Service Manual

M8.2E/L Recumbent Personal Cycle Trainer

PRECOR USA

P/N 20039-109

About This Manual

This manual is written for you, the 8.2E/L Recumbent Cycle service technician. The objective of the 8.2E/L Recumbent Cycle Service Manual is to provide you with the detailed step-by-step instructions you need to maintain, inspect, and adjust the 8.2E/L Recumbent Cycle, troubleshoot malfunctions, and remove and replace components. This manual includes the sections and appendices described in the following paragraphs.

Section One, Troubleshooting Flow Charts. This section allows you to troubleshoot malfunctions and find problems by analyzing and diagnosing 8.2E/L Recumbent Cycle operation and trouble symptoms.

Section Two, Things You Should Know. This section includes warning and caution statements, safety guidelines, and a list of required tools and equipment. It is highly recommended that you read this section, as well as the *8.2E/L Recumbent Cycle Owner's Manual*, before performing the maintenance procedures provided in this manual.

Section Three, Software Features. The 8.2E/L Recumbent Cycle is programmed with several diagnostic and setup features. This section contains the procedures you need to access these features.

Section Four, Preventive Maintenance. This section provides regular (scheduled) maintenance activities that should be performed to keep the 8.2E/L Recumbent Cycle in peak condition.

Section Five, Checking Cycle Operation. This procedure provides you with a quick way of checking the cycle operation. Check the cycle operation at the end of a maintenance procedure and when it is necessary to ensure that the cycle is operating properly.

Section Six, Inspection and Adjustment Procedures. You will perform inspection procedures when a trouble symptom points to a particular problem and after removing and replacing major components. Many maintenance problems can be fixed by adjusting various 8.2E/L Recumbent Cycle components. This section provides you with the step-by-step procedures required to make these adjustments.

Section Seven, Removal and Replacement Procedures. When an 8.2E/L Recumbent Cycle component must be replaced, go to this section and follow the step-by-step instructions required to remove and replace the malfunctioning component.

Appendix A, Fit Test Messages. This appendix describes the error messages that may be encountered when the Fit Test option is used. The information required to interpret and respond to these messages, including a description of probable parameter or equipment-related causes, is also included.

Appendix B, Maintaining 220-Volt 8.2E/L Recumbent Cycles. This appendix includes the maintenance information required to service 220-volt 8.2E/L Recumbent Cycles. A wiring diagram for 220-volt 8.2E/L Recumbent Cycles is also included.

Appendix C, Exploded View Diagrams and Parts List. This appendix includes the 8.2E/L Recumbent Cycle exploded view diagrams and parts list. Use this information to identify and locate cycle components that must be inspected, adjusted, or removed and replaced.

Appendix D, Service Bulletins and Engineering Change Notices. If Precor sends you Service Bulletins or Engineering Change Notices about the 8.2E/L Recumbent Cycle, place them in this appendix.

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Section One

Troubleshooting Flow Charts

The flow charts in this section provide you with the information you need to troubleshoot and fix maintenance problems. The flow charts direct you, as necessary, to perform the inspection and adjustment or removal and replacement procedures included in this manual. If the problem is still not fixed after following the flow chart directions, please call Precor Customer Service.

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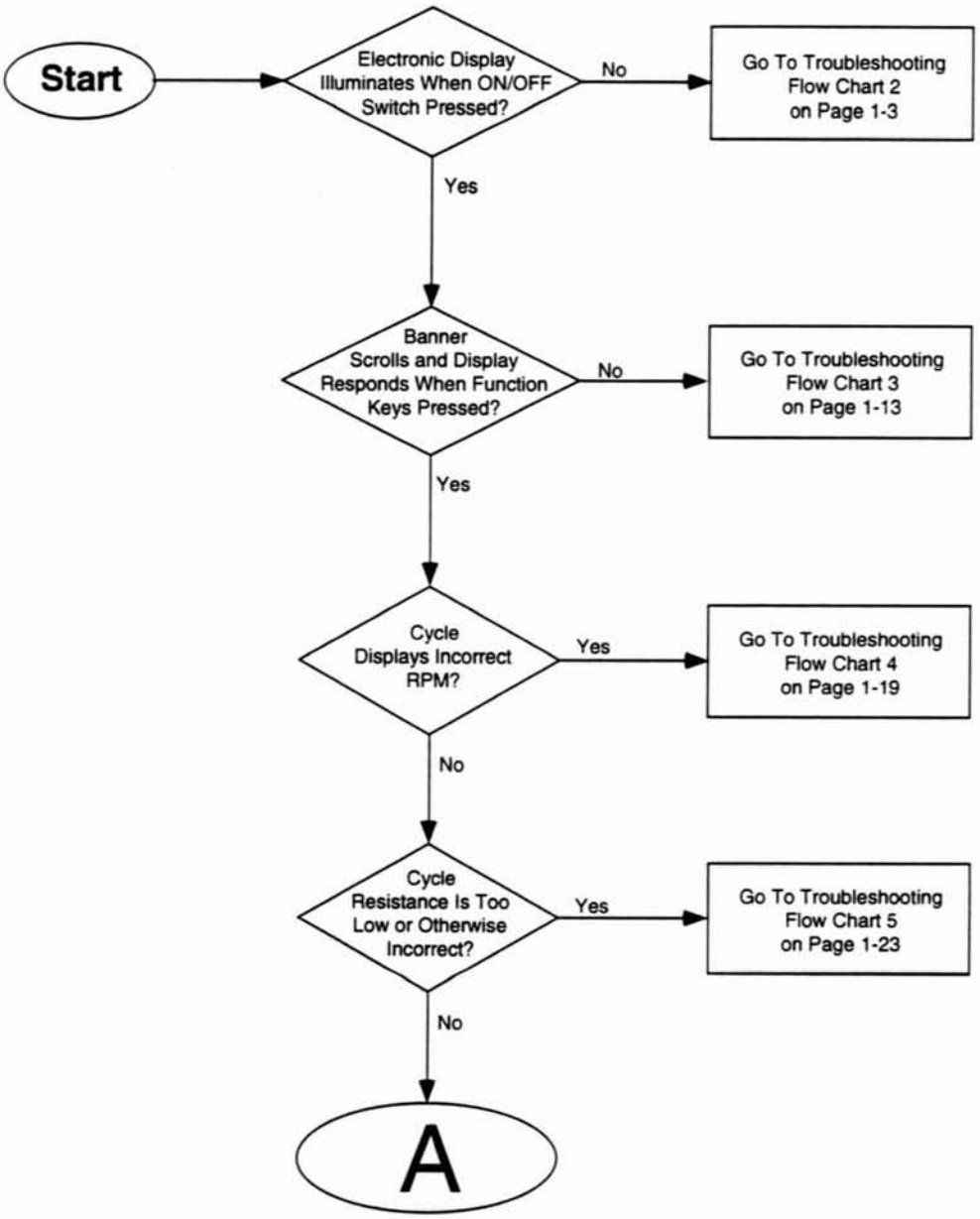
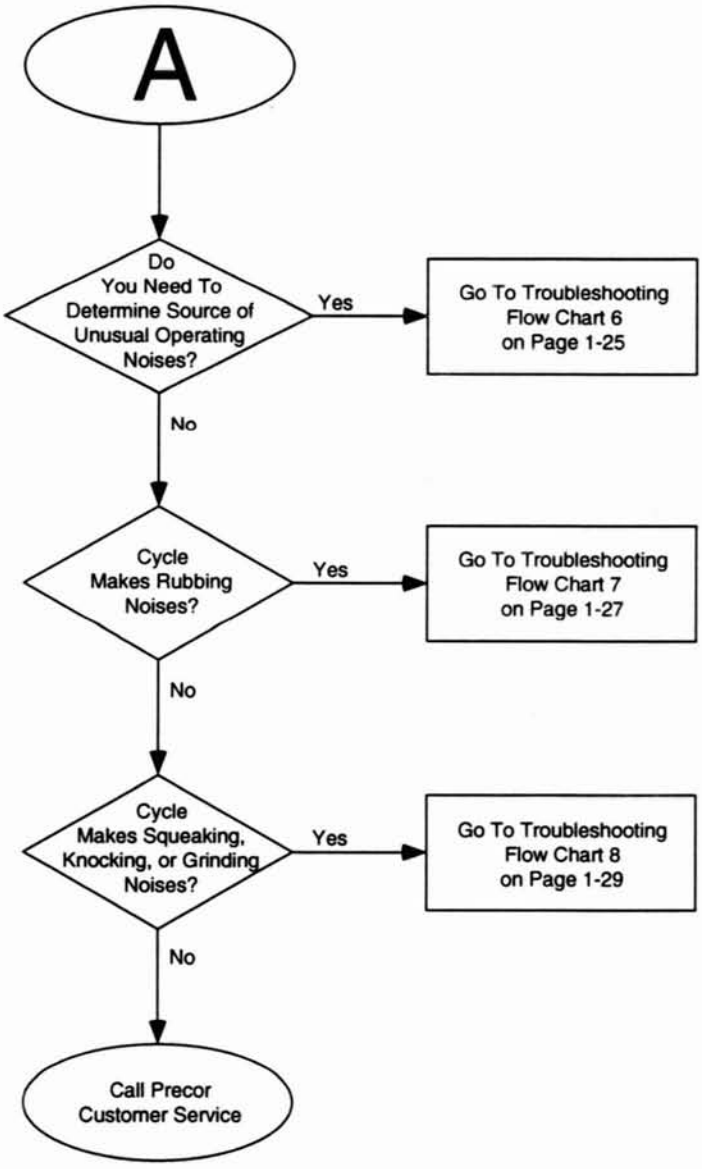
Flow Chart 1 (1 of 2)

Troubleshooting Index

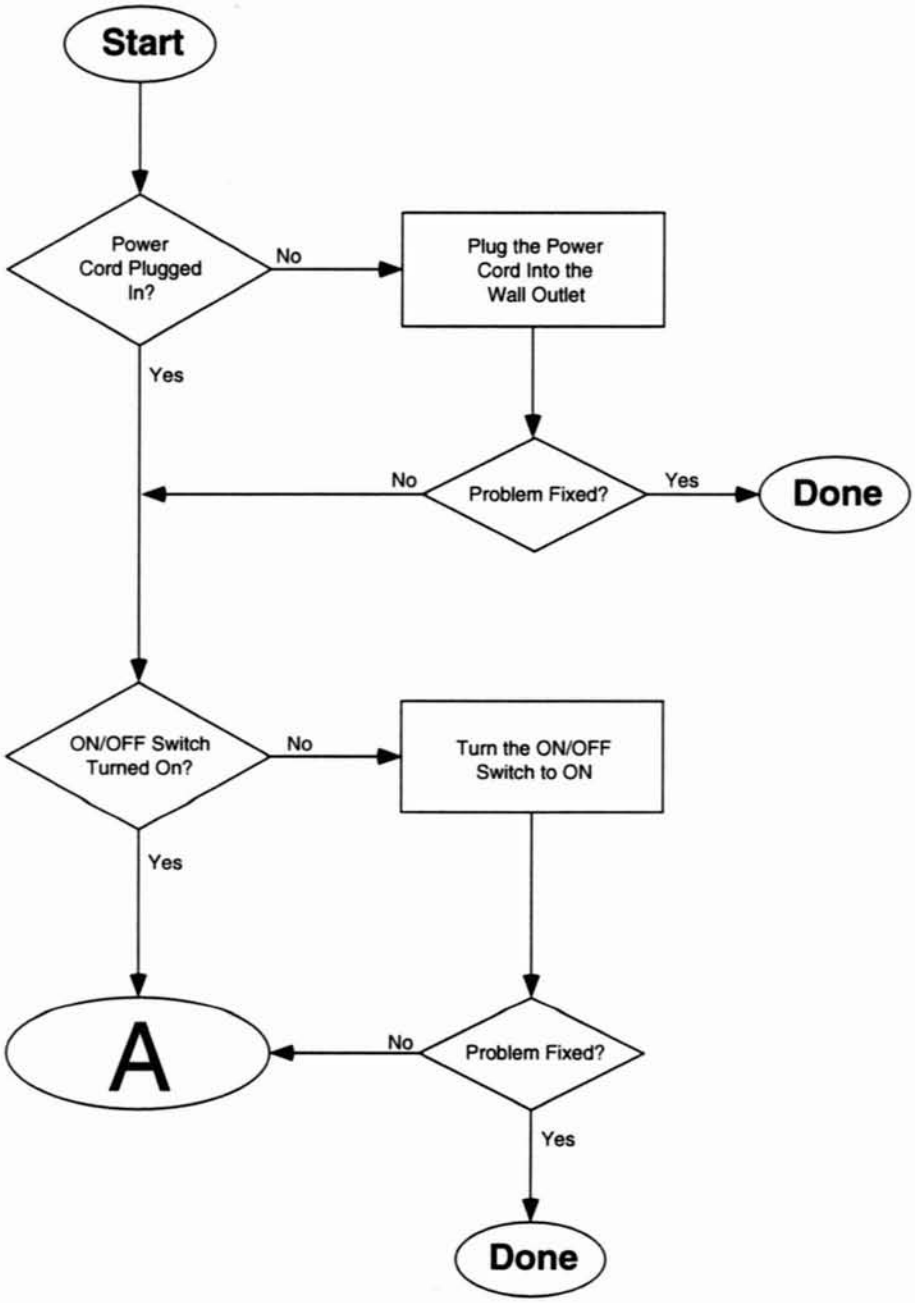


Flow Chart 1 (2 of 2)
Troubleshooting Index



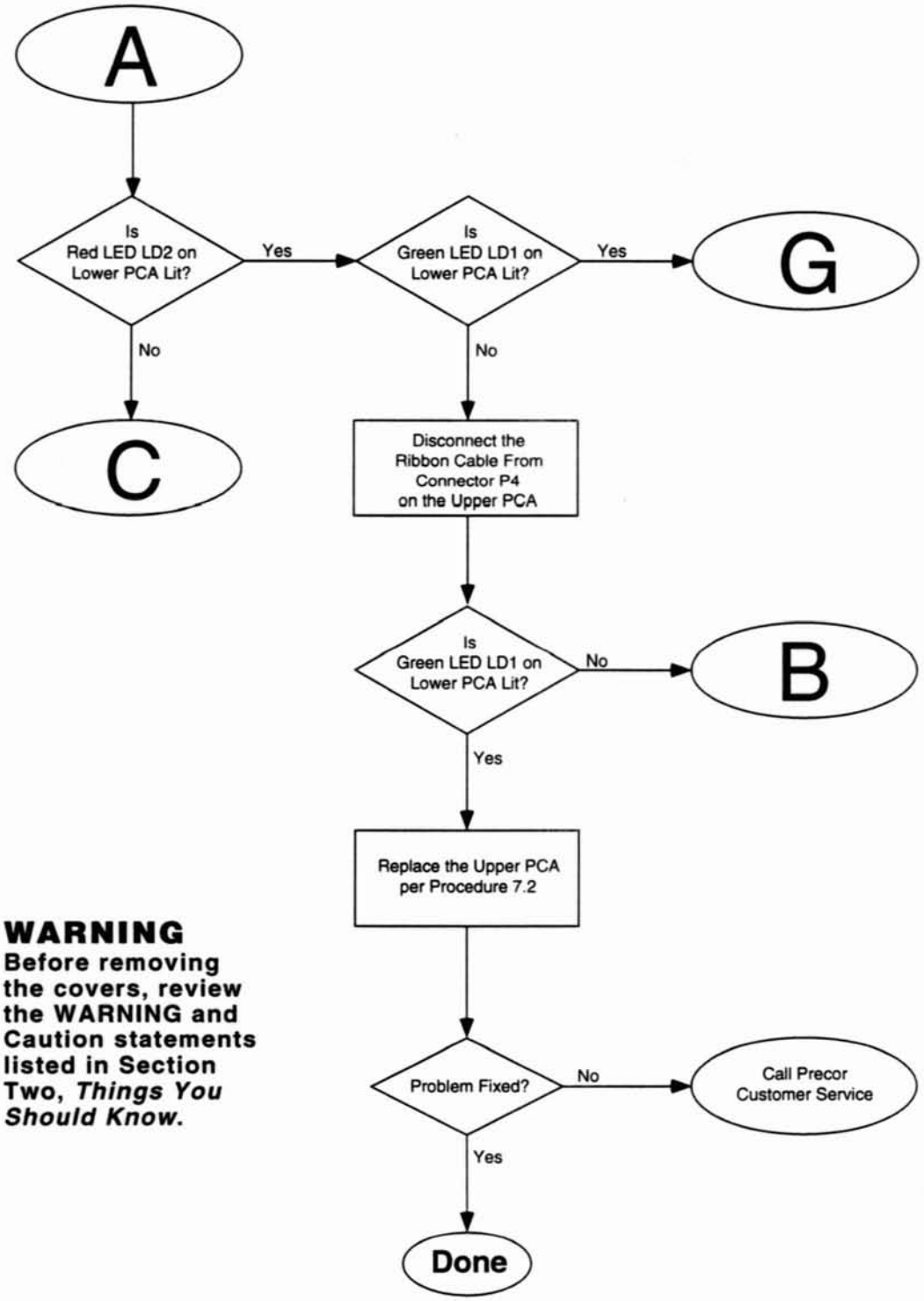
Flow Chart 2 (1 of 9)

Electronic Display Does Not Illuminate When ON/OFF Switch Is Pressed



Flow Chart 2 (2 of 9)

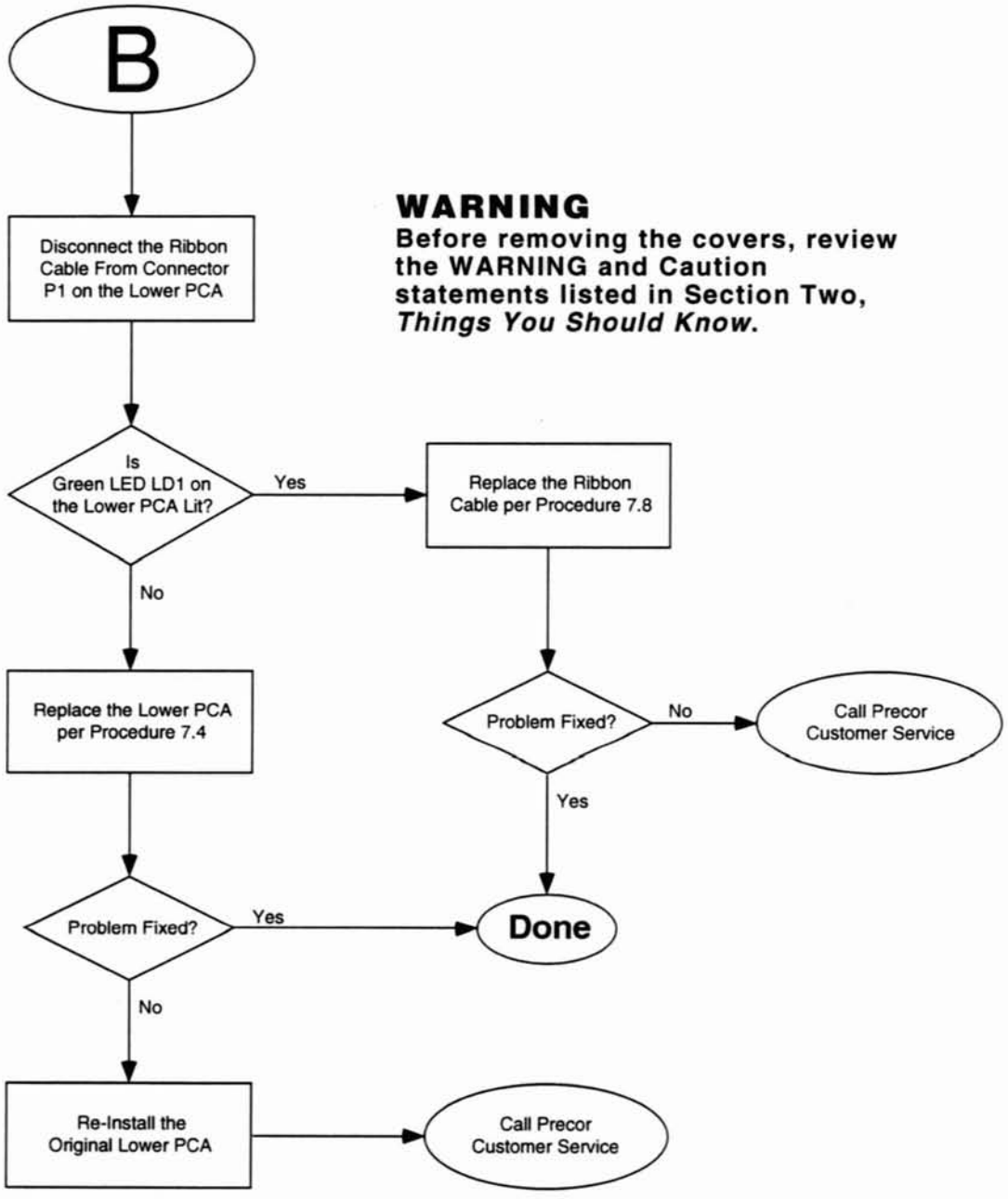
Electronic Display Does Not Illuminate When ON/OFF Switch Is Pressed



WARNING
Before removing the covers, review the WARNING and Caution statements listed in Section Two, *Things You Should Know*.

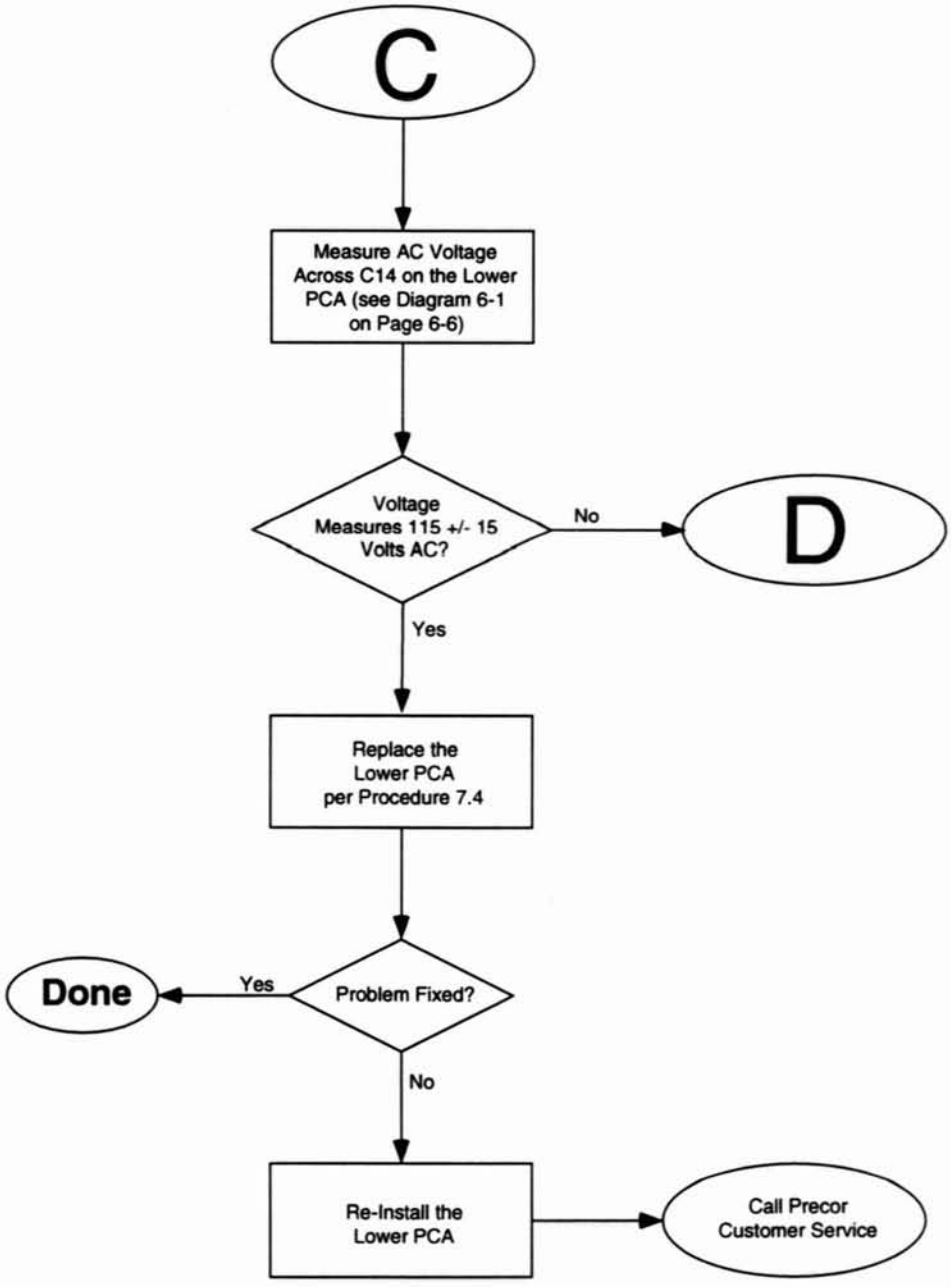
Flow Chart 2 (3 of 9)

Electronic Display Does Not Illuminate When ON/OFF Switch Is Pressed



Flow Chart 2 (4 of 9)

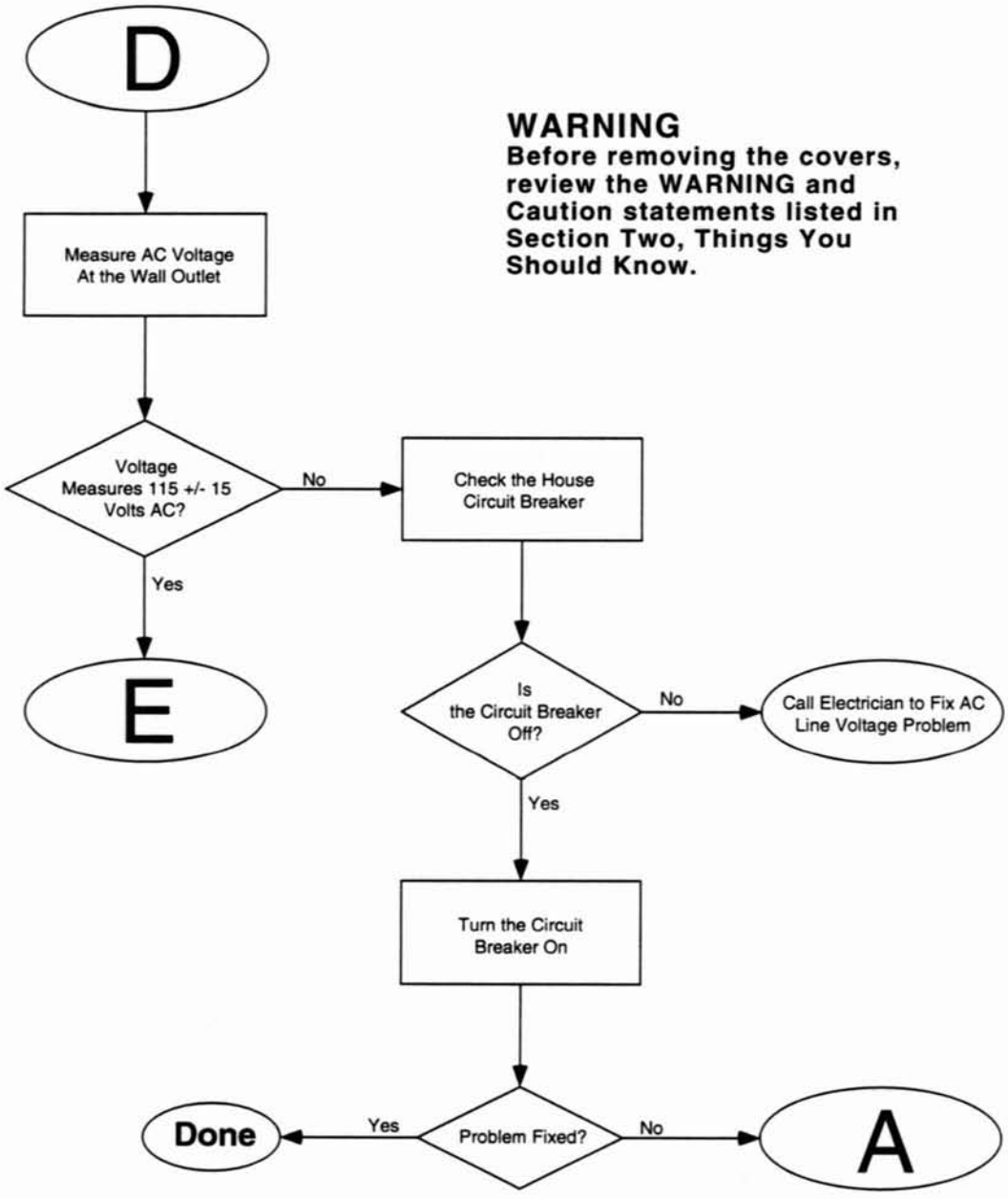
Electronic Display Does Not Illuminate When ON/OFF Switch Is Pressed



WARNING
Before taking voltage measurements, review the WARNING and Caution statements listed in Section Two, Things You Should Know.

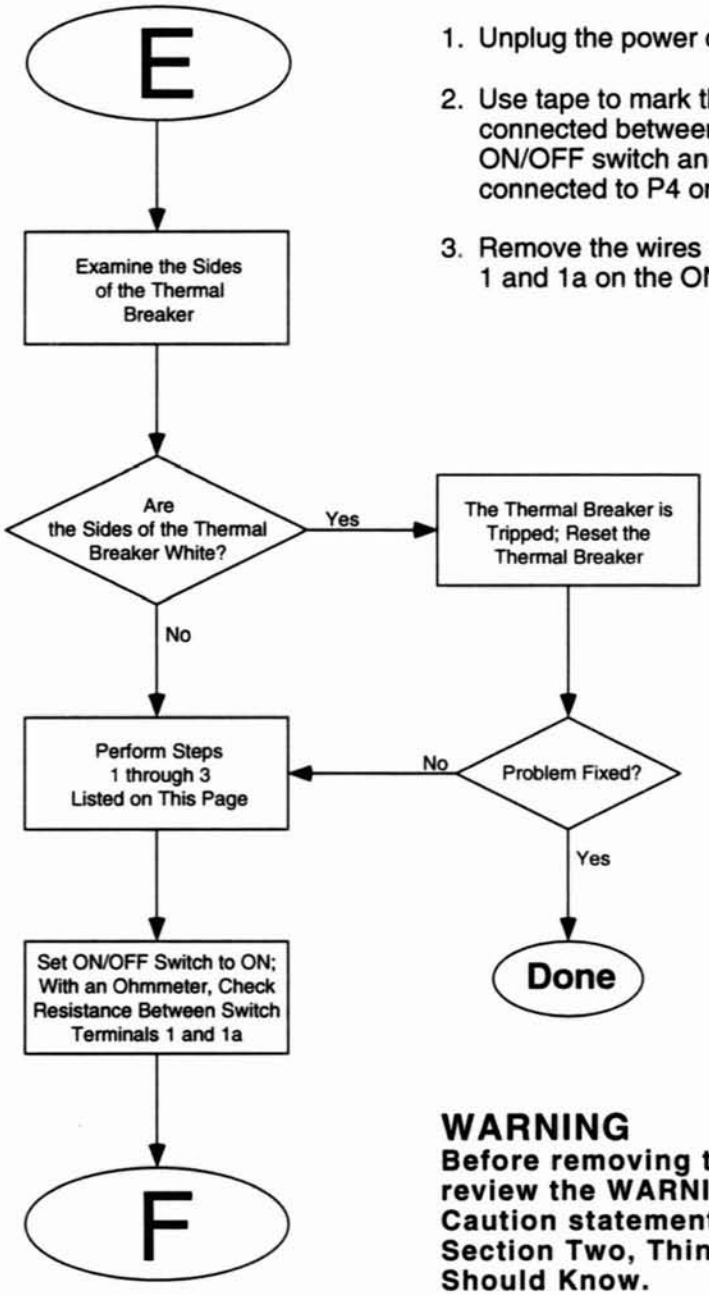
Flow Chart 2 (5 of 9)

Electronic Display Does Not Illuminate When ON/OFF Switch Is Pressed



WARNING
Before removing the covers, review the WARNING and Caution statements listed in Section Two, Things You Should Know.

Flow Chart 2 (6 of 9)
Electronic Display Does Not Illuminate When ON/OFF Switch Is Pressed

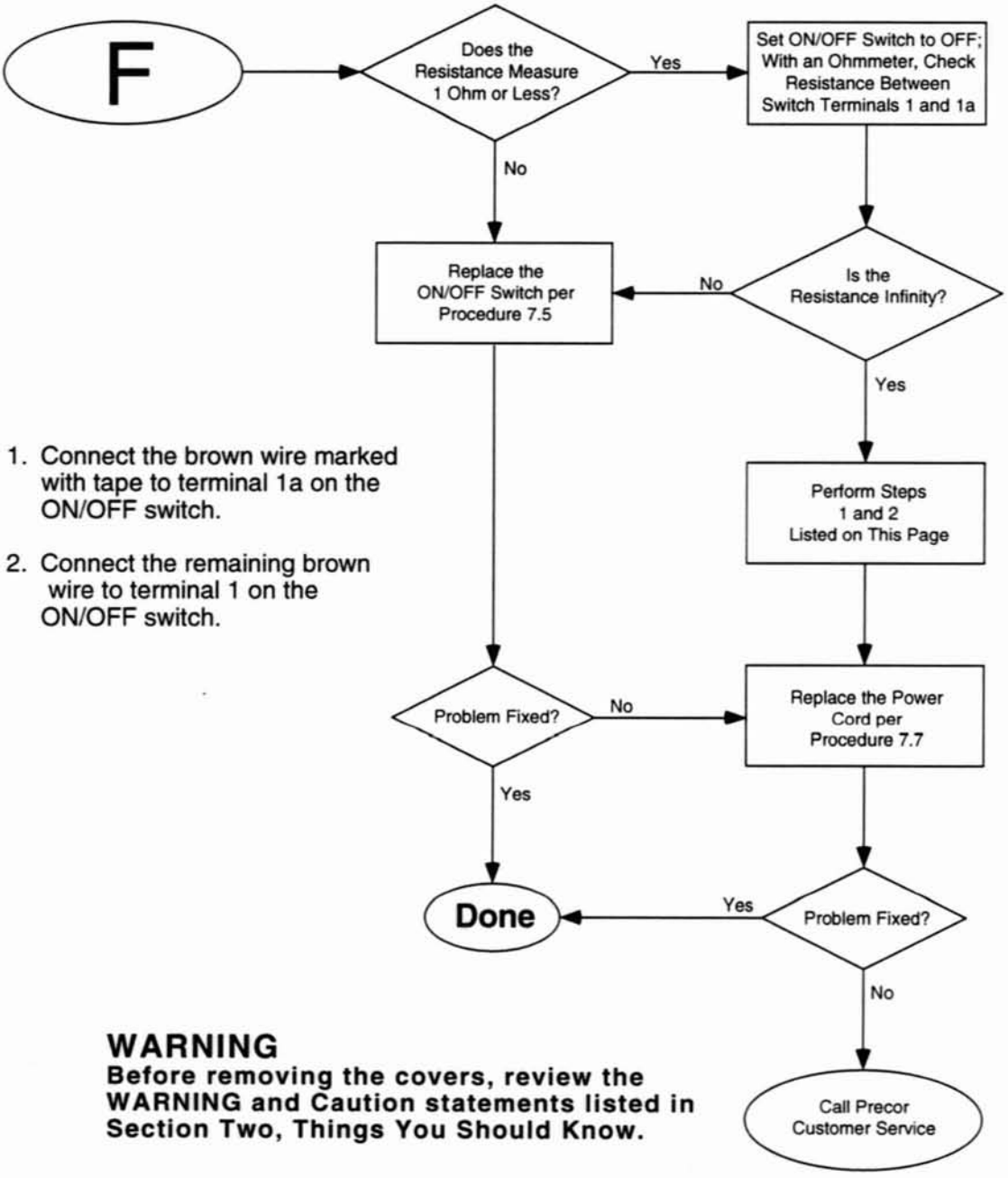


1. Unplug the power cord from the wall outlet.
2. Use tape to mark the brown wire that is connected between terminal 1a on the ON/OFF switch and the molex connector connected to P4 on the lower PCA.
3. Remove the wires connected to terminals 1 and 1a on the ON/OFF switch.

WARNING
Before removing the covers, review the WARNING and Caution statements listed in Section Two, Things You Should Know.

Flow Chart 2 (7 of 9)

Electronic Display Does Not Illuminate When ON/OFF Switch Is Pressed

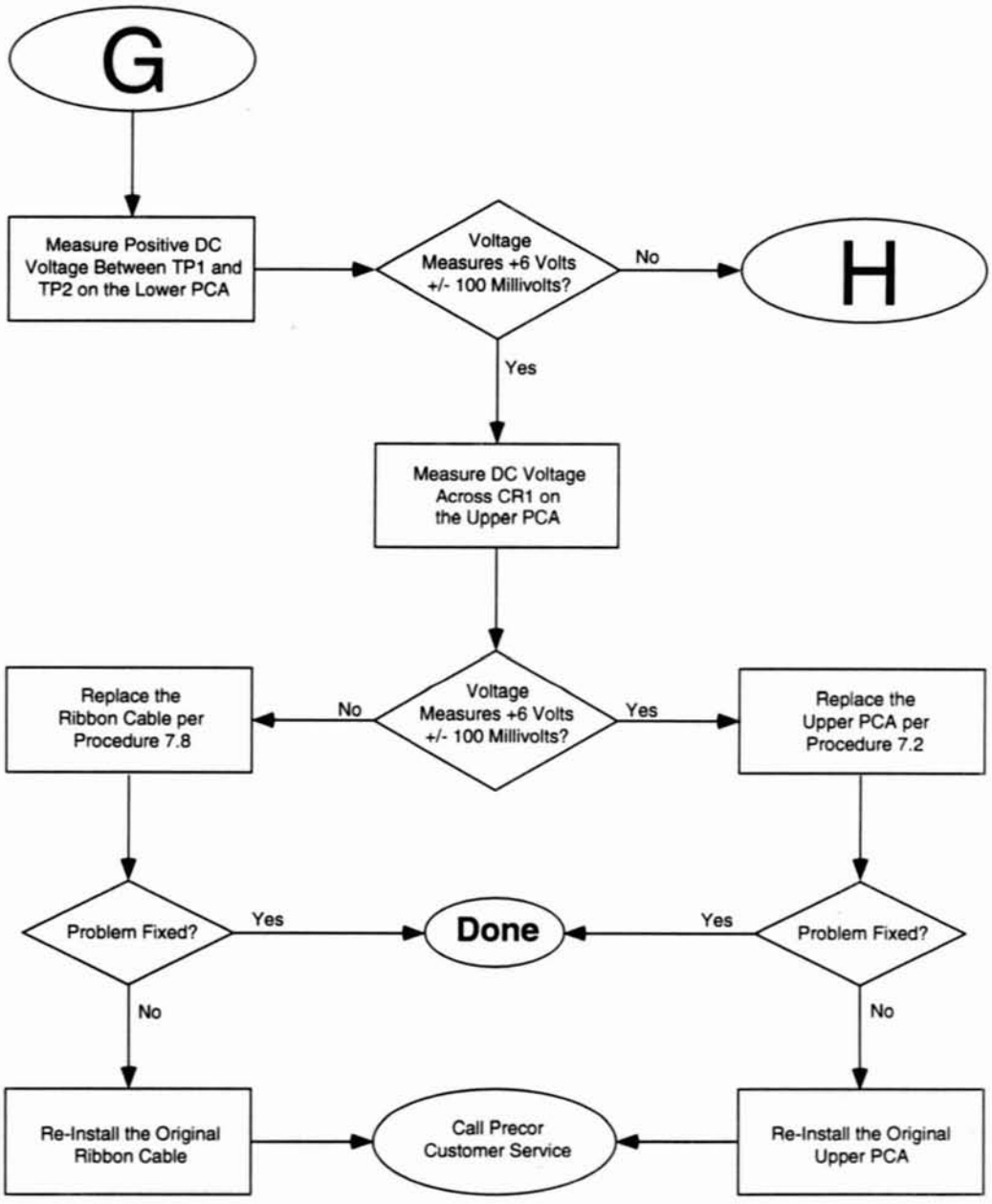


1. Connect the brown wire marked with tape to terminal 1a on the ON/OFF switch.
2. Connect the remaining brown wire to terminal 1 on the ON/OFF switch.

WARNING
Before removing the covers, review the WARNING and Caution statements listed in Section Two, Things You Should Know.

Flow Chart 2 (8 of 9)

Electronic Display Does Not Illuminate When ON/OFF Switch Is Pressed



WARNING
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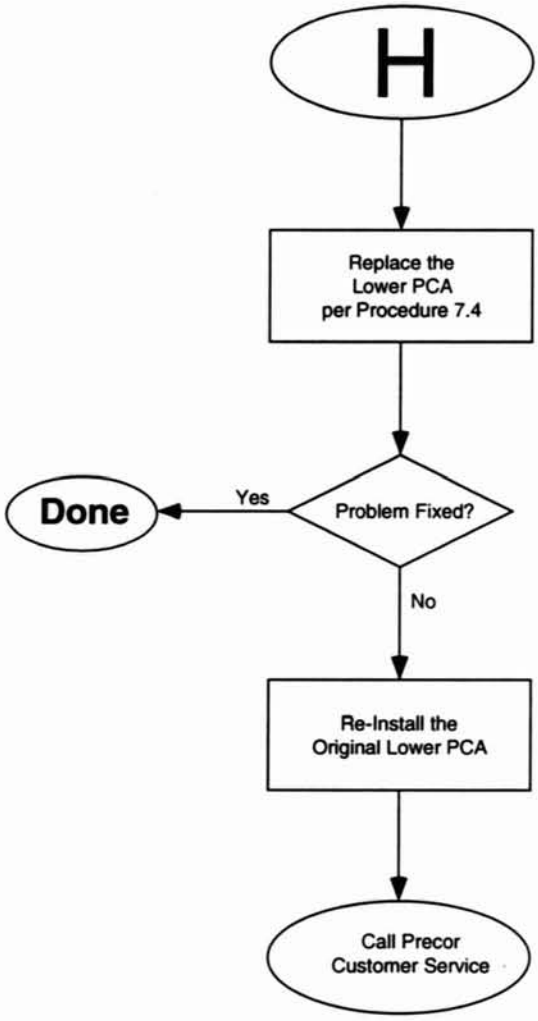
Flow Chart 2 (9 of 9)

Electronic Display Does Not Illuminate When ON/OFF Switch Is Pressed



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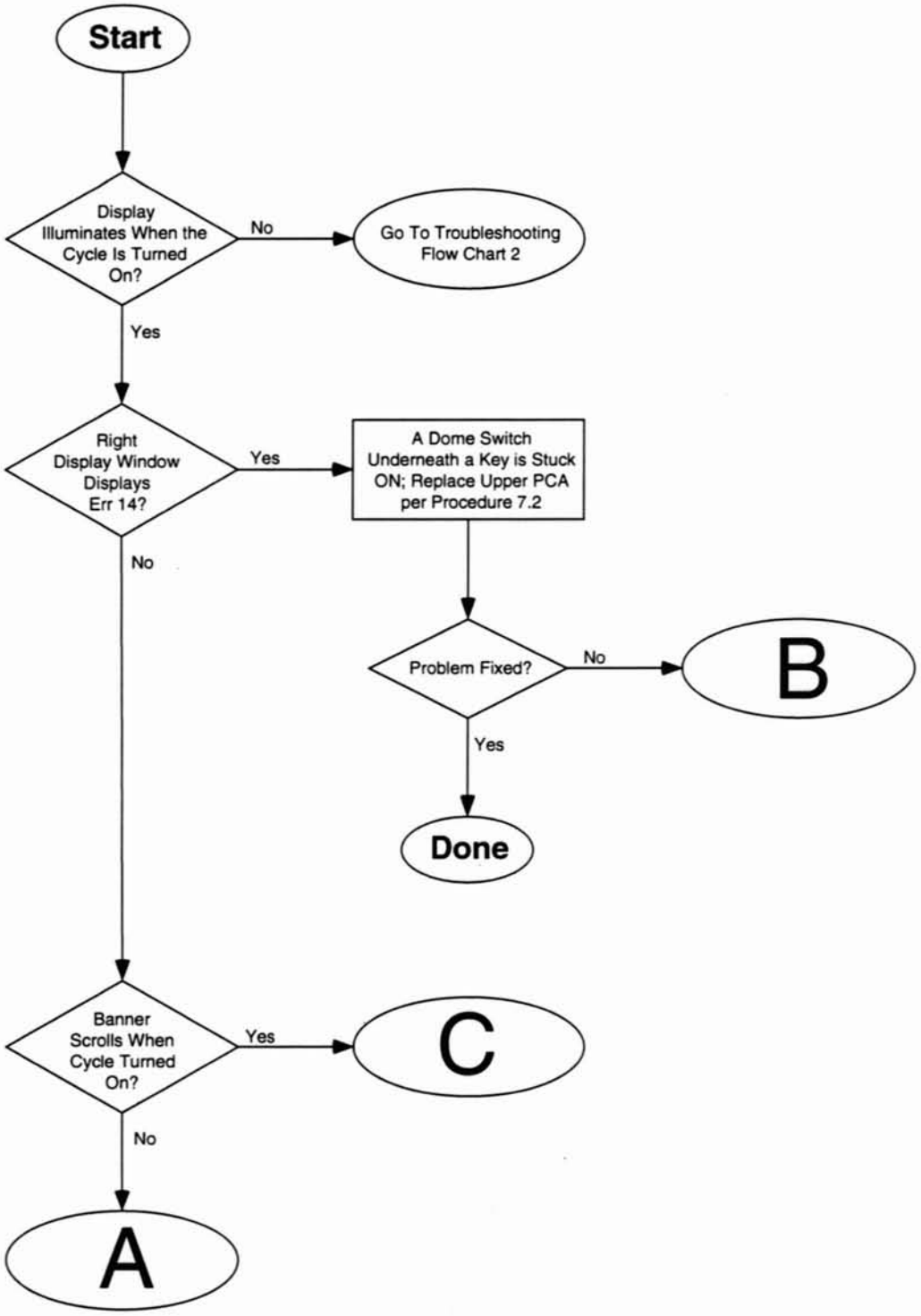
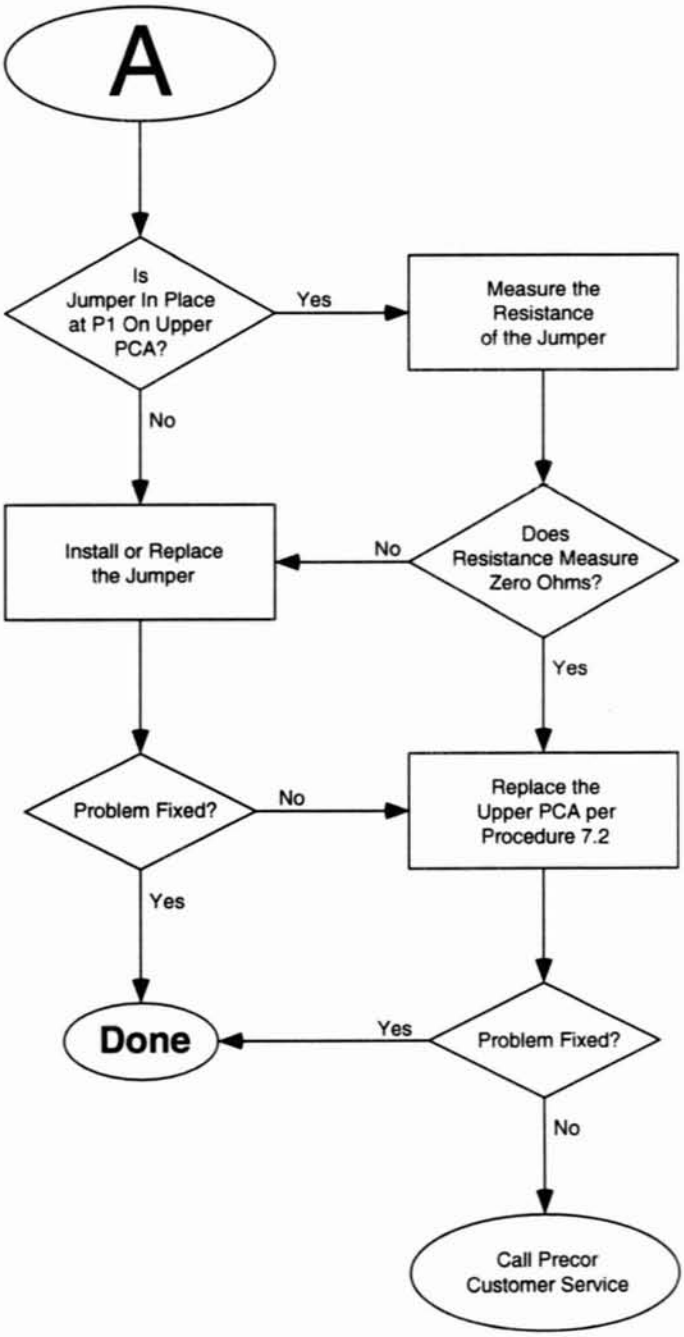
Flow Chart 3 (1 of 5)

8.2E/LR Banner Does Not Scroll or Electronic Display Does Not Respond When Function Keys Are Pressed



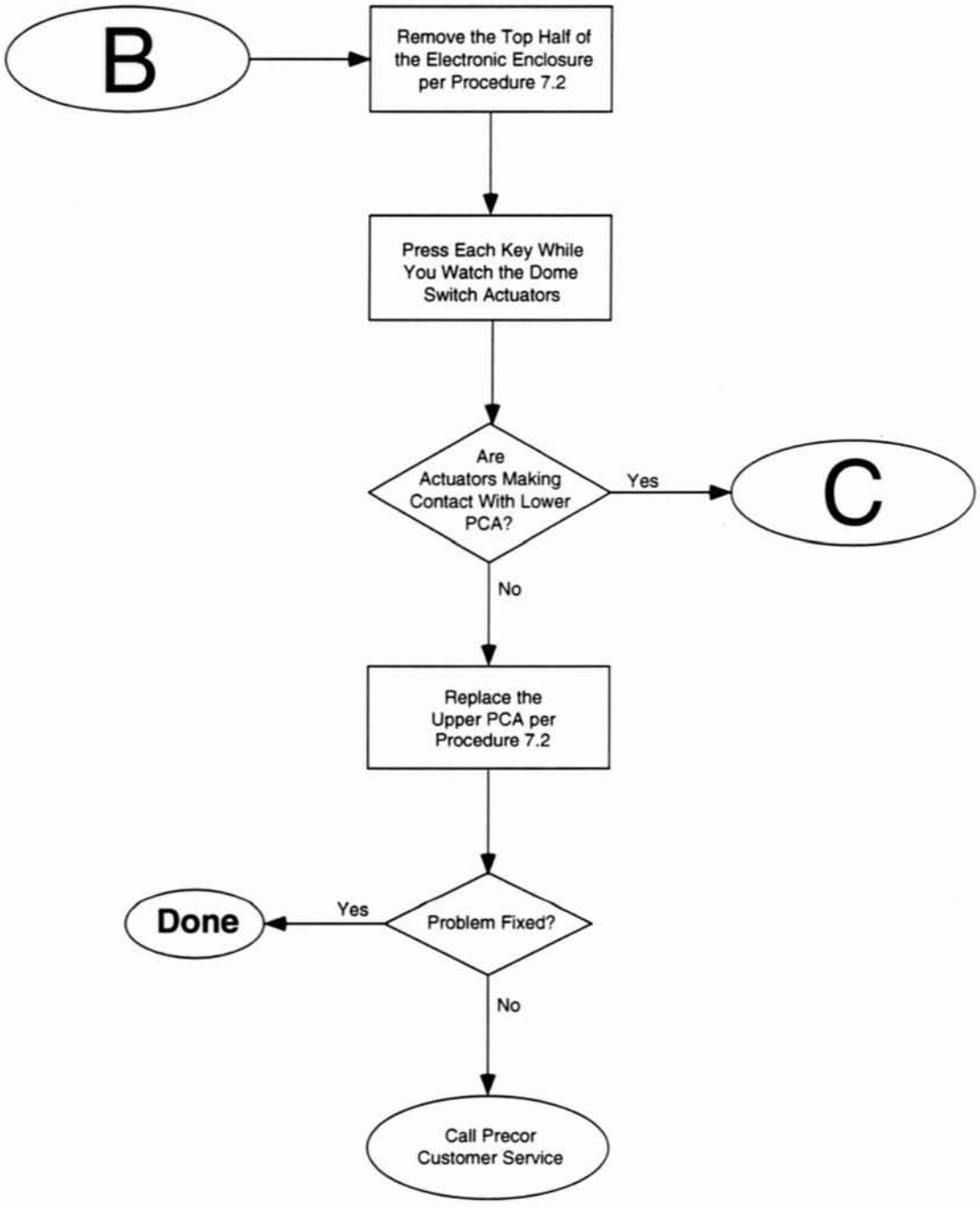
Flow Chart 3 (2 of 5)

8.2E/LR Banner Does Not Scroll or Electronic Display Does Not Respond When Function Keys Are Pressed



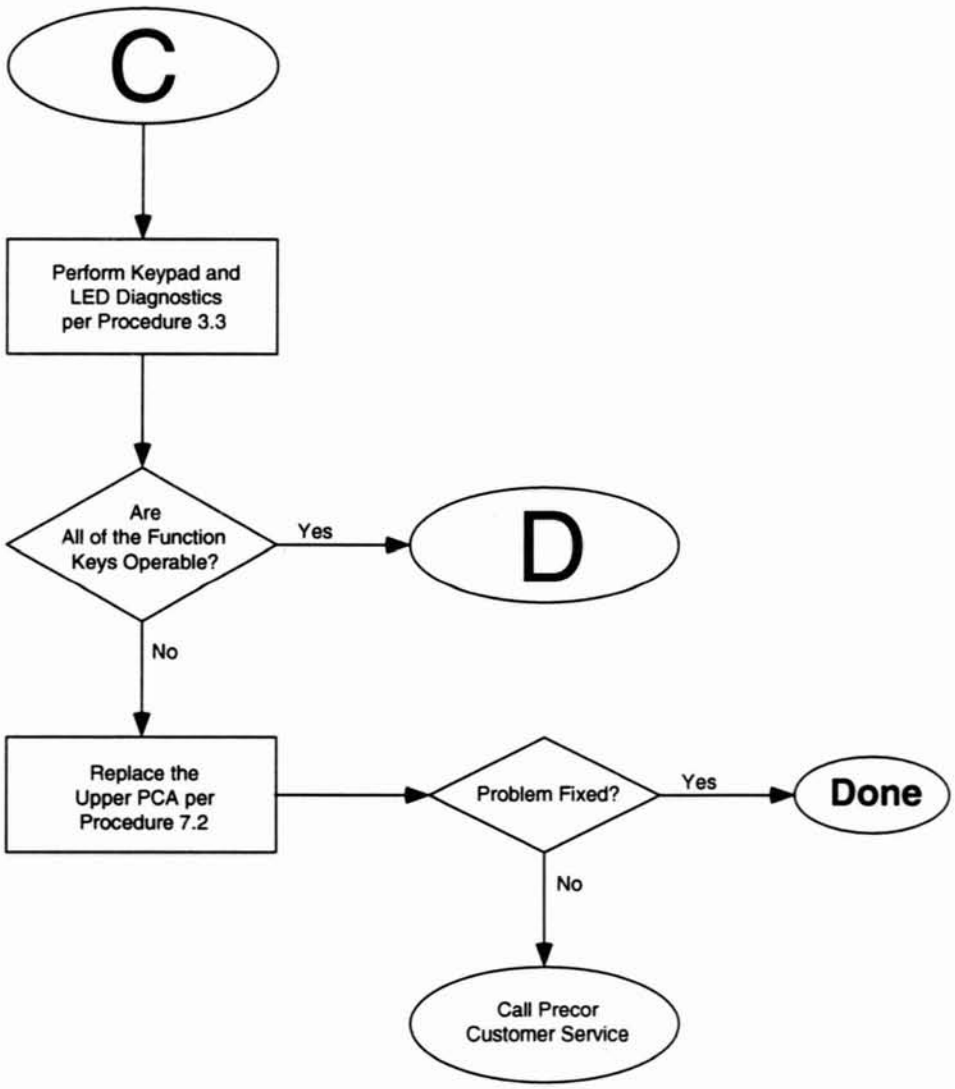
Flow Chart 3 (3 of 5)

8.2E/LR Banner Does Not Scroll or Electronic Display Does Not Respond When Function Keys Are Pressed



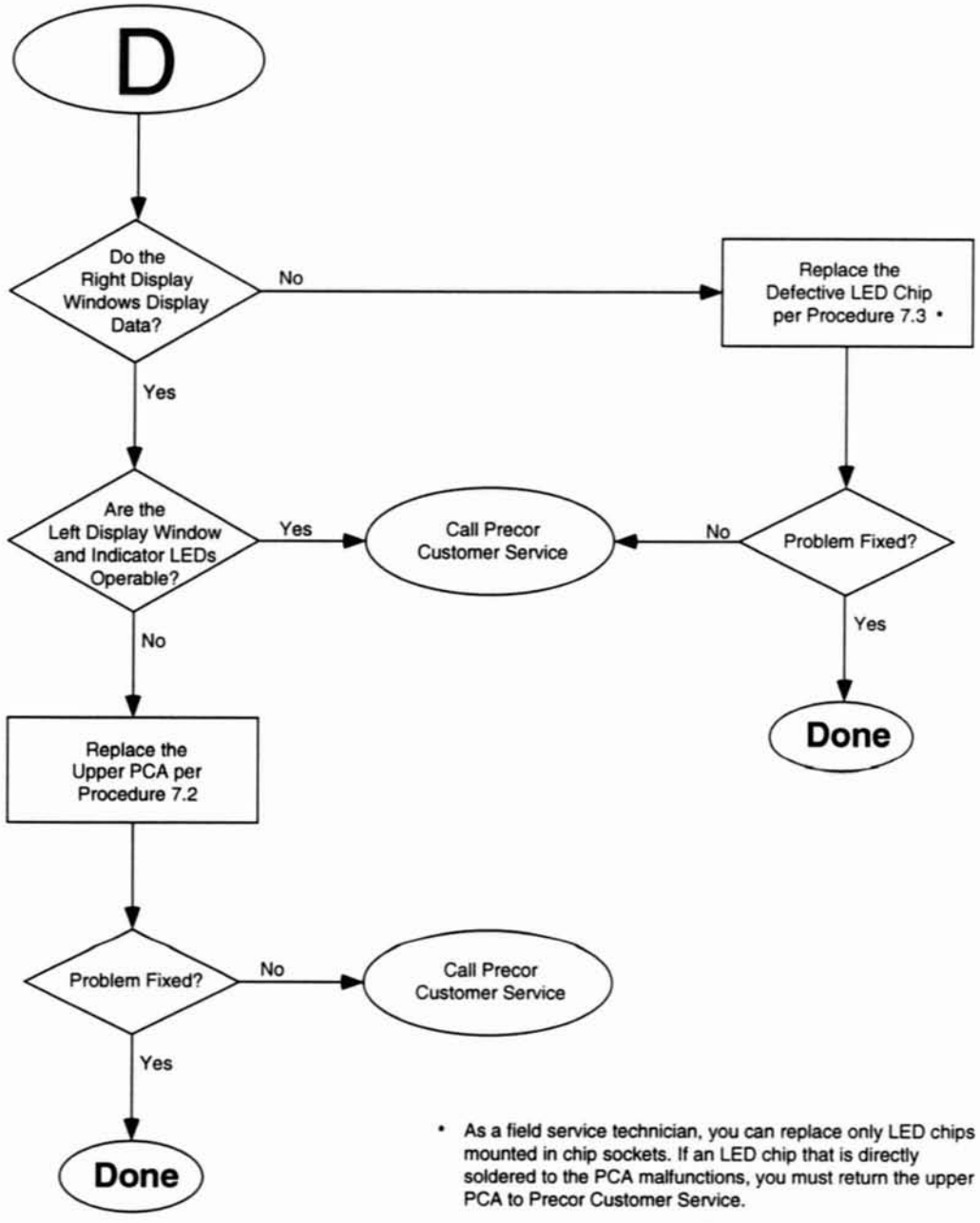
Flow Chart 3 (4 of 5)

8.2E/LR Banner Does Not Scroll or Electronic Display Does Not Respond When Function Keys Are Pressed



Flow Chart 3 (5 of 5)

8.2E/LR Banner Does Not Scroll or Electronic Display Does Not Respond When Function Keys Are Pressed



• As a field service technician, you can replace only LED chips mounted in chip sockets. If an LED chip that is directly soldered to the PCA malfunctions, you must return the upper PCA to Precor Customer Service.

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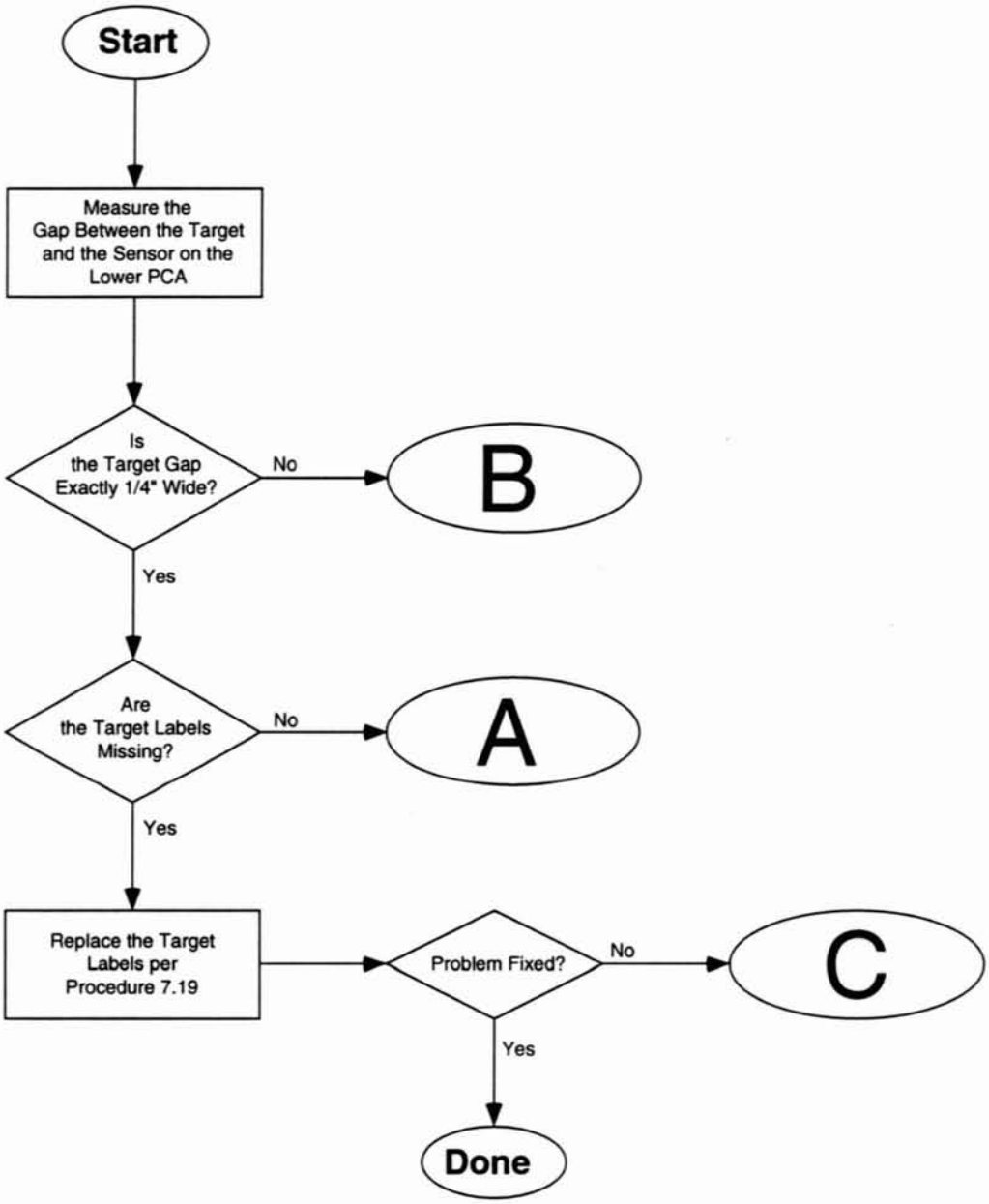
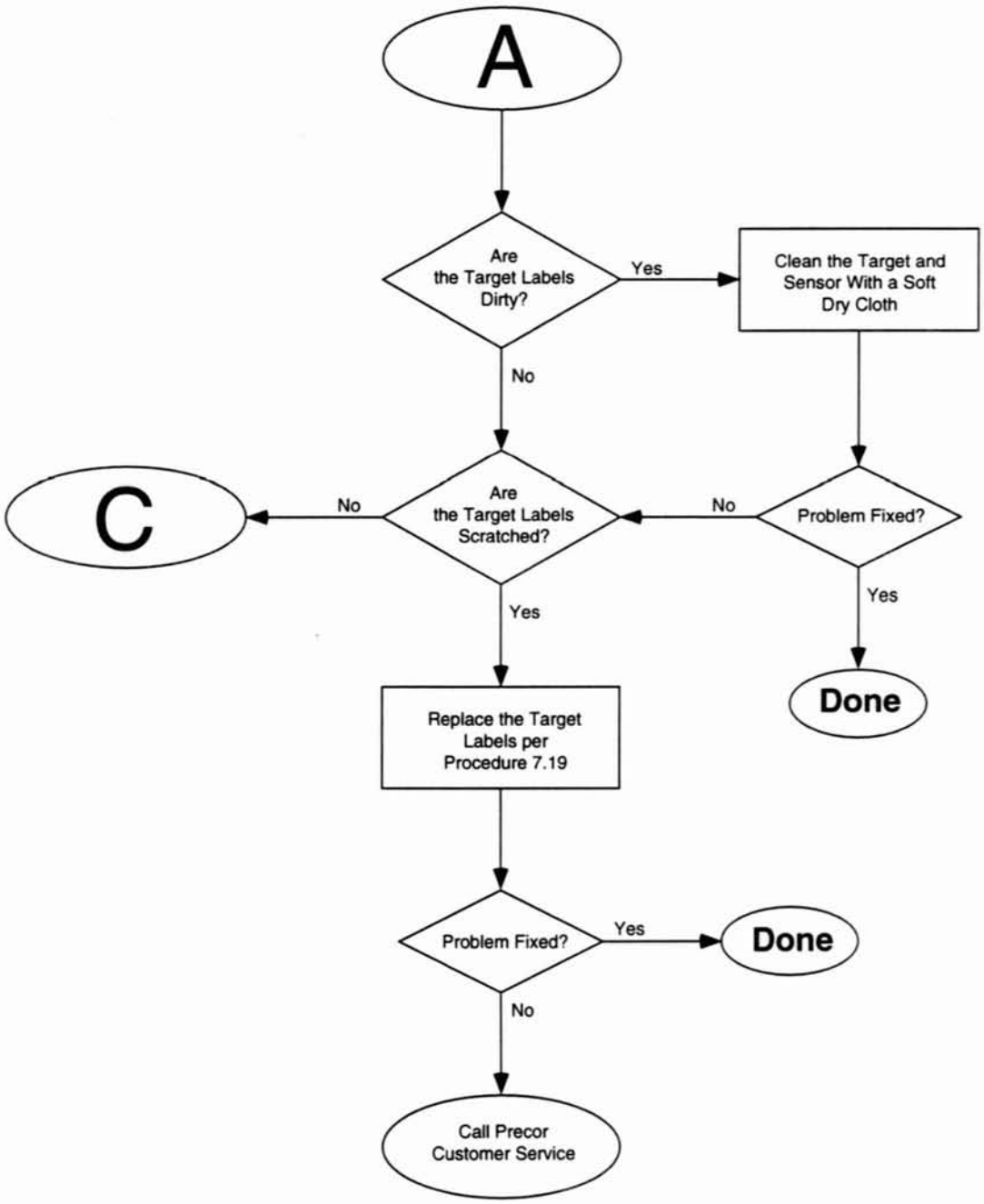
Flow Chart 4 (1 of 4)

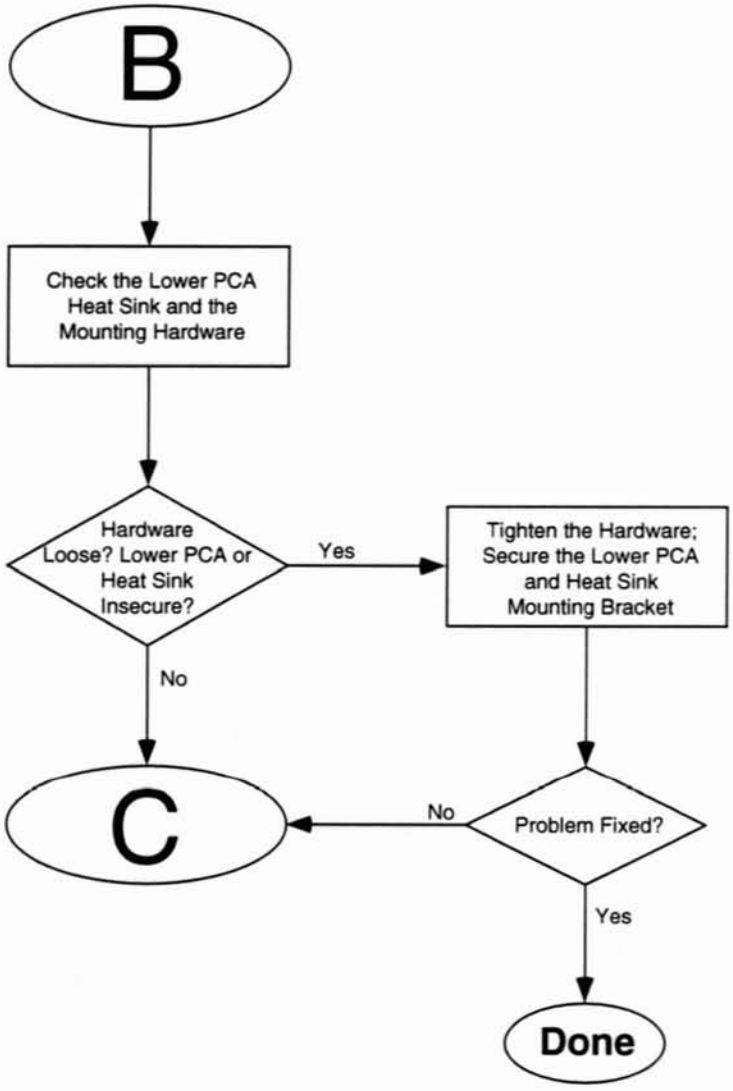
Cycle Displays Incorrect RPM



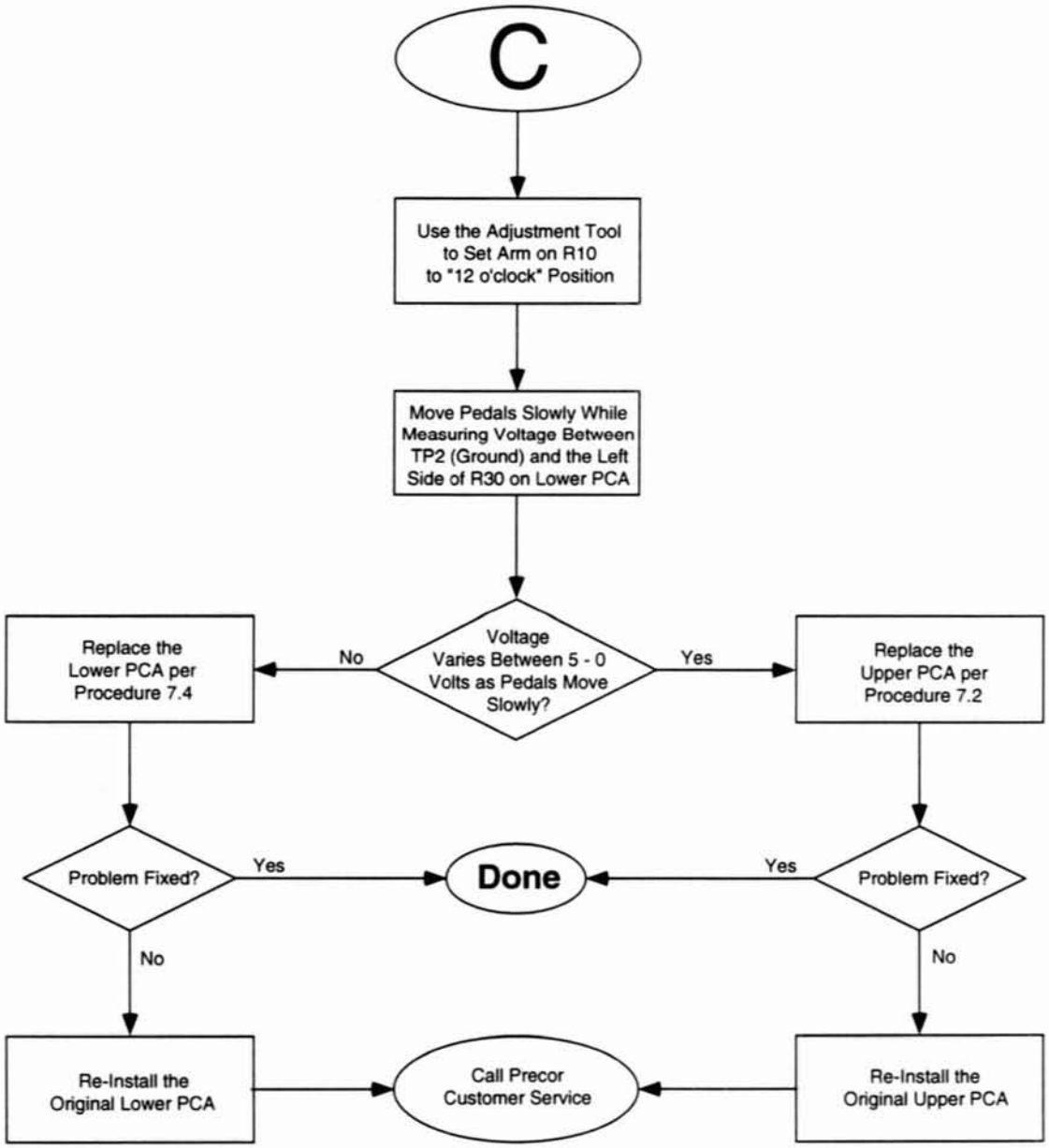
Flow Chart 4 (2 of 4)
Cycle Displays Incorrect RPM



Flow Chart 4 (3 of 4)
Cycle Displays Incorrect RPM

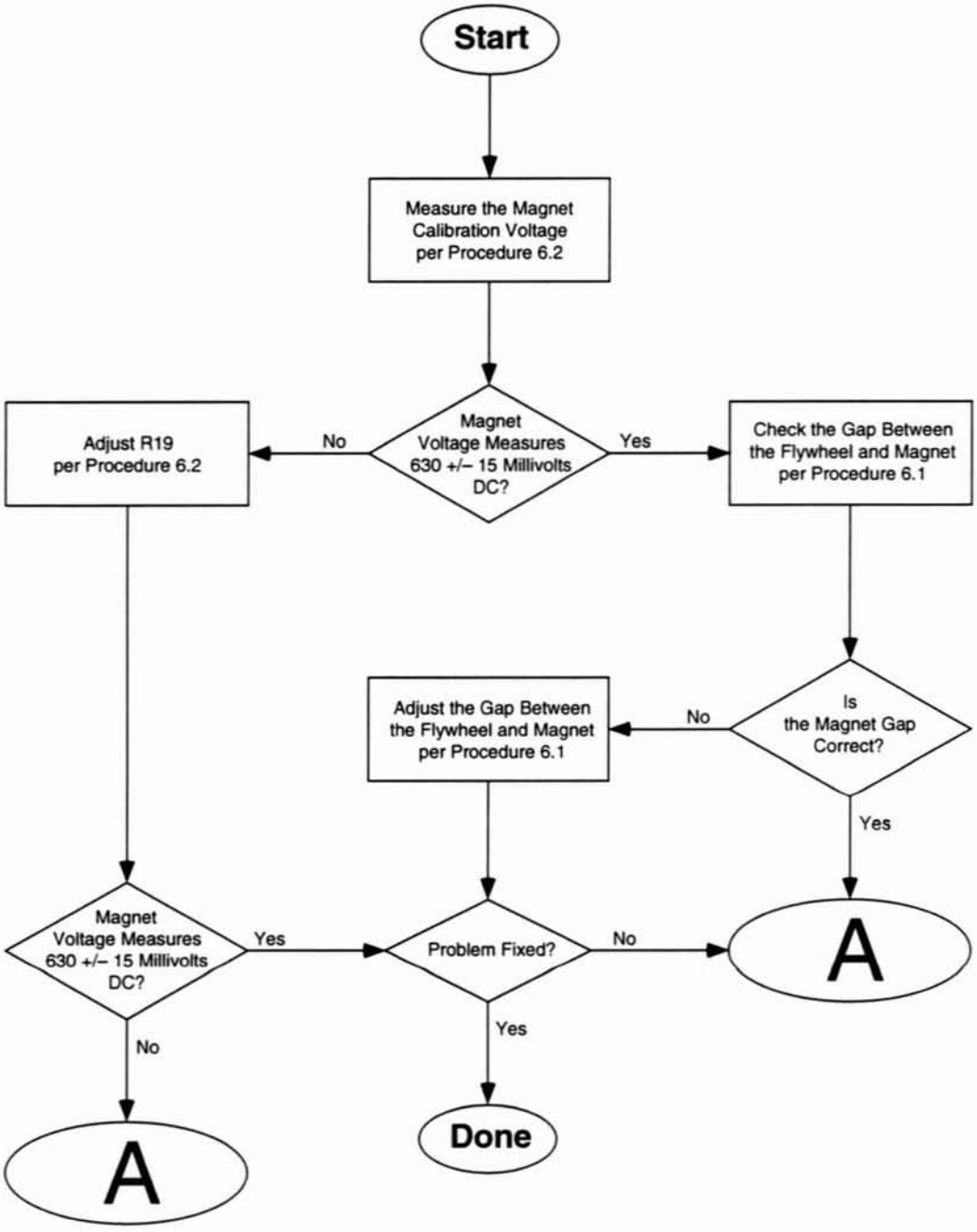


Flow Chart 4 (4 of 4)
Cycle Displays Incorrect RPM

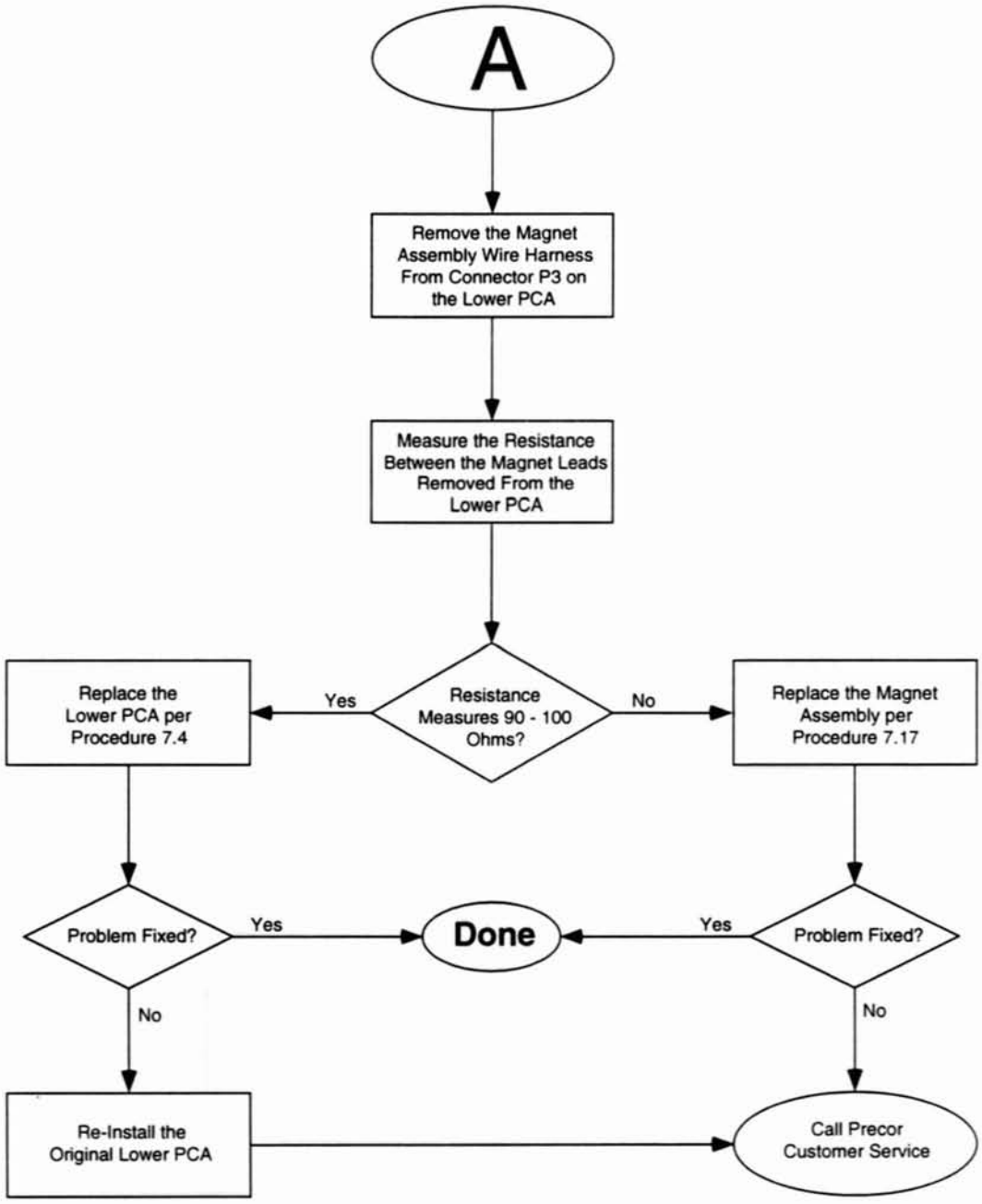


Flow Chart 5 (1 of 2)

Cycle Resistance Is Too Low or Is Otherwise Incorrect

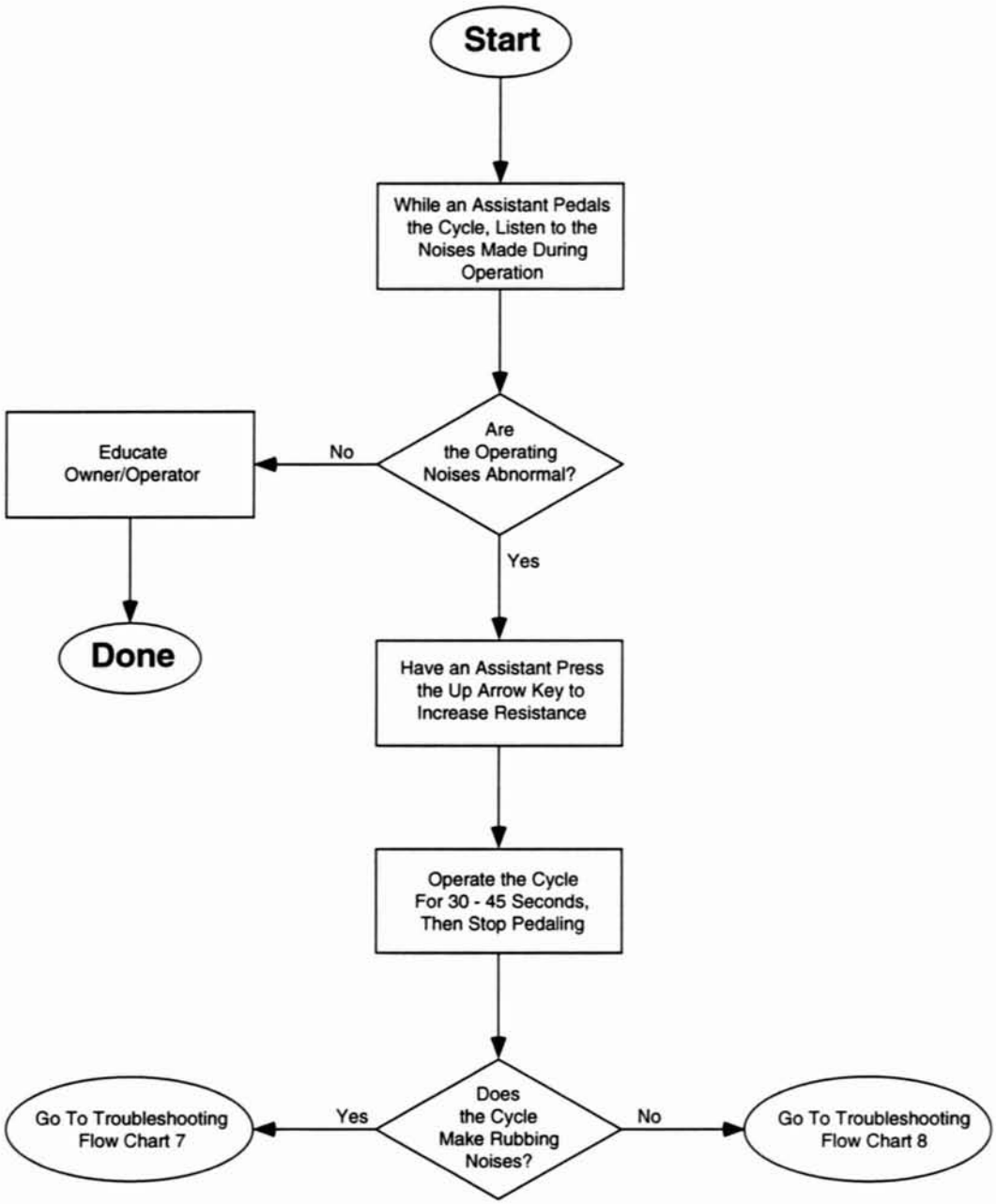


Flow Chart 5 (2 of 2)
Cycle Resistance Is Too Low or Is Otherwise Incorrect



Flow Chart 6 (1 of 1)

Determining the Source of Unusual Operating Noises



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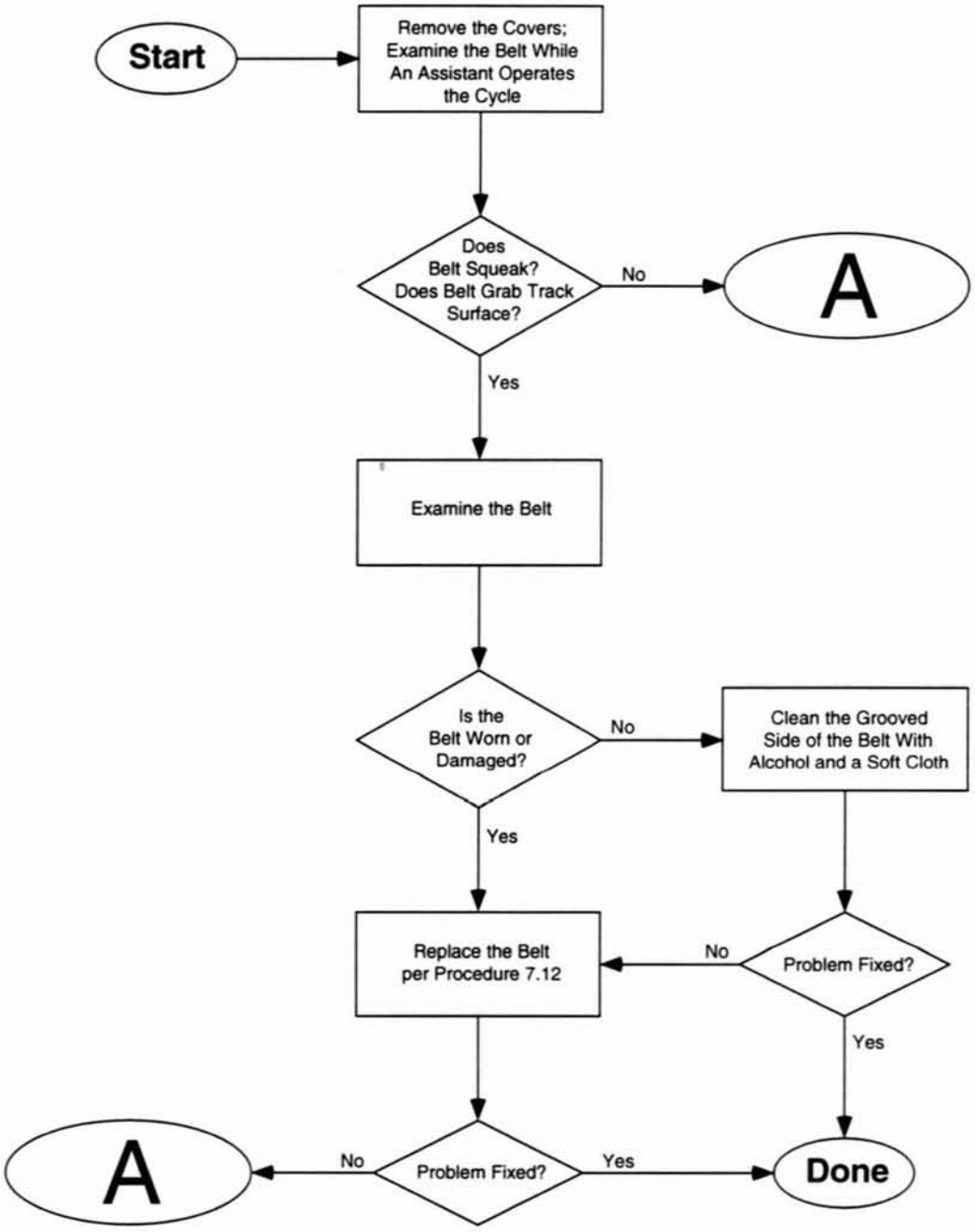
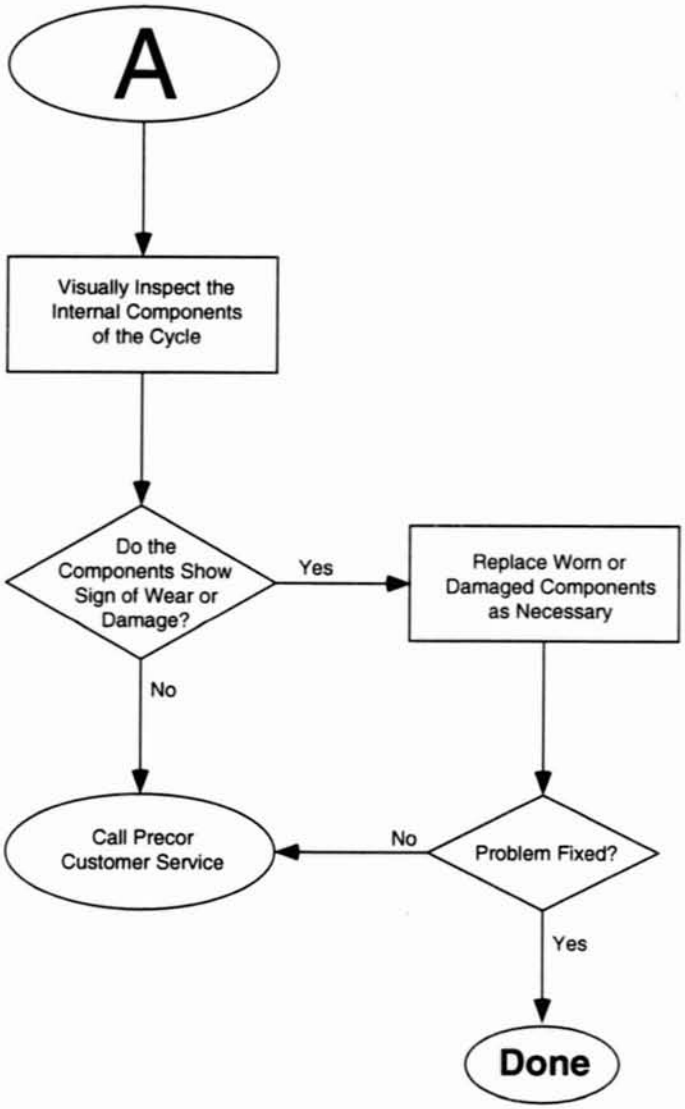
Flow Chart 7 (1 of 2)

Cycle Makes Rubbing Noises

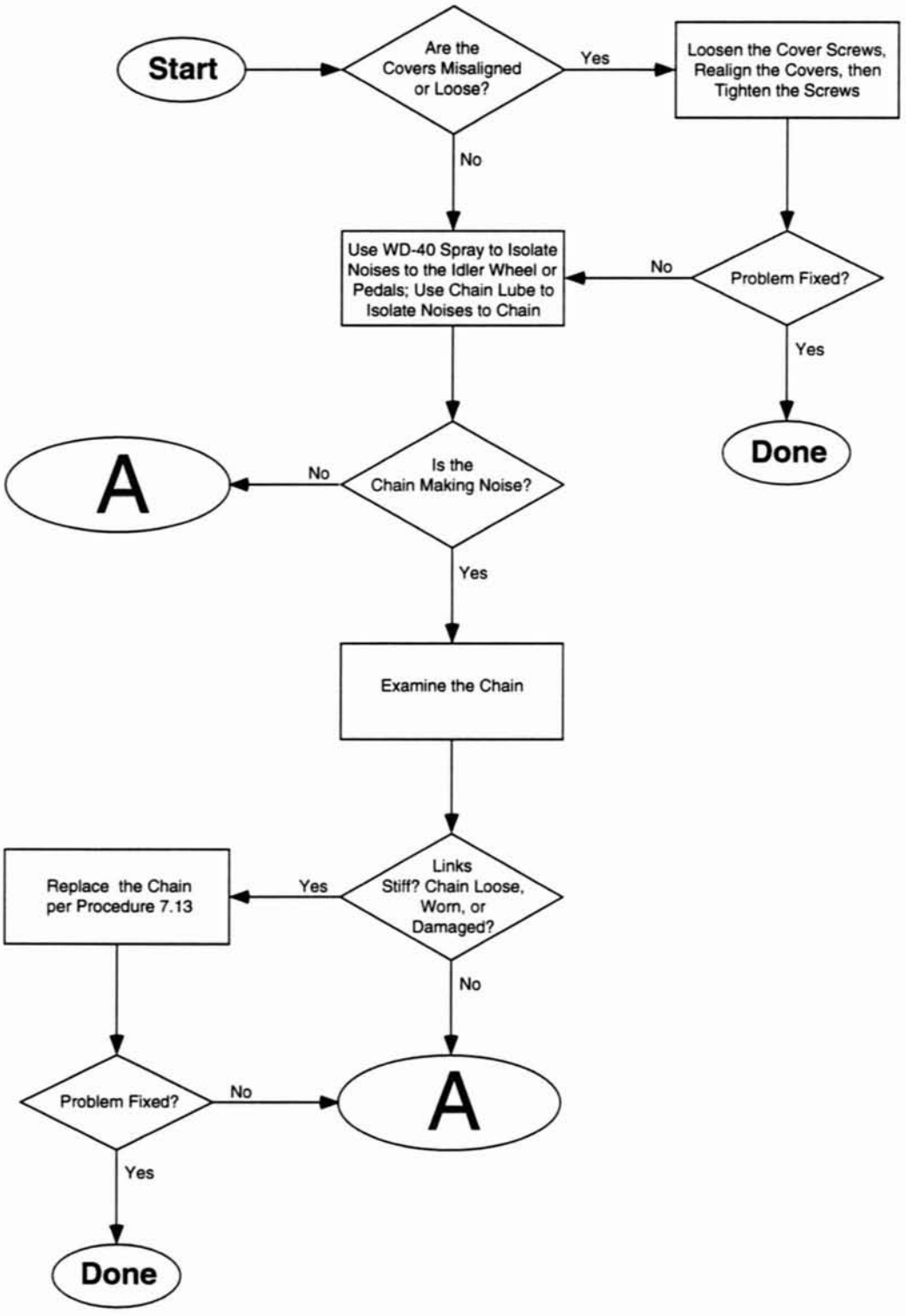


Flow Chart 7 (2 of 2)
Cycle Makes Rubbing Noises



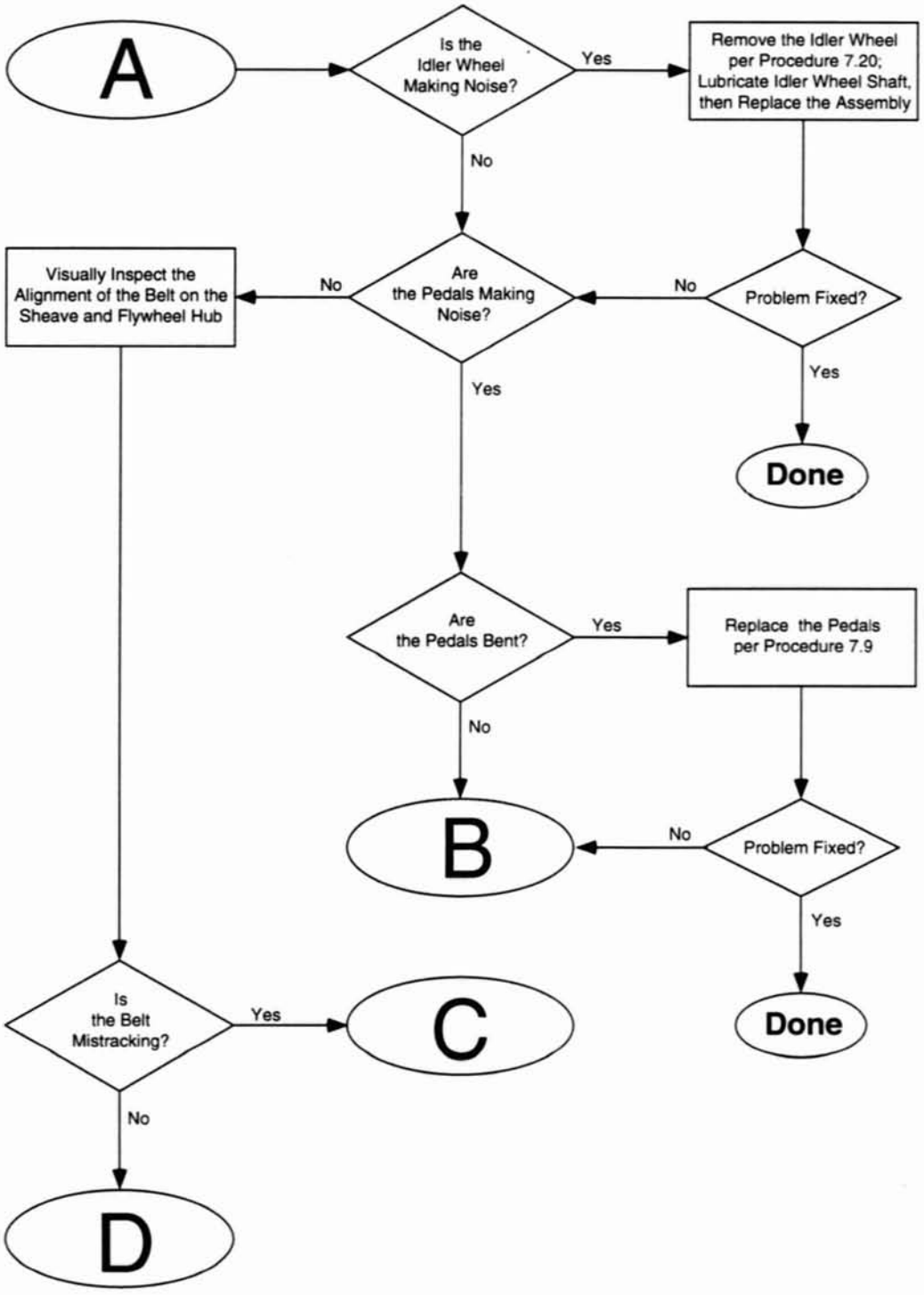
Flow Chart 8 (1 of 6)

Cycle Makes Squeaking, Knocking, or Grinding Noises



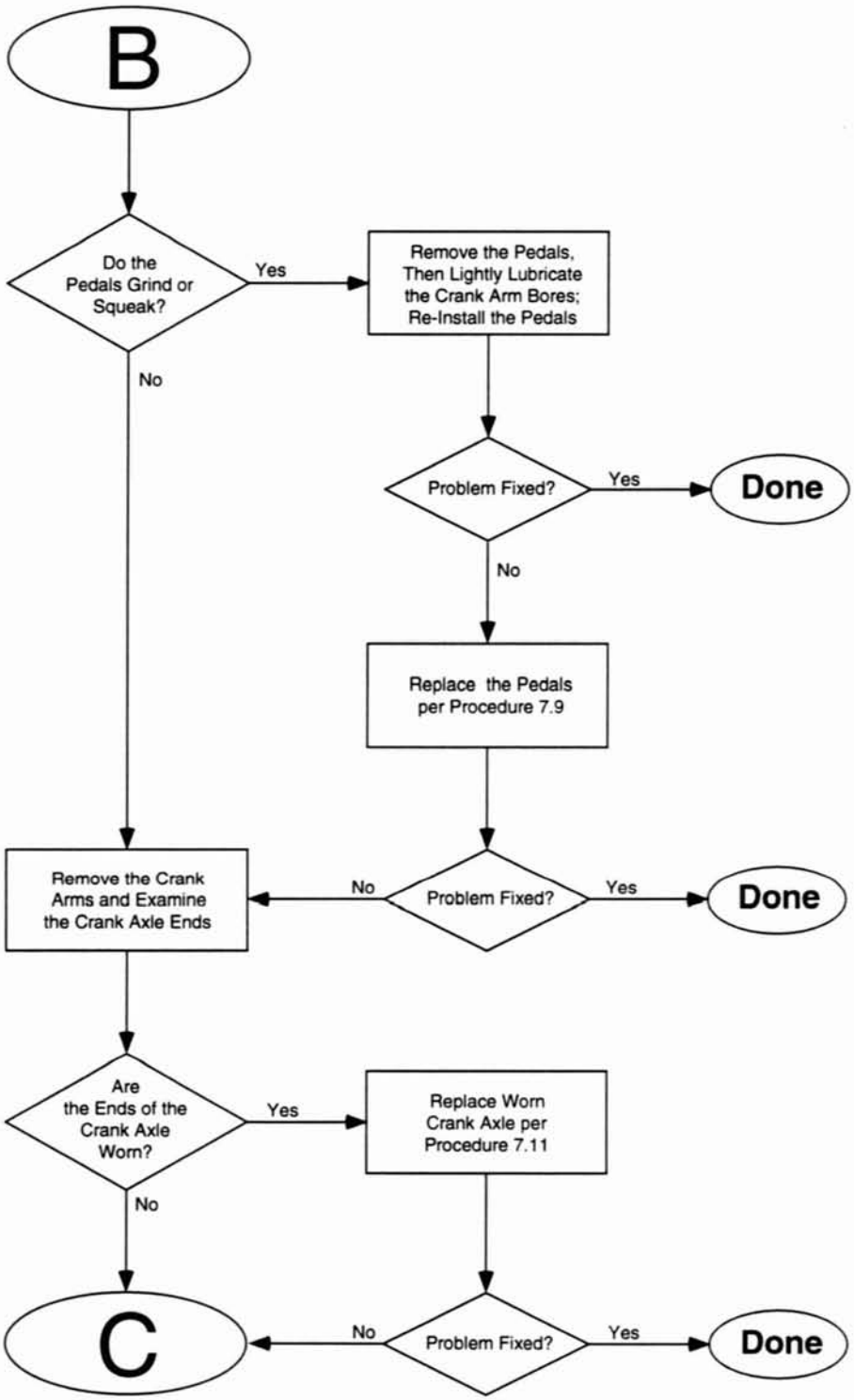
Flow Chart 8 (2 of 6)

Cycle Makes Squeaking, Knocking, or Grinding Noises

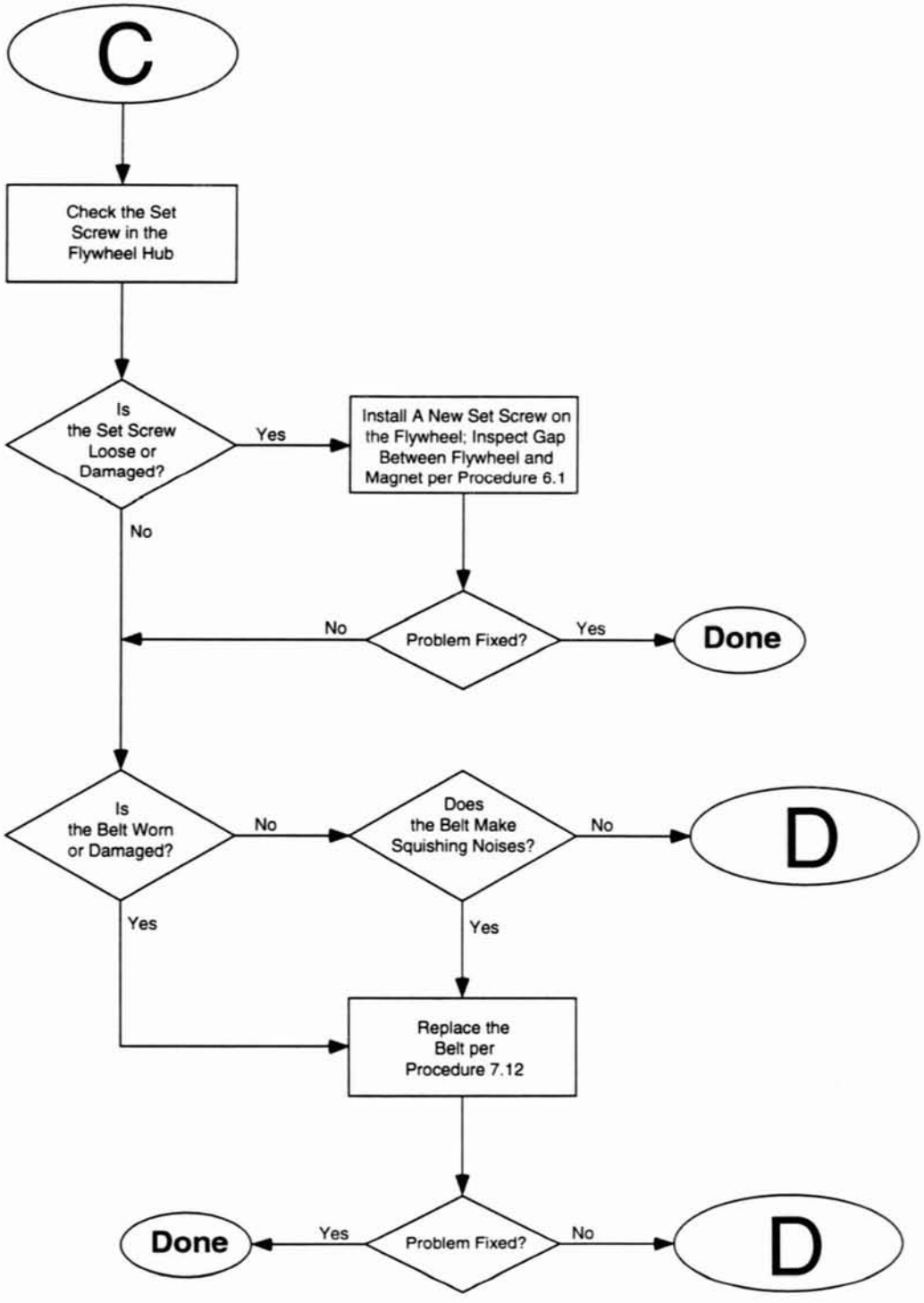


Flow Chart 8 (3 of 6)

Cycle Makes Squeaking, Knocking, or Grinding Noises

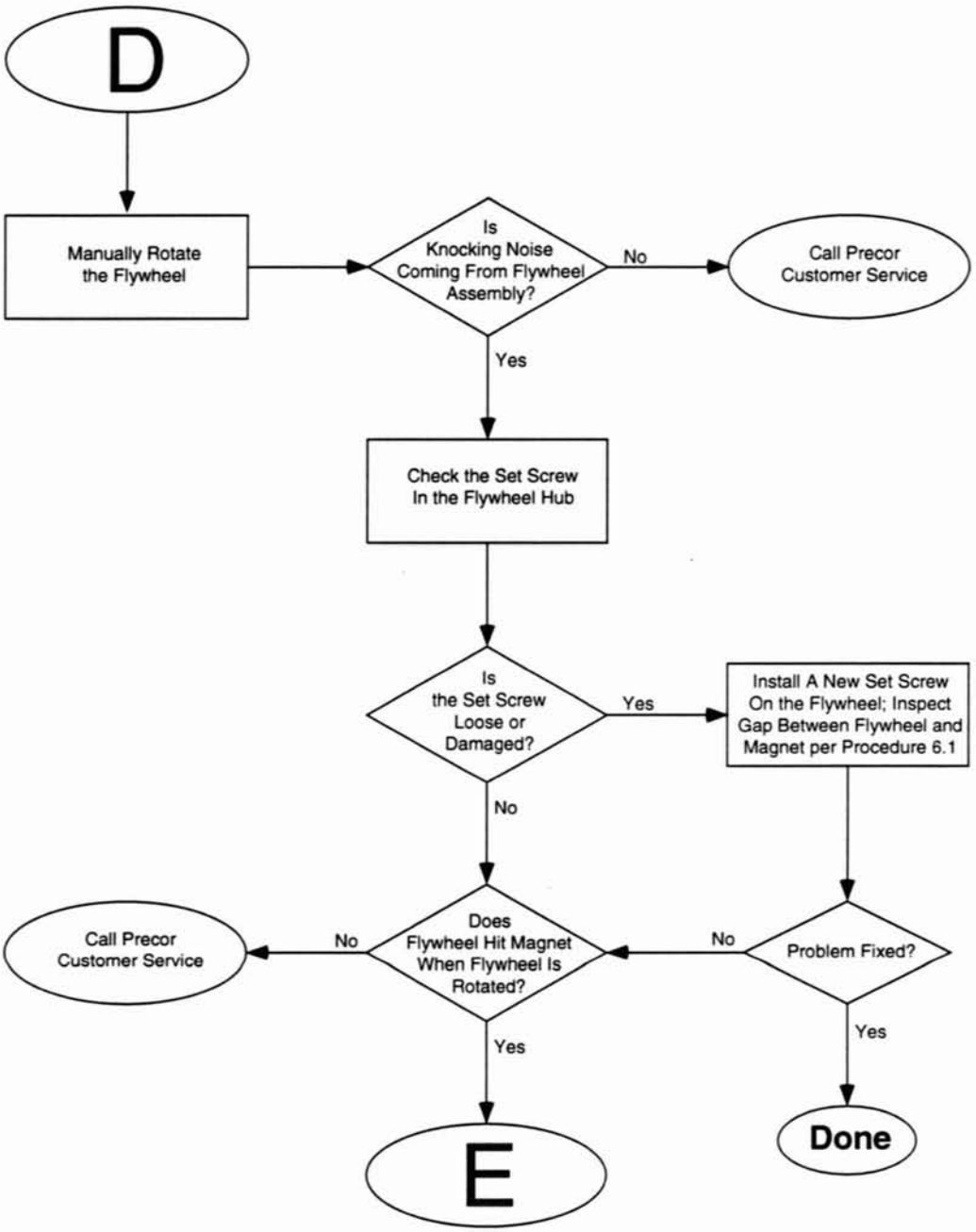


Flow Chart 8 (4 of 6)
Cycle Makes Squeaking, Knocking, or Grinding Noises

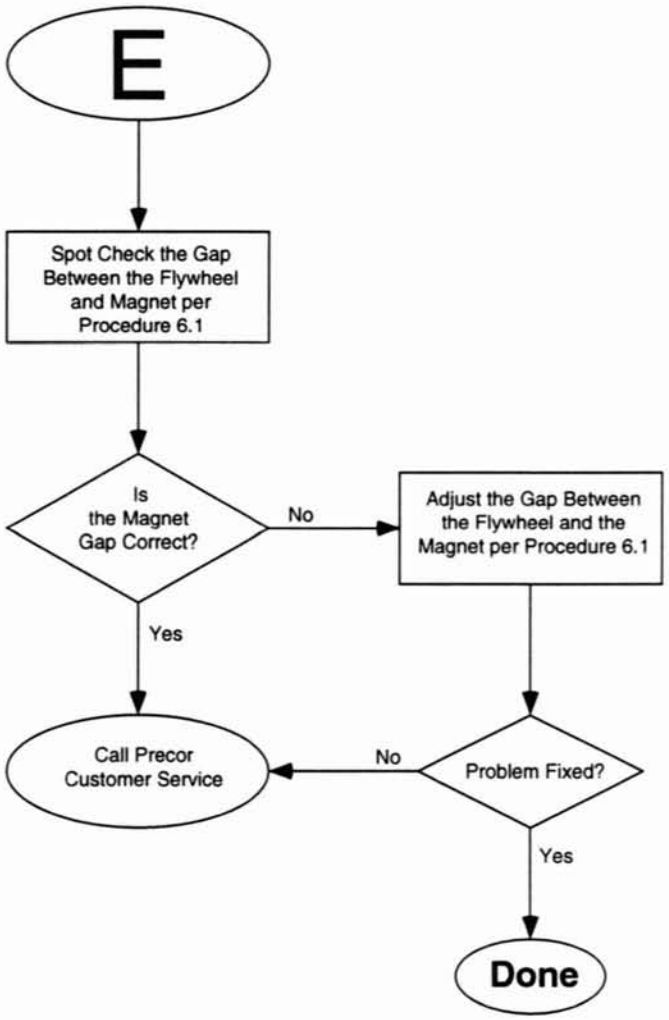


Flow Chart 8 (5 of 6)

Cycle Makes Squeaking, Knocking, or Grinding Noises



Flow Chart 8 (6 of 6)
Cycle Makes Squeaking, Knocking, or Grinding Noises



Section Two

Things You Should Know

Exploded View Diagram References

Many procedures include numbers in parentheses after component references. These numbers match the item numbers on the exploded view diagrams included in Appendix C. For example:

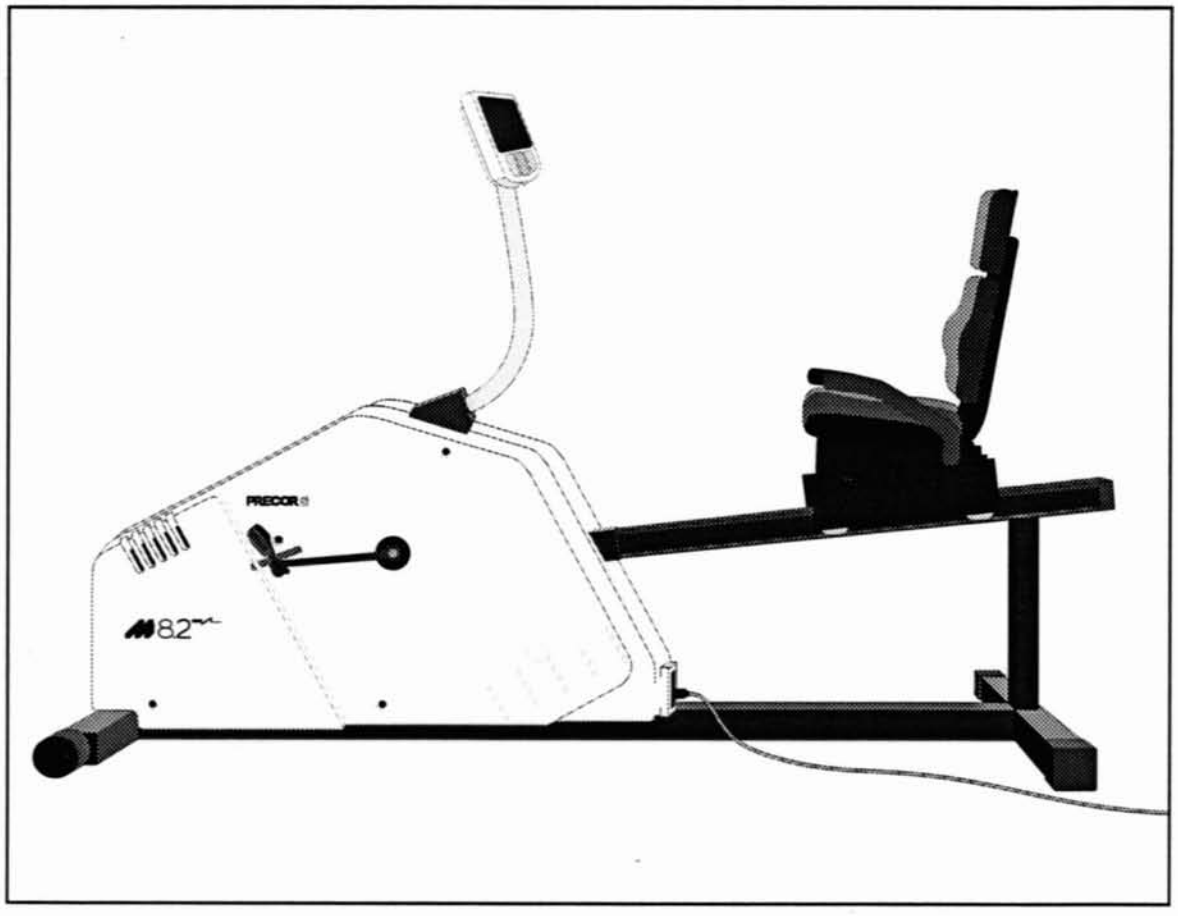
14. Using the needle nose pliers, connect the tension spring (37) to the idle wheel (83).

Use the parts list and exploded view diagrams in Appendix C to locate and identify 8.2E/L Recumbent Cycle components.

Right, Left, Front, and Back Conventions

In this manual, *right, left, front,* and *back* are from the perspective of a user sitting on the cycle, facing the electronic console (see Diagram 2-1).

Diagram 2-1. 8.2E/L Recumbent Cycle



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WARNING and Caution Statements and Safety Guidelines

WARNING and **Caution** statements are used throughout this manual to protect both you and the 8.2E/L Recumbent Cycle. Additional precautions and guidelines are provided to ensure your safety when servicing an 8.2E/L Recumbent Cycle.

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

- To remove power from the 8.2E/L Recumbent Cycle, the power cord must be disconnected from the wall outlet.
- Removing the covers exposes potentially dangerous machinery and high voltage components. Use caution when performing maintenance operations with the covers off.
- You will be very close to high voltage components when you perform this procedure. Protect yourself by removing jewelry (especially from ears, neck, and hands), tying up long hair, and removing neck ties.
- The user's heart rate reached or exceeded the maximum heart rate. The user MUST consult a physician before operating the 8.2E/L Recumbent Cycle.
- Calibration Mode will turn off automatically after four minutes if You do not turn the pedals. Turning the pedals before the four minute period has elapsed prolongs Calibration Mode by another four minutes.
- If the cycle is in Calibration Mode for more than 30 minutes, the magnet will become very hot and the lower PCA may fail. Take the cycle out of Calibration Mode by pressing the GEAR t key, then remove the power from the cycle. Allow the magnet to cool four hours with the covers removed before you perform maintenance procedures or operate the cycle.
- Electrical shock may result if your hands come in direct contact with TP3 and TP4.

Caution statements are intended to prevent damage to the 8.2E/L Recumbent Cycle as a result of the current activity. **Caution** statements included in this manual are listed below:

- Remove power from the cycle before you measure the resistance of the magnet.
- Notice the orientation notch on the PROM (U3). The new PROM must be positioned with the same notch orientation. Replacing the PROM backwards will damage or destroy the PROM.

- The set screw must clamp the square key firmly.

- Striking the crank axle and removing the bearings as described in Steps 5 and 8 may damage the crank axle threads. Inspect the crank axle threads carefully. If the threads are scored or damaged, discard the crank axle.

- Excessive hammering and force will damage the bearings in the sheave axle sleeve assembly.

- The threads on the freewheel sprocket are very fine. Do not cross thread the sprocket when you replace it on the sheave axle.

Safety guidelines you should know and follow include:

- Read the Owner's Manual and follow all operating instructions.

- Operate the 8.2E/L Recumbent Cycle on a solid, level, dry surface.

- Visually check the 8.2E/L Recumbent Cycle before beginning service or maintenance operations. If the cycle is not completely assembled or if it is damaged, exercise extreme caution while operating and checking the 8.2E/L Recumbent Cycle.

- Be aware that the weight limit for the 8.2E/L Recumbent Cycle is 300 pounds.

- Keep all electrical components, such as the power cord and the ON/OFF switch, away from water and other liquids.

Required Tools and Equipment

The equipment listed in each procedure's Required Tools and Equipment section is summarized below. Precor recommends that you have these items available when you are servicing an 8.2E/L Recumbent Cycle.

Tools

small flat-head screwdriver
#2 flat-head screwdriver
#2 phillips screwdriver

5/32", 3/16", and 1/2" allen wrench
3mm T-handle allen wrench

3/8", 7/16", 1/2", and 5/8" open-end wrench
15mm open-end wrench
1/2" socket wrench

5/16" nut driver
1/2" drive ratchet

15mm, 7/16", and 9/16" sockets for 1/2" drive ratchet
17mm deep well socket for 3/8" drive ratchet, 2

C-Clamp (must be adjustable to 8")
chip puller
extraction tool
feeler gauge (0.125")
hammer
needle nose pliers
pin punch, 1/8"
plastic mallet
pliers
potentiometer adjustment tool
ruler
snap ring pliers
steel punch
torque wrench
vice
wire cutters

Equipment

anti-static wrist strap
ohmmeter
Fluke Voltmeter, Model 82, 89, 23, or 29

cable ties
damp cloth
grease
mild detergent
tape

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Eddy Current Resistance and the 8.2E/L Recumbent Cycle

Magnetism

When the disk rotates, it "cuts" the lines of force that make up the magnetic field. As the lines of force are cut, voltage is induced in the disk. The current produced by this induced voltage is called *eddy current.*

How Eddy Current Works

Current flowing through a conductor produces a magnetic field. When the disk rotates, the magnetic field produced by the eddy current in the disk opposes the magnetic field produced by the magnet. Opposing magnetic fields repel each other in precisely the same way that like poles of a magnet repel each other. It is this repelling action that produces the resistance the user works against when operating the 8.2E/L Recumbent Cycle.

Decreasing the Resistance

When the user presses the **GEAR ▼** key, the current flowing through the magnet decreases (see Table 2-1). This, in turn, decreases the strength of the magnetic field. Although the disk is still rotating, it cuts fewer lines of force in the magnetic field and a smaller voltage is induced on the disk. Because current is proportional to voltage, the eddy current decreases as well.

When the eddy current decreases, the magnetic field produced by the eddy current decreases and opposes the magnetic field produced by the magnet with less strength. Because the two fields are not repelling so strongly, the resistance of the cycle decreases, thus allowing the user's speed to increase.

Table 2-1. Pressing the GEAR ▼ Key

GEAR ▼ Key Pressed	Current	Magnetic Fields	Resistance	Speed
	▼	▼	▼	▲

Increasing the Resistance

When the user presses the **GEAR ▲** key, the current flowing through the magnet increases, causing the strength of the magnetic field to increase as well (see Table 2-2).

As the disk rotates and cuts more lines of force in the magnetic field, a greater voltage is induced on the disk. As the voltage increases, the eddy current also increases.

Table 2-2. Pressing the GEAR ▲ Key

GEAR ▲ Key Pressed	Current	Magnetic Fields	Resistance	Speed
	▲	▲	▲	▼

When the eddy current increases, the magnetic field produced by the eddy current increases and opposes the magnetic field produced by the magnet with more strength. Because the two fields are repelling more strongly, the resistance of the cycle increases and the user's speed decreases.

Section Three

Software Features

Note
No tools or equipment are needed to perform the procedures included in this section.

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Procedure 3.1
Resetting System Information

This procedure completely resets the 8.2E/L Recumbent Cycle software. All previously-saved user information will be either reset to zero or changed to default values. All odometers will be reset to zero. If you want to save accumulated user information and odometer readings, record the information before performing this procedure.

Procedure

1. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

2. With the **PRECOR 8.2ELR** banner scrolling, press the **ENTER**, **PACER**, **GEAR ▼**, and **GEAR ▲** keys simultaneously and hold them for approximately five seconds (or until zeros are displayed in the right display windows).

3. Watch the electronic display (see Diagram 3-1). The right middle display window:

   a. Resets to all zeros, then increments to 119

   b. Jumps to 1000, then increments to 1119

   c. Jumps to 2000, then increments to 2119

   d. Jumps to 3000, then increments to 3119

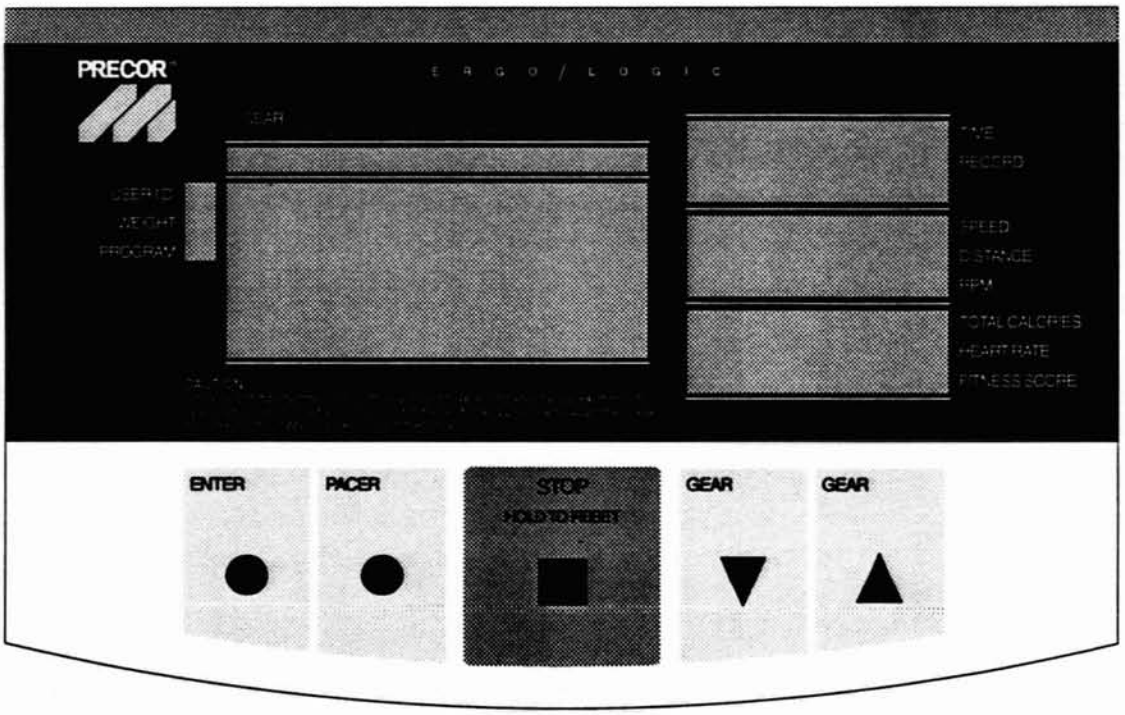
   e. Displays 8.2E/LR

4. Choose one:

If . . .	**Then . . .**	**Otherwise . . .**
The electronic display does not show the information sequence listed in Step 3	Replace the PROM as described in Procedure 7.3, *Removing and Replacing the PROM, Processor, or LED Chips*; then return to Step 2	Continue with the next step

5. Press **ENTER** to return to the **User ID** prompt.

Diagram 3-1. 8.2E/L Recumbent Cycle Electronic Display



Procedure 3.2

Resetting User Information

This procedure resets accumulated user information and odometer readings for an individual User ID. All previously-saved user information for a selected User ID will be either reset to zero or changed to default values. The odometer reading for the selected User ID will be reset to zero. (If you want to save accumulated information, refer to the 8.2E/L Recumbent Cycle Owner's Manual.*)*

Procedure

1. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

2. With the **PRECOR 8.2ELR** banner scrolling, press any key.

3. At the **User ID** prompt, select one of four User IDs using the **GEAR ▲** and **GEAR ▼** keys.

4. Press the **PACER** and **STOP** keys simultaneously and hold them for approximately five seconds (or until the right middle display window displays one of the numbers displayed in the second column of Table 3-1).

5. Watch the right middle display window. This software feature is programmed to display the information provided in Table 3-1.

   Note
   The number displayed in the right middle display window is determined by the User ID you selected in Step 3 (see Table 3-1).

Table 3-1. Individual User Reset Values on the Right Middle Display Window

If you select User ID . . .	The value shown is . . .	The value shown increments to . . .	The value then clears to . . .
1	0000	119	0.000
2	1000	1119	0.000
3	2000	2119	0.000
4	3000	3119	0.000

6. Choose one:

If . . .	**Then . . .**	**Otherwise . . .**
You do not observe the values listed in Table 3-1	Replace the PROM as described in Procedure 7.3, *Removing and Replacing the PROM, Processor, or LED Chips*	Continue with Step 7

7. Press **ENTER** to return to the **Weight** prompt.

Procedure 3.3

Performing Keypad and LED Diagnostics

Procedure

1. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

2. With the **PRECOR 8.2ELR** banner scrolling, press the **PACER**, **STOP**, and **GEAR ▲** keys simultaneously and hold them for five seconds.

   Note
   Pressing the keys listed in Step 3 illuminates five dots in the left display window column that corresponds to the key pressed. When you release the key, a single dot replaces the five dots.

3. Press each of the keys listed below. Verify that five dots illuminate on the left display window column described across from each key.

ENTER	Lights five dots on the second column from the left.
PACER	Lights five dots on the third column from the left.
STOP	Lights five dots on the middle column.
GEAR ▼	Lights five dots on the third column from the right.
GEAR ▲	Lights five dots on the second column from the right.

4. Choose one:

If . . .	**Then . . .**	**Otherwise . . .**
The left display window column illuminates appropriately as each key is pressed **or** if sections of the display window illuminate when no key is pressed	The keypad test passed successfully; continue with the next step	Replace the upper PCA as described in Procedure 7.2, *Removing and Replacing the Upper PCA or Electronic Enclosure*

5. End the keypad test by pressing the **ENTER** and **GEAR ▲** keys simultaneously.

Note
*Pressing the **ENTER** and **GEAR** ▲ keys simultaneously initiates the following LED test.*

6. Watch the electronic display as the LED test progresses. This test is programmed to display the following LED illumination sequence.

   a. Every LED on the left display window illuminates simultaneously.

   b. Diagonal lines of illuminated LEDs sweep across the left display window.

   c. The right display windows illuminate, then decrement from 8.8.8.8 to 0.0.0.0.

   d. The function LEDs illuminate simultaneously and then extinguish.

   e. Each function LED illuminates separately and then extinguishes.

Note
*The message **DIAGNOSTICS COMPLETE–PRESS ANY KEY TO CONTINUE** displays when the LED test is complete.*

7. Choose one:

If . . .	**Then . . .**	**Otherwise . . .**
You do not observe the LED illumination sequence described in "a", "b", "d", and "e" of Step 6	Replace the upper PCA as described in Procedure 7.2, *Removing and Replacing the Upper PCA or Electronic Enclosure*	Continue with Step 8

8. Choose one:

If . . .	**Then . . .**	**Otherwise . . .**
You do not observe the the LED illumination sequence described in "c" of Step 6	Replace the bad LED chip as described in Procedure 7.3, *Removing and Replacing the PROM, Processor, or LED Chips*	The LED test passed successfully

9. Press **ENTER** to return to the **User ID** prompt.

Procedure 3.4

Displaying and Resetting User Odometers

This procedure allows you to display an individual user's cumulative workout distance. The procedure will also display the total time, in minutes, that the cycle has been turned on. (Total time that the cycle has been turned on is different from workout time. Workout time for individual User IDs is displayed as described in the 8.2E/L Recumbent Cycle Owner's Manual.*)*

Procedure

1. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

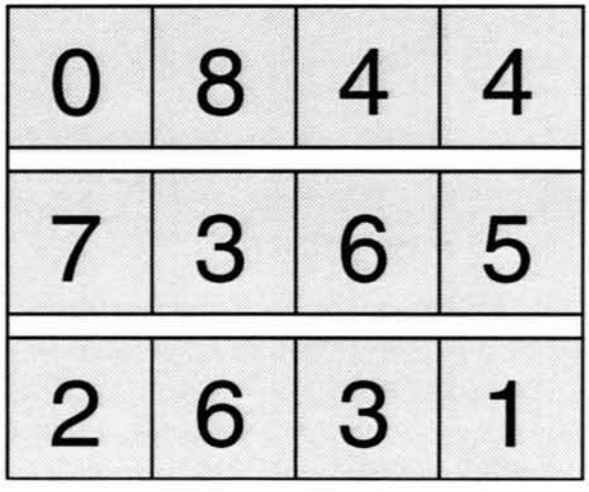
2. With the **PRECOR 8.2ELR** banner scrolling, press the **ENTER**, **GEAR ▼**, and **GEAR ▲** keys simultaneously and hold them for five seconds or until the message **TTL TIME** (Total Time) is displayed in the left display window.

   Note
   The right display window displays the total time, in minutes, that the cycle has been turned on.

3. Use the **GEAR ▼** and **GEAR ▲** keys to select an odometer.

   Note
   If the odometer for User ID 1 is selected, the left display window displays the message USER1 ODOMTR (User 1 Odometer). The right display windows show the feet traversed (see the example shown in Diagram 3-2).

Diagram 3-2. Odometer Reading for an Individual User ID



Note
The number displayed (84,473,652,631) is an odometer reading for an individual User ID. The top display window shows the most significant bits of the number; the lower display window shows the least significant bits of the number.

4. Choose one:

If . . .	**Then . . .**	**Otherwise . . .**
You wish to reset an odometer for an individual User ID	With the selected odometer reading displayed on the right display windows, press and hold the STOP key for seven seconds or until zeros are displayed in the right display windows	Continue with Step 5

Note
If you wish to reset more than one odometer, return to Step 3.

5. Press **ENTER** to return to the **User ID** prompt.

Procedure 3.5

Selecting United States Standard or Metric Units

Selecting United States standard units causes information to be displayed in feet, pounds, and miles. Information is displayed in meters, kilograms, and kilometers if metric units are selected. After you select a measurement standard, the software accumulates and records workout information ***in the units of the measurement standard selected****. Changing to the alternate measurement standard will cause invalid data to be displayed. For this reason, recycle power as described in Step 5 before you change the measurement standard.*

Procedure

1. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

2. Choose one:

If . . .	Then . . .
You wish to verify the measurement standard the cycle is currently using before you change the standard	Continue with the next step
You wish to change the measurement standard the cycle is using	Skip to Step 5

Checking the Measurement Standard

3. Press **ENTER** until the WEIGHT indicator light appears.

4. Watch the number displayed in the left display window while you press the **GEAR ▲** key five or six times.

   Note
   If the cycle is using United States standard units, the numbers in the left display window are repeatable multiples of 5 (such as 160, 165, 170, 175, etc.). Otherwise, the cycle is using metric units.

Changing the Measurement Standard

5. Press and hold **STOP** to get back to the **PRECOR 8.2ELR** banner.

Note
*Releasing the **PACER** key before the **GEAR** ▲ key when you perform the next step may cause the selected measurement standard to change to the alternate measurement standard.*

6. Press the **PACER** and **GEAR** ▲ keys simultaneously and hold them for three seconds.

Note
The left display window displays either U. S. Standard Units or Metric Units.

7. Use the **GEAR** ▲ or **GEAR** ▼ keys to select the alternate measurement standard.

8. Press **ENTER** to return to the **User ID** prompt.

Procedure 3.6

Calibration Mode

WARNING
Calibration Mode will turn off automatically after four minutes IF YOU DO NOT TURN THE PEDALS. Turning the pedals before the four minute period has elapsed prolongs Calibration Mode by another four minutes.

If the cycle is in Calibration Mode for more than 30 minutes, the magnet will become very hot and the lower PCA may fail. If the cycle is left in Calibration Mode for extended periods, press the GEAR ▼ key, then remove power. Allow the magnet to cool four hours with the covers removed before you perform maintenance procedures or operate the cycle.

Note
Placing the 8.2 E/L Recumbent Cycle in Calibration Mode causes the software to cycle through two modes. The following paragraphs describe each mode.

***Magnet Current Calibration Mode**. This mode allows you to measure magnet calibration voltage. The procedure for measuring calibration voltage (and for adjusting this voltage, if necessary) is provided in Procedure 6.2,* Inspecting and Adjusting Magnet Calibration Voltage.

***Heart Rate Verification Mode**. This mode allows you to verify heart rate monitor operation without scanning the other modes as in general operation.*

Procedure

1. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

2. With the **PRECOR 8.2ELR** banner scrolling, press and hold the **PACER** key for about five seconds or until the message **CAL OFF** is displayed in the right display windows.

   Note
   *The software version will be be displayed in the right middle display window when you initially press the **PACER** key.*

3. Place the cycle in Calibration Mode by pressing the **GEAR ▲** key.

4. Choose one:

If . . .	Then . . .	Otherwise . . .
You wish to inspect the magnet calibration voltage	Perform Procedure 6.2, *Inspecting and Adjusting the Magnet Calibration Voltage*	Continue with the next step

5. Take the cycle out of calibration mode by pressing the **GEAR ▼** key; then press the **STOP** key.

6. Check to see that the HEART RATE indicator is blinking in time with your heart beat and that the heart rate information displayed is correct.

7. Choose one:

If . . .	Then . . .	Otherwise . . .
The heart rate information is not correct	Refer to the *Heart Rate Monitor User's Manual*	Continue with the next step

8. Press STOP to return to the **User ID** prompt.

Procedure 3.7

Responding to Error Codes

Procedure

1. Choose one:

If . . .	Then . . .
Err 14 is displayed in the right display windows	A key is stuck in the ON position; Check key operation as described in Procedure 3.3
Err 15 is displayed in the right display windows	Continue with the next step

2. Replace the PROM as described in Procedure 7.3, *Removing and Replacing the PROM, Processor, or LED Chips.*

3. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

4. Choose one:

If . . .	Then . . .	Otherwise . . .
Err 15 is no longer displayed on the right display windows	This procedure is complete	Replace the upper PCA as described in Procedure 7.2, *Removing and Replacing the Upper PCA or Electronic Enclosure*

5. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

6. Choose one:

If . . .	Then . . .	Otherwise . . .
Err 15 is no longer displayed on the right display windows	This procedure is complete	Call Precor Customer Service

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Procedure 3.8

Determining Software Version Numbers

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

Procedure

1. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

2. With the **PRECOR 8.2ELR** banner scrolling, press the **PACER** key.

   Note
   *If you hold the **PACER** key for five seconds or longer, the cycle will go into Calibration Mode. If this occurs, cycle power by turning the ON/OFF switch to OFF and then to ON. If you release the PACER key before the cycle enters Calibration Mode, the version number is cleared from the right middle display window and the **User ID** prompt is displayed.*

3. Note the version number displayed in the right middle display window.

   Note
   If you cannot determine the software version number in this manner, look at the PROM (U3) mounted on the upper PCA. A label on U3 indicates the software version number. The part number of the PROM indicates the version number. For example, the part number for the PROM that has a version number of 3.21 is 36226-321.

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Procedure 3.9

Documenting Software Problems

When a problem is found with either the software or upper or lower PCAs, 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 Customer Service.

When a problem occurs, record the following information:

- Model and serial number

  Note
  The model serial number is located on the bottom of the lower crossbeam.

- Software version number

  Note
  *Determine the version number of the PROM mounted on the upper PCA by pressing the **PACER** key when the **PRECOR 8.2ELR** banner is scrolling (or by looking at the label on the PROM).*

- 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

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Section Four
Preventive Maintenance

Preventive maintenance measures are either scheduled (performed on a regular basis) or unscheduled (performed when a particular procedure is performed). Scheduled preventive maintenance is performed by the owner and is limited to cleaning and visually inspecting the 8.2E/L Recumbent Cycle. Scheduled preventive maintenance activities are included here so that you are aware of preventive measures performed on a regular basis. You, the field service technician, will maintain the 8.2E/L Recumbent Cycle only when a trouble call is placed by the owner. The preventive maintenance activities you perform will be done on an irregular basis.

Regular Preventive Maintenance (Owner)

Cleanliness of the 8.2E/L Recumbent Cycle and its operating environment will keep maintenance problems and service calls to a minimum. For this reason, Precor recommends that the following preventive maintenance schedule be followed regularly.

After Each Use

Wipe down the pedals and 8.2E/L Recumbent Cycle frame with a damp cloth.

Every Week

- Vacuum underneath the 8.2E/L Recumbent Cycle.
- Visually inspect the power cord. Replace the power cord if it is torn or damaged.
- Make sure the power cord is not underneath the cycle wheels or feet.

Every Month

- Wipe the surface of the electronic enclosure with a damp sponge or nonabrasive soft cloth. Dry with a clean towel.

Every Six Months

- Inspect the belt. If the belt shows signs of wear or damage, remove and replace the belt as described in Procedure 7.12, *Removing and Replacing the Belt.*

On-Site Preventive Maintenance (Service Technician)

Perform the following preventive maintenance tasks each time you are called to service an 8.2E/L Recumbent Cycle.

- Examine the belt, chain, sheave, and bearings for wear, cracks, or other signs of deterioration and replace if necessary.

- Visually inspect the power cord. Replace the power cord if it is torn or damaged.

- Visually inspect the part of the ribbon cable that is not inside the column. If the ribbon cable is torn or damaged, replace it per Procedure 7.8, *Removing and Replacing the Ribbon Cable*.

Section Five

Checking Cycle Operation

This section provides you with a quick method for checking the basic operation of the 8.2E/L Recumbent Cycle.

Procedure

1. Plug the power cord into the wall outlet, then turn on the climber by using the circuit breaker.

2. At the **User ID** prompt, select one of four user IDs using the **GEAR** ▲ and ▼ keys, then press ENTER.

3. When the WEIGHT indicator light appears, specify your weight using the **GEAR** ▲ and ▼ keys and press **ENTER**.

4. When the PROGRAM indicator light appears, select program course number 1 (Manual Mode) using the **GEAR** ▲ and ▼ keys and press **ENTER**.

5. Select Gear 1.

6. Operate the cycle for one to two minutes. While you operate the cycle:

   a. Concentrate on the cycle resistance as you pedal.

   b. Listen for the sound of the chain and belt. Be on the alert for unusual rubbing, grinding, or squeaking noises.

   c. Watch the electronic display while you work out. Certain information on the display should change as the workout progresses, such as Time, Distance, RPM, and Heart Rate.

7. Choose one:

If . . .	**Then . . .**	**Otherwise . . .**
The cycle makes unusual noises or the electronic display does not change appropriately	Refer to Flow Chart 6	Continue with the next step

8. Press the GEAR ▲ key until you reach Gear 4. Operate the cycle for another one to two minutes.

9. Choose one:

If . . .	Then . . .	Otherwise . . .
The cycle resistance does not change or the cycle operation feels inconsistent compared with Gear 1	Refer to Flow Chart 5	Continue with the next step

10. Press the GEAR ▲ key until you reach Gear 8. Operate the cycle for another one to two minutes.

11. Choose one:

If . . .	Then . . .	Otherwise . . .
The cycle resistance does not change or the cycle operation feels inconsistent compared with Gears 1 and 4	Refer to Flow Chart 5	The cycle is ready for use

Section Six

Inspection and Adjustment Procedures

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Procedure 6.1

Inspecting and Adjusting the Gap Between the Flywheel and the Magnet Assembly

The gap between the flywheel and the magnet assembly must be inspected and, if necessary, adjusted when the flywheel is loosened or the magnet assembly is replaced.

Required Tools and Equipment

feeler gauge (0.125")
5/32" allen wrench

Procedure

1. Remove the left cover (4) as described in Procedure 7.1, *Removing and Replacing the Covers.*

   WARNING
   Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Place the feeler gauge between the flywheel (19) and the magnet assembly (27).

3. Choose one:

If . . .	Then . . .	Otherwise . . .
The feeler gauge does not fit snugly	Continue with the next step	Skip to Step 8

4. Using the 5/32" allen wrench, loosen the socket head screws (26) that secure the magnet assembly (27) to the cycle frame.

5. Have an assistant lightly press the magnet assembly (27) and feeler gauge against the flywheel (19) while you tighten the socket head bolts.

6. Place the feeler gauge between the flywheel and the magnet assembly.

7. Choose one:

If . . .	Then . . .	Otherwise . . .
The feeler gauge does not fit snugly	The set screw in the flywheel hub may be loose or damaged; refer to Flow Chart 7	Continue with the next step

8. Slowly spin the flywheel while visually checking the gap between the flywheel (19) and the magnet assembly (27).

9. Choose one:

If . . .	Then . . .	Otherwise . . .
The flywheel rubs the magnet assembly or the gap between the flywheel and the magnet assembly is uneven	Continue with the next step	The gap between the flywheel and magnet assembly is correct; skip to Step 11

10. Choose one:

If . . .	Then . . .	Otherwise . . .
You have adjusted the gap between the flywheel and the magnet assembly at least twice and the flywheel still rubs the magnet or the gap is still uneven	Replace the flywheel as described in Procedure 7.15, *Removing and Replacing the Flywheel, Flywheel Axle Assembly, or Fan*	Repeat Steps 2 through 9

11. Check the cycle operation as described in Section 5, Checking Cycle Operation.

12. Replace the cover as described in Procedure 7.1, *Removing and Replacing the Covers.*

Procedure 6.2

Inspecting and Adjusting the Magnet Calibration Voltage

WARNING
Calibration Mode will turn off automatically after four minutes IF YOU DO NOT TURN THE PEDALS. Turning the pedals before the four minute period has elapsed prolongs Calibration Mode by another four minutes.

If the cycle is in Calibration Mode for more than 30 minutes, the magnet will become very hot and the lower PCA may fail. Take the cycle out of Calibration Mode by pressing the GEAR ▼ key, then remove the power from the cycle. Allow the magnet to cool four hours with the covers removed before you perform maintenance procedures or operate the cycle.

You will be very close to high voltage components when you perform this procedure. Protect yourself by removing jewelry (especially from ears, neck, and hands), tying up long hair, and removing neck ties.

Required Tools and Equipment

potentiometer adjustment tool
Fluke Voltmeter, Model 82, 89, 23, or 29

Procedure

1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

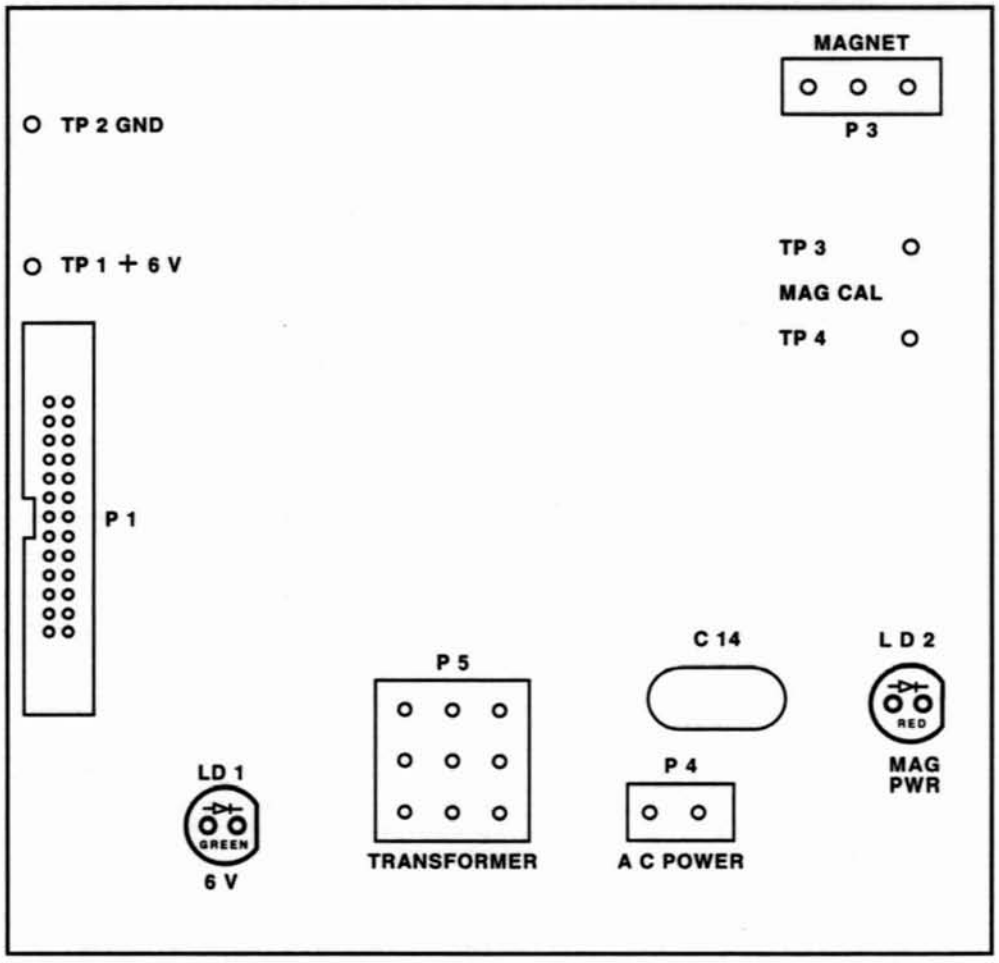
   WARNING
   Before continuing with this procedure, review the Warning and Caution statements listed in Section Two, *Things You Should Know*.

2. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers*.

   WARNING
   Electrical shock may result if your hands come in direct contact with TP3 and TP4.

3. Place the red voltmeter lead on test point TP3 on the lower PCA. Place the black lead (ground) on test point TP4 on the lower PCA (see Diagram 6-1).

Diagram 6-1. Measuring the Magnet Calibration Voltage



4. Set the voltmeter to a range that will conveniently read 1,000 millivolts DC rms.

5. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

   Note
   Ignore any humming sounds when you probe TP3 and TP4.

6. With the **PRECOR 8.2E/L** banner scrolling, press and hold the **PACER** key for about five seconds or until the message CAL OFF is displayed in the right display windows.

7. Place the cycle in Calibration Mode by pressing the **GEAR ▲** key.

8. Note the amount of magnet calibration voltage at TP3 and TP4.

WARNING
If you leave the cycle in calibration mode for more than 30 minutes, the magnet will become very hot and the lower PCA may fail.

9. Take the cycle out of Calibration Mode by pressing the GEAR ▼ key.

10. Choose one:

If . . .	Then . . .	Otherwise . . .
The magnet calibration voltage does not measure 630 +/– 15 millivolts	Adjust the magnet calibration voltage as described in the following steps	The magnet calibration voltage is correct; skip to Step 16

11. Sit by the right side of the cycle and face the lower PCA. Using the potentiometer adjustment tool, turn R19 fully counterclockwise.

12. Place the cycle in Calibration Mode by pressing the **GEAR ▲** key.

13. Using the potentiometer adjustment tool, carefully turn R19 clockwise until the voltmeter reads 630 +/– 15 millivolts.

WARNING
Calibration Mode will turn off automatically after four minutes IF YOU DO NOT TURN THE PEDALS. Turning the pedals before the four minute period has elapsed prolongs Calibration Mode by another four minutes.

If the cycle is in Calibration Mode for more than 30 minutes, the magnet will become very hot and the lower PCA may fail.

14. Take the cycle out of Calibration Mode by pressing the **GEAR ▼** key.

15. Choose one:

If . . .	Then . . .	Otherwise . . .
Adjusting R19 did not set the magnet calibration voltage to the correct millivolt level	Refer to Flow Chart 4	Continue with the next step

16. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

17. Remove the voltmeter leads from the lower PCA.

18. Check the cycle operation as described in Section 5, C*hecking Cycle Operation.*

19. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

Procedure 6.3

Measuring the Resistance of the Magnet Assembly

Caution
Remove power from the cycle before you measure the resistance of the magnet.

Required Tools and Equipment

ohmmeter

Procedure

1. Remove the right cover (50) as described in Procedure 7.1, *Removing and Replacing the Covers.*

   WARNING
   Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Disconnect the magnet assembly wires from connector P3 on the lower PCA (79).

3. Set the ohmmeter to a range that will conveniently read 100 ohms.

4. Measure the resistance between the two magnet assembly wires.

   Note
   The magnet resistance will be higher than optimum (90–100 ohms) when the magnet is warm. Take resistance measurements when the magnet is at room temperature.

5. Choose one:

If . . .	Then . . .	Otherwise . . .
The resistance measures less than 90 ohms or more than 100 ohms	Replace the magnet assembly as described in Procedure 7.17, *Removing and Replacing the Magnet Assembly*	Continue with the next step

6. Connect the magnet assembly wires to connector P3 on the lower PCA (79).

7. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

8. Replace the right cover as described in Procedure 7.1, *Removing and Replacing the Covers.*

Procedure 6.4

Inspecting and Adjusting Chain Tension

Required Tools and Equipment

5/32" allen wrench
7/16" open-end wrench

Procedure

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Place the cycle on its left side.

Note
When you perform the next step, use force when you turn the pedal.

3. Grasp the right pedal and turn the right crank arm/chain wheel assembly clockwise.

4. Choose one:

If . . .	Then . . .	Otherwise . . .
The chain falls off the chain wheel	Chain tension must be increased; skip to Step 6	Continue with the next step

5. Choose one:

If . . .	Then . . .	Otherwise . . .
It is difficult to turn the pedal or if the chain makes a lot of noise as it turns	Chain tension must be decreased; continue with the next step	Chain tension is correct; return cycle to an upright position, then skip to Step 12

6. Choose one:

If . . .	Then . . .	Otherwise . . .
You have already adjusted the position of the chain tensioning assembly 3 times	Replace the chain as described in Procedure 7.13, *Removing and Replacing the Chain*	Continue with the next step

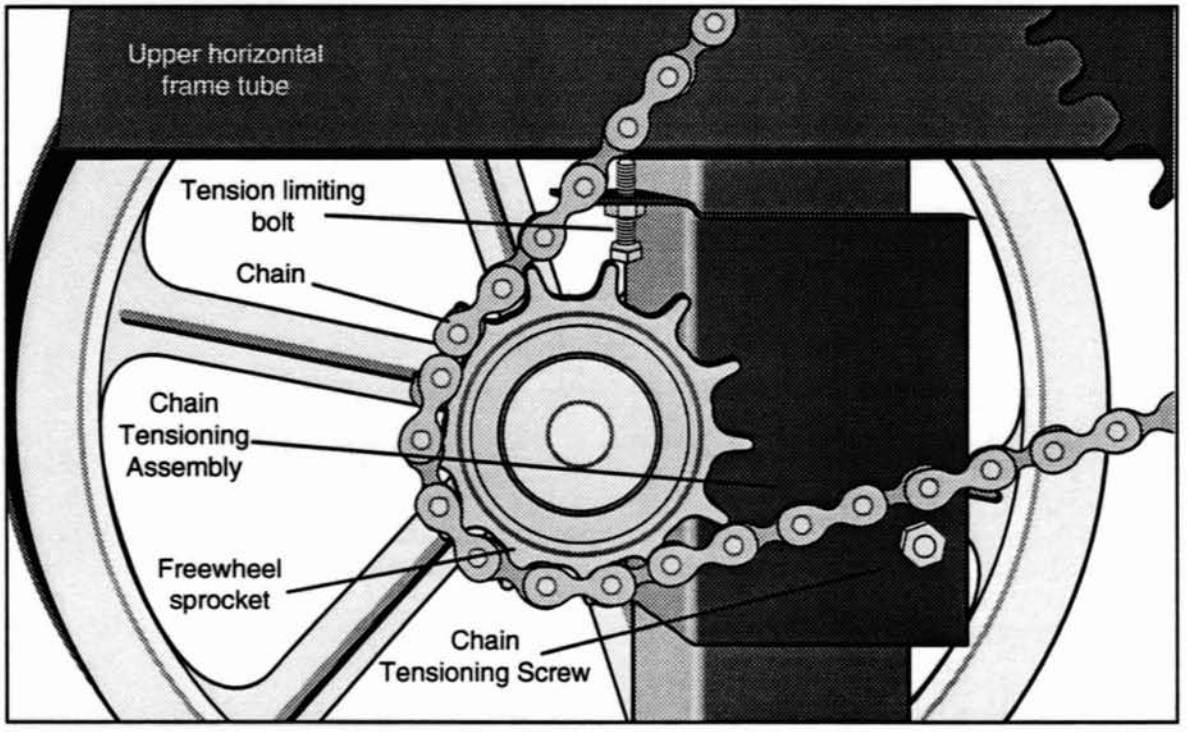
7. Return the cycle to an upright position.

8. Using the 5/32" allen wrench and 7/16" open-end wrench, loosen the screw (13) that secures the chain tensioning assembly (75) to the back frame upright (see Diagram 6-2).

9. Choose one:

If . . .	Then . . .	Otherwise . . .
The chain tension must be increased	Slide the chain tensioning assembly downward; then continue with the next step	Slide the chain tensioning assembly upward; then continue with the next step

Diagram 6-2. Chain Tensioning Assembly



10. Using the 5/32" allen wrench and 7/16" open-end wrench, tighten the bolt that secures the chain tensioning assembly to the cycle frame.

11. Return to Step 2.

12. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

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Procedure 6.5

Tightening the Roller Guide Assembly (Cam)

Required Tools and Equipment

#2 flat-head screwdriver
1/2" open-end wrench
5/32" allen wrench
1/2" drive ratchet
7/16" ratchet socket

Procedure

1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

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

2. Using the 5/32" allen wrench and ratchet with 7/16" socket, remove the four screws (60) and locknuts (14) that secure the seat frame assembly (63) to the carriage assembly (86). Remove the seat frame assembly from the cycle.

3. Using the 1/2" open-end wrench, loosen the nut (90) on the roller guide assembly (96).

4. Using the screwdriver, turn the roller guide shaft counterclockwise until the roller guide assembly (cam) is flush with the top of the carriage. Do not remove the screwdriver from the roller guide shaft.

5. Hold the screwdriver in the slotted end of the roller guide shaft while you use the 1/2" open-end wrench to tighten the nut (90).

6. Position the seat frame assembly on the carriage assembly. Have an assistant hold the frame assembly in place when you perform the next step.

7. Using the 5/32" allen wrench and ratchet with 7/16" socket, install the four screws (60) and locknuts (14) that secure the seat frame assembly (63) to the carriage assembly (86).

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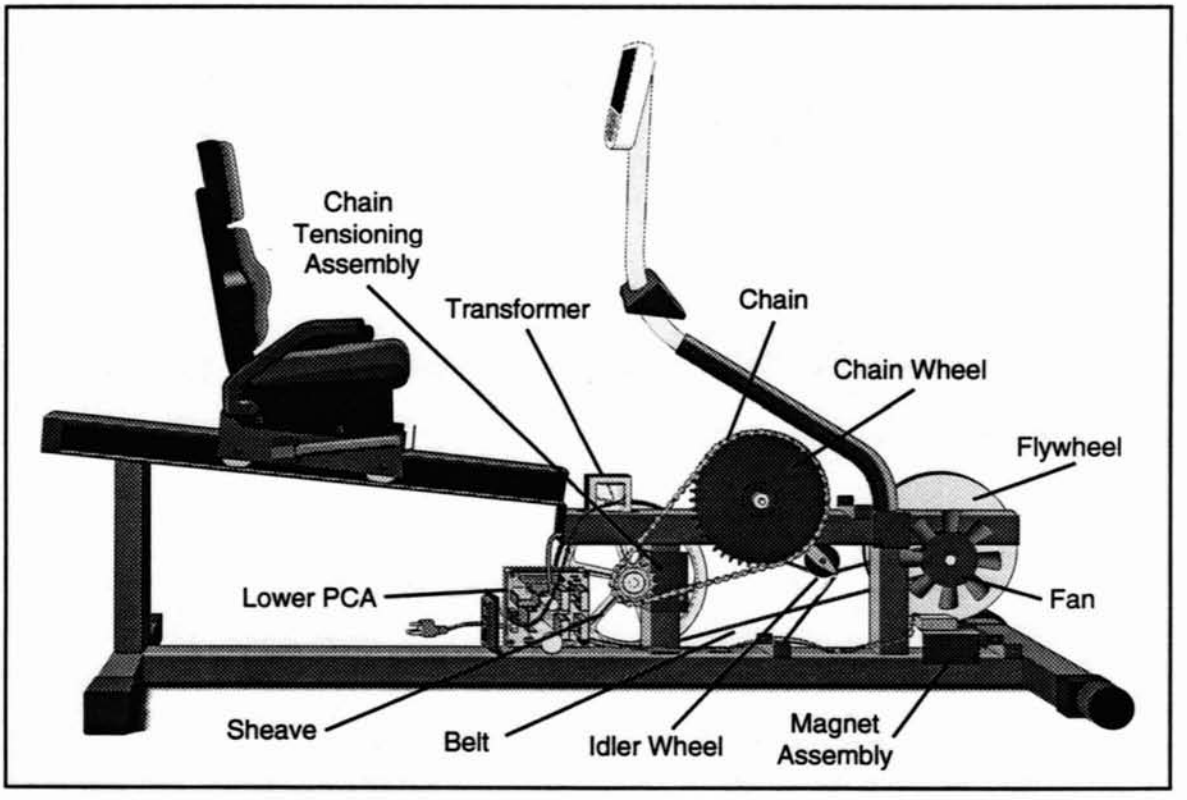
Section Seven

Removal and Replacement Procedures

Note
Diagram 7-1 identifies major mechanical components.

Diagram 7-1. Major Mechanical Components of the 8.2E/L Recumbent Cycle



Procedure 7.1

Removing and Replacing the Covers

The 8.2E/L Recumbent Cycle with covers installed in shown in Diagram 7-2.

Required Tools and Equipment

#2 phillips screwdriver
1/2" socket wrench

Removing the Right Cover

Right, left, front, and back are from the perspective of a user sitting on the cycle and facing the electronic display.

1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

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

2. Using the 1/2" socket wrench, loosen the 6 screws (100) and spring washers (101) that secure the rail to the cycle frame.

3. Slide the rail to the back of the cycle. Hold the rail in place while you use the 1/2" socket wrench to tighten a screw (100) and spring washer (101) to secure the rail to the cycle frame.

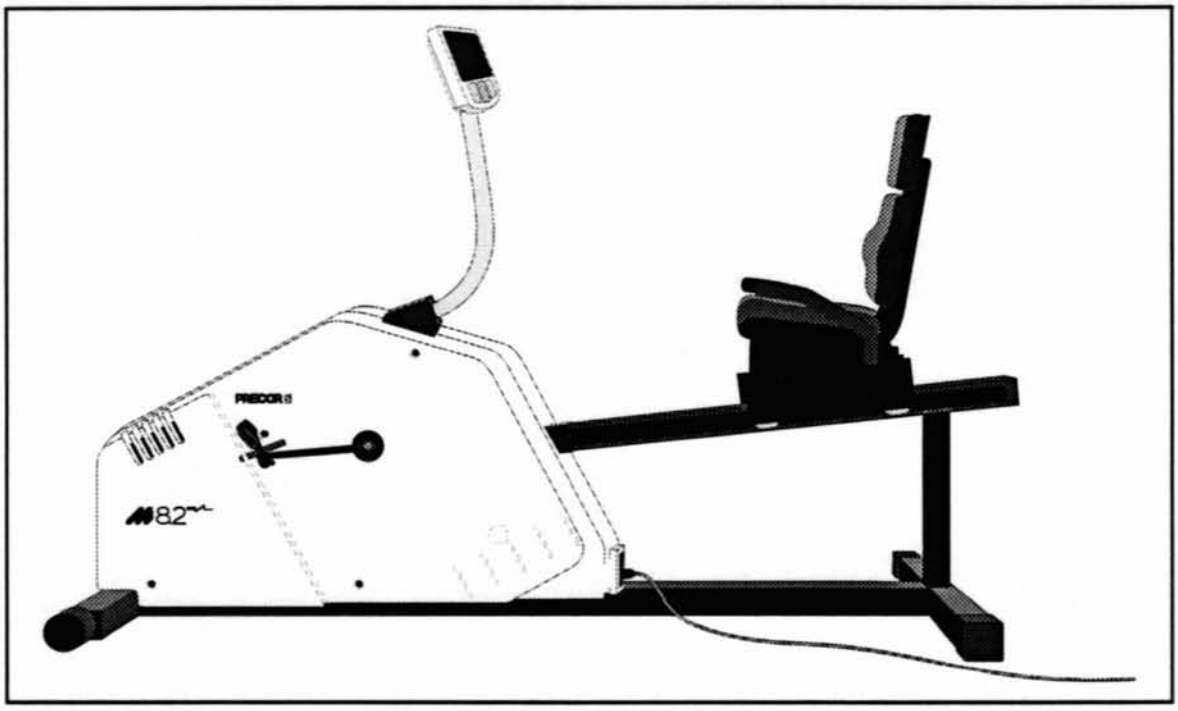
4. Slide the display arm sleeve (11) upward on the display post assembly (12).

5. Using the screwdriver, remove the nine screws (1) that secure the right cover (50) to the cycle and left cover.

6. Rotate the right crank arm/chain wheel assembly (46) until it points toward the ceiling.

7. Lift the right cover (50) over the right crank arm/chain wheel assembly (46) and set the cover aside until maintenance operations are complete.

Diagram 7-2. 8.2E/L Recumbent Cycle



8. Choose one:

If . . .	Then . . .	Otherwise . . .
You must also remove the left cover	Continue with the next step	Skip to Step 14

Removing the Left Cover

Leave the pedal on the crank arm when you perform the next step.

9. Remove the left crank arm (82) as described in Procedure 7.10, *Removing and Replacing the Left Crank Arm or Right Crank Arm/Chain Wheel Assembly.*

10. Using the screwdriver, remove the four screws (1) that secure the left cover (4) to the cycle. Set the cover aside until maintenance operations are complete.

Replacing the Left and Right Covers

11. Position the left cover (4) at its mounting position.

12. Using the screwdriver, replace the four screws (1) that secure the left cover to the cycle.

13. Replace the left crank arm as described in Procedure 7.10, *Removing and Replacing the Left Crank Arm or Right Crank Arm/Chain Wheel Assembly.*

14. Lower the right cover (50) over the right crank arm/chain wheel assembly (46) and position the cover at its mounting position.

15. Using the screwdriver, replace the nine screws (1) that secure the right cover (50) to the cycle and left cover.

16. Push the display arm sleeve (11) down on the display arm post (12).

17. Using the 1/2" socket wrench, loosen the screw (100) and spring washer (101) that hold the rail to the cycle frame.

18. Position the rail by pushing it toward the front of the cycle. Using the 1/2" socket wrench, tighten the six screws (100) and spring washers (101) that secure the rail to the cycle frame.

19. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

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Procedure 7.2

Removing and Replacing the Upper PCA or Electronic Enclosure

The PROM (U3) and the processor (U6) are mounted on the upper PCA. If one of these components is malfunctioning, you do not need to replace the entire upper PCA. Before you install a new PCA, remove and replace the PROM (U3) and processor (U6) as described in Procedure 7.3, Removing and Replacing the PROM, Processor, or LED Chips.

The LED chips (D4, D5, D6, D7, D8, and D9) mounted on the upper PCA display the information shown in the upper, middle, and lower right display windows. If the display windows display incorrect (or incomplete) information, do not install a new upper PCA unless the malfunctioning LED chip is soldered directly to the PCA.

As a field service technician, you can replace only LED chips mounted in chip sockets. If an LED chip that is soldered directly to the PCA malfunctions, return the upper PCA to Precor Customer Service. If you determine that an LED chip mounted in a chip socket is malfunctioning, install a new LED chip as described in Procedure 7.3, Removing and Replacing the PROM, Processor, or LED Chips.

Wear an anti-static device (such as a wrist strap) when you perform this procedure. Anti-static kits can be ordered from Precor Customer Service (Precor part number 20024-101). If a heart monitor is connected to the cycle, remove the monitor before performing this procedure.

Required Tools and Equipment

anti-static wrist strap
3/16" allen wrench

Removing the Top Half of the Electronic Enclosure

1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

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

2. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the cycle frame.

3. Push the slider tabs on the outside of the electronic enclosure toward the edges of the electronic enclosure to release the top half of the enclosure unit (5). Carefully lift the top half of the enclosure unit from the front.

Removing the Upper PCA

4. Disconnect the ribbon cable (10) from the upper PCA (7).

   Note
   Do not allow the ribbon cable to slide into the column.

5. Release the upper PCA (7) from the three plastic tabs and four plastic spacers on the top half of the electronic enclosure (5).

6. Choose one:

If . . .	Then . . .	Otherwise . . .
You removed the upper PCA because you are installing a new electronic enclosure on the cycle	Set aside the upper PCA until you are ready to install it on the new electronic enclosure; then continue with the next step	Set aside the upper PCA for eventual shipment to Precor; then skip to Step 9

   Note
   If you must return the upper PCA to Precor, include the information listed in Procedure 3.9, Documenting Software Problems.

Removing and Replacing the Lower Half of the Electronic Enclosure

7. Using the 3/16" allen wrench, remove the two socket head screws (8) that secure the lower half of the electronic enclosure (102) unit to the cycle frame.

8. Position the lower half of the new electronic enclosure (102) on the display plate welded to the display arm. Using the 3/16" allen wrench, replace the two socket head screws (8) that secure the lower half of the electronic enclosure to the cycle frame.

Replacing the Upper PCA

9. Position the upper PCA over the plastic spacers in the top half of the electronic enclosure (5).

10. Push the upper PCA (7) onto the four plastic spacers on the top half of the electronic enclosure (5). Press down the upper PCA until the edge of the board is held by the three plastic tabs.

11. Connect the ribbon cable (10) to the upper PCA.

12. Remove the ground lead of the wrist strap from the cycle frame, then remove the wrist strap from your arm.

Replacing the Top Half of the Electronic Enclosure

13. Secure the top half of the enclosure unit (5) to the lower half of the enclosure unit (102) by performing the following substeps.

    a. Fit the top edge of the top half of the enclosure unit into the enclosure hinges on the lower half of the enclosure unit.

    b. Position the top half of the enclosure unit on the lower half of the enclosure unit.

    c. Push the slider tabs toward the center of the enclosure sections and release.

    d. Reconnect the heart rate monitor (if applicable).

14. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

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Procedure 7.3

Removing and Replacing the PROM, Processor, or LED Chips

This procedure gives you the instructions for removing and replacing the PROM (U3), the processor (U6), and the LED chips (D4, D5, D6, D7, D8, and D9) on the upper PCA.

As a field service technician, you can replace only LED chips mounted in chip sockets. If an LED chip that is soldered directly to the PCA malfunctions, return the upper PCA to Precor Customer Service.

Wear an anti-static device (such as a wrist strap) when you perform this procedure. Anti-static kits can be ordered from Precor Customer Service (Precor part number 20024-101). If a heart monitor is connected to the cycle, remove it before you perform this procedure.

Required Tools and Equipment

anti-static wrist strap
small flat-head screwdriver
chip puller

Dismounting the Upper PCA

1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

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

2. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the cycle frame.
3. Push the slider tabs on the outside of the electronic enclosure toward the edges of the electronic enclosure to release the top half of the enclosure unit (5). Carefully lift the top half of the enclosure unit from the front.
4. Disconnect the ribbon cable (10) from the upper PCA (7).

Note
Do not allow the ribbon cable to slide into the column.

5. Release the upper PCA from the three plastic tabs and four plastic spacers on the top half of the electronic enclosure (5).

6. Choose one:

If . . .	Then . . .
You are replacing an LED chip	Skip to Step 24
You are replacing the processor chip (U6)	Skip to Step 15
You are replacing the PROM (U3)	Continue with the next step

Removing and Replacing the PROM (U3)

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

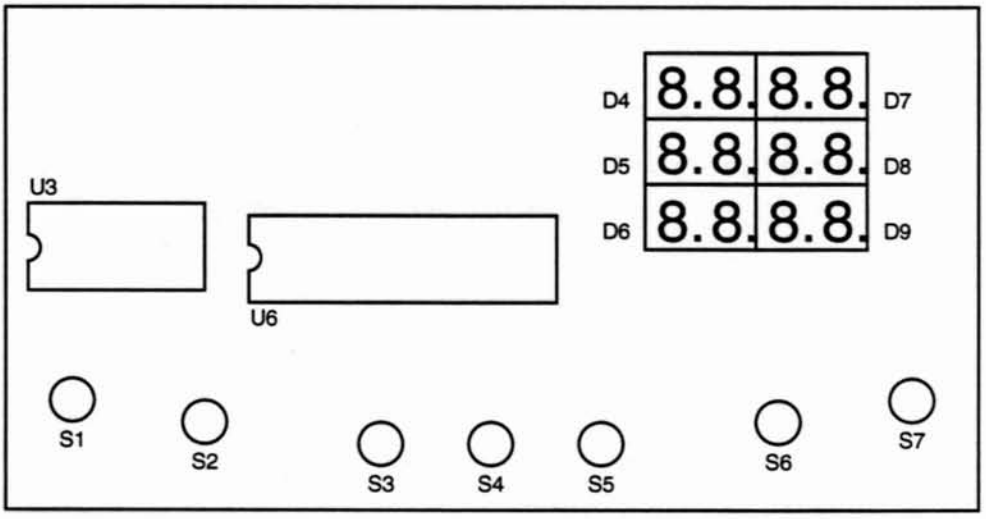
Caution
Notice the orientation notch on the PROM (U3). The new PROM must be positioned with the same notch orientation. Replacing the PROM backwards will destroy the PROM.

7. Using the chip puller, remove the PROM (U3) from the upper PCA (see Diagram 7-3).

8. Carefully insert the new PROM with the correct software version number in the chip socket. Take care not to bend the legs of the PROM.

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

Diagram 7-3. Partial Layout of the Upper PCA



9. Connect the ribbon cable to the upper PCA. Carefully place the upper PCA on the lower half of the electronic enclosure (102).

10. Remove the ground lead of the wrist strap from the cycle frame, then remove the wrist strap from your arm.

11. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

12. Choose one:

If . . .	Then . . .	Otherwise . . .
The cycle operates correctly	Skip to Step 30	Continue with the next step

13. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

14. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the cycle frame.

Removing and Replacing the Processor (U6)

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

Caution
Notice the orientation notch on the processor (U6). The new processor must be positioned with the same notch orientation. Replacing the processor backwards will cause the processor to malfunction.

15. Using the chip puller, remove the processor (U6) from the upper PCA.

16. Carefully insert the new processor in the chip socket. Take care not to bend the legs of the processor.

17. Connect the ribbon cable to the upper PCA if it is not already connected. Carefully place the upper PCA on the lower half of the electronic enclosure (102).

18. Remove the ground lead of the wrist strap from the cycle frame, then remove the wrist strap from your arm.

19. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

20. Choose one:

If . . .	Then . . .	Otherwise . . .
The cycle operates correctly	Skip to Step 30	Continue with the next step

21. Choose one:

If . . .	Then . . .	Otherwise . . .
Incorrect information is displayed in the right display windows	Read the note below, then continue with the next step	Replace the upper PCA per Procedure 7.2, *Removing and Replacing the Upper PCA or Electronic Enclosure*

Note
If ***all*** *of the right display windows are blank (or display incorrect data) during cycle operation, the upper PCA is probably defective. Remove and replace the upper PCA as described in Procedure 7.2,* Removing and Replacing the Upper PCA or Electronic Enclosure.

22. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

23. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the cycle frame.

Removing and Replacing an LED Chip (D4, D5, D6, D7, D8, or D9)

24. Using the chip puller, remove the malfunctioning LED chip from the upper PCA.

Note
You may need to use the small flat-head screwdriver to pry the LED chip from the chip socket.

Caution
Notice the orientation of the decimal points on the remaining LED chips. The new LED chip must be positioned with the same orientation. Replacing the LED chip backwards will cause the chip to malfunction.

25. Carefully insert a new LED chip into the empty chip socket. Take care not to bend the legs of the LED chip.

26. Connect the ribbon cable to the upper PCA if it is not already connected. Carefully place the upper PCA on the lower half of the electronic enclosure (102).

27. Remove the ground lead of the wrist strap from the cycle frame, then remove the wrist strap from your arm.

28. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

29. Choose one:

If . . .	**Then . . .**	**Otherwise . . .**
The cycle operates correctly	Continue with the next step	Replace the upper PCA per Procedure 7.2, *Removing and Replacing the Upper PCA or Electronic Enclosure*

30. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

31. Attach the wrist strap to your arm, then connect the ground lead of the wrist strap to the cycle frame.

Re-Installing the Upper PCA

32. Position the upper PCA over the plastic spacers in the top half of the electronic enclosure (5). Push the upper PCA onto the spacers. Press down on the PCA until the three plastic tabs hold the edge of the board.

33. Remove the ground lead of the wrist strap from the cycle frame, then remove the wrist strap from your arm.

34. Secure the top half of the enclosure unit (5) to the lower half of the enclosure unit (102) by performing the following substeps.

    a. Fit the top edge of the top half of the enclosure unit (5) into the enclosure hinges on the lower half of the enclosure unit (102).

    b. Position the top half of the enclosure unit on the lower half of the enclosure unit.

    c. Push the slider tabs toward the center of the enclosure sections and release.

    d. Reconnect the heart rate monitor (if applicable).

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Procedure 7.4

Removing and Replacing the Lower PCA

Required Tools and Equipment

#2 flat-head screwdriver
5/16" nut driver

Removing the Lower PCA

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Remove the molex connector from P4 on the lower PCA (see Diagram 7-4).

3. Disconnect the ribbon cable (10) from connector P1 on the lower PCA.

4. Disconnect the magnet harness from connector P3 on the lower PCA.

5. Disconnect the transformer cable from connector P5 on the lower PCA.

6. Using the 5/16" nut driver, remove the self-tapping screw (51) and lock washer (52) that secure the green ground wire to the cycle frame.

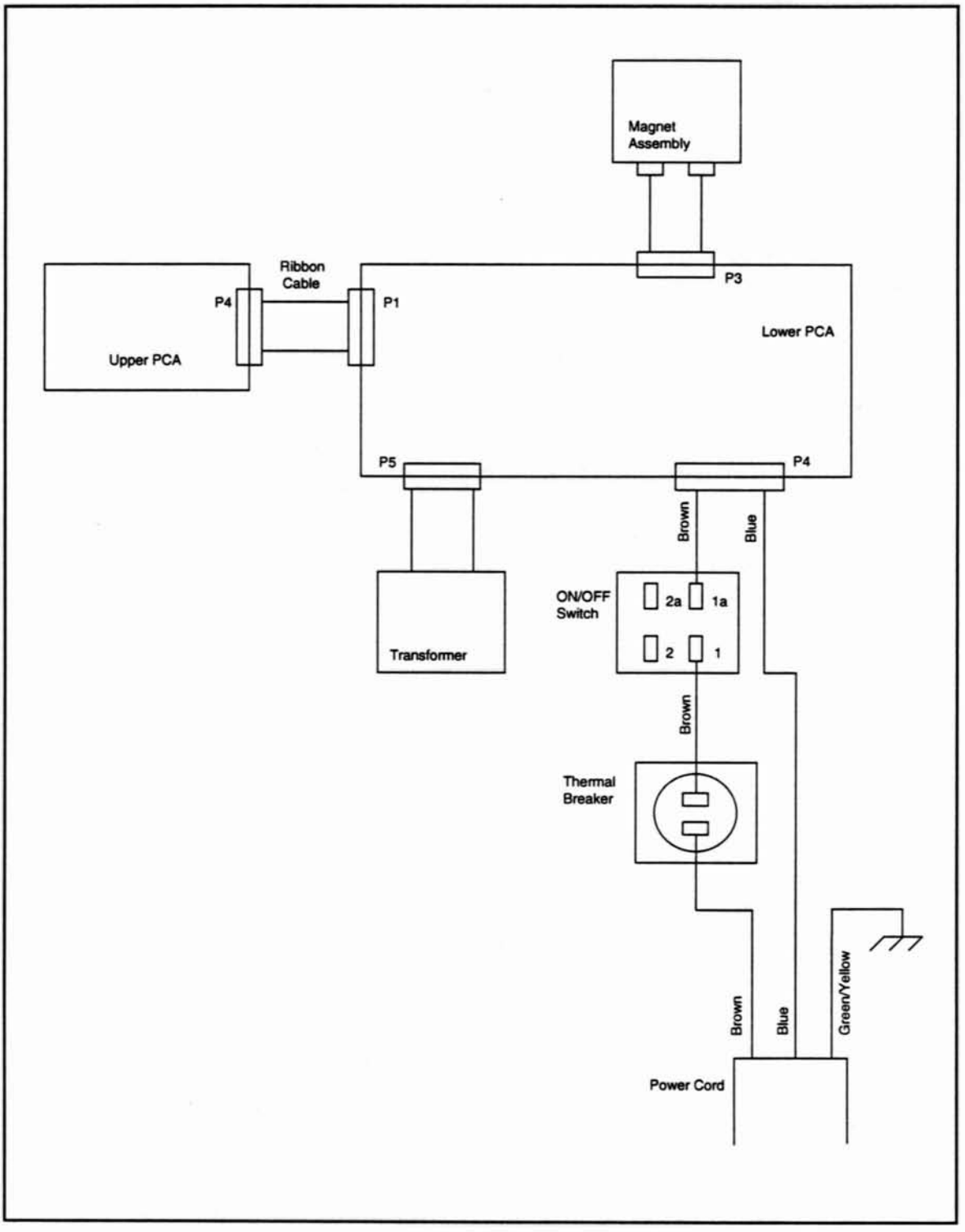
Note
The self-tapping screws that secure the lower PCA and ground wire to the cycle frame may be removed with either a flat-head screwdriver or a 5/16" nut driver.

7. Using the 5/16" nut driver, remove the self-tapping screws (51) that secure the lower PCA (79) to the cycle frame.

8. Set aside the lower PCA for eventual shipment to Precor Customer Service.

Note
When you package the lower PCA, provide the information listed in Procedure 3.9, Documenting Software Problems.

Diagram 7-4. 8.2E/L Recumbent Cycle Wiring Diagram for 110-Volt Units



Replacing the Lower PCA

9. Position the lower PCA (79) at its mounting location.

   Note
   Before tightening the self-tapping screws that secure the lower PCA to the cycle frame, position the lower PCA so that the sensor "eye" is aligned with the target labels on the sheave spokes.

10. Position the green ground wire at its mounting location.

11. Using the 5/16" nut driver, replace the self-tapping screw (51) and lock washer (52) that secure the ground wire to the cycle frame.

12. Using the 5/16" nut driver, replace the self-tapping screws (51) that secure the lower PCA (79) to the cycle frame.

13. Connect the molex connector on the power cord to P4 on the lower PCA.

14. Connect the magnet harness to P3 on the lower PCA.

15. Connect the ribbon cable to connector P1 on the lower PCA.

16. Connect the transformer cable to connector P5 on the lower PCA.

17. Inspect the magnet calibration voltage as described in Procedure 6.2, *Inspecting and Adjusting the Magnet Calibration Voltage*. Adjust the magnet calibration voltage if necessary.

18. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers*.

19. Check the cycle operation as described in Section 5, *Checking Cycle Operation*.

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Procedure 7.5

Removing and Replacing the ON/OFF Switch

Required Tools and Equipment

tape

Removing the ON/OFF Switch

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Using the tape, mark the brown wire connected to terminal 1a on the ON/OFF switch (refer back to Diagram 7-4).

3. Disconnect the brown wire that is connected to terminal 1a on the ON/OFF switch (107).

4. Disconnect the brown wire that is connected to terminal 1 on the ON/OFF switch.

Note
Notice the orientation of the ON/OFF switch in the power bracket. The new switch must be positioned the same way when you mount it in the bracket.

5. Push the ON/OFF switch out of the power bracket assembly.

Replacing the ON/OFF Switch

6. Position the new ON/OFF switch (107) in the power bracket assembly. Make sure that the orientation of the new switch is the same as that of the original switch.

7. Connect the brown wire marked with tape to terminal 1a on the ON/OFF switch.

8. Connect the remaining brown wire to terminal 1 on the ON/OFF switch (107).

9. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

10. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

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Procedure 7.6

Removing and Replacing the Thermal Breaker

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Disconnect both brown wires from the thermal breaker terminals (refer back to Diagram 7-4).

Note
Notice the orientation of the thermal breaker in the power bracket. The new breaker must be positioned the same way when you mount it in the bracket.

3. Push the thermal breaker (105) out of the power bracket assembly.

Replacing the Thermal Breaker

4. Position the new thermal breaker in the power bracket assembly. Make sure that the orientation of the new breaker is the same as that of the original breaker.

5. Connect the brown wires removed in Step 2 to the terminals on the thermal breaker (105).

6. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

7. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

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Procedure 7.7

Removing and Replacing the Power Cord

Required Tools and Equipment

5/16" nut driver
pliers
ruler
tape

Removing the Power Cord

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Using the tape, mark the brown wire that is connected to terminal 1a on the ON/OFF switch (refer back to Diagram 7-4). Disconnect the brown wire from terminal 1a.

3. Remove the molex connector from P4 on the lower PCA.

4. Remove the brown power cord wire from the breaker terminal.

5. Using the 5/16" nut driver, remove the self-tapping screw and lock washer that secure the green/yellow ground wire to the cycle frame.

6. Using the ruler, measure the distance between the strain relief (106) and the power cord terminals.

Note
Make a note of the distance measured in Step 6. When you mount the new power cord, the distance between the strain relief and the power cord terminals must be equal to the distance measured in Step 6.

7. Using the pliers, press the two sections of the strain relief (106) together. Keep the pressure on the strain relief while you pull the power cord (104) away from the power bracket assembly.

8. Remove the strain relief (106) from the defective power cord (104). Pull the new power cord through the strain relief until the distance between the strain relief and the power cord terminals is equal to the distance measured in Step 6.

Replacing the Power Cord

9. Using the pliers, squeeze the strain relief (106) while you push it into the power cord mounting hole on the power bracket assembly.

10. Position the green/yellow ground wire at its mounting location.

11. Using the 5/16" nut driver, replace the self-tapping screw and lock washer that secure the green/yellow ground wire to the cycle frame.

12. Connect the brown power cord wire to the empty terminal on the thermal breaker (105) .

13. Connect the molex connector on the power cord to P4 on the lower PCA.

14. Connect the wire marked with tape to terminal 1a on the ON/OFF switch (107).

15. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

16. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

Procedure 7.8

Removing and Replacing the Ribbon Cable

Before you install a new ribbon cable, ensure that the ribbon cable is defective by connecting a spare ribbon cable to the upper PCA and lower PCA as described in Steps 1 through 7.

Required Tools and Equipment

5/32" allen wrench
3/16" allen wrench
1/2" allen wrench
7/16" open-end wrench

Isolating the Ribbon Cable

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Disconnect the ribbon cable (10) from connector P1 on the lower PCA (79).

3. Using the 3/16" allen wrench, remove the two socket head screws (8) that secure the electronic enclosure to the display arm (9).

4. Disconnect the ribbon cable (10) from connector P4 on the upper PCA (7).

5. Connect the spare ribbon cable between connector P1 on the lower PCA and connector P4 on the upper PCA.

6. Plug the power cord into the wall outlet, then check the operation of the cycle as described in Section 5, *Checking Cycle Operation.*

7. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

8. Disconnect the spare ribbon cable from connector P1 on the lower PCA and connector P4 on the upper PCA.

9. Choose one:

If . . .	Then . . .	Otherwise . . .
The cycle operates correctly	The original ribbon cable is defective; continue with the next step	The original ribbon cable is good; skip to Step 20

Removing the Ribbon Cable

10. Push the ribbon cable through the cable access port in the display arm (see Diagram 7-5).

11. Using the 1/2" allen wrench, loosen the two set screws (15) that secure the display arm (9) to the display post assembly (12). Set aside the display arm.

12. Using the 5/32" allen wrench and the 7/16" open-end wrench, remove the two screws (13) and two locknuts (14) that secure the display post assembly (12) to the upper horizontal frame tube. Set aside the display post.

13. Remove the ribbon cable from the upper horizontal frame tube.

Replacing the Ribbon Cable

A ferrite bead is connected to the end of the ribbon cable that you will connect to the upper PCA. Route the ribbon cable correctly when you perform the next steps.

14. Push the end of the ribbon cable without the ferrite bead through the access port on the upper horizontal frame tube. Push the ribbon cable toward the back of the cycle until the ribbon cable connector clears the frame tube.

15. Thread the other end of the ribbon cable through the display post assembly (12). Hold the display post next to its mounting position on the upper horizontal frame tube while you pull the cable through the post.

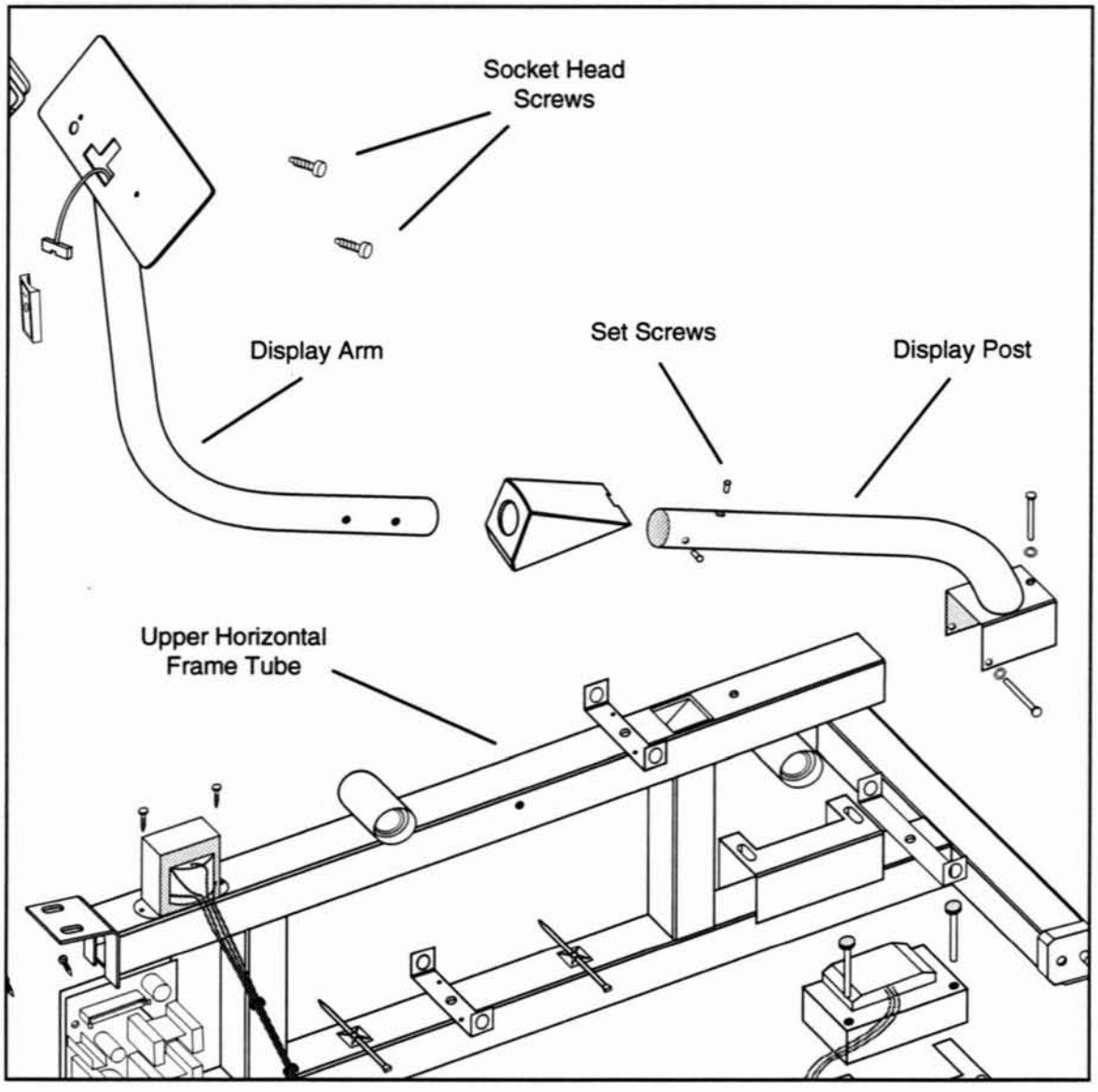
16. Using the 5/32" allen wrench and the 7/16" open-end wrench, install the two screws (13) and two locknuts (14) that secure the display post assembly (12) to the upper horizontal frame tube.

17. Thread the ribbon cable through the display arm assembly (9). Push the ribbon cable connector through the cable access port in the display arm.

18. Position the display arm assembly (9) in the display post assembly (12). Align the locating dimple in the display arm with the set screw hole on the right side of the display post.

19. Using the 1/2" allen wrench, replace the two set screws (15) that secure the display arm assembly (9) to the display post assembly (12).

Diagram 7-5. Exploded View of the Display Arm and Display Post Assemblies



20. Connect the ribbon cable (10) to connector P1 on the lower PCA (79) and connector P4 on the upper PCA.

21. Position the electronic enclosure on the display arm.

22. Using the 3/16" allen wrench, secure the two socket head screws (8) that mount the lower half of the electronic enclosure (102) to the cycle frame.

23. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

24. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

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Procedure 7.9

Removing and Replacing the Pedals

Required Tools and Equipment

15mm or 5/8" open-end wrench

Removing the Pedals

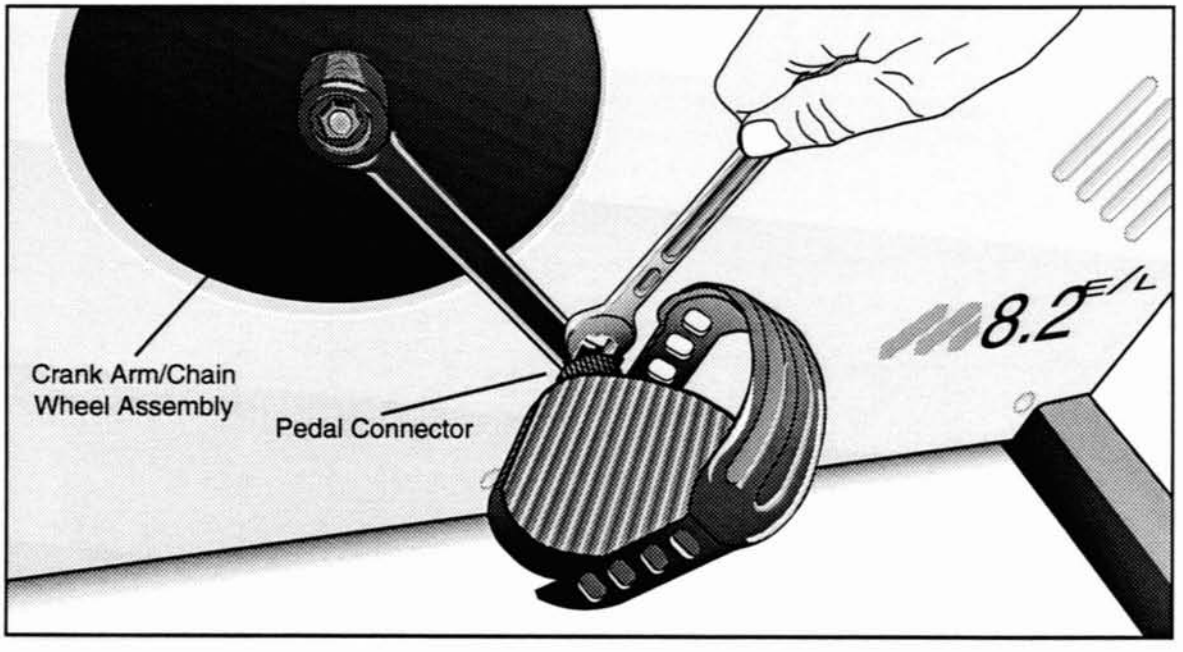
1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

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

2. Face the right side of the cycle. Using the open-end wrench, grasp the connector on the right pedal (see Diagram 7-6). Turn the pedal connector counterclockwise to remove the right pedal (49) from the crank arm/chain wheel assembly (46).

Note
The right pedal comes with right-hand screw threads. When you remove the right pedal, turn the pedal connector counterclockwise.

Diagram 7-6. Removing a Pedal



3. Face the left side of the cycle. Using the open-end wrench, grasp the connector on the left pedal. Turn the pedal connector clockwise to remove the left pedal (81) from the crank arm (82).

   Note
   The left pedal has left-hand screw threads. When you remove the left pedal, turn the pedal connector clockwise.

Replacing the Pedals

The pedals are marked with an R (Right) and an L (Left). When you replace the pedals, make sure that the new pedals are mounted on the appropriate side of the cycle.

4. Face the right side of the cycle. Thread the right pedal connector clockwise onto the crank arm/chain wheel assembly (46). Using the open-end wrench, tighten the pedal connector.

5. Face the left side of the cycle. Thread the left pedal connector counterclockwise onto the crank arm (82). Using the open-end wrench, tighten the pedal connector.

6. Plug the power cord into the wall outlet, then turn on the cycle with the ON/OFF switch.

Procedure 7.10

Removing and Replacing the Left Crank Arm or the Right Crank Arm/Chain Wheel Assembly

If you are removing a crank arm, do not remove the pedal unless the pedal is worn or damaged and must be replaced.

You must remove the right cover before removing the right crank arm/chain wheel assembly. You must remove the left crank arm before removing the left cover.

Required Tools and Equipment

#2 flat-head screwdriver
1/2" drive ratchet
15mm or 9/16" socket for 1/2" drive ratchet
extraction tool
torque wrench

Procedure

Right, left, front, and back are from the perspective of a user sitting on the cycle and facing the electronic display.

1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

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

2. Choose one:

If . . .	Then . . .
You are removing the left crank arm	Skip to Step 17
You are removing the right crank arm/chain wheel assembly	Continue with the next step

Removing the Right Crank Arm/Chain Wheel Assembly

3. Remove the right cover as described in Procedure 7.1, *Removing and Replacing the Covers.*

4. Remove the chain as described in Procedure 7.13, *Removing and Replacing the Chain.*

5. Choose one:

If . . .	Then . . .	Otherwise . . .
You are removing the right crank arm/chain wheel assembly because it must be replaced with a new assembly	Remove the pedal from the crank arm assembly as described in Procedure 7.9, *Removing and Replacing the Pedals*; then continue with the next step	It is not necessary to remove the pedal from the crank arm assembly; continue with the next step

6. Using the screwdriver, remove the crank axle dress cap.

7. Using the 15mm or 9/16" socket and ratchet, remove the flanged nut (47) that secures the right crank arm/chain wheel assembly (46) to the crank axle assembly (39).

8. Screw the extraction tool onto the end of the crank axle assembly (39).

9. Turn the handle of the extraction tool clockwise until the right crank arm/chain wheel assembly (46) is free of the crank axle assembly (39). Unscrew the extraction tool from the crank arm.

Replacing the Right Crank Arm/Chain Wheel Assembly

10. Place the right crank arm/chain wheel assembly on the crank axle assembly (39).

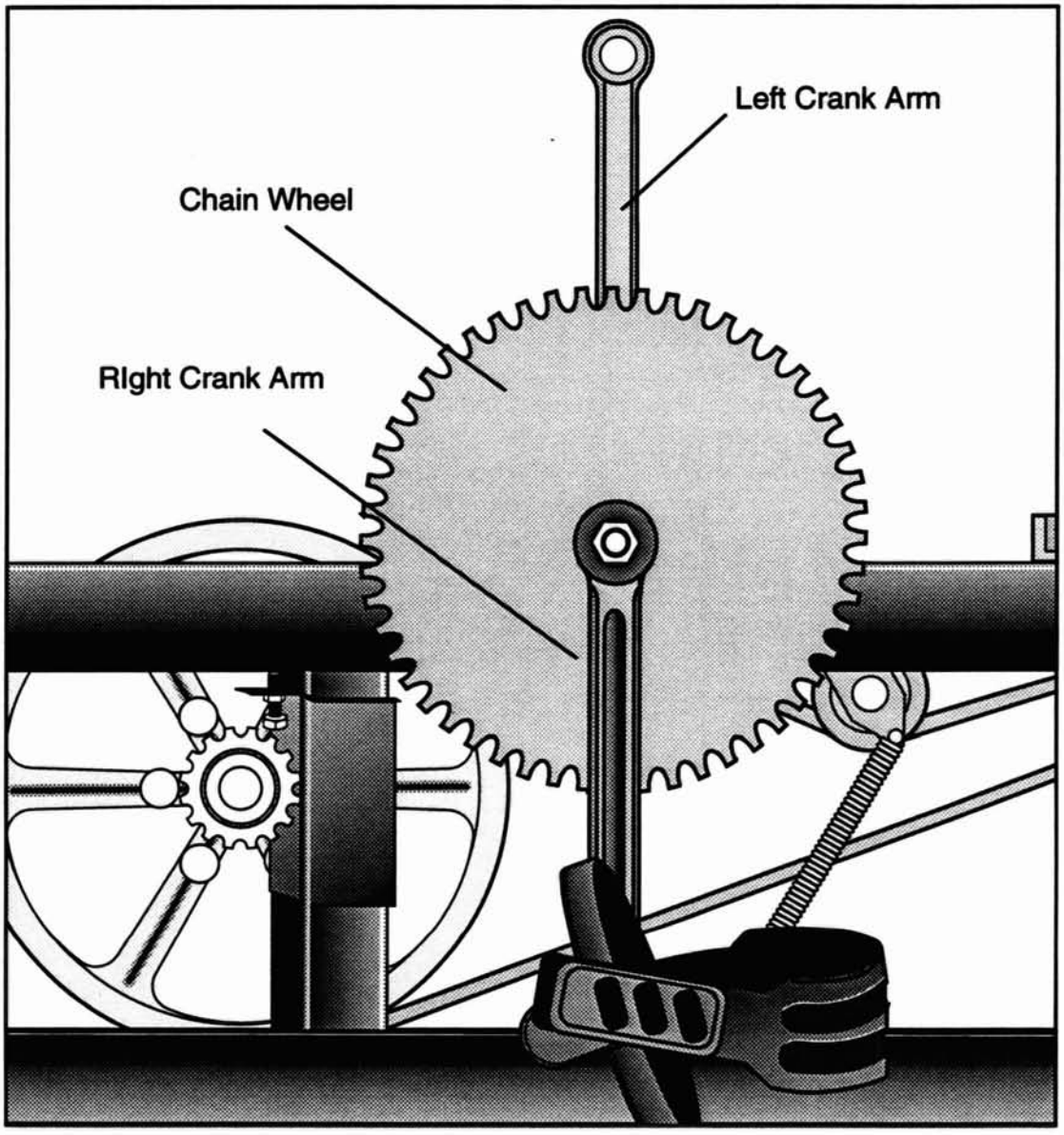
    Note
    The right and left crank arms must be pointing in opposite directions as shown in Diagram 7-7.

11. Using the 15mm or 9/16" socket and ratchet, replace the flanged nut (47) that secures the right crank arm/chain wheel assembly (46) to the crank axle assembly.

12. Using the torque wrench, tighten the flanged nut to 25 foot-pounds.

13. Replace the crank axle dress cap.

Diagram 7-7. Positioning the Crank Arms on the Crank Axle Assembly



Note
Before you perform the next step, make sure that the crank arm/chain wheel assembly (46) is in alignment with the freewheel sprocket.

14. Replace the chain as described in Procedure 7.13, *Removing and Replacing the Chain.*

15. Replace the right cover as described in Procedure 7.1, *Removing and Replacing the Covers.*

16. Choose one:

If . . .	Then . . .	Otherwise . . .
You need to remove the left crank arm	Continue with the next step	Skip to Step 26

Removing the Left Crank Arm

17. Choose one:

If . . .	Then . . .	Otherwise . . .
You are removing the left crank arm because it must be replaced with a new crank arm	Remove the pedal from the left crank arm as described in Procedure 7.9, *Removing and Replacing the Pedals*; then continue with the next step	Continue with the next step

18. Using the screwdriver, remove the crank axle dress cap.

19. Using the 15mm or 9/16" socket and ratchet, remove the flanged nut (47) that secures the left crank arm (82) to the crank axle assembly (39).

20. Screw the extraction tool onto the end of the crank axle.

21. Turn the handle of the extraction tool clockwise until the left crank arm (82) is free of the crank axle assembly (39). Unscrew the extraction tool from the crank arm.

Replacing the Left Crank Arm

22. Place the left crank arm (82) on the crank axle assembly (39).

    Note
    The right and left crank arms must be pointing in opposite directions as shown in Diagram 7-7.

23. Using the 15mm or 9/16" socket and ratchet, replace the flanged nut (47) that secures the left crank arm (82) to the crank axle assembly (39).

24. Using the torque wrench, tighten the flanged nut to 25 foot-pounds.

25. Replace the crank axle dress cap.

26. Choose one:

If . . .	Then . . .	Otherwise . . .
A new crank arm (or crank arm/chain wheel assembly) was mounted on the cycle	Continue with the next step	Skip to Step 28

27. Mount the pedal removed from the original crank arm on the new assembly as described in Procedure 7.9, *Removing and Replacing the Pedals*

28. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

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Procedure 7.11

Removing and Replacing the Crank Axle Assembly

Required Tools and Equipment

snap ring pliers
C-Clamp (must be adjustable to 8")
hammer
grease
vice
steel punch
17mm deep well socket for 3/8" drive ratchet, 2

Removing the Crank Axle Assembly

1. Remove the left crank arm as described in Procedure 7.10, *Removing and Replacing the Left Crank Arm or Right Crank Arm/Chain Wheel Assembly.*

2. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

3. Remove the chain as described in Procedure 7.13, *Removing and Replacing the Chain.*

4. Remove the right crank arm/chain wheel assembly as described in Procedure 7.10, *Removing and Replacing the Left Crank Arm or Right Crank Arm/Chain Wheel Assembly.*

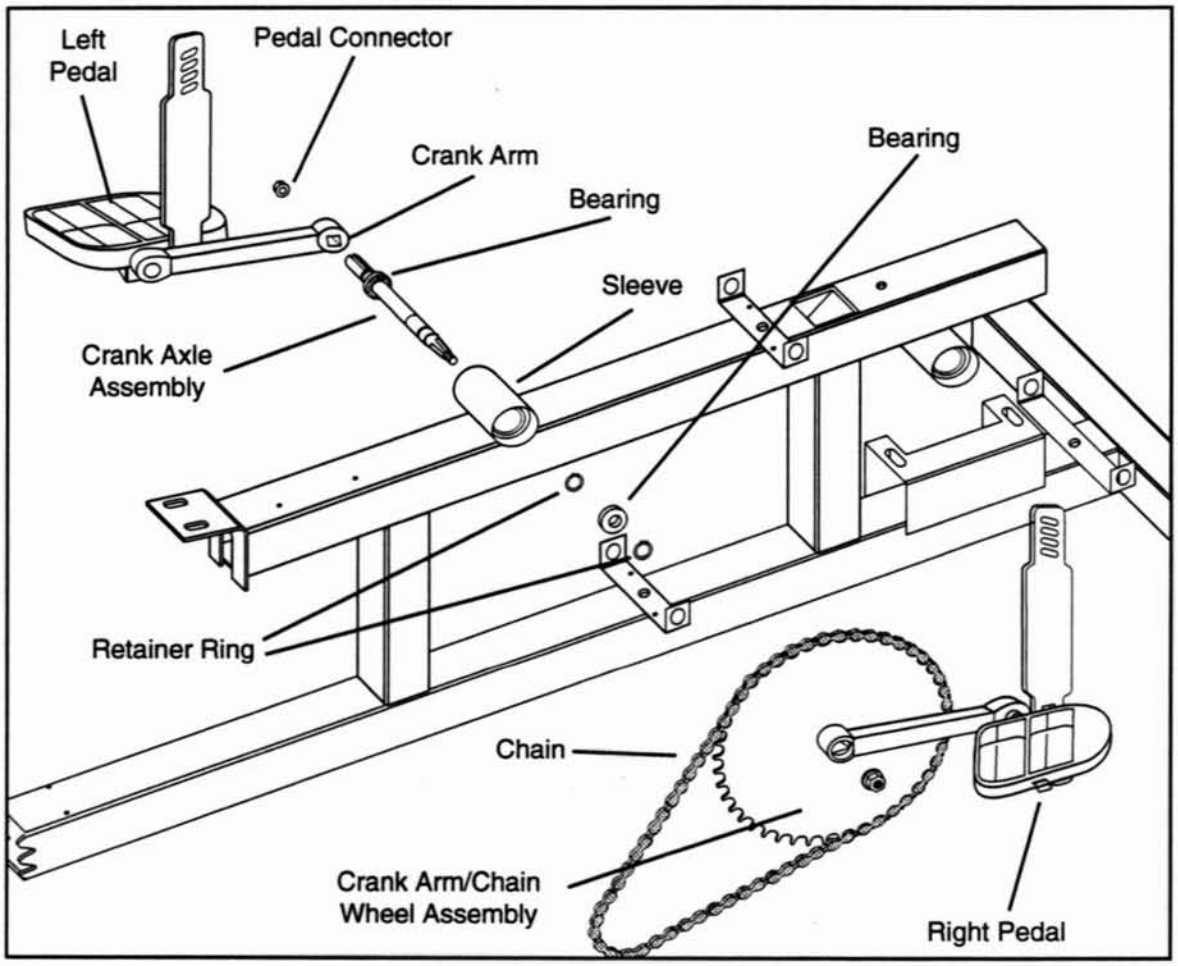
5. Using the snap ring pliers, remove the exterior retainer ring (25) from the right end of the crank axle assembly (see Diagram 7-8).

6. Using the hammer and steel punch, strike the right end of the crank axle assembly (39) until the crank axle assembly is driven out of the sleeve.

Note
The left bearing will remain on the crank axle. Discard the axle assembly after you perform Step 6.

7. Using the hammer and steel punch, tap the right bearing (24) out of the sleeve.

Diagram 7-8. Exploded View of the Pedals and Crank Axle Assembly



Replacing the Crank Axle Assembly

8. Using the snap ring pliers, remove the exterior retainer ring (25) from the right end of the new crank axle assembly (39).

   Note
   The end of the crank axle with the bearing and retainer rings goes on the left side of the cycle.

9. Slide the crank axle assembly (39) into the left side of the crank axle sleeve. Wiggle and pull the crank axle until the outer race of the bearing on the left end of the crank axle seats inside the sleeve.

10. Position a 17mm socket against the inner race of the bearing mounted in the crank axle sleeve. Have an assistant hold one end of the C-Clamp against the socket.

11. Apply a light coat of grease to the inner bore of the new bearing. Position the bearing against the right end of the crank axle assembly.

12. Hold the second 17mm socket against the inner race of the bearing positioned in the previous step. Seat the C-Clamp against the opposite end of the socket.

    Note
    The C-Clamp should be positioned as shown in Diagram 7-9.

13. Steady the throat of the C-Clamp against the upper horizontal frame tube as shown in Diagram 7-9. Turn the clamp handle until the bearing positioned in Step 11 seats inside the sleeve. Remove the C-Clamp and sockets.

14. Using the snap ring pliers, replace the retainer ring (25) removed in Step 8 on the outer groove of the right end of the crank axle assembly (39).

15. Replace the right crank arm/chain wheel assembly as described in Procedure 7.10, *Removing and Replacing the Left Crank Arm or Right Crank Arm/Chain Wheel Assembly.*

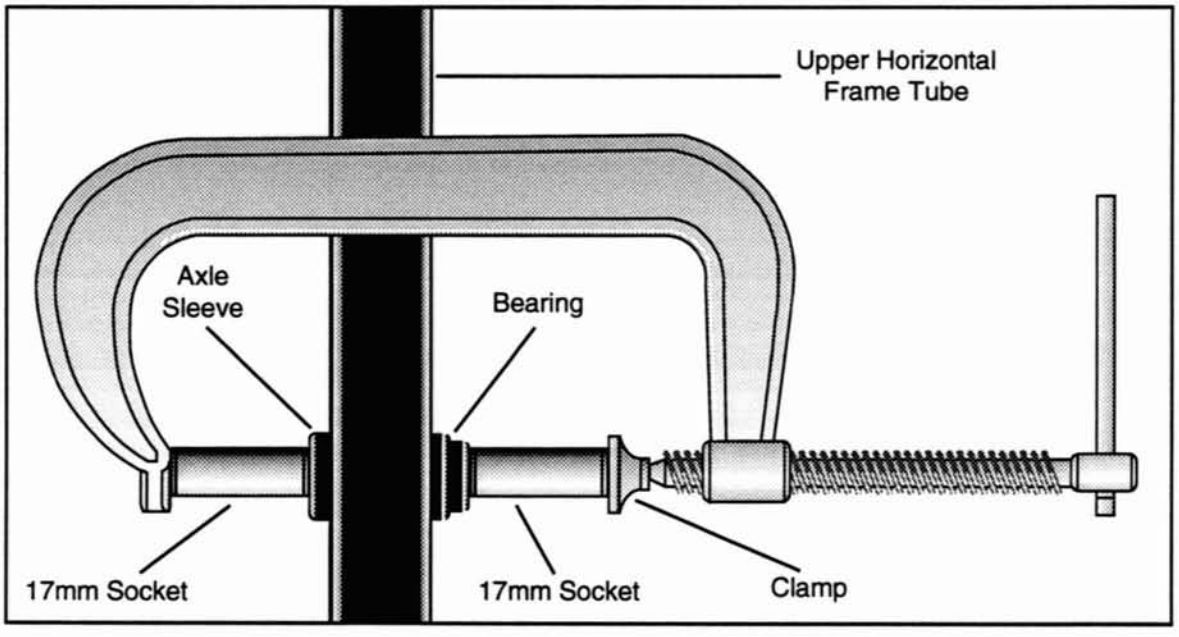
16. Replace the chain as described in Procedure 7.13, *Removing and Replacing the Chain.*

17. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

18. Replace the left crank arm as described in Procedure 7.10, *Removing and Replacing the Left Crank Arm or Right Crank Arm/Chain Wheel Assembly.*

19. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

Diagram 7-9. Replacing An Axle Bearing



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Procedure 7.12

Removing and Replacing the Belt

Required Tools and Equipment

needle nose pliers

Removing the Belt

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Using the needle nose pliers, unhook the upper end of the tension spring (37) from the idler wheel (83).

3. Lift the idler wheel (83) off the belt and rotate it toward the flywheel (19). When belt tension is reduced, remove the belt from the sheave axle assembly (42) and release the idler wheel.

4. Lift the belt from the flywheel hub. Turn the belt sideways and slide it down between the flywheel (19) and the magnet assembly (27).

5. Choose one:

If . . .	Then . . .	Otherwise . . .
The belt was removed to perform additional maintenance operations	When maintenance operations are complete, continue with the next	Skip to Step 7

Inspecting the Belt

6. Visually inspect the belt for wear, cracks, or other damage. Choose one:

If . . .	Then . . .	Otherwise . . .
The visual inspection indicates no wear or damage	Replace the original belt on the cycle	Install new belt on the cycle

Replacing the Belt

7. Turn the belt sideways and slide it up between the flywheel (19) and the magnet assembly (27).

8. Position the belt on the flywheel hub.

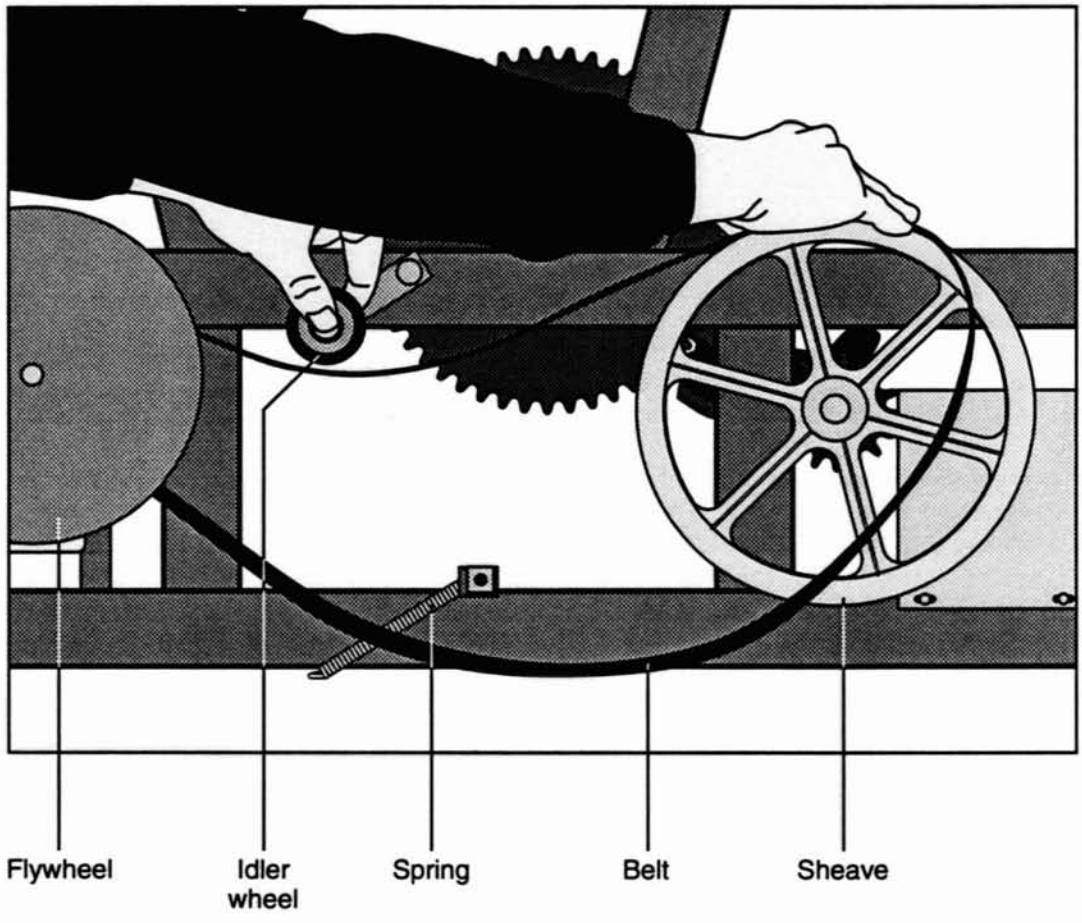
   Note
   The grooved side of the belt must face the grooves on the flywheel hub and sheave.

9. Lift the idler wheel (83) and rotate it toward the flywheel (19). Have an assistant keep the idler wheel rotated toward the flywheel when you perform the next three steps (see Diagram 7-10).

10. Pull the belt as far as possible toward the sheave axle assembly (42).

11. Face the sheave axle assembly (42) and slowly rotate it clockwise while you wrap the belt around the sheave rim (see Diagram 7-10). As the sheave turns, position the belt in the center of the flywheel hub and sheave grooves.

Diagram 7-10. Replacing the Belt



12. Align the belt (72) grooves with the grooves on the flywheel hub and sheave axle assembly (42).

13. Lower the idler wheel (83) until it comes in contact with the belt.

14. Using the needle nose pliers, connect the tension spring (37) to the idler wheel (83).

15. Inspect the gap between the flywheel (19) and the magnet assembly (27) as described in Procedure 6.1, *Inspecting and Adjusting the Gap Between the Flywheel and the Magnet Assembly.* Adjust the gap if necessary.

16. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

17. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

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Procedure 7.13

Removing and Replacing the Chain

Required Tools and Equipment

#2 flat-head screwdriver
5/32" allen wrench
7/16" open-end wrench

Removing the Chain

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Choose one:

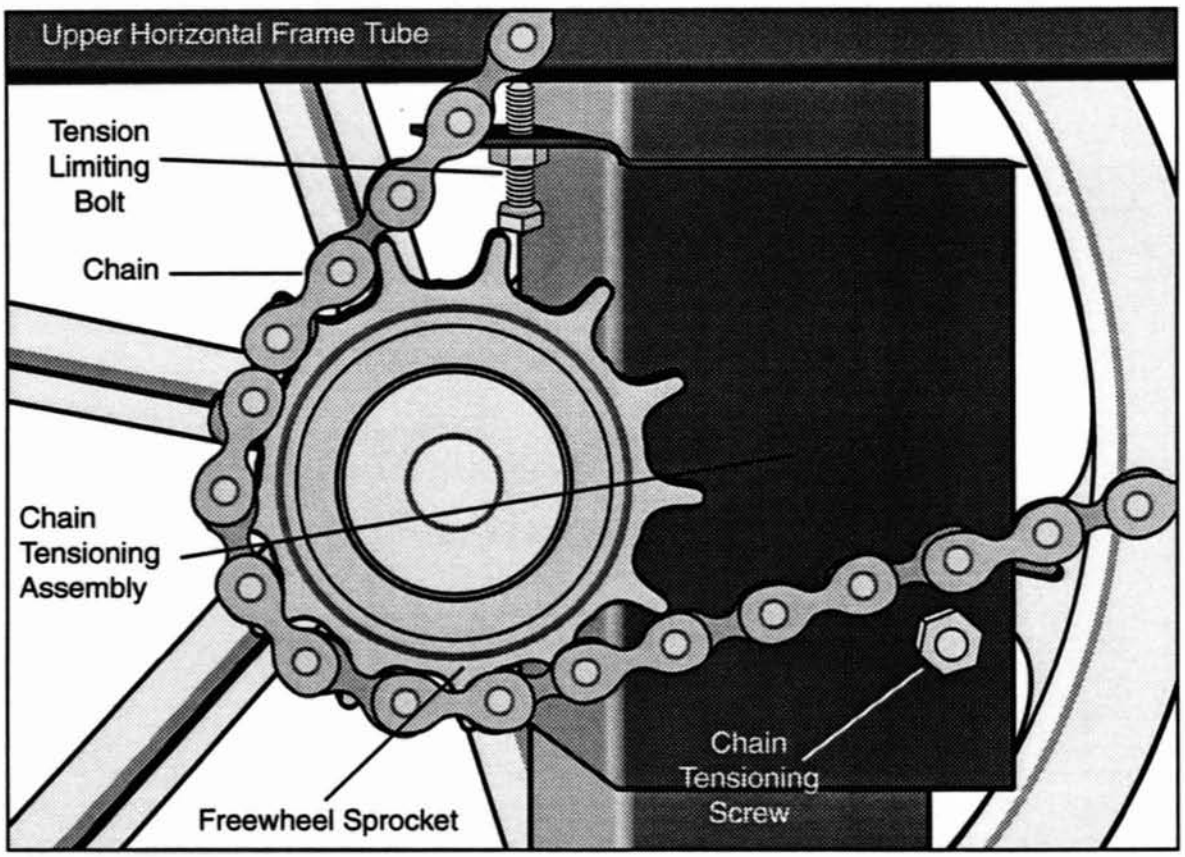
If . . .	Then . . .
The cycle you are servicing **does not** have a chain tensioning assembly	Skip to Step 7
The cycle you are servicing has a chain tensioning assembly	Continue with the next step

3. Look at the tension limiting bolt. Choose one:

If . . .	Then . . .	Otherwise . . .
There is **no** gap between the tension limiting bolt and the upper horizontal frame tube	Continue with the next step	Skip to Step 6

4. Place the screwdriver at a point where the lower edge of the chain tensioning assembly (75) meets the frame upright (see Diagram 7-11). Score a line on the frame upright that runs the width of the tensioning assembly.

Diagram 7-11. Chain Tensioning Assembly



5. Using your fingers, turn the tension limiting bolt counterclockwise 1–2 turns.

6. Using the 5/32" allen wrench and the 7/16" open-end wrench, loosen the chain tensioning screw (13). Slide the chain tensioning assembly (75) upward as far as possible. Have an assistant hold the tensioning assembly in place while you use the 5/32" allen wrench and the 7/16" open-end wrench to tighten the chain tensioning screw.

7. Grasp the chain (45) as shown in Diagram 7-12 and rotate the right crank arm/chain wheel assembly (46) clockwise while easing the chain off the rim of the chain wheel. Remove the chain from the cycle and set it aside.

8. Choose one:

If . . .	Then . . .	Otherwise . . .
The chain was removed as part of a different maintenance operation	When maintenance operations are complete, continue with the next step	Skip to Step 10

Inspecting the Chain

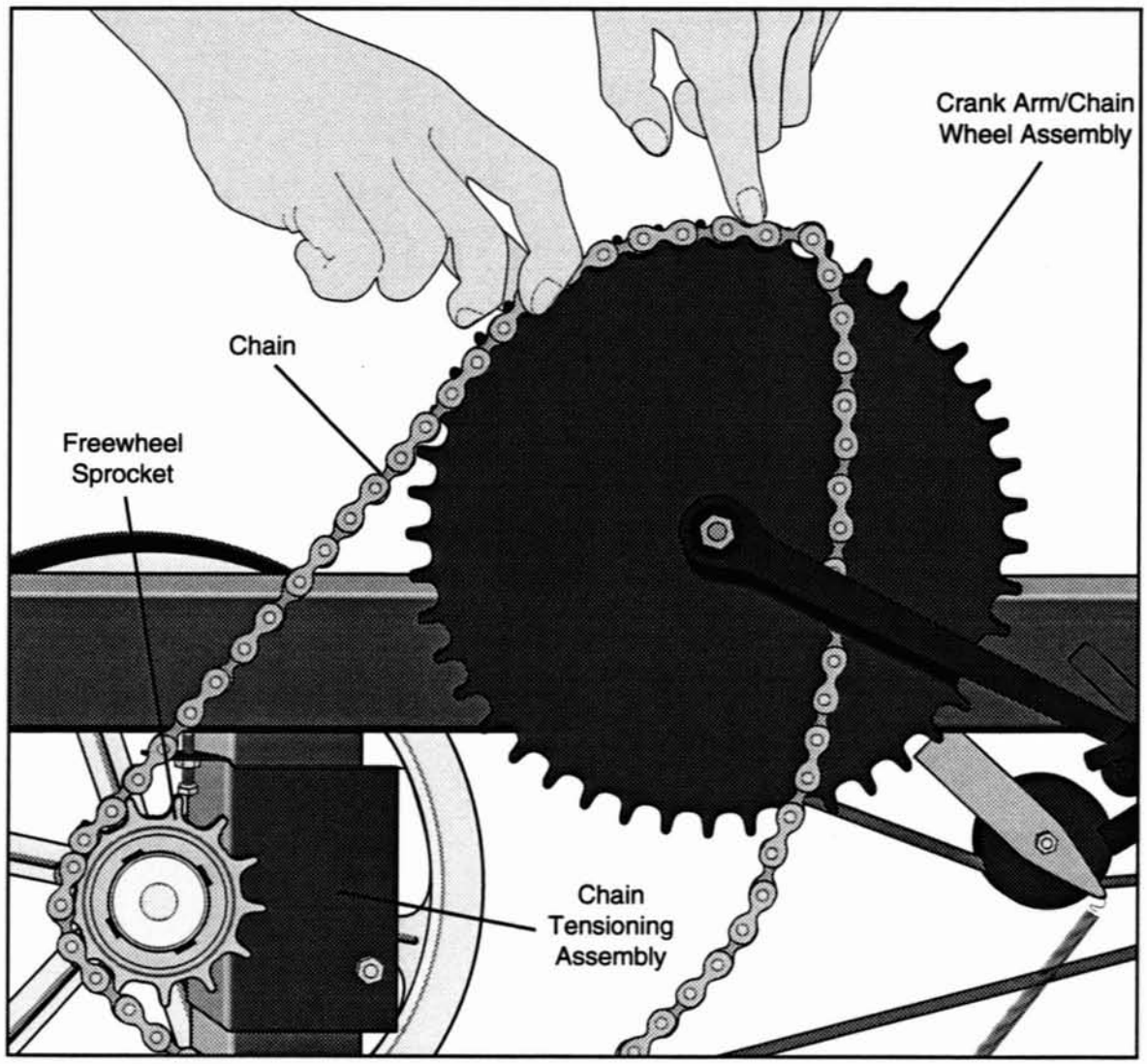
9. Visually inspect the chain links for rust, wear, or other damage. Choose one:

If . . .	Then . . .	Otherwise . . .
The visual inspection indicates no wear or damage	Install the original chain on the cycle	Install a new chain on the cycle

Replacing the Chain

10. Position the chain around the freewheel sprocket (see Diagram 7-12). Place the other end of the chain (45) on the rim of the crank arm/chain wheel assembly (46).

Diagram 7-12. Mounting the Chain



11. Face the crank arm/chain wheel assembly (46) and rotate it clockwise. As the chain wheel assembly turns, ease the chain onto the chain wheel rim.

12. Choose one:

If . . .	**Then . . .**
The cycle you are servicing **does not** have a chain tensioning assembly	Skip to Step 17
You did not turn the tension limiting bolt in Step 5	Skip to Step 16
You turned the tension limiting bolt in Step 5	Continue with the next step

13. Using the 5/32" allen wrench and the 7/16" open-end wrench, loosen the chain tensioning screw.

14. Line up the chain tensioning assembly (75) with the line scored on the frame upright. Have an assistant hold the assembly in place while you use the 5/32" allen wrench and the 7/16" open-end wrench to tighten the chain tensioning screw.

15. Using your fingers, turn the tension limiting bolt clockwise until the bolt is flush with the upper horizontal frame tube (refer back to Diagram 7-11).

16. Inspect and adjust chain tension as described in Inspection and Adjustment Procedure 6.4, *Inspecting and Adjusting Chain Tension.*

17. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

18. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

Procedure 7.14

Removing and Replacing the Freewheel Sprocket and Freewheel Hub

Required Tools and Equipment

steel punch
hammer

Removing the Freewheel Sprocket and Freewheel Hub

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers*.

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know*.

2. Remove the chain as described in Procedure 7.13, *Removing and Replacing the Chain*.

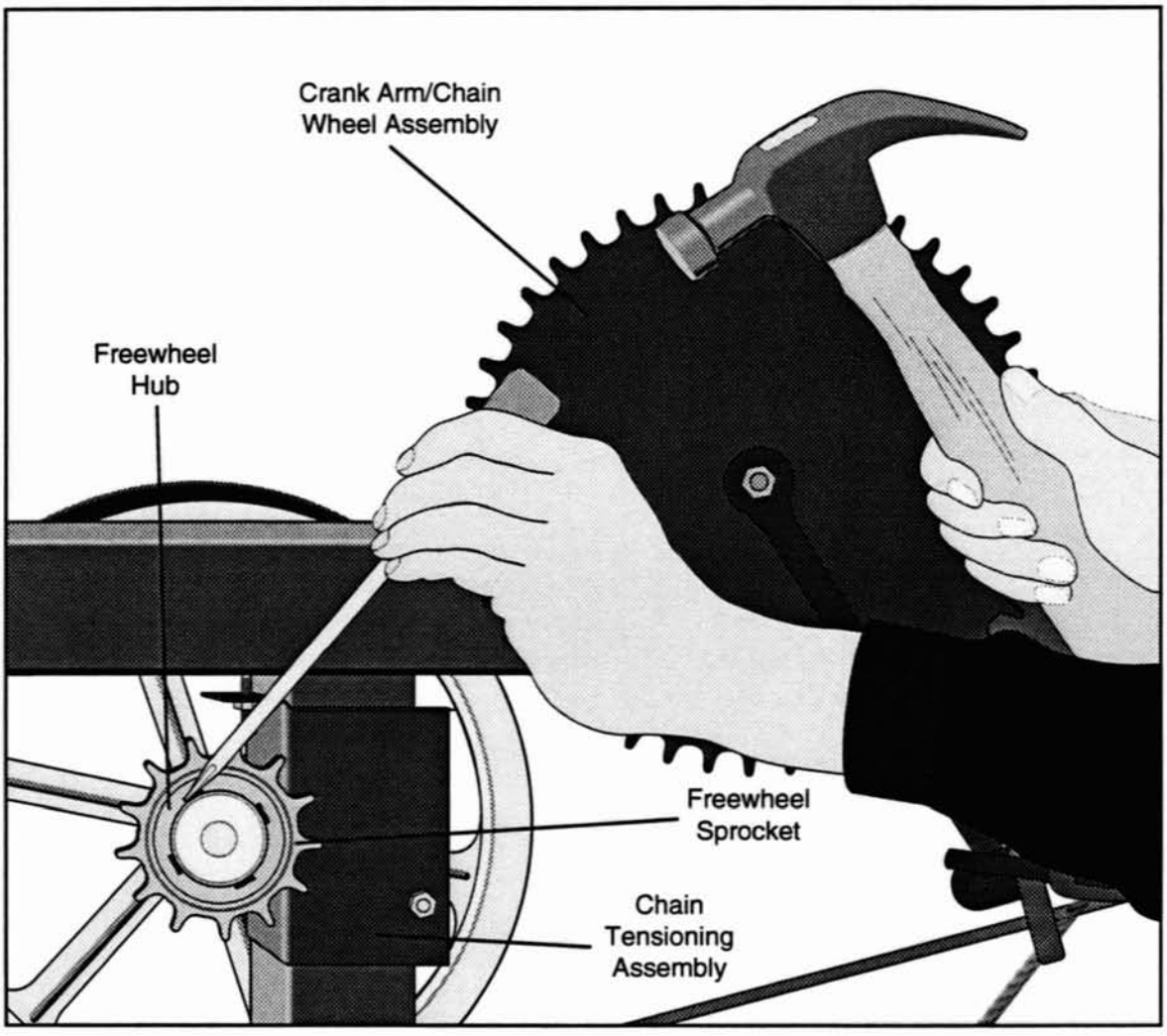
3. Loosen the freewheel sprocket (44) by placing the steel punch in the sprocket indents. Use the hammer to tap the punch so that the sprocket moves in a counterclockwise direction (see Diagram 7-13).

Caution
Excessive hammering and force will damage the bearings in the sheave axle sleeve.

4. Face the freewheel sprocket (44) and rotate it counterclockwise until it is free of the freewheel hub (43). Discard the sprocket. Choose one:

If . . .	Then . . .	Otherwise . . .
The freewheel hub is still on the sheave axle	Rotate the freewheel hub counterclockwise to remove it from the sheave axle	Discard the freewheel hub and sprocket assembly

Diagram 7-13. Loosening the Freewheel Sprocket



Replacing the Freewheel Sprocket and Freewheel Hub

5. Thread the new freewheel hub onto the sheave axle.

Caution
The threads on the freewheel sprocket are very fine. Do not cross thread the sprocket when you perform the next steps.

6. Thread the new freewheel sprocket (44) clockwise onto the freewheel hub (43).

7. Rotate the sprocket only until it is fully seated. Do not overtighten the sprocket on the freewheel hub. The chain will tighten the freewheel sprocket as the cycle is pedaled.

8. Replace the chain as described in Procedure 7.13, *Removing and Replacing the Chain.*

9. Inspect and adjust chain tension as described in Inspection and Adjustment Procedure 6.4, *Inspecting and Adjusting Chain Tension.*

10. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

11. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

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Procedure 7.15

Removing and Replacing the Flywheel, Flywheel Axle Assembly, or Fan

Required Tools and Equipment

3mm T-handle allen wrench
snap ring pliers
needle nose pliers
C-Clamp (must be adjustable to 8")
hammer
grease
vice
steel punch
17mm deep well socket for 3/8" drive ratchet, 2

Procedure

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

Removing the Fan

2. Remove the fan (35) from the right end of the flywheel axle assembly (36).

3. Choose one:

If . . .	Then . . .	Otherwise . . .
You are only installing a new fan	Skip to Step 27	Continue with the next step

Removing the Flywheel

4. Using the needle nose pliers, unhook the upper end of the tension spring (37) from the idler wheel (83).

5. Lift the idler wheel (83) off the belt and rotate it toward the flywheel (19). When belt tension is reduced, remove the belt from the sheave axle assembly (42) and release the idler wheel.

6. Lift the belt from the flywheel hub. Turn the belt sideways and slide it down between the flywheel (19) and the magnet assembly (27).

7. Using the 3mm T-handle allen wrench, remove the set screw (20) from the flywheel hub.

8. Pull the flywheel (19) from the flywheel axle assembly (36).

9. Remove the square key (23) from the key slot on the flywheel axle.

10. Choose one:

If . . .	Then . . .	Otherwise . . .
You are only installing a new flywheel	Skip to Step 21	Continue with the next step

Removing the Flywheel Axle Assembly

11. Using the snap ring pliers, remove the exterior retainer ring (25) from the right end of the flywheel axle (see Diagram 7-14).

12. Using the hammer and steel punch, strike the right end of the flywheel axle assembly (36) until the flywheel axle and left bearing (24) are driven out of the sleeve.

    Note
    The left bearing will remain on the flywheel axle. Discard the axle assembly after you perform Step 12.

13. Using the hammer and steel punch, tap the right bearing (24) out of the sleeve.

Replacing the Flywheel Axle Assembly

The keyway is on the left side of the flywheel axle assembly.

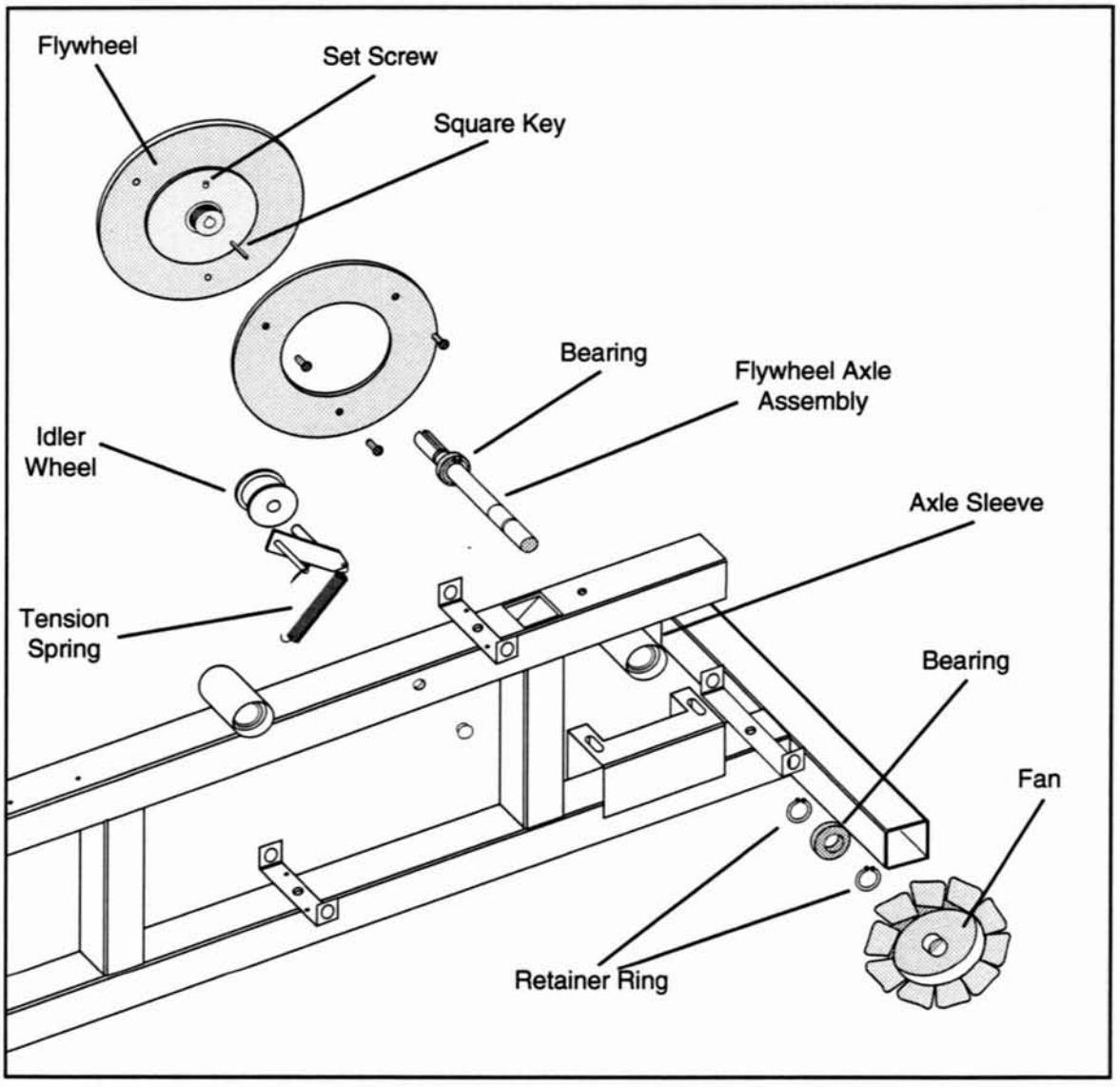
14. Using the snap ring pliers, remove the exterior ring (25) from the right end of the new flywheel axle assembly.

15. Slide the flywheel axle assembly (36) into the left end of the sleeve. Wiggle and pull the axle until the outer race of the bearing seats inside the sleeve.

16. Position a 17mm socket against the inner race of the bearing mounted in the flywheel axle sleeve. Have an assistant hold one end of the C-Clamp against the socket.

17. Apply a light coat of grease to the inner bore of the new bearing. Position the bearing against the right end of the flywheel axle assembly.

Diagram 7-14. Exploded View of the Flywheel Assembly



18. Hold the second 17mm socket against the inner race of the bearing positioned in the previous step. Seat the C-Clamp against the opposite end of the socket.

    Note
    The C-Clamp should be positioned as shown in Diagram 7-9.

19. Turn the clamp handle until the bearing positioned in Step 17 seats inside the sleeve. Remove the C-Clamp and sockets.

20. Using the snap ring pliers, replace the retainer ring (25) removed in Step 14 on the outer groove of the right end of the flywheel axle assembly (36).

Replacing the Flywheel

21. Hold the belt on the flywheel hub, then position the new flywheel on the flywheel axle assembly. Rotate the flywheel (19) until the hub keyway is aligned with the axle keyway.

22. Insert the square key (23) into the key slot until it is flush with the flywheel (19). Using the 3mm T-handle allen wrench, push the key into the key slot as far as possible.

23. Install a new set screw on the flywheel hub. Using the 3mm T-handle allen wrench, tighten the set screw.

Caution
The set screw must clamp the square key firmly.

24. Replace the belt as described in Procedure 7.12, *Removing and Replacing the Belt.*

25. Using the needle nose pliers, connect the tension spring (37) to the idler wheel (83).

26. Inspect the gap between the flywheel and the magnet assembly as described in Procedure 6.1, *Inspecting and Adjusting the Gap Between the Flywheel and the Magnet Assembly.* Adjust the gap if necessary.

Replacing the Flywheel Axle Assembly

27. Push the fan (35) onto the right end of the flywheel axle assembly (36).

28. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

29. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

Procedure 7.16
Removing and Replacing the Chain Tensioning Assembly

Required Tools and Equipment

5/32" allen wrench
7/16" open-end wrench
needle nose pliers
plastic mallet
steel punch

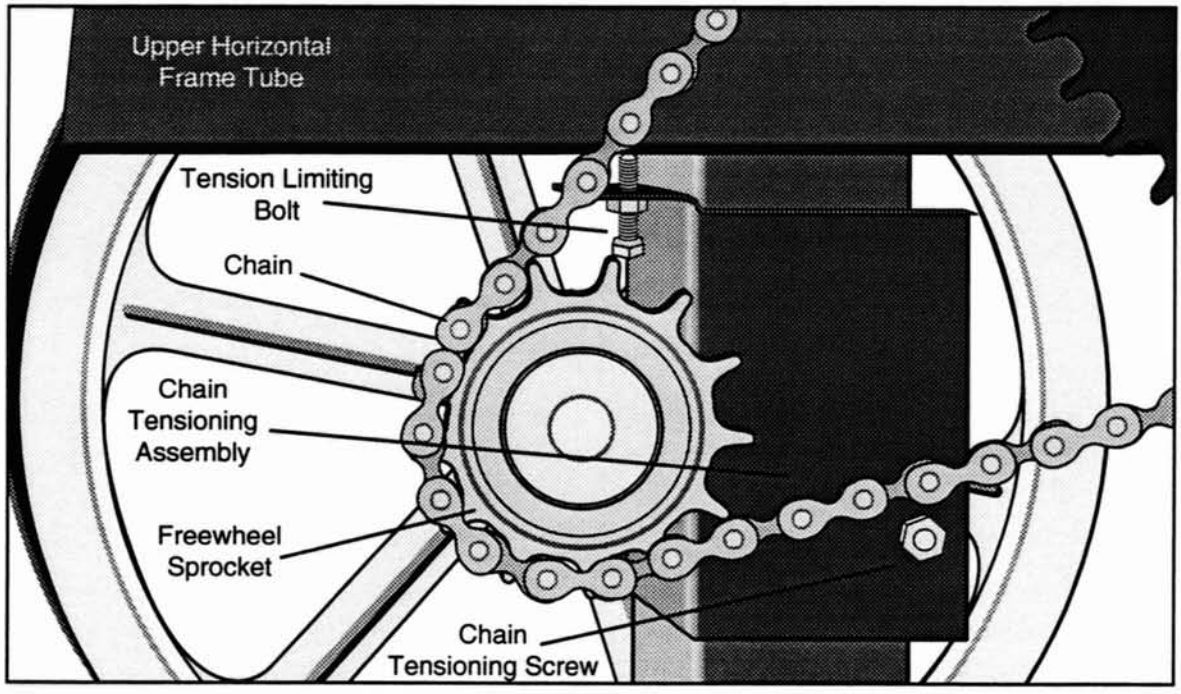
Removing the Chain

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Using your fingers, remove the tension limiting bolt from the chain tensioning assembly (see Diagram 7-15).

Diagram 7-15. Chain Tensioning Assembly



3. Using the 5/32" allen wrench and 7/16" open-end wrench, loosen the chain tensioning screw (13) and locknut (14). Slide the chain tensioning assembly (75) toward the upper horizontal frame tube.

4. Hold the chain tensioning assembly against the upper horizontal frame tube while you lift the chain (45) from the freewheel sprocket (44). Remove the chain from the cycle and set it aside.

5. Using the 5/32" allen wrench and 7/16" open-end wrench, tighten the chain tensioning screw (13) and locknut (14) on the chain tensioning assembly (75).

Removing the Freewheel Sprocket and Freewheel Hub

Caution
Take care when you perform the next step. Excessive hammering and force will damage the bearings in the axle sleeve.

6. Loosen the freewheel sprocket (44) by placing the steel punch in the sprocket indents. Use the plastic mallet to tap the punch so that the sprocket moves in a counterclockwise direction (refer back to Diagram 7-13).

7. Face the freewheel sprocket (44) and rotate it counterclockwise until it is free of the freewheel hub (43). If the freewheel hub is still on the sheave axle assembly (42), rotate the hub counterclockwise to remove it from the sheave axle.

Removing the Belt

8. Using the needle nose pliers, unhook the upper end of the tension spring (37) from the idler wheel (83).

9. Lift the idler wheel (83) off the belt and rotate it toward the flywheel (19). When belt tension is reduced, remove the belt from the sheave axle assembly (42) and release the idler wheel.

10. Lift the belt from the flywheel hub. Turn the belt sideways and slide it down between the flywheel (19) and the magnet assembly (27).

Removing the Chain Tensioning Assembly

11. Using the 5/32" allen wrench and 7/16" open-end wrench, remove the chain tensioning screw (13) and locknut (14) from the chain tensioning assembly (75). Remove and set aside the chain tensioning assembly.

Note
The sheave axle assembly is mounted in the sleeve that is welded to the chain tensioning assembly. You will need to install a new sheave axle assembly after you mount the new tensioning assembly on the cycle.

Replacing the Chain Tensioning Assembly

12. Position the new chain tensioning assembly (75) on the back frame upright (see Diagram 7-16). Slide the chain tensioning assembly upward until the tension limiting bolt is flush with the upper horizontal frame tube.

13. Push the chain tensioning screw through the mounting holes on the chain tensioning assembly. Thread the nut removed in Step 11 onto the screw.

    Note
    Have an assistant hold the tensioning assembly while you perform the next step.

14. Using the 5/32" allen wrench and 7/16" open-end wrench, tighten the screw (13) until the chain tensioning assembly (75) is held in place against the frame upright. When you are through, the chain tensioning assembly should appear as shown in Diagram 7-16.

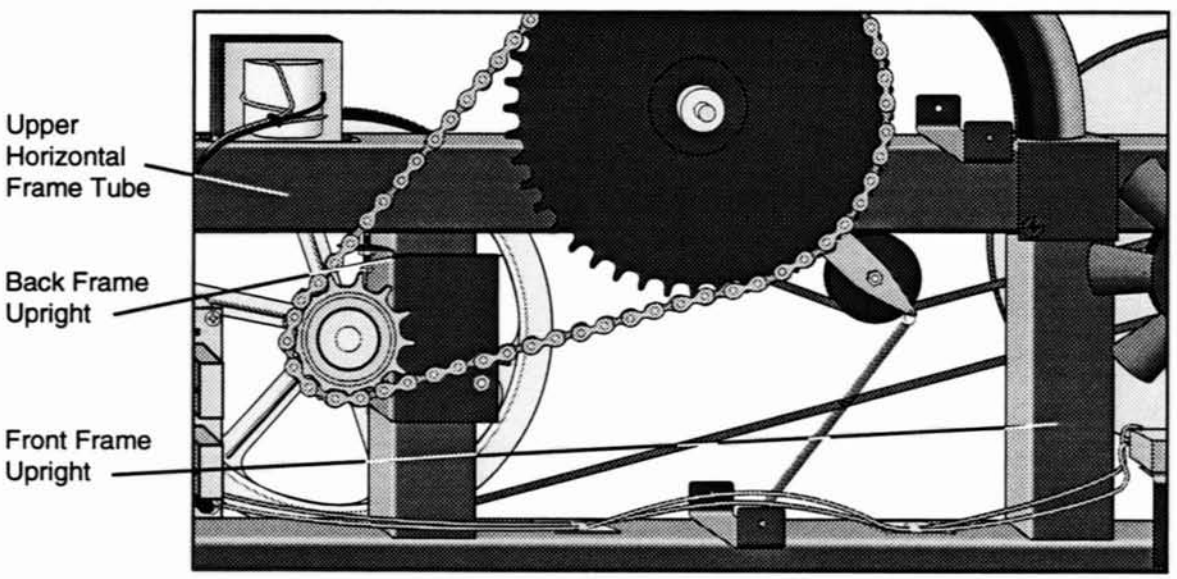
    Note
    The freewheel sprocket, freewheel hub, and belt are installed on the cycle when you perform the next step.

15. Position and press target labels on the new sheave. Then, perform Steps 13 through 25 of Procedure 7.19, *Removing and Replacing the Sheave Axle Assembly or the Target Labels.*

Replacing the Chain

16. Position the chain around the freewheel sprocket (refer back to Diagram 7-12). Place the other end of the chain on the rim of the crank arm/chain wheel assembly (46).

Diagram 7-16. Upper Horizontal Frame Tube and Frame Uprights



17. Face the crank arm/chain wheel assembly (46) and rotate it clockwise. As the chain wheel turns, ease the chain onto the chain wheel rim.

18. Inspect and adjust chain tension as described in Procedure 6.4, *Inspecting and Adjusting Chain Tension.*

19. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

Procedure 7.17

Removing and Replacing the Magnet Assembly

Required Tools and Equipment

5/32" allen wrench
wire cutters
cable ties
3/8" open-end wrench

Removing the Magnet Assembly

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Using the wire cutters, cut the cable ties that secure the magnet harness to the cycle frame.

3. Disconnect the magnet harness from connector P3 on the lower PCA (79).

4. Using the 5/32" allen wrench and the 3/8" open-end wrench, remove the two screws (26) that secure the magnet assembly (27), gasket (28), and nut plate (29) to the cycle frame (see Diagram 7-17).

5. Remove the old magnet assembly (27), gasket (28), and the nut plate (29) from the cycle.

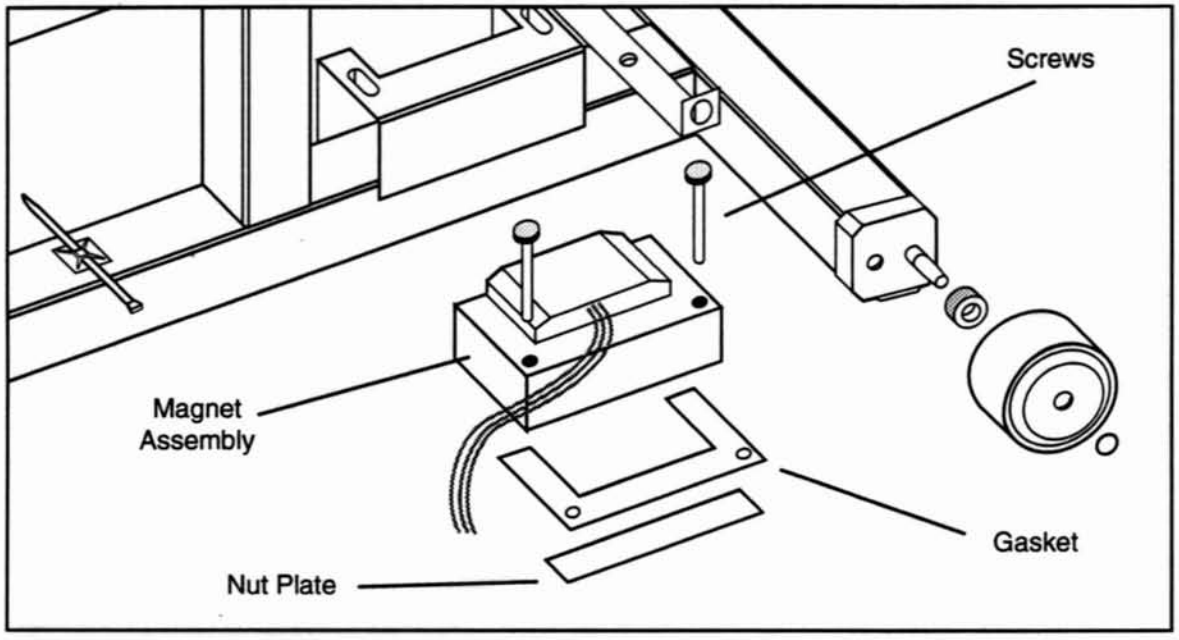
Replacing the Magnet Assembly

6. Position the new magnet assembly, gasket (28), and the nut plate (29) on the cycle.

Note
When you mount the magnet assembly, do not tighten the mounting hardware securely until you have adjusted the gap between the flywheel and the magnet assembly.

7. Using the 5/32" allen wrench, lightly tighten the two screws that secure the magnet assembly (27) to the cycle frame.

Diagram 7-17. Exploded View of the Magnet Assembly



8. Adjust the gap between the flywheel (19) and the magnet assembly (27) as described in Procedure 6.1, *Inspecting and Adjusting the Gap Between the Flywheel and the Magnet Assembly.*

9. Using the 5/32" allen wrench, securely tighten the two screws (26) that mount the magnet assembly (27), gasket (28), and nut plate (29) to the cycle frame.

10. Connect the magnet harness to connector P3 on the lower PCA (79).

11. Replace the cable ties removed in Step 2.

12. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

13. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

Procedure 7.18

Removing and Replacing the Isolation Transformer

Required Tools and Equipment

5/16" nut driver

Removing the Isolation Transformer

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Disconnect the transformer cable from connector P5 on the lower PCA.

3. Using the 5/16" nut driver, remove the two self-tapping screws (51) that secure the transformer (78) to the cycle frame.

Replacing the Isolation Transformer

4. Position the new transformer at its mounting location.

5. Using the 5/16" nut driver, install the two screws (51) that secure the transformer to the cycle frame.

6. Connect the transformer cable to connector P5 on the lower PCA.

7. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

8. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

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Procedure 7.19

Removing and Replacing the Sheave Axle Assembly or the Target Labels

Required Tools and Equipment

snap ring pliers
C-Clamp (must be adjustable to 8")
hammer
grease
damp cloth
mild detergent
steel punch
17mm deep well socket for 3/8" drive ratchet

Mounting the Target Labels

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers*.

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Choose one:

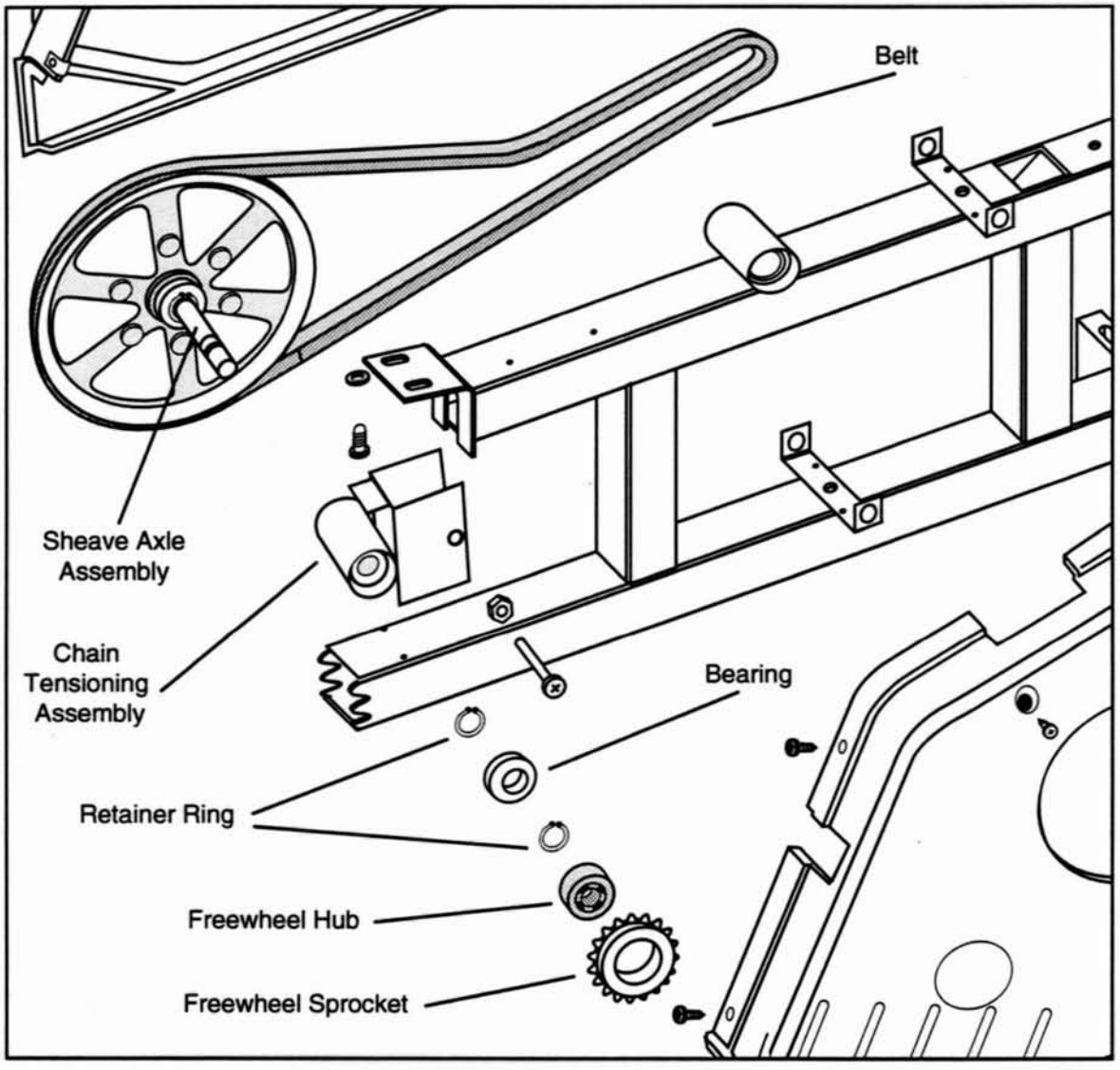
If . . .	Then . . .
You are removing and replacing the target labels	Rotate the sheave to gain access to each of the target labels; then perform Steps 3 through 6
You are installing a new sheave on the cycle	Position and press target labels on the new sheave; then skip to Step 7

3. Remove the target labels and adhesive from the sheave spokes.

4. Clean the sheave spokes with a mild detergent. Remove the detergent with a damp cloth.

5. Position and press new target labels (74) on the sheave axle assembly (42).

Diagram 7-18. Exploded View of the Sheave Axle Assembly



6. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

Note
If you are not installing a new sheave axle assembly on the cycle, this procedure is complete.

Removing the Sheave Axle Assembly

7. Remove the belt as described in Procedure 7.12, *Removing and Replacing the Belt.*

8. Remove the chain as described in Procedure 7.13, *Removing and Replacing the Chain.*

9. Remove the freewheel sprocket (44) and freewheel hub (43) as described in Procedure 7.14, *Removing and Replacing the Freewheel Sprocket and Freewheel Hub.*

10. Using the snap ring pliers, remove the retainer ring (25) from the right end of the sheave axle assembly (42).

11. Using the hammer and steel punch, strike the right end of the sheave axle assembly (42) until the axle and left bearing (24) are driven out of the sleeve.

    Note
    The left bearing will remain on the sheave axle. Discard the axle assembly after you perform Step 11.

12. Using the hammer and steel punch, tap the right bearing (24) out of the sleeve.

Replacing the Sheave Axle Assembly

13. Using the snap ring pliers, remove the exterior retainer ring (25) from the right end of the sheave axle assembly (42).

    Note
    The sheave, bearing, and retainer rings are on the left end of the sheave axle.

14. Slide the sheave axle assembly into the left end of the sleeve. Wiggle and pull the axle until the outer race of the bearing on the axle seats inside the sleeve.

15. Have an assistant hold one end of the C-Clamp against the sheave hub.

16. Apply a light coat of grease to the inner bore of the new bearing. Position the bearing against the right end of the sheave axle assembly (42).

17. Hold the 17mm socket against the inner race of the bearing positioned in the previous step. Seat the C-Clamp against the opposite end of the socket.

    Note
    The C-Clamp should be positioned as shown in Diagram 7-9.

18. Turn the clamp handle until the bearing positioned in Step 16 seats inside the sleeve. Remove the C-Clamp and socket.

19. Using the snap ring pliers, replace the retainer ring (25) removed in Step 13 on the outer groove of the right end of the sheave axle assembly (42).

20. Replace the freewheel sprocket (44) and freewheel hub (43) as described in Procedure 7.14, *Removing and Replacing the Freewheel Sprocket and Freewheel Hub.*

21. Replace the chain as described in Procedure 7.13, *Removing and Replacing the Chain.*

22. Replace the belt as described in Procedure 7.12, *Removing and Replacing the Belt.*

23. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

24. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

Procedure 7.20

Removing and Replacing the Idler Wheel

Required Tools and Equipment

needle nose pliers

Procedure

1. Remove the left cover as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Choose one:

If . . .	Then . . .	Otherwise . . .
You are not replacing the tension spring	Use the needle nose pliers to unhook the upper end of the tension spring from the idler wheel; skip to Step 4	Continue with Step 3

Note
If the spring is worn or damaged, do not replace the idler wheel. Remove and replace the tension spring with the needle nose pliers.

3. Using the needle nose pliers, unhook the lower end of the tension spring (37) from the cycle frame.

4. Straighten and remove the cotter pin (85) that secures the back of the idler wheel (83). Remove the idler wheel from the idler arm weldment (84).

5. Position the new idler wheel at its mounting location and place the cotter pin (85) through the back of the idler wheel.

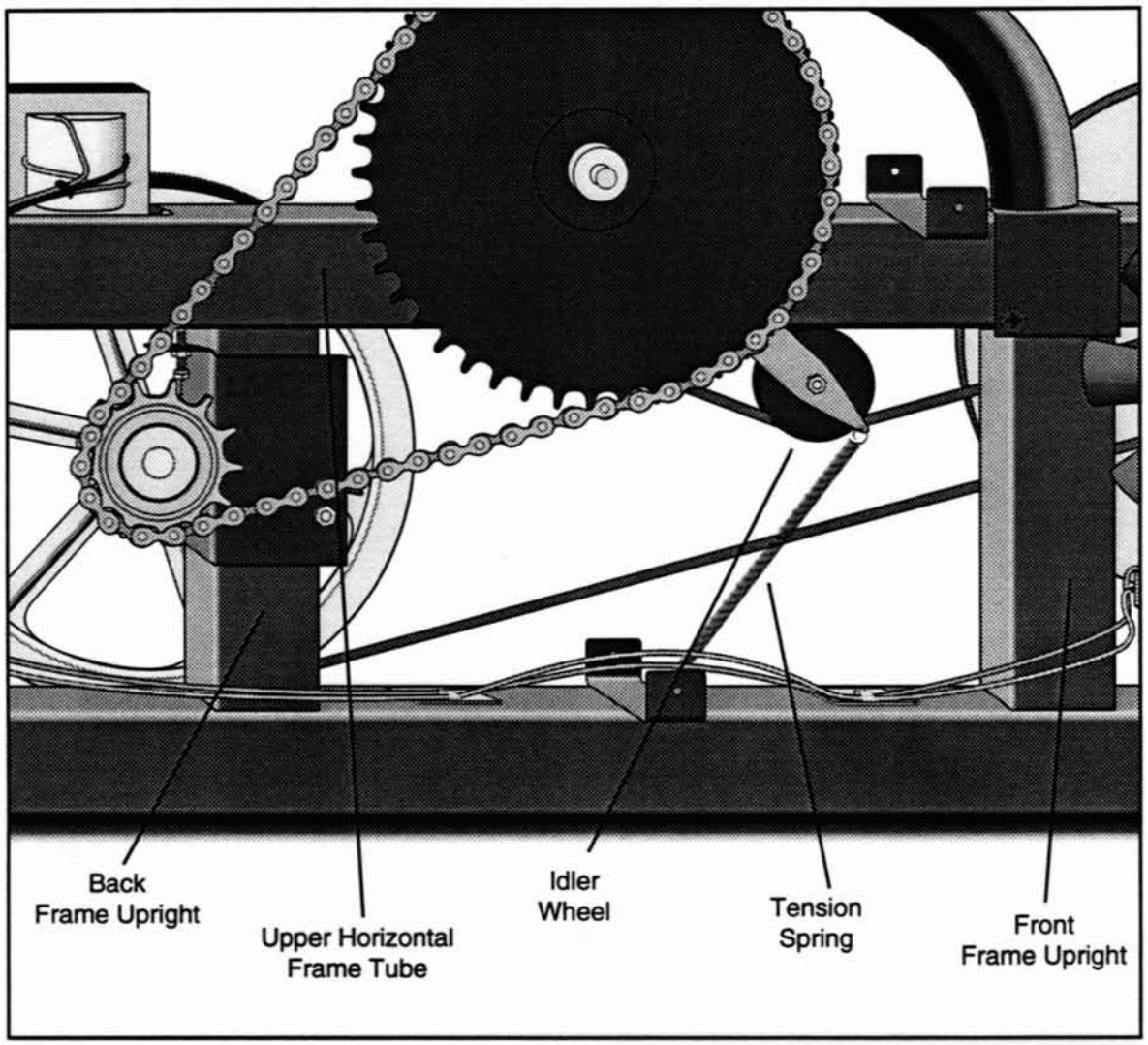
6. Using the needle nose pliers, bend back one leg of the cotter pin (85) to secure the idler wheel (83).

7. Connect the tension spring (37) between the idler wheel (83) and the cycle frame (see Diagram 7-19).

8. Replace the cover as described in Procedure 7.1, *Removing and Replacing the Covers.*

9. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

Diagram 7-19. Upper Horizontal Frame Tube and Frame Uprights



Procedure 7.21

Removing and Replacing the Seat Assembly

Required Tools and Equipment

1/2" socket wrench
5/32" allen wrench
1/2" drive ratchet
7/16" ratchet socket

Procedure

1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

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

2. Choose one:

If . . .	Then . . .	Otherwise . . .
You are installing a new seat backrest on the seat frame assembly	Perform Steps 3 through 5	Skip to Step 6

Removing and Replacing the Seat Backrest

3. Using the 1/2" socket wrench, remove the four bolts (100) that secure the seat backrest (65) to the seat frame assembly (see Diagram 7-20). Set aside the backrest.

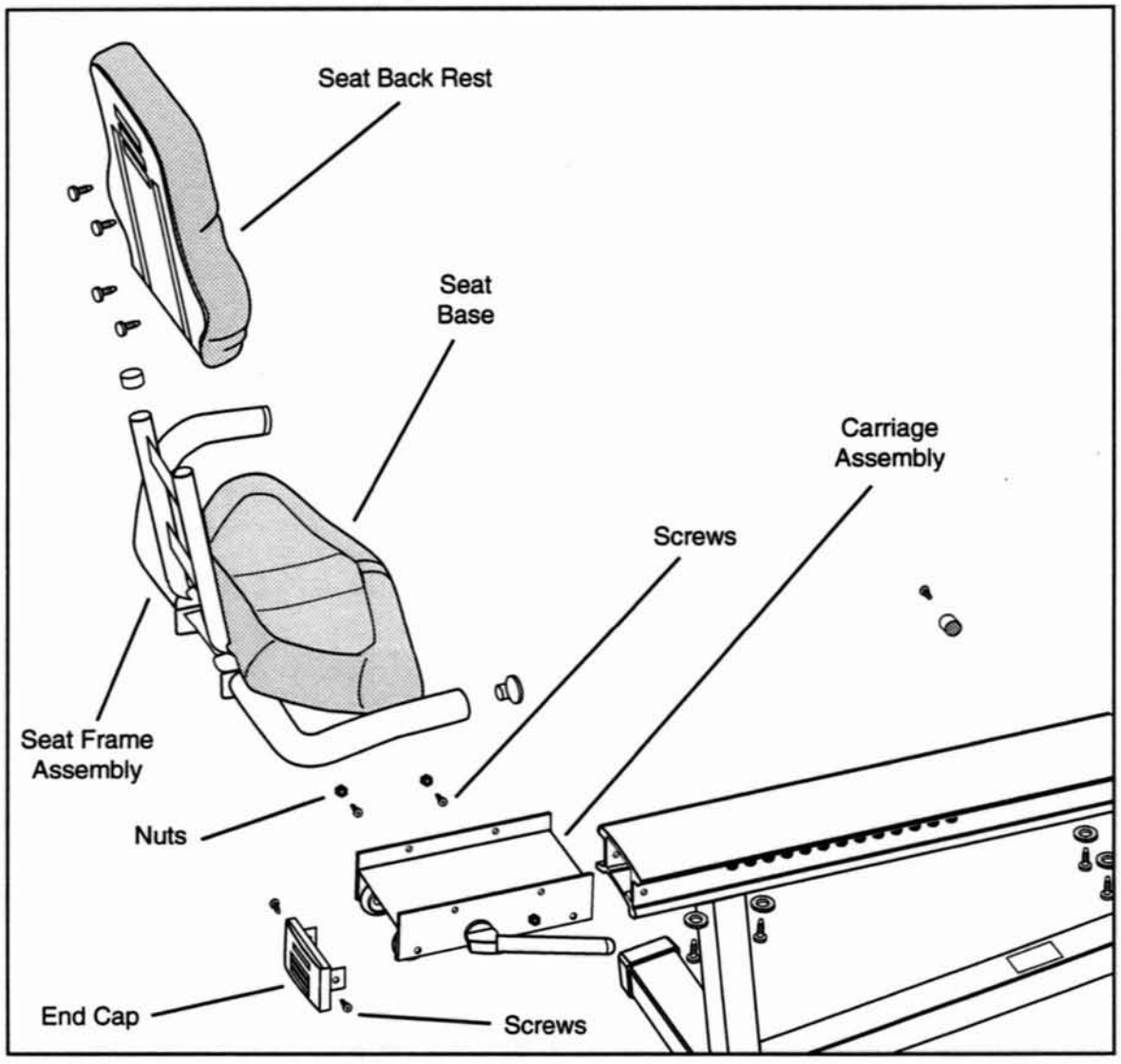
4. Position the new seat backrest next to the mounting holes on the frame assembly.

5. Using the 1/2" socket wrench, install the four bolts (100) that secure the seat backrest to the seat frame assembly.

Removing the Seat Frame Assembly

6. Using the 5/32" allen wrench and ratchet with 7/16" socket, remove the four screws (60) and locknuts (14) that secure the seat frame assembly (63) to the carriage assembly (86). Remove the seat frame assembly from the cycle.

Diagram 7-20. Exploded View of the Seat Assembly



7. Choose one:

If . . .	Then . . .
You are installing a new seat base on the seat frame assembly	Perform Steps 8 through 11
You are installing a new seat frame assembly on the cycle	Skip to Step 12
You are removing the seat frame assembly as part of a different maintenance procedure	When maintenance operations are complete, skip to Step 16

Removing and Replacing the Seat Base

8. Using the 1/2" socket wrench, remove the four bolts that secure the seat base (66) to the seat frame assembly. Set aside the seat base.

9. Position the new seat base next to the mounting holes on the seat frame assembly. Using the 1/2" socket wrench, install the four bolts that secure the seat base to the frame assembly.

10. Position the seat frame assembly on the carriage assembly. Have an assistant hold the frame assembly in place when you perform the next step.

11. Using the 5/32" allen wrench and ratchet with 7/16" socket, install the four screws (60) and locknuts (14) that secure the seat frame assembly (63) to the carriage assembly (86).

Replacing the Seat Frame Assembly

12. Using the 1/2" socket wrench, remove the four bolts (100) that secure the seat back rest (65) to the seat frame assembly. Set aside the back rest.

13. Using the 1/2" socket wrench, remove the four bolts that secure the seat base (66) to the seat frame assembly. Set aside the seat base.

14. Position the original seat base (66) next to the base mounting holes on the new seat frame assembly. Using the 1/2" socket wrench, install the four bolts that secure the seat base to the frame assembly.

15. Position the original seat backrest (65) next to the backrest mounting holes on the new seat frame assembly. Using the 3/16" allen wrench, install the four bolts (100) that secure the backrest to the frame assembly.

16. Position the seat frame assembly on the carriage assembly. Have an assistant hold the frame assembly in place when you perform the next step.

17. Using the 5/32" allen wrench and ratchet with 7/16" socket, install the four screws (60) and locknuts (14) that secure the seat frame assembly (63) to the carriage assembly (86).

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Procedure 7.22

Removing and Replacing the Carriage Assembly

Required Tools and Equipment

#2 phillips screwdriver
#2 flat-head screwdriver
5/32" allen wrench
1/2" open-end wrench
1/2" drive ratchet
7/16" ratchet socket
1/8" pin punch
mallet or hammer

Procedure

1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

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

2. Using the 5/32" allen wrench and ratchet with 7/16" socket, remove the four screws (60) and locknuts (14) that secure the seat frame assembly (63) to the carriage assembly (86). Remove the seat frame assembly from the cycle.

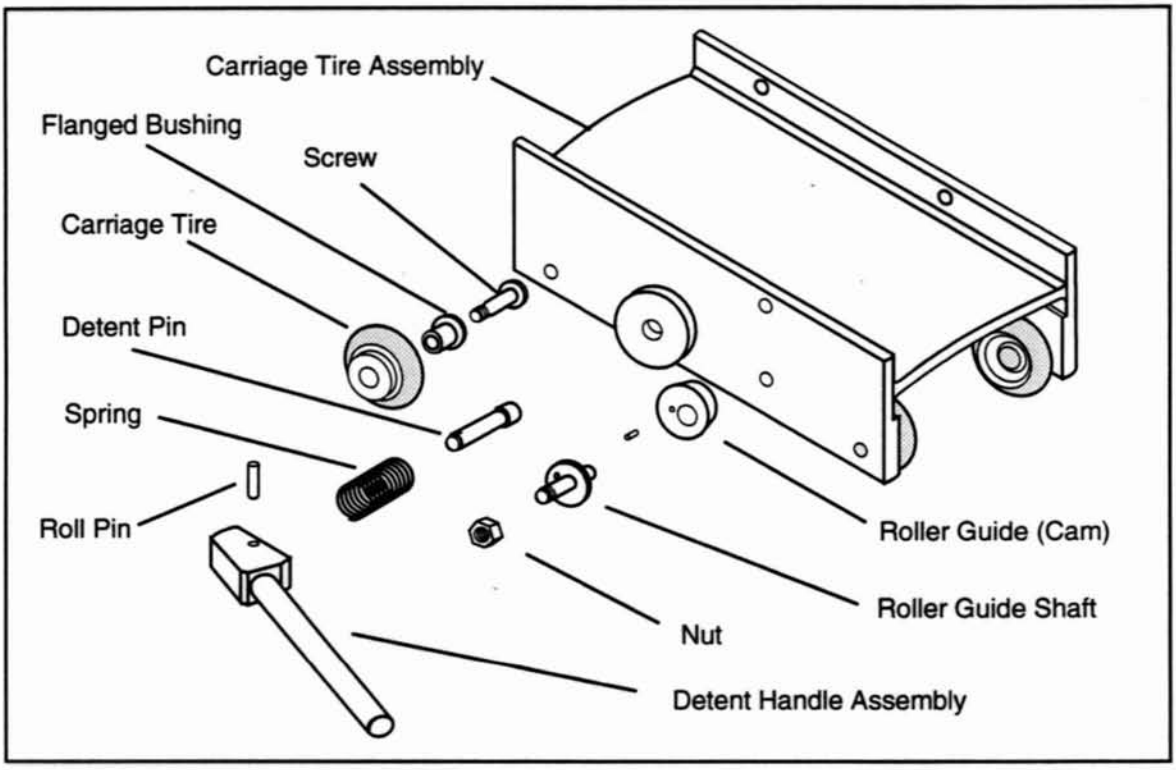
3. Using the phillips screwdriver, remove the two screws (17) that secure the seat rail end cap (59) to the back end of the rail. Set aside the end cap.

4. Using the 1/2" open-end wrench, loosen the nut (90) on the roller guide assembly (see Diagram 7-21).

5. Using the screwdriver, turn the roller guide assembly (96) clockwise 1/2 turn.

6. Release and hold open the handle, then slide the carriage assembly off of the rail.

Diagram 7-21. Exploded View of the Carriage Assembly



7. Choose one:

If . . .	Then . . .
You are installing a carriage tire	Perform Steps 8 through 11
You are installing a roller guide assembly (cam)	Perform Steps 12 through 13
You are installing a detent handle assembly, detent pin, or spring	Skip to Step 16
You are removing the carriage assembly as part of another maintenance procedure	When maintenance operations are complete, skip to Step 22

Removing and Replacing a Carriage Tire

8. Using the 3/16" allen wrench, remove the screw (8) that secures the carriage tire (89) to the carriage assembly. Set aside the flanged bushing (88) and screw and discard the carriage tire.

Note
Scrape off the old loc-tite and add a drop of fresh loc-tite to the tip of the screw before you mount the carriage tire to the carriage assembly.

9. Push the flanged bushing (88) into the new carriage tire. Position the tire at its mounting position on the carriage assembly, then push the screw (8) through the carriage tire and the side of the carriage assembly.

10. Using the 3/16" allen wrench, install the screw (8) that secures the carriage tire to the carriage assembly.

11. Skip to Step 22.

Removing and Replacing a Roller Guide Assembly (Cam)

12. Using the 1/2" open-end wrench, remove the nut (90) on the roller guide assembly (96). Remove the roller guide assembly (cam) from the carriage assembly.

13. Position the new roller guide assembly inside of the carriage assembly. Thread the slotted end of the new roller guide through the mounting hole in the side of the carriage assembly.

14. Loosely thread the nut (90) onto the slotted end of the roller guide assembly.

15. Skip to Step 22.

Removing and Replacing a Detent Handle Assembly

16. Using the pin punch and mallet, remove the roll pin (91) from the detent handle assembly (92). Set aside the handle assembly, then remove the detent pin (95) and spring (94) from the carriage assembly.

17. Push the new detent pin (95) through the spring (94), then position the detent pin inside of the carriage assembly.

18. Push the smaller end of the detent pin through the mounting hole in the side of the carriage assembly.

19. Hold the larger end of the detent pin and spring assembly against the inside of the carriage assembly.

20. Position the detent handle assembly on the smaller end of the detent pin. Line up the hole in the detent handle assembly with the hole in the detent pin.

21. Tap a new roll pin (91) through the holes in the detent handle and detent pin.

Replacing the Carriage Assembly

22. Release and hold open the handle, then slide the carriage assembly onto the rail.

23. Position the seat rail end cap (59) against the back end of the rail assembly.

24. Using the phillips screwdriver, install the two screws (17) that secure the seat rail end cap (59) to the back end of the rail.

Tightening the Roller Guide Assembly (Cam)

25. Using the 1/2" open-end wrench, loosen the nut (90) on the roller guide assembly (96).

26. Using the screwdriver, turn the roller guide shaft counterclockwise until the roller guide assembly (cam) is flush with the top of the carriage. Do not remove the screwdriver from the roller guide shaft.

27. Hold the screwdriver in the slotted end of the roller guide shaft while you use the 1/2" open-end wrench to tighten the nut (90).

28. Position the seat frame assembly on the carriage assembly. Have an assistant hold the frame assembly in place when you perform the next step.

29. Using the 5/32" allen wrench and ratchet with 7/16" socket, install the four screws (60) and locknuts (14) that secure the seat frame assembly (63) to the carriage assembly (86).

Procedure 7.23

Removing and Replacing the Rail

Required Tools and Equipment

#2 phillips screwdriver
5/32" allen wrench
1/2" open-end wrench
1/2" socket wrench
1/2" drive ratchet
7/16" ratchet socket

Removing the Rail Assembly

1. Turn off the cycle with the ON/OFF switch, then unplug the power cord from the wall outlet.

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

2. Using the 5/32" allen wrench and ratchet with 7/16" socket, remove the four screws (60) and locknuts (14) that secure the seat frame assembly (63) to the carriage assembly (86). Remove the seat frame assembly from the cycle.

3. Using the 1/2" open-end wrench, loosen the nut (90) on the roller guide assembly (96).

4. Using the screwdriver, turn the roller guide shaft clockwise 1/2 turn.

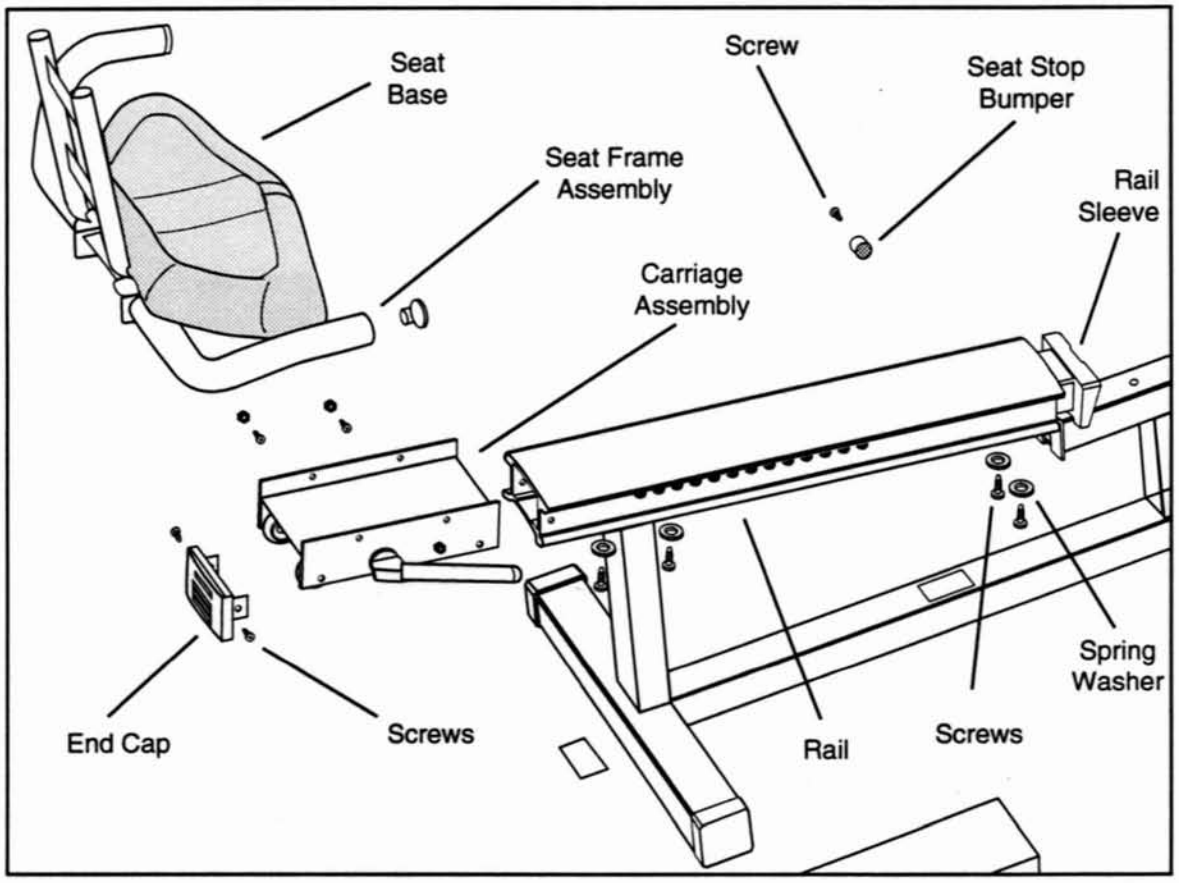
5. Using the phillips screwdriver, remove the two screws (17) that secure the seat rail end cap (59) to the back end of the rail. Set aside the end cap.

6. Release and hold open the handle, then slide the carriage assembly off of the rail.

7. Using the 1/2" socket wrench, remove the six screws (100) and spring washers (101) that secure the rail (57) to the cycle frame. Remove the rail sleeve (70) from the end of the rail (see Diagram 7-22).

8. Using the screwdriver, remove the screw (17) that secures the seat stop bumper (68) to the rail. Remove the seat stop bumper from the rail.

Diagram 7-22. Exploded View of the Rail Assembly



Replacing the Rail Assembly

9. Remove the adhesive cover from the back of the rail label (69). Carefully position the label on rail. Press the label firmly.

10. Position the seat stop bumper (68) next to the rail (see Diagram 7-22). Using the screwdriver, install the screw (17) that secures the bumper to the rail.

11. Push the rail sleeve (70) into the end of the rail.

12. Position the rail next to the rail mounting holes on the cycle frame. Using the 1/2" socket wrench, install the six screws that secure the rail to the cycle frame.

Replacing the Carriage Assembly

13. Release and hold open the handle, then slide the carriage assembly onto the rail.

14. Position the seat rail end cap (59) against the back end of the rail assembly.

15. Using the phillips screwdriver, install the two screws (17) that secure the seat rail end cap (59) to the back end of the rail.

Tightening the Roller Guide Assembly (Cam)

16. Using the 1/2" open-end wrench, loosen the nut (90) on the roller guide assembly (96).

17. Using the screwdriver, turn the roller guide shaft counterclockwise until the roller guide (cam) is flush with the top of the carriage. Do not remove the screwdriver from the roller guide shaft.

18. Hold the screwdriver in the slotted end of the drive roller shaft while you use the 1/2" open-end wrench to tighten the nut (90).

19. Position the seat frame assembly on the carriage assembly. Have an assistant hold the frame assembly in place when you perform the next step.

20. Using the 5/32" allen wrench and ratchet with 7/16" socket, install the four screws (60) and locknuts (14) that secure the seat frame assembly (63) to the carriage assembly (86).

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Appendix A
Fit Test Messages

The Fit Test option allows users to check their fitness levels. The Fit Test is a powerful, sophisticated feature with critical parameters. If these parameters are not met (or if the heart rate monitor is not functioning), the left display window will display Fit Test messages. This appendix includes the possible causes for the Fit Test messages listed on the following pages.

Sorry - Test Invalid - Must Complete at Least Two Stages

Reason	The user's heart rate was detected as reaching or exceeding 100% of the maximum heart rate at some time during the first two test stages. - or - The user's heart rate was detected as reaching or exceeding 85% of the maximum heart rate within the last 15 seconds of the first test stage.
Parameter-Related Causes	The maximum heart rate is calculated using the formula 220 – the age of the user. The Fit Test software monitors the user's heart rate and discontinues the test if the maximum heart rate is reached. The Fit Test software uses the results of the two previously-completed test stages to compute a Fit Test score. The score cannot be computed if at least two test stages have not been completed.
Required Action	See the **WARNING** statement below.
Equipment-Related Causes	The heart rate function may not be operating correctly.
Recommended Action	Verify operation of the heart rate monitor as described in Procedure 3.6, *Calibration Mode*.
To Continue	Press the **ENTER** key.

WARNING
The user's heart rate reached or exceeded the maximum heart rate. The user MUST consult a physician before operating the 8.2E/L Cycle.

Test Incomplete - You Must Not Stop

Reason	The test was interrupted.
Parameter-Related Causes	Interruptions in the test result in invalid test results.
Recommended Action	After a period of rest, retake the Fit Test.
Equipment-Related Causes	None.
Recommended Action	Not applicable.
To Continue	Press the **ENTER** key.

Heart Rate Bad - Cannot Perform Fitness Test - Check Monitor Installation

Reason	The electronics cannot validate the user's heart rate.
Parameter-Related Causes	The Fit Test was started immediately without allowing enough time for the cycle to validate the user's heart rate.
Recommended Action	Stand on the pedals for at least ten seconds before selecting the Fit Test option.
Equipment-Related Causes	The heart rate function may not be operating correctly.
Recommended Action	Verify operation of the heart rate monitor as described in Procedure 3.6, *Calibration Mode.* Recheck the installation of the heart rate monitor as described in the *Heart Rate Monitor User's Manual.*
To Continue	Press either the **ENTER** or **STOP** key.

Sorry - Inconsistent Data - Please Consult Manual For Help

Reason	The heart rate or the amount of work performed during the last stage completed was equal to or less than the heart rate or the amount of work performed in the previous stage.
Parameter-Related Causes	The user may not be performing the test correctly and consistently.
Recommended Action	Refer to the *Heart Rate Monitor User's Manual* for the correct procedure on performing the Fit Test and using the heart rate option. After a period of rest, have the user retake the test.
Equipment-Related Causes	The heart rate function may not be operating correctly.
Recommended Action	Verify operation of the heart rate monitor as described in Procedure 3.6, *Calibration Mode.*
To Continue	Press the **ENTER** key.

Sorry - Inconsistent Data - Please Retake Test At A Later Time

Reason	The electronics computed a Fit Test score of 80 or more, which is considered to be unattainable under normal circumstances.
Parameter-Related Causes	The user may not be performing the test correctly and consistently.
Recommended Action	Refer to the *Heart Rate Monitor User's Manual* for the correct procedure on performing the Fit Test and using the heart rate option. After a period of rest, have the user retake the test in a consistent, uninterrupted manner.
Equipment-Related Causes	The heart rate function may not be operating correctly.
Recommended Action	Verify operation of the heart rate monitor as described in Procedure 3.6, *Calibration Mode.*
To Continue	Press the **ENTER** key.

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Appendix B

Maintaining 220-Volt 8.2E/L Recumbent Cycles

To be provided.

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Appendix C

Exploded View Diagrams and Parts List

Many procedures include numbers in parentheses after component references. These numbers correlate to item numbers on the 8.2E/L Recumbent Cycle exploded view diagrams shown in Diagram C-1. For example:

11. Using the 3/16" allen wrench, secure the two socket head bolts (8) that mount the lower half of the electronic enclosure to the cycle frame.

Use the parts list and exploded view diagrams included in this appendix to locate and identify 8.2E/L Recumbent Cycle components.

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Diagram C-1. 8.2E/L Recumbent Cycle Exploded View Diagram (Page 1 of 6)

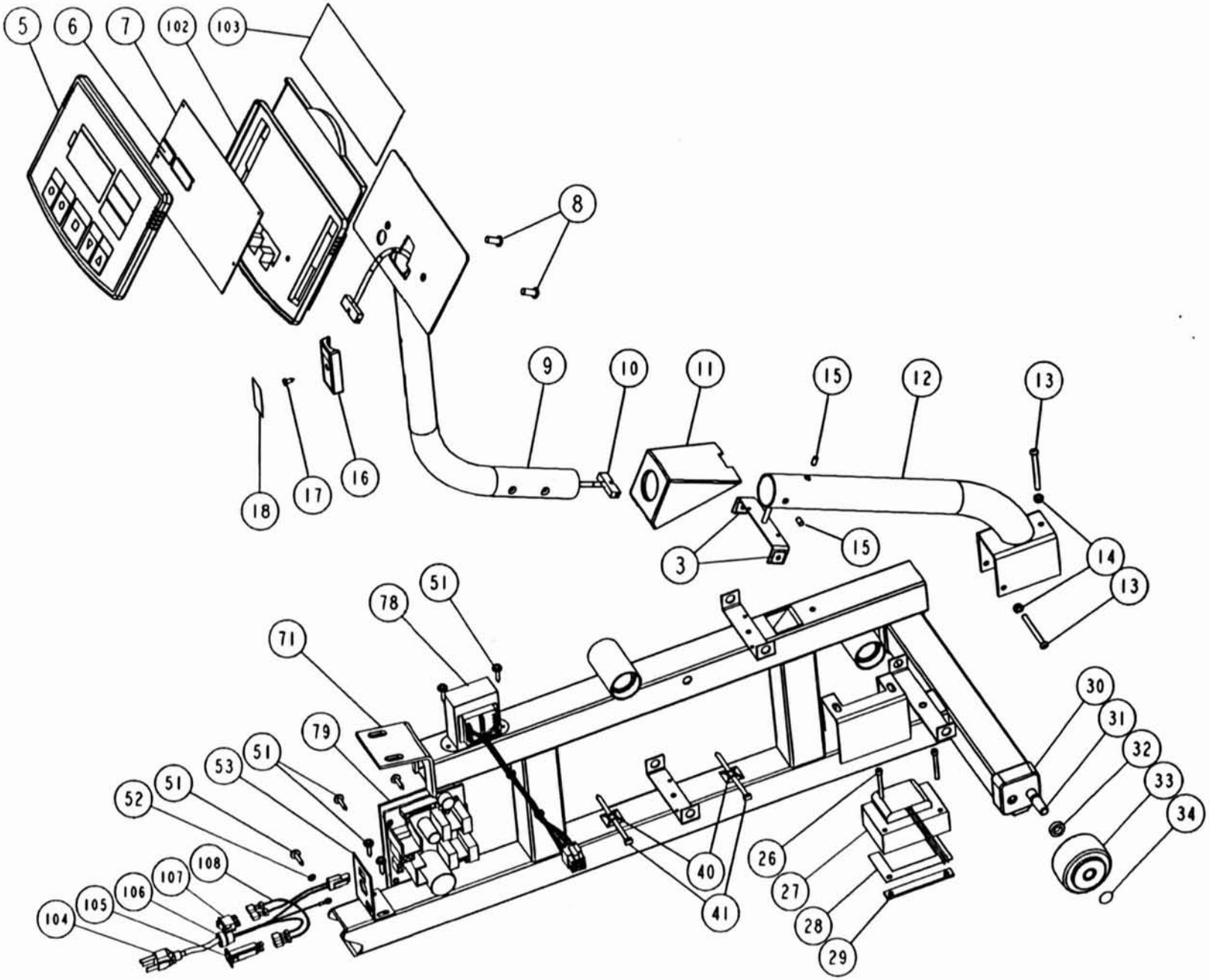

Diagram C-1. 8.2E/L Recumbent Cycle Exploded View Diagram (Page 2 of 6)

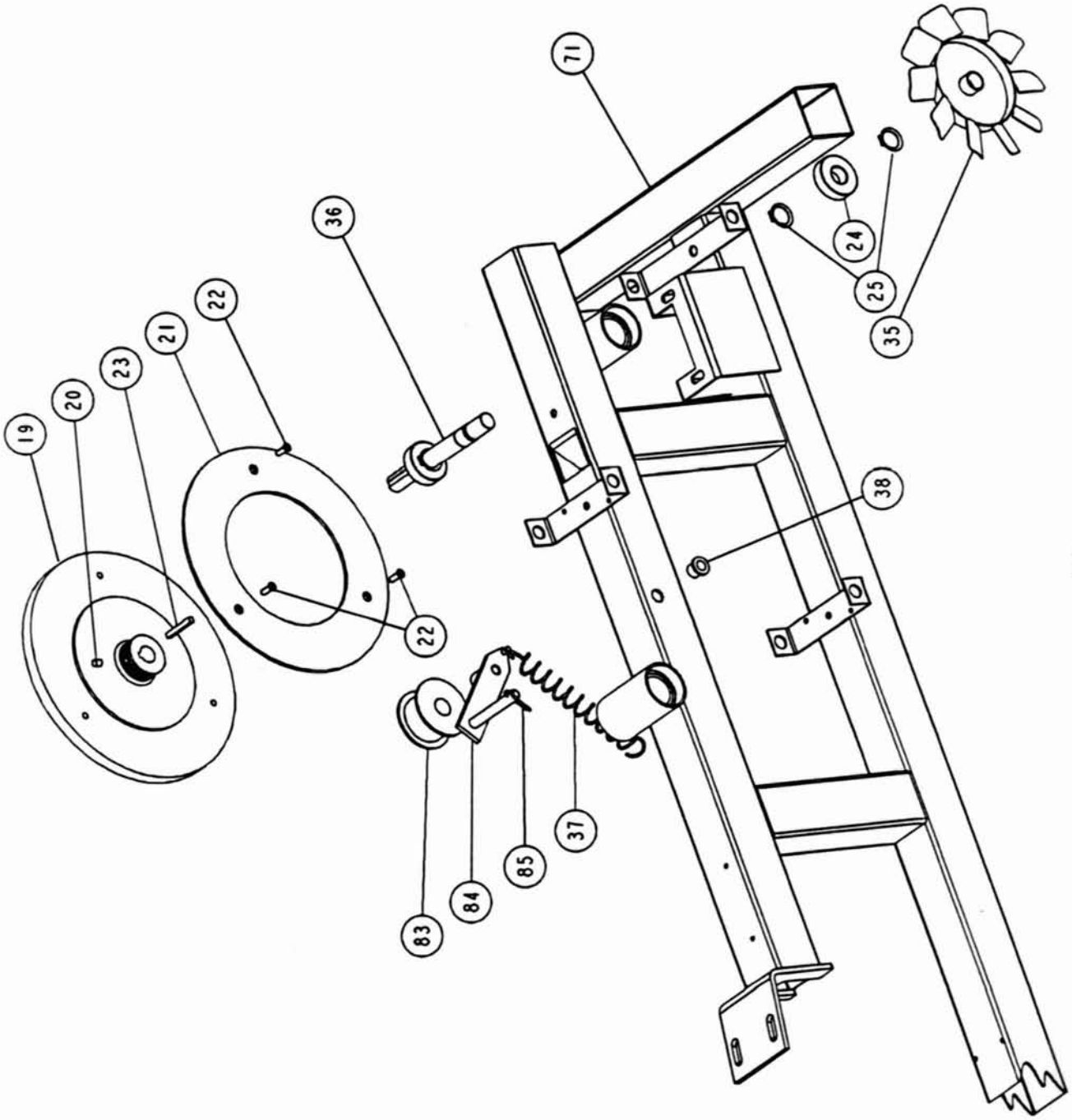

Diagram C-1. 8.2E/L Recumbent Cycle Exploded View Diagram (Page 3 of 6)

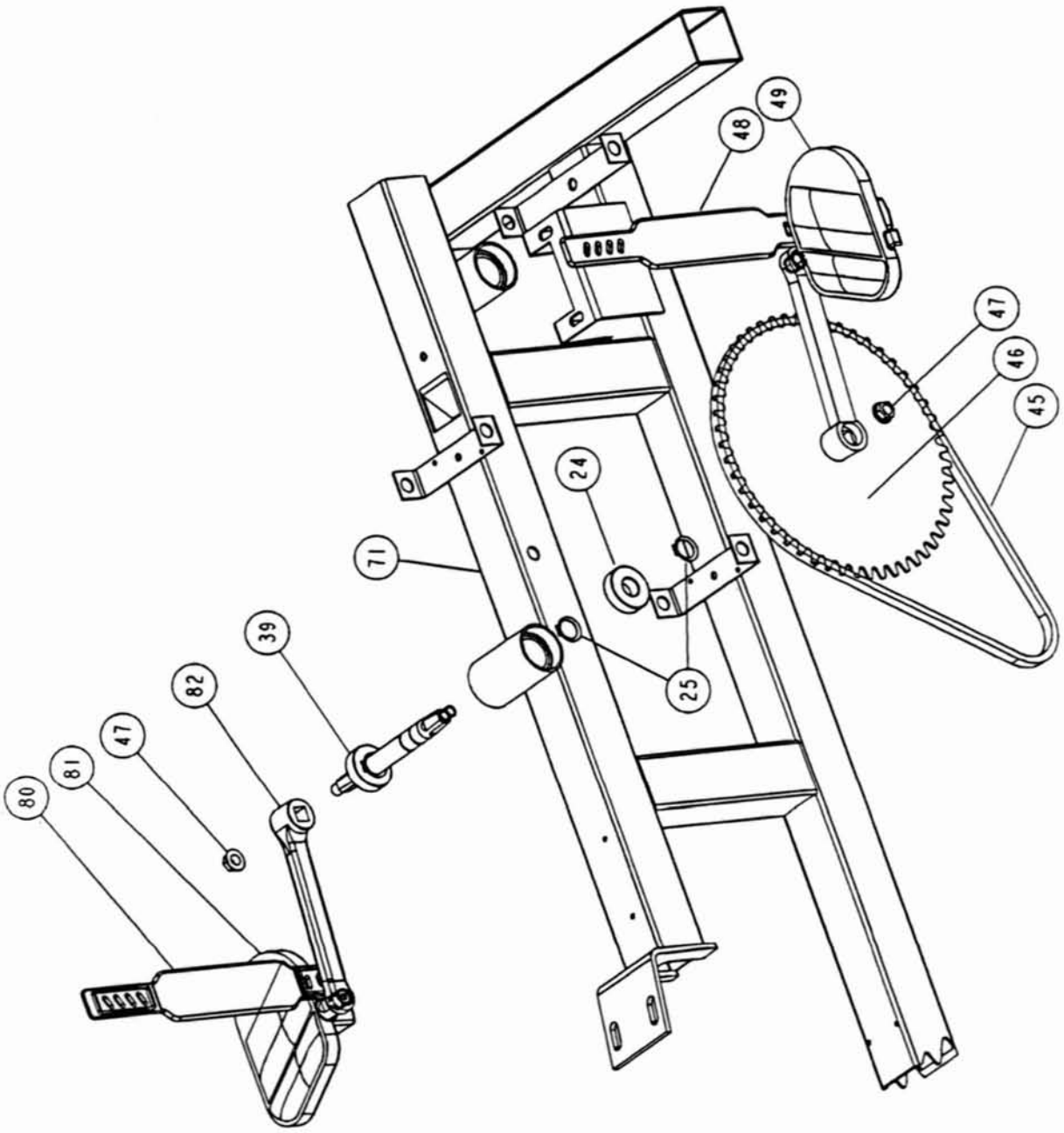

Diagram C-1. 8.2E/L Recumbent Cycle Exploded View Diagram (Page 4 of 6)

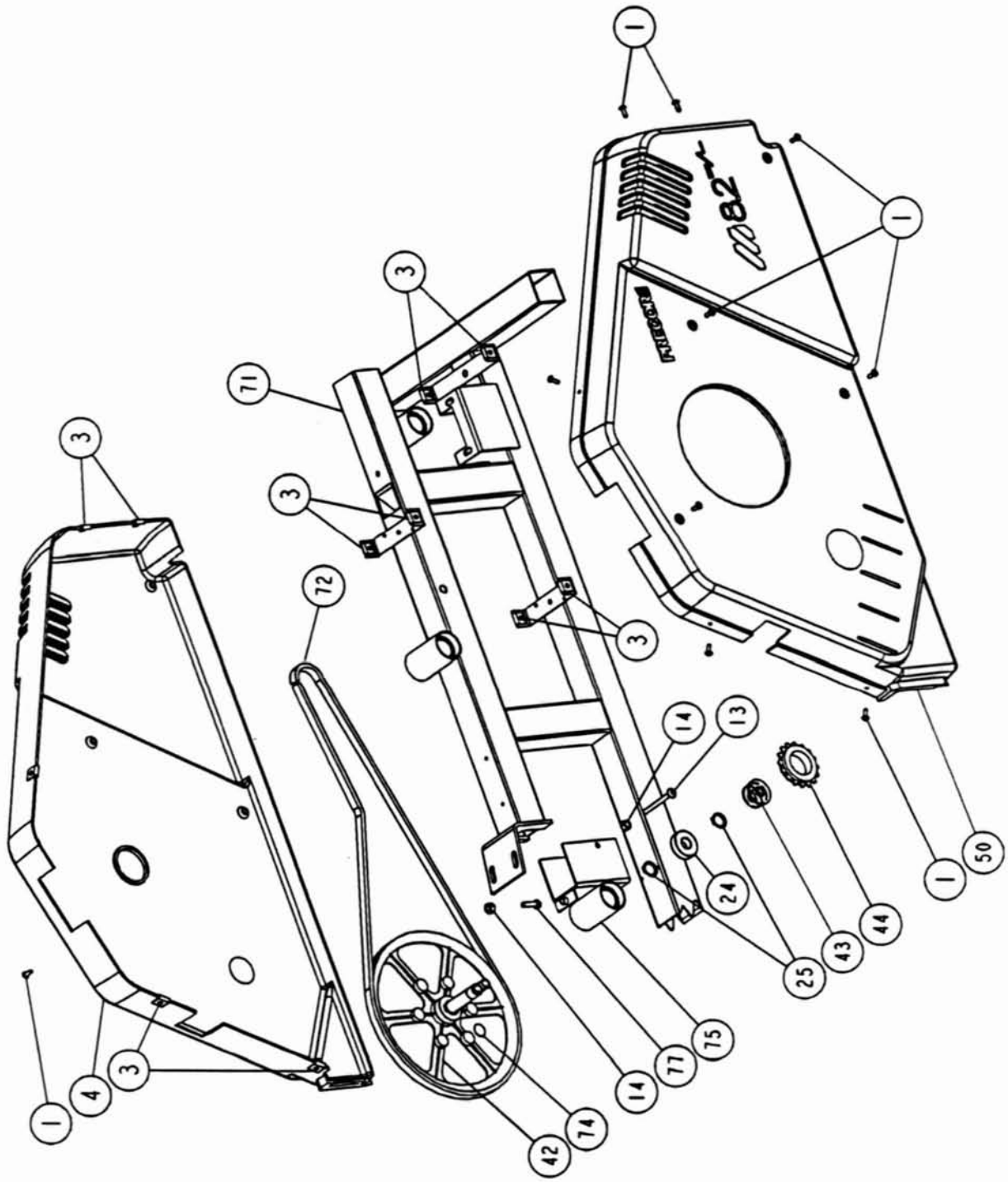

Diagram C-1. 8.2E/L Recumbent Cycle Exploded View Diagram (Page 5 of 6)

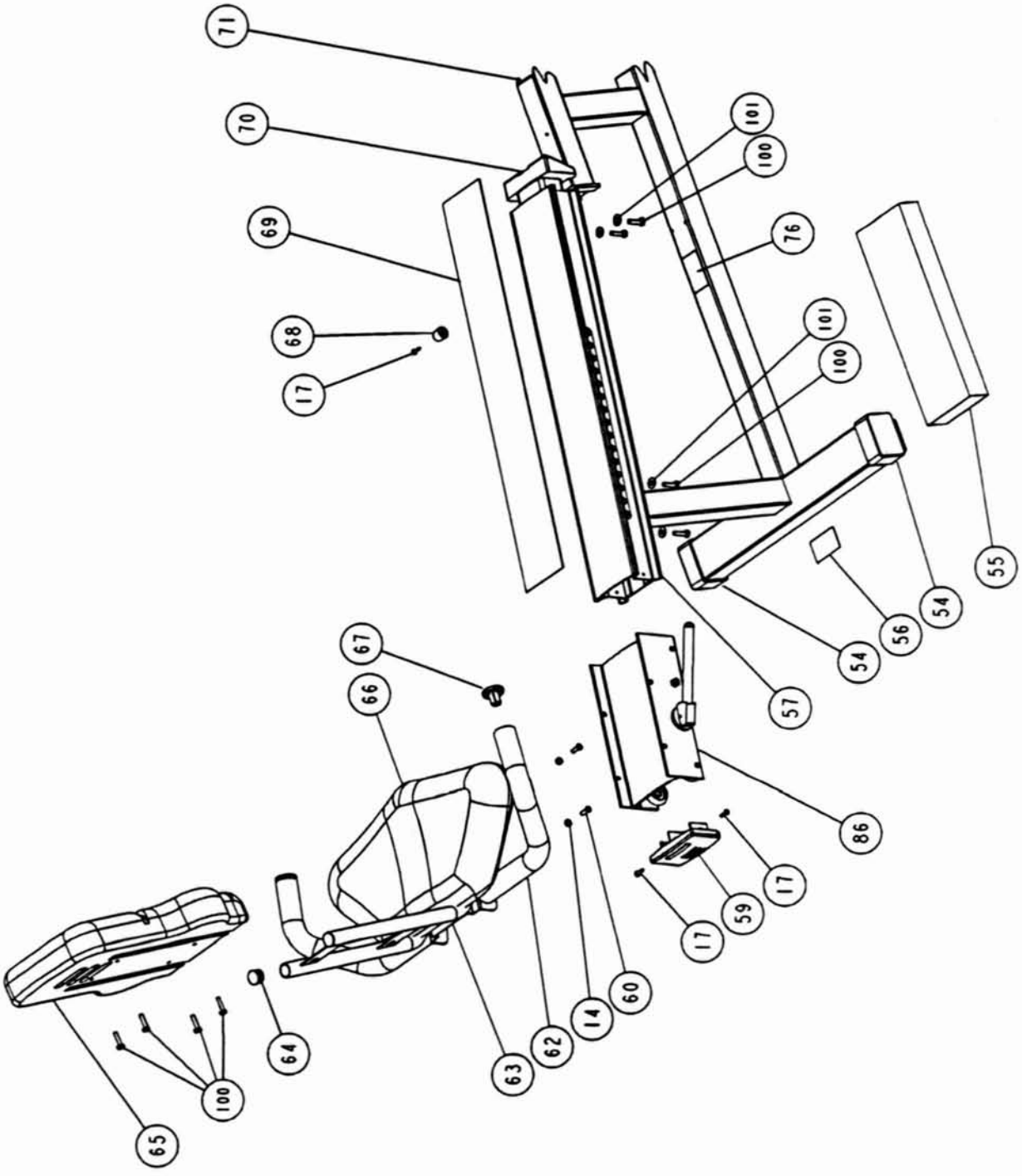

Diagram C-1. 8.2E/L Recumbent Cycle Exploded View Diagram (Page 6 of 6)

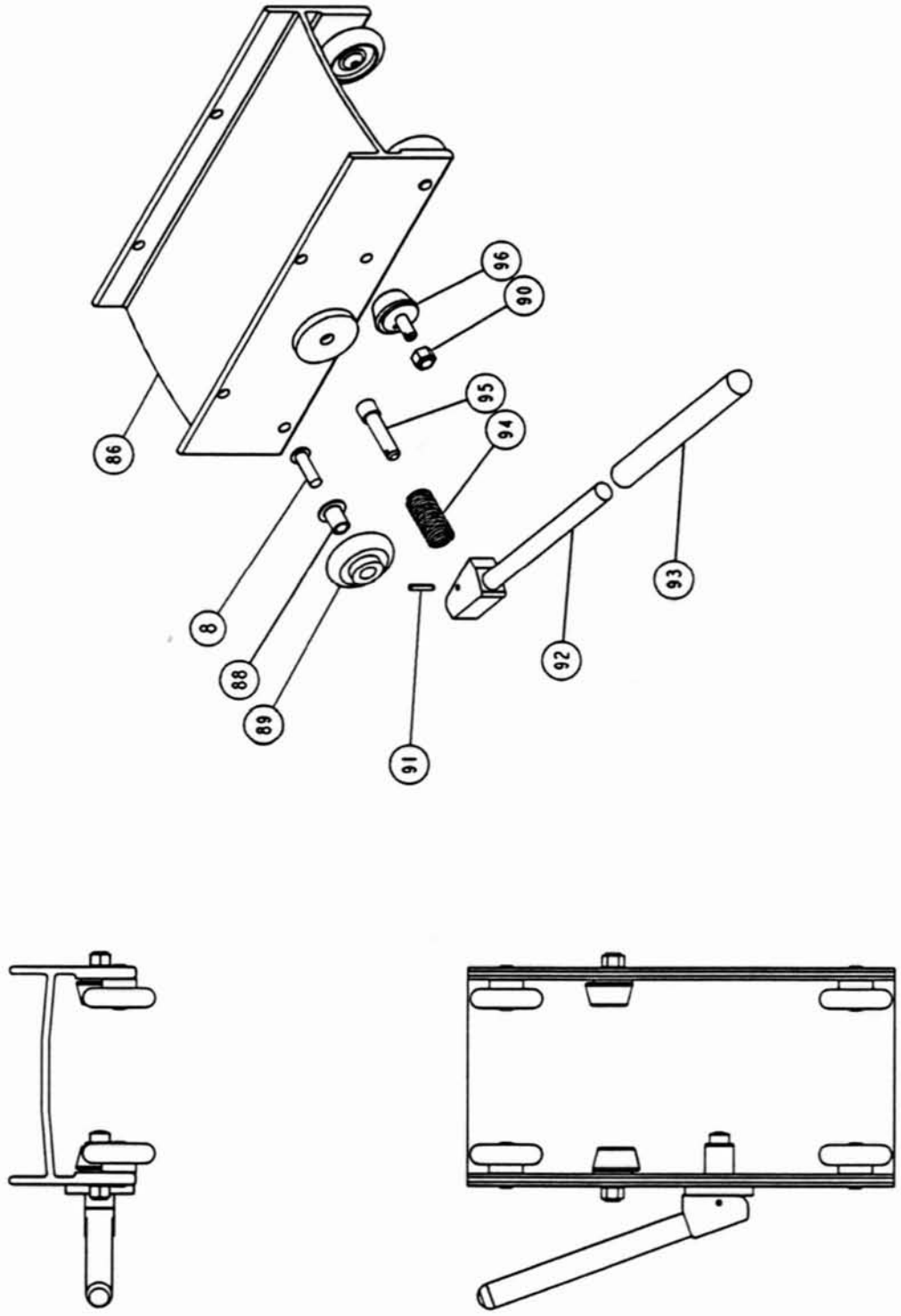

Table C-1. Exploded View Item Numbers

Item Number	Part Number	Description
1	10016-107	SCREW, TRUSS HD TAPP, #8 X3/4, PHIL DR, BLK XYL
3	10136-101	CLIP, U TYPE, TINNERMAN, #8
4	36128-101	COVER, LEFT, 8.2R
5	33716-101	ASSY, TOP ENCLOSURE W/LABEL, 8.2
6	36226-321	PROM, PROGRAMMED, 8.2R, VER 3.21
7	33431-106	ASSY, PCA UPPER DISPLAY, 7.2, 8.2
8	10005-126	SCREW, BTN SCKT, HD, 5/16-18 X 1, HX DR., BLK XYL
9	33618-102	ASSY, DISPLAY ARM, PAINTED
10	33625-102	ASSY, CABLE, DISPLAY, 8.2R
11	36026-101	SLEEVE, DISPLAY ARM, 8.2R
12	36046-104	ASSY, DISPLAY POST, PAINTED
13	10005-131	SCREW, BTN SOC,1/4-20 X 2-1/2HEX DR, BLK XYLAN
14	10008-110	LOCKNUT, HALF, 1/4-20, BLK OXIDE
15	10030-112	SCREW SET, 5/16-24 X 3/8
16	36082-101	MOUNT, HEART RATE MONITOR
17	10006-124	SCREW, PAN HD, S/T, #10 X 3/4 AB, PHIL DR, BLK XYL
18	33899-101	LABEL, HEART MONITOR PLACEMENT
19	33386-101	FLYWHEEL, 8.2
20	10425-116	SCREW, SET, KNURLED CUP POINT
21	33419-101	DISC, ALUMINUM 8.2
22	10139-134	SCREW, FLT HD,10-32 X 1/2 BRASSPHILLIPS
23	10220-105	KEY, SQUARE 3/16 X 1 3/8
24	10158-106	BEARING, BALL, 6203-2RSC4
25	10133-123	RING, RETAINER, .688
26	10003-131	SCREW, 10-32 X 1 3/4 HEX SOC
27	33539-102	ASSY, MAGNET, 8.2R
28	33482-101	GASKET, COIL, 8.2
29	33481-101	PLATE, NUT, GOLD ZINC, 8.2
30	33395-101	GUIDE, AXLE, 8.2 C760
31	33421-101	AXLE, WHEEL, 8.2
32	10196-109	SPACER, .50 X .80 X .22, NYLON
33	33392-101	WHEEL, FRONT, 8.2 7.2 C760
34	33009-101	LABEL, PLUNGER, 8.8SP
35	32468-101	FAN, TREADS, 8.2
36	50801-105	ASSY, FLYWHEEL AXLE, 8.2
37	10589-105	SPRING, EXT, 375 X 4.50LEE# LE-055D-12M
38	10043-104	BEARING, FLANGED, .377 ID, 8.2
39	50819-101	ASSY, CRANK AXLE, 8.2
40	10332-101	MOUNT, CABLE TIE
41	10123-102	TIE, CABLE, 3 7/8
42	50818-102	ASSY, SHEAVE AXLE, 8.2
43	33471-102	HUB, FREEWHEEL, 8.2
44	10074-103	SPROCKET, FREEWHEEL, 18 TOOTH, 8.2
45	10075-104	CHAIN, 1/2 X 3/32, 72 PITCHES 8.2
46	33332-102	CHAINWHEEL W/CRANKARM, 52 TH8.2U/R
47	10735-101	NUT, FLANGED, 8.2U
48	33521-101	STRAP, PEDAL, RIGHT, 8.2
49	33433-101	PEDAL, RIGHT, W/STRAP, 8.2

Table C-1. Exploded View Item Numbers (continued)

Item Number	Part Number	Description
50	36127-101	COVER, RIGHT, 8.2R
51	10141-105	SCRW, WSHR HD, #10 X 3/4SELFTAP, HEX/SLOT, ZNC
52	10013-102	WASHER, LOCK #10
53	36260-102	BRACKET, SWITCH, PAINTED, 8.2R
54	33398-101	ENDCAP, REAR, 7.2, 8.2
55	10743-102	CABLE, COILCORD, HEARTRATE MONITOR
55	10744-101	TRANSMTTR, POLAR W/STRP, HEARTRATE MONITOR
55	10745-101	RECEIVER, POLAR, HEARTRATE MONITOR
55	10774-101	CLIP, PLASTIC
55	33690-101	COVER, HEARTRATE MONITOR
55	33851-101	SHIELD, HEARTRATE RECEIVEREL PRODUCTS
55	36170-101	KIT, HEART RATE MONITOR, 7.2, 8.2
56	33273-150	LABEL, SERIAL NBR/PATENT, 8.2R
57	33584-103	RAIL, PAINTED AND SLOTTED, 8.2R
59	33632-101	CAP, END, SEAT RAIL, 8.2R
60	10005-148	SCREW, BTN SKT 1/4-20 X 3/4, HEXDR, BLK XYL
62	33414-105	GRIP, FOAM, 17.00, 8.2R
63	33592-102	ASSY, SEAT FRAME, PAINTED, 8.2R
64	31150-103	CAP, TUBE, 1"
65	33591-101	SEAT, BACKREST, MOLDED, 8.2R
66	33590-101	SEAT, BASE, MOLDED, 8.2R
67	33861-101	CAP, HANDLEBAR
68	30696-101	BUMPER, SEAT STOP
69	33926-101	LABEL, RAIL
70	33633-101	SLEEVE, RAIL, 8.2R
71	33629-102	ASSY, FRAME, PAINTED, 8.2R
72	10561-105	BELT, POLY-V, 61", 610J6, 8.2
74	33695-101	LABEL, TARGET, SHEAVE, 8.2
75	33470-102	ASSY, BRACKET, SLEEVEADJUSTMENT, PTD, 8.2
76	36236-101	LABEL, FCC COMPLIANCE, 8.2R
77	10002-120	SCREW, HEX CAP, GR 2, 1/4-20 X 1, ZINC
78	36182-101	ASSEMBLY, TRANSFORMER, STEPDOWN, 7.2
79	33854-102	PCA, WITH BRACKET, 8.2RLOWER
80	33521-102	STRAP, PEDAL, LEFT, 8.2
81	33433-102	PEDAL, LEFT, W/STRAP, 8.2
82	10717-101	CRANKARM, 8.2
83	10547-101	WHEEL, IDLER W/BEARINGDAYCD#175IF075
84	33790-101	WELDMENT, IDLER ARM, 8.2
85	10553-101	PIN, COTTER 1/8 X 3/4 STL
86	34015-102	ASSY, CARRIAGE WELDMENT, PAINTED
88	30892-101	BUSHING, FLANGED, 515E
89	33067-102	TIRE, CARRIAGE, NEW, 515E
90	10009-104	LOCKNUT, FULL, 5/16-18, HEX1/2, BLACK
91	10014-116	PIN, ROLL, 1/8 X 3/4, BLACK
92	36190-102	ASSY, DETENT HANDLE, PAINTED
93	11029-101	GRIP, HANDLE
94	10231-112	SPRING, COMPRESSION, 8.2R
95	34014-101	PIN, DETENT

Table C-1. Exploded View Item Numbers (continued)

Item Number	Part Number	Description
96	50831-101	ASSY, ROLLER GUIDE
99	50828-103	ASSY, SHIPPER, 8.2R
100	10002-121	SCREW, HEX CAP, 5/16-18 X 1, BLACK XYLAN
101	10019-105	WASHER, DISK SPRING, .383 I0 9.3
102	33639-101	ASSY, BTM ENCLOSURE W/PLACARD 7.2 8.2 9.4 EL
103	33612-101	LABEL, PLACARD, 8.2
104	33725-102	ASSY, POWER CORD, 110V, 8.2R
105	11074-101	BREAKER, 3 AMP, 250V, 7.2, 8.2
106	10130-111	STRAIN RELIEF, 1247
107	10749-101	SWITCH, ROCKER, TWO POLE 7.2, 8.2
108	33724-101	ASSY, WIRE, BREAKER/SWT, 7.2 8.2
200	33626-101	KIT, LITERATURE, 8.2R
209	36287-101	WARRANTY CARD, RESIDENTIALEQUIPMENT

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Appendix D
Service Bulletins and Engineering Change Notices

If you receive a Service Bulletin or Engineering Change Notice (ECN) from Precor about an 8.2E/L Recumbent Cycle, record the number, title, topic, and effective date of the service bulletin or ECN in the table below. File the service bulletin/ECN in this appendix.

Number	Title	Date

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Appendix B
Maintaining 220-Volt 8.2E/L Recumbent Cycles

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About 220-Volt 8.2E/L Recumbent Cycles

220-Volt Components

Component differences between 110- and 220-volt units are listed below:

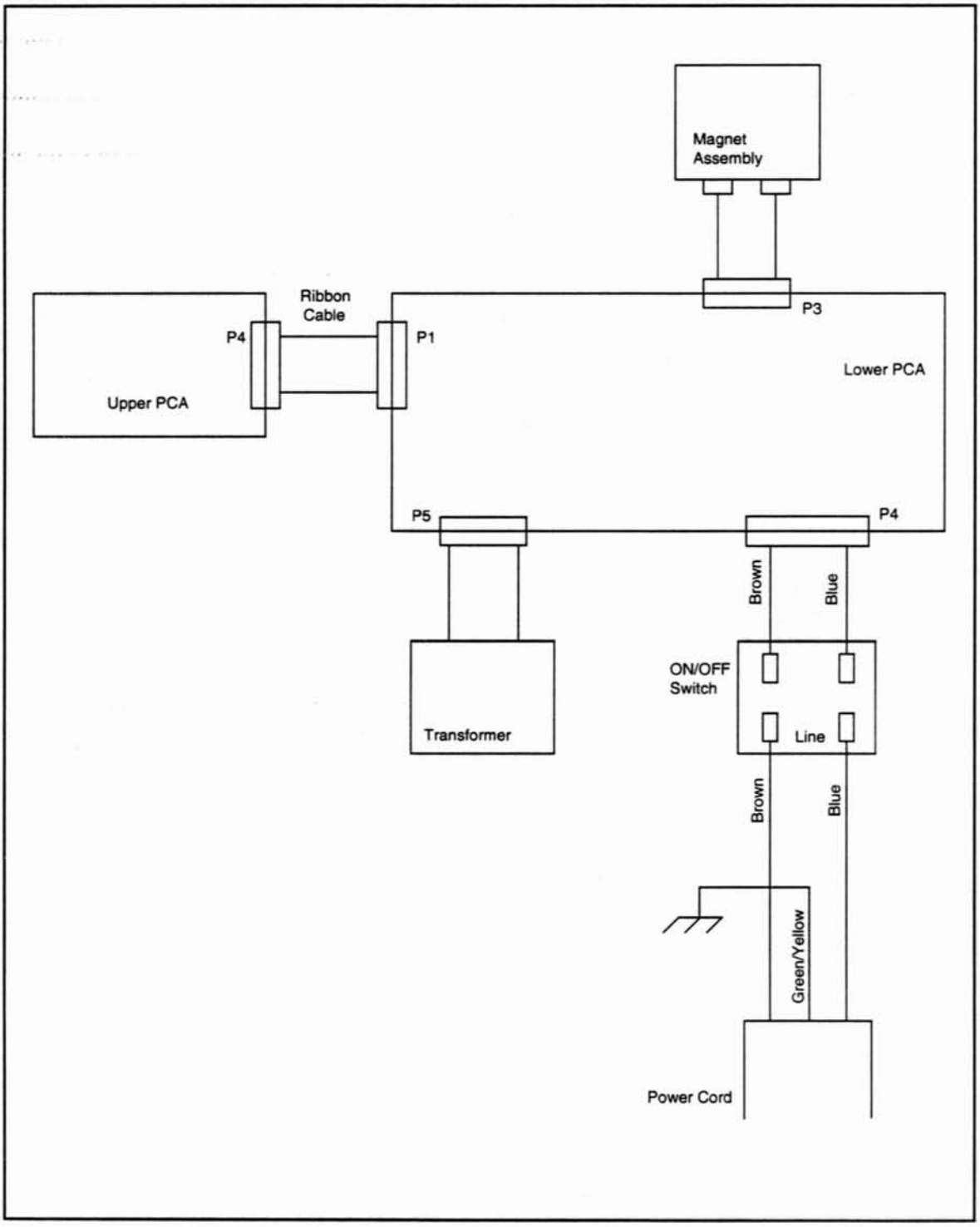
- Lower PCAs, power cords, and ON/OFF switches are not interchangeable between 110– and 220-volt units.
- 220-volt units do not use a thermal breaker.
- 220-volt units have an AC power cable (this cable is not used on 110-volt units).

Table B-1 lists the part numbers for 220-volt components. Diagram B-1 is the wiring diagram for 220-volt 8.2E/L Recumbent Cycles.

Table B-1. 220-Volt Part Numbers

Voltage	Description	Part Number
110-Volt	Lower PCA (with transformer) - older units	33500-104
110-Volt	Lower PCA (without transformer)	33500-105
220-volt	Lower PCA (without transformer)	36293-101
110-Volt	Power cord (plugged into power entry module) - older units	10392-101
110-Volt	Power cord (wired to ON/OFF switch and P4 on lower PCA)	33725-101
220-volt	Power cord (wired to ON/OFF switch only)	36100-101
110-Volt	ON/OFF switch (mounted in power entry module) - older units	10714-101
110-Volt	ON/OFF switch (mounted in power entry bracket)	10749-101
220-volt	ON/OFF switch	11076-101
220-volt	AC power cable	36180-101

Diagram B-1. Wiring Diagram for 220-Volt 8.2E/L Recumbent Cycles



Maintenance Procedures For 220-Volt Recumbent Cycles

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Procedure B.1

Removing and Replacing the ON/OFF Switch

Required Tools and Equipment

None required for this procedure.

Removing the ON/OFF Switch

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

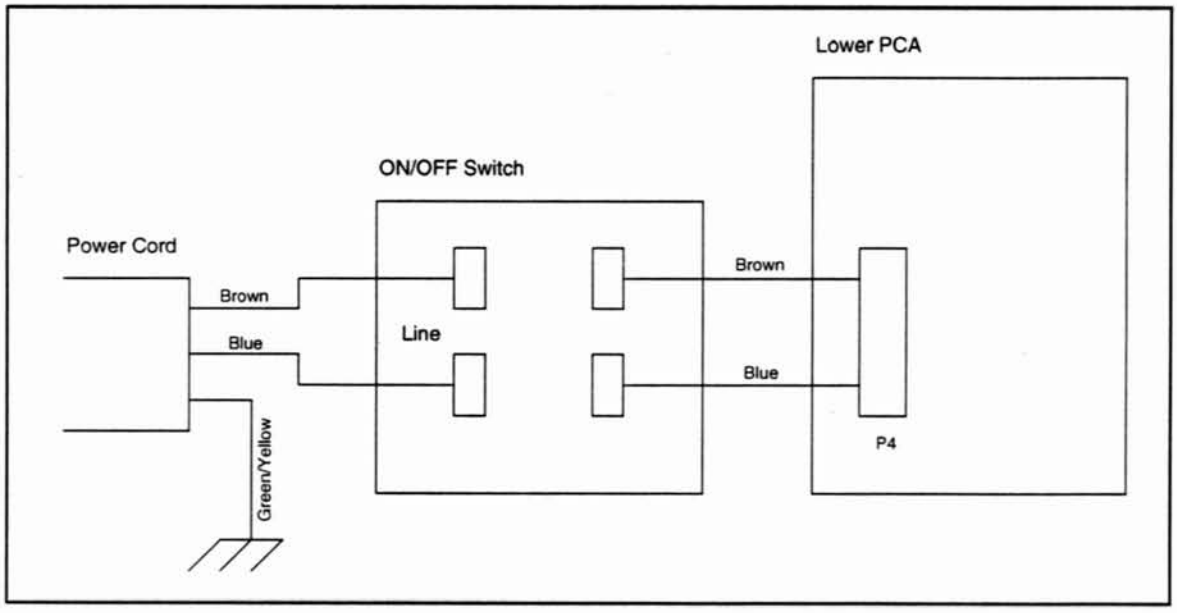
WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Remove the four wires connected to the ON/OFF switch (see Diagram B-2).

Note
Notice the orientation of the ON/OFF switch in the power bracket. The new switch must be positioned the same way when you mount it in the bracket.

3. Push the ON/OFF switch out of the power bracket assembly.

Diagram B-2. ON/OFF Switch For 220-Volt 8.2E/L Recumbent Cycles



Replacing the ON/OFF Switch

4. Position the new ON/OFF switch in the power bracket assembly. Make sure that the orientation of the new switch is the same as that of the original switch.

   Note
   The line terminals are marked on the ON/OFF switch. The load terminals on the ON/OFF switch are not marked. When you attach the wires to the ON/OFF switch, make sure that you connect the same color of wire to opposing terminals (refer back to Diagram B-2).

5. Attach the brown and blue wires connected to P4 on the lower PCA to the unmarked terminals on the ON/OFF switch.

6. Connect the brown power cord wire to the empty terminal across from the brown wire on the ON/OFF switch. Connect the blue power cord wire to the terminal across from the blue wire on the ON/OFF switch (refer back to Diagram B-2).

7. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

8. Check the cycle operation as described in Section 5, *Checking Cycle Operation.*

Procedure B.2

Removing and Replacing the Power Cord

Required Tools and Equipment

5/16" nut driver
pliers
ruler

Removing the Power Cord

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Disconnect the brown and blue wires from the line terminals on the ON/OFF switch (refer back to Diagram B-2).

3. Using the 5/16" nut driver, remove the self-tapping screw and lock washer that secure the green/yellow ground wire to the cycle frame.

4. Using the ruler, measure the distance between the strain relief and the power cord terminals.

Note
Make a note of the distance measured in Step 4. When you mount the new power cord, the distance between the strain relief and the power cord terminals must be equal to the distance measured in Step 4.

5. Using the pliers, press the two sections of the strain relief together. Keep the pressure on the strain relief while you pull the power cord away from the power bracket assembly.

6. Remove the strain relief from the defective power cord. Pull the new power cord through the strain relief until the distance between the strain relief and the power cord terminals is equal to the distance measured in Step 4.

Replacing the Power Cord

7. Using the pliers, squeeze the strain relief while you push it into the power cord mounting hole on the power bracket assembly.

8. Position the green/yellow ground wire at its mounting location.

9. Using the 5/16" nut driver, replace the self-tapping screw and lock washer that secure the green/yellow ground wire to the cycle frame.

10. Refer back to Diagram B-2. Connect the brown power cord wire to the empty terminal across from the brown wire on the ON/OFF switch. Connect the blue power cord wire to the terminal across from the blue wire on the ON/OFF switch.

11. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers*.

12. Check the cycle operation as described in Section 5, *Checking Cycle Operation*.

Procedure B.3

Removing and Replacing the AC Power Cable

Required Tools and Equipment

None required for this procedure.

Removing the AC Power Cable

1. Remove the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

WARNING
Before performing maintenance operations with the covers removed, review the Warning and Caution statements listed in Section Two, *Things You Should Know.*

2. Remove the molex connector from P4 on the lower PCA.

3. Remove the brown and blue wires from the ON/OFF switch terminals that are not marked (refer back to Diagram B-2).

Replacing the AC Power Cable

4. Connect the brown wire on the AC power cable to the empty terminal across from the brown wire on the ON/OFF switch. Connect the blue wire on the AC power cable to the empty terminal across from the blue wire on the ON/OFF switch.

5. Connect the molex connector on the power cord to P4 on the lower PCA.

6. Replace the covers as described in Procedure 7.1, *Removing and Replacing the Covers.*

7. Check the operation of the cycle as described in Section 5, *Checking Cycle Operation.*

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Troubleshooting Flow Charts For 220-Volt Recumbent Cycles

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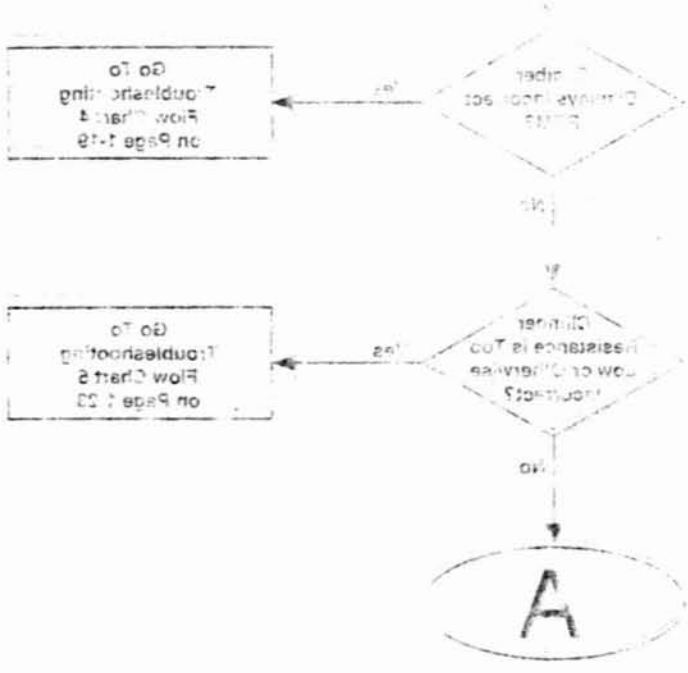
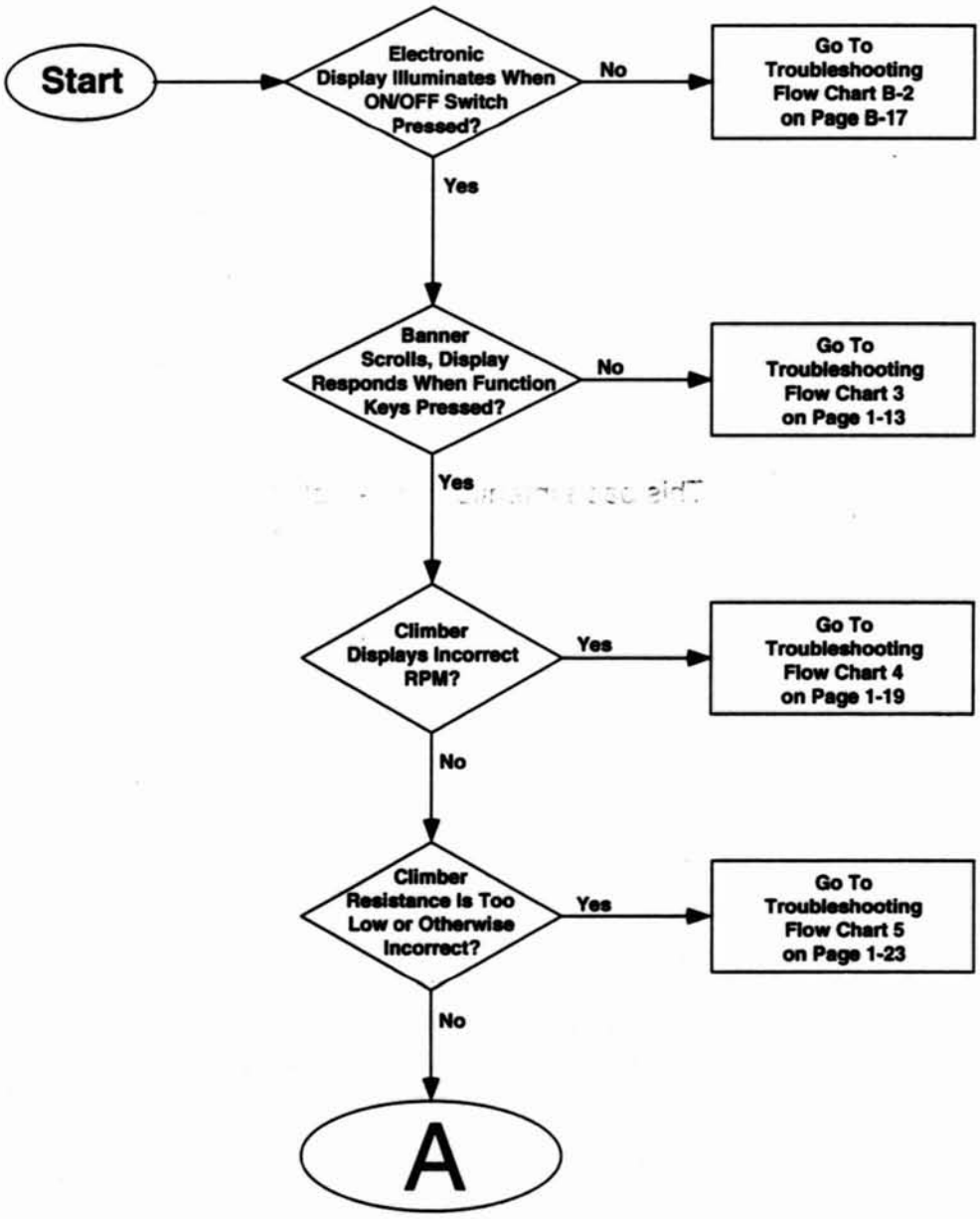
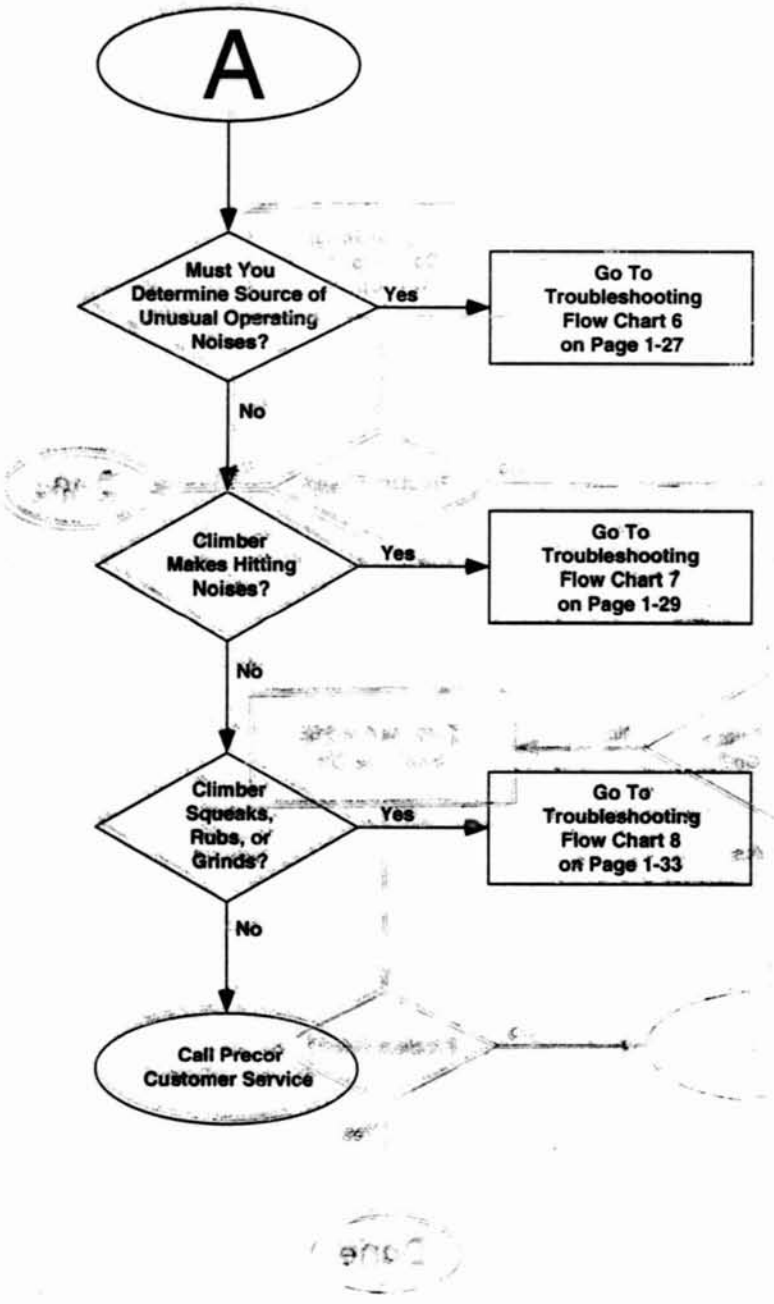


Flow Chart B-1 (1 of 2)

Troubleshooting Index For 220-Volt Recumbent Cycles

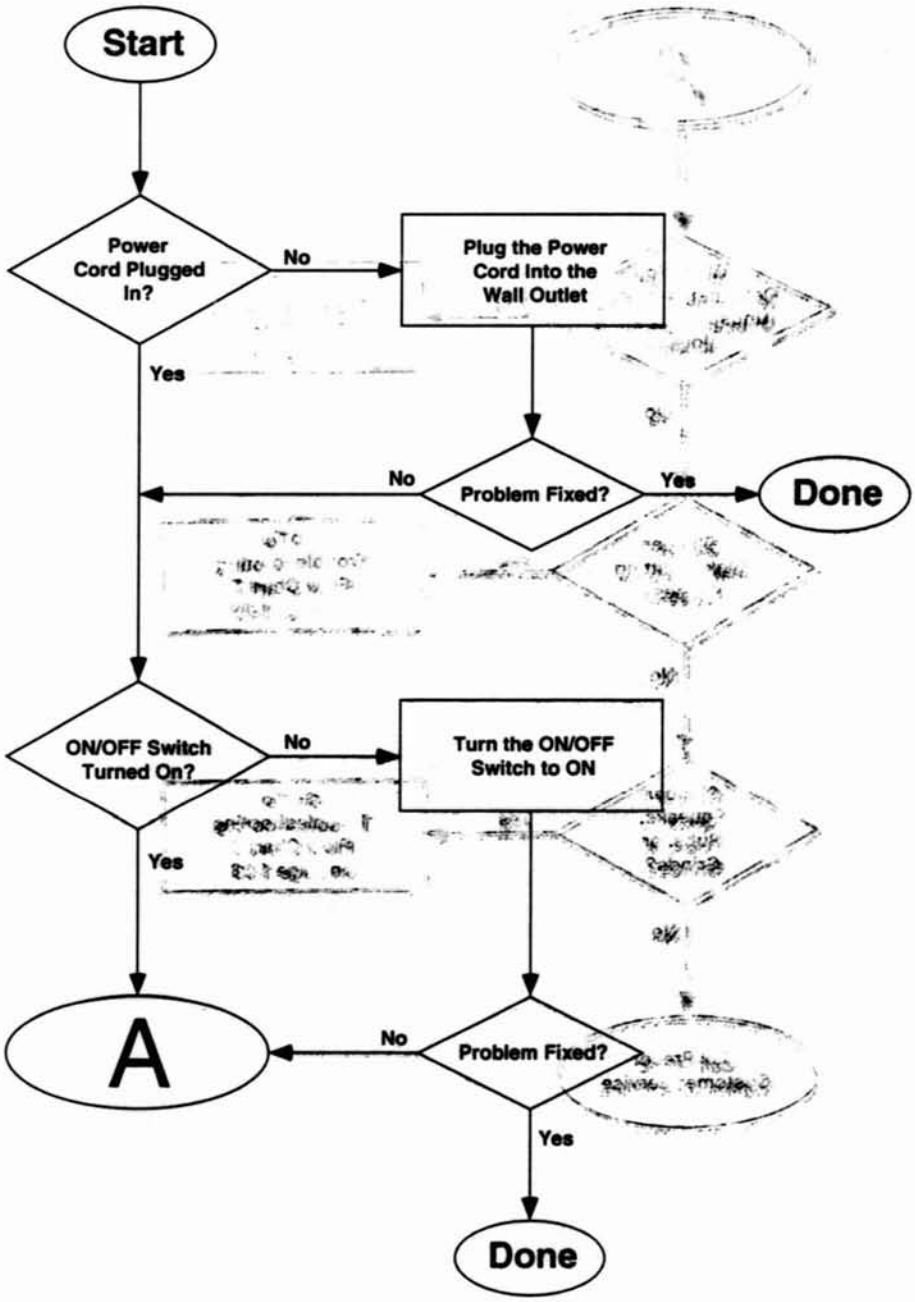


Flow Chart B-1 (2 of 2)
Troubleshooting Index For 220-Volt Recumbent Cycles



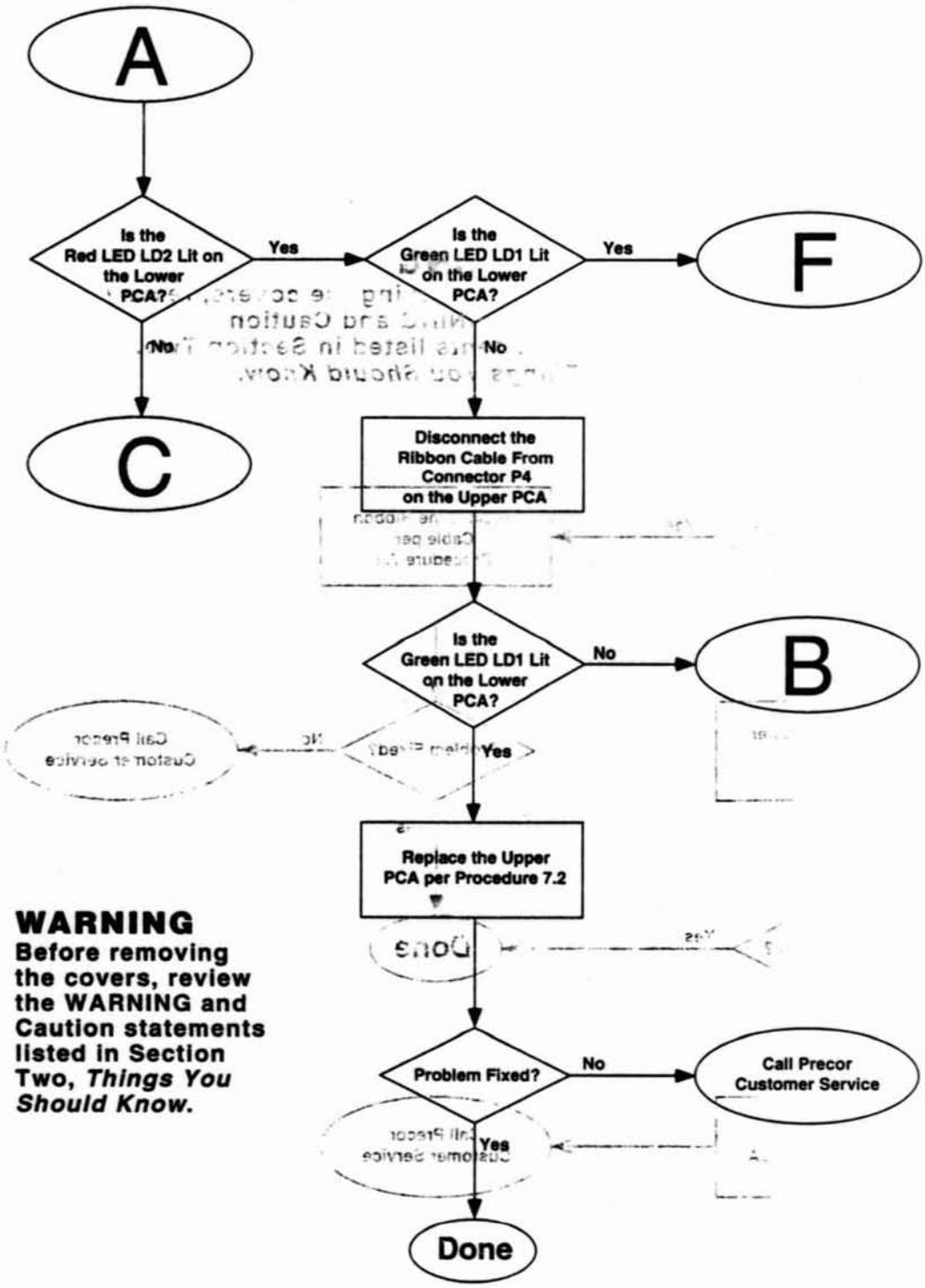
Flow Chart B-2 (1 of 8)

Electronic Display Does Not Illuminate On 220-Volt Recumbent Cycles



Flow Chart B-2 (2 of 8)

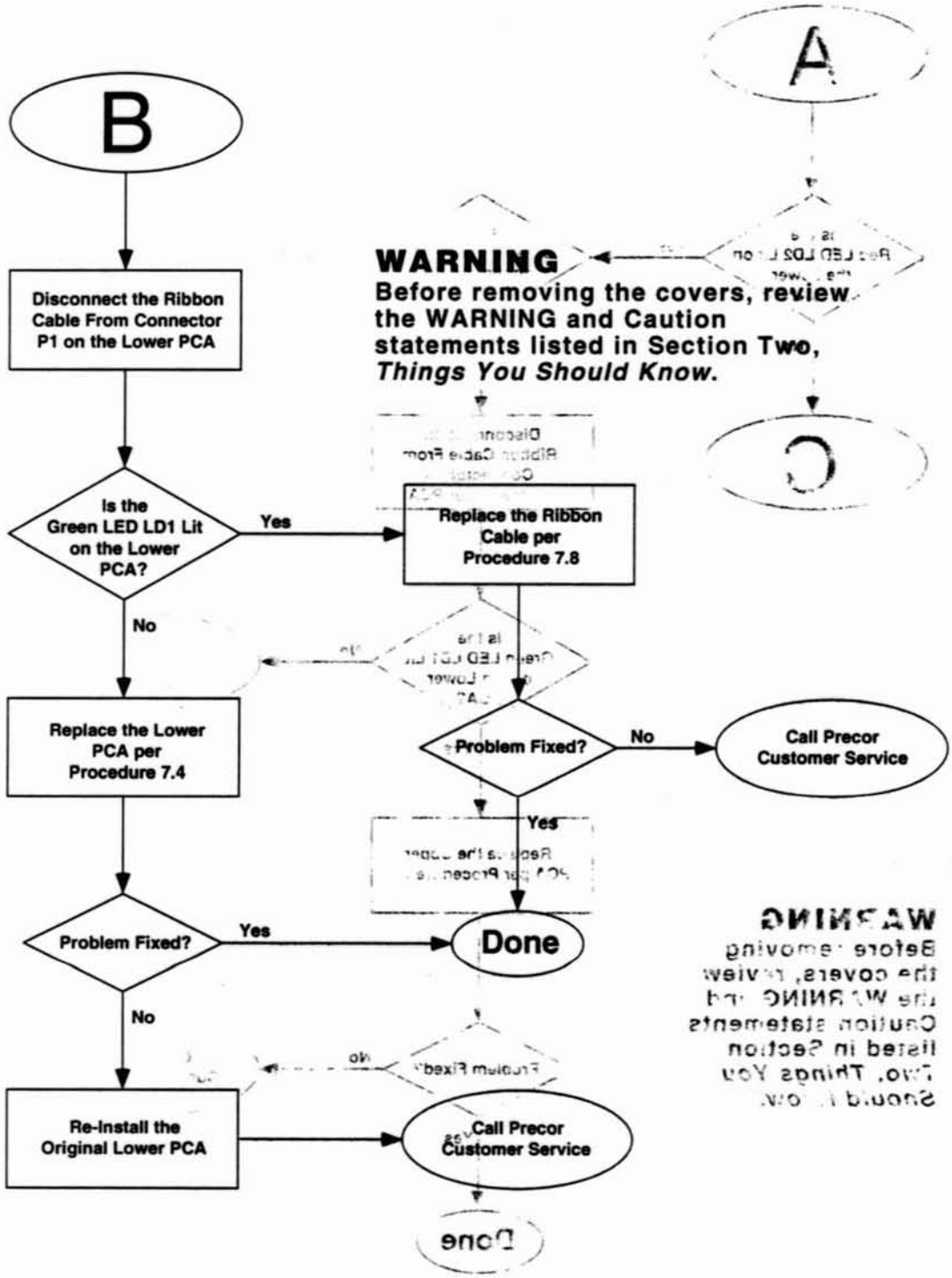
Electronic Display Does Not Illuminate On 220-Volt Recumbent Cycles



WARNING
Before removing the covers, review the WARNING and Caution statements listed in Section Two, *Things You Should Know.*

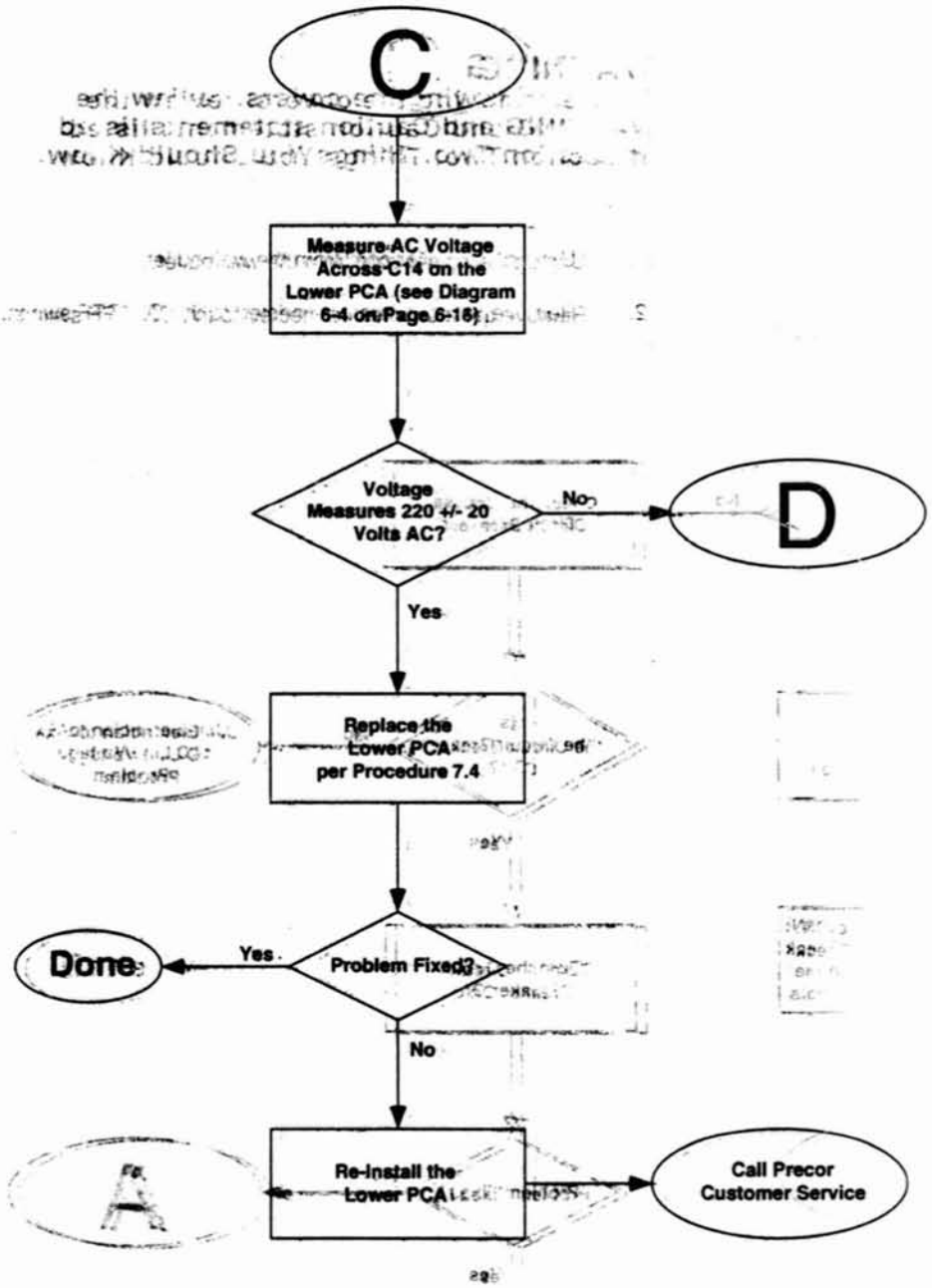
Flow Chart B-2 (3 of 8)

Electronic Display Does Not Illuminate On 220-Volt Recumbent Cycles



Flow Chart B-2 (4 of 8)

Electronic Display Does Not Illuminate On 220-Volt Recumbent Cycles

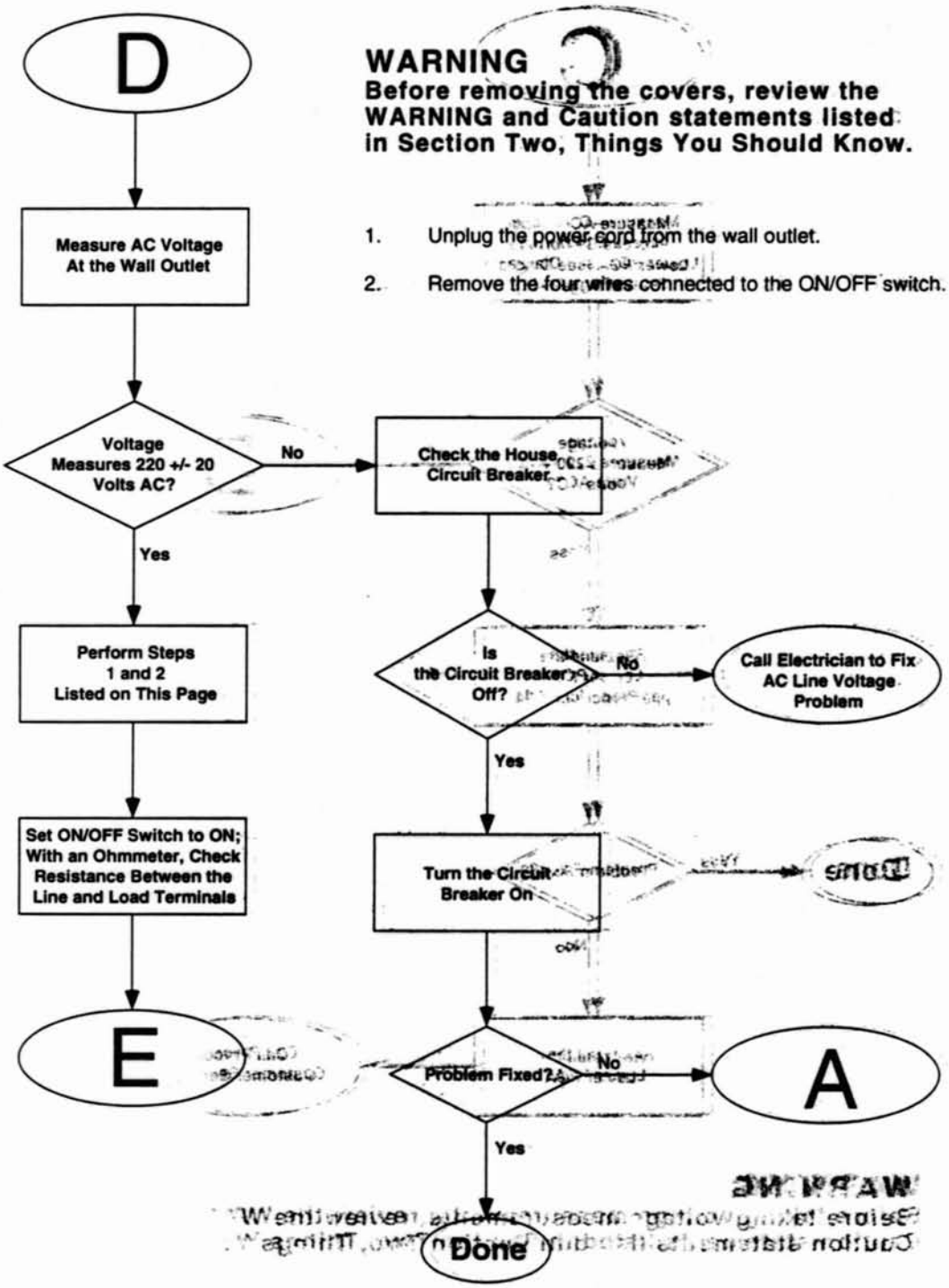


WARNING

Before taking voltage measurements, review the WARNING and Caution statements listed in Section Two, Things You Should Know.

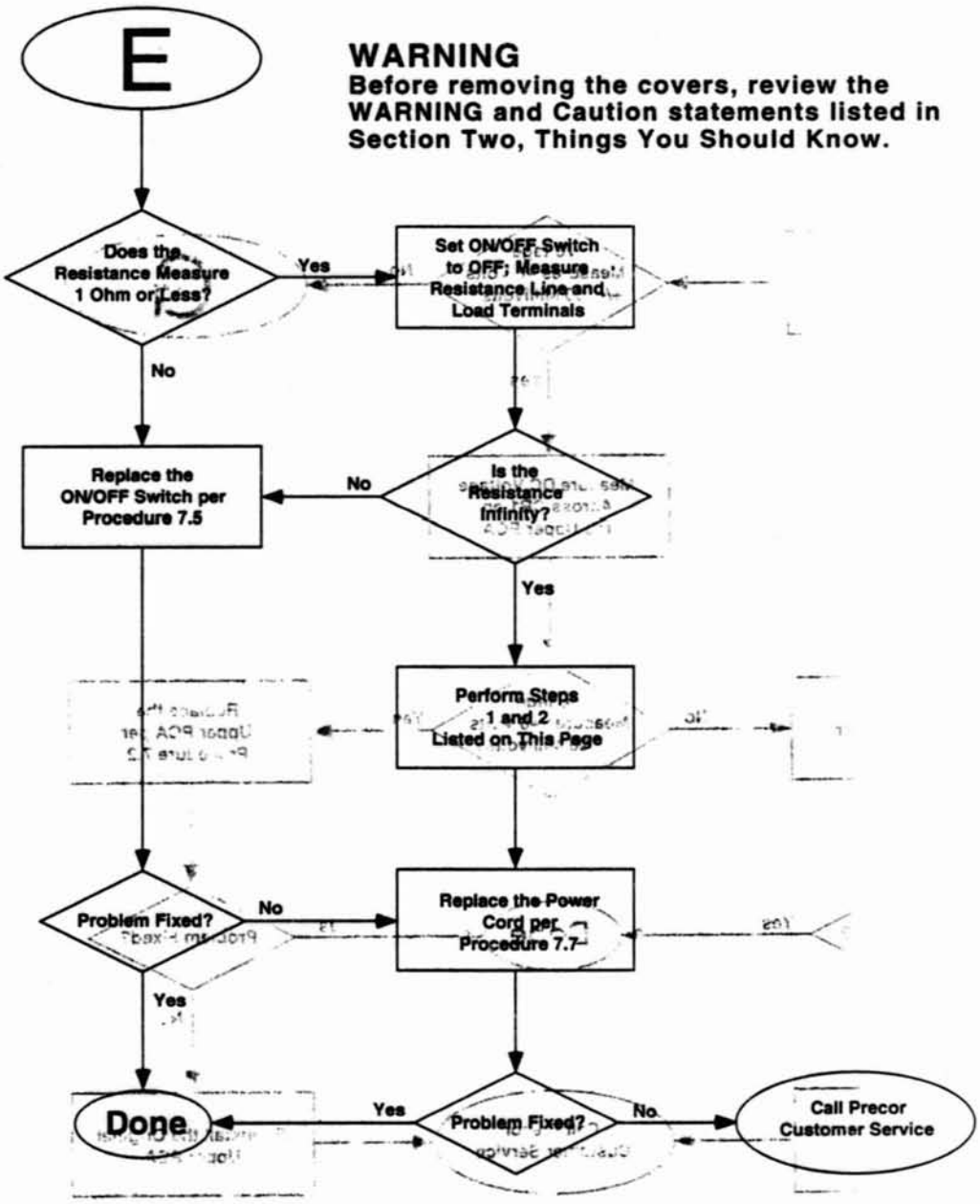
Flow Chart B-2 (5 of 8)

Electronic Display Does Not Illuminate On 220-Volt Recumbent Cycles



Flow Chart B-2 (6 of 8)

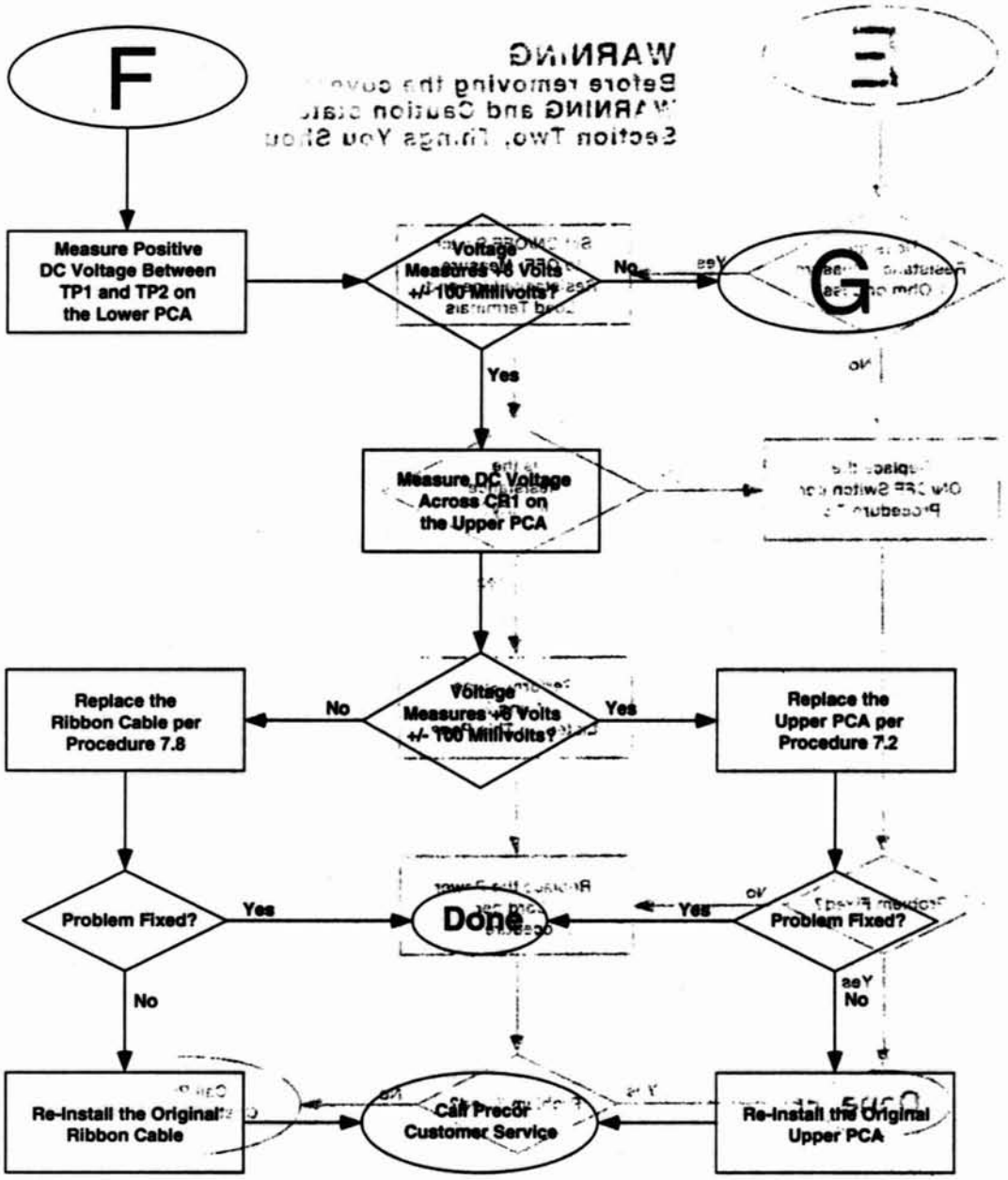
Electronic Display Does Not Illuminate On 220-Volt Recumbent Cycles



1. **Attach the brown and blue wires connected to P4 on the lower PCA to the unmarked terminals on the ON/OFF switch.**
2. **Connect the brown power cord wire to the empty terminal across from the brown wire on the ON/OFF switch. Connect the blue power cord wire to the terminal across from the blue wire on the ON/OFF switch (refer back to Diagram B-2).**

Flow Chart B-2 (7 of 8)

Electronic Display Does Not Illuminate On 220-Volt Recumbent Cycles



WARNING

Before removing the covers, review the WARNING and Caution statements listed in Section Two, *Things You Should Know*.

Flow Chart B-2 (8 of 8)

Electronic Display Does Not Illuminate On 220-Volt Recumbent Cycles