

C546 Elliptical Fitness Crosstrainer

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

C546 Serial Codes and Manufacturing Dates

The C546 has been manufactured in three versions. The applicable serial codes and manufacturing dates associated with each version will be detailed below. When servicing a C546 it is critical that you are aware of which version of C546 you are servicing. The differences in the versions may greatly impact service requirements and procedures. For convenience, the versions detailed below will be referred to as version 1, version 2 or version 3 in the remainder of this service manual. Any procedures that do not reference a specific version is applicable to all versions of the C546.

Version 1 was manufactured between March 1998 and September 2000. The serial codes associated with version 1 are 4H, 4K, 4L, 4J, 4M, 4N, 4P, 4R, 4S, 4T, 4U, 4Q, 4V, 4X, 4Y, 4W, 4Z, 5A, 5V, 5W, 5X and H9.

Version 2 was manufactured between July 2000 and August 2001. The serial codes associated with version 2 are 69, 75, 8N, 9A, 9B, 9K, AP, AS, AT, AY, AX, AZ, BL, BM, BN, BP, BR, BT, BW, BY, CA, CB, CC, CD and CE.

Version 3 was manufactured between August 2001 and the present. The serial codes associated with version 3 are DC, DE, EX, GT and GU.

Right, Left, Front, and Back Conventions

In this manual, right, left, front, and back are from the perspective of a user standing on the EFX 546, facing the display enclosure.

Warning and Caution Statements and General Safety Guidelines

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

- To remove power from the EFX, the power cord must be disconnected from the wall outlet. Always ensure that the EFX is unplugged from the wall outlet when you inspect or adjust the EFX, or when you isolate, remove, or replace an EFX component.
- Removing the covers exposes high voltage components and potentially dangerous machinery. Exercise extreme caution when you perform maintenance procedures with the hood removed.
- During service operations you will be very close to moving machinery and high voltage 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 EFX operation.

- A pinching hazard exists when the unit is operated by turning the crankarms by hand. It is possible to seriously pinch a finger between the crankarm and stairarm. The stairarms should be removed before operating the crankarms by hand.

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

- Notice the orientation notch on the PROM. These components must be positioned with the correct notch orientation.
- When it is necessary to lift or move the EFX, ensure that the EFX has adequate support and that you use proper lifting techniques.

Safety guidelines you should know and follow include:

- Read the owner's manual and follow all operating instructions.
- Operate the EFX on a solid, level surface.

- Visually check the EFX 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 EFX.
- When operating the EFX, 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 EFX, while performing service. A water bottle holder is furnished as standard on the EFX 546.
- To prevent electrical shock, keep all electrical components, such as the power cord and circuit breaker away from water and other liquids.
- Do not use accessory attachments that are not recommended by the manufacturer-such attachments might cause injuries.

General Information

On units manufactured prior to August 16, 1998 a single lift connector (J4) was used. On subsequent units the lift motor wiring is in the J3 connector and the lift potentiometer wiring is in the J4 connector. This text will use the connections used on current production units. For units manufactured prior to August 16, 1998, convert the lift connections as shown:

CONNECTION 8/16/98 AND LATER

J3 terminal 1
J3 terminal 2
J3 terminal 3
J4 terminal 1
J4 terminal 2
J4 terminal 3

CONNECTION PRIOR TO 8/16/98

J4 terminal 1
J4 terminal 2
J4 terminal 3
J4 terminal 4
J4 terminal 5
J4 terminal 6

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

Tools Required

Multimeter
Anti-static kit
4" - 6" gear puller
"C" clamp or Carpenter's clamp
US and metric end wrench set
US and metric socket wrench set
Torque wrench, 200 in/lbs.

Allen wrench set
Screwdriver set
Straight edge
Precor part number 20030-117 belt gauge

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 EFX 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

- Turn off and unplug the EFX.
- Wipe down the covers, handlebars, stairarm wheels and stairarm ramps with a damp cloth.

Daily Maintenance

Clean the EFX's frame, covers, stairarms, stairarm ramps and stairarm wheels using water or "Simple Green". Wipe the surface of the electronic console with a damp sponge or soft cloth. Dry with a clean towel. "Simple Green" is the only cleaning solution that has been tested and approved for use on the C546 ramps. Use of any other cleaner, may cause degradation of the ramp anodizing and void the ramp warranty. The use of an acid (citric) based cleaner will cause ramp anodizing damage and is not authorized by Precor.

Weekly Maintenance

- Vacuum underneath the EFX, following these steps:
 1. Turn off the EFX with the circuit breaker, then unplug it from the wall outlet
 2. Place the EFX on its side.

Note:

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

3. Vacuum the rug or damp mop the floor.
4. Make sure that the floor is dry before returning the EFX to an upright position.

Quarterly Maintenance

1. Remove front and rear covers.
2. Clean and lubricate the lift motor drive screw with bearing grease.
3. Check the step up and input belt tension as in Procedure 5.3.
4. Replace both covers.

On-Site Preventive Maintenance (Service Technician)

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

- Perform the software diagnostics. Check LED and keypad function. Record the odometer reading.
- Check speed sensor function (is the stride rate displayed when the unit is in operation?). If not, see Procedure 6.4
- Does the ramp (lift) operate smoothly and quietly? If not, see Procedure 6.5.
- Visually inspect the drive belts for cracks, fraying or excessive wear.
- Inspect the power cord. If the power cord is damaged, install a new power cord.
- Visually examine all wires and check connectors and wire connections. Secure connections and replace wiring as necessary.
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Procedure 3.1 - Software Access Codes

The C546 uses the standard access codes to provide access to the various software features. In using the standardized access codes the keys are hypothetically numbered left to right with key #1 on the far left and key #7 on the far right. 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. If the access is aborted, it will be necessary to start over from the beginning. See 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

Procedure 3.2 - Accessing the Diagnostic Program (version 1)

The EFX diagnostic software cycles through the following tests:

- LED Diagnostics
- Power Bits
- Lift Calibration Number
- Heart Rate
- Keypad Test

Procedure

1. Plug the power cord into the wall outlet, then turn on the EFX with the circuit breaker.
2. Press keys **RESET,5,1,7,6,5,7,6,1.**, sequentially.
3. Watch the upper display as the LED test progresses. The test will illuminate every LED on the display. The test will illuminate the LED's in a specific pattern. When you are familiar with the pattern, it is easy to determine when a LED does not illuminate.
4. If you do not observe the LED illumination sequences described in Step 3...

THEN...

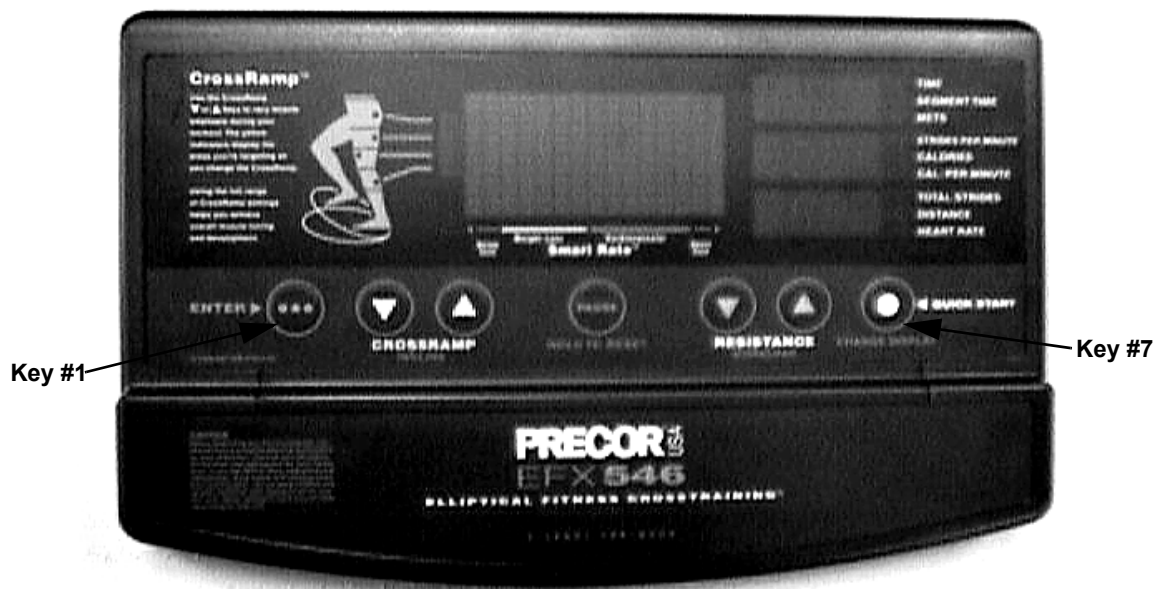
Replace the upper PCA as described in Procedure 7.2 or 7.3.

OTHERWISE...

The LED test passed successfully; continue with the next step.

5. Power Bits will be displayed. Power bits indicates the amount of power being applied to the eddy current magnets and will vary directly with the resistance. Press **ENTER** to continue.
6. With **LIFT** displayed in the right display window, watch the right display window (shown in Diagram 3.1). Press the **CROSSRAMP ▲** or **CROSSRAMP ▼** keys one at a time. Verify that the lift calibration number increments or decrements as each of the **CROSSRAMP** keys are pressed.

Diagram 3.1 - C546 Display



7. Press **ENTER**, then release.
8. With **HART** displayed in the right display window, a heart rate will be displayed when a chest strap or test transmitter is used and the optional heart rate receiver has been installed in the EFX.
9. Press **ENTER** until seven dots illuminate in the left display window.
10. Press each key listed below. Verify that each single dot expands to four dots as the appropriate key is pressed.

ENTER**CROSSRAMP DOWN****CROSSRAMP UP****STOP/RESET****RESISTANCE DOWN****RESISTANCE UP****QUICK START**

Expands the far left dot.

Expands the second dot from the left.

Expands the third dot from the left.

Expands the center dot.

Expands the third dot from the right.

Expands the second dot from the right.

Expands the far right dot.

11. If the left display window column illuminates appropriately as each key is pressed...

THEN...

The keypad test passed successfully;
continue with the next step.

OTHERWISE...

Troubleshoot per Procedure 6.2 or 6.3

12. End the keypad test by pressing the **CROSSRAMP ▼** and **RESISTANCE ▲** keys simultaneously.

Procedure 3.3 - Accessing the Diagnostic Program (version 2,3)

The EFX diagnostic software cycles through the following tests:

- Display Test
- Keyboard Test
- Heart Rate
- Lift Calibration
- Brake Test

Procedure

1. Plug the power cord into the wall outlet, then turn on the EFX with the circuit breaker.
2. Press keys **RESET,5,1,7,6,5,7,6,1.**, sequentially.
3. The message **DISPLAY TEST** will be displayed.
4. All of the LED's on the display will be illuminated. Check to ensure that all of the LED's are illuminated.
5. Press the **ENTER** key to continue to the next test.
6. The message **KEYBOARD TEST** will be displayed.
7. The display will light two dots for each key on the display. When a key is pressed the upper of the two lights will go out. Check each key position to ensure that all keys are functioning normally.
8. Press and hold the **ENTER** key to continue to the next test.
9. The message **HEART RATE TEST** will be displayed.
10. Three heart rate readings will be displayed. They will be from left to right, unfiltered, filtered and polar readings. They will be designated **U**, **F** and **P**, respectively.
11. Press the **ENTER** key to continue to the next test.

Diagram 3.1 - C546 Display



12. The message **LIFT TEST** will be displayed.
13. The display will read **INCLINE** followed by the incline setting and **A/D** followed by the analog to digital lift number (lift calibration number). When the lift is operated, the incline position should change and the A/D number should track the incline position.
14. The A/D number should range between approximately 94 and 209.
15. Press the **ENTER** key to continue to the next test.
16. The message **BRAKE TEST** will be displayed.
17. The display will read **LEVEL** followed by the resistance level and **BRAKE** followed by the power bits number. When the resistance level is changed, the level should change and the power bits number (brake) should track the resistance level.
18. The brake level should range between approximately 0 and 89.
19. Press the **ENTER** key to exit the diagnostics program.

Procedure 3.4 - Displaying the Odometer (version 1)

Procedure

1. Plug the power cord into the wall outlet, then turn on the EFX with the circuit breaker.
2. With the **PRECOR EFX 546** banner scrolling, press keys **RESET,6,5**, sequentially until the message **EFX 546 ODOMETER** scrolls across the display window.
3. Press **ENTER**, then release.

Note:

The right display window displays the total strides on the EFX 546 (see Diagram 3.2). The number displayed is 102,187. To convert strides to miles, divide the total number of strides by 2241. To convert strides to kilometers, divide the total number of strides by 1392.5.

Diagram 3-2. - Odometer Reading

0	0	0	0
0	0	1	0
2	1	8	7

4. Press **ENTER**, the software version and part number of the PROM will be displayed.

Note:

If you cannot determine the software version number in this manner, look at the PROM mounted on the upper PCA. A label on the PROM indicates the software version number.

5. Press **ENTER**, to exit.

Procedure 3.5 - Displaying the Odometer (version 2,3)

Procedure

1. Plug the power cord into the wall outlet, then turn on the EFX with the circuit breaker.
2. With the **PRECOR EFX 546** banner scrolling, press keys **RESET,6,5**, sequentially.
3. The message **ODOMETER** will be displayed.
4. The display will then read **XXXXXXXX STRIDES**. Where XXXXXXXX is the total number of strides accumulated on the EFX.
5. Press the **ENTER** key to continue.
6. The message **HOOR METER** will be displayed.
7. The display will then read **XXXX HOURS**. Where XXXX is the total number of hours the unit has been in operation.
8. Press the **ENTER** key to continue.
9. The message **SOFTWARE VERSION** will be displayed.
10. The display will then read **UPPER X.XX** and **LOWER X.XX**. Where X.XX is the software version number. Both the upper PCA software version and lower PCA software version numbers are displayed.
11. Press the **ENTER** key to continue.
12. The message **ERROR LOG** will be displayed.
13. The display will then show the log position number in the upper (heart rate) display window, the error code in the middle (large) window and the stride count and hour meter reading when the error occurred in the lower window. Log position 1 will be the most recent error logged.
14. Press the **ENTER** key to exit the odometer program.

Procedure 3.6 - Club Settings (version 1)

1. Enter the club settings by pressing keys **RESET,5,6,5,1,5,6,5**, sequentially.
2. The maximum workout time will be displayed. The maximum workout may be selected with either of the ▲ or ▼ keys. Press **ENTER** to continue.
3. The maximum workout time is displayed on the left display window. The maximum workout time is the maximum time a user is allowed to use the unit.
4. The maximum workout time is adjustable between 10 and 240 minutes. If you wish to change the maximum workout time...

THEN...

Use the ▲ or ▼ keys to select the new maximum workout time; then continue with the next step.

OTHERWISE...

Continue with the next step.

5. Press **ENTER**, to continue.
6. The pause time will be displayed. The pause time is the length of time from the point that the **PAUSE** key is pressed until the unit resets to the start up point if the unit is left inactive. The pause time is adjustable between 1 and 120 seconds. The pause time may be selected with either of the ▲ or ▼ keys. Press **ENTER** to exit.

Procedure 3.7 - Club Settings (version 2,3)

1. Enter the club settings by pressing keys **RESET,5,6,5,1,5,6,5**, sequentially
2. The message **SELECT LANGUAGE** will be displayed.
3. Use the **▲**, **▼** keys to select the language to be displayed.
4. When the desired language has been selected, press the **ENTER** key to continue.
5. The message **SELECT UNITS** will be displayed.
6. Use the **▲**, **▼** keys to select the unit of measure to be displayed.
7. When the desired unit of measure has been selected, press the **ENTER** key to continue.
8. The message **SELECT MAXIMUM WORKOUT TIME** will be displayed.
9. Use the **▲**, **▼** keys to select the maximum workout time to be displayed. The maximum workout time sets the maximum amount of time the user can remain in a course.
10. When the desired maximum workout time has been selected, press the **ENTER** key to continue.
11. The message **SELECT MAXIMUM PAUSE TIME** will be displayed.
12. Use the **▲**, **▼** keys to select the maximum pause time to be displayed. The maximum pause time sets the amount of time the unit will remain in the pause mode before it resets to the start up banner.
13. When the desired maximum pause time has been selected, press the **ENTER** key to exit the club settings program.

Procedure 3.8 - Documenting Software Problems

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

When a problem occurs, record the following information:

- Model and serial number
- Software version number

Note:

Look at the PROM mounted on the upper PCA. A label on the PROM indicates the software version number.

- 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.

Section Four - Checking EFX 546 Operation

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

Procedure

1. Plug the power cord into the wall outlet and set the on/off switch in the “on” position.
2. When the **PRECOR EFX 546.....WORK OUT SMARTER** banner scrolling, press **QUICK START**.
3. If the ramp is not currently at the mid-point, the ramp will automatically move to the mid-point.
4. Select Resistance Level 1 and press **ENTER**.
5. Operate the EFX for 4–5 minutes. As you operate the EFX, concentrate on the operating sounds made by the unit. Be on the alert for unusual rubbing, hitting, grinding, or squeaking noises.
6. If the EFX 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 EFX for another 2–3 minutes.
8. If the EFX resistance does not change or the operation of the EFX feels inconsistent compared with Resistance Level 1, troubleshoot per Section 6.
9. Press the **RESISTANCE ▲** key until you reach Resistance Level 20. Operate the EFX for another 2–3 minutes.
10. If the resistance of the EFX 546 does not change or the EFX operation feels inconsistent with Resistance Levels 1 and 10, troubleshoot per Procedure 6.6.
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. Press the **CROSSRAMP ▲** key while viewing the electronic console. Confirm that the foot pads incline and the ramp display increments to 20 as the **CROSSRAMP ▲** key is pressed.
13. Press the **CROSSRAMP ▼** key while viewing the electronic console. Confirm that the foot pads return to a level position and the ramp display decrements to 1 as the **CROSSRAMP ▼** key is pressed.

14. If the ramp system of the EFX 546 does not operate properly, troubleshoot per Procedure 6.5.
15. Turn off the EFX with the circuit breaker, then unplug the power cord from the wall outlet.

Procedure 5.1 - Measuring the Resistance of an Eddy Current Magnet

Caution

Remove power from the EFX before you measure magnet resistance.

Procedure

1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.

WARNING

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

1. Remove the rear cover as described in Procedure 7.1.
2. Set the ohmmeter to a range that will conveniently read up to 125 Ω .
3. Disconnect the magnet wires. Measure the resistance between the two magnet wires.

Note:

The resistance of the magnets will be higher than optimum (90 - 110 Ω) when they are warm.

4. If the resistance measures significantly less than 90 Ω or significantly more than 110 Ω ...

THEN...

Replace the magnet as described in Procedure 7.20.

OTHERWISE...

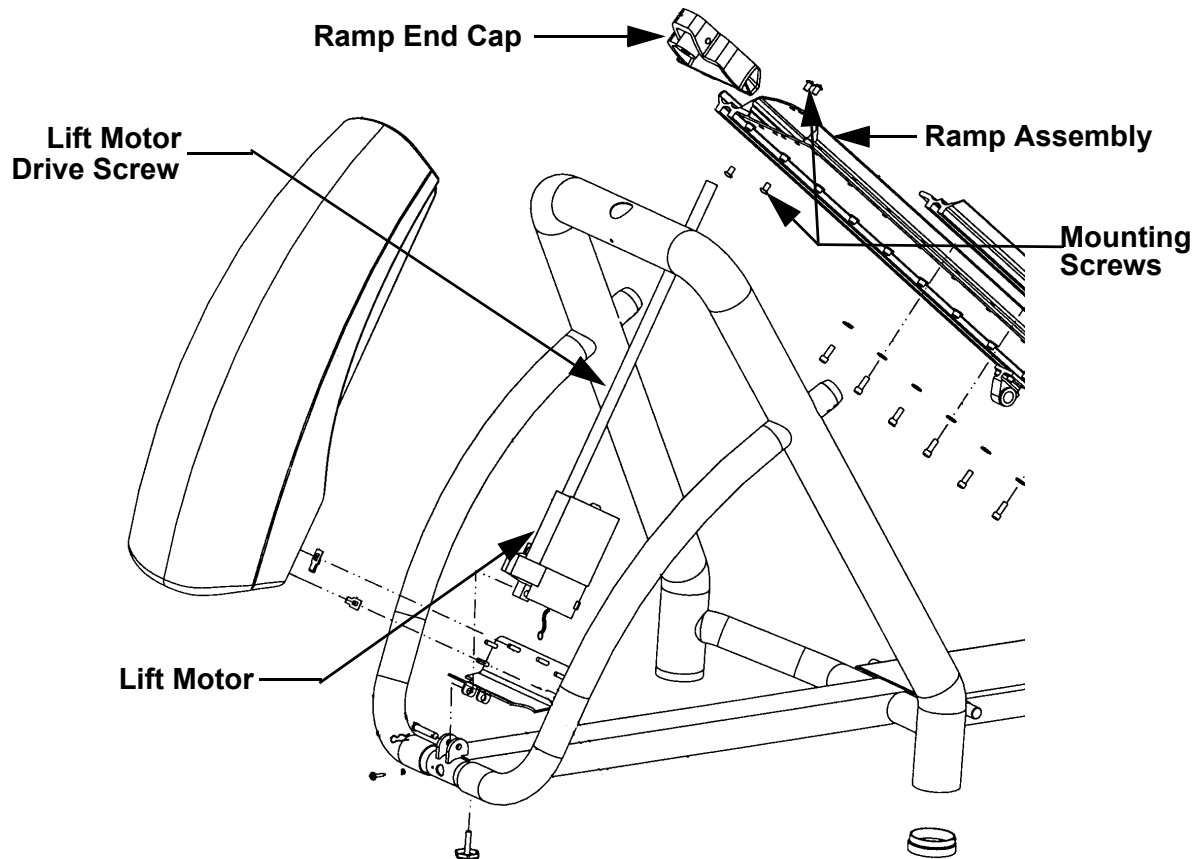
Reconnect the magnet wires, then continue with the next step.

5. Re-install the rear cover as described in Procedure 7.1, then check the operation of the unit as described in Section Four.

Procedure 5.2 - Calibrating the Lift Motor (version 1,2)

1. In order to correctly calibrate the lift the unit's software version must be known. If the unit's software version is not known, access the software version per Procedure 3.3.
2. In order to calibrate the lift motor, it is necessary to disconnect the lift motor from the ramp assembly.
3. Set the on/off switch in the "off" position. Remove the screws that retain the front cover and remove the front cover.
4. Remove the four screws that retain the ramp end cap to the ramp assembly. Support the lift motor and ramp assembly as you separate the ramp end cap from the ramp assembly. Lower the ramp assembly until it is resting on the frame. (See Diagram 5.1)

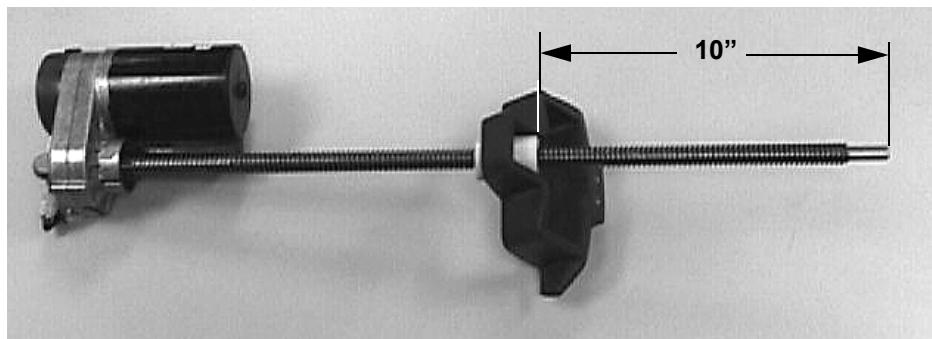
Diagram 5.1 - Lift Motor Mounting



5. Do not remove the ramp end cap from the lift motor drive screw.
6. Set the on/off switch in the "on" position. Enter the diagnostics routine per Procedure 3.2. After the L.E.D. test is complete, power bits will be displayed. Press the **ENTER** key to display the lift calibration number.

7. If the unit is equipped with software version 1.13 or less, continue with step 7. If the software version is 1.14 or greater, skip to step 10.
8. Operate the **CROSSRAMP ▲** or **CROSSRAMP ▼** keys as required to set the lift calibration number to 200.
9. Rotate the ramp end cap on the lift motor drive screw until the distance from the upper surface of the plastic nut in the ramp end cap to the end of the lift motor drive screw is 1-1/2". If the lift motor drive screw rotates the lift calibration number will no longer be 200. The lift calibration number must be 200 and the distance measurement must be correct for the lift calibration to be correct.
10. Set the on/off switch in the "off" position. Do not exit the diagnostic program in the normal manner. Exiting the diagnostic program will cause the lift to self center and invalidate the lift calibration just performed. Skip to step 13.
11. Operate the **CROSSRAMP ▲** or **CROSSRAMP ▼** keys as required to set the lift calibration number to 139.
12. Rotate the ramp end cap on the lift motor drive screw until the distance from the upper surface of the plastic nut in the ramp end cap to the end of the drive screw is 10". If the lift motor drive screw rotates the lift calibration number will no longer be 139. The lift calibration number must be 139 and the distance measurement must be correct for the lift calibration to be correct. See Diagram 5.2.
13. Set the on/off switch in the "off" position. Do not exit the diagnostic program in the normal manner. Exiting the diagnostic program will cause the lift to self center and invalidate the lift calibration just performed.
14. Raise the ramp assembly to a convenient height and slide the ramp end cap into the ramp assembly. Hand tighten the four ramp end cap mounting screws and then torque them to 100 in/lbs.
15. Set the on/off switch in the "on" position. Thoroughly test all lift related functions per Section Four.
16. Set the on/off switch in the "off" position, replace the front cover per Procedure 7.1.

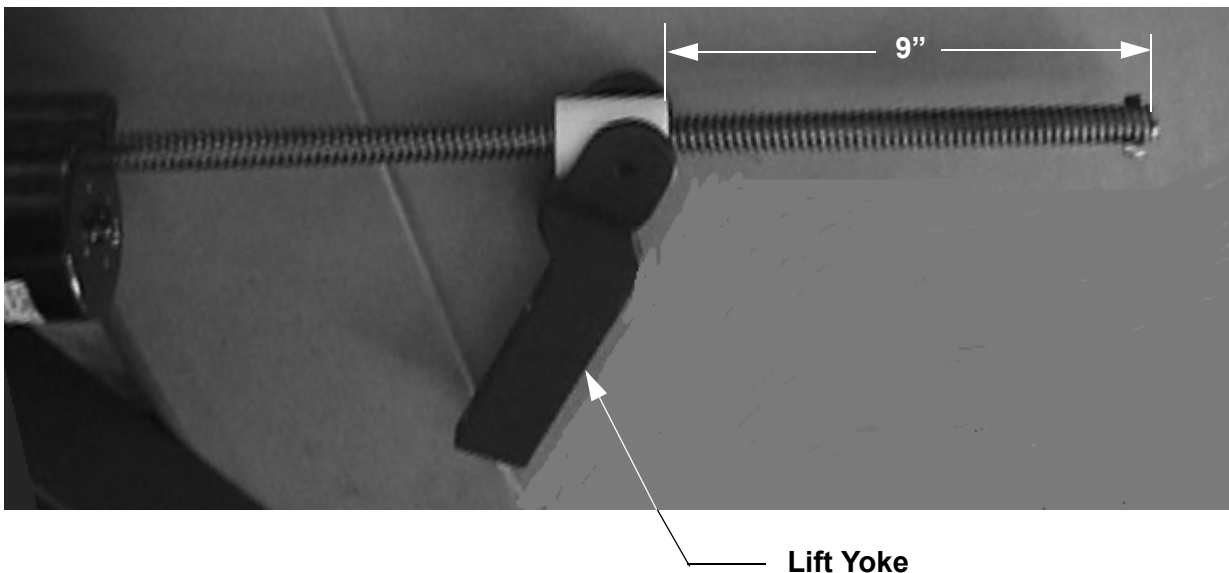
Diagram 5.2 - Lift Motor Calibration (Version 1,14 or greater)



Procedure 5.3 - Calibrating the Lift Motor (version 3)

1. In order to calibrate the lift motor, it is necessary to disconnect the lift motor from the ramp assembly.
2. Set the on/off switch in the "off" position. Remove the s front cover per Procedure 7.1.
3. Remove the four screws that retain the lift yoke to the ramp assembly. Support the lift motor and ramp assembly as you separate the lift yoke from the ramp assembly. Lower the ramp assembly until it is resting on the frame. (See Diagram 5.3)

Diagram 5.3 - Lift Motor Calibration



4. Set the on/off switch in the "on" position. Enter the diagnostics routine per Procedure 3.2. After the L.E.D. test is complete, power bits will be displayed. Press the **ENTER** key to display the lift calibration number.
5. Operate the **CROSSRAMP ▲** or **CROSSRAMP ▼** keys as required to set the lift calibration number to 127.
6. Rotate the lift yoke on the lift motor drive screw until the distance from the upper surface of the plastic nut in the lift yoke to the end of the drive screw is 9". If the lift motor drive screw rotates the lift calibration number will no longer be 127. The lift calibration number must be 127 and the distance measurement must be correct for the lift calibration to be correct. See Diagram 5.3.
7. Set the on/off switch in the "off" position. Do not exit the diagnostic program in the normal

manner. Exiting the diagnostic program will cause the lift to self center and invalidate the lift calibration just performed.

8. Raise the ramp assembly to a convenient height and slide the lift yoke into the ramp assembly. Hand tighten the four lift yoke mounting screws and then torque them to 240 in/lbs.
9. Set the on/off switch in the "on" position. Thoroughly test all lift related functions per Section Four.
10. Set the on/off switch in the "off" position, replace the front cover per Procedure 7.1.

Procedure 5.4 - Inspecting and Adjusting Belt Alignment and Tension

Procedure

1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.

WARNING

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

2. Remove the rear cover as described in Procedure 7.1.
3. Remove both stairarms as described in Procedure 7.24.
4. Operate the unit by rapidly rotating a crankarm by hand. As the unit operates watch the drive belts for proper alignment. The belts should operate parallel to each other and the belts should maintain even spacing.
5. If the belts are not correctly aligned...

THEN...

Continue with the next step.

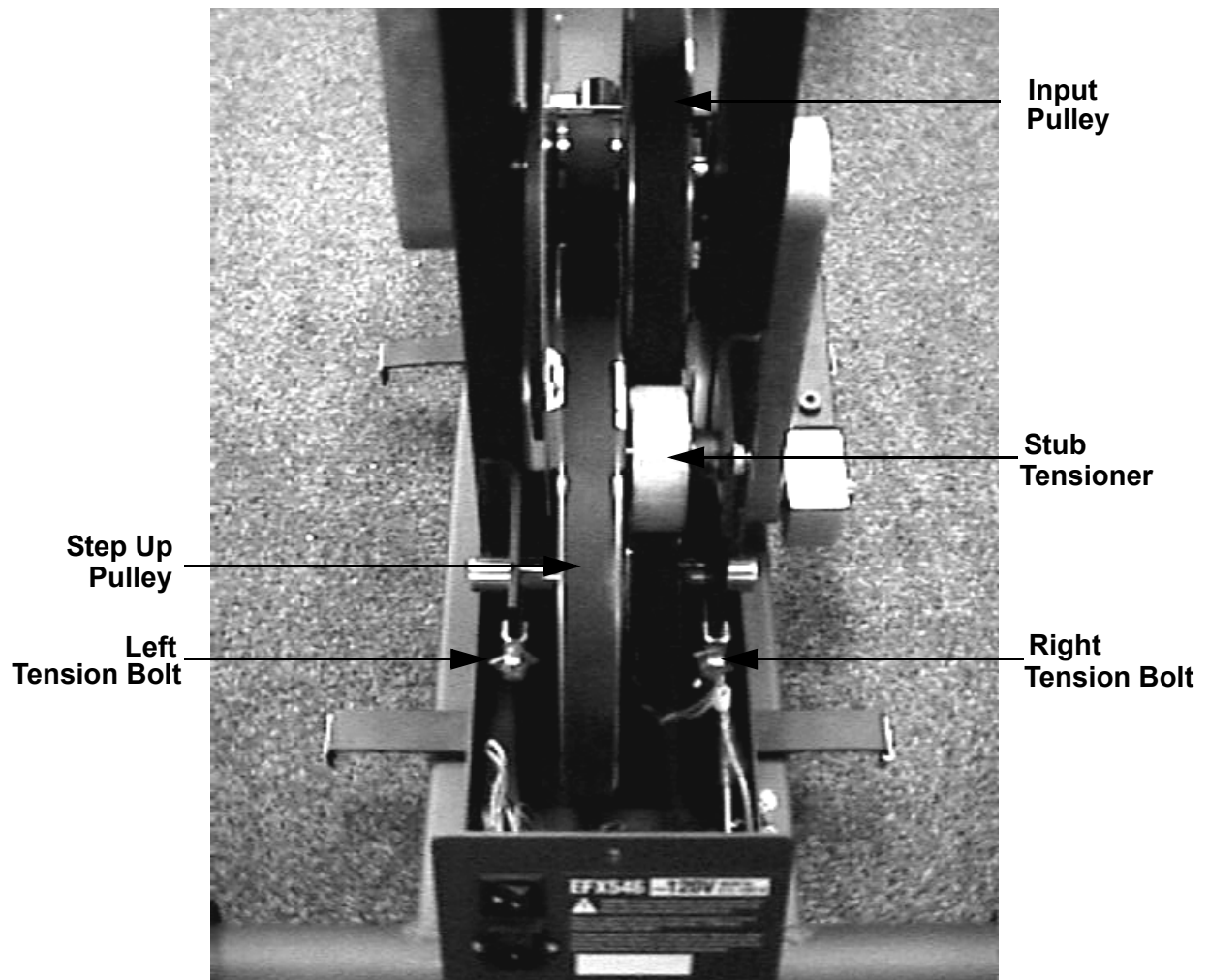
OTHERWISE...

Skip to step 13

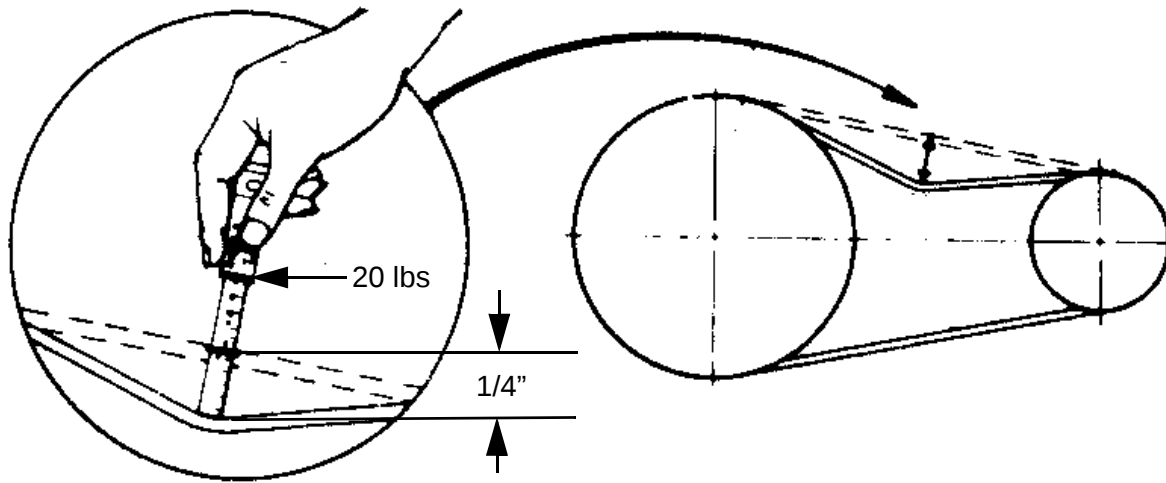
6. Refer to Diagram 5.4 for the following belt alignment steps. The right and left tension bolts have locking tabs. If necessary, use pliers to bend the locking tabs out of the way so that the bolts can be turned.
7. If the step up pulley belt is out of alignment to the right, continue with step 9.
8. If the step up pulley belt is out of alignment to the left, continue with step 11.
9. Turn the left tension bolt 1/4 turn clockwise, then repeat step 4. If turning the left adjustment bolt 1/4 of a turn was not sufficient, turn the right tension bolt 1/4 of a turn counterclockwise.
10. Repeat step 8, alternating between the left and right tension bolts until the alignment is correct. Continue with step 13.
11. Turn the right tension bolt 1/4 of a turn clockwise, then repeat step 4. If turning the right adjustment bolt 1/4 of a turn was not sufficient, turn the left tension bolt 1/4 turn counterclockwise.
12. Repeat step 11, alternating between the right and left tension bolts until the alignment is correct.

13. Belt tension must now be checked and if necessary corrected. Remember, if it is necessary to change the belt tension, the belt alignment must be maintained.

Diagram 5.4 - Drive Unit



14. Place a belt gauge (McMaster-Carr 6160K12 or Grainger 3HX33) in the middle of the step up belt and the center of the belt span (see Diagram 5.5). Lay a straight edge along the length of the belt and beside the belt gauge. Slide one of the o-rings up against the shoulder of the belt gauge. Press downward on the belt gauge, causing the belt to deflect. Read the deflection on the belt gauge at the edge of the straight edge. Deflect the belt 1/4". Read the tension across the top edge of the o-ring. If the belt is correctly tensioned the gauge will read between 19 and 21 pounds.
15. If the tension in step 13 is correct skip to step 18. Otherwise continue with the next step.

Diagram 5.5 - Measuring Belt tension

16. If the locking tabs on the right and left tension bolts have not been straightened, use pliers to bend the locking tabs out of the way so that the bolts can be turned.

IF...

The belt tensioning gauge reads less than 19 pounds

THEN...

Turn both tension bolts **clockwise**, in equal quarter-turn increments, until the belt tensioning gauge reads 19 - 21 pounds @ 1/4" deflection.

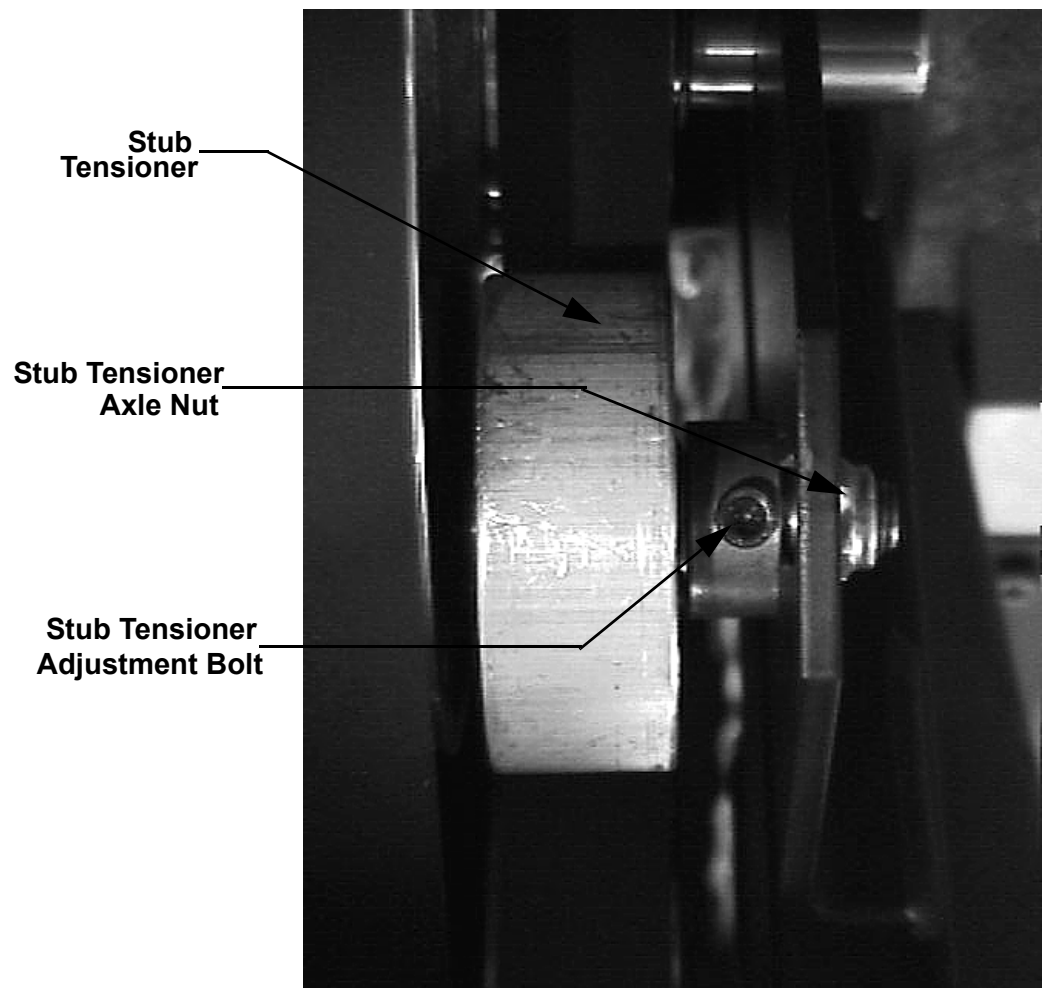
The belt tensioning gauge reads more than 21 pounds

Turn both tension bolts **counterclockwise**, in equal quarter-turn increments, until the belt tensioning gauge reads 19 - 21 pounds @ 1/4" deflection.

17. Verify that the belt alignment is still correct by performing the procedure in step 4.
18. When both the step pulley tension and alignment are correct, use pliers to bend the tension bolt locking tabs into the "locking" position.
19. The input pulley tension must now be checked and corrected, if necessary. There is not sufficient room to use the belt tension gauge to set the input pulley belt tension. It will be necessary to use the correctly tensioned step up belt as a comparison to set the input belt tension.
20. Using your finger, press in on the center of the step up pulley belt to get a feeling of how much pressure it takes to deflect the belt a 1/4".

21. Using your finger, press in on the center of the lower span of the input belt. Compare the pressure required to deflect the input belt to the pressure required to deflect the step up belt.

Diagram 5.6 - Stub Tensioner



22. Loosen the stub tensioner axle nut slightly. Turn the stub tensioner adjustment bolt clockwise to increase or counterclockwise to decrease the input belt tension.
23. When the input belt tension is correct, torque the stub tensioner nut to 200 in/lbs. Replace the stairarms per Procedure 7.24.
24. Check the operation of the unit as described in Section Four, then re-install the rear cover as described in Procedure 7.1

Procedure 6.1 - Troubleshooting the Lower and Upper Interconnect Cables

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

Troubleshooting the Upper Interconnect Cable

Note:

There are three different interconnect cable combinations that were used on the C546. Units with serial numbers starting with 4H or 5V manufactured prior to Feb. 8, 1999 used an upper and lower ribbon cable. Units with serial numbers starting with 4H or 5V manufactured after Feb. 8, 1999 used a single ribbon cable. Units with serial numbers starting with 9A, 9B, 75 or 9K use an upper and lower telephone cable (RJ45). For units with serial numbers starting with 4H or 5V manufactured prior to Feb. 8, 1999 start with step 1. For units with serial numbers starting with 4H or 5V manufactured after Feb. 8, 1999 start with step 22. For units with serial numbers starting with 9A, 9B, 75 or 9K manufactured start with step 31.

Version 1 units, manufactured prior to Feb. 8, 1999

1. Set the on/off switch in the "off" position.

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 lead of the wrist strap to the units frame.
3. Remove the interconnect cable cover. (See Diagram 7.2)
4. Remove the rear cover. For convenience the upper interconnect cable is the cable that attaches to the upper PCA and the lower interconnect cable is the cable that connects to the lower PCA.
5. Lay the unit on it's side. There is an access hole in the bottom of the main frame tube that allows access to the junction of the upper and lower interconnect cables. (See Diagram 7.6)
6. Disconnect the upper interconnect cable from the upper PCA and the lower interconnect cable.
7. Connect a known good upper interconnect cable from the lower interconnect cable to the upper PCA. Route the cable outside of the unit at this time.
8. Check operation as described in Section Four.
9. If the unit operated correctly when the new interconnect cable was installed, the original

interconnect cable is bad. Install a new interconnect cable per Procedure 7.7. If the unit does not operate properly, continue with the next step.

10. Reconnect the original upper interconnect cable to the upper PCA.

Troubleshooting the Lower Interconnect Cable

11. Remove the shield from the lower PCA.
12. Remove the interconnect cable from the lower PCA.
13. Connect a known good lower interconnect cable between the lower PCA and the upper interconnect cable.
14. Check operation as described in Section Four.
15. If the unit operated correctly when the spare lower interconnect cable was installed, the original interconnect cable is bad. Install a new interconnect cable per Procedure 7.7. If the unit does not operate properly, continue with the next step.
16. Reconnect the original lower interconnect cable to the lower PCA.
17. Reconnect the lower interconnect cable to the upper interconnect cable.
18. Replace the lower PCA shield.
19. Replace the rear cover.
20. Replace the interconnect cable cover.
21. Check operation as described in Section Four.

Version 1 units, manufactured after Feb. 7, 1999

22. Set the on/off switch in the "off" position.
23. Attach the anti-static wrist strap to your arm, then connect the ground lead of the wrist strap to the units frame.
24. Remove the interconnect cable cover. (See Diagram 7.2)
25. Remove the rear cover.
26. Disconnect the interconnect cable from the upper PCA and from the lower PCA.
27. Connect a known good upper interconnect cable from the lower PCA to the upper PCA. Route the cable outside of the unit at this time.
28. Check operation as described in Section Four.

29. If the unit operated correctly when the new interconnect cable was installed, the original interconnect cable is bad. Install a new interconnect cable per Procedure 7.7. If the unit does not operate properly, continue with the next step.
30. Reconnect the original upper interconnect cable to the upper PCA.

Version 2,3

31. Set the on/off switch in the "off" position.
32. Attach the anti-static wrist strap to your arm, then connect the ground lead of the wrist strap to the units frame.
33. Remove the interconnect cable cover. (See Diagram 7.2)
34. Remove the rear cover. For convenience the upper interconnect cable is the cable that attaches to the upper PCA and the lower interconnect cable is the cable that connects to the lower PCA.
35. Connect a known good upper interconnect cable from the lower interconnect cable to the upper PCA. Route the cable outside of the unit at this time.
36. Check operation as described in Section Four.
37. If the unit operated correctly when the new interconnect cable was installed, the original interconnect cable is bad. Install a new interconnect cable per Procedure 7.5. If the unit does not operate properly, continue with the next step.
38. Reconnect the original upper interconnect cable to the upper PCA.

Troubleshooting the Lower Interconnect Cable

39. Remove the shield from the lower PCA.
40. Remove the interconnect cable from the lower PCA.
41. Connect a known good lower interconnect cable between the lower PCA and the upper interconnect cable.
42. Check operation as described in Section Four.
43. If the unit operated correctly when the spare lower interconnect cable was installed, the original interconnect cable is bad. Install a new interconnect cable per Procedure 7.7. If the unit does not operate properly, continue with the next step.
44. Reconnect the original lower interconnect cable to the lower PCA.
45. Reconnect the lower interconnect cable to the upper interconnect cable.

46. Replace the lower PCA shield.
47. Replace the rear cover.
48. Replace the interconnect cable cover.
49. Check operation as described in Section Four

Procedure 6.2 - Troubleshooting the Keypad and Upper PCA (version 1)

If the function keys on the electronic console are unresponsive, the problem may be either the upper PCA or keypad. This troubleshooting procedure gives you the information you need to determine which of these components is malfunctioning.

Procedure

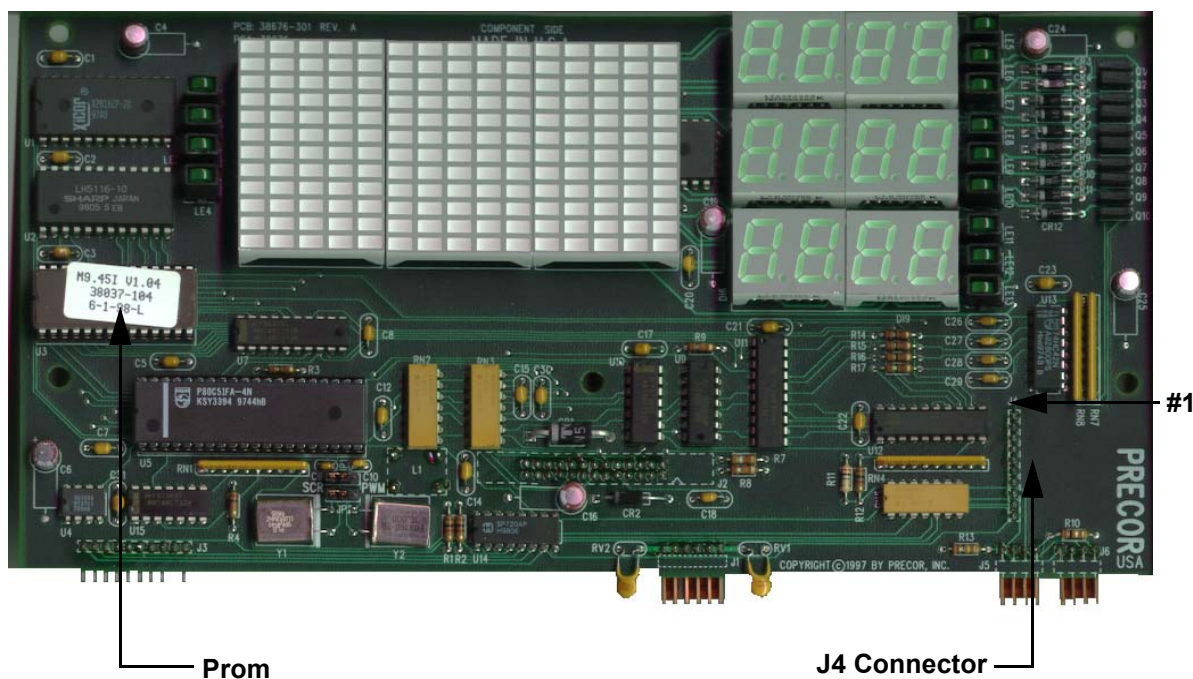
1. Set the circuit breaker in the "off" position.

WARNING

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

2. Remove the screws that secure the upper display assembly to the upper handrail. Carefully, pull some excess interconnect cable out from the targa upright. Rotate the display housing, so that the rear of the upper PCA is facing upward, and set the display housing on the upper handrail.
3. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the treadmill frame.

Diagram 6.1 - Upper PCA



4. Set the voltmeter to a range that will conveniently read +6 Vdc.
5. Set the circuit breaker in the “on” position.
6. Use a DVM, set for DC volts, and read between pin 6 of J4 and the each of the pins in Table 6.1 (no keys pressed) and Table 6.2 (with the appropriate key pressed)...

Table 6.1. - Voltage Test Points (Function Keys Not Pressed)

PLACE THE POSITIVE LEAD OF THE VOLTMETER ON...	THE VOLTMETER SHOULD READ...
Pin 3 of J4	5.25 Vdc $\pm$ 50 mVdc
Pin 4 of J4	5.25 Vdc $\pm$ 50 mVdc
Pin 5 of J4	5.25 Vdc $\pm$ 50 mVdc
Pin 7 of J4	5.25 Vdc $\pm$ 50 mVdc
Pin 8 of J4	5.25 Vdc $\pm$ 50 mVdc
Pin 9 of J4	5.25 Vdc $\pm$ 50 mVdc
Pin 10 of J4	5.25 Vdc $\pm$ 50 mVdc

Table 6.2. - Voltage Test Points (Function Keys Pressed)

PLACE THE POSITIVE VOLTMETER LEAD ON...	AT THE DISPLAY ENCLOSURE, PRESS...	THE VOLTMETER SHOULD READ BETWEEN...
Pin 3 of J4	ENTER	0 Vdc and 500 mVdc
Pin 4 of J4	CROSSRAMP ▼	0 Vdc and 500 mVdc
Pin 5 of J4	CROSSRAMP ▲	0 Vdc and 500 mVdc
Pin 7 of J4	PAUSE	0 Vdc and 500 mVdc
Pin 8 of J4	RESISTANCE ▼	0 Vdc and 500 mVdc
Pin 9 of J4	RESISTANCE ▲	0 Vdc and 500 mVdc
Pin 10 of J4	QUICK START	0 Vdc and 500 mVdc

7. If the voltage readings match those listed in Tables 6.1 and 6.2 and one or more keys do not function, replace the upper PCA.
8. If the voltage readings in Table 6.1 are incorrect, disconnect the keypad cable from the keypad connector and repeat the voltage measurements in 6.1. If the voltage readings are now correct, replace the display housing (keypad). If the voltage readings are still incorrect, replace the upper PCA.
9. If the voltage readings in Table 6.1 are correct and one or more voltage readings in Table 6.2 are incorrect, replace the display housing (keypad).
10. Set the circuit breaker in the “off” position.
11. If necessary, carefully re-connect the keypad cable to the keypad connector.
12. Remove the ground lead of the wrist strap from the treadmill frame, then remove the wrist strap from your arm.

13. Position the display enclosure on the display plate. Install the screws that secure the display enclosure to the display plate.
14. Check the operation of the treadmill as described in Section Three of this appendix

Procedure 6.3 - Troubleshooting the Keypad and Upper PCA (version 2,3)

If the function keys on the electronic console are unresponsive, the problem may be either the upper PCA or keypad. The keys on this unit are touch sensitive keys. It is necessary to use the keypad diagnostics to troubleshoot the key functions.

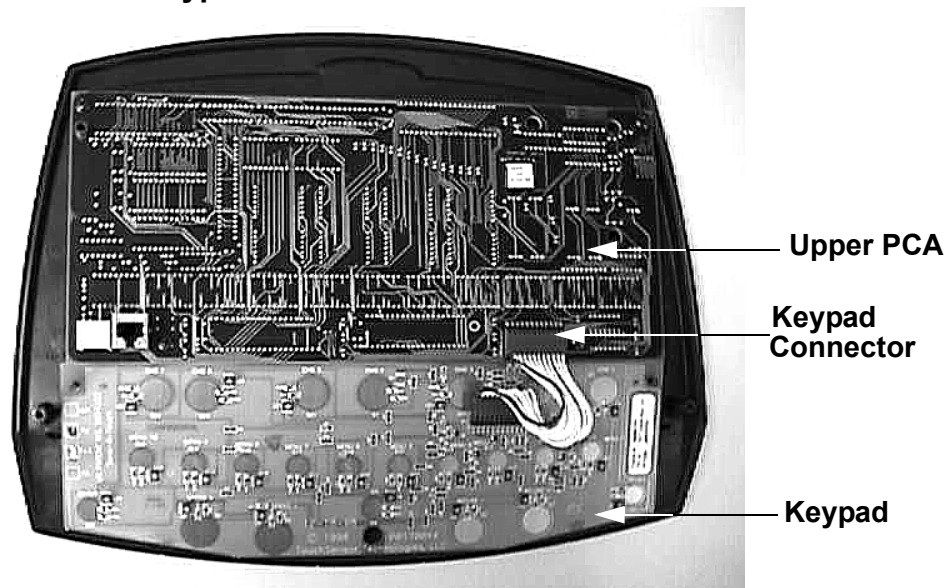
Procedure

1. Set the on/off switch in the "off" position.

WARNING

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

2. Attach the anti-static wrist strap to your arm, then connect the ground lead of the wrist strap to the units frame.
3. If the EFX powers up and functions normally until a particular key(s) is pressed, skip to step 12.
4. If a "key depressed" message is immediately displayed when the EFX is powered up, continue with the next step.
5. This condition may be caused by either the keypad or upper PCA. Set the on/off switch in the "off" position.
6. Remove the four screws that fastens the display housing front panel to the display housing backing plate. These screws are located on the rear of the display housing backing plate.
7. Lift the display housing front panel off of the display housing backing plate. Remove the keypad connector from the upper PCA. See Diagram 6.2.

Diagram 6.2 - Upper PCA & Keypad

8. Set the on/off switch in the "on" position.
9. If a "key depressed" message is immediately displayed when the EFX is powered up, replace the upper PCA.
10. If a "key depressed" message is not displayed when the EFX is powered up, replace the display housing front panel. The display housing front panel is equipped with the keypad.
11. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer service.
12. 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.
13. Test the keypad per Procedure 3.2, step 4.
14. 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.
15. 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.
16. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer service.

Procedure 6.4 - Troubleshooting the Speed Sensor

Circuit Description

The speed sensor is a hall effect sensor. A magnet is mounted on the right hand crankarm and passes the hall effect sensor once per revolution. The output from the speed sensor is a 5 Vdc square wave, the frequency of which indicates the operating speed. When a square wave output is not being generated by the speed sensor the system assumes the unit is not in use and removes resistance from the eddy current magnet system.

WARNING

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

Procedure

1. Remove the rear cover. Plug the unit into a wall outlet and set the on/off switch in the "on" position. Set the unit in the manual program and operate the unit. If a stride rate is not displayed, the speed sensor is not operative. We shall use the presence of a stride rate to determine when the speed sensor is functioning normally.
2. A magnet must be installed in the crankarm that passes the speed sensor with it's south pole facing the speed sensor. If the stride rate is not being displayed in step 1, verify that a magnet is installed in the crankarm associated with the speed sensor and that the south pole faces outward. The magnet polarity may be checked with another magnet with known poles or a compass. The north pole of the test magnet or the south facing needle should be attracted to the speed sensor magnet.
3. Using a DC voltmeter, measure the voltage between terminal 1 (red wire) and terminal 5 (black wire) on the speed sensor connector. The measurement should be approximately 5 Vdc. If the voltage is correct, skip to step 5. If the voltage is missing or significantly low, disconnect the speed sensor connector from the speed sensor and repeat the measurement on the connector. If the voltage is now correct, replace the speed sensor. If the voltage is still missing or significantly low, continue with step 4.
4. Repeat the measurements in step 3 at terminals 1 and 5 of J8 on the lower PCA. If the voltage is missing or significantly low, replace the lower PCA. If the voltage is now correct, replace the speed sensor assembly.
5. Using a DC voltmeter, measure the voltage between terminal 1 (red wire) and terminal 2 (blue/white wire) on the speed sensor connector. Slowly rotate the flywheel as you monitor the voltage. The measurement should switch between approximately 0.5 Vdc and approximately 4.25 Vdc. If the voltage is correct, skip to step 6. If the voltage does not switch (the voltage is constantly low or high as the flywheel is slowly rotated), replace the speed sensor. If the voltage switches correctly, but the stride rate is still not displayed when the unit is operated, replace the lower PCA.

6. Repeat the measurement in step 5 at terminals 1 and 2 of J8 on the lower PCA. If the voltage is missing or significantly low, replace the speed sensor assembly.
7. If you have performed all of the above tests and the stride rate is not displayed when the unit is operated, there are three parts that could cause the problem. There are not any good tests to check these parts other than substituting a known good part. They are lower PCA, ribbon cable and upper PCA. Replace only one part at a time. If the new part does not correct the problem, replace the original part.
8. If you have performed all of the above tests and the speed sensor is still not functioning, call Precor Technical Support.

Procedure 6.5 - Troubleshooting the Lift System

Note:

The lift motor is disabled when the EFX is not being used. The speed sensor must detect motion in order for lift operation to be enabled. In the following procedures, when lift motor movement is being tested the stairarms must be in motion. Before performing this procedure, ensure that the speed sensor is operating normally per Procedure 6.4.

Note:

On version 1 units manufactured prior to August 16, 1998 a single lift connector (J4) was used. On subsequent units the lift motor wiring is in the J3 connector and the lift potentiometer wiring is in the J4 connector. This text will use the connections used on current production units. For version 1 units manufactured prior to August 16, 1998, convert the lift connections as shown:

CONNECTION 8/16/98 AND LATER

J3 terminal 1
J3 terminal 2
J3 terminal 3
J4 terminal 1
J4 terminal 2
J4 terminal 3

CONNECTION PRIOR TO 8/16/98

J4 terminal 1
J4 terminal 2
J4 terminal 3
J4 terminal 4
J4 terminal 5
J4 terminal 6

1. If the lift motor will not move skip to step 7. If the lift motor moves and an error occurs continue with step 2.
2. Access the diagnostics program per Procedure 3.2 and proceed to the lift calibration portion of the diagnostics program. If the lift calibration number is 0 or 255 skip to step 3. Operate the lift, if the lift calibration number does not increment as the lift moves, skip to step 3. If the calibration number increments as the lift moves, re-calibrate the lift per Procedure 5.3. If re-calibration does not correct the problem, continue with step 3.
3. Set the on/off switch in the "off" position. Using an ohmmeter, measure between terminal 1 (brown or green wire) and terminal 3 (orange wire) of the J4 connector on the lower PCA. The measurement should be approximately 10 K Ω (or 1K Ω depending on manufacturer). If the measurement is open (∞) or significantly high or low, replace the lift motor.
4. Using an ohmmeter, measure between terminals 1 and 2 of J4 and measure between 2 and 3 of J4 on the lower PCA. The two measurements should total approximately 10 K Ω (or 1K Ω depending on manufacturer). If the measurement is open (∞) or significantly high or low, replace the lift motor.
5. If you have performed all of the above tests and an error still occurs when the lift motor operates, there are three parts that could cause the problem. There are not any good tests to check these parts other than substituting a known good part. They are lower PCA, ribbon cable and upper PCA. Replace only one part at a time. If the new part does not correct the problem, replace the original part.

6. If you have performed all of the above tests and the lift system is still not functioning, call Precor Technical Support.
7. Set the circuit breaker in the “off” position. Remove the F2 (2 amp slow blow) fuse from the lower PCA. Measure the fuse with an ohmmeter. The measurement should be 1Ω or less. If the fuse is good, re-insert the fuse and skip to step 9. If the fuse is open (∞) or significantly high, replace the fuse. Before operating the lift motor it is necessary to perform a continuity test on the lift motor.
8. Remove the J3 connector from the lower board. Using an ohmmeter, measure between terminals 1 and 3 of J3, between terminals 1 and 2 of J3 and between terminals 2 and 3 of J3. The measurements should be approximately 20.5Ω , 20.5Ω and 41Ω , respectively. If any of the measurements are significantly low, replace the lift motor. If any of the readings are open (∞) or significantly high, check the lift motor cable and connectors. Repair any wires or connections that are bad. If the cable and connectors are good, replace the lift motor.
9. Re-insert the J3 connector in the lower PCA. Set the on/off switch in the “on” position. Using an AC voltmeter, monitor the voltage between terminals 1 and 2 (red and white wires) of the J3 connector. Enter the manual program and press the **RAMP ▲** key. The measurement should be approximately 120 Vac (line voltage). If the voltage is present and the lift motor moves normally, skip to step 10. The voltage will only be present until such time as an error occurs. If line voltage is not present skip to step 11. If line voltage is measured but the motor does not move, replace the lift motor.
10. Monitor terminals 1 and 3 (white and black wires) of J3. Enter the manual program and press the **RAMP ▼** key. The measurement should be approximately 120 Vac (line voltage). If the voltage is present and the lift motor moves normally skip to step 12. The voltage will only be present until such time as an error occurs. If line voltage is measured but the motor does not move, replace the lift motor.
11. If line voltage is not present in both steps 9 and 10, connect a dc voltmeter between TP3 and TP6 on the Lower PCA (See Diagram 7.2). The DC voltmeter should read approximately 5.5 Vdc. Walk on the unit and press the **CROSSRAMP ▼** key. The DC voltmeter should read near 0 Vdc and the ramp should go downward. Connect a dc voltmeter between TP4 and TP6 on the Lower PCA (See Diagram 7.2). The DC voltmeter should read approximately 5.5 Vdc. Pedal on the unit and press the **CROSSRAMP ▲** key. The DC voltmeter should read near 0 Vdc and the ramp should go upward.
12. If all of the voltages in step 11 were correct but the ramp did not move in both directions replace the LPCA.
13. If one or more of the voltages in step 11 were incorrect the problem is either one of the interconnect cables or the Upper PCA. If the display does not indicate that the ramp is moving in both directions when the appropriate **CROSSRAMP** key is pressed the problem is either the Upper PCA or the keypad (display housing). Use Procedures 6.1, 6.2 and 6.3 to determine if the problem is an interconnect cable, keypad or Upper PCA.
14. If you have performed all of the above tests and the lift system is still not functioning, call Precor Technical Support.

Procedure 6.6 - Troubleshooting the Eddy Current System

Note:

If the control circuit does not see an output from the speed sensor, it removes power from the eddy current system. Therefore, when it is necessary to check the resistance or take voltage measurements in the eddy current system it will be necessary to slowly turn the flywheels to ensure that the power time out has not occurred.

WARNING

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

1. There are three typical symptoms concerning the eddy current system. No resistance (pedaling resistance), no resistance shortly after power up and incorrect resistance. If the problem is no resistance, continue with step 2. If the problem is no resistance shortly after power up, test the speed sensor per Procedure 6.4. If the problem is incorrect resistance, skip to step 7.
2. Set the on/off switch in the "on" position, enter the manual program and set the resistance at level 10. Using a DC voltmeter, check the voltage across the magnet. The voltage should measure approximately 29.5 Vdc. If the voltage is missing or significantly low, skip to step 4. If the voltage is correct, continue with step 3.
3. Set the on/off switch in the "off" position. Check the magnet wiring per Diagram 8.1. If any of the magnet wiring is reversed or incorrect the resistance will be affected. If you have performed all of the above tests and there is still no resistance, call Precor Technical Support.
4. Set the on/off switch in the "off" position. Using an ohmmeter, measure between the M- and M+ terminals of the lower PCA. The measurement should be approximately 90Ω to 110Ω . If the measurement is open (∞), check the connections at both magnets and the lower PCA.
5. If all of the wiring connections are good and there is still no resistance, there are three parts that could cause the problem. There are not any good tests to check these parts other than substituting a known good part. They are lower PCA, ribbon cable and upper PCA. Replace only one part at a time. If the new part does not correct the problem replace the original part.
6. If you have performed all of the above tests and there is still no resistance, call Precor Technical Support.
7. If the resistance is greater than normal, the cause could be mechanical rather than electrical. Check all moving parts in the drive section and stairarms for worn parts that could be "binding". Replace the appropriate parts.
8. Set the on/off switch in the "on" position, enter the manual program and set the resistance at level 10. Using a DC voltmeter, check the voltage across the magnet. The voltage should measure approximately 29.5 Vdc.

9. If the voltage is still significantly high or low, there are three parts that could cause the problem. There are not any good tests to check these parts other than substituting a known good part. They are lower PCA, ribbon cable and upper PCA. Replace only one part at a time. If the new part does not correct the problem, replace the original part.
10. If you have performed all of the above tests and the resistances are still incorrect, call Precor Technical Support.

Procedure 6.7 - Upper Display does not illuminate **(version 1)**

1. Set the on/off switch in the "off" position, unplug the line cord from the wall outlet.
2. Remove the F1 and F2 fuses from the lower PCA. (See Diagram 7.4)
3. Remove the fuses from the input power module. (See Diagram 7.7)
4. Check all four fuses with an ohmmeter. They should read approximately 1Ω or less. Replace any fuse that reads significantly high.
5. Replace the fuses in the power input module.
6. With the line cord still unplugged from the wall outlet, set the on/off switch in the "on" position. check between the power terminals of the line cord with an ohmmeter. The ohmmeter reading should be very high, megohms or greater.
7. If the reading is good skip to step 11, otherwise continue with the next step.
8. If the reading in step 5 is significantly low, check the wiring between the lower PCA and the on/off switch, between the on/off switch and the input module. Replace any cut or nicked wiring.
9. Check the line cord for nicked or cut wiring. Replace the line cord if necessary.
10. If you have performed all of the above tests and are unable to resolve the problem, contact Precor customer support.
11. Replace the F1 (1/4 amp) fuse in the lower PCA, perform the resistance measurement in step 6. The reading should be approximately $40-75\Omega$.
12. Replace the F2 (2 amp) fuse in the lower PCA, perform the resistance measurement in step 6. The reading should be approximately $40-75\Omega$.
13. If either of the readings in step 11 or 12 were significantly low, replace the lower PCA.
14. Plug the line cord into the wall outlet and set the on/off switch in the "on" position.
15. The green LED (D1) and the red LED (D2) should illuminate. Check between TP5 and TP6 on the lower PCA with a DC voltmeter. The reading should be approximately 5 Vdc. (See Diagram 7.4)
16. If the reading in step 15 is good, skip to step 18. If the reading in step 15 is significantly low, set the on/off switch in the "off" position. Disconnect the lift cable (J4) and the interconnect cable (J5) from the lower PCA.

17. Set the on/off switch in the “on” position. Repeat step 15. If the reading is still significantly low, replace the lower PCA. If the reading is now good, the problem is either the interconnect cable or the upper PCA.
18. Substitute a known good upper PCA. If the upper PCA does not correct the problem, troubleshoot the upper and lower interconnect cables per Procedure 6.1
19. If you have performed all of the above tests and are unable to resolve the problem, contact Precor customer support.

Procedure 6.8 - Upper Display does not illuminate (version 2,3)

1. Set the on/off switch in the "off" position, unplug the line cord from the wall outlet.
2. Attach the anti-static wrist strap to your arm, then connect the ground lead of the wrist strap to the units frame.
3. Remove the F1 fuse from the lower PCA. (See Diagram 7.5)
4. Remove the fuses from the input power module. (See Diagram 7.7)
5. Check all three fuses with an ohmmeter. They should read approximately 1Ω or less. Replace any fuse that reads significantly high.
6. Replace the fuses in the power input module.
7. With the line cord still unplugged from the wall outlet, set the on/off switch in the "on" position. check between the power terminals of the line cord with an ohmmeter. The ohmmeter reading should be infinity (open).
8. If the reading is good skip to step 11, otherwise continue with the next step.
9. If the reading in step 5 is significantly low, check the wiring between the lower PCA and the on/off switch, between the on/off switch and the input module. Replace any cut or nicked wiring.
10. Check the line cord for nicked or cut wiring. Replace the line cord if necessary.
11. If you have performed all of the above tests and are unable to resolve the problem, contact Precor customer support.
12. Replace the F1 (1/4 amp) fuse in the lower PCA, perform the resistance measurement in step 6. The reading should be approximately 1.0 to 1.5 megohms.
13. Replace the F2 (2 amp) fuse in the lower PCA, perform the resistance measurement in step 6. The reading should be approximately 1.0 to 1.5 megohms.
14. If either of the readings in step 11 or 12 were significantly low, replace the lower PCA.
15. Plug the line cord into the wall outlet and set the on/off switch in the "on" position.
16. The red LED (D7) and the red LED (D2) should illuminate. Check between TP11 and TP14 on the lower PCA with a DC voltmeter. The reading should be approximately 5 Vdc.

17. If the reading in step 15 is good, skip to step 18. If the reading in step 15 is significantly low, set the on/off switch in the "off" position. Disconnect the interconnect cable (J5) from the lower PCA.
18. Set the on/off switch in the "on" position. Repeat step 15. If the reading is still significantly low, replace the lower PCA. If the reading is now good, the problem is either one of the interconnect cables or the upper PCA.
19. Substitute a known good upper PCA. If the upper PCA does not correct the problem, troubleshoot the upper and lower interconnect cables per Procedure 6.1
20. If you have performed all of the above tests and are unable to resolve the problem, contact Precor customer support.

Procedure 6.9 - Troubleshooting Hand Held Heart Rate

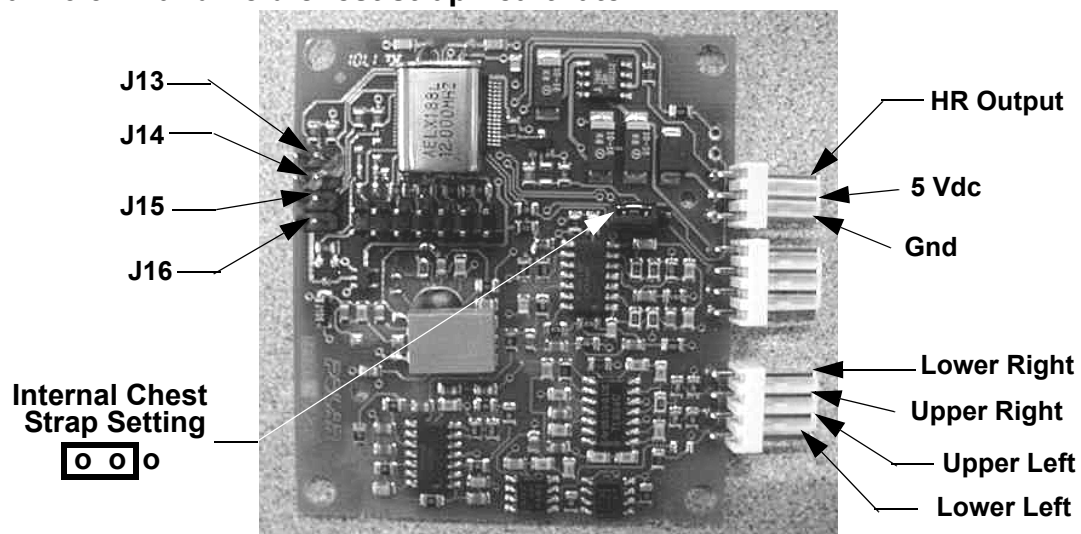
Circuit Description

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. Refer to Diagram 6.3 and verify that no jumpers are equipped on J13, J14, J15 or J16. Also, verify that there is a jumper equipped on the internal chest strap setting. The internal chest strap setting is the two left hand pins on the three pin connector as shown below in Diagram 6.3. These settings allow the heart rate system to operate on the internal chest strap receiver with the chest strap heart rate priority. That is, if both a chest strap and hand heart rate signal is being received, the system will accept the chest strap signal and ignore the hand held signal. If a chest strap signal is not being received, the system will accept the hand held signal.

Note:

There are four typical failure modes for the hand held/chest strap heart rate system. They are:
 1 - hand held is normal - no chest strap reading; 2 - no hand held reading - chest strap normal;
 3 - no hand held or chest strap reading; 4 - 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. Set the on/off switch in the "on" position and access the diagnostic program (Procedure 3.3). 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 Polar heart rate test receiver, verify the operation of the chest strap transmitter furnished with the unit. If the Polar heart rate test receiver does not receive a signal, replace the chest strap transmitter.

3. Set the on/off switch in the "off" position and remove the display housing.
4. Verify the internal chest strap setting is set as shown in Diagram 6.3. Verify that a ferrite bead is installed on the heart rate PCA to upper PCA cable.
5. If the above procedures did not correct the problem, replace the heart rate PCA.

No hand held reading - Normal chest strap reading

6. Set the on/off switch in the "on" position and access the diagnostic program (Procedure 3.3). 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.
7. If a hand held signal is not being accepted, set the on/off switch in the off position.
8. Temporarily, install a spare jumper on J14 of the heart rate PCA (hand held priority). Set the on/off switch in the "on" position and repeat the procedure in step 6.
9. 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. Disabling the chest strap signal proves that it is radiated energy that is causing the problem.
10. If a hand held signal still not being accepted, skip to step 13.
11. The source of the radiated energy must be determined and relocated so that it no longer affects the heart rate PCA. Televisions, cell phones, Cardio-theatre receivers, etc. are possible sources of radiated energy.
12. Set the on/off switch in the "off" position, and remove the temporary jumper from J14 of the heart rate PCA. Re-locate all potential sources of radiation. Set the on/off switch in the "on" position and repeat the procedure in step 6.
13. Set the on/off switch in the "on" position and access the diagnostic program (Procedure 3.3). 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 15.
14. If a hand held signal was accepted in step 13, 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 6.

15. Set the on/off switch in the "off" position. 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

16. Set the on/off switch in the "on" position and access the diagnostic program (Procedure 3.3). 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.
17. Check the plug/connector connections on both the heart rate PCA (J4), and upper PCA (J1).
18. 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.
19. 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

20. Verify that a ferrite core is clamped around the heart rate PCA to upper PCA cable.
21. 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.
22. Temporarily, install a spare jumper on J14 of the heart rate PCA (hand held priority). Set the on/off switch in the "on" position and repeat the procedure in step 6.
23. If the hand held signal is now being accept, something in the near vicinity is radiating RF energy that is being received by the chest strap portion of the heart rate PCA. Disabling the chest strap signal proves that it is radiated energy that is causing the problem.
24. The source of the radiated energy must be determined and relocated so that it no longer affects the heart rate PCA. Televisions, cell phones, Cardio-theatre receivers, etc. are possible sources of radiated energy.

25. Set the on/off switch in the “off” position, and remove the spare jumper from J14 of the heart rate PCA. Re-locate all potential sources of radiation. Set the on/off switch in the “on” position and repeat the procedure in step 6.

Procedure 7.1 - Replacing the Front or Rear Covers

Procedure

1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet. For version 1,2 units, continue with step 2. For version 3 units skip to step 13.

WARNING

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

Removing and Replacing the Rear Cover (version 1, 2)

2. Remove the screws that secure the rear cover.
3. Lift and slightly spread the rear cover until it clears the unit, then set it aside.
4. When maintenance operations are complete, position the rear cover at its mounting position.
5. Replace the screws that secure the rear cover.

Removing and Replacing the Front Cover (version 1,2)

6. Remove the screws that secure the bottom of the front cover to the cover bracket.
7. Remove the screws that secure the cover badge. The cover badge is located at the top of the cover. Remove the cover badge.

Diagram 7.1 - Front Cover Badge



8. Remove the cover by sliding it between the frame uprights.
9. When maintenance operations are complete, slide the cover into place through the frame uprights.
10. Replace and hand tighten the screws that retain the bottom of the cover to the cover bracket.
11. Replace the cover badge. The cover badge must slide over the lift motor drive screw. If the cover badge is not mated with the lift motor drive screw, the cover is not secured and will vibrate when the lift is operated. Replace and tighten the cover badge screws.
12. Tighten the screws replaced in step 10.

Removing and Replacing the Rear Cover (version 3)

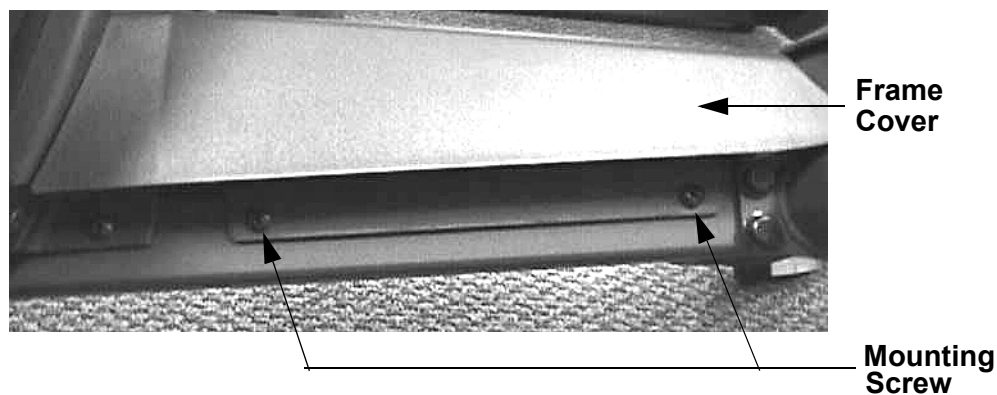
13. Set the on/off switch in the "off" position, then unplug the power cord from the A.C. outlet.

WARNING

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

14. The rear cover is a four piece cover; front, top, left and right sections. If the front cover section is being removed, the frame cover must also be removed (See Diagram 7.2).
15. If you are removing either the right or left cover section, it is only necessary to remove the four screws that fasten the cover section.

Diagram 7.2- Frame Cover

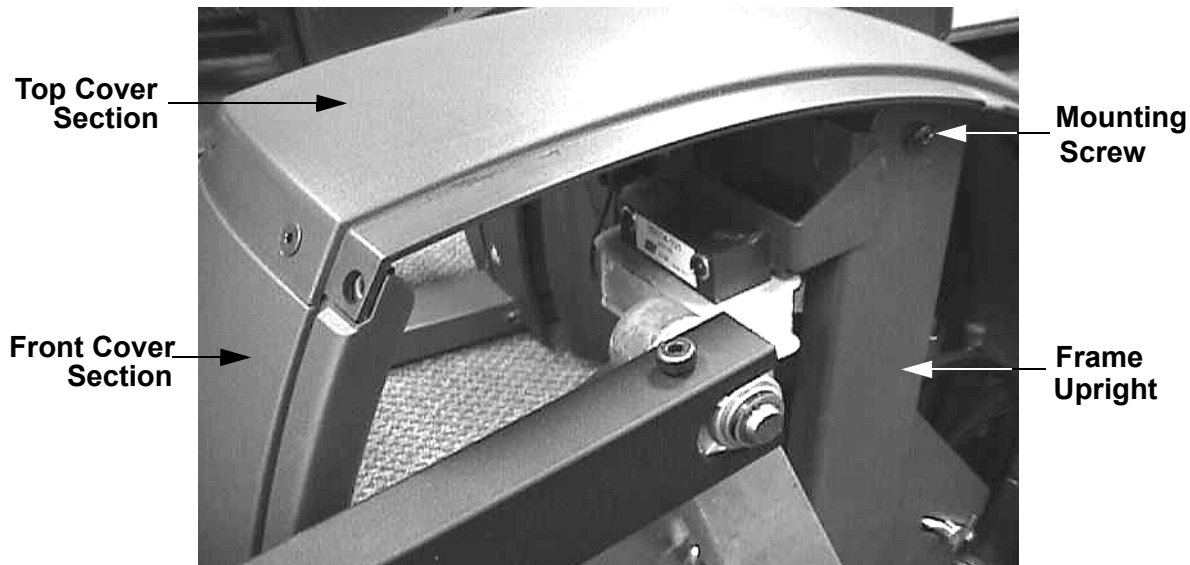


16. If you are replacing either the front or top cover section, you must first remove the left and right cover sections and then remove the cover section being replaced.
17. If you are removing the top cover (See Diagram 7.3), remove the two phillip screws that fasten the top cover section to the frame upright. Remove three screws that fasten the top cover section to the rear cover support. Remove two screws that fasten the top cover

section to the front cover section.

18. If you are removing the front cover section, the right, left and top cover sections must be removed first. Remove the four screws that fasten the frame cover to the frame (See Diagram 7.2). Remove two phillips screws that fasten the bottom of the front cover section to the frame. Lift the rear portion of the frame cover and carefully remove the front cover section. If it is necessary to remove the frame cover, lift the rear of the frame cover, slide the frame cover out of the ramp and remove the frame cover.

Diagram 7.3 - Top Cover Section (with right & left cover sections removed)



19. If all four cover sections have been removed, first replace the frame cover and front cover section, then the top cover section and then the left and right cover sections as described below.
20. Slide the tongue of the frame cover into the ramp. Lift the rear of the frame cover and fit the front cover against the frame cover. Slide the front and frame covers into place as a unit. Replace and tighten the four phillips screws that fasten the frame cover to the frame. Replace and tighten the two phillips screws that fasten the front cover section to the frame.
21. Set the top cover section in it's mounting position, replace and tighten the two phillips screws that fasten the top cover section to the frame upright. See Diagram 7.3. Replace and tighten the three screws that fasten the top cover section to the rear cover support. Replace and tighten the two screws that fasten the top cover section to the front cover section.
22. Set the left cover section in it's mounting position, replace and tighten the four screws that fasten the left cover section to the front cover section, top cover section and rear cover support.
23. Set the right cover section in it's mounting position, replace and tighten the four screws that fasten the right cover section to the front cover section, top cover section and rear cover support.

Removing and Replacing the Front Cover (version 3)

24. Remove the four lower front cover mounting screws (two each side) from the lower frame.
25. Remove the four upper front cover mounting screws (two each side) from the upper frame.
26. Remove both front cover halves from the unit.
27. When service is complete, set both cover halves in their mounting positions.
28. Replace the four upper front cover mounting screws (two each side) in the upper frame.
29. Replace the four lower front cover mounting screws (two each side) in the lower frame.

Procedure 7.2 - Replacing the Display Enclosure or Upper PCA (version 1)

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

Removing the Display Enclosure

1. Set the on/off switch in the “off” position.

WARNING

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

2. Remove the screws that secure the interconnect cable cover to the bottom of the display backing plate. Remove the interconnect cover cable. See Diagram 7.4.
3. Remove the screws that secure the reading rack to the to the display backing plate. Remove the reading rack.
4. Remove the screws that secure the display housing to the display backing plate.
5. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the EFX frame.
6. Disconnect the interconnect cable from the upper PCA.
7. If you are going to re-install the display enclosure without replacing the upper PCA...

THEN...

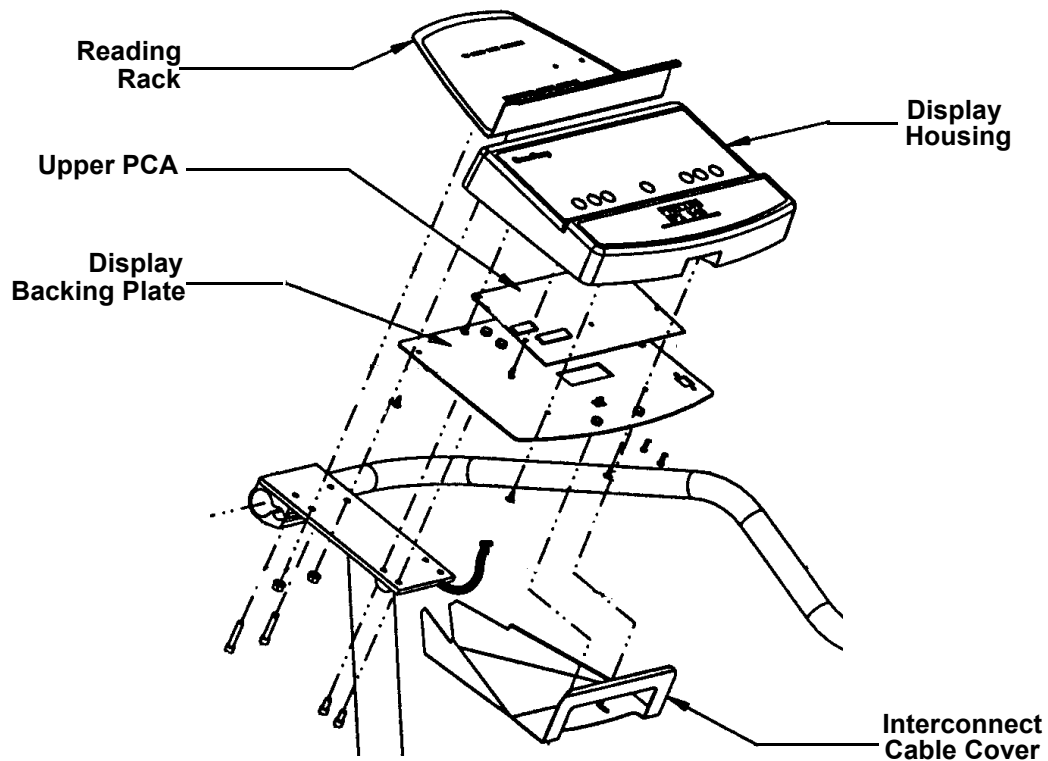
Skip to Step 10.

OTHERWISE...

Continue with the next step.

Removing and Replacing the Upper PCA

8. Carefully disconnect the keypad cable from the upper PCA.
9. Remove the screws that secure the upper PCA to the display enclosure.

Diagram 7.4 - Upper Handlebar Assembly

10. Reposition the upper PCA at its mounting location on the display enclosure (refer to Diagram 7.4). Replace and tighten the upper PCA mounting screws.
11. Reconnect the keypad cable to the upper PCA.
12. Reconnect the interconnect cable to the upper PCA.
13. Remove the ground lead of the wrist strap from the EFX frame, then remove the wrist strap from your arm.
14. Position the display enclosure on the display plate. Replace and tighten the display mounting screws.
15. Reposition the reading rack, replace and tighten the reading rack mounting screws.
16. Reposition the interconnect cable cover, replace and tighten the interconnect cable cover mounting screws.
17. Check operation as described in Section Four.

Procedure 7.3 - Replacing the Display Enclosure or Upper PCA (version 2,3)

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. Set the on/off switch in the "off" position.

WARNING

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

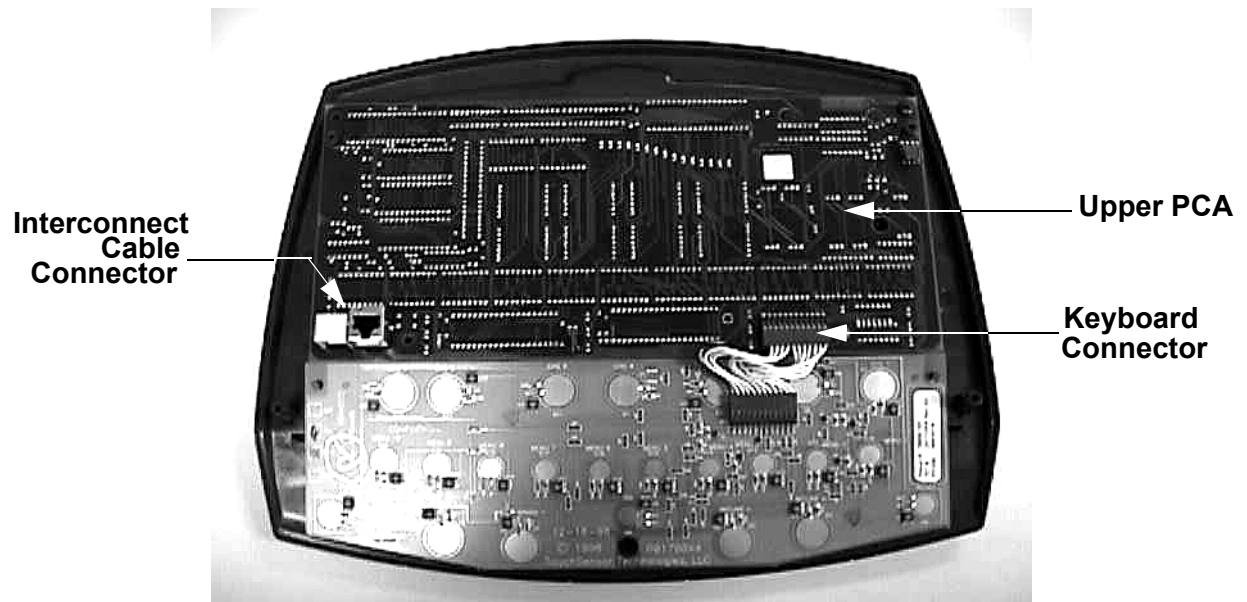
2. Attach the anti-static wrist strap to your arm, then connect the ground lead of the wrist strap to the units frame.
3. Remove the four screws that secure the display housing front panel to the display backing plate.
4. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the EFX frame.
5. Disconnect the upper interconnect cable from the upper PCA (connector J5).

Removing and Replacing the Upper PCA

6. Carefully disconnect the keyboard cable from the upper PCA (connector J2).
7. Remove the four screws that secure the upper PCA to the display housing front panel.

Note:

Package the upper PCA in an anti-static bag and document the problem as described in Procedure 3.5, Documenting Software Problems.

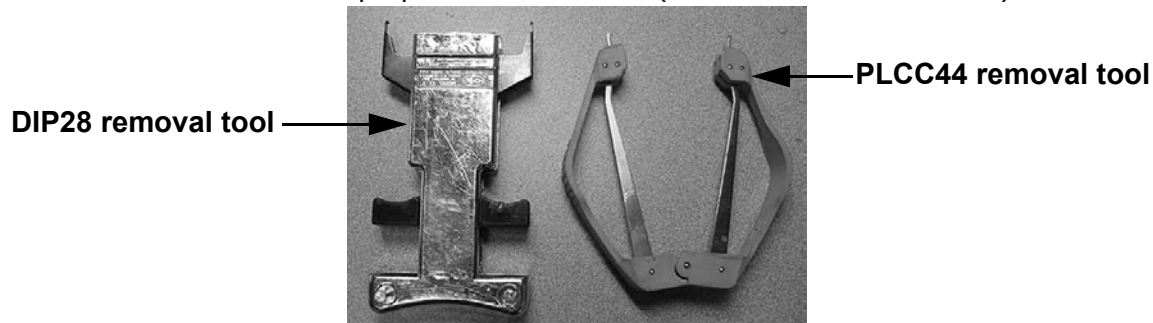
Diagram 7.5 - Display Housing Front Panel, Rear View

8. Position the upper PCA at its mounting location on the display housing front panel (refer to Diagram 7.5). Replace and tighten the upper PCA mounting screws.
9. Reconnect the keyboard cable to the upper PCA.
10. Reconnect the upper interconnect cable to the upper PCA.
11. Remove the ground lead of the wrist strap from the EFX frame, then remove the wrist strap from your arm.
12. Position the display enclosure on the display plate. Replace and tighten the display mounting screws.
13. Check operation as described in Section Four.

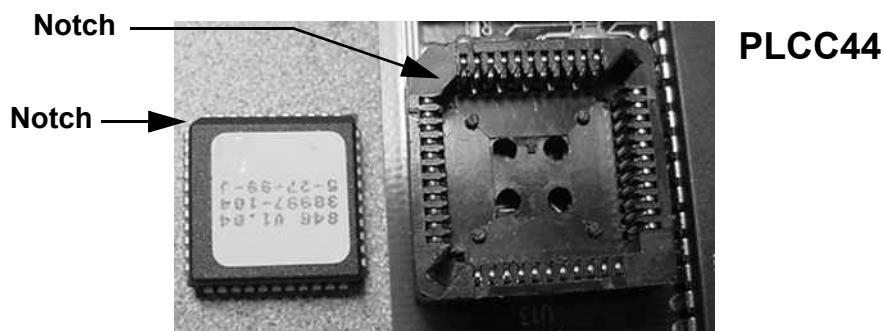
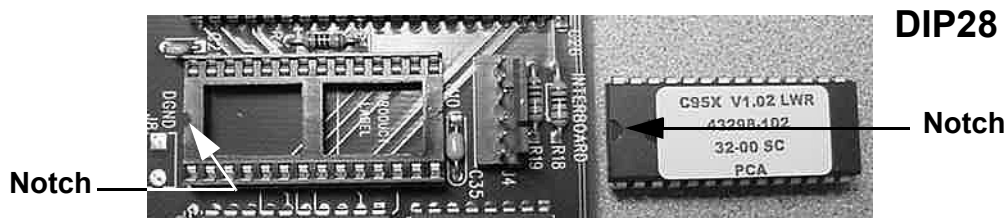
Procedure 7.4 - Replacing the PROM

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

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



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



Procedure 7.5 - Replacing the Lower PCA (version 1)

Removing the Lower PCA

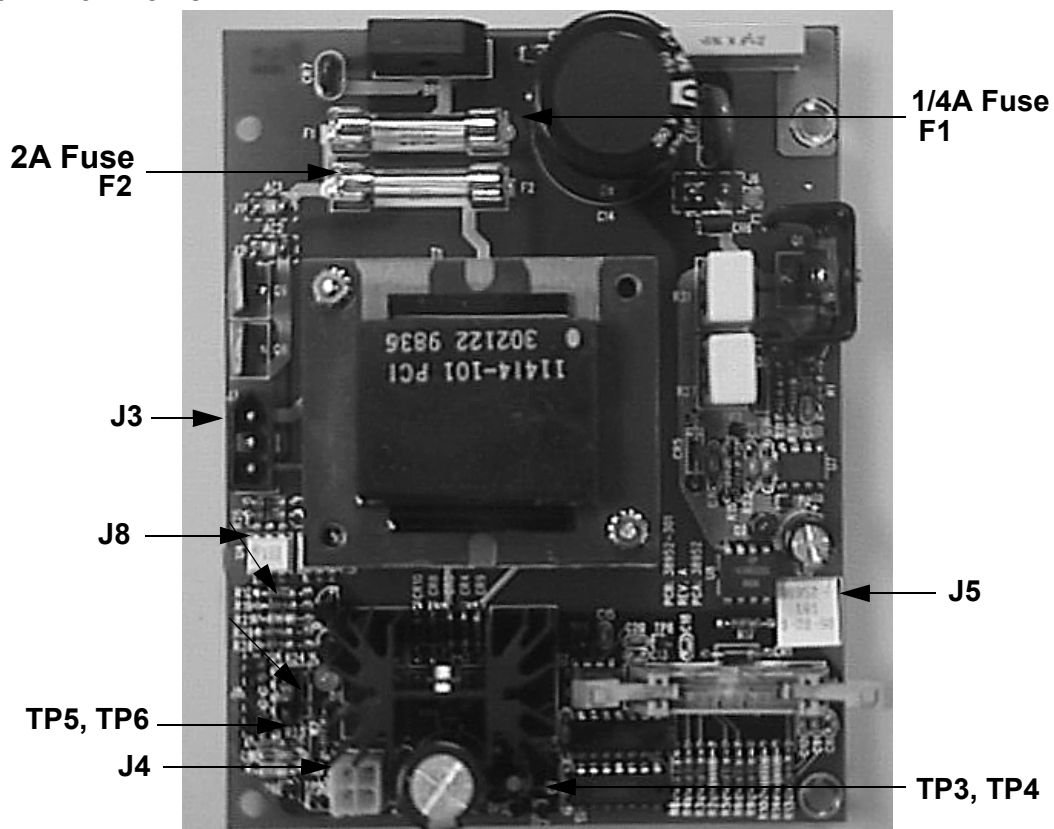
1. Set the on/off switch in the "off" position.

WARNING

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

2. Remove the rear cover as described in Procedure 7.1.
3. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the EFX frame.
4. Remove the shield from the lower PCA.
5. Disconnect the cables from the lower PCA.
6. Remove the screws that secure the lower PCA.

Diagram 7.6 - Lower PCA



Replacing the Lower PCA

7. Position the replacement lower PCA at its mounting position.
8. Install the screws that secure the lower PCA.
9. Connect the cables you disconnected in Step 5.
10. Install the lower PCA shield.
11. Remove the ground lead of the wrist strap from the EFX frame, then remove the wrist strap from your arm.
12. Re-install the rear cover as described in Procedure 7.1, then check the operation of the EFX 546 as described in Section Four.

Procedure 7.6 - Replacing the Lower PCA (version 2,3)

Removing the Lower PCA

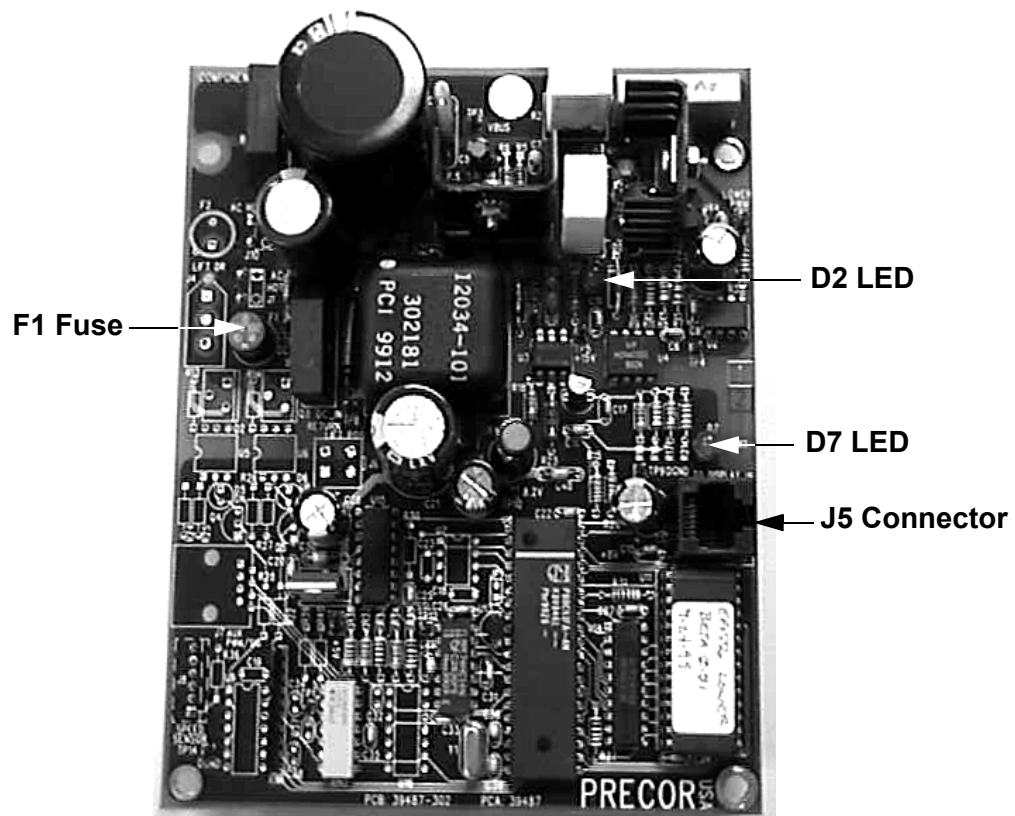
1. Set the on/off switch in the "off" position.

WARNING

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

2. Remove the rear cover.
3. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the EFX frame.
4. Remove the shield from the lower PCA.
5. Disconnect the cables from the lower PCA.
6. Remove the screws that secure the lower PCA.

Diagram 7.7 - Lower PCA



Replacing the Lower PCA

7. Position the replacement lower PCA at its mounting position.
8. Install the screws that secure the lower PCA.
9. Connect the cables you disconnected in Step 5.
10. Install the lower PCA shield.
11. Remove the ground lead of the wrist strap from the EFX frame, then remove the wrist strap from your arm.
12. Re-install the rear cover, then check the operation of the C556 as described in Section Four.

Procedure 7.7 - Replacing the Lower and/or Upper Interconnect Cables

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

Procedure

1. Set the on/off switch in the "off" position.

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 lead of the wrist strap to the EFX frame.

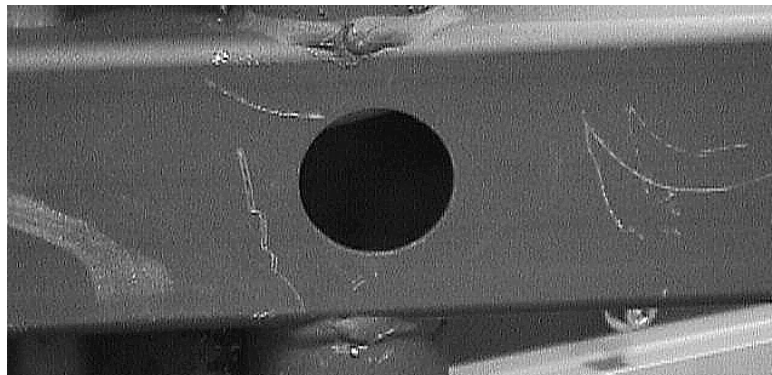
Note:

There are three different interconnect cable combinations that were used on the C546. Version 1 units manufactured prior to Feb. 8, 1999 used an upper and lower ribbon cable. Version 1 units manufactured after Feb. 7, 1999 used a single ribbon cable. Version 2,3 units used an upper and lower telephone cable (RJ45). For version 1 units manufactured prior to Feb. 8, 1999 start with step 3. For version 1 units manufactured after Feb. 7, 1999, start with step 20. For version 2,3 units start with step 29.

Replacing the Upper Interconnect Cable

3. If you are replacing the lower interconnect cable, skip to step 12.
4. Remove the display housing per Procedure 7.2, steps 2 to 6.
5. Lay the EFX on it's side. The upper and lower interconnect cables are connected in the main frame tube. Locate the access hole in the main frame tube. (See Diagram 7.8).

Diagram 7.8 - Interconnect Cable Access



6. Two cables are in the main frame tube. The lift motor cable and the interconnect cable(s). Locate the interconnect cable connectors in the access hole and disconnect the interconnect cables.
7. Tape the end of the replacement interconnect cable with the small (16 pin) connector to the upper end of the old interconnect cable (display housing end).
8. Carefully pull the old interconnect cable out of the bottom access hole while feeding the new interconnect cable into the unit. When the new cable is fully into the unit, remove the tape and discard the old interconnect cable. Connect the two interconnect cables and push them into the access hole.
9. Replace the display housing per Procedure 7.2, steps 14 to 18.
10. Remove the ground lead of the wrist strap from the EFX frame, then remove the wrist strap from your arm.
11. Check the operation of the EFX as described in Section Four.

Replacing the Lower Interconnect Cable

12. Remove the rear cover. Remove the shield from the lower PCA. Disconnect the interconnect cable from the lower PCA. (See Diagram 7.6)
13. Lay the EFX on it's side. The upper and lower interconnect cables are connected in the main frame tube. Locate the access hole in the main frame tube. (See Diagram 7.8).
14. Two cables are in the main frame tube. The lift motor cable and the interconnect cable(s). Locate the interconnect cable connectors in the access hole and disconnect the interconnect cables.
15. Connect the male connector of the replacement interconnect cable to the old interconnect cable at the lower PCA end of the old interconnect cable.
16. Carefully pull the old interconnect cable out of the bottom access hole while feeding the new interconnect cable into the unit. When the new cable is fully into the unit, remove the tape and discard the old interconnect cable. Connect the two interconnect cables and push them into the access hole.
17. Connect the new interconnect cable to the lower PCA.
18. Replace the shield on the lower PCA. Replace the rear cover.
19. Check the operation of the EFX as described in Section Four.

Version 1 units manufactured after Feb. 7, 1999

20. Remove the display housing per Procedure 7.3. Remove the rear cover.
21. Tie one end of a stout string (at least 12' long) to the upper end of the old interconnect cable (display housing end).
22. Carefully pull the old interconnect cable out of the access hole near the lower PCA while feeding the string into the unit. When the string is fully into the unit, remove the old interconnect cable from the string.
23. Tie the upper end of the string to the end of the new interconnect cable with the small (16 pin) connector. Carefully pull the string out of the access hole near the lower PCA while feeding the interconnect cable into the unit.
24. Replace the display housing per Procedure 7.3.
25. Remove the ground lead of the wrist strap from the EFX frame, then remove the wrist strap.
26. Connect the new interconnect cable to the lower PCA.
27. Replace the shield on the lower PCA. Replace the rear cover.
28. Check the operation of the EFX as described in Section Four.

Version 2,3 units

29. Loosen but do not remove the upper handrail clamp bolts.
30. Remove the four screws that fasten the center handrail tube clamp. See Diagram 7.24.
31. Slowly rotate the center handrail tube forward to expose the cables in the center handrail tube. Disconnect the upper and lower interconnect cables from the mid-point connector.

Replacing the Upper Interconnect Cable

32. Remove the upper display per procedure 7.3, steps 2-7.
33. Tape the replacement upper interconnect cable to the lower end of the upper interconnect cable. Carefully, pull the upper interconnect cable out of the top of the center handrail frame tube.
34. Remove the tape and discard the old upper interconnect cable.
35. Connect the replacement upper interconnect cable to the upper PCA. Replace the upper display per procedure 7.3, steps 8-13.
36. Using the mid-point connector removed in step 31, connect the upper interconnect cable to the lower interconnect cable.

37. Carefully, rotate the center handrail mounting tube back into it's mounting position.
38. Set the two halves of the clamp in position, be sure that the pins in the rear half of the clamp mate with the holes in the frame, thread and hand tighten the four clamp mounting screws. Tighten the upper clamp mounting screws before the lower clamp mounting screws. (See Diagram 7.24)
39. Tighten the upper handrail clamp mounting screws.
40. Check operation of the EFX as described in Section Four.

Replacing the Lower Interconnect Cable.

41. Remove the rear cover. Remove the shield from the lower PCA.
42. Tape the replacement interconnect cable to the upper end of the existing lower interconnect cable.
43. Carefully, pull the interconnect cable out of the access hole near the lower PCA.
44. Remove the tape and discard the old lower interconnect cable.
45. Connect the lower interconnect cable to the lower PCA. Replace the lower PCA shield. Replace the rear cover.
46. Using the mid-point connector removed in step 31, connect the upper interconnect cable to the lower interconnect cable.
47. Carefully, rotate the center handrail mounting tube back into it's mounting position.
48. Set the two halves of the clamp in position, be sure that the pins in the rear half of the clamp mate with the holes in the frame, thread and hand tighten the four clamp mounting screws. Tighten the upper clamp mounting screws before the lower clamp mounting screws. (See Diagram 7.24)
49. Tighten the upper handrail clamp mounting screws.
50. Check operation of the EFX as described in Section Four.

Procedure 7.8 - Replacing the Power Entry Module

(version 1,2 units manufactured before 10-16-2000)

Removing the Power Entry Module

1. Set the on/off switch in the off position, then unplug the power cord from the wall outlet and from the EFX.

WARNING

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

2. Release the fuse drawer from the power entry module. Remove the fuse drawer.
(See Diagram 7.9)

Diagram 7.9 - Fuse Drawer, Power Entry Module



3. Remove the fuses from the fuse drawer and test them with an ohmmeter. Both fuses should read approximately 1Ω or less. If both fuses test good, continue with step 4. If either fuse reads significantly high, replace the fuse and retest the EFX. It may not be necessary to replace the power entry module. If the fuse blows again as soon as power is applied, troubleshoot the EFX per Procedure 6.6.
4. Remove two screws from the bottom of the EFX frame that secure the power entry module mounting bracket to the frame. Swing the power entry module mounting bracket away from the frame to gain access to the on/off switch wiring.
5. Remove the wires from the power entry module, a brown and blue wire, a brown and blue jumper. Remove the ground wire from the ground stud.

6. Note the orientation of the power entry module. The new module must be positioned with the same orientation. Remove the screws that secure the power entry module to the rear assembly bracket.

Replacing the Power Entry Module

7. Position the new power entry module at its entry position. Make sure that the module is oriented correctly. Install the screws that secure the power entry module to the EFX frame.
8. Refer to appropriate wiring diagram in Section 8 and reconnect the wires removed in step 5. Replace the ground wire on the ground stud.
9. Fasten the power entry module mounting bracket to the EFX frame with the screws removed in step 4.
10. Remove the fuses from the fuse drawer of the defective input power module. Check the fuses as in step 3 and insert the fuses into the replacement fuse drawer. Insert the fuse drawer into the input power module.
11. Check the operation of the EFX as described in Section Four.

Procedure 7.9 - Replacing the Line Filter

(version 1,2 units manufactured before 10-16-2000)

Removing the Line Filter

1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.

WARNING

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

2. Remove the rear cover as described in Procedure 7.1.
3. Remove two screws from the bottom of the EFX frame that secure the power entry module mounting bracket to the frame. Swing the power entry module mounting bracket away from the frame to gain access to the on/off switch wiring
4. Choose One:

IF...

You are removing a line filter on a 120-volt unit

You are removing a line filter on a 240-volt unit

THEN...

Disconnect the line filter assembly from the on/off switch and J1 and J2 connectors on the lower PCA.

Disconnect the line filter assembly from the on/off switch and step-down transformer.

5. Remove the screws that secure the line filter. Remove the filter from its mounting position.

Replacing the Line Filter

6. Position the new line filter on the rear assembly bracket. Install the screws that mount the line filter to the rear assembly bracket.
7. Refer to Wiring Diagram 8.1 or 8.5 for 120V units or Wiring Diagram 8.3 or 8.7 for 240V units and reconnect the wiring removed in step 4.
8. Fasten the power entry module mounting bracket to the EFX frame with the screws removed in step 3.
9. Re-install the rear cover as described in Procedure 7.1, then check the operation of the EFX as described in Section Four.

Procedure 7.10 - Replacing the ON/OFF Switch

(version 1,2 units manufactured before 10-16-2000)

Removing the ON/OFF Switch

1. Set the on/off switch in the “off” position, then unplug the power cord from the wall outlet.

WARNING

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

2. Remove the rear cover as described in Procedure 7.1.
3. Remove two screws from the bottom of the EFX frame that secure the power entry module mounting bracket to the frame. Swing the power entry module mounting bracket away from the frame to gain access to the on/off switch wiring.
4. Disconnect the wiring from the on/off switch.
5. Depress the mounting tabs that secure the switch to its mounting bracket. Remove the switch from its mounting position.

Replacing the ON/OFF Switch

6. Make sure that the new on/off switch is set to the “off” position. Position the switch assembly so that the label is facing up. Snap the switch assembly into the mounting bracket.
7. Refer to Wiring Diagram 8.1 or 8.5 for 120V units or Wiring Diagram 8.3 or 8.7 for 240V units and reconnect the switch wiring removed in step 4.
8. Fasten the power entry module mounting bracket to the EFX frame with the screws removed in step 3.
9. Re-install the rear cover as described in Procedure 7.1, then check the operation of the EFX as described in Section Four.

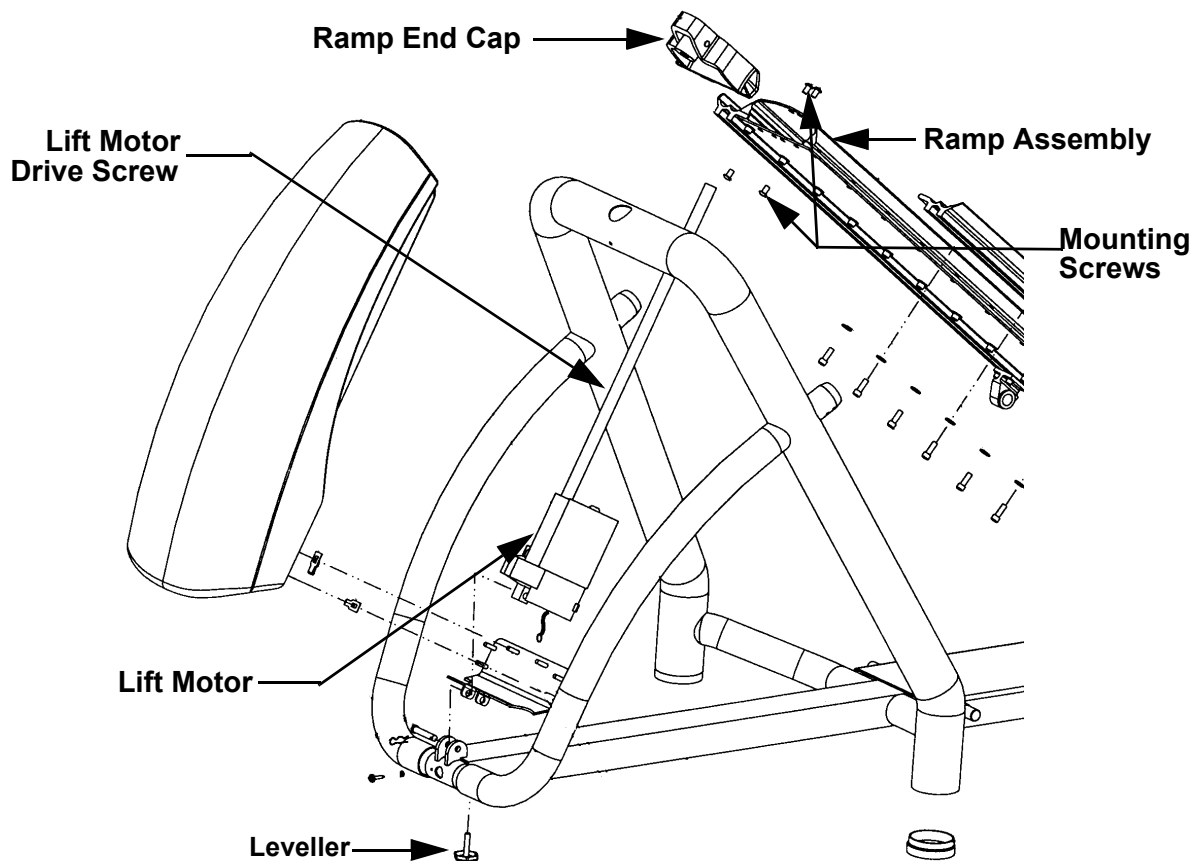
Procedure 7.11 - Replacing the Lift Motor

Removing the Lift Motor

Note: This procedure references The version 1 & 2 units. The only difference in this procedure is that on version 1, 2 units the lift motor mounts to the ramp via a ramp end cap. Version 3 units lift motors mount to the ramp via a lift yoke. When replacing a lift motor on a version unit substitute the word lift yoke for ramp end cap See Diagram 5.3.

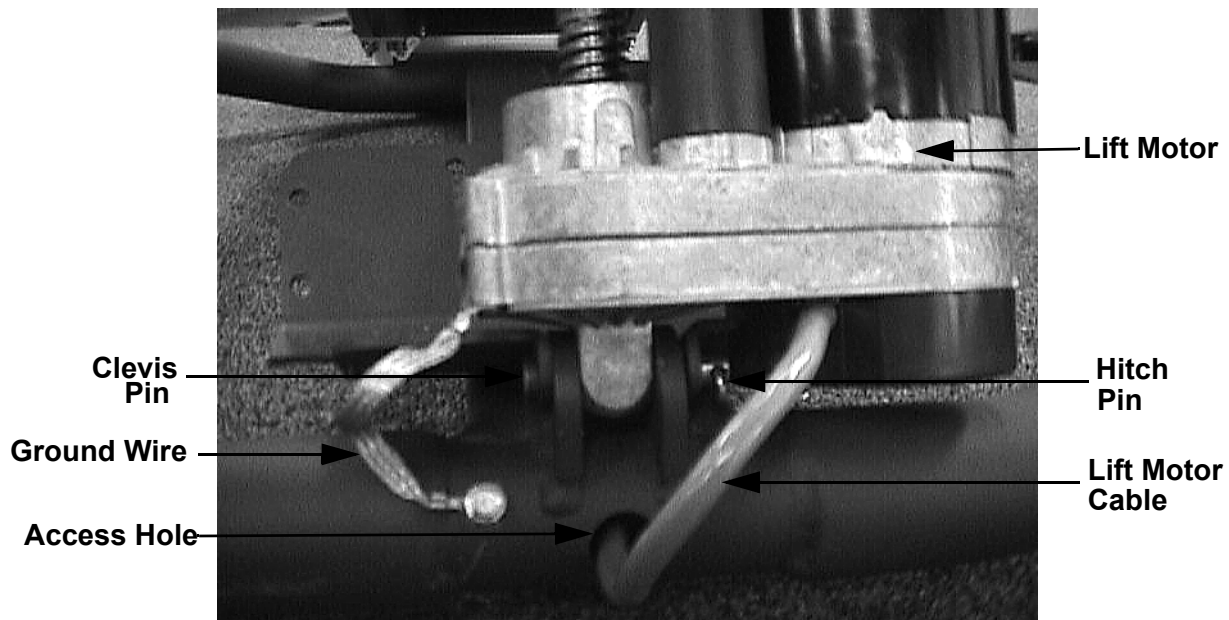
1. Set the on/off switch in the "off" position. Remove the front cover as described in Procedure 7.1.
2. Remove the four screws that retain the ramp end cap or lift yoke to the ramp assembly. Support the lift motor and ramp assembly as you separate the ramp end cap from the ramp assembly. Lower the ramp assembly until it is resting on the frame. (See Diagram 7.10)

Diagram 7.10 - Lift Motor Mounting



3. Unthread the ramp end cap or lift yoke from the lift motor drive screw. On version 1,2 units, unthread and remove the leveller. (See Diagram 7.10)
4. Pull the lift motor cable out of the access hole and disconnect the lift motor cables. (See Diagram 7.11).
5. Remove the hitch pin from the clevis pin. Remove the clevis pin from the lift motor.

Diagram 7.11 - Lift Motor Mounting



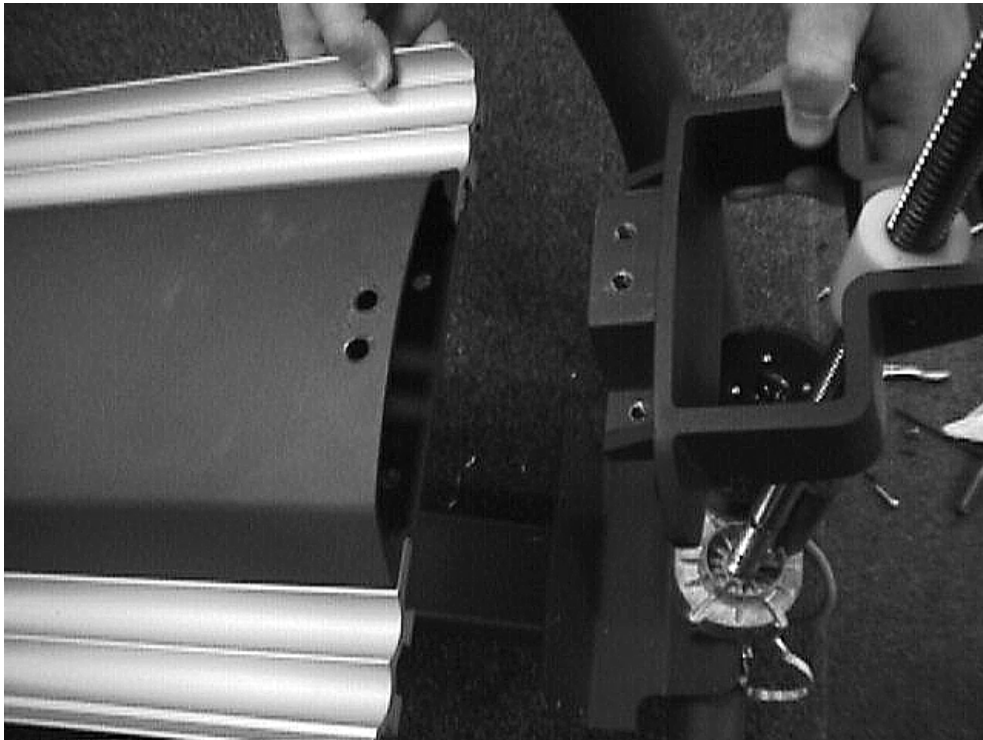
6. Remove the lift motor from the EFX.

Replacing the Lift Motor

7. Mount the replacement lift motor with the clevis and hitch pins. Thread the ramp end cap or lift yoke onto the lift motor drive screw. Reconnect the lift motor cable and carefully push the excess cable into the access hole. Replace the leveller.
8. Set the on/off switch in the "on" position. Calibrate the lift motor per Procedure 5.2

9. Set the on/off switch in the "off" position. Do not exit the diagnostic program in the normal manner. Exiting the diagnostic program will cause the lift to self center and invalidate the lift calibration just performed.
10. On version 1, 2 units, raise the ramp assembly to a convenient height and slide the ramp end cap into the ramp assembly. Hand tighten the four ramp end cap mounting screws and then torque them to 100 in/lbs.
11. On version 3 units, raise the ramp assembly to a convenient height and slide the lift yoke into the ramp assembly. Hand tighten the four lift yoke mounting screws and then torque them to 240 in/lbs.

Diagram 7.12 - Ramp End Cap or Lift Yoke Mounting



12. Set the on/off switch in the "on" position. Thoroughly test all lift related functions per Section Four.
13. Set the on/off switch in the "off" position, replace the front cover.

Procedure 7.12 - Replacing a Crankarm Assembly

Removing a Crankarm Assembly

1. Set the on/off switch in the “off” position, then unplug the power cord from the wall outlet.

WARNING

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

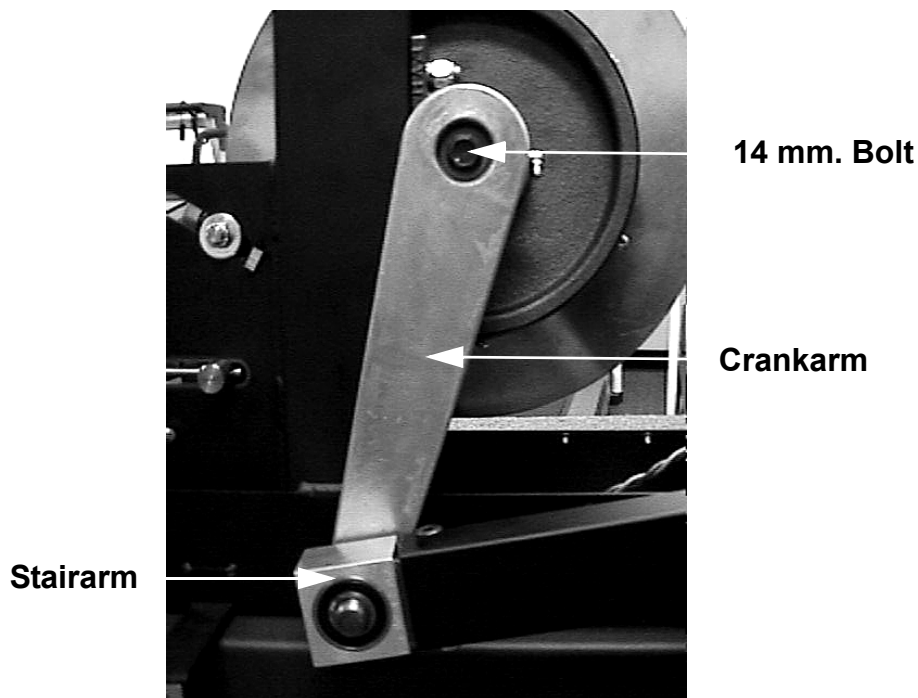
2. Remove the rear cover as described in Procedure 7.1.
3. Remove the stairarm assembly as described in Procedure 7.24.

Note:

Notice the position of the two crank arms. When the crankarms are replaced, they must be positioned so that they are 180 degrees opposing.

4. Remove the 14 mm. bolt that secures the crankarm to the input pulley shaft. It will be necessary, use a Pitman arm puller or 4” to 6” gear puller to remove the crankarm. Do not use a hammer or mallet to remove the crankarm.
5. If you are removing both crank arm assemblies, repeat Steps 3 and 4 for the second crankarm assembly.

Diagram 7.13 - Crankarm



6. The crankarm removed from the right hand side has a magnet in a recess on the lower backside of the crankarm. The magnet is held in the crankarm by its magnetism. Remove the magnet either by prying it out with a thin bladed screwdriver or by placing a heavy piece of steel near the magnet and allowing it to adhere to the heavy piece of steel.

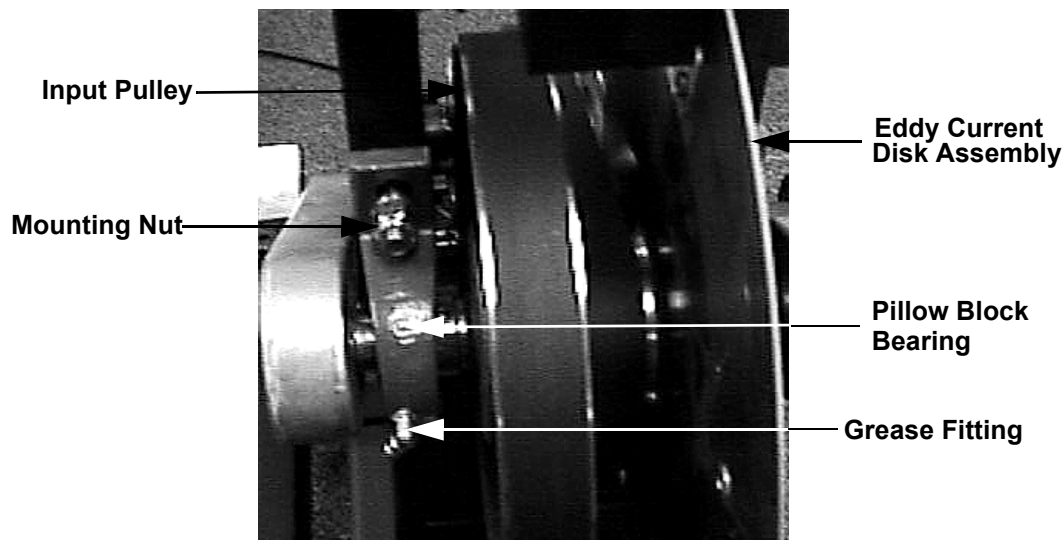
Replacing a Crank Arm Assembly

7. Place the magnet removed in step 6 in the crankarm that will be mounted on the right hand side of the EFX.
8. Clean the crankarm mounting bolt threads and the input pulley shaft threads with an alcohol swab. Allow them to dry and apply blue loctite to the crankarm mounting bolt threads.
9. Position the crankarm on the input pulley shaft. Thread and hand tighten the 14 mm. crankarm mounting bolt into the input pulley shaft. Torque the nut to 300 in/lbs.
10. Replace the stairarm assembly as described in Procedure 7.24.
11. If you are replacing both crankarm assemblies, repeat steps 8 and 9 for the second crankarm assembly.
12. Set the on/off switch in the "on" position. Use the unit and note whether the stride rate is being displayed. If the stride rate is zero while the unit is being used, the magnet was installed backwards. The hall effect sensor is polarity sensitive, therefore the magnet installed in step 7 must be reversed.
13. If the stride rate in step 11 was zero, remove the magnet from the right hand crankarm, reverse and reinstall it. Repeat step 11.
14. Set the unit at its highest resistance setting and use the EFX for a minimum of 3 minutes. Stride in a forward direction for half of the time and in a backward direction for half of the time. Set the on/off switch in the "off" position and re-torque both of the 14 mm. crankarm mounting bolts to 300in/lbs.
15. Replace the rear cover per Procedure 7.1.

Procedure 7.13 - Replacing a Pillow Block Bearing

1. Current production of C546's utilize an assembly that consists of the eddy current disk, input pulley assembly and pillow block bearings. The pillow block bearings are permanently attached to the input pulley shaft and can not be removed. If you encounter a situation where a pillow block bearing is damaged and requires replacement, the entire assembly consisting of eddy current disk, input pulley and pillow block bearings must be replaced. See Procedure 7.17 for replacement instructions.
2. The pillow block bearings contains grease fitting. It is recommended that the bearings be periodically checked and greased if necessary.

Diagram 7.14 - Pillow Block Bearings



Procedure 7.14 - Replacing the Eddy Current Disk Assembly

1. Current production of C546's utilize an assembly that consists of the eddy current disk, input pulley assembly and pillow block bearings. The pillow block bearings are permanently attached to the input pulley shaft and can not be removed. If you encounter a situation where the eddy current disk is damaged and requires replacement, the entire assembly consisting of eddy current disk, input pulley and pillow block bearings must be replaced. See Procedure 7.17 for replacement instructions.

Procedure 7.15 - Replacing the Input Pulley Belt

1. Set the on/off switch in the “off” position, then unplug the power cord from the wall outlet.

WARNING

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

2. Remove the rear cover as described in Procedure 7.1.
3. Remove the stairarm assemblies as described in Procedure 7.24.
4. Remove the crankarm assemblies as described in Procedure 7.12.
5. Remove the magnet assembly as described in Procedure 7.20.
6. Remove the input drive assembly per Procedure 7.17, steps 6-9.
7. Carefully, lay the EFX on it's side. Remove the bolts that retain mounting plate for the input module and on/off switch. Swing the mounting plate away from the drive unit.
8. Remove the left and right tension bolts, locking tabs and brackets. Slide the step up pulley assembly with both the step up and input belts out of the drive unit.
9. Remove the input pulley belt. Set the replacement input pulley belt in it's mounting position on the step up pulley assembly.
10. Set the step up pulley assembly with the step up and input belt at it's mounting position in the drive unit. Replace the tensioning bolts, locking tabs and brackets removed in step 8. Thread the left and right tension bolts into the step up pulley shaft.
11. Complete the installation per Procedure 7.17, steps 10-17.

Procedure 7.16 - Replacing the Step-Up Pulley Belt

1. Set the on/off switch in the “off” position, then unplug the power cord from the wall outlet.

WARNING

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

2. Remove the rear cover as described in Procedure 7.1.
3. Remove the stairarm assemblies as described in Procedure 7.24.
4. Remove the crankarm assemblies as described in Procedure 7.12.
5. Remove the magnet assembly as described in Procedure 7.20.
6. Remove the input drive assembly per Procedure 7.17, steps 6-9.
7. Carefully, lay the EFX on it's side. Remove the bolts that retain mounting plate for the input module and on/off switch. Swing the mounting plate away from the drive unit.
8. Remove the left and right tension bolts, locking tabs and brackets. Slide the step up pulley assembly with both the step up and input belts out of the drive unit.
9. Remove the step up pulley belt. Set the replacement step up pulley belt in it's mounting position on the step up pulley assembly.
10. Set the step up pulley assembly with the step up and input belt at it's mounting position in the drive unit. Replace the tensioning bolts, locking tabs and brackets removed in step 8. Thread the left and right tension bolts into the step up pulley shaft.
11. Complete the installation per Procedure 7.17, steps 10-17.

Procedure 7.17 - Replacing the Input Drive Assembly

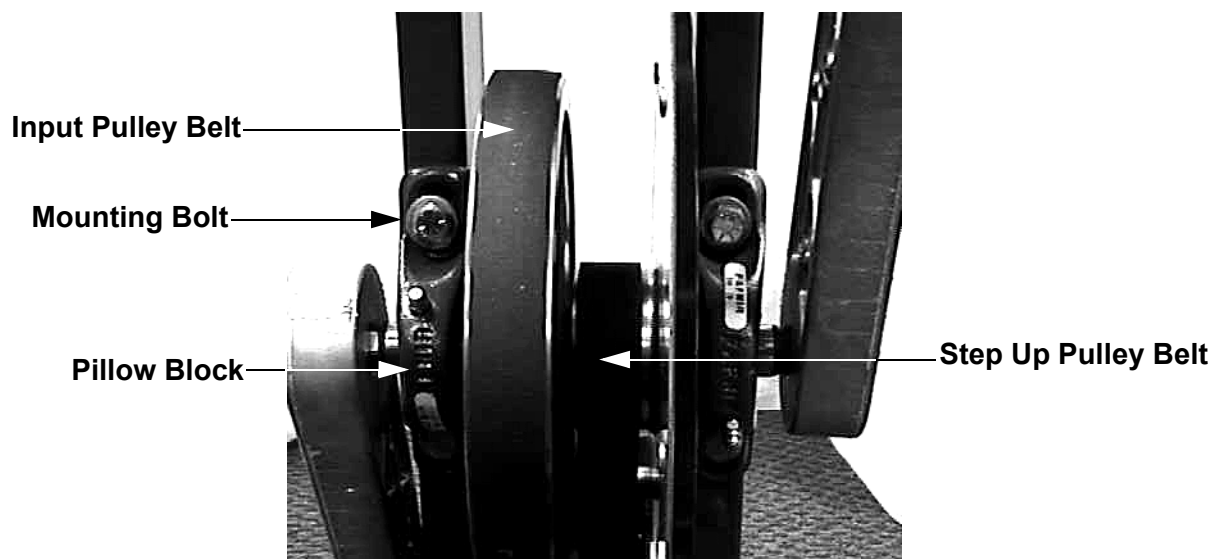
1. Set the on/off switch in the “off” position, then unplug the power cord from the wall outlet.

WARNING

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

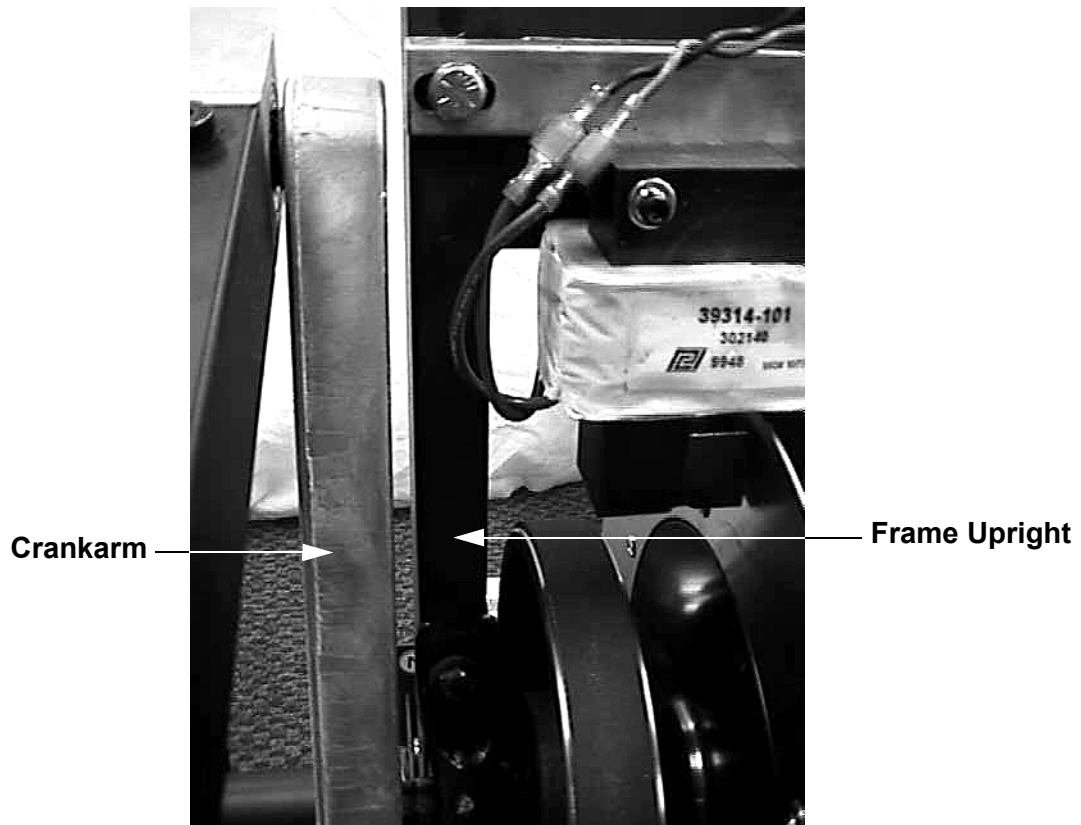
2. Remove the rear cover.
3. Remove the stairarm assemblies as described in Procedure 7.24.
4. Remove the crankarm assemblies as described in Procedure 7.12.
5. Remove the magnet assembly as described in Procedure 7.20.
6. Remove tension from the input pulley and step-up pulley belts as described below:
 - a. Loosen the stub tensioner axle nut and turn the stub tensioner adjustment nut counterclockwise until tension is removed from the input belt. (See Diagram 5.4)
 - b. Straighten the locking tabs and turn the left and right tension bolts counterclockwise until tension is removed from the step up belt. (See Diagram 5.2)
 - c. Slide the input and step up belts off of their pulleys.
7. Remove the stub tensioner per procedure 7.28, steps 4 and 5.
8. Remove the input drive assembly mounting bolts (2 per pillow block bearing).

Diagram 7.15 - Input Drive Assembly



9. Remove the input drive assembly. Slide both belts off of the ends of the input drive assembly.
10. Hold the replacement input drive assembly at its mounting position and slide the input belt over and past the pillow block bearing on the left side of the input drive assembly. Slide the step belt over and beyond the pillow block bearing on the right side of the input drive assembly.
11. Replace the input drive assembly. Torque the four bolts that mount the input drive assembly to 500 inch pounds.

Diagram 7.16 - Drive Unit Alignment



12. Place the input belt and step up belt in place on their pulleys. Tighten both belts enough so that they don't slip and are roughly aligned. The tensioning and alignment of the belts will be completed in a later step.
13. Replace the magnet assembly per procedure 7.20.
14. Complete the installation, drive belt alignment and tensioning per Procedure 5.3.
15. Replace the crankarms per Procedure 7.12. The crankarms must be parallel to the frame uprights. See Diagram 7.16. If necessary loosen the four drive unit mounting bolts, align the drive unit and torque the drive unit mounting bolts to 500 inch pounds.

16. If the drive units was moved in step 15, re-check the drive belt alignment and tensioning per Procedure 5.3.
17. Replace the cover.

Procedure 7.18 - Replacing the Step-Up Pulley Assembly

1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.

WARNING

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

2. Remove the rear cover as described in Procedure 7.1.
3. Remove the stairarm assemblies as described in Procedure 7.24.
4. Remove the crankarm assemblies as described in Procedure 7.12.
5. Remove the magnet assembly as described in Procedure 7.20.
6. Remove tension from the drive belts.
7. Slide the step up and input belts off of their pulleys and remove the input pulley assembly from the drive unit. (See Diagram 7.14)
8. Remove the left and right tension bolts, locking tabs and brackets.
9. Carefully, lay the EFX on it's side. Remove the bolts that retain mounting plate for the input module and on/off switch. Swing the mounting plate away from the drive unit.
10. Slide the step up pulley assembly with both the step up and input belts out of the drive unit.
11. Place the step up and input belts on the replacement step up pulley assembly.
12. Set the replacement step up pulley assembly with the step up and input belt at it's mounting position in the drive unit. Replace the tensioning bolts, locking tabs and brackets removed in step 8. Thread the left and right tension bolts into the step up pulley shaft.
13. Slide the step up and input belts onto the input pulley assembly as you set the input pulley assembly in it's mounting position in the drive unit.
14. Replace the magnet assembly per procedure 7.20.
15. Complete the installation, alignment and tensioning per Procedure 7.17, steps 10 to 17.

Procedure 7.19 - Replacing the Speed Sensor Assembly

Removing the Speed Sensor Assembly

1. Set the on off/off switch in the “off” position, then unplug the power cord from the wall outlet.

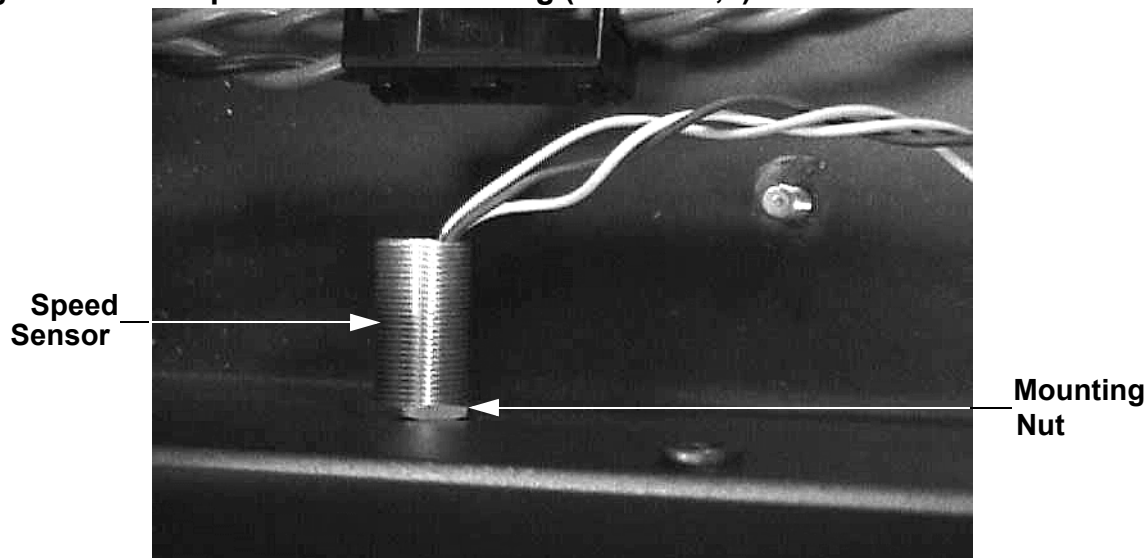
WARNING

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

Note: The speed sensor magnet must be mounted in the right hand crankarm on version 1, 2 units and in the left hand crankarm of version 3 units. The speed sensor magnet must be mounted in the correct crankarm or the speed sensor will not function.

2. For version 1, 2 units continue with step 3. For version 3 units skip to step 10.
3. Remove the rear cover.
4. Disconnect the speed sensor cable from the lower PCA. See Diagram 7.17A.

Diagram 7.17A - Speed Sensor Mounting (version 1,2)



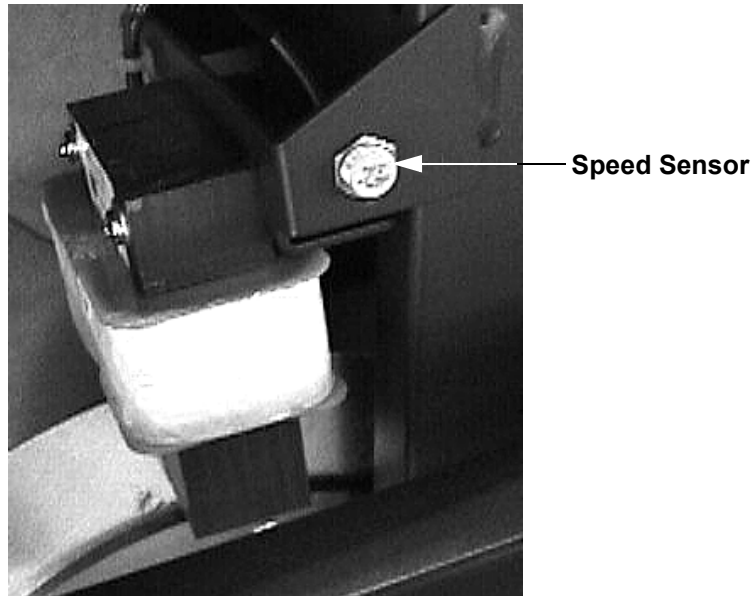
5. Remove the mounting nut that secures the speed sensor assembly to the frame. Thread the speed sensor out of the frame.

Replacing the Speed Sensor Assembly

6. Thread the replacement speed sensor into the frame as far as possible. Rotate the crankarm until the magnet in the crankarm is next to the speed sensor. Thread the speed sensor out of frame, as required, to set the distance between the speed sensor and the magnet to 1/4 inch.

7. Replace mounting nut that secures the speed sensor to the frame.
8. Reconnect the speed sensor cable to the lower PCA.
9. Re-install the rear cover, then check the operation of the C546 as described in Section Four.
10. Remove the left rear cover.
11. Disconnect the speed sensor cable from the lower PCA.

Diagram 7.17B - Speed Sensor Mounting (version 3)



12. Remove the mounting nut that secures the speed sensor assembly to the frame. Thread the speed sensor out of the frame.

Replacing the Speed Sensor Assembly

13. Thread the replacement speed sensor into the frame as far as possible. Rotate the crankarm until the magnet in the crankarm is next to the speed sensor. Thread the speed sensor out of frame, as required, to set the distance between the speed sensor and the magnet to 1/4 inch.
14. Replace mounting nut that secures the speed sensor to the frame.
15. Reconnect the speed sensor cable to the lower PCA.
16. Re-install the left rear cover, then check the operation of the C546 as described in Section Four.

Procedure 7.20 - Replacing the Eddy Current Magnet Assembly

Removing the Magnet Assembly

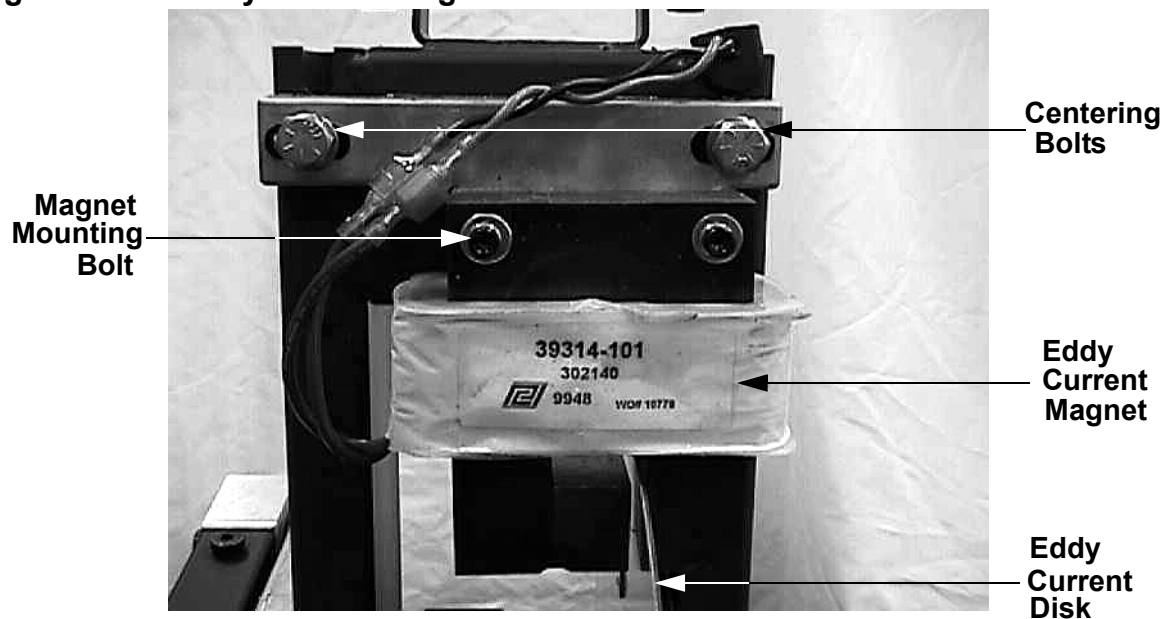
1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.

WARNING

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

2. Remove the rear cover.
3. Disconnect the magnet cable from the magnet assembly.
4. Remove the bolts that secure the magnet assembly to the drive unit. Remove the magnet from the drive unit.

Diagram 7.18 - Eddy Current Magnet



Replacing the Magnet Assembly

5. Position the magnet assembly at its mounting position.
6. Replace and hand tighten the magnet assembly mounting bolts. Torque the magnet assembly mounting bolts to 60 in/lbs.

7. Check that the eddy current disk is centered between the “legs” of the eddy current magnet. If not, loosen the centering bolts, see Diagram 7.18, and center the eddy current magnet on the eddy current disk. Torque the centering bolts to 150 inch pounds.
8. Reconnect the magnet cable to the magnet assembly.
9. Re-install the rear cover, then check the operation of the EFX as described in Section Four.

Procedure 7.21 - Replacing a Stairarm Pivot Block

1. The stairarm pivot has been made an integral part of the stairarm assembly. The pivot block is no longer individually replaceable. The stairarm is provided with a pivot block that is permanently attached to the stairarm. If the pivot block is defective, the stairarm must be replaced per Procedure 7.24.

Procedure 7.22 - Replacing a Wheel Assembly

Procedure

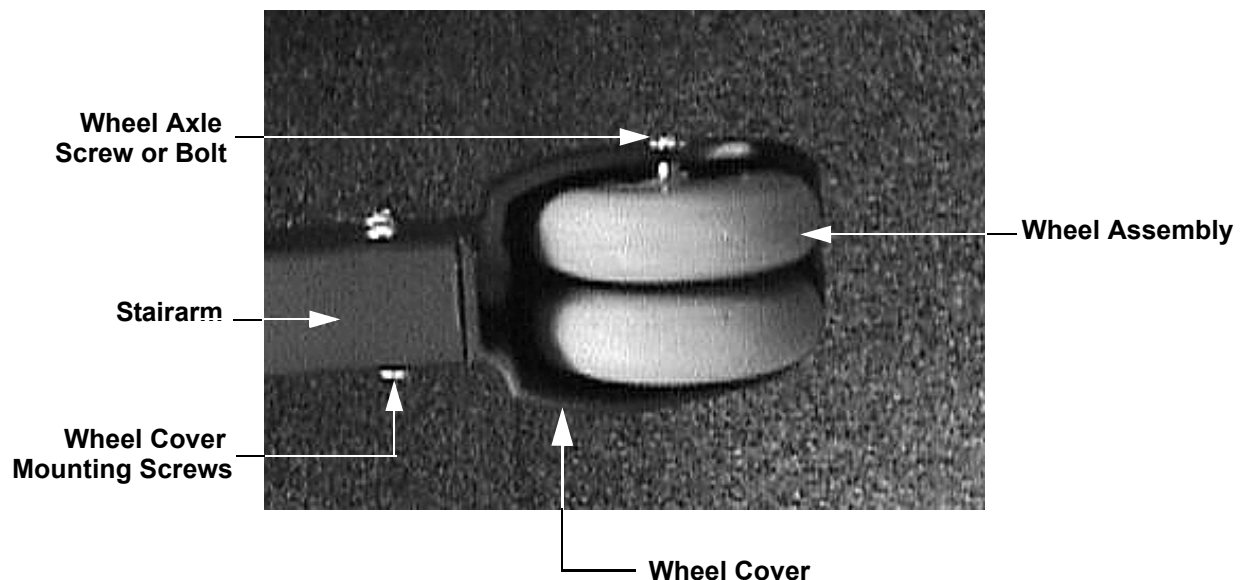
1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.
2. On February 2, 2004 the wheel assembly was modified to a wheel assembly utilizing larger bearings and a larger mounting bolts. If the wheel being replaced has large (5/16-18) mounting bolts, skip to step 8. If the wheel being replaced has a small (8-32) mounting screw, continue with step 3.

WARNING

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

3. Because the replacement wheels are improved, both the right and left wheel should be replaced. Additionally, two new wheel covers (43702-504) will be required accommodate larger wheel mounting bolts.
4. The wheel assembly is provided as an assembly that includes both wheels and replacement wheel axle screws. Remove the four wheel cover mounting screws, wheel cover from the stairarm and discard the wheel and cover.
5. Mount the replacement wheel cover on the stairarm with the screws removed in step 4.

Diagram 7.19 - Wheel Assembly



6. Install the replacement wheel assembly in the wheel cover. Install and hand tighten the two wheel axle bolts. Torque the wheel cover bolts to 15 foot-pounds.

7. Plug the power cord into the wall outlet, set the on/off switch in the “on” position and thoroughly test the operation of the wheel assemblies.
8. Remove the two wheel axle bolts from the wheel. Discard the bolts and the wheel. Replacement wheel mounting bolts are furnished with the replacement wheel.
9. Install the replacement wheel assembly in the wheel cover. Install and hand tighten the two wheel axle bolts. Torque the wheel cover bolts to 15 foot-pounds.
10. Plug the power cord into the wall outlet, set the on/off switch in the “on” position and thoroughly test the operation of the wheel assemblies

Procedure 7.23 - Replacing a Stairarm Pedal

1. Set the on/off switch in the “off” position, then unplug the power cord from the wall outlet
2. Loosen and remove the two bolts that fasten the stairarm pedal onto the stairarm.
3. Remove the stairarm pedal from the stairarm.
4. Set the replacement stairarm pedal at its mounting position on the stairarm.
5. Install and hand tighten the stairarm pedal mounting hardware removed in step 2. Torque the stairarm pedal mounting bolts to 60 in/lbs.

Procedure 7.24 - Replacing a Stairarm

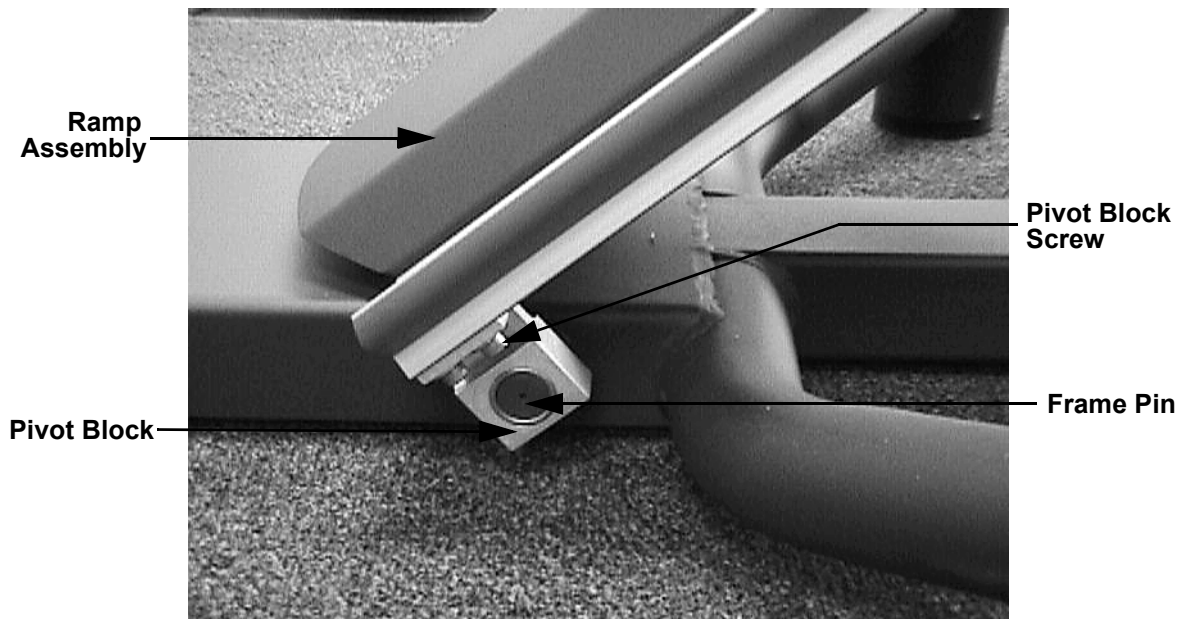
1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.
2. Remove the rear cover per Procedure 7.1.
3. Remove the retaining clip that fastens the stairarm pivot block to the crankarm. Slide the stairarm off of the crankarm.
4. Loosen and remove the two bolts that fasten the stairarm pedal onto the stairarm.
5. Remove the stairarm pedal from the stairarm.
6. Set the stairarm pedal at it's mounting position on the replacement stairarm.
7. Install and hand tighten the stairarm pedal mounting hardware removed in step 5. Torque the stairarm pedal mounting bolts to 60 in/lbs.
8. Remove the four screws that fasten the wheel/cover assembly to the stairarm. Remove the wheel/cover assembly from the stairarm.
9. Install the wheel/cover assembly on the replacement stairarm. Install and hand tighten the four wheel/cover assembly screws. Torque the wheel/cover assembly mounting screws to 70 in/lbs.
10. Slide the replace stairarm onto the crankarm. Replace the retaining clip removed in step 3.
11. Replace the rear cover per Procedure 7.1.

Procedure 7.25 - Replacing All or Part of a Ramp Assembly

Procedure

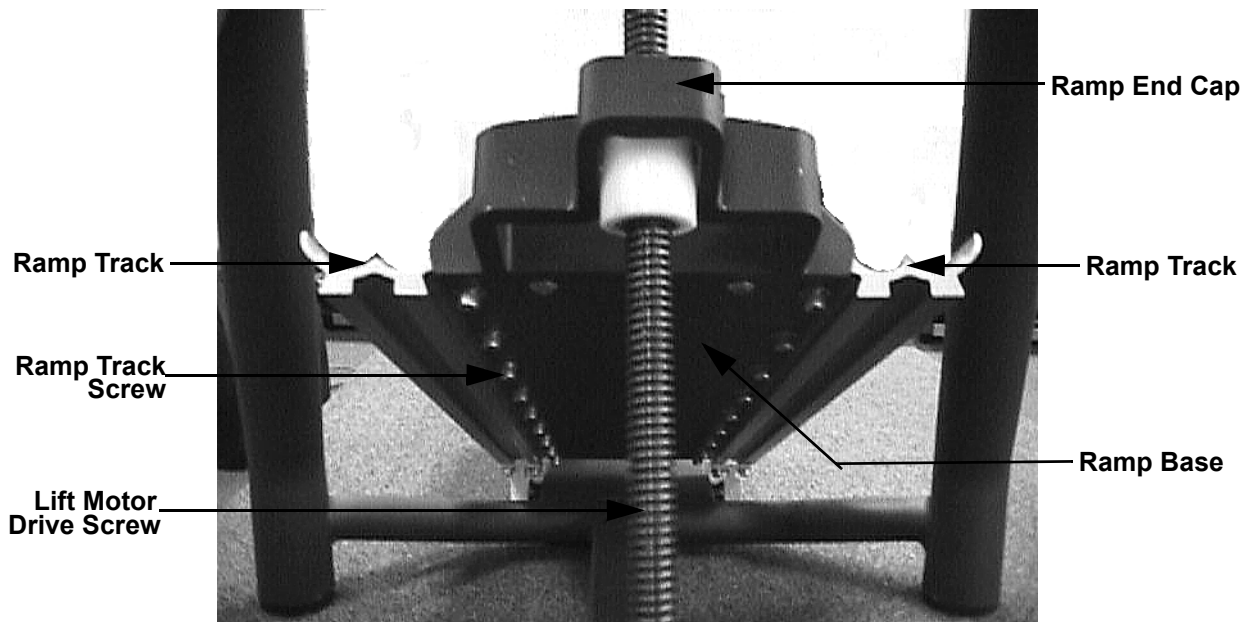
1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.
2. Remove the rear cover per Procedure 7.1 and pivot both stairarms to the rear of the unit.
3. Remove the four screws that fasten the ramp end cap to the ramp assembly. Slide the ramp end cap out of the ramp assembly and rotate the ramp assembly toward the rear of the unit.
4. If the ramp end cap is not being replaced, do not allow the ramp end cap to rotate on the lift motor drive screw. If the ramp end cap is rotated, the lift motor must be re-calibrated per Procedure 5.2.
5. If only the ramp end cap is being replaced skip to step 13. Otherwise continue with the next step.
6. Remove the ramp pivot block mounting screws from one of the ramp pivot blocks. Slide the entire ramp off of the frame pin and place it in a convenient work area. Slide the other ramp pivot block off of it's frame pin. (See Diagram 7.20)

Diagram 7.20 - Ramp Pivot



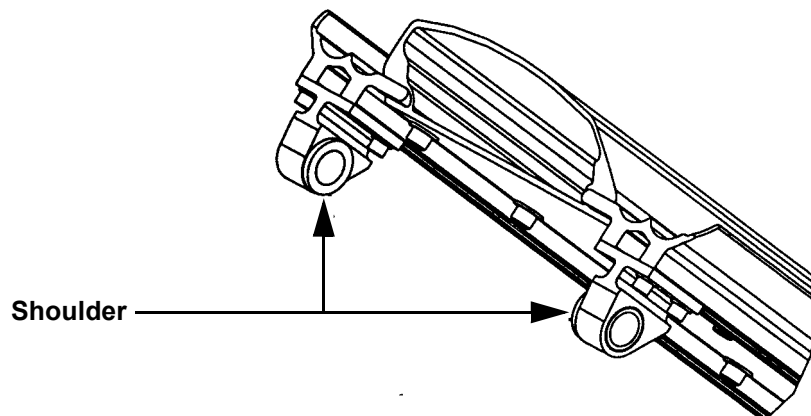
7. If you are only replacing a ramp pivot block(s), skip to step 11.
8. If you are replacing a ramp base, remove the nine screws that fasten each ramp track to the ramp base. (see Diagram 7.21)
9. If you are replacing one or more ramp tracks remove the nine ramp track screws associated with the ramp track(s) that you are replacing.

Diagram 7.21 - Ramp Assembly



10. Set the ramp track(s) in their mounting position on the ramp base, thread and hand tighten the ramp track mounting screws. Torque the ramp track mounting screws to 200 in/lbs.
11. If necessary mount one ramp pivot block onto the ramp assembly. Be sure to orient the ramp pivot block so that the shoulder on the ramp pivot block faces inward. Hand tighten the pivot block mounting screws and the torque them to 120 in/lbs.(See Diagram 7.22)

Diagram 7.22 - Ramp Pivot Block Orientation



12. Slide the ramp assembly onto its frame pin. Slide the remaining ramp pivot block onto other frame pin. Thread and hand tighten the ramp pivot block mounting screws and then torque them to 120 in/lbs.
13. If ramp end cap has been replaced or the ramp end cap was rotated on the lift motor drive screw, recalibrate the lift motor per Procedure 5.2.
14. Align the ramp assembly with the ramp end cap and slide the ramp end cap into the ramp assembly.
15. Thread and hand tighten the ramp end cap mounting screws and then torque them to 100 in/lbs.
16. Replace the front cover per Procedure 7.1.

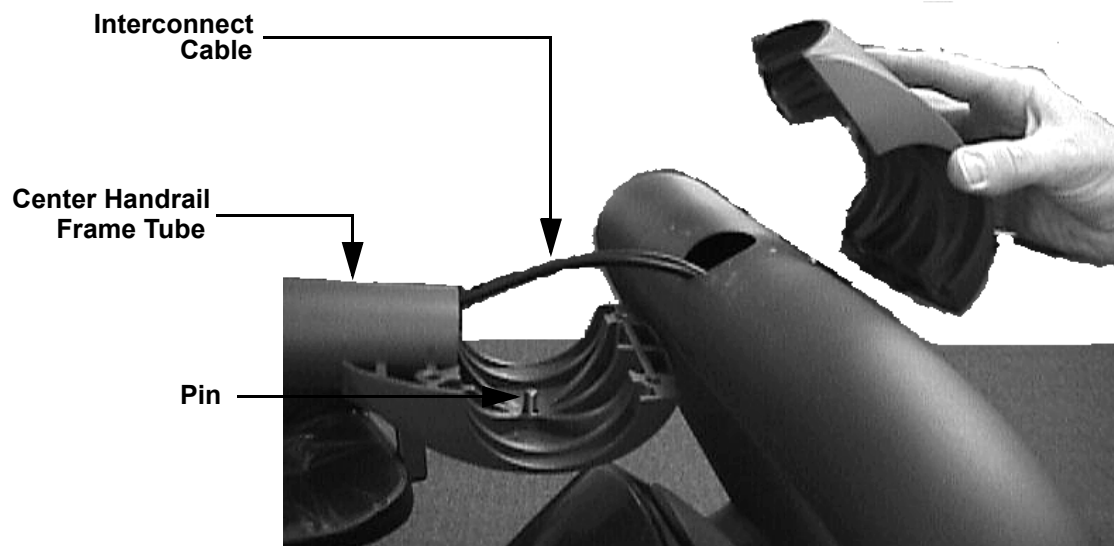
Procedure 7.26 - Replacing a Handlebar

1. Set the on/off switch in the “off” position, then unplug the power cord from the wall outlet.
2. Loosen the screws that fasten the upper end of the handrail into the upper handrail clamp.
3. Loosen the four set screws that fasten the lower end of the handrail into the frame tube.
4. Slide the upper end of the handrail out of the upper handrail clamp and then slide the lower end of the handrail off of the frame tube.
5. Slide the upper end of the replacement handrail into the upper handrail clamp and then insert the lower end of the handrail onto the frame tube mount.
6. Tighten the upper handrail screws and lower handrail set screws.

Procedure 7.27 - Replacing the Center Handrail Frame Tube (version 1, 2))

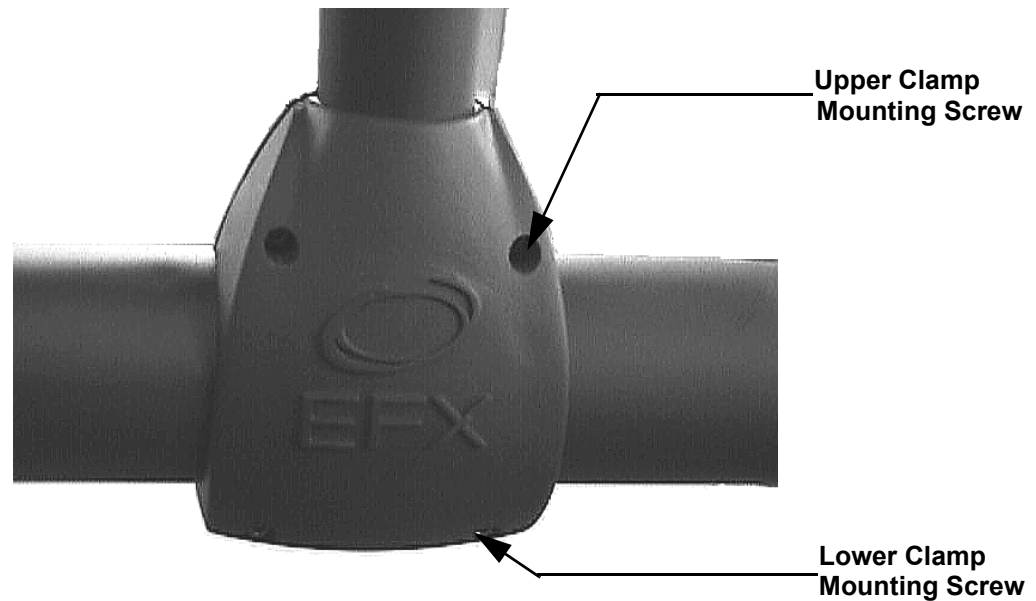
1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.
2. Loosen the screws that fasten the upper end of the handrails into the upper handrail clamp.
3. Loosen the four set screws that fasten the lower end of the handrails into the frame tubes.
4. Slide the upper end of one of the handrails out of the upper handrail clamp and then slide the lower end of the handrail off of the frame tube. Repeat this step for the other handrail.
5. Remove the screws that secure the interconnect cable cover to the bottom of the display backing plate. Remove the interconnect cover cable. See Diagram 7.4.
6. Remove the screws that secure the reading rack to the to the display backing plate. Remove the reading rack.
7. Remove the screws that secure the display housing to the display backing plate.
8. Disconnect the interconnect cable from the upper PCA.
9. Remove the display assembly.
10. Remove the screws that fasten the upper handrail clamp to the center handrail frame tube. Remove the upper handrail clamp.
11. Have an assistant support the center handrail frame tube as you remove the four screws that fasten the center handrail frame tube clamp. Remove the two halves of the clamp taking care not to lose the pin in the rear half of the clamp. (See Diagram 7.23)

Diagram 7.23 - Center Handrail Frame Tube



12. Carefully feed the interconnect cable out of the center handrail frame tube.
13. Hold the replacement center handrail frame tube near it's mounting position and feed the interconnect cable into the bottom of the center handrail frame tube. After the interconnect cable emerges from the top of the center handrail frame tube, have your assistant hold the frame tube in it's mounting position. Set the two halves of the clamp in position, be sure that the pins in the rear half of the clamp mate with the holes in the frame, thread and hand tighten the four clamp mounting screws. Tighten the upper clamp mounting screws before the lower clamp mounting screws. (See Diagram 7.24)

Diagram 7.24 - Clamp Mounting



14. Hold the display assembly in it's mounting position and reconnect the interconnect cable to the upper PCA.
15. Position the display enclosure on the display plate. Replace and tighten the display mounting screws.
16. Reposition the reading rack, replace and tighten the reading rack mounting screws.
17. Reposition the interconnect cable cover, replace and tighten the interconnect cable cover mounting screws.
18. Hold the upper handrail clamp in it's mounting position and install and tighten the upper handrail clamp mounting hardware.
19. Slide the upper end one of the handrails into the upper handrail clamp and then insert the lower end of the handrail onto the frame tube mount.
20. Tighten the upper handrail screws and lower handrail set screws.

21. Repeat steps 19 and 20 for the other handrail.
22. Check the operation of the EFX as described in Section Four.

Procedure 7.28 - Replacing the Stub Tensioner

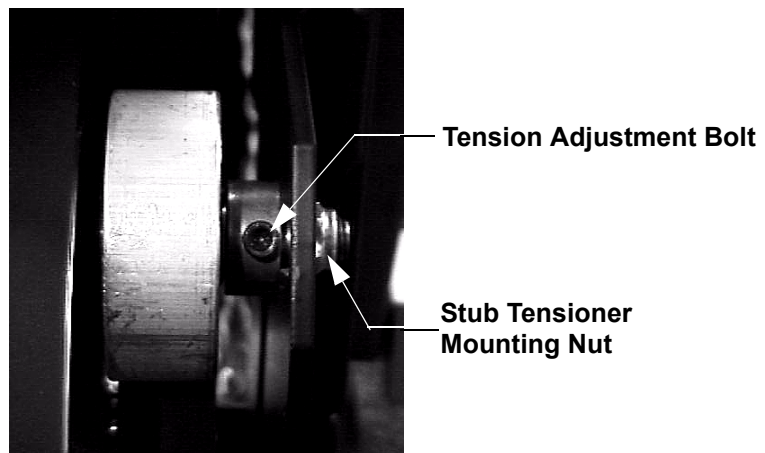
1. Set the on/off switch in the "off" position, then unplug the power cord from the wall outlet.

WARNING

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

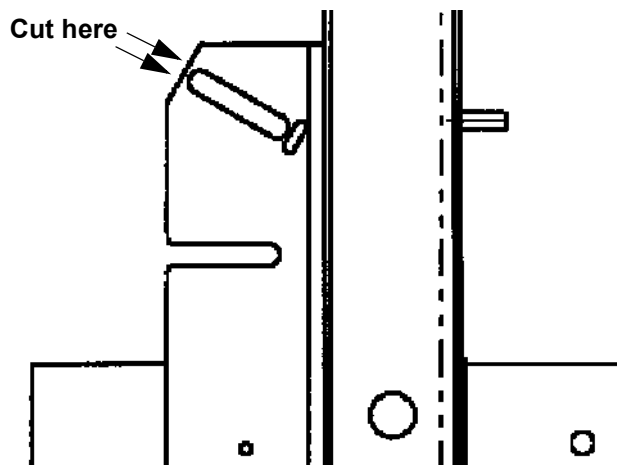
2. Remove the rear cover as described in Procedure 7.1.
3. Loosen the tension adjustment bolt to remove tension from the input belt. See Diagram 7.25.

Diagram 7.25 - Stub Tensioner Mounting



4. The early C546's mounted the stub tensioner in a closed slot. If you have a unit with a closed slot it is recommended that the slot be cut open with a hacksaw. Care must be taken not to cut the belt or other adjacent parts. See Diagram 7.26.

Diagram 7.26 - Stub Tensioner Mounting Slot



5. Remove the stub tensioner mounting nut and remove the stub tensioner from the drive unit.
6. Loosely mount the replacement stub tensioner in it's mounting position.
7. Complete the installation, alignment and tensioning per Procedure 7.15, steps 11 to 15.

Procedure 7.29 - Replacing a Power Entry Module

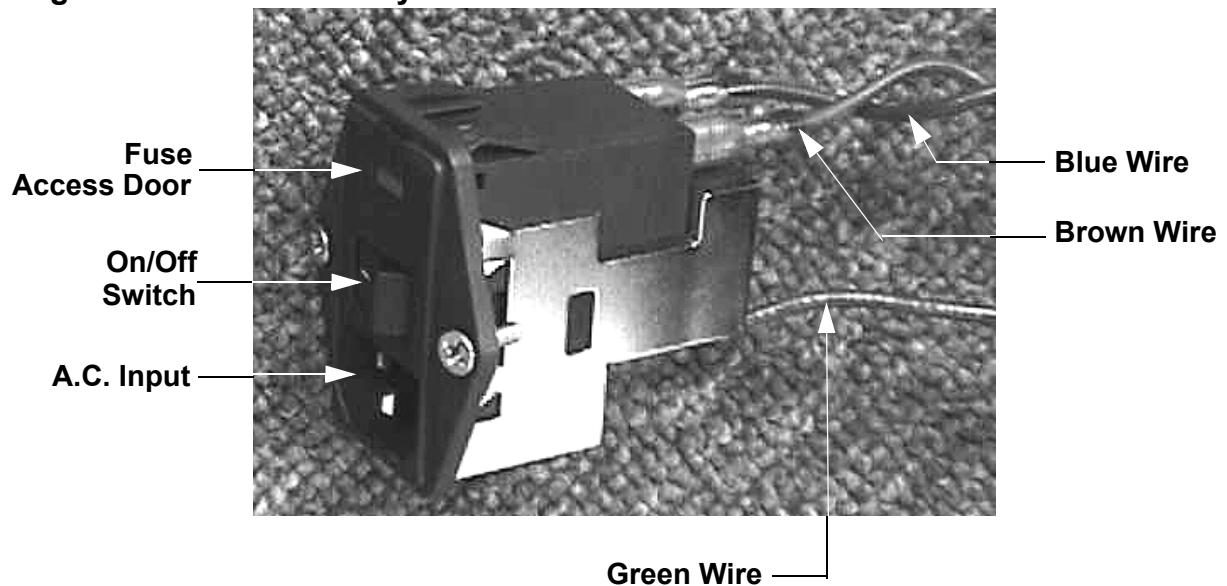
(version 2,3 units manufactured after 10-15-2000)

Procedure

Note: The power entry module on this EFX is a multifunction unit. It functions as a power entry module, A.C. line fuse holder, on/off switch and A.C. line filter.

1. Set the on/off switch in the off position. Remove the A.C. line cord from the A.C. outlet and from the power entry module.
2. Remove the rear cover per Procedure 7.1.

Diagram 7.27 - Power Entry Module



3. Remove the blue wire from terminal D and the brown wire from terminal A of the power entry module.
4. Remove the two screws that mount the power entry module to the rear cover support.
5. Open the fuse compartment and remove both fuses (See Procedure 7.30). Check both fuses with an ohmmeter. They should read approximately 1Ω or less. Replace any fuse that reads significantly high.
6. Install the tested fuses, from step 5, in the replacement power entry module.

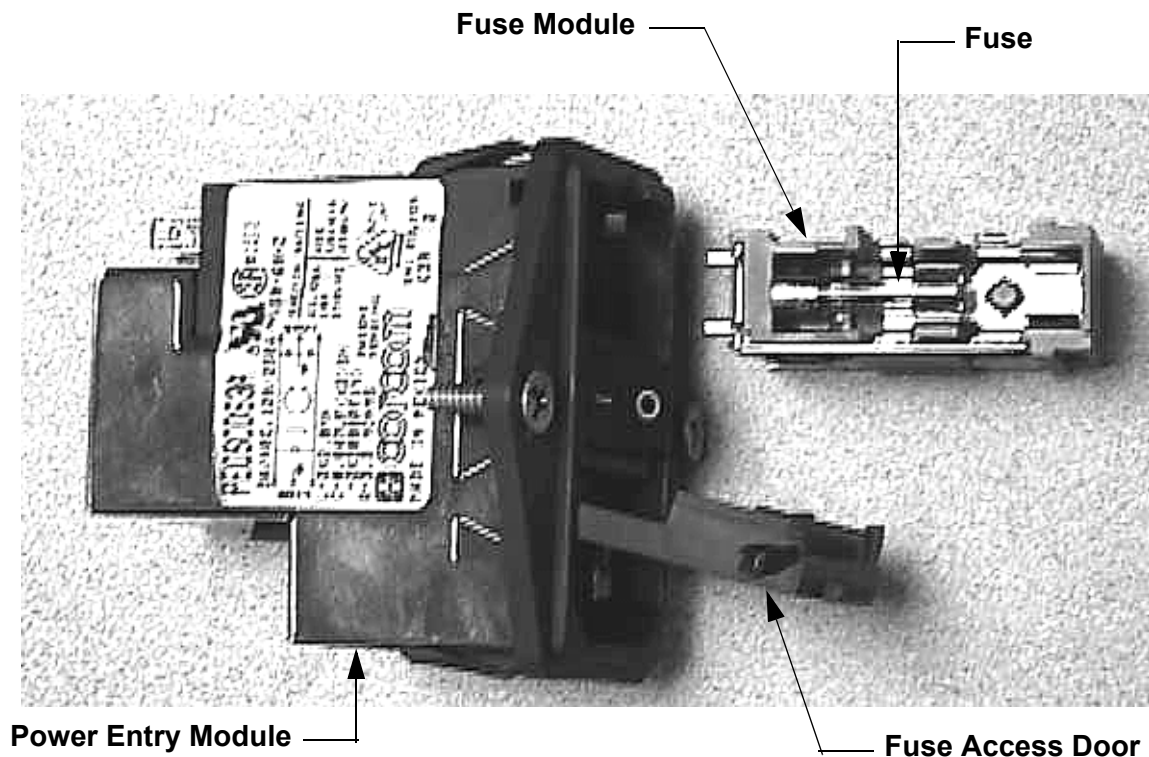
7. Set the replacement power entry module at its mounting position, secure the power entry module with the screws removed in step 4.
8. Replace the wires removed in step 3. Connect the blue wire to terminal D and the brown wire to terminal A of the power entry module.
9. Replace the cover per Procedure 7.1.
10. Insert the A.C. line cord in the power entry module and the A.C. outlet.
11. Set the on/off switch in the on position and test the EFX per Section Four.

Procedure 7.30 - Replacing a Power Entry Module Fuse (version 2,3 units manufactured after 10-15-2000)

Procedure

1. Set the on/off switch in the off position. Remove the A.C. line cord from the A.C. outlet and from the power entry module.
2. Using a thin bladed screwdriver, carefully pry the fuse access door open (See Diagram 7.28).

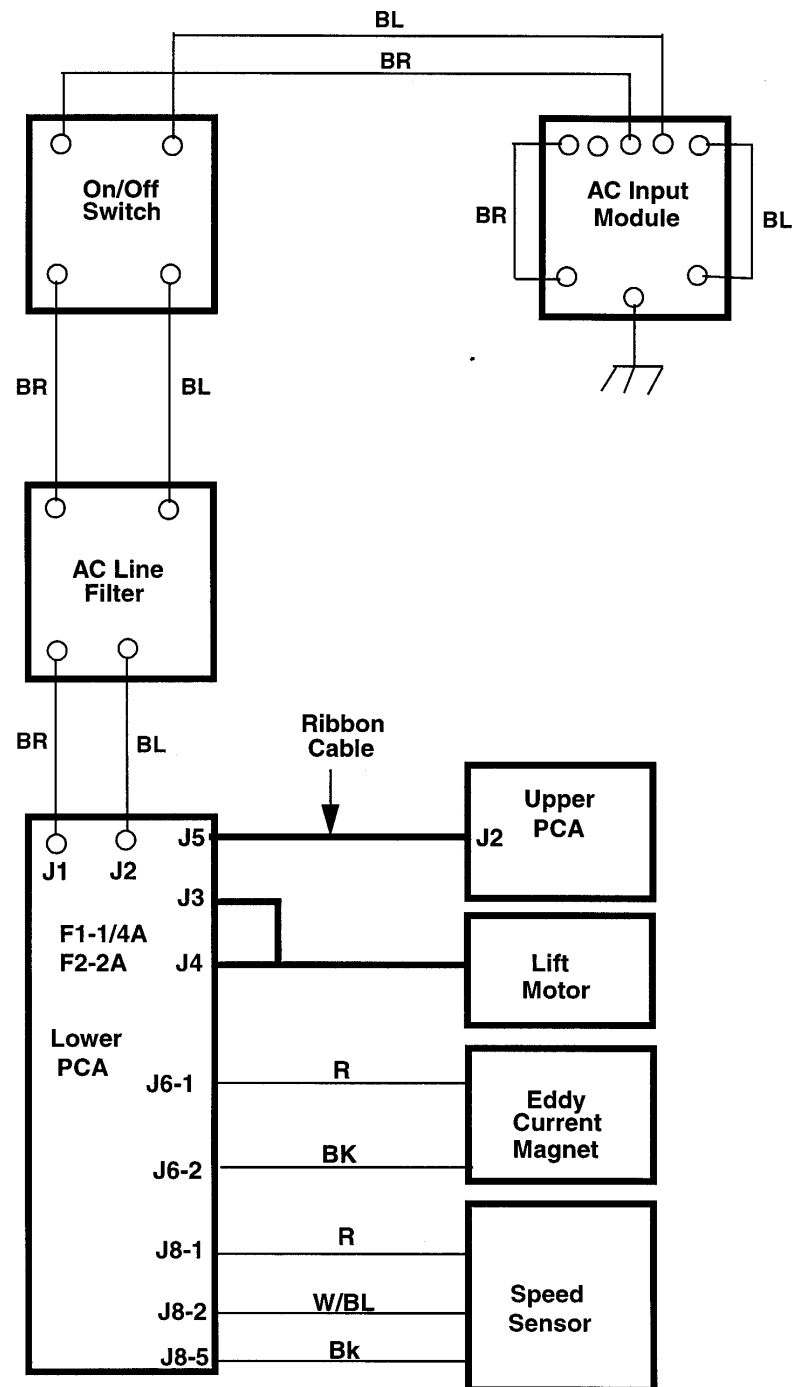
Diagram 7.28 - Power Entry Module Fuse



3. Using the thin bladed screwdriver, carefully pry the fuse module out of the power entry module.
4. The fuse module contains two fuses, carefully pry one or both fuses out of the fuse module, as required.
5. Snap the replacement fuse(s) into the fuse module.
6. Slide the fuse module back into the power entry module and close the fuse access door.

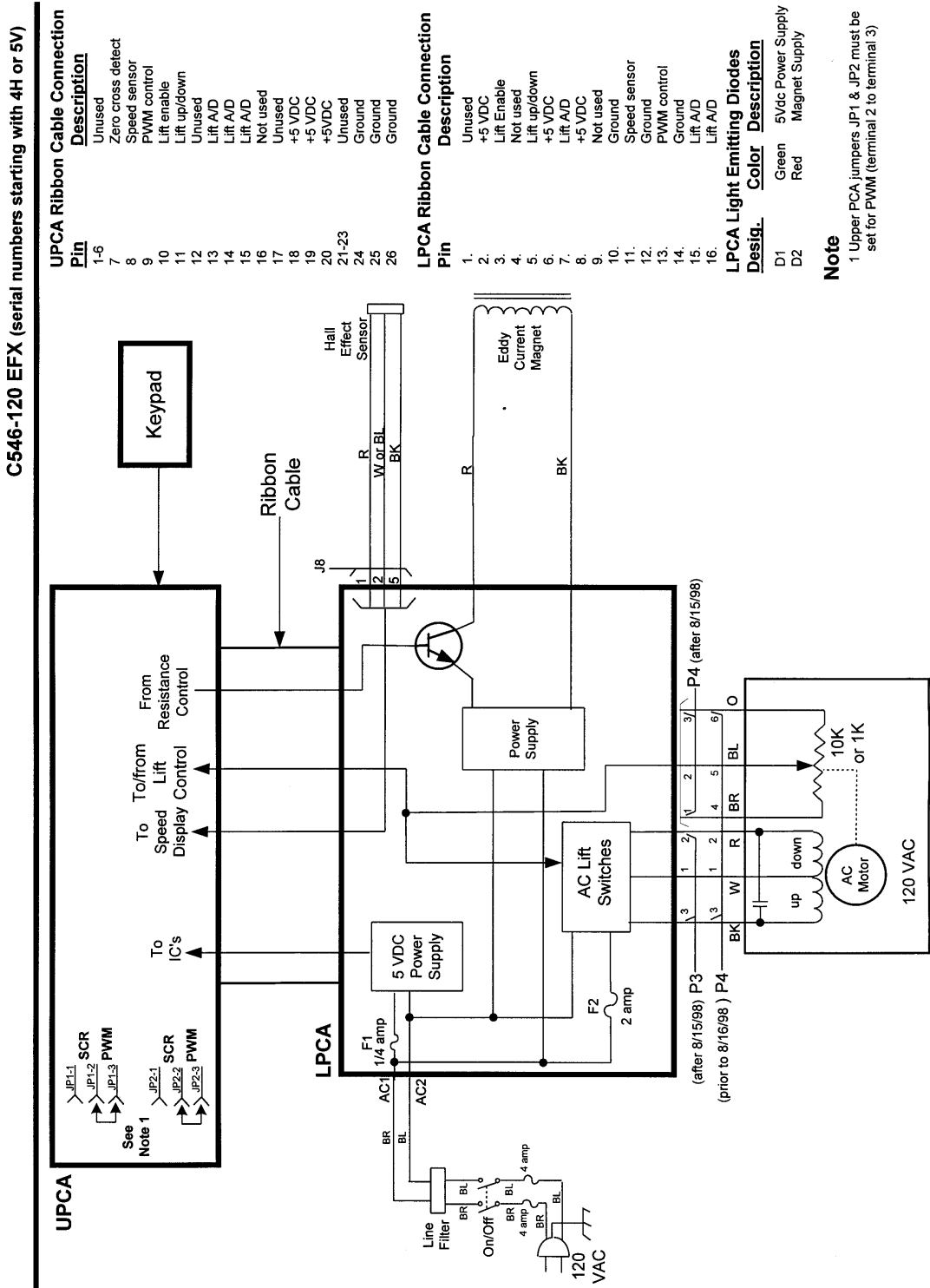
7. Insert the A.C. line cord in the power entry module and the A.C. outlet.
8. Set the on/off switch in the on position and test the EFX per Section Four.

Wiring Diagram 8.1 - C546 120 Vac ((version 1)

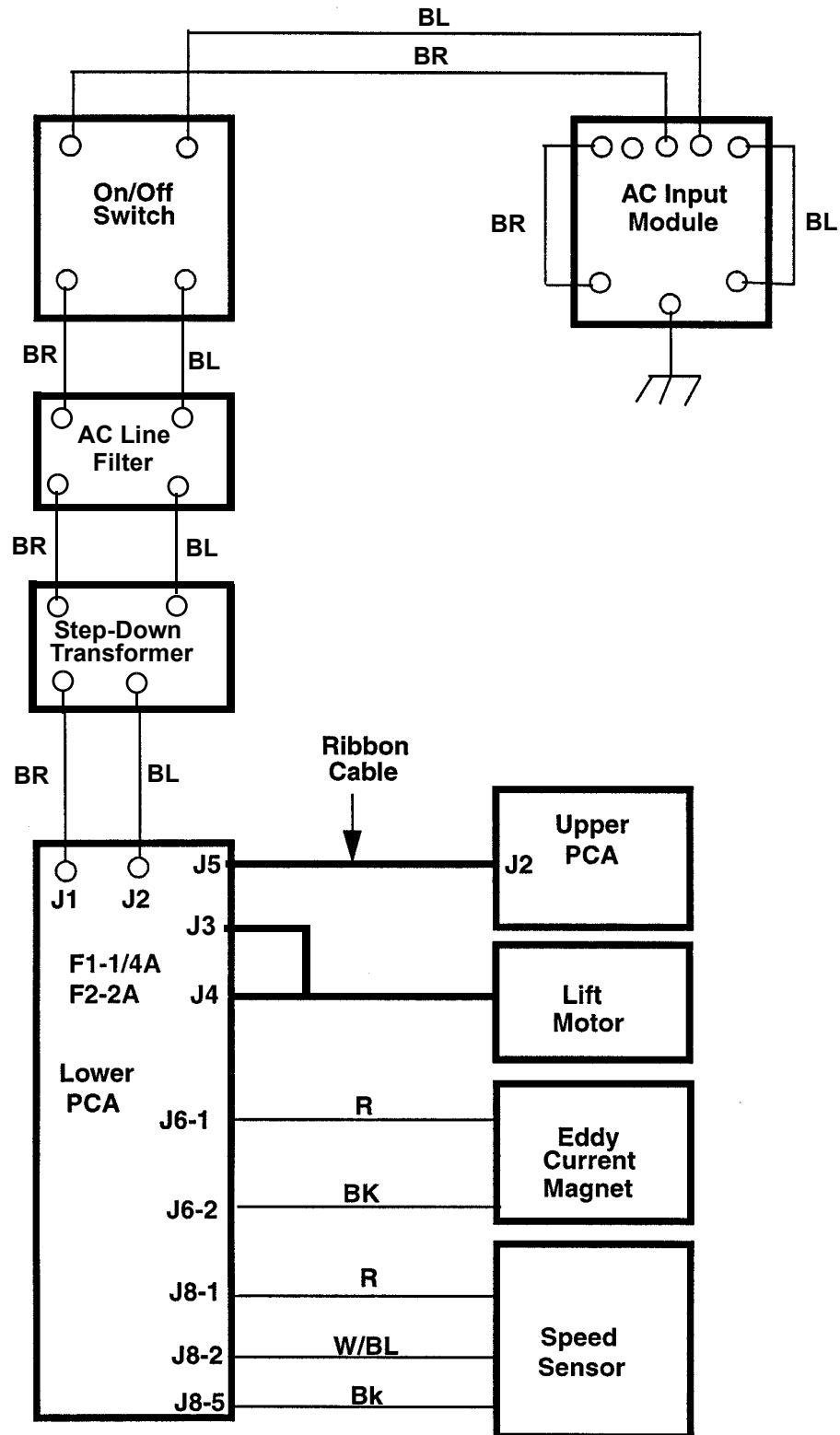


Block Diagram 8.2 - C546 120 Vac (version 1))

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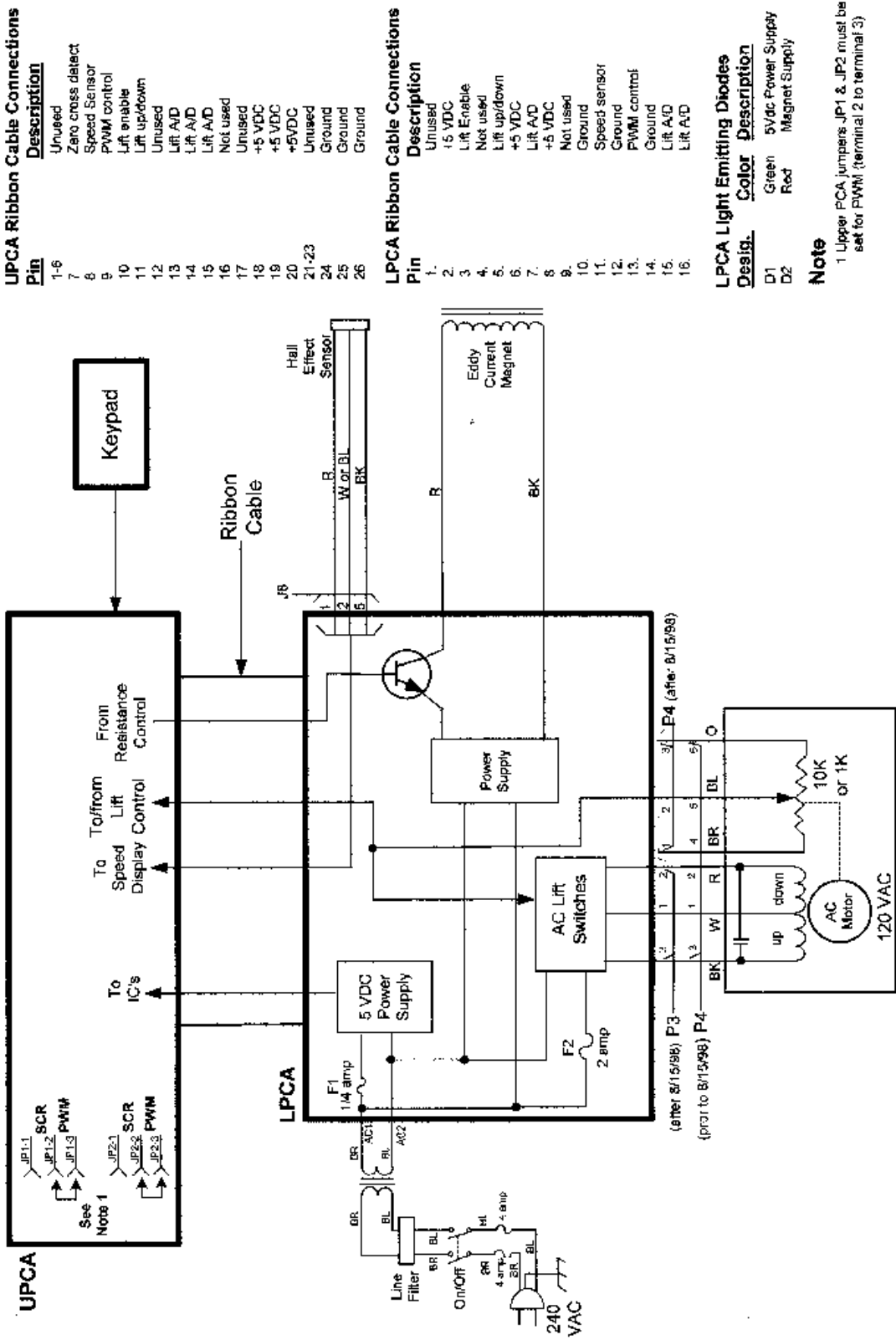
Wiring Diagram 8.3 - C546 240 Vac (version 1)



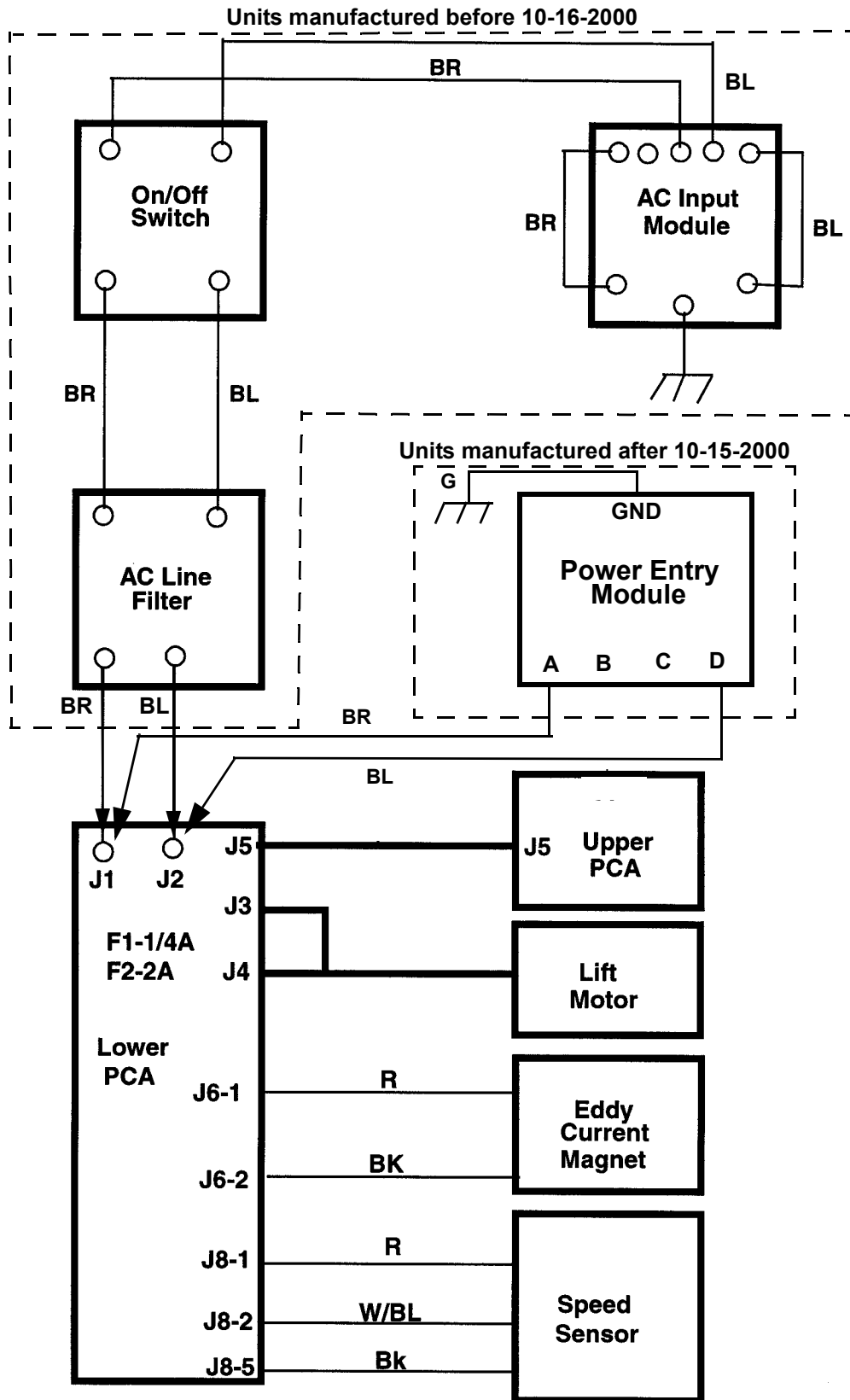
Block Diagram 8.4 - C546 240 Vac (version 1)

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C546-240 EFX (serial numbers starting with 4J or 5X)

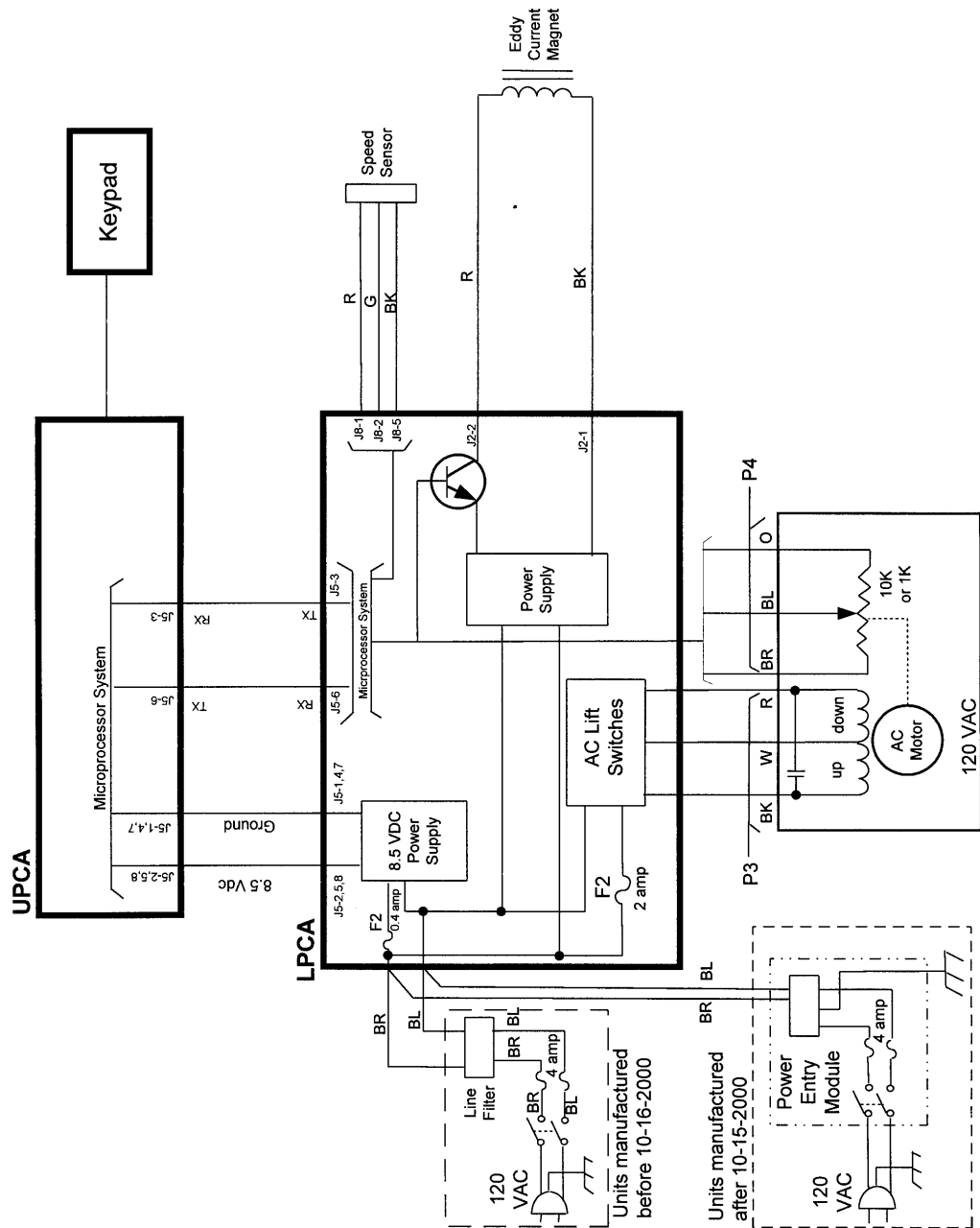


Wiring Diagram 8.5 - C546 120 Vac (version 2, 3)

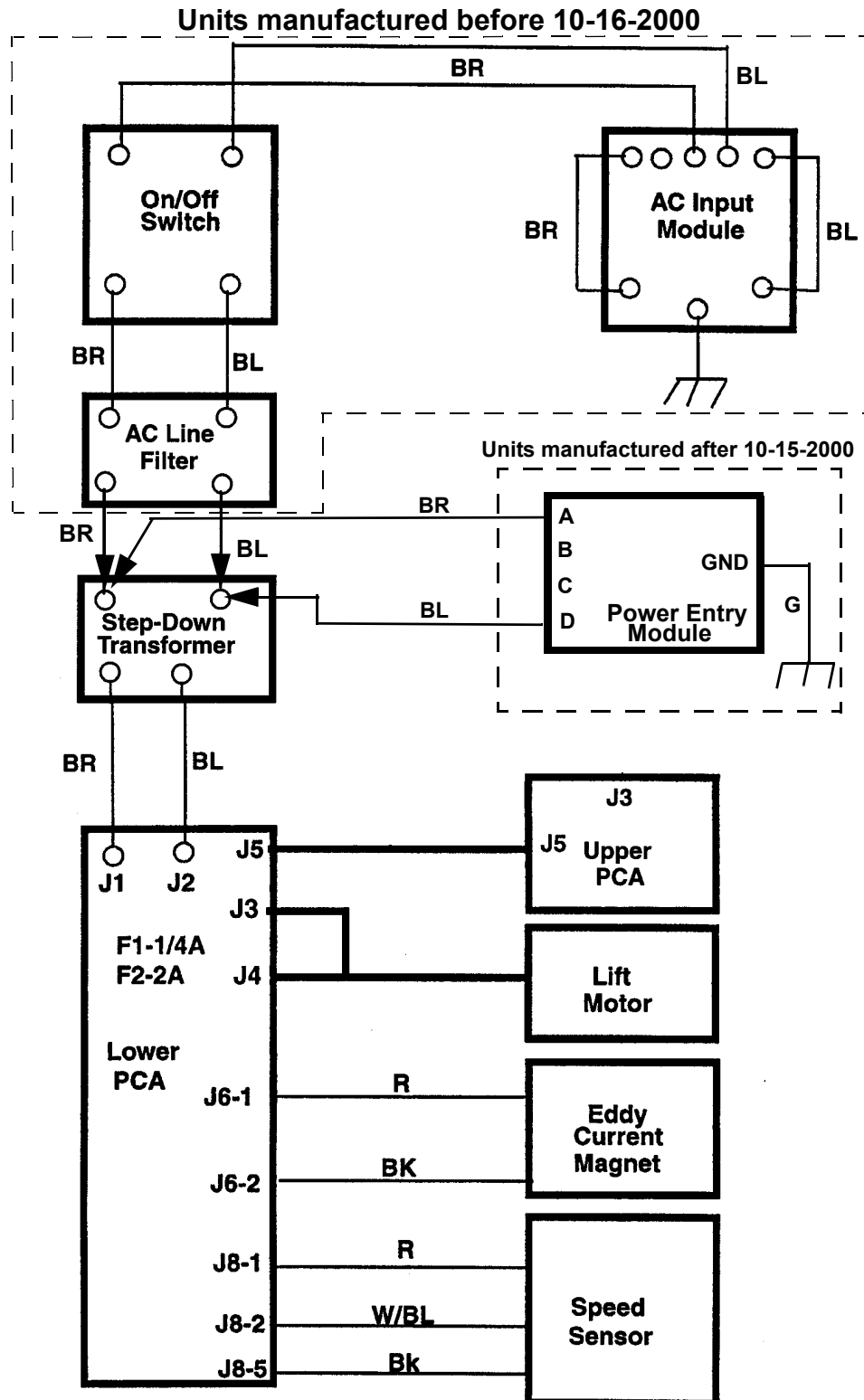


Block Diagram 8.6 - C546 120 Vac (version 2, 3)

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Wiring Diagram 8.7 - C546 240 Vac (version 2, 3)



The diagram illustrates the electrical connections for the UPCA/LPCA system. It includes a Microprocessor System with pins J5-1, 4, 7 (Ground), J5-2, 5, 8 (8.5 Vdc), J5-3 (TX), J5-6 (RX), and J5-5 (Microprocessor System). A Keypad is connected to the Microprocessor System. The system is powered by an 8.5 VDC Power Supply (F2, 0.4 amp) and an AC Lift Switches (F2, 2 amp). The AC Lift Switches are connected to a 240 VAC Line Filter (BR, BL) and a Power Entry Module (BR, BL). The Power Entry Module is connected to a 240 VAC source. The AC Lift Switches are also connected to an AC Motor (120 VAC) through a 10K or 1K resistor. The AC Motor is connected to a 120 VAC source. The diagram also shows connections for a Speed Sensor (R, G, BK) and an Eddy Current Magnet (R, BK).