

FREERUNNER



5400 ESS

# FreeRunner™ 5400 ESS Owner's Manual



**StairMaster**



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**PINZ7027-B**

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## **10 REASONS WHY MORE HEALTH AND FITNESS FACILITIES CHOOSE STAIRMASTER® EQUIPMENT**

### **OUTSTANDING QUALITY**

Equipment you can depend upon, week after week, for heavy commercial use - instead of a sign that says "out of order."

### **EXCEPTIONAL PERFORMANCE**

Generates exceptional customer satisfaction - allowing you to retain existing club members and attract new ones.

### **IMMEDIATE CUSTOMER RECOGNITION**

An excellent first impression is critical to attracting new club members to your facility. The StairMaster name on your equipment reinforces your club's reputation for quality and effectiveness.

### **NATIONAL SALES SUPPORT**

StairMaster is one of the few organizations that maintains its own fully staffed national sales organization. These individuals will bend over backwards to make sure you are satisfied.

### **FACTORY-TRAINED SERVICE NETWORK**

The StairMaster service staff is on call to quickly address any product concerns. Service is just a toll-free call away.

### **FACTORY DIRECT PRICES**

No warehousing fee. No retail markup. StairMaster sells directly to you for the best prices available.

### **AFFORDABLE LEASING PROGRAM**

We help you make the most of your money, with several types of leasing programs available.

### **FACILITY PLANNING**

Cordless units. Space-efficient designs. Exciting facility layout plans. Our staff works closely with you to maximize the equipment layout of your club or fitness area.

### **PRE-ASSEMBLED DELIVERY**

No set-up, no hassle.

### **MARKETING SUPPORT**

Lots of sizzle - with StairMaster product catalogs, posters, promotional kits, and seasonal promotions.



## A FULL LINE OF EXCEPTIONAL PRODUCTS

### STAIRCLIMBERS

*The Best in the Industry*

Our popular FreeClimber® stairclimber line - with upright handlebars and a rail-less design - now offers you 3 different models to choose from. These models include the fully featured FreeClimber 4400 PT, the cordless FreeClimber 4400 CL with Polar® Heart Rate Monitor, and the cost-efficient FreeClimber 4200 PT - designed especially for health clubs.

Other StairMaster® stairclimbers include the Stepmill® 7000 PT - for the most challenging stairclimbing workout - as well as the legendary StairMaster 4000 PT®.

### ELLIPTICAL STRIDING SYSTEMS

*The New StairMaster FreeRunner*

Introducing the StairMaster FreeRunner™ 5400 ESS - a revolutionary new design that allows you to vary your stride length from 10" to 40." Not only does this unique VSL feature accommodate all users, it also provides enhanced lower-body conditioning - with greater involvement of the glutes, quadriceps, and hamstrings.

For total-body conditioning, club members will love the fact they can use the handles on the StairMaster FreeRunner 5400 for an effective upper-body workout. These handles can also be easily disengaged to rest on the side of the machine.



## A FULL LINE OF EXCEPTIONAL PRODUCTS

### TREADMILLS

*The Highest Quality*

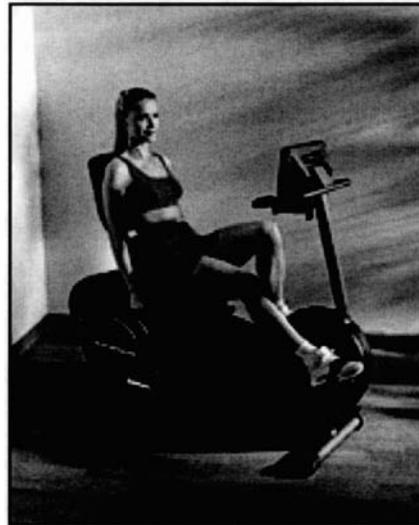
In response to many requests we received from our customers for a high quality treadmill, StairMaster® has selected the Quinton® treadmill as a new addition to our product line - with three different models to choose from - the ClubTrack®, the HR ClubTrack® and the HR ClubTrack Plus™. Only Quinton could match the StairMaster reputation for maximum performance, durability, and product safety.

### STRATUS EXERCISE BIKES

*New Models & Prices*

At last - a cordless line of variable resistance exercise bikes that not only provide the exciting workout programs that StairMaster is famous for, but are designed with such uncompromising attention to every biomechanical detail, they offer you extraordinary safety and comfort.

Introducing Stratus exercise bikes - a new cordless variable resistance line from StairMaster - that are available with either an upright or recumbent seat. Just like StairMaster's legendary stairclimbers, Stratus exercise bikes are very different from other models - simply because they feel so good to use.





## A FULL LINE OF EXCEPTIONAL PRODUCTS

### **CROSSROBICS®**

*The Ultimate Exercise Machines*

The StairMaster® Crossrobics products are innovative machines that combine aerobic exercise with a weight stack for strength conditioning. Available only from StairMaster, the Crossrobics machines provide the ultimate workout.

StairMaster offers you two Crossrobics machines - the Crossrobics 1650 LE and the Crossrobics 2650 UE Kayak. Both products feature an easy-to-operate, first-time user option as well as a quick-start feature.

### **STAIRMASTER STRENGTH SYSTEMS**

*Feel the Difference*

Club members will feel the difference the first time they use StairMaster® strength equipment - designed to work the way your body works.

Consisting of the Gravitron® 2000 AT and the new Arcuate® and Linear™ lines, StairMaster offers you 17 different strength training products to choose from. To ensure the highest quality, all StairMaster strength equipment is now manufactured at our own factory in Tulsa, Oklahoma.





## WARRANTY

This is to certify that the StairMaster @FreeRunner™ 5400 ESS elliptical system is warranted by StairMaster Sports/Medical Products, Inc. to be free of all defects in materials and workmanship. This warranty does not apply to any defect caused by negligence, misuse, accident, alteration, improper maintenance, or an "act of God." This warranty is nontransferable from the original owner.

If, within three years from the date of purchase, any part of the StairMaster FreeRunner elliptical system should fail to operate properly (except any accessories), contact our Customer Service Department to report the problem. When calling, please be prepared to provide the customer service representative with the following information:

- Your name, shipping address, and telephone number.
- The model and serial number of the inoperable machine.
- The date(s) of purchase for the inoperable machine(s).
- Your billing address.

This information will ensure that you are the only one ordering parts under your warranty agreement. If warranty replacement parts are shipped to you, you may be required to return the inoperable part. To facilitate this process, the following policy has been established:

- Please call our Customer Service Department to receive a return goods authorization prior to shipment.
- StairMaster Sports/Medical Products, Inc. will incur all freight charges for warranty parts for a machine that is less than 45 days old. You will not be responsible for the return shipment of the inoperable parts.
- Some inoperable warranty parts must be promptly returned to our Customer Service Department. We will pay the shipping cost for such inoperable warranty parts. Detailed instructions are included with each warranty replacement part.

StairMaster Sports/Medical Products, Inc. neither makes, assumes, nor authorizes any representative or other person to make or assume for us any other warranty whatsoever, whether expressed or implied, in connection with the sale, service, or shipment of our products. We reserve the right to make changes and improvements in our products without incurring any obligation to similarly alter products previously purchased. In order to maintain your product warranty and to ensure the safe and efficient operation of your machine, only authorized replacement parts can be used. This warranty is void if parts other than those provided by StairMaster Sports/Medical Products, Inc. are used.

*Note: Aerosol products cannot be transported via air.*



## PREFACE

Regular use of the StairMaster FreeRunner™5400 ESS is a safe and effective way to develop aerobic fitness while conditioning the major muscles of the lower body. In order to get the best results, and to keep your machine in peak operating condition, you should carefully read and follow the guidelines presented in this manual.

### WHAT IS IN THIS MANUAL?

The first part of this manual includes sections on safety, installation, operating instructions, and preventive maintenance. The second part contains detailed information on problem troubleshooting and repair procedures. An Appendix at the end of the manual provides important phone numbers, additional instructional illustrations, and wiring diagrams.

Throughout this manual, the console keypad keystrokes are enclosed in []. The names of the keys and special console operational modes are shown in capital letters. For example, your machine is ready to use when the console is in the ATTRACT mode. Press the [MANUAL] key to select the MANUAL workout option.

### WHAT IS THE STAIRMASTER FREERUNNER ELLIPTICAL STRIDING SYSTEM?

The StairMaster FreeRunner 5400 ESS is an elliptical striding system that allows users to simulate the natural movement path of running without joint impact or trauma. With its patent pending VSL (Variable Stride Length) technology, the FreeRunner permits users to adjust their stride lengths from 10" to 40." The FreeRunner also has retractable handles to provide users with the options of lower body only or total body workouts. Another feature of the FreeRunner is Polar® and contact heart rate monitoring.



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## SAFETY GUIDELINES

WHEN USING ELECTRICAL EQUIPMENT, ALWAYS FOLLOW THESE BASIC PRECAUTIONS:

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### IMPORTANT SAFETY INSTRUCTIONS

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This symbol appearing throughout this manual means Attention! Be Alert! Your safety is involved.

The following definitions apply to the words "Danger" and "Warning" found throughout this manual:

**DANGER**· Used to call attention to IMMEDIATE hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.

**WARNING**· Used to call attention to POTENTIAL hazards that could result in personal injury or loss of life.

#### READ ALL INSTRUCTIONS BEFORE USING THE MACHINE.



**DANGER** To reduce the risk of electrical shock, always unplug the external power supply from the AC wall outlet before cleaning, maintaining, or repairing.



**WARNING** To reduce the risk of burns, electric shock, or injury to persons:

1. The external power supply should always be unplugged from the AC wall outlet before removing or installing parts. Never make adjustments or repairs while an exercise program is in progress.
2. Close supervision is necessary whenever the machine is used by or near children, invalids, or disabled persons.



## SAFETY GUIDELINES

3. Keep your hands away from all moving parts and keep your feet on the pedals while exercising. Do not operate the machine with the side covers removed.
4. Use this machine only for its intended use as described in this Manual. Do not use parts, attachments, or accessories other than those provided by StairMaster® Sports/Medical Products, Inc.
5. Do not use the external power supply if it has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged, or dropped into water. Contact our Customer Service Department to arrange for the return of damaged parts. Refer to the Appendix for the appropriate phone number.
6. Connect the external power supply to a properly grounded AC wall outlet; refer to the "Grounding Instructions" section. Keep all cords away from heated surfaces.
7. To disconnect the external power supply, remove the plug from the AC wall outlet.
8. Never drop or insert any object into any opening on the machine.
9. Do not operate where aerosol (spray) products are being used.
10. Do not use the machine outdoors.

The safety level given by the design of this equipment can only be maintained when the equipment is regularly examined for damage and wear. Inoperable components shall be replaced immediately or the equipment shall be put out of use until it is repaired.

Failure to follow all guidelines may compromise the effectiveness of the exercise experience, expose yourself (and possibly others) to injury, and reduce the longevity of the machine. Follow all training instructions listed in the manual and/or on the machine. Physical injury may result from incorrect or excessive training.

---

**SAVE THESE INSTRUCTIONS**

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## INTRODUCTION

Before leaving the manufacturing facility in Tulsa, Oklahoma, your StairMaster® FreeRunner™ elliptical striding system was thoroughly inspected and tested to ensure proper operation. The major parts of the machine are shown in Figure 1.

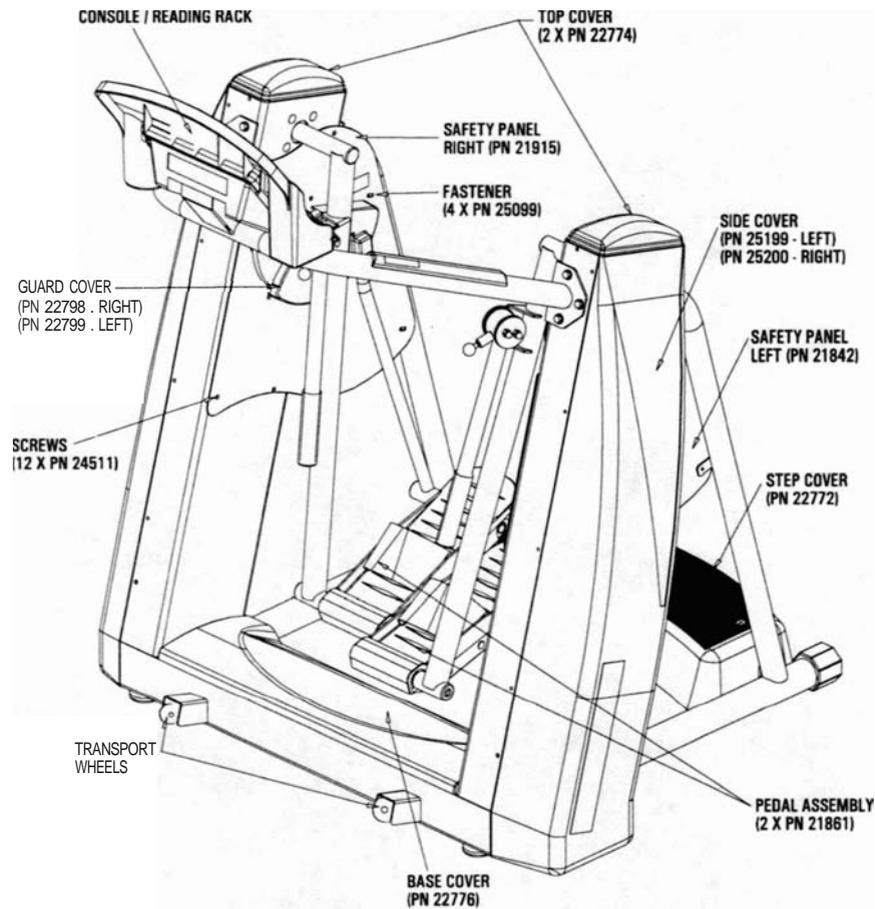


Figure 1: Major Parts



## INTRODUCTION

Throughout this Manual, all references to the left or right side and to the front or back are made as if you were on the machine, ready to exercise. For example, the console is located on the front of the machine. The dimensions and general specifications of the machine are listed in Table 1.

**Table 1. Dimensions and Specifications for the StairMaster® FreeRunner™ Elliptical Striding System**

<b><u>Physical Dimensions:</u></b>	
Height	65.5" (166 cm)
Depth	42.0"(107 cm)
Width	53.0" (135 cm)
Weight	460.0 lbs (209 kg)
<b><u>Range of Motion:</u></b>	
Maximum stride length	54"
Peak elliptical pattern	12 \ - 36"
<b><u>Power Supply Specifications*:</u></b>	
Input Voltage	110-120 VAC, 50/60 Hz
Output Current Capacity	2.5 Amps
Input Power Consumption	55 Watts

\*Optional power supplies, intended for use outside the United States, are available for 220 - 240 VAC, 50/60 Hz power requirements.

## INSTALLATION INSTRUCTIONS

Your FreeRunner™ is shipped complete with all parts required for assembly. Study the assembly instructions carefully. The shipping components are shown below in Figure 2. Contact our Customer Service Department at (800) 331-3578 for assistance. International customers should contact their local distributors.

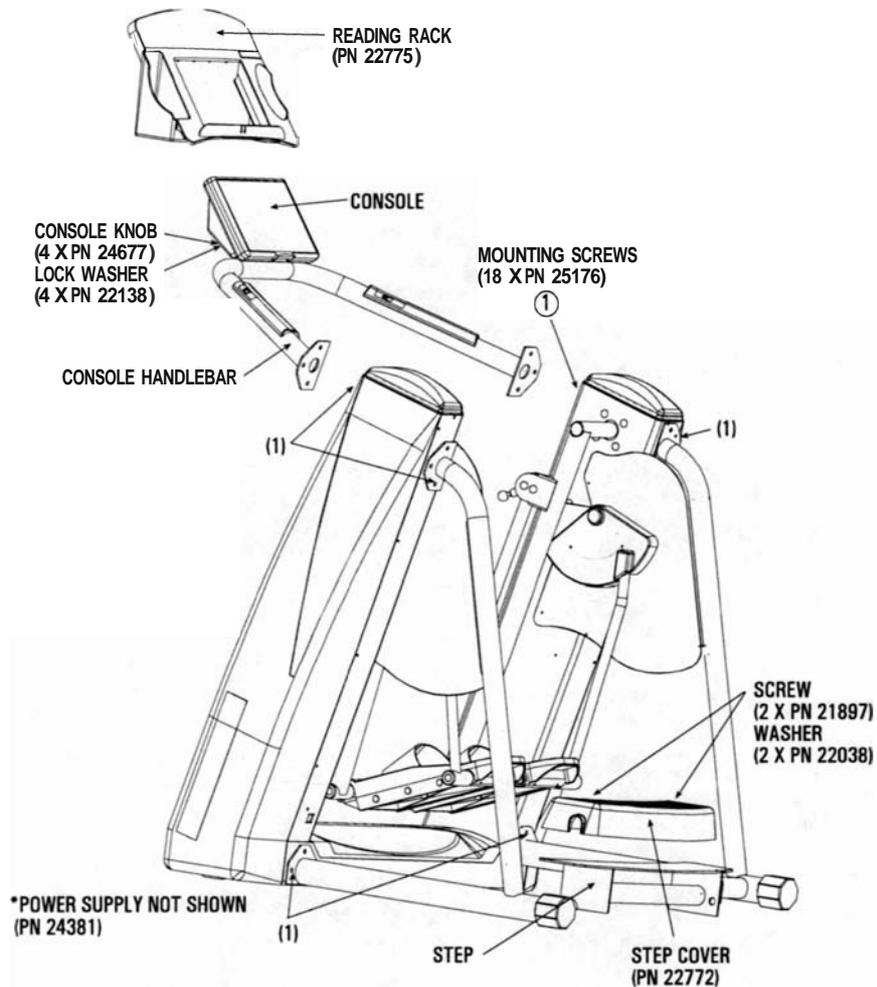
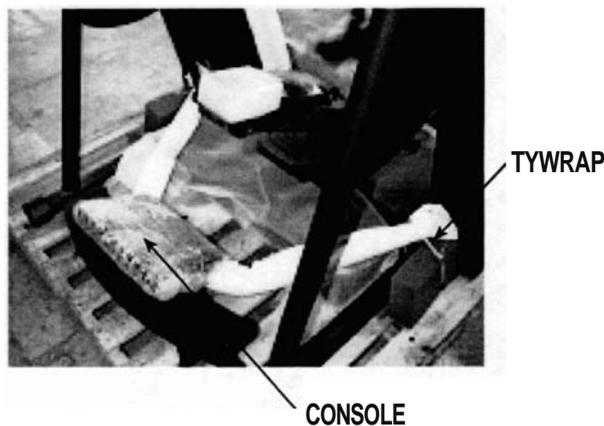


Figure 2: Shipping Components

## INSTALLATION INSTRUCTIONS

### A. Assemble the Machine:

1. Cut each tywrap that secures the console handlebar to the rear support bars (see Figure 3). Remove the foam protection from each side of the handlebar. Lift the handlebar out from under the pedals. Set the handlebar with console aside. Remove the step cover from under the pedals and set the cover aside.

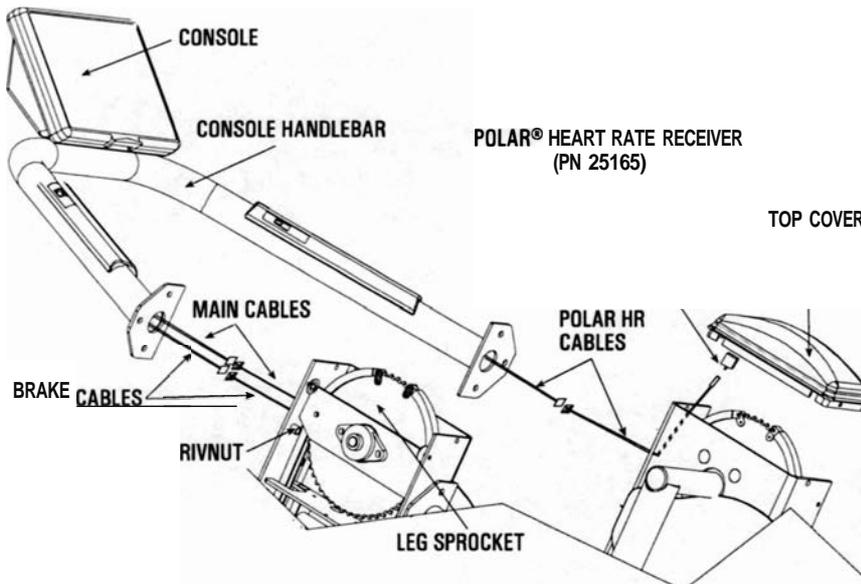


**Figure 3: Tywrap Location**

2. Remove the shrink wrap from the pedal, and lift the power supply box, owner's manual, and hardware bag off the pedal. Set the parts aside.
3. Remove the top covers. Use the fastener removal tool from the hardware bag to remove the top cover rivets. Disconnect the Polar® heart rate receiver from under the right top cover (see Figure 4).
4. Have an assistant support the console handlebar. Stand on the right side of the machine and connect the plug-in Polar cable from the handlebar to the upper Polar cable in the frame. Connect the Polar heart rate cable to the heart rate receiver and reinstall the top cover (see Figure 4).
5. Stand on the left side of the machine and connect the upper main cable to the lower main cable. Next, connect the upper brake cable to the lower brake cable. Tuck any excess slack in the cables up inside the handlebar.

## INSTALLATION INSTRUCTIONS

6. Attach the console handlebar to the frame. To prevent the rivnuts (see Figure 4) from spinning in the frame, hold the rivnuts with pliers while securing the mounting screws to the frame.



"NOTE: KEEP EXCESS SLACK IN CABLES AWAY FROM THE LEG SPROCKETS.

**Figure 4: Cable Locations**

7. Have an assistant help you slide the machine off the shipping pallet and onto the floor. Use the transport wheels (see Figure 1) to roll the machine into the desired location.
8. Remove the packing material from the console, handlebar, and step cover. Place the step cover over the step and insert a mounting screw and a washer into each cover hole. Tighten each screw with the 5/32" allen wrench.

## INSTALLATION INSTRUCTIONS

### B. Level the Machine:

1. Make sure the machine is level before you use it for the first time. The rubber end caps (see Figure 5) are designed to compensate for uneven floors. Each face of the caps is a different thickness. Twist the caps to stabilize the machine.

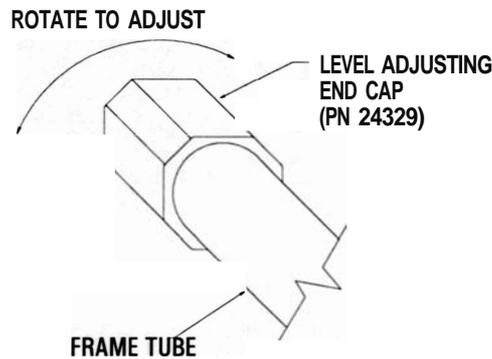


Figure 5: Level Adjusting End Caps

### C. Connect the Power Supply:

1. Remove the external power supply from the shipping box. Connect the DC power cable to the DC power connector located on the lower left side (see Figure 6).



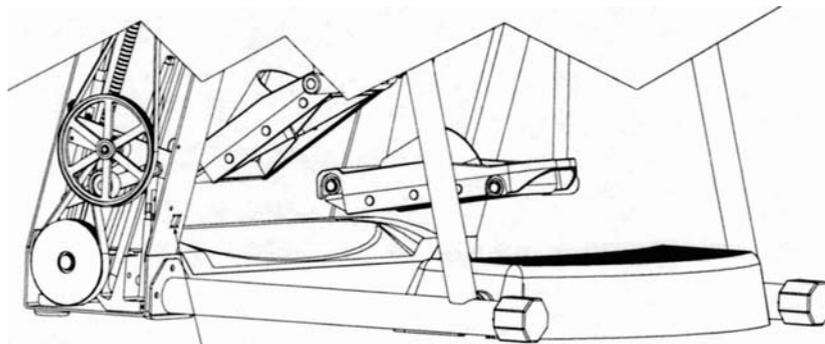
#### WARNING

TO REDUCE THE RISK OF ELECTRICAL SHOCK AND FIRE AND TO PREVENT SEVERE DAMAGE TO THE MACHINE, USE ONLY THE POWER SUPPLY APPROVED FOR USE WITH THIS EQUIPMENT. IN ADDITION, YOUR MACHINE MUST BE PROPERLY GROUNDED.

2. Place the power supply on the floor near an AC wall outlet. To reduce the hazard of electrical shock, place the power supply in a location away from the machine and away from exposure to perspiration. You should not place your power supply on a carpet because it may overheat.

## INSTALLATION INSTRUCTIONS

3. Check to be sure that the input AC power rating marked on the power supply matches the available power. If it does not, obtain the matching power supply from StairMaster® Sports/Medical Products, Inc. before proceeding any further.



DC POWER CONNECTOR

**Figure 6: DC Power Connector**

4. Connect the AC power cord to the AC wall outlet. Refer to the "Grounding Instructions" section if the AC wall outlet does not accept a three-prong plug.
5. Watch the console, it should scroll a copyright message and then display two messages; "Pedals Locked" and "Select Workout". If it does not, unplug the power supply, then plug it back in. If the console still does not power up correctly, contact our Customer Service Department. Refer to the Appendix for the appropriate telephone number.
6. The console alternates the two messages in the display window when it is in the ATTRACT mode and ready to use.



## **BASIC OPERATING PROCEDURES**

### **GENERAL GUIDELINES FOR SAFE OPERATION**



#### **WARNING**

**THESE GUIDELINES ARE DIRECTED TO YOU, AS THE OWNER OF THE MACHINE. YOU SHOULD INSIST THAT ALL USERS FOLLOW THE SAME GUIDELINES. YOU SHOULD MAKE THIS MANUAL AVAILABLE TO ALL USERS.**

1. Obtain a complete physical examination from your medical doctor, and enlist a health/fitness professional's aid in developing an exercise program suitable for your current health and fitness status.
2. When working out for the first time use the MANUAL exercise program at the lower resistance level until you feel comfortable and capable of higher resistance levels.
3. The intensity and duration of your exercise program should always be subject to how you feel. Never permit peer pressure to influence your personal judgment while exercising.
4. Overweight or severely deconditioned individuals should be particularly cautious when using the machine for the first time. Even though such individuals may not have histories of serious physical problems, they may perceive the exercise to be far less intense than it really is, resulting in the possibility of overexertion or injury.
5. Although all equipment manufactured by StairMaster® Sports/Medical Products, Inc. has been thoroughly inspected by the manufacturing facility prior to shipment, proper installation and regular maintenance are required to ensure safety. Maintenance is the sole responsibility of the owner.



## BASIC OPERATING PROCEDURES

### YOUR FIRST WORKOUT ON THE STAIRMASTER® FREERUNNERTM ELLIPTICAL STRIDING SYSTEM

#### The ATTRACT Mode

All workouts on the StairMaster FreeRunner elliptical striding system start from the ATTRACT mode. The console displays a factory set message or scrolls a custom message in the text bar during the ATTRACT mode.

You can customize the ATTRACT mode on the console by programming your own scrolling message. Refer to the "Custom Scrolling Message" section for instructions.

#### Basic Instructions for First-Time Users

1. Warm up with light calisthenics and easy stretching exercises for at least five minutes before beginning your exercise program.



**IF AT ANY TIME DURING YOUR WORKOUT YOU FEEL CHEST PAIN, EXPERIENCE SEVERE MUSCULAR DISCOMFORT, FEEL FAINT, OR ARE SHORT OF BREATH, STOP EXERCISING IMMEDIATELY. If THE CONDITION PERSISTS, YOU SHOULD CONSULT YOUR MEDICAL DOCTOR IMMEDIATELY.**

2. Stand on the step, and then step forward onto the pedals (see Figure 7).
3. To raise or lower the retractable handles, pull the handle adjustment knob out on each handle to move the handle (see Figure 8). Ensure that each knob is locked into place before beginning your workout.

*Note: Always use the handles when they are in the upright position.*

## BASIC OPERATING PROCEDURES



**Figure 7: Correct Foot Placement for Stepping onto the FreeRunner™ Pedals**

4. Select the MANUAL exercise program so that you can control the pace of your first workout and get accustomed to the exercise motion. Press [MANUAL] and then press [ENTER]. The console will return to the ATTRACT mode if you do not press [ENTER] within ten seconds.
5. The console will prompt you to enter your body weight. Enter your weight in pounds (or kilograms if the console is set to metric). Correct entry errors by pressing [CLEAR] before you press [ENTER].
6. The console will prompt you to enter the workout time in one-minute increments between five and 60 minutes. Press [1], [0], [ENTER] to exercise for ten minutes. If you do not start exercising within 30 seconds, the console will return to the ATTRACT mode.

## BASIC OPERATING PROCEDURES



Pull the pin out to unlock the handle



Swing the handle upwards and release the pin to lock the handle in position

**Figure 8: Handle Adjustment**

### **Begin Exercising**

1. Lean forward and take running strides without overextending your legs. The MANUAL program starts at intensity level three. Adjust the intensity level up or down as desired.
2. Relax and stand up straight while exercising. Use the handles for balance. If you do not have the handles engaged, use the console handlebar for balance (see Figure 9).
3. Select an intensity level that allows you to maintain a comfortable stride. Faster is not always better. Exercise at a level that is consistent with your fitness level.
4. When you are finished with your workout, the machine will go back to

## BASIC OPERATING PROCEDURES

full resistance, and the brake will engage after both pedals have come to a complete stop. After the pedals are stopped, position yourself on the step before getting off the machine (see Figure 7).

5. Cool down after you get off the machine by walking or stretching for at least five minutes.

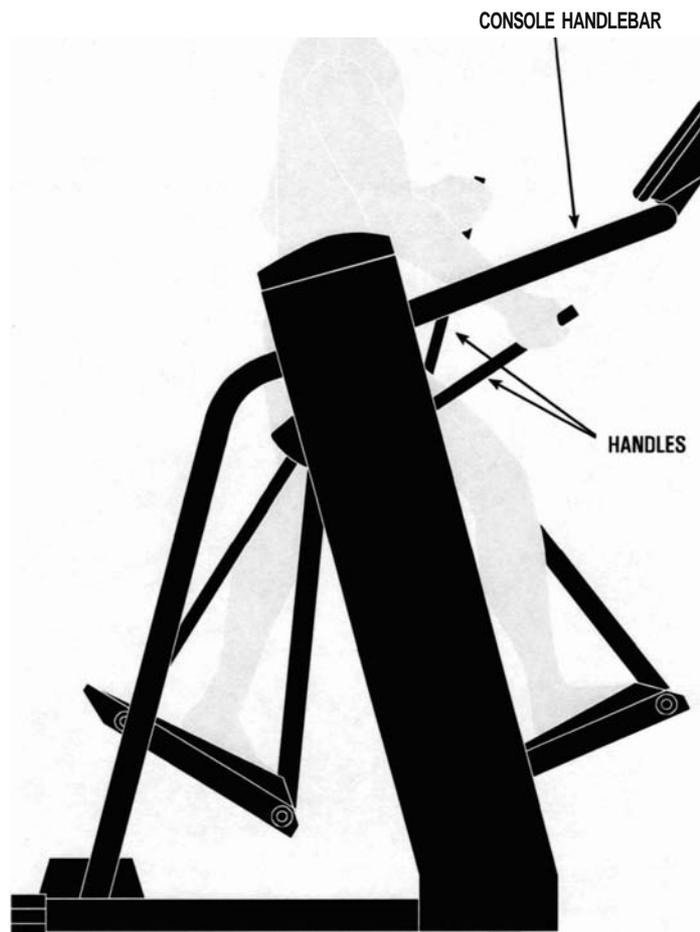


Figure 9: Correct Exercise Position



## CONTACT HEART RATE

The StairMaster® FreeRunner™ features a digitized contact heart rate monitoring system. Through the use of stainless steel sensors built into the console handlebar and sophisticated software, heart rate can be checked at any time during a workout.

The heart generates a rhythmic, electronic signal each time it beats (the electrocardiogram or EKG). The sensors detect this electrical signal through the hands when the sensors are gripped during a workout. The signal is converted into a heart rate, which is displayed on the console.

The contact heart rate system is very accurate (within 3% of the medical standard), but its ability to detect a heart rate signal is influenced by several factors. Movement of the muscles of the upper body produces an electrical signal that will interfere with the detection of the heart rate signal by the sensors. Movement of the hands while they are in contact with the sensors also produces interference. Calluses and hand lotion act as an insulating layer to reduce the signal strength. And finally, the EKG signal generated by some individuals is not strong enough to be detected by the sensors. Typically, these individuals account for 5 - 7% of the population. Most people (between 93 - 95%) will not have a problem with the system provided interference from movement is minimal.

Lightly grip the sensors with each hand. The heart rate display is shown automatically in the upper window the first time the sensors are touched. A valid signal is shown by a pulsating heart icon and the number of beats per minute next to the word "Pulse". The heart icon will stop beating and two dashes replace the numbers when the sensors are released or an invalid signal is received. Press [O/Pulse] once, or any other key twice, to return to the heart rate statistic from any other display during a workout.

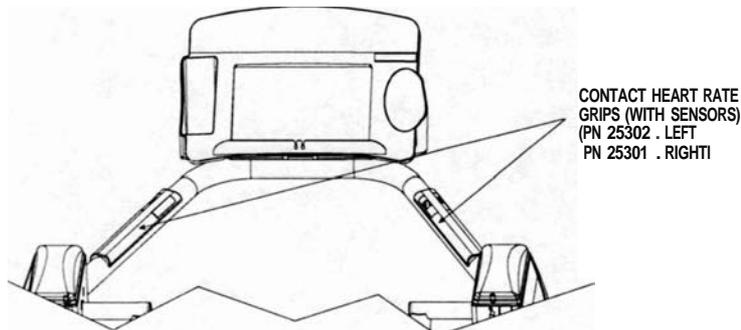


Figure 10. Contact Heart Rate Sensors

## POLAR HEART RATE

The StairMaster® FreeRunner™ also features Polar® heart rate monitoring. The system consists of the receiver (see Figure 11), and a transmitter belt, worn across your chest. The transmitter belt (available separately) senses the heart beat and sends a signal to the receiver. Your heart rate, in beats per minute, is shown in the console text bar.

Before you put the transmitter belt on, wet the two contact patches (the grooved rectangles on the reverse side of the belt). Secure the transmitter belt as high under the pectoral muscles (breasts) as is comfortable. The transmitter belt should fit snugly, but comfortably, allowing normal breathing.

When the console detects a heart rate signal, the word "PULSE," your heart rate in beats per minute, and a pulsing heart icon are automatically displayed in the text bar.

If you display a statistic other than heart rate during your workout, you can return to heart rate by pressing the white "0" key once or any other statistic key twice. Heart rate is part of the workout stats scrolling display. Average heart rate is shown at the end of your workout.

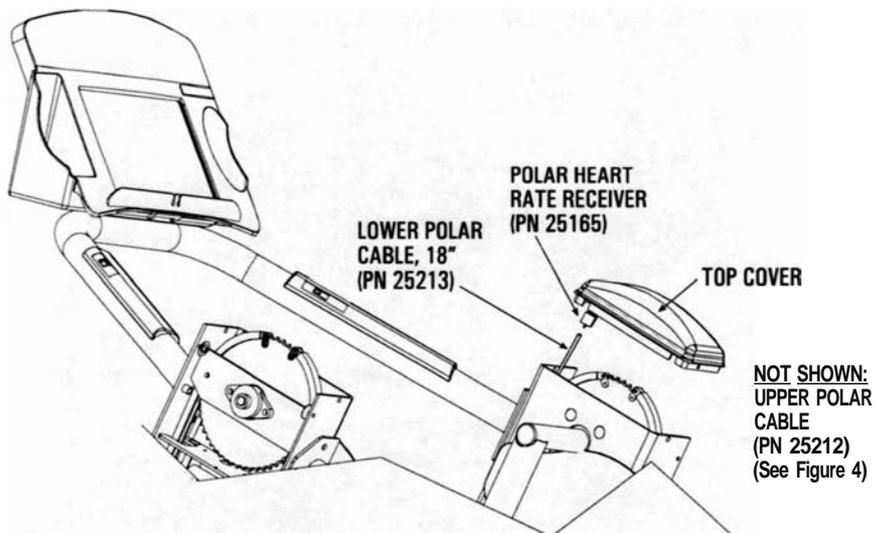


Figure 11: Polar® Heart Rate Receiver

## FREERUNNER 5400 ESS CONSOLE

The StairMaster® FreeRunner™5400 ESS console is divided into four sections: the text bar, display, the function keypad, and the exercise program keypad (see Figure 12).

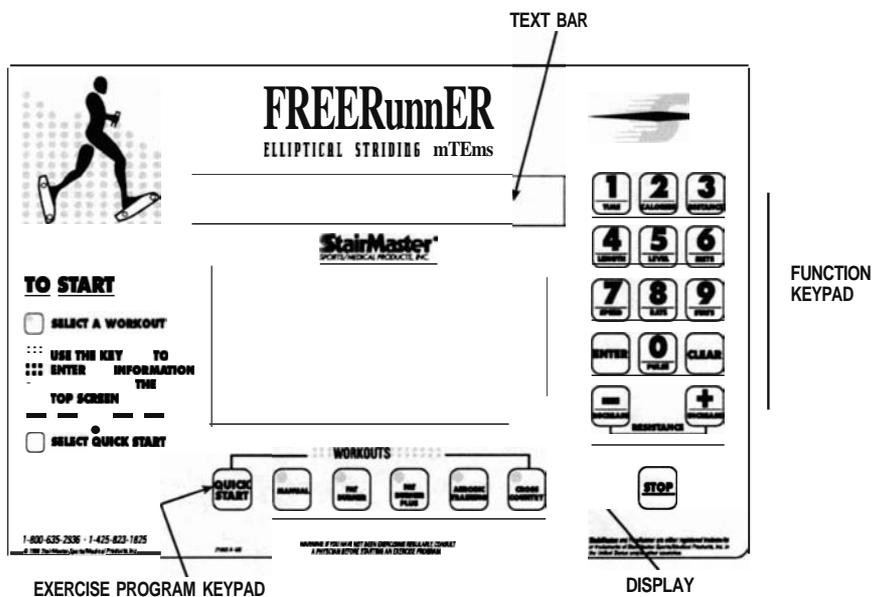


Figure 12: 5400 E55 Console Diagram

### TEXT BAR

Information regarding workout statistics, data entry, and heart rate is displayed or scrolled across the text bar. A countdown timer, displayed in the text bar, shows the number of seconds remaining in the current interval.

### DISPLAY

The exercise program profile (except QUICKSTART and MANUAL) appears in the display when you press its key. The taller the column, the greater the resistance for that interval. The flashing column shows your current interval. The flashing column moves from the left to right on the display as you complete each program interval.



## FREERUNNER 5400 ESS CONSOLE

### FUNCTION KEYPAD

The white function keypad is located on the right side of the console. Some of the keys have two functions-data entry and workout statistics. Before you start your workout, use the numbers on the keys to enter your personal data. During and after your workout, use the workout statistics on the keys to display the feedback.



**Time.** Displays the elapsed time of your workout, in minutes and seconds.



**Calories.** Provides a running total of the number of Calories burned during a workout.



**Distance.** Provides the equivalent horizontal distance you would have traveled if you used the same amount of energy while jogging on level terrain.



**Length.** Displays the stride length in inches. If pressed immediately after your workout, the average stride length is displayed.



**Intensity.** Shows the current intensity level between 1 (the easiest) and 20 (the hardest). Shows the number of lights in the MANUAL program between 1 and 14 (Note: levels 15-20 are not displayed).



**METs.** Gives you the relative energy cost of exercise. MET stands for multiples of the resting metabolic rate. While you are sitting quietly, your body consumes oxygen at the rate of about 3.5 milliliters per kilogram of body mass per minute. When you exercise, your body needs more oxygen in order to function. For example, exercising at 10 METs requires ten times the resting rate of oxygen consumption, or about 35 milliliters per kilogram per minute. During a workout, this key shows the current MET level. If pressed immediately after your workout, the average MET level is displayed.



## FREERUNNER 5400 ESS CONSOLE



**Speed.** Shows the equivalent running speed in miles per hour (or kilometers per hour if your console is set to metric units) based on energy expenditure. If pressed immediately after your workout, the average speed is displayed.



**Rate.** Indicates the stride rate per minute.



**Stats.** If pressed during your workout, all workout statistics continuously scroll across the text bar. Press any key to stop scrolling at a certain statistic.

- If pressed immediately after your workout, the workout summary statistics will scroll once across the text bar. Press any key to stop scrolling at a certain statistic.

- If pressed while the console is in the ATTRACT mode, the final totals from the last workout will scroll across the text bar. This summary is stored in the console memory until the next workout is started.



**Pulse.** Displays the heart rate. If pressed immediately after your workout, the average heart rate is displayed.



**[ENTER].** Confirms workout selections and stores the information used by the console to calculate workout statistics.



**[CLEAR].** Erases information from the console memory if pressed before [ENTER].



**[INCREASE].** Increases the resistance.



**[DECREASE].** Decreases the resistance.

**[STOP] [STOP].** If pressed, the console will return to the ATTRACT mode.



## FREERUNNER 5400 ESS CONSOLE

### EXERCISE PROGRAM KEYPAD

The purple exercise keypad is located below the display and to the left of the function keypad. Press one of the exercise program keys to preview the desired workout while the console is in the ATTRACT mode.

The sequence of prompts for the preset exercise programs is slightly different than the sequence for the MANUAL program. After you press one of the exercise program keys, the exercise program profile is scrolled across the display.

After the profile is scrolled, the prompts are:

- "PRESS ENTER KEY TO SELECT" - press [ENTER] to select the program.
- "ENTER BODY WEIGHT" - type in your body weight in pounds (or kilograms if your console is set to metric units).
- "ENTER LEVEL 1 - 20" - select your intensity level with level 1 having the least resistance and level 20 having the most resistance.
- "ENTER TIME 5 - 60" - select the workout duration in one-minute increments from five to 60.



#### The Quick-Start Option

Pressing the Quick-Start key will give you a 15-minute manually controlled workout.

### Preset Exercise Programs

There are four preset exercise programs. The pedal resistance during the programs varies automatically over 14 increments within each of the 20 different intensity levels. Varying the intensity of an exercise program does not change the profile shown on the display. Change the intensity level of your workout by pressing [INCREASE] or [DECREASE]. For each level, the average energy cost of all programs is approximately the same.



The Fat Burner program is a 60-interval workout designed for people just starting a weight control program.



## FREERUNNER 5400 ESS CONSOLE



The Fat Burner Plus program is similar, but has gO intervals. Use this program for longer workouts as your fitness level increases.



The Aerobic Training program is a 50-interval workout with slightly more varied speed changes. It is ideal for targeted workouts to increase your aerobic capacity.



The Cross Country program is a gO-interval workout with numerous speed changes to maximize your fitness performance. The speed changes equate to the type of terrain you would find on a cross-country run.

### CUSTOM EXERCISE PROGRAMS

The console has enough memory space for five custom exercise programs. Only the exercise profile is saved. You must enter your body weight, the intensity level, and the workout time when you use the custom program.

#### Programming Your Workout

1. The console must be in the ATTRACT mode. Press [INCREASE], [1], [5], [5], [0], and [ENTER]. Press the exercise program keypad button that you want to assign to your custom program.
2. If you select an exercise program keypad button that is already programmed, the profile will appear and it can be modified or completely rewritten. If the exercise program keypad button was not previously programmed, you will see a single row of dots along the bottom of the display.
3. The flashing dot or column indicates which interval can be modified. Press [INCREASE] or [DECREASE] to make the column taller or shorter. Press [ENTER] to move one column to the right and [CLEAR] to move one column to the left.
4. When all of the intervals are correctly programmed, press [0] to save the program profile. Press [STOP] to abort the programming process without saving the profile.



## FREERUNNER 5400 ESS CONSOLE

### Using a Custom Program

1. Press [DECREASE] and the exercise program keypad button you assigned to the custom program.
2. Enter your body weight, the intensity level, and the workout time in response to the prompts.

### CUSTOM SCROLLING MESSAGE

The message that scrolls across the text bar during the ATTRACT mode can be replaced with a message of your choice. The console accepts messages up to 128 characters in length, including spaces. To program your message:

1. Encode your message using the character codes listed in Table 2.
2. While the console is in the ATTRACT mode, press [INCREASE], [7], [6], [0], [7], [ENTER].
3. Enter the two-digit code for each letter of your message. The letter will appear in the text bar as you press the second digit of each code. Do not press [ENTER] between the code numbers.
4. For example, to program the message "EXERCISE IS FUN," press [INCREASE], [7], [6], [0], [7], [ENTER]. Then press [1], [5], [3], [4], [1], [5], [2], [8], [1], [3], [1], [9], [2], [9], [1], [5], [1], [0], [1], [9], [2], [9], [1], [0], [1], [6], [3], [1], [2], [4], [ENTER]. After you press [ENTER], your message will begin scrolling, and the console is in the ATTRACT mode. If you make a mistake while entering the codes, press [CLEAR] to erase the last character entered. The factory set message will not be seen again until the custom message is inactivated.

## FREERUNNER 5400 ESS CONSOLE

**Table 2. Character Codes for the Scrolling Message**

Character	Code	Character	Code	Character	Code
0	00	M	23	i	46
1	01	N	24	À	47
2	02	O	25	ì	48
3	03	P	26	È	49
4	04	Q	27	Â	50
5	05	R	28	Ç	51
6	06	S	29	Ê	52
7	07	T	30	ï	53
8	08	U	31	+	54
9	09	V	32	\$	55
SPACE	10	W	33		56
A	11	X	34	,	57
B	12	Y	35	%	58
C	13	Z	36	?	59
0	14	Ä	37		60
E	15	Ö	38	!	61
F	16	Û	39		62
G	17	ß	40	#	63
H	18	Å	41		64
I	19	À	42	,	65
J	20	Ó	43	)	66
K	21	É	44	(	67
l	22	Ñ	45	/	68

### EDITING THE SCROLLING MESSAGE

1. While the console is in the ATTRACT mode, press [INCREASE], [7], [6], [0], [7], [ENTER] to display the first character of the message onto the text bar.
2. Press [INCREASE] or [DECREASE] to scroll through the message character by character.
3. Press [CLEAR] to delete the last character displayed on the text bar. Press [ENTER] to end the editing process.



## FREERUNNER 5400 ESS CONSOLE

4. To edit multiple characters at one time, press [9], [9], [ENTER] to erase all the characters to the right of the last character displayed on the text bar.
5. To erase the entire message, press [INCREASE], [1], [0], [5], [ENTER], while in the ATTRACT mode.
6. The edited message will scroll across the text bar. If you have erased the entire message, the factory set message will scroll in the text bar.
7. Press [INCREASE], [2], [1], [2], [3], [ENTER] to display the default scrolling message in the text bar.
8. Press [INCREASE], [2], [1], [2], [1], [ENTER] to display your custom scrolling message on the text bar.

## CHANGING THE CONSOLE UNITS AND PROMPT LANGUAGE

The console is set at the manufacturing facility to English language prompts and English units. While the console is in the ATTRACT mode, you can set the console for foreign language prompts or metric units.

1. To change the prompt language, press [INCREASE], [7], [4], [2], [4], [ENTER]. Press the code number for the desired language (see Table 3) and then press [ENTER].
2. To change the console to metric units, press [INCREASE], [9], [7], [6], [0], [ENTER] and then [1], [ENTER]. Press [INCREASE], [9], [7], [6], [0], [ENTER] and then [0], [ENTER], to change back to English units.

## CONSOLE CODES

The console codes and the corresponding functions are listed in Table 3. From the ATTRACT mode, press [INCREASE], [CONSOLE CODE], and then [ENTER]. Some codes, like the one to change the language of the console prompts, have options that require you to press a number and then [ENTER] to select that option.

## FREERUNNER 5400 ESS CONSOLE

**Table 3. Console Codes**

CODE	FUNCTION
105	Clears the custom programmed scrolling message
107	Activates the Diagnostic mode 0 Display test    4 Software revision test 1 Speaker test    5 Not used 2 Keypad test    6 Brake cycling test 3 Not used        7 Limit switch test
1650	Programs a custom workout
2121	Turns on the custom scrolling message
2123	Turns off the custom scrolling message
7424	Changes the language of the console prompts 0 English    4 Spanish 1 German    5 Swedish 2 French    6 Danish 3 Italian    7 Japanese
7607	Turns on the custom message option 99 Text bar scrolling message editing function
7703	Displays machine usage information
7704	Allows you to turn the console speaker on or off 0 Turns the speaker on 1 Turns the speaker off
7705	Allows you to turn the Polar Heart Rate feature on or off 0 Turns the Polar Heart Rate feature on 1 Turns the Polar Heart Rate feature off
7706	Allows you to turn the brake on or off 0 Turns the brake on 1 Turns the brake off
7707	Allows you to turn the jackpot option on or off 0 Turns the jackpot option off 1-999 Sets the jackpot odds
9760	Allows you to change the units displayed by the console 0 Changes the console to English <b>units</b> 1 Changes the console to metric units
97405	Changes the maximum workout time
52475	Reset time limit to 60 minutes



## **FREERUNNER 5400 ESS CONSOLE**

### **THE JACKPOT OPTION**

When you finish your workout, a "GOAL ATTAINED" message is normally displayed in the text bar. This message may be replaced by a Native American casino style slot machine. When the wheels of the slots stop turning, the console display will spell out either "YOU WIN" or "THE END". The odds of winning may be programmed anywhere from 1-in-1 to 1-in-999. The computer will then randomly select a winner and display "YOU WIN", otherwise it will display "THE END." Workout statistics are shown, as usual, after the jackpot message.

Commercial owners often use the jackpot option to further stimulate consumer interest in their establishment and to add variety to their overall workout program. Many such owners offer a prize or some tangible incentive for individuals who win while using the jackpot option. If there is only one prize, you should remember to disable the option after there is a winner. The jackpot option remains in effect until disabled by entering zero odds. StairMaster® assumes no liability stemming from the use of the jackpot option. Laws or ordinances in your area may govern the use of this option.

#### **Turning the Jackpot Option On and Off**

1. The computer must be in the ATTRACT mode. Press [INCREASE], [7707], [ENTER].
2. The prompt "ENTER ODDS" will appear in the console display. Enter the numeric odds you have selected, between 1 and 999.
3. The jackpot results are saved in the console memory until the next workout is started. Press [WORKOUT STATS] to review the results.
4. Program the odds to zero to turn the jackpot option off and to return to having the "GOAL ATTAINED" message appear after you finish your workout.



## MAINTENANCE INSTRUCTIONS

### HELPFUL HINTS

Read all maintenance instructions thoroughly before beginning work. In some cases, an assistant is required to perform the necessary tasks.

All references to the left or right side, and to the front or back, are made as if you were on the machine ready to exercise. For example, the console is located on the front of the machine. Major component names and locations are shown in Figures 19 and 20. When ordering parts, reference the part number in parentheses next to the part's description on the figures.

### TOOL LIST

The following tools are needed to perform service and maintenance:

- Standard screwdriver
- Phillips screwdriver
- Alligator Clips
- External snap ring pliers
- Multimeter
- Allen wrench set (sizes 5/64 - 1/4")
- Eye protection
- Socket set or nut driver set (sizes 1/4 - 3/4")
- Combination wrenches (sizes 7/16 - 3/4")

### MAINTENANCE RECORDS

The 5400 ESS console will keep track of the following data on machine usage:

- The **TOTAL** number of hours the power supply was turned on.
- The number of hours (**HRS**) the machine was in use.
- The number of **WORKOUTS** started.
- The hours of **MANUAL** use.
- The number of workouts where the console registered a heart rate (**HR**) for greater than 90% of the program.
- The **EE PROM** diagnostic for service technician use.

To display the data, press [INCREASE], [7], [7], [0], [3], [ENTER] while the console is in the ATTRACT mode. The console will display the data in the sequence listed above. The machine may show a few hours of use when received due to testing at the manufacturing facility.



## **MAINTENANCE INSTRUCTIONS**

### **INITIAL SERVICE**

Upon receiving your machine, use a soft, clean towel to wipe off the dust that may have accumulated during shipping. Your new machine will require minor assembly. Refer to the "Installation Instructions" section for details.

### **PREVENTIVE MAINTENANCE**

A schedule of the recommended preventive maintenance is shown in Table 4. This schedule assumes moderate to heavy usage in a commercial health club environment. Always unplug the power prior to working on the machine. Refer to the "Parts Removal and Replacement" section for all disassembly and assembly instructions.

#### **Cleaning**

1. DO NOT USE GLASS CLEANERS OR ANY OTHER HOUSEHOLD CLEANER ON THE CONSOLE. Clean the console daily with a water-dampened cloth and wipe dry after cleaning.
2. Clean the exterior of the machine daily using soap and water or a diluted household cleaner such as Fantastic®.
3. Thoroughly clean the entire machine, including the interior, at least once a week.

#### **Inspection**

1. Inspect the exposed frame for any rust, bubbling, or paint chips during the weekly cleaning. The salt in perspiration can damage any unpainted surfaces. Repair the damaged area with touch-up paint (PN 22181).
2. Clean the contact heart rate sensors weekly with a water-dampened cloth and wipe dry after cleaning.
3. Remove the left side cover, and inspect the belts for undue wear and/or fraying during quarterly lubrication. Adjust the belt tension if necessary.



## MAINTENANCE INSTRUCTIONS

- Carefully turn each of the Poly-V pulleys counterclockwise, and check for smoothness of operation during quarterly lubrication. Reinstall the left side cover.

### Lubrication

The following components need periodic lubrication: the drive chain assemblies, the step chains, the heel link chains, the pedal return springs, pedal shafts, sprockets, and the pedal bushings. Remove the covers to access the components.

- Place a protective mat on the floor while you lubricate your machine. A rubber floor mat is available from StairMaster® Sports/Medical Products, Inc.
- Each week lubricate the entire length of the chains, and around each sprocket with chain lube (e.g. PJ-1®).
- Thoroughly clean all of the chains every three months. Use a mild degreaser and a stiff brush to remove dirt and corrosion from the chains. Remember to lubricate the chains after cleaning them.
- To protect the pedal return springs from corrosion, wipe the entire length of each pedal spring with a cloth dampened with 30W motor oil. Replace the spring if it is rusty or otherwise damaged.
- Remove the pedals every three months. Clean the pedal bushings and the pedal shafts. Protect the pedal shafts from corrosion with a thin coat of mineral oil before reassembling.



### WARNING

TO REDUCE THE POSSIBILITY OF SLIPPING, BE SURE THE PEDAL AREA IS FREE OF GREASE OR OIL. WIPE ANY EXCESS OIL OFF THE MACHINE SURFACES.

## MAINTENANCE INSTRUCTIONS

**Table 4. Recommended Preventive Maintenance Schedule**

PART	RECOMMENDED ACTION	FREQUENCY	CLEANER	LUBRICANT
Belts	Inspect and adjust tension	Every 3 months or 900 hours	NA	NA
Covers	Clean and inspect	Daily	Soap and water, diluted household cleaner	NA
Console	Wipe clean	Daily	Water	NA
Contact heart rate sensors	Clean and inspect	Each week, or after every 70 hours of use	Clean, dry rag	NA
Chain assemblies	lubricate	Each week, or after every 70 hours of use	NA	Chain lube le.g. <b>PJ-1®</b> )
	Remove, clean, and lubricate	Every 3 months, or 900 hours of use	Degreaser	Chain lube le.g. PJ-11
Pedal shafts	Clean and lubricate	Every 3 months, or 900 hours	Clean, dry rag	Mineral oil
Pedal bushings	Clean and inspect	Every 3 months, or 900 hours	Clean, dry rag	NA
Sprockets	Clean and lubricate	Each week, or after every 70 hours of use	NA	Chain lube le.g. PJ-11

***Note: Use of lubricants other than those specified will result in diminished performance and a shorter life span for that part.***



## TROUBLESHOOTING

### GENERAL TROUBLESHOOTING GUIDELINES

This troubleshooting section is organized into three basic problem sections: the Electrical System, Console Diagnostics, and the Mechanical System. Perform the tests in exactly the same order as written. Refer to the "Parts Removal and Replacement" section of this manual for any assembly and disassembly instructions. To order a replacement part or to get help with the troubleshooting process, contact our Customer Service Department at (800) 331-3578. International customers should contact their local distributor or call (425) 823-1825.

### SYSTEMATIC ELECTRICAL TROUBLESHOOTING

The electrical system has six major components: the power supply, the power cables, the alternator, the power control board, the console, and the load resistor. In order to identify the component that is causing the problem, you must systematically test the entire system. You will need a multimeter to conduct portions of the following procedures. The console, power supply, and power control board are not user serviceable. If any of these parts are inoperable, they must be replaced. Opening the console or the power supply will void the warranty.



#### WARNING

**TO REDUCE THE RISK OF ELECTRICAL SHOCK, A QUALIFIED ELECTRICIAN SHOULD PERFORM ALL ELECTRICAL TESTS THAT INVOLVE CHECKING AC POWER.**

1. Disconnect the AC power cord from the AC wall outlet.
2. Use a multimeter to verify that the AC line voltage of the wall outlet is between 100 and 120 VAC (220 and 240 VAC, if applicable). Consult an electrician for further assistance if the voltage is outside the range specified or if an alternate AC device (a lamp, for example) does not work when plugged into the AC wall outlet.



## TROUBLESHOOTING

3. Plug the AC power cord back into the wall outlet.
4. Disconnect the power supply from the machine. Use a multimeter to verify 16- 19 VDC at the end of the power supply DC cable . Pin #1 is positive, and pin #2 is negative. Replace the power supply if the reading is outside the specified range.
5. Remove the left side cover and reconnect the power supply to the machine .
6. Locate the black and white power connector wires inside the left side cover. Unplug the wires from the power control board, and use a multimeter to verify 16 -19 VDC in pin #1 and pin #2. Replace the power connector if the voltage is outside the specified range .
7. Verify that all of the alternator connections are tight and in the correct location (see Figure 36).
8. Inspect the power control board for loose connections. Use a multimeter to verify 16 - 19 VDC at J1- pin #2, and test point 5 on the power control board.
9. Disconnect the upper main cable from the lower main cable inside the frame . Use a multimeter to measure for 16-19 VDC at pin #1 (positive) and pin #7 (negative) of the lower main cable. Replace the lower main cable assembly if the voltage measured is outside the specified range.
10. Reconnect the upper and lower main cables . Remove the console and use a multimeter to measure for 16-19 VDC at pin #1 (positive) and pin #7 (negative) of the upper main cable connector. Replace the upper main cable assembly if the voltage measured is outside the specified range .
11. If all voltage readings have been within the specified range and the console will not power up, the console should be replaced .



## TROUBLESHOOTING

12. Perform the following Positive Output to Field test on the alternator:
  - Turn the power off.
  - Disengage the brake.
  - Remove the white wire from the B+ terminal on the alternator.
  - Remove the brown wire from the field (FLO) terminal on the alternator.
  - Place alligator clips on the B+ terminal and the field terminal of the alternator.
  - Step on the machine for 15 - 20 seconds.
  - If resistance is achieved during this time, your alternator has correct current flow.
  - If no resistance builds up during this time, you either have a bad alternator or bad alternator brushes.
13. Unplug the diode from the FLO terminal of the alternator.
14. Use a multimeter set to ohms to test the diode. A good diode will show a high resistance reading in one direction and a low resistance reading when the multimeter leads are reversed.
15. Unplug the load resistor from the power control board. Set your multimeter to ohms. Insert the multimeter leads into the load resistor plug.
16. A load resistor in proper working condition should read approximately 0.5 ohms. If the number recorded is outside the specified range, replace the load resistor.
17. Check the main cable assemblies for continuity, and cross check each wire in the cables for shorted wires (see Figure 35).
18. Contact our Customer Service Department at (800) 331-3578 for assistance. International customers should contact their local distributors.



## TROUBLESHOOTING

### CONSOLE DIAGNOSTIC TESTS

While the console is in the ATTRACT mode, press [INCREASE], [1], [0], [7], [ENTER], to enter the DIAGNOSTIC mode. If the console fails any test, the console should be replaced or exchanged. To return to the ATTRACT mode, press [STOP] while in DIAGNOSTIC mode.

#### Display Test

Use this test if the console display or text bar exhibits blank spots during use. This test checks for inoperable Light Emitting Diodes (LEOs) in the console display and the text bar. If any LED will not light, replace the console.

1. Press [0] to start the test.
2. All LEOs in the console display and the text bar will flash on and off as a block.
3. Press [STOP] to end the test.

#### Speaker Test

Use this test to make sure the console speaker is fully operational. The speaker will ascend and then descend through the musical scale.

1. Press [1] to start the test.
2. Press [STOP] to end the test.

#### Keypad Test

Use this test if are having trouble entering data. Replace the console if you cannot enter the DIAGNOSTIC mode code due to an inoperable keypad.

1. Press [2] to start the test.
2. The display LEOs will light up in an L-shaped formation, representing the keypad matrix. Press each key on the exercise program keypad and the function keypad. The corresponding LED should light up on the console when each key is pressed.



## TROUBLESHOOTING

3. Firmly press each button. If the LED corresponding to the key you pushed does not light up, the keypad is bad and the console should be replaced.
4. Press [STOP] to end the test.

### Software Revision Level Test

This test will show you the revision number of the console software.

1. Press [4] to start the test.
2. The software revision number will be scrolled across the text bar. The console automatically returns to the DIAGNOSTIC mode.

### Brake Test

Use this test to verify that the brake limit switches are triggered correctly. Adjust the limit switches if these tests fail. For replacement procedures refer to the cable section of "Parts Removal and Replacement."

1. Remove the left side cover.
2. From the DIAGNOSTIC mode, press [7] to start the test. The console will scroll the message, "brake on," or "brake off," accordingly.
3. Press [INCREASE] to turn the brake on. Verify that the "Motor On" LED is off, and that the "Motor Direction" LED is on (see Figure 33).
4. Press [DECREASE] to turn the brake off. Verify that the "Motor On" LED is off, and that the "Motor Direction" LED is off (see Figure 33). Press [STOP] to end the test.
5. From the DIAGNOSTIC mode, press [6] to cycle the motor continuously. Verify that the brake cam is triggering the upper and lower limit switches, and that the cam is not hitting the mechanical stops (see Figure 31).
6. Press [STOP] to end the test. Reinstall the side cover.

## TROUBLESHOOTING

### SYSTEMATICAL MECHANICAL TROUBLESHOOTING

If you hear a grinding or clicking noise or experience excessive vibration during exercise, a problem exists in the drive train of your machine. Isolate the problem area by performing the following tests in precisely the order listed below. Refer to the appropriate "Parts Removal and Replacement" section of this manual for all disassembly and assembly instructions.



#### WARNING

**TO REDUCE THE RISK OF INJURY, DO NOT OPERATE THE MACHINE WHILE THE COVERS ARE REMOVED. DO NOT MOVE THE PEDALS WHILE ANYONE'S HANDS ARE INSIDE THE MACHINE.**

1. Remove the base and side covers.
2. Remove the upper and lower POly-V belts, and inspect the belts for cracks and/or fraying. A worn belt could cause the loss of resistance - replace if necessary.
3. Verify that the brake is off, and spin the alternator pulley. The pulley should spin freely four to five revolutions without any clicking or grinding noises. Replace the alternator if any noises are heard.
4. Spin the intermediate and lower POly-V pulleys (see Figure 22). The pulleys should spin freely without any clicking or grinding. Replace the pUlley(s) if any noises are heard.
5. Inspect the step chains, heel link chains, and the drive chain assemblies for frozen links and/or corrosion. Replace a chain if any frozen links are found.
6. Inspect the pedal return springs for corrosion. Clean corrosion off the springs with fine steel wool. Replace the springs if the metal is pitted.
7. Rotate the drive sprockets (see Figure 23). Each sprocket should lock in one direction and rotate freely in the reverse direction. Inspect the drive shaft for wear when replacing a failed clutch sprocket.



## TROUBLESHOOTING

8. Check the pedal shafts and bushings by removing the pedal (see Figure 26). Inspect the shafts and bushings for signs of wear and corrosion. Clean corrosion off the pedal shafts with fine steel wool and replace any worn bushings before reassembling. DO NOT SAND THE PEDAL SHAFT.
9. Reinstall all parts, ensuring proper tension of the POLY-V pulley belts and that the top edge of the heel link pivot assembly is parallel with the floor (see Figure 29). Lubricate all chain assemblies.
10. Contact our Customer Service Department at (800) 331-3578 for assistance. International customers should contact their local distributors.

## PARTS REMOVAL AND REPLACEMENT

### ALTERNATOR

1. Remove the left side cover.
2. Mark the location of each wire attached to the alternator (see Figure 36). Remove the wires and the diode from the alternator.
3. Remove the brake mounting bolt from the alternator (see Figure 13).
4. Remove the alternator adjusting bolt from the slotted brace (see Figure 13). Loosen the pivot bolt on the alternator. Pivot the alternator down.
5. Remove the upper Poly-V belt. Inspect the belt for wear and replace the belt if it is cracked, cut, or otherwise damaged.
6. Remove the pivot bolt from the alternator, and then remove the alternator from the frame.
7. Reverse the removal procedures to install the new alternator. Remember to verify the wiring.
8. Pivot the alternator up or down as necessary to allow  $\frac{1}{4}$ " (0.6 cm) of belt deflection at the midpoint between the two pulleys (see Figure 22).

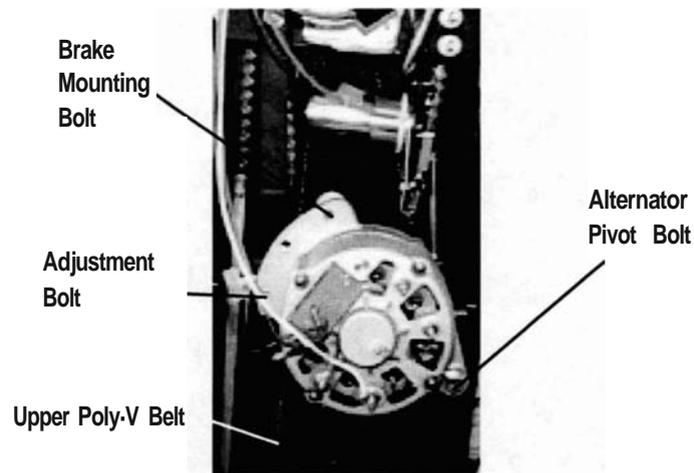


Figure 13: Alternator Mounting



## PARTS REMOVAL AND REPLACEMENT

### BEARINGS

#### **Bearing Blocks - Heel Link**

1. Remove the side cover.
2. Remove the pedal shaft housing from the pedal and pivot the pedal forward.
3. Remove the heel link pillow block bearing, jam nut, and heel link sprocket. Use the heel link turnbuckle to loosen the heel link chain. Keep track of the shaft key.
4. Remove the heel link from the bearing plate.
5. Remove the four mounting screws from the bearing plate and set the bearing block aside.
6. Install the new bearing block, reassemble the machine, and adjust the top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).

#### **Bearing Blocks - Leg Assembly**

1. Remove the pedal and the side cover.
2. Loosen the drive chain turnbuckle.
3. Remove the pillow block bearing. Remove the jam nut and washer from the leg shaft.
4. Remove the leg assembly from the bearing plate.
5. Remove the four mounting screws from the bearing plate.
6. Install the new bearing plate, reassemble the machine, and adjust the top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).



## PARTS REMOVAL AND REPLACEMENT

### Pillow Block Bearings - Heel Link

1. Remove the side cover,
2. Loosen the two set screws on the pillow block bearings.
3. Remove the two mounting screws and washers from the pillow block bearing and slide the bearing off the heel link shaft.
4. Install the new pillow block bearing and tighten the set screws.
5. Reinstall the side cover.

### Pillow Block Bearings - Leg Assembly

1. Remove the side cover.
2. Loosen the two set screws on the pillow block bearing.
3. Remove the two mounting screws and washers and slide the bearing off the leg shaft.
4. Install the new pillow block bearing and tighten the set screws.
5. Reinstall the side cover.

## BELTS



### WARNING

THE BELTS MUST BE PROPERLY TENSIONED. A BELT THAT IS TOO TIGHT WILL CAUSE SLOW AND SLUGGISH OPERATION. A BELT THAT IS TOO LOOSE WILL CAUSE EXCESSIVE NOISE AND BELT WEAR.

### Upper Poly-V Belt

1. Remove the left side cover.

## PARTS REMOVAL AND REPLACEMENT

2. Loosen the alternator screw and mounting bolt. Pivot the alternator down.
3. Remove the belt (see Figure 14).
4. Reinstall the belt. Pivot the alternator up or down as necessary to allow  $\frac{1}{4}$ " (0.6 cm) deflection at the midpoint between the two pulleys (see Figure 22).
5. Reinstall the cover.

### Lower Poly-V Belt

1. Remove the left side cover and then remove the upper POly-V belt.
2. Push the idler pulley away from the belt (see Figure 14) and remove the lower POly-V belt. Install the new belt, and then reinstall the upper Poly-V belt. Verify proper tension on the upper belt (see Figure 22).
3. Ensure that the belt grooves are seated in the pulley grooves, and that the outside edge of the lower belt is flush with the outside face of the lower POly-V pulley. Reinstall the cover.

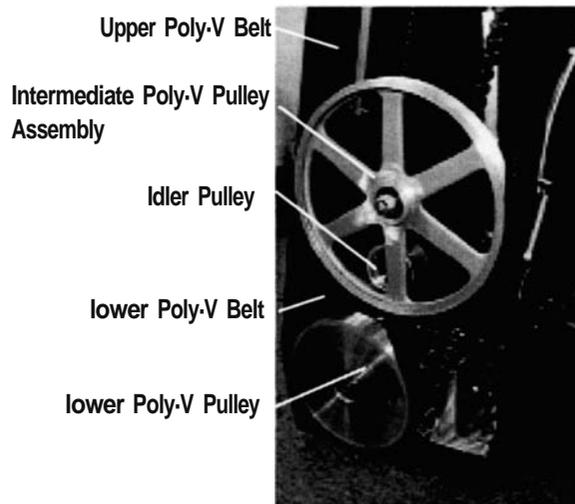


Figure 14: Belt Location



## **PARTS REMOVAL AND REPLACEMENT**

### **BRAKE SYSTEM**

#### **Brake Actuator Arm**

1. Remove the left side cover.
2. Remove the brake cam mounting screw from the top of the brake actuator arm.
3. Loosen the jam nut from the center of the actuator arm, and remove the lower screw (see Figure 15).
4. Install the new arm.
5. Use the brake actuator spring nut and/or the lower mounting nut to adjust the throw on the arm to properly engage/disengage the brake (see Figure 15).

#### **Brake Motor**

1. Remove the left side cover.
2. Remove the brake actuator arm.
3. Remove the brake cam mounting screw and slide the cam off the brake motor shaft (see Figure 14).
4. Unplug the motor cable from the power control board, remove the mounting bolts from the motor, and remove the motor from the frame.
5. Install the new motor and reassemble the machine.
6. Use the brake actuator spring nut and/or the lower mounting nut to adjust the throw on the arm to properly engage/disengage the brake (see Figure 15).

## PARTS REMOVAL AND REPLACEMENT

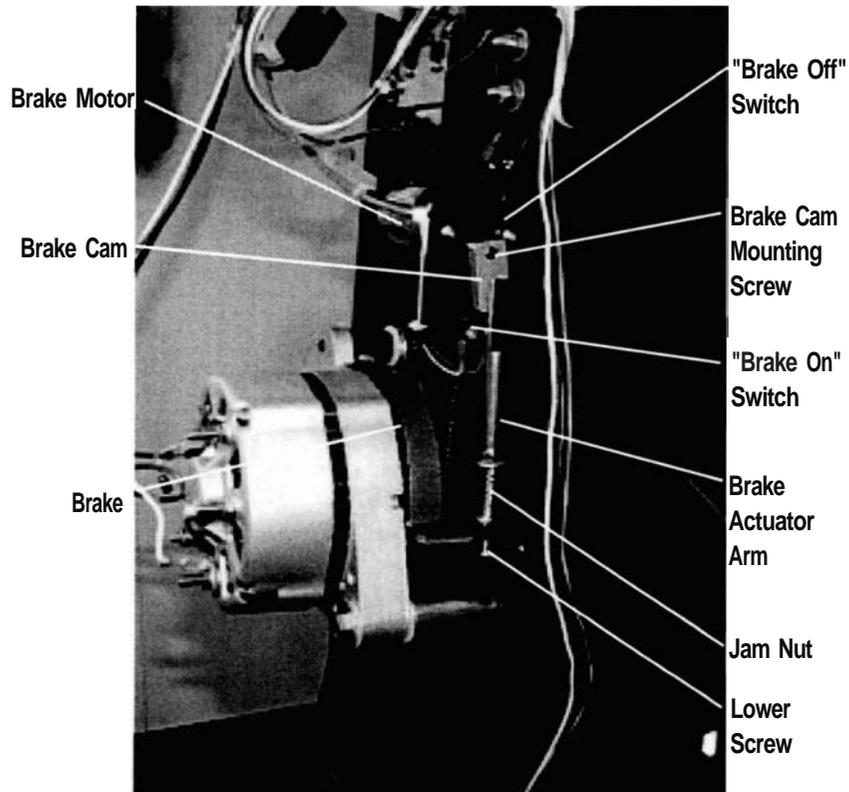


Figure 15: Brake Location

### Brake

1. Remove the left side cover. Remove the brake actuator arm from the brake.
2. Remove the mounting bolt from the brake and lift the brake off the alternator flywheel.
3. Install the new brake and reassemble the machine.
4. Use the brake actuator spring nut and/or the lower mounting nut to adjust the throw on the arm to properly engage/disengage the brake (see Figure 15).



## PARTS REMOVAL AND REPLACEMENT

### CABLES

#### Alternator Cable

1. Remove the left side cover.
2. Unplug the alternator cable from the power control board.
3. Remove the wiring from the alternator, noting the origin and color of the wires removed from each terminal.
4. Install the new cable and verify the wiring connections (see Figure 36).
5. Reinstall the cover.

#### Contact Heart Rate Cable

1. Remove the console knobs, and gently lift the console up.
2. Disconnect all cables from the back of the console and remove the console.
3. Lift each sensor grip up from the console handlebar and disconnect the two wires from each pair of sensors.
4. Pull the contact heart rate cable out from the middle hole in the console handlebar.
5. Thread the left side of the new cable through the left side of the console handlebar, and connect the wires to the sensors.

***Note: Do not reverse the left and right heart rate cables during installation. Pins 1 and 3 are used in the left cable, and pins 1 and 2 are used in the right cable.***

6. Thread the right side of the new cable through the right side of the console handlebar, and connect the wires to the sensors.



## PARTS REMOVAL AND REPLACEMENT

7. Replace each sensor grip, connect the cable to the console, and reinstall the console.

### **Polar® Heart Rate Cable**

1. Disconnect the Polar heart rate cable from the console, and remove the right top cover.

***Note: When removing the top cover, lift up gently and disengage the Polar heart cable from the heart rate receiver located in the top cover (see Figure 11).***

2. Pull the cable out through the console handlebar.
3. Thread the new cable through the console handlebar and connect the cable to the heart rate receiver. Reinstall the top cover.
4. Connect the cable to the console and reinstall the console.

### **Upper Main Cable**

1. Remove the left side cover and the console.
2. Disconnect the upper main cable from the lower main cable inside the left frame.
3. Pull the upper main cable out through the console handlebar.
4. Thread the new cable through the console handlebar, and connect the upper and lower main cables.
5. Connect the upper main cable to the console. Reinstall the console and the cover.



## **PARTS REMOVAL AND REPLACEMENT**

### **Upper Brake Cable**

1. Remove the console .
2. Remove the left side cover.
3. Unplug the upper brake cable from the lower motor control cable , and pull the upper brake cable out through the console handlebar.
4. Thread the new cable into the console handlebar and plug the new cable into the lower brake cable .
5. Reinstall the side cover, connect the cable to the console, and reinstall the console .

### **lower Brake Cable**

1. Remove the left side cover.
2. Disconnect the upper brake cable from the lower brake cable. Unplug the lower motor cable from the power control board .
3. Install the new cable and reinstall the side cover.

### **lower Main Cable**

1. Remove the left side cover and disconnect the upper main cable from the lower main cable.
2. Unplug the lower main cable from the power control board and pull the cable away from the machine .
3. Install the new lower main cable and use a tywrap to secure the cable away from the leg sprocket.
4. Reinstall the cover.



## PARTS REMOVAL AND REPLACEMENT

### limit Switch Cable

1. Turn the power off and remove the left side cover.
2. Unplug the motor cable and the limit switch cable from the power control board (see Figure 32).
3. Remove the mounting screws from the upper and lower limit switches and remove the limit switch assembly.
4. Install the new limit switch assembly.

**Note:** *The " Brake On" switch is positioned on the machine below the "Brake Off" switch. Do not reverse the switches during installation - see Figure 31.*

5. Use the mounting screws to adjust the upper and lower limit switches so that the brake cam triggers the limit switches first before it hits the mechanical stops (see Figure 15).
6. Turn the power on. From the DIAGNOSTIC mode, press [INCREASE], [107], [ENTER], [7]. Look at the "Motor On" Light Emitting Diode (LED) on the power control board (see Figure 33). The LED light should be off. Next, look at the "Motor Direction" LED on the power control board. The LED should be on.
7. Press [STOP] on the console, and plug the motor cable into the power control board. Verify correct adjustment of the "Brake On" and "Brake Off" limit switches by pressing [INCREASE], [107], [ENTER], and [6]. The motor will cycle continuously while you check the stopping position of the brake cam. The cam should not be running into the mechanical stops. Press [STOP] to end the test.
8. If necessary, use the actuator arm spring nut and/or the lower mounting nut on the actuator arm to adjust the throw of the arm to rotate the brake cam correctly. Reinstall the cover.

## PARTS REMOVAL AND REPLACEMENT

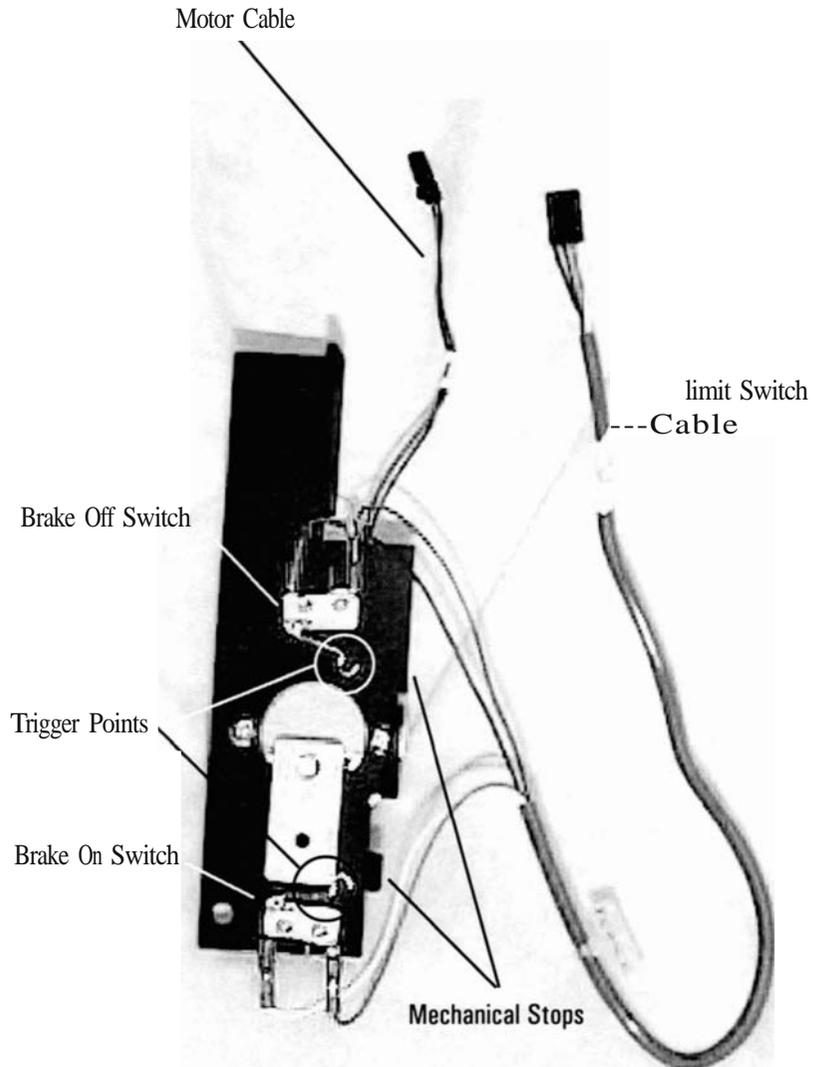


Figure 16: Limit Switch Assembly



## PARTS REMOVAL AND REPLACEMENT

### **Power Connector Cable**

1. Remove the left side cover.
2. Unplug the power connector from the power control board.
3. Remove the four mounting screws and grounding screw from the frame.  
Remove the power connector cable from the frame.
4. Install the new cable, secure the grounding screw, and reinstall the side cover.

### **Stride Sensor Cable**

1. Remove the left side cover.
2. Unplug the cable from the stride sensor board. Remove it from the power control board.
3. Install the new cable and reinstall the side cover.

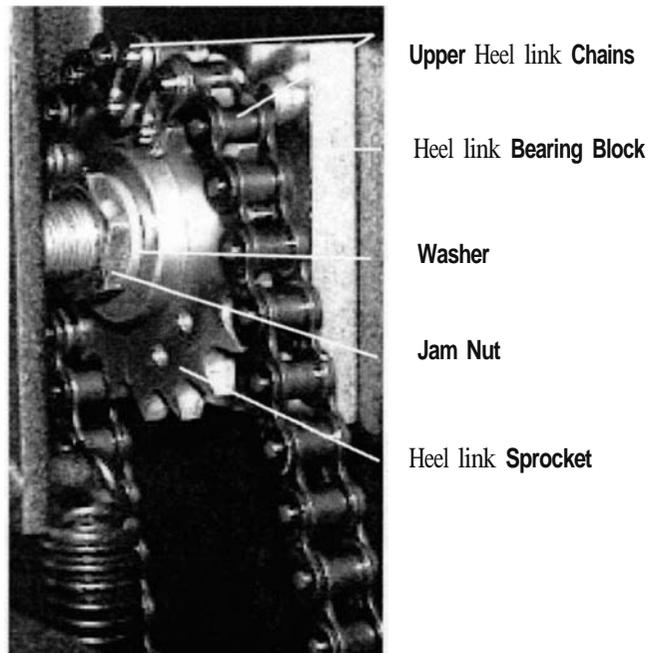
## **CHAINS**

### **Upper Heel Link Chains**

1. Remove the pedal and the appropriate side cover.
2. Remove the power control board (left side only).
3. Loosen the heel link turnbuckle.
4. Remove the heel link pillow block bearing.
5. Unhook the extension spring from the spring hanger.
6. Remove the jam nut and washer from the heel link shaft (see Figure 17).

## PARTS REMOVAL AND REPLACEMENT

7. Support the upper heel link sprocket and remove the heel link from the heel link bearing block.
8. Disconnect the master links from the upper heel link chains and install the new chains.
9. Reinstall the heel link and ensure that the heel link shaft key is fully inserted into the key way. Reconnect the extension spring to the frame.
10. Adjust top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).



**Figure 17: Upper Heel Link Chains**

### **Lower Heel Link Chains**

1. Remove the base and side covers.
2. Rotate the heel link turnbuckle to slacken the chain.



## PARTS REMOVAL AND REPLACEMENT

**Note: It may be necessary to rotate the heel link turnbuckle both directions to see which way will loosen the chain.**

3. Disconnect the single pitch master links from each end of the chain. Pull the chain away from the lower heel link sprocket.
4. Install the new chain. Adjust the top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).
5. Reinstall the covers.

### Front Drive Chain Assembly

1. Remove the side and base covers.
2. Rotate the drive chain turnbuckle to loosen the drive chain. Remove the front drive chain master link from each leg sprocket.
3. Disconnect the master links from the turnbuckle and from the chain adapter link.
4. Pull the lower chain out from under the drive chain idler sprockets (see Figure 23).
5. Install the new drive chain assembly. Adjust the drive chain turnbuckle so that the chain does not slap the frame during a moderate paced workout.

**Note: Do not over-tighten - over-tensioning the turnbuckle will cause the machine to feel rough and cause premature wear of components.**

6. Reassemble the machine, and adjust the top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).

**Note: There are two types of master links. Do not interchange single pitch master links with the double pitch master links (see Figure 28).**



## PARTS REMOVAL AND REPLACEMENT

### Rear Drive Chain Assembly

1. Remove the side and base covers.
2. Rotate the drive chain turnbuckle to loosen the drive chain assembly.
3. Remove the rear drive chain master links from each leg sprocket.
4. Remove each pedal spring from the spring hanger and disconnect each step chain from each drive chain adapter link.
5. Disconnect the master links from each end of the chain adapter links, and pull the lower chain out from under the drive chain idler sprockets (see Figure 23).
6. Install the new chain assembly, and adjust the drive chain turnbuckle so that the chain does not slap the frame during a moderate paced workout.

**Note: Do not over-tighten - over-tensioning the turnbuckle will cause the machine to feel rough and cause premature wear of components.**

7. Reassemble the machine, and adjust the top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).

**Note: There are two types of master links. Do not interchange single pitch master links with double pitch master links (see Figure 28).**

### Step Chains

1. Remove the side cover.
2. Reach between the alternator and the main frame (left side only) to pull up on the spring and remove it from the spring hanger.
3. Detach the spring from the step chain by removing the single pitch master link.
4. Detach the step chain from the drive chain adapter link by removing the single pitch master link.



## PARTS REMOVAL AND REPLACEMENT

5. Pull the step chain away from the drive sprocket and install the new chain.
6. Reinstall the spring and verify that the spring is seated in the spring hanger groove.

***Note: If you are having difficulty removing the left spring, remove the power control board for more accessibility.***

### CONSOLE

1. Remove the four mounting knobs and lock washers from the back of the console.
2. Lift up the console and disconnect the upper main cable, the Polar® heart rate cable, the left and right contact heart rate cables, and the upper brake cable.

### CONSOLE HANDLEBAR

1. Remove the console and the side covers.
2. Disconnect the upper main cable from the lower main cable. Unplug the upper brake cable from the lower brake cable.
3. Remove the main cable and the Polar heart rate cable from the console handlebar.
4. Have an assistant support the handlebar. Remove the bolts and washers from each end of the handlebar. Gently pull the handlebar away from the machine.
5. Install the new handlebar and connect all cables. Ensure that the cables are not pinched between the frame and the handlebar, and are not in the way of moving parts.
6. Reinstall the console and the covers.

## PARTS REMOVAL AND REPLACEMENT

### COVERS



#### WARNING

TO REDUCE THE RISK OF INJURY, DO NOT OPERATE THE MACHINE WHILE THE COVERS ARE REMOVED. DO NOT MOVE THE PEDALS WHILE ANYONE'S HANDS ARE INSIDE THE MACHINE.

#### Base Cover

1. Remove the side covers.
2. Remove one inside mounting rivet from each side of the frame.
3. Lift the bottom cover up to detach it from the frame.
4. Pull the cover out and away from the frame.

#### Heel Link Pivot Cover

1. Remove the two mounting screws from the cover, and then remove the old cover.
2. Install the new cover using the two mounting screws.

#### Safety Panel

1. Remove the fasteners from the inside edge of the safety panel.
2. Slide the panel out from behind the heel link pivot assembly and install the new panel.

#### Side Cover

1. Remove the top cover.
2. Loosen the wing nuts holding the top of the side cover in place.



## PARTS REMOVAL AND REPLACEMENT

3. Lift the side cover up and remove it from the frame.
4. Install the new side cover by aligning the cover hooks with the frame pins and tightening the wing nuts. Reinstall the top cover.

### Step Cover

1. Remove the two screws and washers from the step cover and lift the step cover off the step.

### Top Cover

1. Remove the two cover fasteners from the top cover.
2. Right side: Gently lift the cover up and disconnect the POlar® heart rate receiver. Remove the receiver from the cover. Install the heart rate receiver on the new right cover.
3. Both sides: Install the new cover on the frame.

### DRIVE SHAFT ASSEMBLY

1. Remove all the covers.
2. From the left side, remove the lower POly-V belt.
3. Remove the snap ring from the drive shaft, back the lower POly-V pulley set screw out and slide the pulley off the drive shaft (see Figure 23).



**TO REDUCE THE RISK OF EYE INJURY, WEAR EYE PROTECTION WHEN REMOVING SNAP RINGS.**

4. Remove the spring from the spring hanger and disengage the step chain from the drive sprocket.



## **PARTS REMOVAL AND REPLACEMENT**

5. Remove the drive sprocket, thrust washers, thrust bearings, and spacers from the drive shaft (see Figure 23).
6. From the right side, remove the snap ring, washers, bearings, drive sprocket from the drive shaft and slide the shaft out from the frame .
7. Install the new shaft and reassemble the machine.

### **HANDLE ASSEMBLY**

1. Remove the two bolts from the handle .
2. Remove the handle from the leg assembly.

### **HANDLE KNOB ASSEMBLY**

1. Remove the handle assembly.
2. Remove the shoulder washer from each side of the handle yoke (see Figure 30).
3. Pull the handle adjustment knob out and slide the yoke out of the handle.
4. Remove the knob . Do this by inserting a phillips screwdriver into the handle knob pin to prevent it from spinning while you rotate the knob counterclockwise . Remove the o-ring from the knob pin.
5. Remove the knob pin from the inside of the handle. Slide the spring off the knob pin.
6. Install the new handle knob assembly on the handle and align the handle yoke groove with the knob pin . Ensure that the groove on the yoke faces out, towards the console (see Figure 30).
7. Slide the yoke into the handle and verify that the knob shaft locks into each handle position.



## PARTS REMOVAL AND REPLACEMENT

### HEEL LINK

1. Remove the pedal (see Figure 26).
2. Remove the snap ring from the heel link pivot assembly.



### WARNING

TO REDUCE THE RISK OF EYE INJURY, WEAR EYE PROTECTION WHEN REMOVING SNAP RINGS.

3. Separate the heel link from the pivot assembly.
4. Install the new heel link and reinstall the pedal. Remember to lubricate the pedal shaft with mineral oil before installing the pedal.

### Heel Link Pivot Assembly

1. Remove the pedal.
2. Remove the safety panel and side cover.
3. Remove the heel link pillow block bearing and unhook the extension spring.
4. Remove the jam nut and washer from the pivot assembly shaft (see Figure 25).
5. Remove the heel link sprocket, with the chain attached, from the pivot assembly shaft.
6. Pull the pivot assembly out from the heel link bearing block.
7. Install the new pivot assembly, and ensure that the pivot shaft key is fully inserted into the key way. Reassemble the machine in reverse order.
8. Adjust the top edge of the heel link pivot assembly so that it is horizontal with the floor (see Figure 29).



## **PARTS REMOVAL AND REPLACEMENT**

### **LEG ASSEMBLY**

1. Remove the pedal assembly.
2. Remove the side cover.
3. Remove the spring from the spring hanger, and loosen the drive chain assembly turnbuckle (see Figure 20).
4. Loosen the leg sprocket set screws (see Figure 24).
5. Remove the leg assembly pillow block bearing.
6. Remove the jam nut and washer from the leg assembly shaft.
7. Stand by the leg assembly, and pull the leg shaft out from the bearing block. The leg sprocket will drop onto the frame brace.
8. Install the new leg assembly and ensure that the leg assembly shaft key is fully inserted into the key way.
9. Reassemble the machine by reversing steps 1 through 8, and adjust the top edge of the heel link pivot assembly so it is parallel with the floor (see Figure 29).

### **LOAD RESISTOR**

1. Remove the left side cover and unplug the load resistor from the power control board.
2. Remove the two mounting screws from the resistor and remove the load resistor.
3. Install the new load resistor.
4. Plug the load resistor back into the power control board and reinstall the side cover.



## **PARTS REMOVAL AND REPLACEMENT**

### **MOUNTING BLOCKS**

1. Remove the covers. Have an assistant help you prop the front of the machine up with wooden blocks. Be careful not to block access to the mounting screws!
2. Remove the front and rear drive chain assemblies.
3. Remove the step chains and heel link chains.
4. Remove the drive shaft assembly.
5. Remove the mounting block screws and washers from the bottom of the machine, and remove the mounting blocks.
7. Remove the heel link idler sprockets and the drive chain idler sprockets from the mounting blocks.
8. Attach the drive chain idler sprockets and the heel link idler sprockets to the new mounting blocks.
9. Install the new mounting blocks. Do not reverse the right and left mounting blocks.
10. Reassemble the machine in reverse order, and adjust the top edge of the heel link pivot assembly so it is parallel with the floor (see Figure 29).

### **PEDAL ASSEMBLY**

1. Disengage the brake and push the pedals apart.
2. Remove the six cover fasteners from the pedal cover, and lift the cover, with the foot strap, off the pedal support (see Figure 27).
3. Remove the foot strap mounting fasteners from under the pedal cover.
4. Remove the four mounting screws from the rear bearing block of the pedal support.

## PARTS REMOVAL AND REPLACEMENT

5. Remove the snap rings and washers from the pedal shafts.



**WARNING**

**TO REDUCE THE RISK OF EYE INJURY, WEAR EYE PROTECTION WHEN REMOVING SNAP RINGS.**

6. Slide the pedal assembly off the pedal shafts and remove the remaining washers.
7. Install the new pedal assembly in reverse order.

### PEDAL RETURN SPRINGS

1. Remove the appropriate side cover.
2. Reach between the alternator and the main frame (left side only) to pull up on the spring and remove it from the spring hanger.

***Note: If you are having difficulty removing the left spring, remove the power control board for more accessibility.***

3. Detach the spring from the step chain by removing the single pitch master link.
4. Reinstall the spring and verify that it is seated in the spring hanger groove.



**WARNING**

**DO NOT TWIST THE SPRING DURING INSTALLATION. IT WILL WEAR EXCESSIVELY AND REDUCE THE LIFE OF THE SPRING.**

### POWER CONTROL BOARD

1. Remove the left side cover.



## PARTS REMOVAL AND REPLACEMENT

2. Unplug the lower brake cable, alternator cable, lower main cable, stride sensor cable, load resistor cable, brake motor cable, and power connector from the power control board (see Figure 32).
3. Remove the two mounting screws from the board, and set the board aside.
4. Apply a thin coat of heat sink grease on the aluminum block of the new power control board, and attach the board to the frame.
5. Reconnect all the cables, and reinstall the side cover.

### PULLEYS

#### Idler Pulley Assembly

1. Remove the side cover.
2. Remove the idler spring from the frame.
3. Remove the snap ring from the idler pulley assembly mount and remove the assembly from the frame.
4. Remove the snap ring from the pulley, and slide the pulley off the shaft.



#### WARNING

TO REDUCE THE RISK OF EYE INJURY, WEAR EYE PROTECTION WHEN REMOVING SNAP RINGS.

5. Install the new pulley on the idler pulley bracket.
6. Reassemble the idler pulley assembly on the frame, and ensure that the lower Poly-V belt aligns with the idler pulley. Reinstall the side cover.

#### Intermediate Poly-V Pulley Assembly

1. Remove the left side cover.



## PARTS REMOVAL AND REPLACEMENT

2. Remove the upper and lower POly-V belts .
3. Remove the mounting bolt and washer from the pulley, and slide the pulley assembly off the shaft.
4. Install the new pUlley assembly, and install the belts .
5. Install the upper POly-V belt and pivot the alternator up or down as necessary to allow  $\frac{1}{4}$ " of deflection at the midpoint between the two pulleys (see Figure 22) .
6. Reinstall the side cover.

### Lower Poly-V Pulley

1. Remove the left side cover.
2. Remove the lower POly-V belt.
3. Remove the snap ring and washers from the drive shaft, and slide the pulley off the shaft.



### WARNING

TO REDUCE THE RISK OF EYE INJURY, WEAR EYE PROTECTION WHEN REMOVING SNAP RINGS.

4. Verify that the drive shaft key is fully inserted into the key way when installing the new pulley.

### REAR SUPPORT BAR

1. Remove the safety panel.
2. Remove the step cover.
3. Have an assistant help you tilt the machine forward onto the console handlebar.



## **PARTS REMOVAL AND REPLACEMENT**

4. Remove the step.
5. Remove the mounting bolts and washers from the rear support bar and remove the rear support bar from the frame.
6. Install the new rear support bar, and have an assistant help you tilt the machine back into place.
7. Reassemble the machine in reverse order.

### **STEP**

1. Remove the step cover.
2. Remove the two bolts and washers from each end of the step.
3. Remove the step.
4. Reassemble the step in reverse order.

### **STRIDE SENSOR**

1. Remove the left side cover.
2. Unplug the stride sensor from the power control board and remove the mounting screw from the stride sensor board.
3. Install the new board, ensuring that the leg sprocket magnet is aligned between the two drilled holes in the stride sensor board. The distance between the leg sprocket magnet and the board should be approximately .25 - .30 inches.

### **SPRING CARTRIDGE**

1. Remove the covers.
2. Prop the pedals up and remove both lower heel link chains from the spring cartridge.



## PARTS REMOVAL AND REPLACEMENT

3. Have an assistant help you tilt the machine forward onto the console handlebar.
4. Loosen and remove the spring cartridge mounting bolts from the frame. Remove the spring cartridge.
5. Install the new spring cartridge, connect the lower heel link chains and have an assistant help you tilt the machine back into place.
6. Tension the heel link turnbuckles and adjust the top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).
7. Reinstall the covers.



**DANGER**

**THE SPRING CARTRIDGE IS UNDER HIGH PRESSURE. DO NOT OPEN THE SPRING CARTRIDGE.**

## SPROCKETS

### **Drive Chain Idler Sprockets and Heel Link Idler Sprockets**

1. Remove all of the covers.
2. Remove the drive chain assemblies from the drive chain sprockets.
3. Remove the drive shaft assembly.
4. Remove the heel link chains from the heel link sprockets.
5. Remove the mounting blocks.
6. Remove the idler mounting bolts and install the new sprocket(s).



## PARTS REMOVAL AND REPLACEMENT

7. Reassemble the machine in reverse order, and adjust the top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).

### Drive Sprockets

1. Remove the side cover.
2. Remove the lower Poly-V belt, and remove the snap ring, washers, and lower Poly-V pulley from the drive shaft.



**WARNING**

**TO REDUCE THE RISK OF EYE INJURY, WEAR EYE PROTECTION WHEN REMOVING SNAP RINGS.**

3. Remove the spring from the spring hanger, and disengage the pedal arm spring chain from the sprocket.
4. Remove the snap ring and washers from the drive shaft (right side only).



**WARNING**

**TO REDUCE THE RISK OF EYE INJURY, WEAR EYE PROTECTION WHEN REMOVING SNAP RINGS.**

5. Rotate the sprocket off the drive shaft.
6. Install the right sprocket with the teeth facing the mounting block and the left sprocket with the teeth facing the side cover (see Figure 23).
7. Reinstall the side cover.

### Upper Heel Link Idler Sprockets

1. Remove the appropriate pedal, side cover, and safety panel.
2. Remove the power control board (left side only).



## **PARTS REMOVAL AND REPLACEMENT**

3. Loosen the heel link turnbuckle (see Figures 19 and 20), and remove the heel link pillow block bearing.
4. Unhook the extension spring from the spring hanger.
5. Remove the jam nut and washer from the heel link assembly shaft.
6. Support the sprocket with chains attached, and remove the heel link assembly from the bearing block.
7. Lower the sprocket and remove the upper heel link chains from the sprocket.
8. Install the new sprocket and reassemble the machine in reverse order. Adjust the top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).

### **Leg Assembly Sprockets**

1. Remove the pedal and the side cover.
2. Remove the front and rear drive chain assemblies from the leg sprocket (see Figure 21).
3. Remove the leg assembly pillow block. Remove the jam nut and washer from the leg assembly shaft (see Figure 24).
4. Support the sprocket, remove the leg assembly from the bearing block, and set the leg assembly aside.
5. Remove the old sprocket and install the new sprocket.
6. Reassemble the machine and adjust the top edge of the heel link pivot assembly so that it is parallel with the floor (see Figure 29).

### **TURNBUCKLE ASSEMBLY ADJUSTMENTS**

1. Remove the side cover and loosen the turnbuckle jam nut.
2. Rotate the center link to the desired tension, and tighten the jam nut.

## GROUNDING INSTRUCTIONS

The external power supply must be grounded. Grounding provides the path of least resistance for the electric current, thereby reducing the risk of electric shock. The power supply must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.



IMPROPER CONNECTION OF THE EQUIPMENT-GROUNDING CONNECTOR CAN RESULT IN THE RISK OF ELECTRIC SHOCK. CHECK WITH A QUALIFIED ELECTRICIAN OR SERVICE PERSON IF YOU ARE IN DOUBT AS TO WHETHER THE MACHINE IS PROPERLY GROUNDED. DO NOT MODIFY THE PLUG PROVIDED WITH THIS MACHINE. IF IT WILL NOT FIT THE AVAILABLE OUTLET, HAVE A PROPER OUTLET INSTALLED BY A QUALIFIED ELECTRICIAN.

The grounding plug on the power supply is shown in sketch A of Figure 18\*. A temporary adapter, shown in sketches B and C, may be used to connect the plug to a two-pole receptacle if a properly grounded outlet is not available. The adapter should be used only until a properly grounded outlet (sketch A) can be installed by a qualified electrician. The tab extending from the adapter must be connected to a permanent ground such as the metal screw on the outlet cover.

\* This may vary for International power supplies.

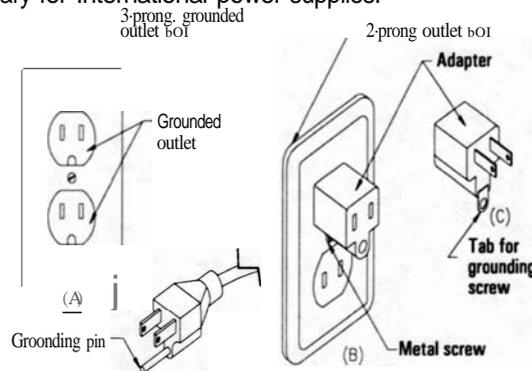


Figure 18: Grounding System



## FCC COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



**WARNING**

**CHANGES OR MODIFICATIONS TO EQUIPMENT NOT EXPRESSLY  
APPROVED BY STAIRMASTER®SPORTS/MEDICAL PRODUCTS, INC.  
COULD VOID THE USER'S AUTHORITY TO OPERATE THIS EQUIPMENT.**

The contact heart rate sensors are electrostatic discharge (ESD) sensitive. A discharge directly to the sensors may cause the console to reset.

## CANADIAN DOC CLASS B COMPLIANCE

This digital apparatus does not exceed the Class B limits for radio emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

La présent appareil numérique ne dépasse pas les limites établies pour les bruits radioélectriques applicables aux appareils numériques de la Class B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

**IMPORTANT PHONE NUMBERS**

If you need assistance, please have both the serial number of your machine and the date of purchase available when you contact the appropriate StairMaster® Sports/Medical Products, Inc. office listed below.

**OFFICES IN THE UNITED STATES****CORPORATE HEADQUARTERS**

12421 Willows Road NE, Suite 100  
Kirkland, WA 98034  
(800) 635-2936 or (425) 823-1825  
FAX: (425) 823-9490

**CUSTOMER SERVICE**

12421 Willows Road NE, Suite 100  
Kirkland, WA 98034  
(800) 331-3578  
FAX: (425) 814-0601

**INTERNATIONAL OFFICES AND DISTRIBUTORS**

For technical assistance and a list of distributors in your area, please call or fax one of the following numbers:

**INTERNATIONAL DIVISION**

(425) 823-1825  
FAX: (425) 820-7505

**EUROPE: HEADQUARTERS**

41-91-827-3801  
FAX: 41-91-827-8902

**GERMANY: HEADQUARTERS**

49-2204/610-27  
FAX: 49-2204/628-90

**U.K.: HEADQUARTERS**

44-1908/221-323  
FAX: 44-1908/223-162

**APPENDIX**

**Figure 19: Final Assembly- Left Side**

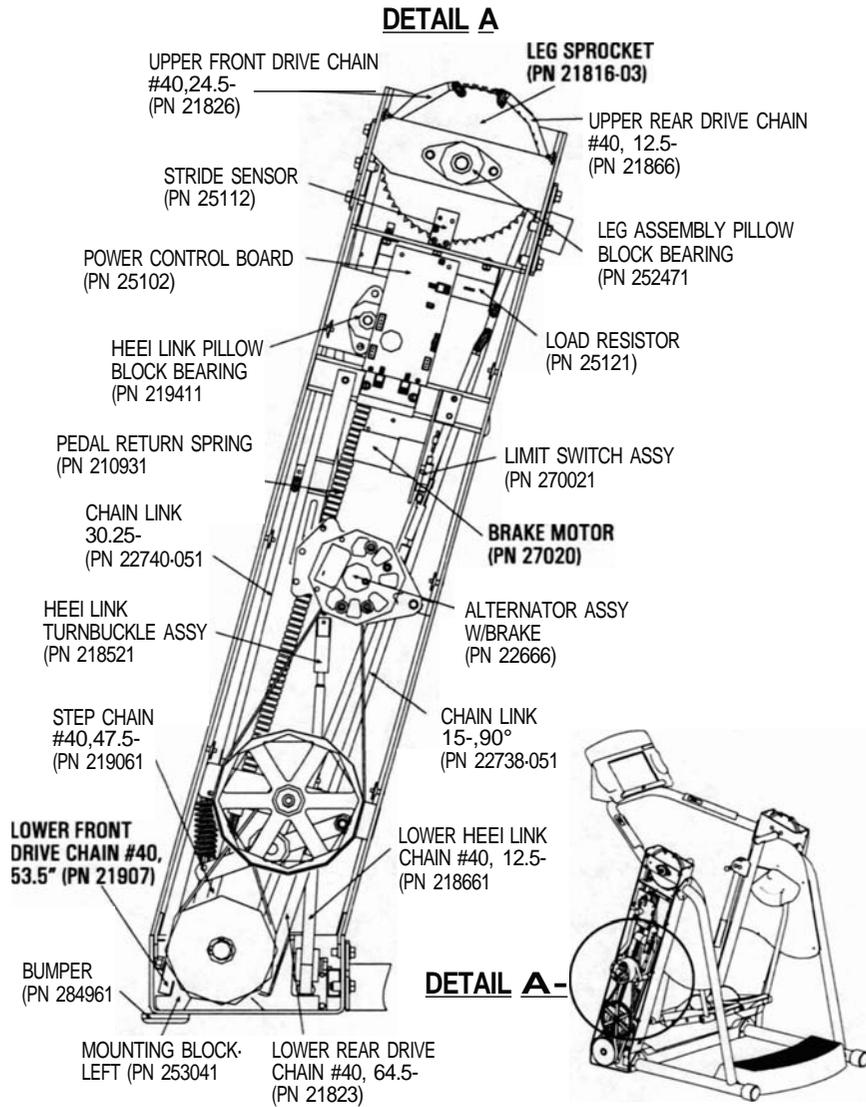


Figure 20: Final Assembly- Right Side

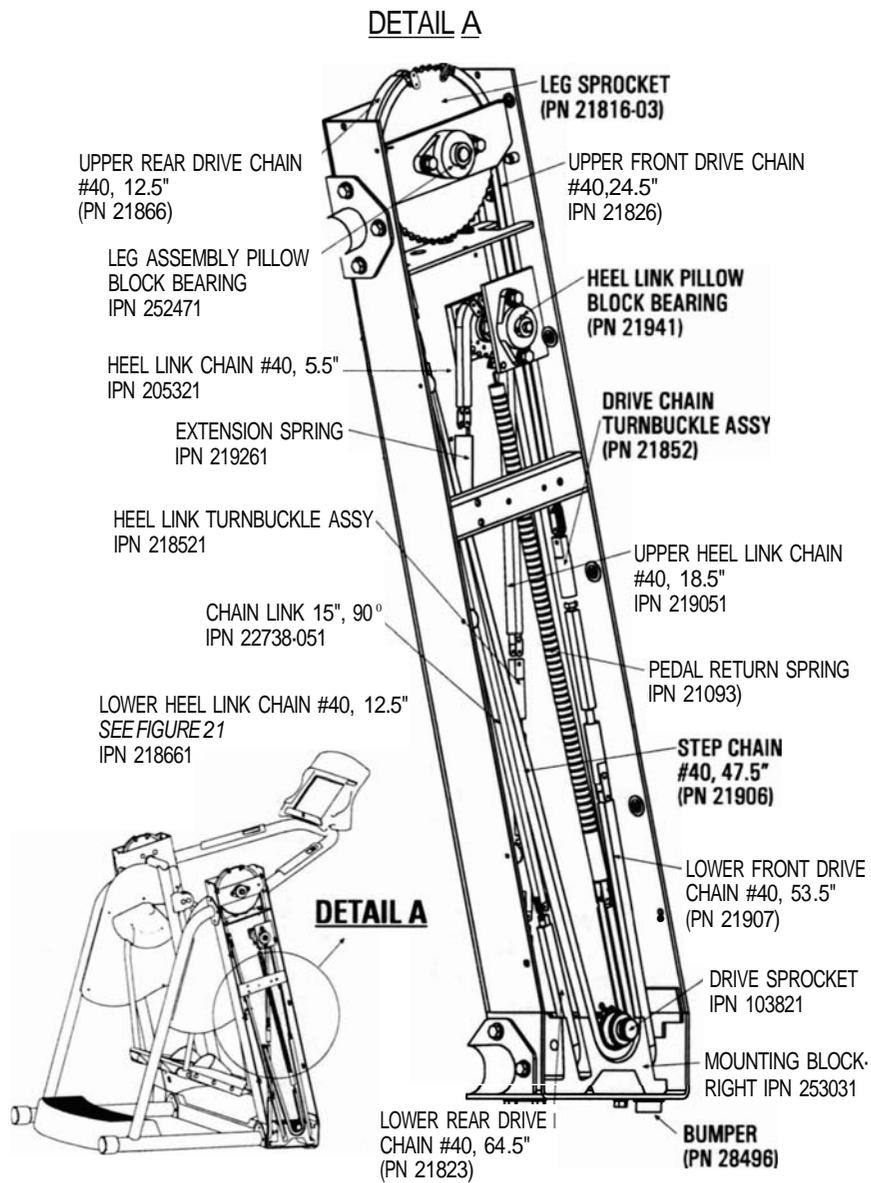
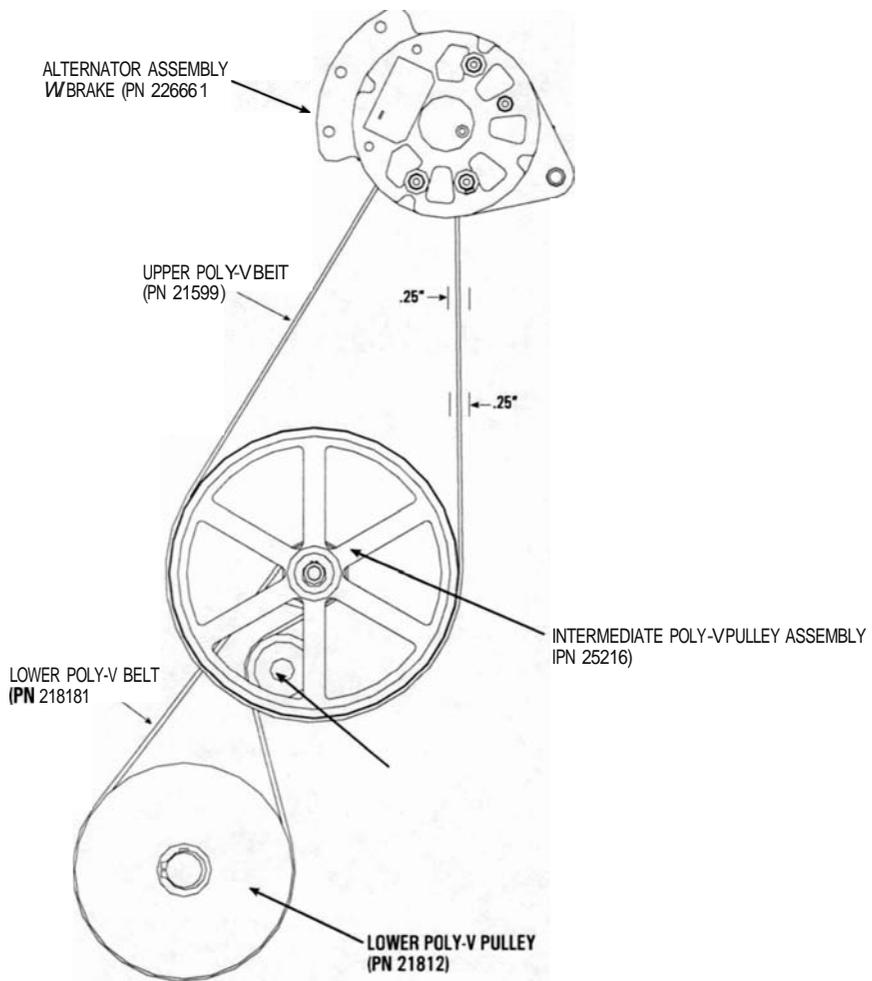




Figure 22: Belt Tension



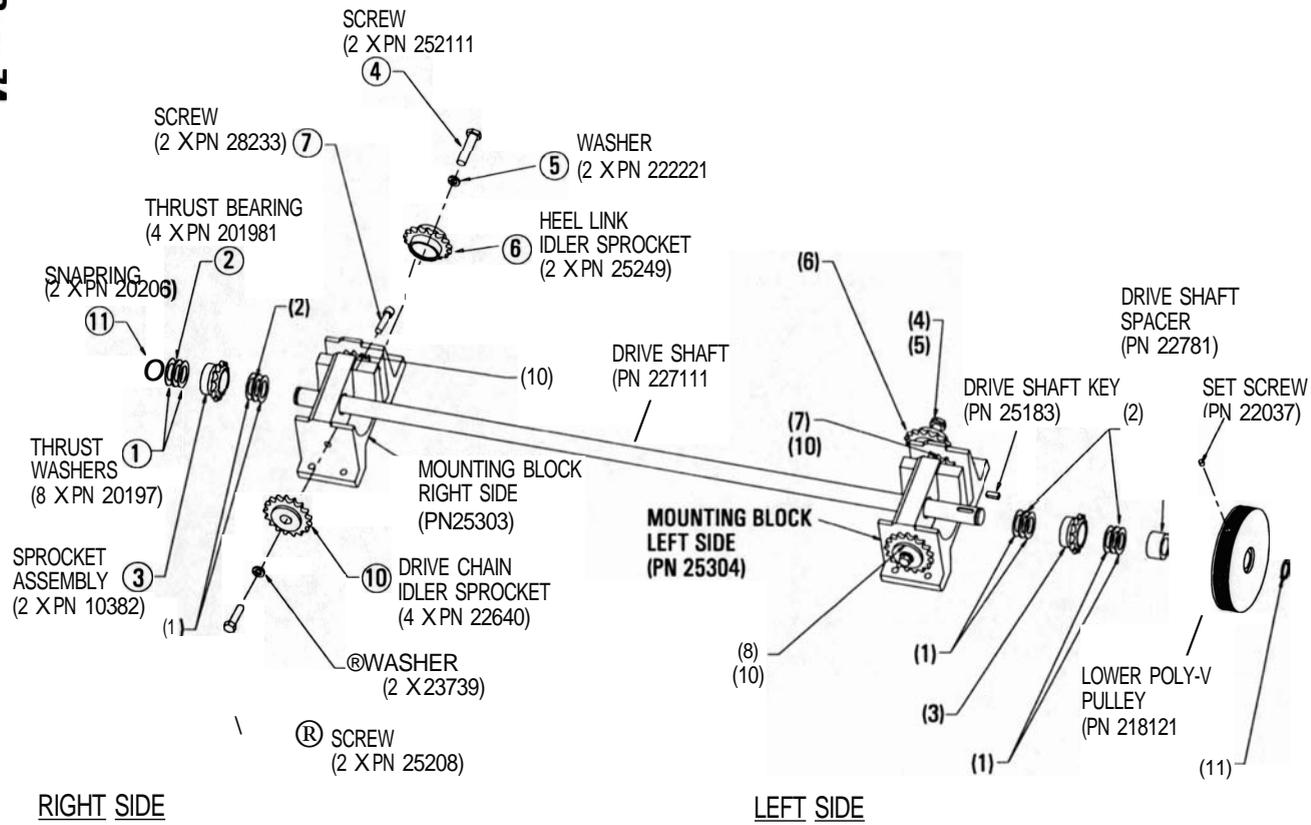


Fig. 23: Drive Shaft Assembly

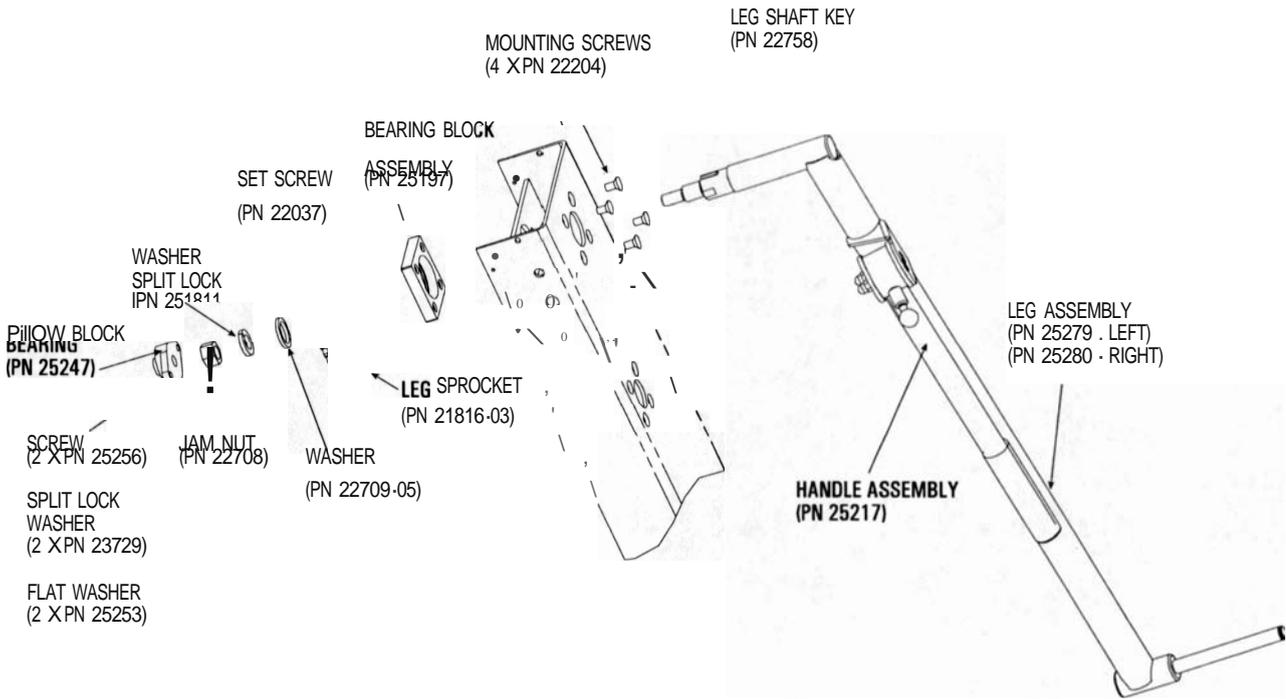


Figure 24: Leg Assembly

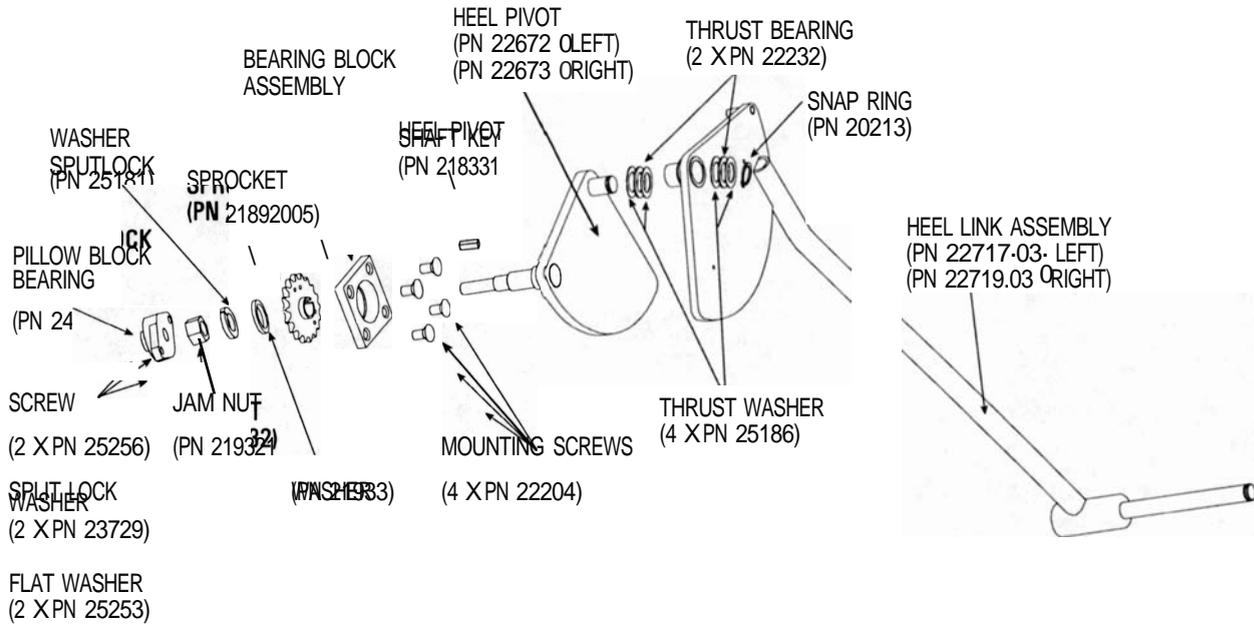
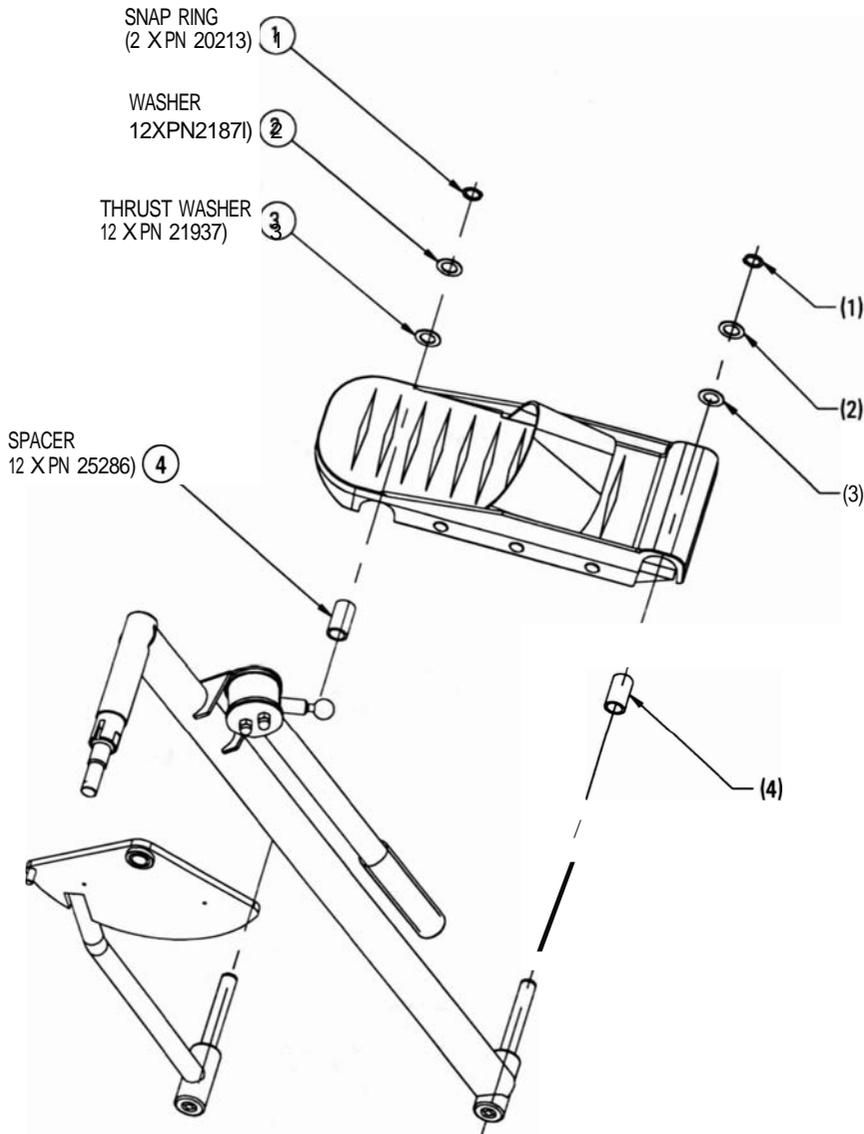


Fig. 25: Heel Link Assembly

Figure 26: Pedal Mounting



APPENDIX

Figure 27: Pedal Assembly

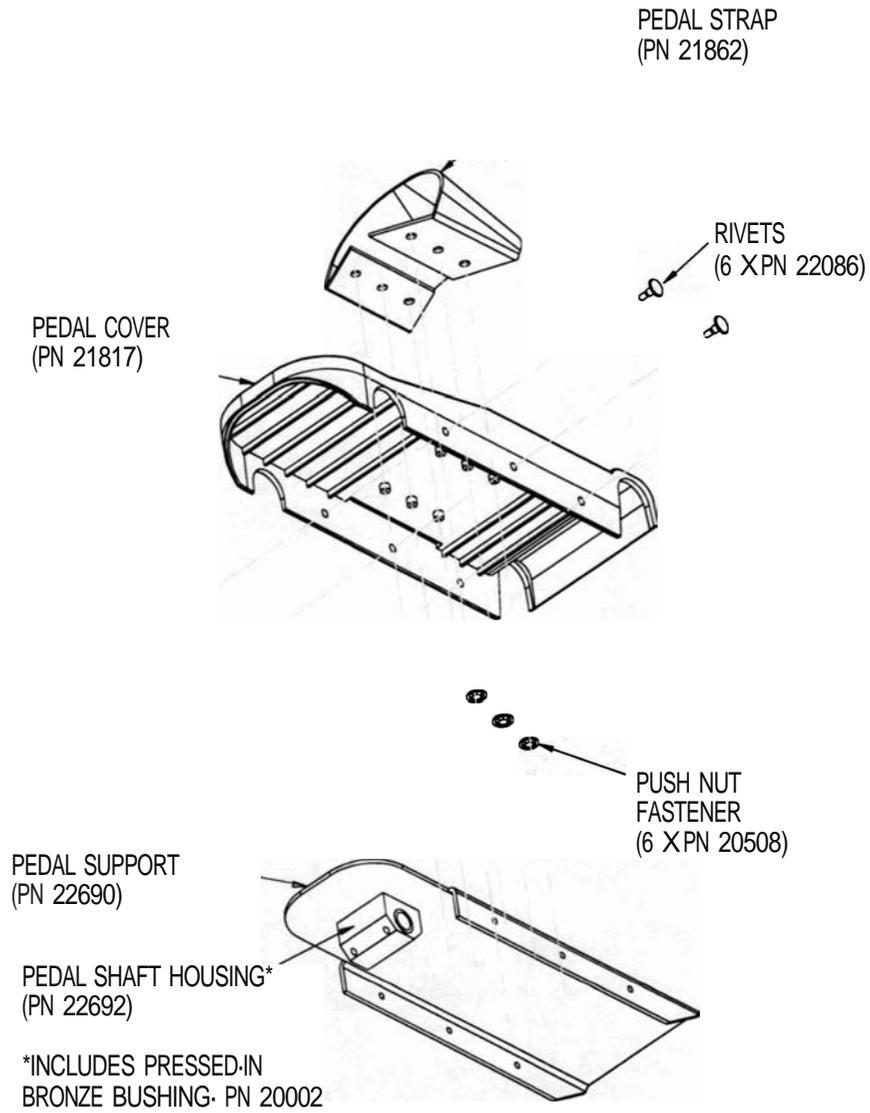
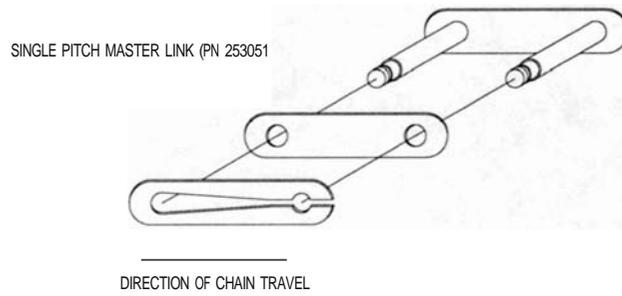
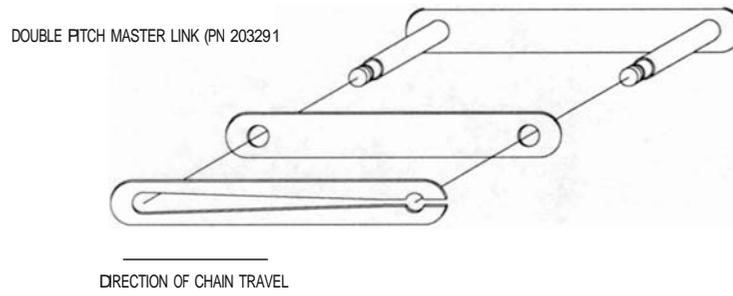


Figure 28: Master Links



APPENDIX

Figure 29: Heel Link Pivot Adjustment

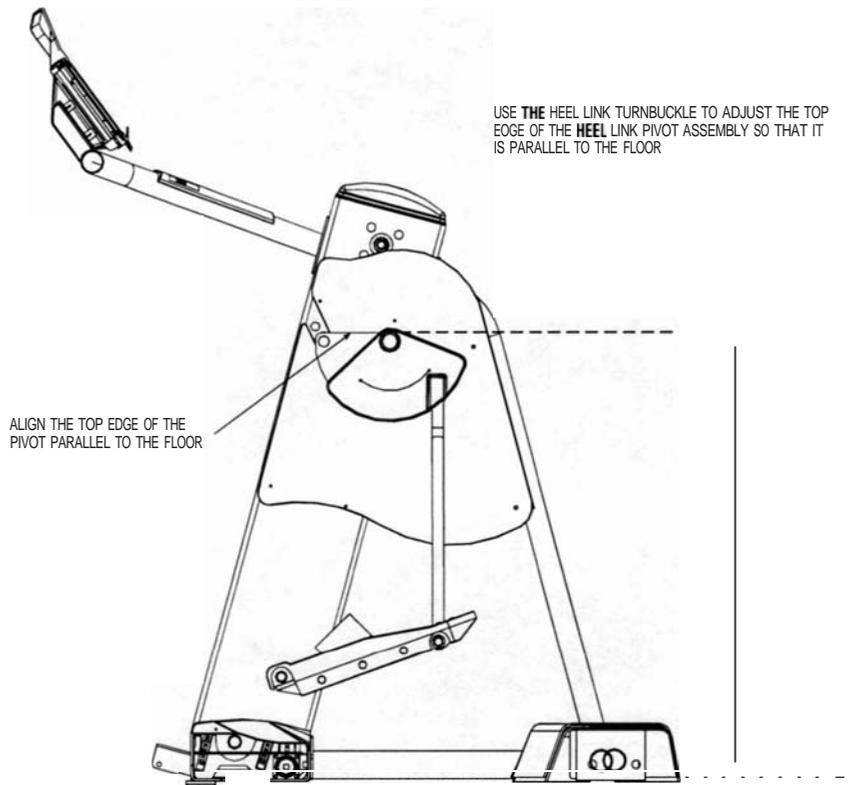
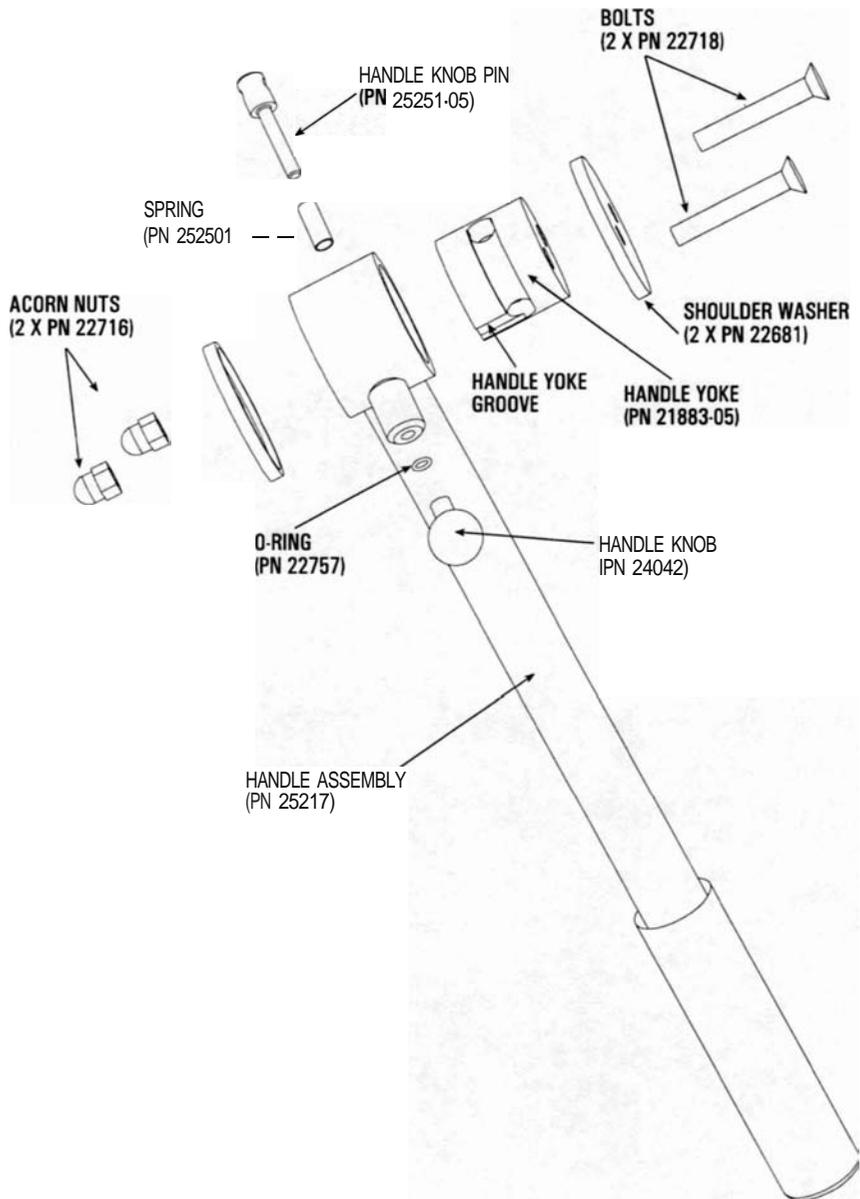


Figure 30: Handle Assembly



**APPENDIX**

**Figure 31: Limit Switch Assembly**

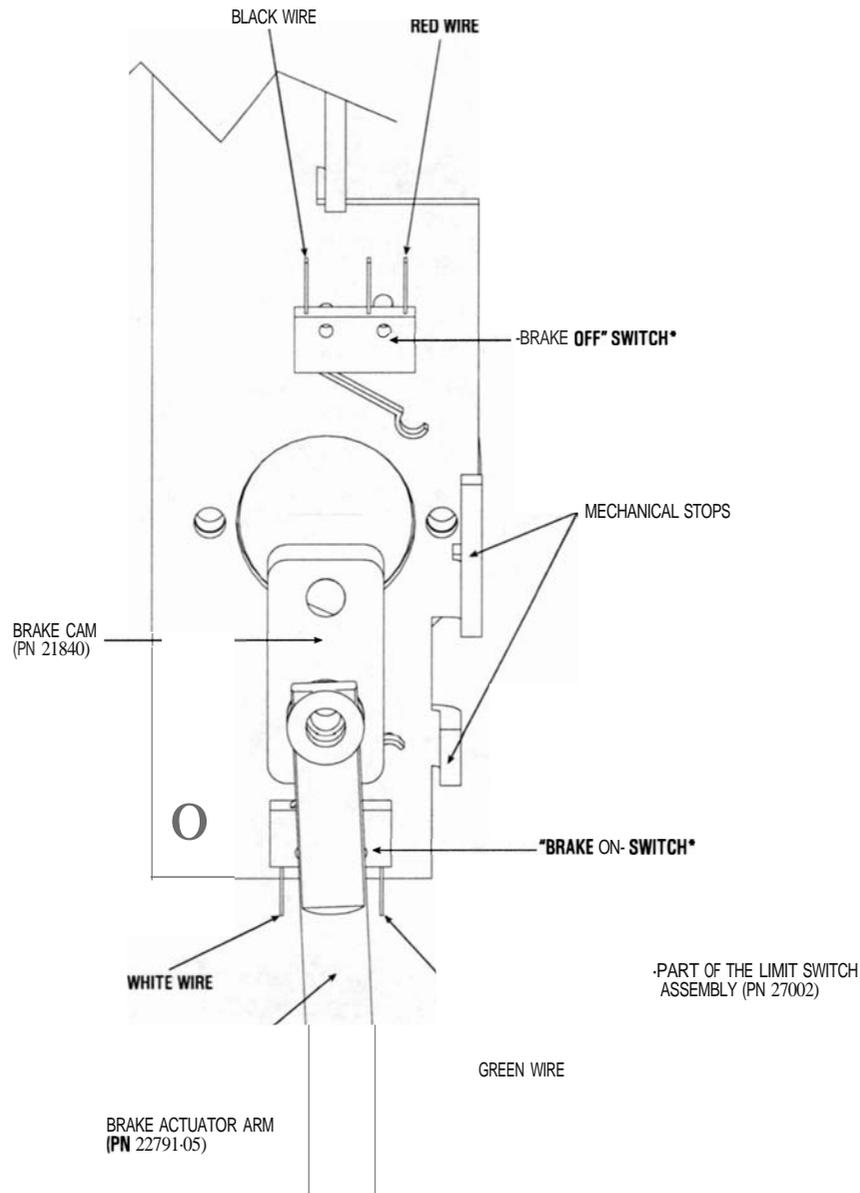
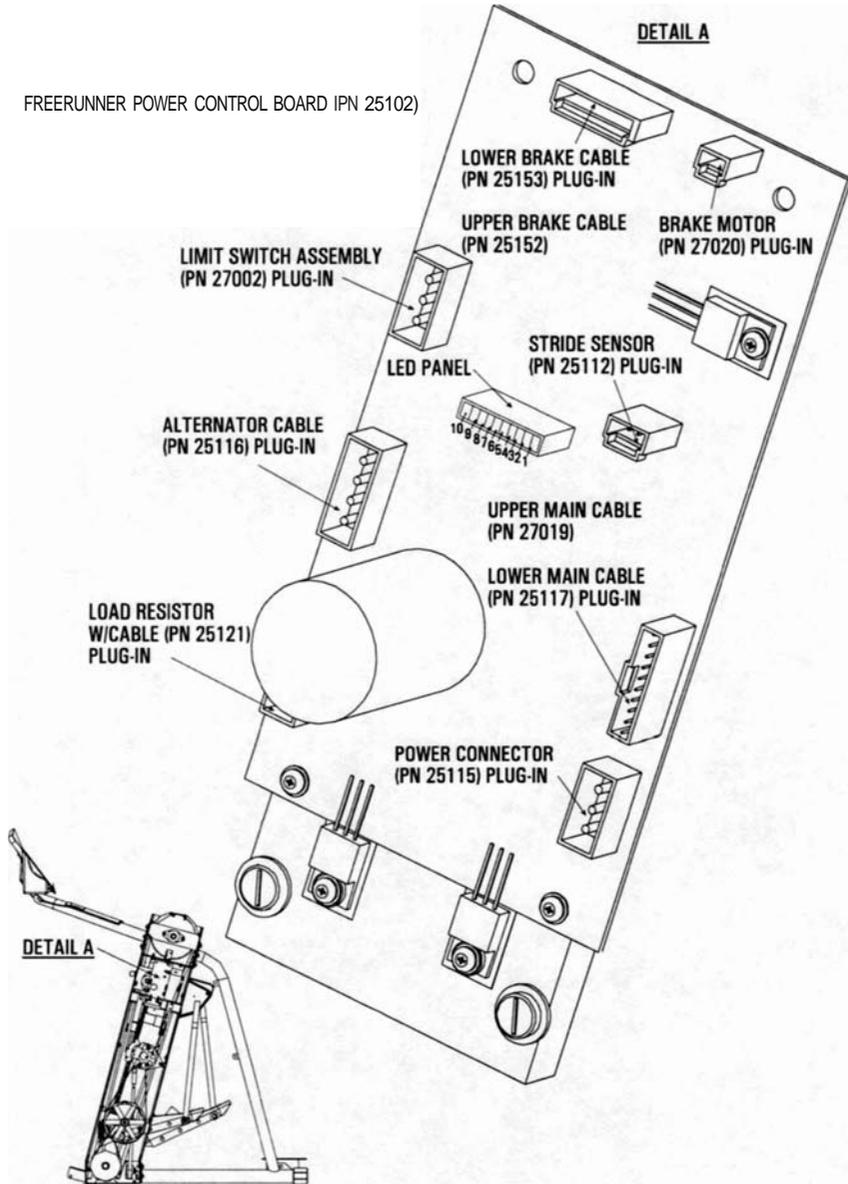
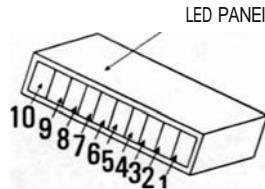


Figure 32: Power Control Board "A"



## APPENDIX

Figure 33: LED Panel

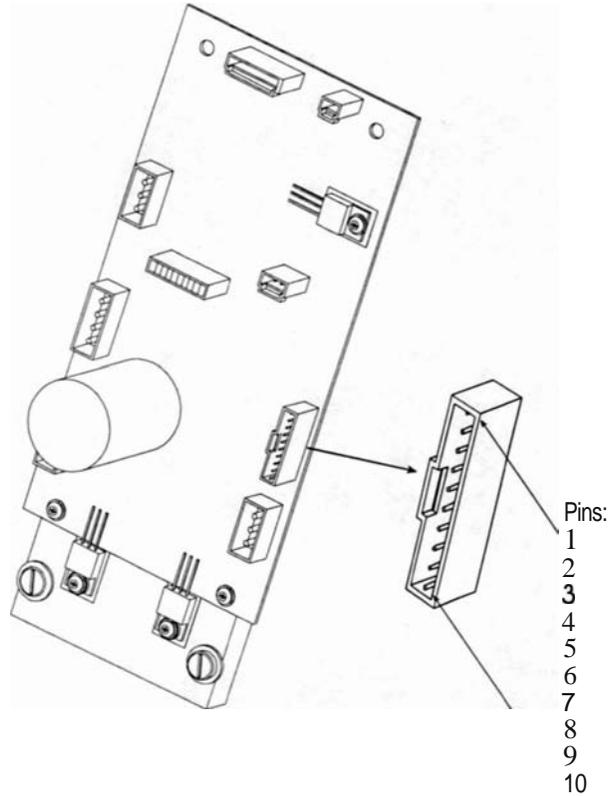


### POWER CONTROL BOARD - UGHT EMMING DIODES (LEOs)

- #1 - V SiPly • "ON" if the power supply is operating. If "OFF", check the following: wall outlet, power supply, power connector, and power control board.
- #2- VCC- "ON" if power is getting to the console, and if the console is providing +5V back down to the power control board. If "OFF", check the following: upper and lower main cable, console, and power control board.
- #3- Alt Off- "ON" if the console is disabling the alternator (as in the ATTRACT model. "OFF" when the alternator is turned ON (as in an exercise program). Inspect the console, alternator cable, alternator and power control board if the LED is not functioning property.
- 14- Load Resistor - "ON" when the main load resistor is OFF. Have an assistant exercise on the machine while you watch the LED. Start at intensity level 1 on the console and continue through level 20. The LED will fade out as you increase intensity. If the LED does not function property, check the main cable and power control board.
- #5- Stride Sensor - "ON" when the pedals are aligned. If OFF-, ensure that the pedals are aligned and check the stride sensor magnet position (see page 63). Also check the stride sensor board, stride sensor cable, and power control board.
- 16- Motor Dir - "ON" indicates that the brake will be engaged when cycled, "OFF" indicates that the brake will be disengaged when cycled (see "Brake Test", page 35).
- 17- Motor On - "ON" when the brake motor is OFF. "OFF" when the brake motor is driving the brake to ON or OFF (see "Brake Test-, page 35).
- #8- UI -BrIb 0.-- -OFF- when the brake motor is driving the brake to ON, until the limit switch is contacted (see "Brake Test-, page 35).
- #9- II -BrIk. Off- -OFF- when the brake motor is driving the brake to OFF, until the limit switch is contacted (see "Brake Test-, page 35).
- #10 -Not Used - This LED should never be on. Inspect the power control board if it is on.

**\*\*\*AT REST, WITHOUT ANYONE ON THE MACHINE, ALL THE LEDS SHOULD BE ON\*\*\***

Figure 34: Power Control Board "B"

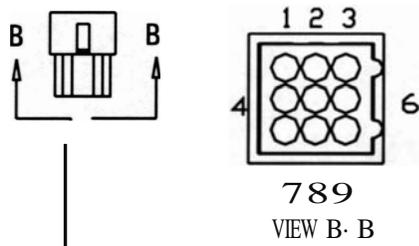


**CONSOLE PLUG-IN  
(On the PCB Board)**

- Pin 1 - Alt Off
- Pin 2 - V Supply
- Pin 3 - B+ Scaled
- Pin 4 - Resistor Control
- Pin 5 - VCC
- Pin 6 - N/C
- Pin 7 - Tach
- Pin 8 - N/C
- Pin 9 - Stride Sensor
- Pin 10 - Ground

APPENDIX

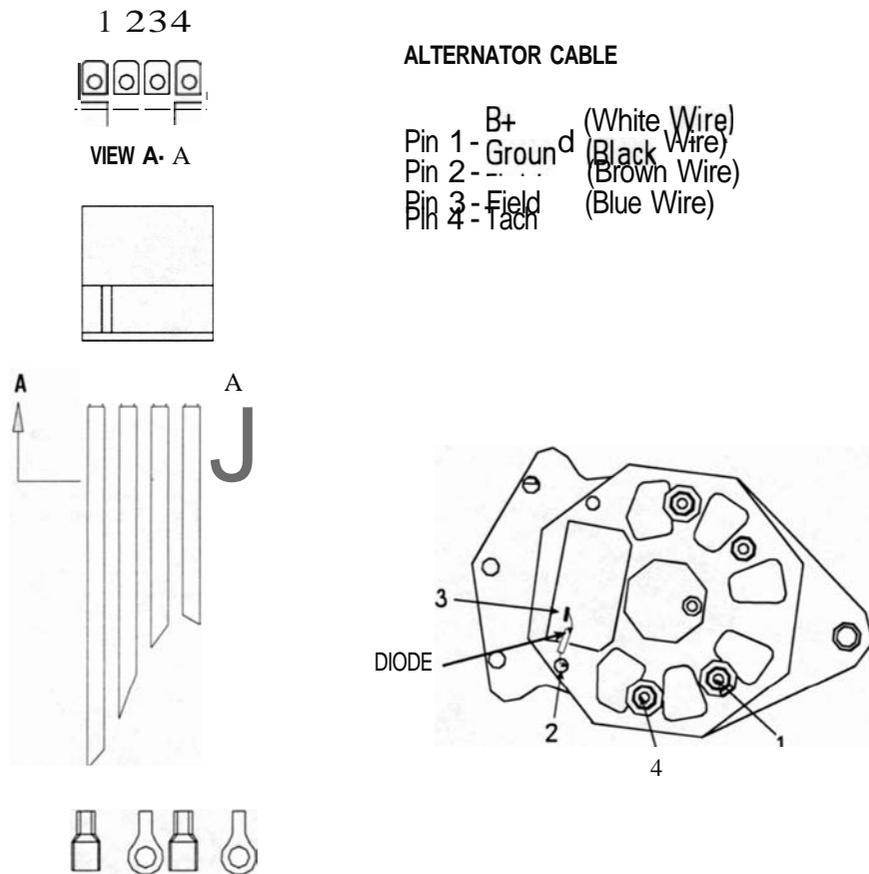
Figure 35: Console Main Cable



**CONSOLE MAIN CABLE**

- Pin 1 - **BLK** V-Supply
- Pin 2 - **BROWN** Art Off
- Pin 3 - **RED B+** Scaled
- Pin 4 - **ORC Resistor** Control
- Pin 5 - **YELLOW** V<sub>EE</sub>
- Pin 6 - **CRN** Tach
- Pin 7 - **BLU** Ground
- Pin 8 - **VIO** Stride Sensor
- Pin 9 - **NIC**

Figure 36: Alternator Cable



APPENDIX

Figure 37: Power Supply

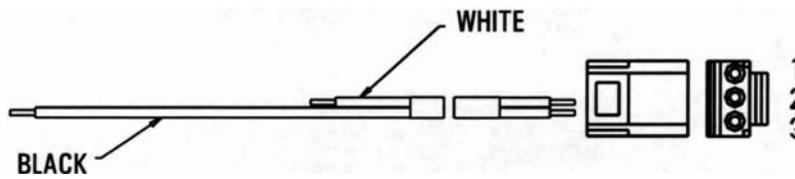
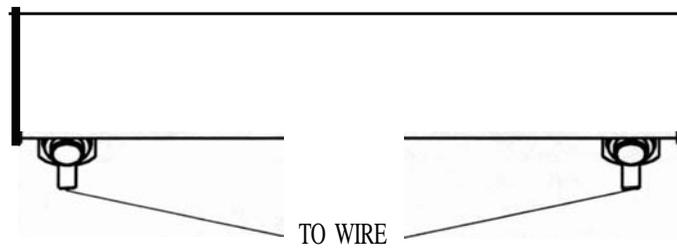


POWER SUPPLY

- Pin 1 . V Supply
- Pin 2 . Ground
- Pin 3 . Earth Ground

- Pins:
- 1
  - 2
  - 3

Figure 38: Load Resistor



LOAD RESISTOR

1/2 Ohm 240 Watt

1/2 Ohm measured at Pins 1 and 3