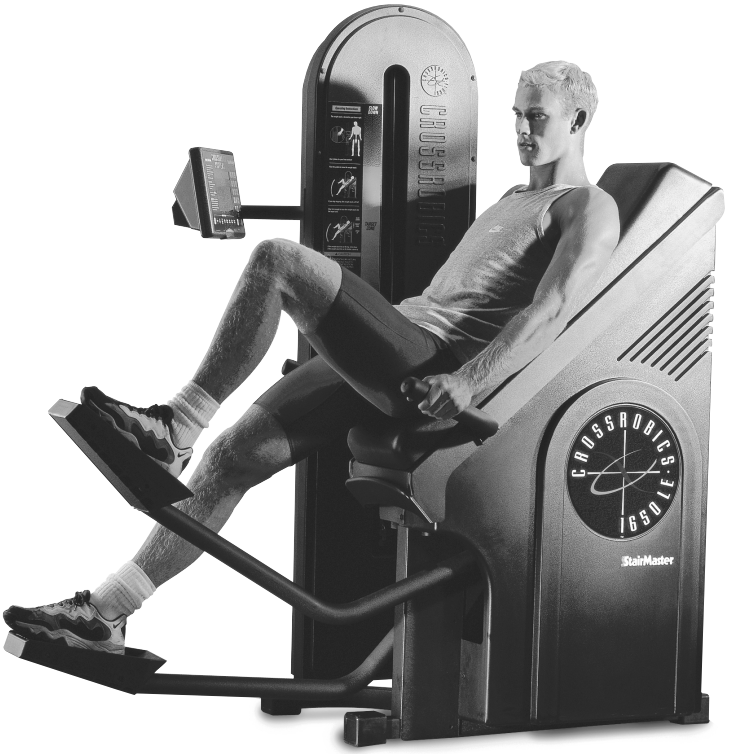
CROSSROBICS® 1650 LE
OWNER'S MANUAL



StairMaster®
THE RESULTS YOU WANT™

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P/N 22872-A

WARRANTY

This is to certify that the StairMaster® Crossrobics® 1650 LE conditioning system is warranted for a period of three years by StairMaster Health & Fitness 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 date of purchase, any part of the StairMaster Crossrobics 1650 LE conditioning system should fail to operate properly, contact our Customer Service Department to report the problem. Refer to the Appendix for the phone number of the office nearest you. When calling, please be prepared to provide our customer service representative with the following information:

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

This information will ensure that you are the only one ordering parts under your warranty protection. 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 Material Authorization (RMA) prior to shipment.
- StairMaster Health & Fitness Products, Inc. will incur all freight charges for warranty parts ordered for a product that is less than 45 days old. The parts will be shipped to you via an overnight courier*.
- You are responsible for freight charges on warranty parts for products that are more 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 cost to return the inoperable parts. Detailed instructions are included with each warranty replacement part shipment.

StairMaster Health & Fitness Products, Inc. neither makes, assumes, nor authorizes any representative or other person to make or assume for us, any other warranties 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 any parts other than those provided by StairMaster Health & Fitness Products, Inc. are used.

* Note: Aerosol products cannot be transported via air.

The StairMaster® Crossrobics® 1650 LE conditioning system is a highly effective tool for developing and improving lower extremity strength and aerobic fitness. 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 additional information for the owner.

WHAT IS THE STAIRMASTER CROSSROBICS 1650 LE CONDITIONING SYSTEM?

The Crossrobics 1650 LE conditioning system is a non weight-bearing, weight-loading, exercise system. Regular use produces increased aerobic capacity as well as stronger muscles and bones. Traditional types of weight-loading exercise, such as weight lifting, produce stronger muscles and bones but cannot be performed in the rhythmic, continuous fashion needed to improve aerobic fitness. Traditional weight-bearing exercise, such as jogging, improves aerobic fitness, but does little to enhance muscular strength. This type of exercise also increases a user's risk of injury by placing high impact forces on their joints.

The difference between the Crossrobics 1650 LE conditioning system and other types of exercise is the patented Crossrobics loading system. The Crossrobics loading system allows the user independent control of both speed level and resistance. The exercise speed is controlled with the FASTER and SLOWER keys on the console. The resistance is controlled by selecting the appropriate number of plates on the weight stack.

The training emphasis of any given workout depends on how the two variables, speed level and resistance, are combined (see The Crossrobics® Conditioning Matrix Table - pg. 6). A strength workout consists of lower exercise speeds and heavier resistance. A power workout combines faster exercise speeds and heavy resistance. Fast exercise speeds and lighter resistance improve leg speed. An endurance program using slower speeds and lighter weights is ideal for the long-duration workouts recommended by weight-control experts.

The Crossrobics® Conditioning Matrix Table

Type of Training Emphasis	Power	Speed	Strength	Endurance
Speed level	Fast	Fast	Medium	Slowest
Resistance (Weight Plates)	Heavy	Medium	Heaviest	Light
Duration	Short	Medium	Medium	Long
Primary Energy System	Anaerobic	Anaerobic + Aerobic	Anaerobic + Aerobic	Aerobic

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WHEN USING ELECTRICAL EQUIPMENT, ALWAYS FOLLOW THESE BASIC PRECAUTIONS:

IMPORTANT SAFETY INSTRUCTIONS

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.

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.

SAFETY GUIDELINES

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® Health & Fitness Products, Inc.

5. Do not use the external power supply if it has a damaged cord or plug, or if it is not working properly, if it has been dropped or damaged, or dropped into water. Contact our Customer Service Department at 1-800-331-3578 to arrange for the return of damaged parts.

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.

11. 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

Before leaving the manufacturing facility in Tulsa, Oklahoma, your StairMaster® Crossrobics® 1650 LE conditioning system was thoroughly inspected and tested for proper operation. The major parts of the machine are shown in Figure 1.

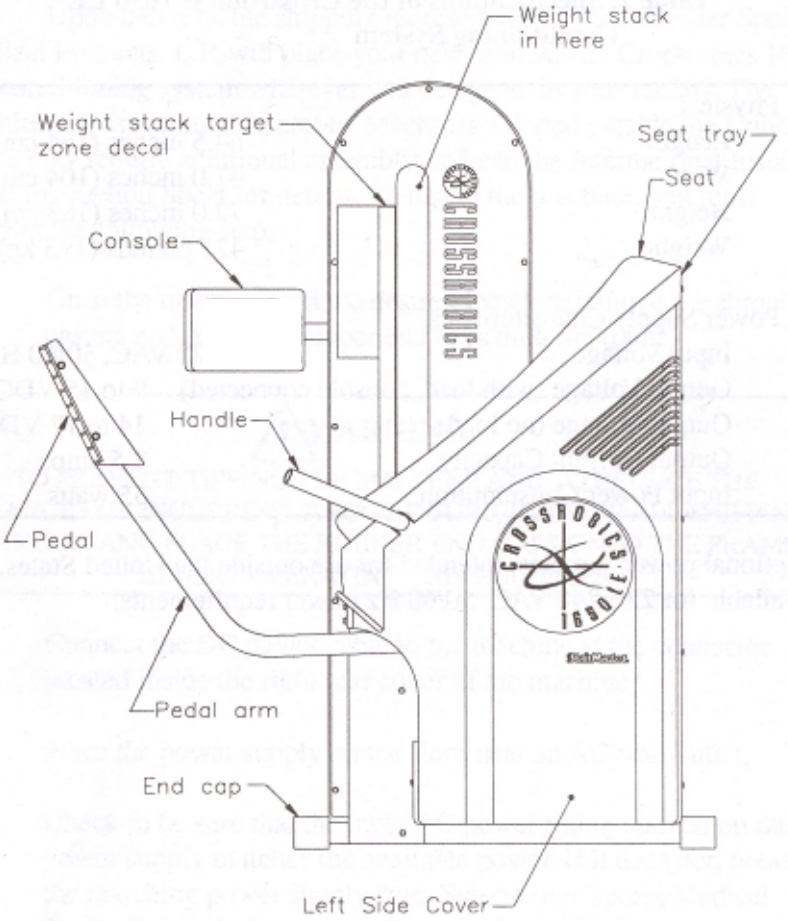


Figure 1: Major Parts

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 weight stack is on the right side of the machine. The dimensions and electrical specifications for a fully assembled machine are listed in Table 1.

Table 1. Specifications of the Crossrobics® 1650 Conditioning System

Physical:	
Length	64.5 inches (164 cm)
Width	41.0 inches (104 cm)
Height	72.0 inches (183 cm)
Weight	425 pounds (193 kg)
Power Supply Characteristics:	
Input Voltage	110-120 VAC, 50/60 Hz*
Output Voltage (with load, console connected)	9 to 15 VDC
Output Voltage (no load)	14 to 17 VDC
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

The StairMaster® Crossrobics® 1650 LE exercise system must be placed on a solid, level surface near an AC wall outlet. A minimum ceiling height of 6.5 feet (1.98 meters) and a doorway width of 34 inches (86 cm) is required.

Upon delivery, the shipping representative of StairMaster Health & Fitness Products, Inc. will place your new StairMaster Crossrobics 1650 LE conditioning system wherever you designate in your facility. The machine requires minor assembly. Machines shipped outside the United States may require additional assembly; refer to the International Installation Instruction Sheet for details. To install the machine, perform the following steps:

1. Once the machine is in the desired location, remove the shipping casters and place the rubber end caps onto the frame.

⚠ WARNING

TO PREVENT TIPPING THE MACHINE, AND TO REDUCE THE CHANCES OF INCURRING A FOOT INJURY, REMOVE ALL SHIPPING CASTERS AND PLACE THE RUBBER END CAPS ONTO THE FRAME BEFORE OPERATING THIS EQUIPMENT.

2. Connect the DC power cable to the machine at the connector located inside the right rear cover of the machine.

3. Place the power supply on the floor near an AC wall outlet.

4. 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 Health & Fitness Products, Inc. before proceeding any further.

5. 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.

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.

6. Watch the console. The console should display a software revision code and then show "SELECT WORKOUT." If the console does not, unplug the power supply and 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 phone number.

10. The display "SELECT WORKOUT" tells you the machine is ready to use.

A selection of different length DC cables, brackets for multiple power supplies, and other accessories are available from StairMaster® Health & Fitness Products, Inc. Refer to the Appendix for the phone number of the office nearest you.

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 status.

2. When working out for the first time, use the [MANUAL] workout option with low weight and a low intensity until you feel comfortable and capable of exercising at a higher intensity, or with heavier weight.

3. The speed and the duration of your workout should always be consistent with how you feel. Never permit external influences to override your personal judgment about what constitutes a safe exercise intensity for you at a particular moment in time.

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® Health & Fitness Products, Inc. has been thoroughly inspected at the manufacturing facility prior to shipment, proper installation and regular maintenance are required to ensure safety. The owner has sole responsibility for maintaining the machine.

BASIC OPERATING INSTRUCTIONS

YOUR FIRST WORKOUT ON THE STAIRMASTER® CROSSROBICS® 1650 LE CONDITIONING SYSTEM

Basic Instructions for First-Time Users

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

⚠ WARNING

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. Face the machine so that you can see both the console and the weight stack. Next, step over and straddle both pedal arms.

3. Reach over with your right hand and place the weight stack pin in the number three plate.

4. Select the MANUAL exercise program so you can control the pace of your first workout and get used to the exercise motion. Press [MANUAL] and then press [ENTER]. The console will return to the start screen if you do not press [ENTER] within 60 seconds.

5. The console will prompt you to enter your body weight. Enter your weight in pounds (or kilograms if the console is set up for metric units). Correct entry errors by pressing [CLEAR] before you press [ENTER].

6. The console will prompt you to enter the number of weight plates. Enter [3] for three weight plates. Correct entry errors by pressing [CLEAR] before you press [ENTER].

7. The console will prompt you to enter your intensity level. Enter [3] for intensity level 3. Correct entry errors by pressing [CLEAR] before you press [ENTER].

8. The console will prompt you to enter the workout time in one minute increments between 5 and 99 minutes. Press [1], [0], [ENTER] to exercise for ten minutes. If you do not start exercising within 60 seconds, the console will return to the start screen.

9. Grasp both handles with your palms facing inwards. Support your weight with your arms and lean back on the seat. Bend your legs and swing your feet up onto the pedals (see Figure 2).

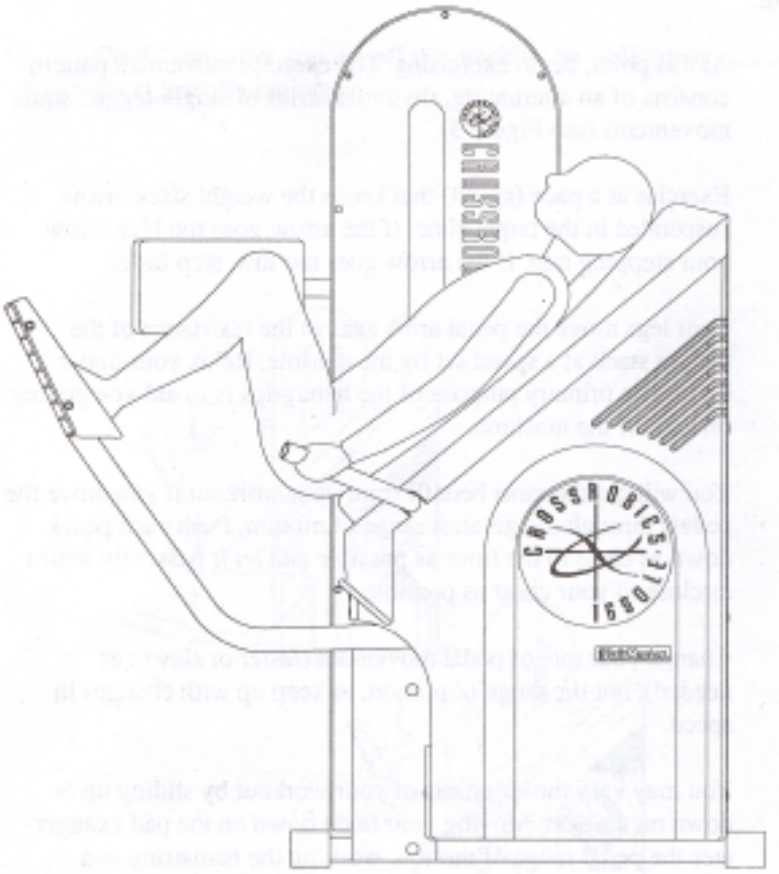


Figure 2: Exercise Starting Position

NOTE: SOME INDIVIDUALS MAY NEED ASSISTANCE TO GET THEIR FEET ONTO THE PEDALS. WHOEVER IS GOING TO PROVIDE ASSISTANCE SHOULD STAND IN FRONT OF THE MACHINE AND PUSH BOTH PEDAL ARMS DOWN AS FAR AS NECESSARY. THE EXERCISER THEN PLACES THEIR FEET ONTO THE PEDALS—ONE FOOT AT A TIME.

Begin Exercising

10. At this point, begin exercising. The exercise movement pattern consists of an alternating, rhythmic series of single-legged squat

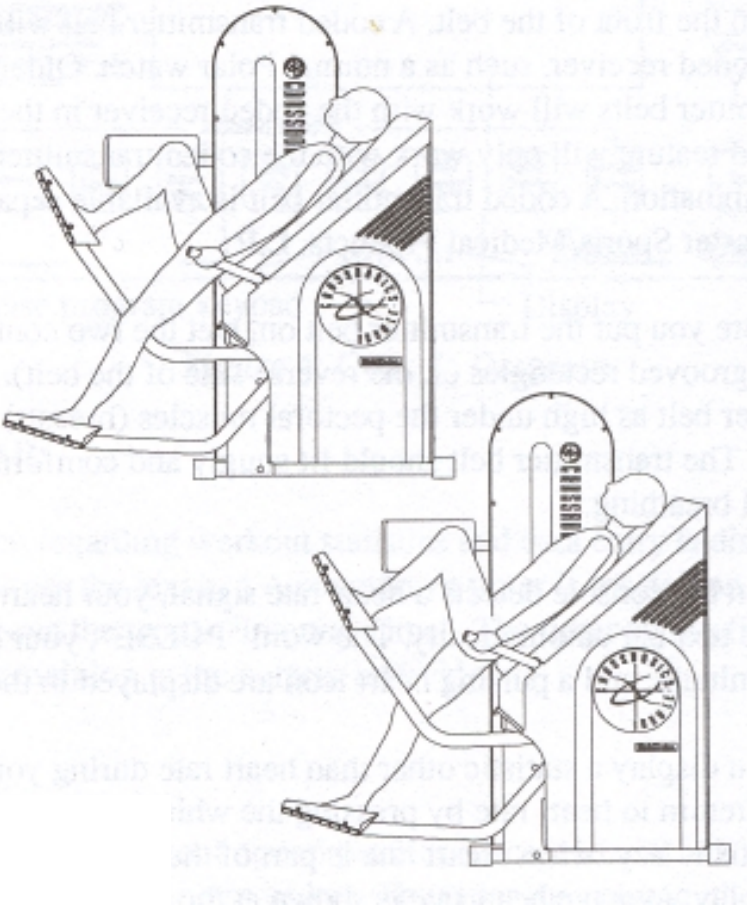


Figure 3: Exercise Motion

11. Exercise at an intensity that keeps the weight stack arrow suspended in the target zone. If the arrow goes too high, slow your stepping rate. If the arrow goes too low, step faster.

12. Your legs move the pedal arms against the resistance of the weight stack at a speed set by the console. Relax your upper body. The primary purpose of the handgrips is to aid you getting on and off the machine.

13. You will get the most benefit from your workout if you move the pedals through the greatest range of motion. Push each pedal down as close to the floor as possible and let it passively return as close to your chest as possible.

14. Change your rate of pedal movement (faster or slower as needed), not the range of motion, to keep up with changes in speed. As you become comfortable with exercise motion, press [LEVEL: $\wedge$] and [LEVEL: $\vee$] to adjust your speed.

15. You may vary the emphasis of your workout by sliding up or down on the seat. Moving your body down on the pad exaggerates the pedal range of motion, working the hamstring and gluteal muscles. Moving your body up on the pad shortens the stroke, emphasizing the quadriceps muscles.

Rest Periods

16. You can stop and rest as many times as necessary for up to one minute for each rest period during all programs. The console returns to the start screen if you rest longer than the allotted rest period. Follow the onscreen prompt to continue your work out after a rest period. To stop completely, either press [STOP], or stop the exercise movement and step off the machine.

Cool Down

17. When you are finished with your workout, the machine will slow down and the message “GOAL ATTAINED” will be displayed. You can

cool down on the machine by continuing to step. The console timer will continue to count up from the selected time, and the intensity level will default to level 3. If there is a time limit set on the console, the timer will last only until the maximum time has been met. For example, if the time limit was set for 30 minutes and you worked out for 25 minutes, the cool down period would last for 5 minutes, or until you stepped off the machine. If no time limit has been set, the console will continue to run the cool down until the [STOP] key is pressed.

17. You can also cool down by getting off the machine walking or stretching for at least five minutes. Keep your feet on the pedals and let both pedal arms return all the way up. Support your weight on the handles and swing your right foot off to the right and then your left foot off to the left. Step over the pedal arms with your right foot.

NOTE: SOME INDIVIDUALS MAY NEED ASSISTANCE GETTING OFF THE MACHINE. PROVIDE ASSISTANCE BY HOLDING THE PEDALS DOWN UNTIL THEY ARE OFF THE MACHINE.

HEART RATE INPUT

The 1650 LE console uses telemetry (e.g., Polar®) heart rate signal detection. Ensure that your console is set up for telemetry signal detection only. There is a short "lock out" period at the beginning of each workout session during which the console first detects a signal and then validates the signal type.

- Telemetry heart rate - after the initial belt signal is detected, the console will enter a validation phase in which four good heart beat signals within four seconds are required before locking on telemetry heart rate signals for the duration of the workout session. During the validation phase the console will not recognize contact heart rate signals.

Locked/Non-locked Option

When the "not locked" option is selected the heart rate source signal is not fixed during the exercise (if the signal is lost either input will be valid). If the "locked" option is selected then the heart rate source signal is locked on the first detected signal during the workout. To set a heart rate signal input, or to turn off the heart rate option all together, perform the following steps:

1. On the console keypad, press [LEVEL: ∧], [3], [2]. At this point the screen will display "HR INPUTS." Press [ENTER] to select this option.

2. There are 4 options to handle heart rate input signals. Only 2 of those options are appropriate for the 1650 LE; "Both HR Off", and "Telemetry Only." Press the [SELECT] key to scroll past the other options until you find either "Both HR Off" or "Telemetry Only." Press the [ENTER] key to select the desired option.

"TELEMETRY ONLY" - locks out contact heart rate signals and will only detect telemetry signals. Set your console to this default.

"BOTH HR OFF" - turns off the ability to detect any signal at all. Used in rare situations where there is excessive interference with the heart rate signals. This option turns off disables the Constant HR program and the Fitness Test program.

Error Messages

Text line messages are only seen in the Constant Heart Rate and Fitness Test programs due to the design of the program that necessitates a valid heart rate signal at all times during the program.

"**CHECK HR BELT**" - The heart rate signal has been missing for the last 30 seconds in telemetry signal detection.

"HR BELT NEEDED" - No telemetry belt signal been sensed during the initial setup time.

"**HR MODE DISABLED**" - No heart rate signal is allowed due to the set up option that was chosen. Heart rate monitoring is not possible.

TELEMETRY HEART RATE

The StairMaster® Crossrobics® 1650 LE features telemetry (Polar®) heart rate monitoring. The system consists of the receiver, located on the stepper, and a transmitter belt (purchased separately) worn across your chest. The monitoring function is activated as soon as you strap on the chest belt and step within range of the receiver in the machine. Two electrodes on the underside of the chest belt sense the heart rate signal and send it to the receiver. The heart symbol on the console pulses to indicate that the console is receiving a valid signal. A microprocessor in the console calculates the heart rate and displays it, in beats per minute, on the console.

Using the Transmitter Belt

⚠ WARNING

PACEMAKER USERS SHOULD NOT USE THE POLAR TRANSMITTER BEFORE CONSULTING THEIR DOCTOR.

Before you put the transmitter belt on, wet the two electrode patches (the grooved rectangles on the reverse side of the belt). Secure the transmitter belt as high under the pectoral muscles (chest) as is comfortable. The transmitter belt should fit snugly and comfortably, and allow normal breathing. When the console detects a heart rate signal, heart rate is shown in the display automatically. Your heart rate in beats per minute and a pulsing heart icon are displayed on the console.

After the initial belt signal is detected, the console will enter a validation phase in which four good heart beat signals lasting four seconds are required before locking on telemetry heart rate signals for the duration of the workout session. During the validation phase the console will not recognize contact heart rate signals. If you do not see a heart rate on the console, try one of the following:

- Move closer to the console.
- Tighten the elastic part of the chest belt.

- Adjust the belt higher or lower on your chest.
- Remoisten the electrodes.
- Test your chest strap with a machine that you know is working, or with a heart rate watch that you know is working.
- If possible, replace or exchange your console with a console (from the same type of machine) that you know is working and retest the machine.
- Verify that the console software has been set up properly for heart rate detection (see pg. 13).

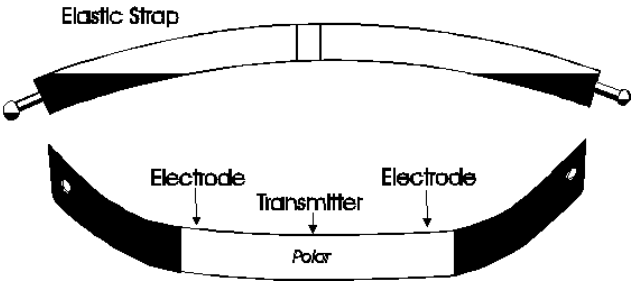


Figure 4: Transmitter Belt

Maintaining the Transmitter Belt

Clean the chest belt regularly with mild soap and water, then dry thoroughly - residual sweat and moisture keep the transmitter active and drain the battery in the transmitter. Do not use abrasives or chemicals such as steel wool or alcohol for cleaning, as they can damage the electrodes permanently. You can order replacement belts from StairMaster, Polar Electro, Inc., or your local fitness store:

StairMaster	800-331-3578	P/N 64000
Polar Electro, Inc.	800-227-1314	

The StairMaster® Crossrobics 1650 LE console is divided into seven sections: the display window, the workout options, the numeric keypad, the entertainment keypad, the workout statistics, the stop key, and the intensity level keys (see Figure 5).

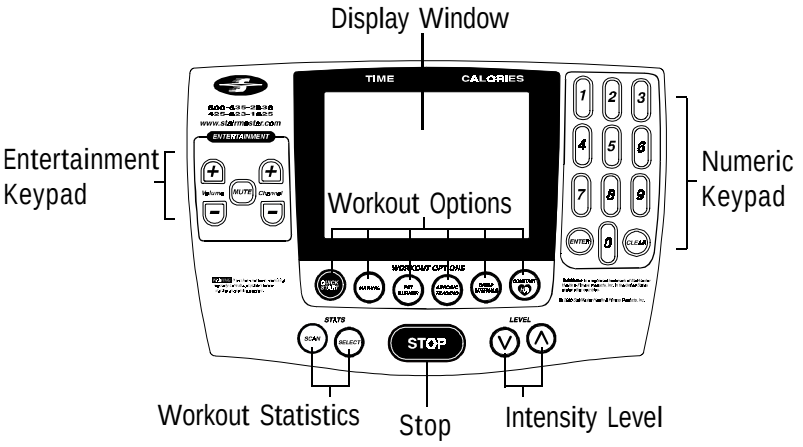


Figure 5: Crossrobics 1650 LE Console

DISPLAY WINDOW

• ***Time*** - The selected workout time is displayed in the upper left section of the display window. Once the time is entered, the timer will count down, in minutes and seconds, until the workout is finished or stopped. If [0] is entered in the MANUAL or CONSTANT HEART RATE program, the timer will count up.

• ***Calories*** - The real-time amount of calories burned is continually updated and displayed in the upper right section of the display window.

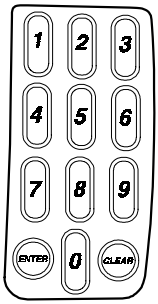
• ***Interval Timer*** - The interval timer is displayed below the Time. The interval timer counts down time left within each interval.

• ***Heart Rate*** - Current heart rate is displayed below the Calories, next to the heart icon.

• ***Workout Option Profile*** - A profile of the selected exercise program appears in the lower section of the display window during a workout. The taller the column, the higher the intensity (watts) for that interval. The flashing column shows your current interval. The flashing column moves from left to right across the display as you complete each interval.

CROSSROBICS 1650 LE CONSOLE

NUMERIC KEYPAD

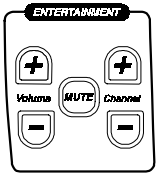


The numeric keypad is located on the right side of the console. Before the exercise program begins, the numbers are used to enter data in response to the console prompts.

• ***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].

ENTERTAINMENT KEYPAD



The Crossrobics® comes equipped to facilitate the use of commercial entertainment systems. Using any of these keys will send an output signal through the Communication Specification for Fitness Equipment (C.S.A.F.E.) port to a connected C.S.A.F.E. or compatible system. If a system is not connected, pressing these keys will have no effect.

• ***Volume Up/Down*** - Increases or decreases the volume level of the audio source.

• ***Mute*** - Removes the audio sound from the headphones.

• ***Channel Up/Down*** - Changes the channel of the commercial entertainment system.

INTENSITY LEVEL KEYS

The exercise intensity level may be changed at any time during a workout. Pressing the [∨] key decreases the intensity and pressing the [∧] key increases the intensity.

STOP KEY

Press the [STOP] key any time you want to pause the exercise program for up to one minute. Press [STOP] a second time, or [1], and the console will return to the "SELECT WORKOUT" Prompt.

WORKOUT STATISTICS

During the exercise program, the Stats keys are used to track workout statistics which are then shown in the display window. Pressing the [SELECT] key turns off the scanning feature and shows the statistic of choice in the display window. Continue to press the [SELECT] key until you reach the desired statistic. Pressing the [SCAN] key will prompt the console to cycle through the following statistics:

- ***Distance*** - Provides a cumulative total of the equivalent horizontal distance (in miles or kilometers), you would have traveled if you used the same amount of energy.
- ***Calories/Hour*** - Provides a running total of the number of calories burned during a workout.
- ***Rate -*** Displays the current pedal strokes per minute.
- ***Reps -*** One rep is counted each time one pedal arm is pushed down toward the floor. The length of an average person's pedal stroke is used to calculate the number of reps.
- ***Level*** - Shows the current intensity level between 1 (the easiest) and 20 (the hardest).
- ***Watts*** - Displays the exercise intensity in watts (746 watts = 1 horsepower).
- ***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. During the workout summary, the average MET level is displayed.
- ***Target Heart Rate*** - Available only during the Constant Heart Rate program. Shows the selected target heart rate.

At the completion of a workout, the statistic averages are calculated based on the accumulation of data during the workout program, and not including the cool down period.

EXERCISE PROGRAM KEYPAD

The exercise keypad is located below the display window. While the console is in the "SELECT WORKOUT" mode, press one of the six exercise program keys to preview the desired workout. The standard defaults are (pressing [ENTER] without inputting data first will prompt the console to enter these values):

- **Weight** - 175 lbs.
- **Intensity Level** - 3
- **Workout Time** - The default time in the programmed workouts and Quick Start is 20 minutes. The Manual and Constant Heart Rate programs do not have a specified default time. In these programs, the console timer will count up to the maximum time of 99 minutes, return to 0, and count back up if no time limit is set.
- **Age** (Constant Heart Rate program only) - 40 years

Once you have selected a program, the prompts are:

- "**ENTER WEIGHT - LBS**" - type in your body weight in pounds (or kilograms if your console is set to metric units).
- **"ENTER PLATE 3 - 12"** - select the desired number of plates.
- "**ENTER LEVEL 1 - 20**" - select your intensity level with level 1 being the easiest and level 20 the hardest.
- "**ENTER TIME 5 - 99**" - select the workout duration in one minute increments from 5 to 99. Press 0 in the MANUAL and CONSTANT HEART RATE program to workout for an unspecified amount of time.

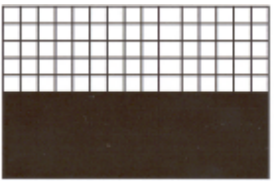
The Quick Start Program

Provides an immediate start, without having to enter any user information. This program uses the standard default settings for derivation of calories burned.

The Manual Program

After pressing the [MANUAL] key, enter user and workout information. Begin exercising at the selected level. If desired, adjust the workout manually by using the intensity level arrow keys. The profile in the display window is divided into 15 equal intervals within the workout time. The profile is based

on the selected intensity level, with 2 levels equating to one vertical bar.

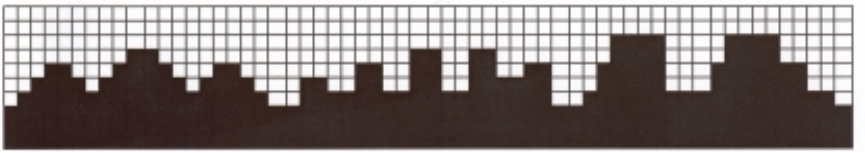


The Fat Burner Program

The Fat Burner program is a 60-interval workout designed for people just starting a weight control program. The relative intensity level is indicated on the profile and any changes in the intensity level will continue for the remainder of the program.

The Aerobic Training Program

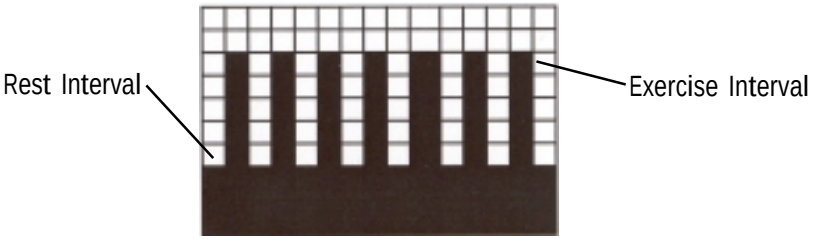
The Aerobic Training program is a 60-interval workout designed to increase aerobic capacity. The relative intensity level is indicated on the profile and any changes in the intensity level will not change the look of the remaining profile.



The Speed Intervals Program

The Speed Intervals program is a workout with 8-rest intervals and 7-exercise intervals that alternate speed/intensity level changes. You can change the REST interval speed/level and the EXERCISE interval speed/level independently, using the level keys. For example, if you decrease the intensity level during a rest interval then subsequent rest intervals will be the same. However, the EXERCISE interval remains at the same intensity level you started with. To change the intensity level of the EXERCISE interval, you must change

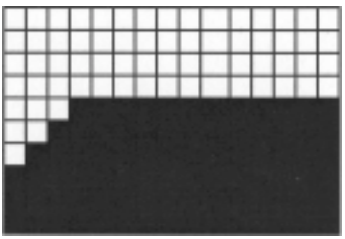
the intensity level during an EXERCISE interval. The intensity level shown during an EXERCISE interval is indicative of your current speed. However, the current speed during a REST interval is equal to a scaled percentage of the displayed intensity level. Note that the program profile does not change at any time during the workout session.



The Constant Heart Rate Program

The Constant Heart Rate program maintains a chosen target heart rate by automatically varying the climbing speed during each workout. The default target heart rate is equal to 70% of your maximum heart rate which is calculated by the following equation: 220 - (Age) x .70. Choose a different target heart rate (between 80 and 180 beats per minute) at any time during the workout by using the numeric keypad to enter the new target heart rate, followed by the [ENTER] key. The following messages may be shown during a workout:

- *"***CHECK HR BELT***"* - The heart rate signal has been missing for the last 30 seconds in telemetry signal detection.
- **"HR BELT NEEDED" -** No telemetry belt signal has been sensed during the initial setup time.
- **"HOLD HR SENSORS" -** In contact heart rate signal situations this message will come every 30 seconds to prompt the user to hold the sensors.
- "**HR MODE DISABLED**" - No heart rate signal is allowed due to the set up option that was chosen. Heart rate monitoring is not possible.



THE FITNESS TEST PROGRAM

Understanding Submaximal Exercise Testing

Before using the StairMaster® Crossrobics® 1650 LE for submaximal exercise testing, it should be noted that all submaximal fitness tests make several assumptions:

- That a steady-state heart rate is obtained for each exercise workload.
- That a linear relationship exists between heart rate, oxygen uptake and workload.
- That the maximal heart rate for a given age is uniform.
- That the mechanical efficiency of the physical activity performed (i.e., oxygen uptake at a given workload) is the same for everyone.

It should be kept in mind that any one or all of the above mentioned assumptions may not be met during a submaximal exercise test. If for any reason one of the assumptions is not met, then errors in predicting $VO_{2\ max}$ will occur.

Unfortunately, it is often quite difficult to meet all of the requirements for the four listed assumptions. For example, exercising at a given workload for only a few minutes can involve an insufficient amount of time for many individuals to achieve a true steady-state. To ensure that a steady-state has been achieved, the heart rate should be measured after two minutes of exercise at a given workload and again after the third minute of exercise at that workload. These two heart rates should then be compared. If a difference of more than five beats per minute between the two is found, the subject should continue to exercise at one-minute intervals at the same workload until two successive heart rates differ by less than five beats per minute.

It is also important that the submaximal heart rates obtained be between 115 and 150 beats per minute, because it is within this heart rate range that a linear relationship tends to exist between heart rate and oxygen uptake or workload for most adults. When the heart rate is less than 115, many external factors (e.g., talking, laughing, apprehension, etc.) can greatly influence heart rate. Once the heart rate reaches a level between 115 and

150, external factors no longer influence heart rate, and a linear relationship exists. As the heart rate rises above 150, the heart-rate/oxygen uptake relationship becomes curvilinear.

The third assumption involves maximal heart rate. Maximal heart rate is the greatest heart rate that can be measured when an individual is exercising to the point of volitional fatigue (i.e., exhaustion) during a graded exercise test. Several equations have been developed to estimate the average maximal heart rate for humans:

- Maximal heart rate = 220 minus age (low estimate)
- Maximal heart rate = 210 minus [0.5 x age] (high estimate)
- Maximal heart rate = 226 minus age (estimate for older individuals)

Maximal heart rate can, however, vary greatly among different individuals of the same age. One standard deviation is ±12 bpm, which means that two-thirds of the population varies an average of plus or minus 12 heart beats from the average given by a prediction equation. If an individual's age-predicted maximal heart rate is higher than that person's true maximal heart rate, then his/her estimated $VO_{2\ max}$ will be an overestimation of the correct or actual value.

The final assumption addresses the issue of mechanical efficiency. Oxygen uptake at any given work rate can vary by approximately 15% between different individuals. Therefore, individuals vary in the amount of oxygen they require to perform a certain exercise workload. Some individuals are more efficient at performing a given task than others. As a result, the average oxygen consumption associated with a given workload may vary significantly from one person to another. Thus, $VO_{2\ max}$ predicted by submaximal exercise tests tends to be overestimated for those who are mechanically efficient and underestimated for those who are inefficient.

The point to remember is that submaximal exercise testing, though not as precise as maximal exercise testing, is not without advantages. For example, the results of such testing can provide a fairly accurate reflection of an individual's fitness status without the cost, risk, effort (on the part of the subject) and time involved in max testing. If an individual is given repeated

submaximal exercise tests and that person's heart rate response to a fixed workload is found to decrease over time, it is reasonably safe to conclude that the individual has made improvements in aerobic (cardiorespiratory) fitness, irrespective of the accuracy of the $VO_{2\ max}$ prediction.

Pretest Screening

Prior to any exercise test (maximal or submaximal), participants should complete a brief health/medical questionnaire, have their resting blood pressure and heart rate measured, and provide an informed consent form. The Physical Activity Readiness Questionnaire (PAR-Q) is an example of a valid health/medical questionnaire for screening individuals prior to submaximal exercise testing. Canadian health and fitness practitioners have extensively (and quite successfully) used the PAR-Q to determine whether individuals should be given an exercise test. A "yes" answer to any of the following seven questions taken from the PAR-Q would disqualify a participant from taking part in an exercise test until appropriate medical clearance was obtained.

PHYSICAL ACTIVITY READINESS QUESTIONNAIRE (PAR-Q)

1. Has your doctor ever said you have a heart condition and recommended only medically supervised physical activity?
2. Do you have chest pain brought on by physical activity?
3. Have you developed chest pain within the past month?
4. Do you tend to lose consciousness or fall over as a result of dizziness?
5. Do you have a bone or joint problem that could be aggravated by the proposed physical activity?
6. Has a doctor ever recommended medication for your blood pressure or a heart condition?
7. Are you aware, through your own experience or a doctor's advice, of any other physical reason against your exercising without medical supervision?

The StairMaster Submaximal Fit Test

The StairMaster branching protocol is a series of 3-minute stages of continuous exercise at increasing intensity. The first stage is a warmup at approximately 4 METs. The intensity of the remaining stages is based on the heart rate response to the warmup. The test is designed to raise the steady-

state heart rate of the subject to 110 to 150 beats/min for two consecutive stages. It is important to remember that two consecutive heart rate measurements must be obtained in the 110 to 150 beats/min range to predict VO_{2max}. The test typically lasts from 9 to 15 minutes.

In the StairMaster protocol, each work rate is performed for 3 minutes, with heart rates recorded during the final 4 seconds of the 2nd and 3rd minutes of each stage. If the heart rates are within 5 beats/min, then the heart rate during the last minute is plotted against the work rate, and the program advances to the next 3-minute stage. The program continues for 2 to 4 stages until 2 steady state heart rates between 110 to 150 beats/min are obtained in 2 consecutive stages. The line generated from the plotted points is then extended to the age-predicted maximal heart rate. A corresponding maximal work rate and VO_{2max} can then be calculated.

At the end of the 3rd minute of each stage, if the heart rates at the end of the 2nd and 3rd minute are not within 5 beats/min of each other, then that work rate is maintained for an additional minute. At the end of the 4th minute, the heart rate is compared to the heart rate at the end of the 3rd minute. If the heart rates are within 5 beats/min, then the heart rate during the 4th minute is plotted against the work rate. If the heart rate at the end of the 3rd and 4th minute are not within 5 beats/min, then the work rate is maintained for one more additional minute. If the heart rate at the end of the 4th and 5th minutes are within 5 beats/min, then the heart rate at the end of the 5th minute is plotted against the work rate. If the heart rate at the end of the 4th and 5th minutes are not within 5 beats/min, then the test failed.

Once 2 consecutive heart rate measurements are obtained in the 110 to 150 beats/min range, then the test ends successfully and the results are displayed. The estimated maximum aerobic capacity is shown in ml/kg/min and METs. Next, the results are compared to normative values for others of the same age range and gender (see Table 2). Results are stored in the console until the next person starts an exercise program.

Figure 6: StairMaster® Fitness Protocol

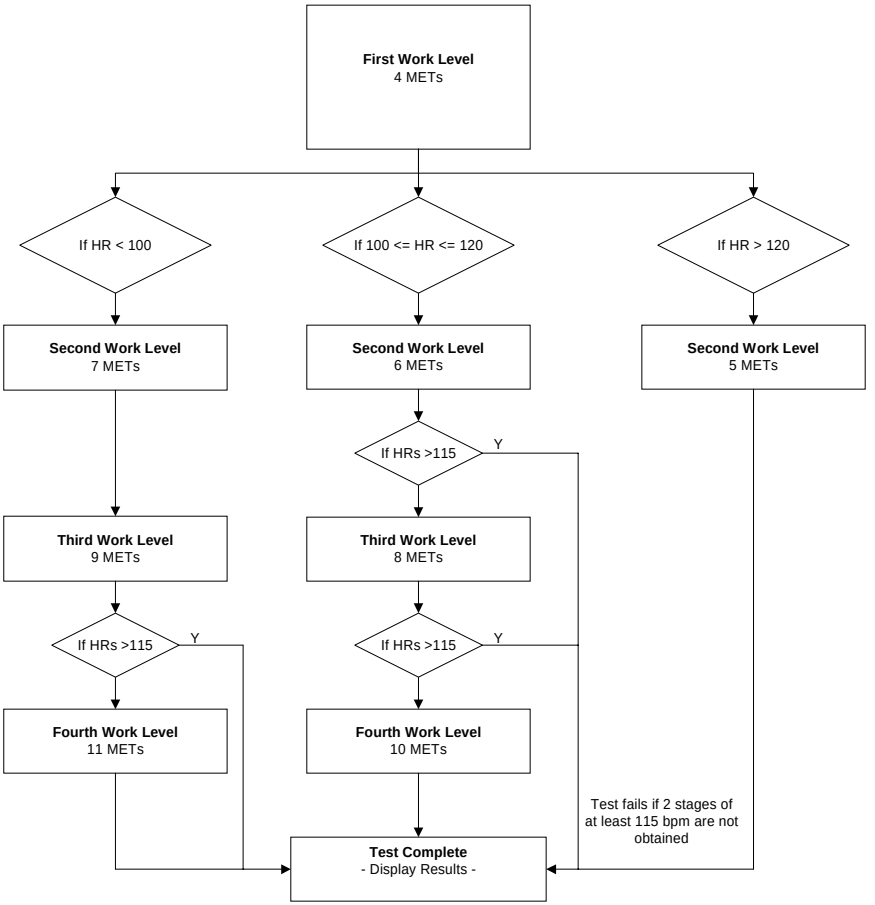


Table 2. Fitness Rating Norms (VO_{2max})

MEN

Age	High	Good	Average	Fair	Low
20 – 29	>51	51 – 47	47 – 43	42 – 40	<39
30 – 39	>50	50 – 45	45 – 41	41 – 37	<37
40 – 49	>48	48 – 42	42 – 38	38 – 35	<35
50 – 59	>45	45 – 39	38 – 35	35 – 32	<32
60+	>43	42 – 35	35 – 32	32 – 29	<29

WOMEN

Age	High	Good	Average	Fair	Low
20 – 29	>44	44 – 38	38 – 35	35 – 32	<32
30 – 39	>41	41 – 37	37 – 34	34 – 31	<30
40 – 49	>40	39 – 34	34 – 31	31 – 28	<28
50 – 59	>35	35 – 31	31 – 28	28 – 26	<25
60+	>35	35 – 39	29 – 26	26 – 24	<24

CONSOLE CODES

There are three groups of console codes which are differentiated according to function. The first group of codes are customization codes and are used to set defaults such as units, language, heart rate input type, etc. The second group of codes are machine status codes and are used to track hours and other general usage patterns for maintenance purposes. The third group of codes are diagnostic codes and are used for troubleshooting. The following key actions are valid in each group of console codes:

- Pressing [LEVEL ∧], [1st #], [ENTER] displays what group of codes is being accessed.
- Pressing [SELECT] or [LEVEL ∧] at that point allows you to view all possible selections. Once in this mode pressing [LEVEL ∨] backs up through the selections; pressing [ENTER] then selects that item. If another test level is available at this point, the [SELECT] / [ENTER] process is repeated.
- Pressing [∧] [1st #, or 2nd #], [ENTER] selects that item directly.
- Pressing [CLEAR] exits any of the special access modes.

Custom Codes

[^] [3] [0]	change workout time limit between 5 to 99 minutes
[^] [3] [1]	change units (MPH or KMH)
[^] [3] [2]	choose type of heart rate input and priority (telemetry or contact)
[^] [3] [3]	- N/A -
[^] [3] [4]	choose console language
[^] [3] [5]	change contrast on console
[^] [3] [6]	- N/A -
[^] [3] [7]	- N/A -
[^] [3] [8]	- N/A -
[^] [3] [9]	reset to factory defaults

1. Change the workout time by pressing [LEVEL: ^], [3], [0]. The console will display “MAX TIME.” Press [ENTER]. The console will then display the current time limit. Use the keypad to enter the desired time, then press [ENTER]. For no time limit, press [0]. The console will display "TIME LIMIT OFF."

2. Change the units to either Metric or USA units by pressing [LEVEL: ^], [3], [1], [ENTER]. The console will display the current units - either "USA UNITS" or "METRIC UNITS." Use the [SELECT] key to change option, and then press [ENTER].

3. Choose the desired heart rate input preference by pressing [LEVEL: ^], [3], [2]. The console will then display "HR INPUTS." Press [ENTER]. The console will then display the current hear rate input selection. Press the [SELECT] key to scroll through the other options. Press [ENTER] after the desired option.

4. Change the language by pressing [LEVEL: ^], [3], [4]. The console will display "LANGUAGE." Press [ENTER]. The console will then display the current language. Press the [SELECT] key to scroll through the other options. Press [ENTER] to change the option.

5. Adjust the contrast on the LCD screen by pressing [LEVEL: ^], [3], [5]. The console will display "CONTRAST ADJ." Press [ENTER]. The console will then display the current contrast number. Press the [LEVEL: ^], and [LEVEL: ⌄] keys to increase or decrease the contrast. The changed value will remain on exit.

6. Reset the console to factory defaults by pressing [LEVEL: ^], [3], [9]. The console will display "SET DEFAULTS ." Press [ENTER]. Then console will rest itself and then display "DONE."

Quick Scan Programming

You can quickly access any of the custom menus by pressing [LEVEL: ^], [3], [ENTER]. The console will then display "CUSTOMIZE." Scroll through the following options:

[SELECT]	" MAX TIME"	0
[SELECT]	"CHANGE UNITS"	1
[SELECT]	"HR INPUTS"	2
[SELECT]	"LANGUAGE"	4

[SELECT]	"CONTRAST ADJ"	5
[SELECT]	"MAX SPEED" **- N/A-**	6
[SELECT]	"CLINICAL MODE"-**N/A**-	7
[SELECT]	"SET DEFAULTS "	9

Machine Status Codes

[^][4][0] display machine run time in hours
[^][4][1] display number of workouts
[^][4][2] display distance traveled
[^][4][3] display software rev
[^][4][4] display machine type
[^][4][5] **-N/A-**
[^][4][6] display machine run time in hours since last cleared (used for maintenance)

1. Display the machine run time by pressing [LEVEL: ^], [4], [0]. The console will display "RUN HOURS XXXXX".

2. Display the number of workouts by pressing [LEVEL: ^], [4], [1]. The console will display "WORKOUTS XXXX."

3. Display the total distance covered up to date by pressing [LEVEL: ^], [4], [2]. The console will then display "DISTANCE XXXX."

4. Display the console software revision number by pressing [LEVEL: ^], [4], [3]. The console will display "CONS 92111-XXX."

5. Display the machine type by pressing [LEVEL: ^], [4], [4]. The console will display "CROSSROBIC (or other machine type)."

6. Display the machine run time since last cleared by pressing [LEVEL: ^], [4], [6]. The console will display "MAINT HOURS XXXX."

Quick Scan Programming

You can quickly access any of the custom menus by pressing [LEVEL: ^], [4], [ENTER]. The console will then display "MACHINE STATUS." Scroll through the following options:

[SELECT]	" RUN HOURS XXXX"	0
[SELECT]	" WORKOUTS XXXX"	1
[SELECT]	" DISTANCE XXXX"	2
[SELECT]	" CONS 90211- XXX "	3
[SELECT]	" CROSSROBIC"	4
[SELECT]	**-N/A-**	
[SELECT]	" MAINT HOURS xxxx"	6

Resetting the Maintenance Hour Counter

For ease of maintenance records, the console has a maintenance timer that will clock the number of hours, workouts, and time between last servicing. After each maintenance period reset the counter.

[^][7][1] Reset Service

1. Reset the maintenance hour counter by pressing [LEVEL: ^], [7], [1]. The console will display "RESET SERVICE." Press [ENTER]. The console will display "DONE." Press [CLEAR] to return to the starting screen.

Configuration Code

The Crossrobic® console supports other StairMaster® exercise systems. It is important to verify that the machine configuration code matches the type of machine you have.

[^][8][0] Change Machine

1. Change the machine type by pressing [LEVEL: ^], [8], [0]. The console will display "CHANGE MACHINE." Press [ENTER]. The console will then display the current machine type. Use the [SELECT] key to toggle between options. Press [ENTER] for the desired option.

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 right or left side and to the front or back are made as if you were on the machine ready to exercise. Major component names and locations are shown in Figure 7.

TOOL LIST

The following tools are needed to perform service and maintenance:

- Torx screwdriver
- phillips screwdriver
- combination wrenches (sizes 7/16 - 3/4")
- wonder bar (included w/ unit)
- combination pliers
- locking pliers
- volt-ohm meter (multimeter)
- wire stripper/crimper tool
- allen wrench set (sizes 5/64 - 1/4")
- external snap ring pliers
- shop goggles or other eye protection
- torque wrench
- socket set or nut driver set (sizes 1/4 - 3/4" in 1/16" increments)

MAINTENANCE RECORDS

For ease of maintenance the Crossrobic® console will keep track of hours, number of workouts, time between last servicing, etc. You can quickly access any of the custom menus by pressing [LEVEL: ^], [4], [ENTER]. The console will then display "MACHINE STATUS." Scroll through the following options:

[SELECT]	" RUN HOURS XXXX"*	0
[SELECT]	" WORKOUTS XXXX"	1
[SELECT]	" DISTANCE XXXX"	2
[SELECT]	" CONS 90211- XXX "	3
[SELECT]	" CROSSROBIC "	4
[SELECT]	**-N/A-**	
[SELECT]	" MAINT HOURS xxxx"	6

*The machine may show a few hours of use due to testing at the manufacturing facility.

MAINTENANCE INSTRUCTIONS

PREVENTIVE MAINTENANCE

A schedule of the recommended preventive maintenance is shown in Table 3. This schedule assumes moderate to heavy usage in a commercial health club environment. Refer to the appropriate "Parts Removal and Replacement" section of this manual for all disassembly and assembly instructions.

Initial Service

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

Cleaning

1. DO NOT USE GLASS CLEANER OR ANY OTHER HOUSEHOLD CLEANERS ON THE CONSOLE. Use a water-dampened cloth when you clean the electronic parts and wipe them dry after cleaning.

2. Clean the covers daily using soap and water.

3. Clean the pedals weekly with a solution of either vinegar and water or ammonia and water.

⚠ 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.

4. Thoroughly clean the entire machine, including the interior, at least once a week.

Weekly Inspection

1. Inspect the exposed frame for any rust, bubbling, or paint chips during the weekly cleaning. The salt in perspiration can damage the unpainted surfaces. Repair the damaged area with a touch-up kit.

2. Remove the seat, seat tray and the left side cover.

WARNING

TO REDUCE THE RISK OF INJURY, DO NOT EXERCISE ON THIS MACHINE WHILE THE SIDE COVERS ARE REMOVED. DO NOT DEPRESS OR RAISE THE PEDALS WHILE ANYONE'S HANDS ARE INSIDE THE MACHINE. DO NOT WEAR LOOSE CLOTHING OR NECKTIES WHILE WORKING ON THIS MACHINE.

- Inspect the weight stack belt for undue wear and/or fraying. The 3/4" (2 cm) weight stack belt is made of Kevlar fibers and can withstand rather severe fraying. Replace the belt if it wears to two-thirds of its original width (i.e., 1/2" or 1 cm).
- The frame-end junction of the belt is located on the bottom frame rail (see Figure15). Plug in the machine and inspect this end of the belt by repeatedly pushing down on the left pedal arm, raising the floating pulley assembly until it contacts the upper stop. Allow the weight stack to fall and inspect the rest of the belt through the slot in the weight stack covers. Unplug the machine.
- Inspect the weight stack belt connector plates at both ends of the belt (see Figure 14). The plates should be evenly tensioned with a parallel gap between them. Inspect the belt at the connections. Visible serrations on the weight stack belt above the connector plates indicate belt slippage that should be corrected immediately.
- Inspect the alternator reduction and the drive reduction belts for wear and proper tension. You should be able to deflect the belt approximately 1/4" (0.6 cm) in either direction with your fingertip (see Figure 8).

- Carefully turn the 8-inch Poly-V pulley counterclockwise and check for smoothness of operation. If noise or roughness of operation is present, you must inspect the pivot shaft assembly.
- Inspect the pedal arm return springs at both connection points. Replace broken spring(s).

3. Reinstall the left side cover, the seat tray and the seat.

MAINTENANCE INSTRUCTIONS

Lubrication

There are five components that require periodic lubrication: the weight stack guide rods, the pedal arm chains, the drive chain, the pedal arm return springs, and the lower spring stop assembly (see Figure 7). These lubrication procedures, if performed as outlined, will minimize chain wear and maximize parts life. You will need to remove the seat, seat tray and the left side cover to lubricate these components.

1. Place a protective mat on the floor when you are oiling your machine. A rubber floor mat is available from StairMaster® Health & Fitness Products, Inc.

2. Lubricate the drive and pedal arm chains weekly using SAE 30W motor oil. Rotate the 8-inch Poly-V pulley counterclockwise while you drip oil onto the drive chain and pedal arm chain rollers, especially on the section of the pedal arm chains which are in contact with the drive hub sprockets. Let the oil soak in for a few minutes and then remove any excess oil with a dry rag.

⚠ WARNING

TO REDUCE THE RISK OF SERIOUS BODILY INJURY, BE EXTREMELY CAREFUL WHEN LUBRICATING THE CHAINS. BE PARTICULARLY AWARE OF ALL BELTS AND PULLEYS WHICH ARE EXPOSED WHEN THE SIDE COVERS ARE REMOVED.

3. Remove the chains every three months to thoroughly clean and lubricate them. Use a mild degreaser and a stiff brush to remove dirt and corrosion from the chains.

4. Wipe the weight stack guide rods weekly (do not remove the weight stack covers) with a rag dampened with window cleaner in order to clean off the old lubricant and prevent buildup. To lubricate the guide rods, spray silicon lubricant onto a clean rag and wipe the guide rods.

5. In order to keep the pedal arm return springs free of corrosion, wipe the springs with an oil-dampened rag once each week.

6. Have an assistant work the pedal arms to raise the floating pulley assembly. Remove the lower spring from the lower spring stop assembly (located on the bottom frame rail) every three months. Wipe off the old grease and apply a new coat of heavy multi-purpose grease before replacing the spring in its holder. The grease will keep the spring from squeaking and rattling in its housing.

⚠ WARNING

NEVER LUBRICATE THE SEALED BEARINGS ON THE IDLER PULLEYS OR IDLER SPROCKETS. THEY ARE PERMANENTLY LUBRICATED AND MAY FAIL IF YOU ADD LUBRICATION.

Table 3. Preventive Maintenance Schedule

PART	RECOMMENDED ACTION	FREQUENCY	CLEANER	LUBRICANT
Plastic Side Cover (ext. only)	Clean	Daily	Soap & Water	N/A
Seat	Clean	Daily	Soap & Water	N/A
Console	Clean	Daily	Water	N/A
Weight stack belt and connectors	Inspect	Weekly or after 70 hours of use	N/A	N/A
Pedal arm return springs	Inspect, clean &	Weekly or after 70 hours of use	N/A	Oil-dampened rag
Alternator and drive belts	Check tension &	Weekly or after 70 hours of use	N/A	N/A
Pedal arm chains and drive chain	Clean & lubricate	Weekly or after 70 hours of use	Degreaser	30W motor oil
	Remove, clean & lubricate	Every 3 months or after 900 hours of use	Degreaser	30W motor oil
Guide rods	Clean & lubricate	Weekly or after 70 hours of use	Window cleaner	Silicone spray
Bottom stop spring	Wipe clean & grease	Every 3 months or after 900 hours of use	N/A	Heavy multi-purpose grease

Note: Use of a silicone spray on parts not so specified will result in diminished performance and a shorter life span for that part.

N/A = Not Applicable

This section outlines several tests to systematically identify and isolate the cause of problems in the electrical system and the drive train. The first step is to identify the problem. This troubleshooting section is organized into three problem sections: Electrical Troubleshooting, Console Diagnostics, and mechanical Troubleshooting. Once you have identified the problem, perform the tests in exactly the same order as written.

Refer to the appropriate “Parts Removal and Replacement” section of this manual for all disassembly and assembly instructions. Contact our Customer Service Department to order a replacement part or to get help with the troubleshooting process. See the "Appendix" for the appropriate phone number.

Troubleshooting The Electrical System

The electrical power system has four major components: the power supply, the power cables, the alternator and the console. In order to identify the component that is causing the problem, you must systematically test the system. You will need a volt-ohm meter (multimeter) to conduct portions of the following procedures. The console and power supply are not user serviceable. If either of these parts are inoperable, they must be replaced. Opening the console or power supply will void the warranty.

⚠ WARNING

TO REDUCE THE RISK OF ELECTRICAL SHOCK WHEN WORKING WITH AC VOLTAGE, A QUALIFIED ELECTRICAL TECHNICIAN SHOULD PERFORM ALL ELECTRICAL TESTS THAT INVOLVE CHECKING AC POWER.

1. Use a voltmeter set on VAC to verify that the AC wall outlet has 100 to 120 VAC (or 220 to 240 VAC, if applicable). If you do not have a voltmeter plug in an alternate AC-powered device (e.g., a lamp). If the device does not work when plugged into the electrical outlet, consult an electrician for further assistance and then retest the electrical outlet.

2. Plug the power supply into the wall outlet. The green Light Emitting Diode (LED) on the power supply should be on. If the LED does not light up, replace the power supply.

3. Disconnect the DC cable from the left side panel. Set the voltmeter to VDC and test for 12 to 19 VDC in pins #1 (+) and #2 (-). Replace the power supply if the voltage reading is outside the specified range.

4. Remove the bottom cover and connect the DC cable to the power connector on the left side of the frame. Locate the black and white wires on the backside of the power connector.

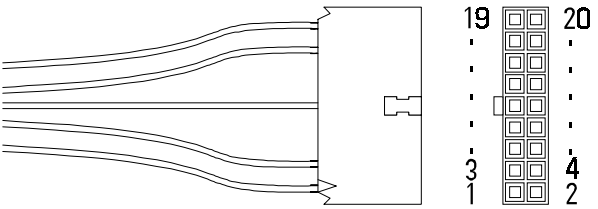
5. Follow the white power connector wire to the where it plugs into the main cable white wire, and disconnect it from the main cable white wire.

6. Set your voltmeter to VDC. Connect the positive lead of your voltmeter to the white wire from the power connector and touch the gray casing of the alternator with the negative lead of your voltmeter.

7. DC voltage measured should be 12 to 19 VDC. Replace the power connector if the voltage is not the same value as in step 3. Connect the two white wires.

8. Remove the console knobs from the back of the console, lift the console up, and disconnect the 20-pin main cable from the console.

9. Test for 12 to 19 VDC in pins #1 (-) and #10 (+) in the main cable connector. Replace the main cable if the voltage reading is not the same as in step 7.



10. If all voltage readings have been within the specified range and the console will not power up, the console should be replaced.

Alternator Test

11. Check for loose wiring connections on the alternator, diode, and load resistor.

12. Perform the Positive Output to Field test on the alternator:

- Disconnect the power cord from the electrical outlet.
- Remove the black wire from the B+ terminal on the alternator.
- Remove the brown wire from the field terminal on the alternator.
- Place a short wire with alligator clips on the B+ terminal and the field (FLD) terminal of the alternator.
- Step on the machine for approximately 10 to 15 seconds.
- If full resistance is achieved during this time, your alternator has correct current flow. If no resistance is achieved, replace the alternator.

Diode Test

13. Remove the brown wire and diode from the field terminal of the alternator and set your voltmeter to the Ohms setting.

14. Place one lead from the voltmeter on each end of the diode, and then reverse the leads. A diode that is good will show a high reading in one direction and a low reading when the leads are reversed. Replace the diode if the readings recorded are both high or both low.

Resistor Test

15. Remove one wire from the load resistor and place one lead from the voltmeter on each of the threaded posts on the load resistor. Replace the load resistor if the voltmeter does not read 0.5 Ohms ($\pm$ 10%).

CONSOLE DIAGNOSTICS

The following tests are performed while the console is in the "SELECT WORKOUT" mode. If the console fails any test, the console should be replaced or exchanged. To return to the "SELECT WORKOUT" mode, press either [CLEAR] or [STOP] while in the DIAGNOSTIC mode. Please note that there may be additional verbiage on the display other than is listed in this manual. The Crossrobics® console is used on other StairMaster® equipment.

DIAGNOSTIC CODES

[^][6][0] Test display
[^][6][1] Test keyboard
[^][6][2] Test serial port
[^][6][3] Test alternator
[^][6][4] **-N/A-**
[^][6][5] **-N/A-**
[^][6][6] Test Tach
[^][6][7] **-** [6][9] **-N/A-**

Display Test

During the display test, the console screen alternates between all LCD segments turned on and the sample program profile screen at a 2-second rate.

1. Press [LEVEL: ^], [6], [0], [ENTER]. The console will display "DISPLAY TEST."

2. All LCD segments will turn on for 2 seconds, and then a sample program profile will be displayed for 2 seconds. Press [CLEAR] to end the test.

Keypad Test

Perform this test if you are having trouble entering data into the console. During the test, pressing any key displays that key name on the message line. Press [CLEAR] to exit.

1. Press [LEVEL: ^], [6], [1], [ENTER], to start the test.

2. Firmly press each button except [CLEAR]. The name of the key will be shown in the display window. Press [CLEAR] to end the test.

Serial Port Test

This test verifies that the RS 232 port used for linking to external C.S.A.F.E. systems (commercial entertainment systems) is working. You must have the loop-back cable assembly (PN 040051-001) to perform this test.

1. Insert the loop-back cable assembly into the RS 232 port on the back of the console.

2. Press [LEVEL: ^], [6], [2]. The console will display “SERIAL TESTS.” Press [ENTER] to access the C.S.A.F.E. test.

3. Press [ENTER] a second time. The console will run a diagnostic test and then display either “PASS” or “FAIL.” Replace the console if it fails this test.

Alternator Test

Use this test to verify the alternator field routines of the console. You will need to briefly exercise on the machine for this test.

1. Press [LEVEL: ^], [6], [3], to start the test.

2. For “Field on” press [LEVEL: ^]. Step on the machine for approximately 10 to 15 seconds. If full resistance is achieved during this time, your console has correct current flow. If no resistance is achieved, either the console or the alternator is bad. See the electrical troubleshooting portion of this manual to isolate and test the alternator. Replace the console if the alternator is good.

3. For ‘Field off” press [LEVEL: V]. Step on the machine for approximately 10 to 15 seconds. You should not get resistance with the field turned off. Press [CLEAR] to end the test.

Tach Test

If you do not have resistance, perform the tach test. The tach test will tell you the tach signal, in revolutions per minute (RPMs), picked up by the console.

1. Press [LEVEL: ^], [6], [6], [ENTER]. The console will display "TAR TACH ACT." The target tach speed of 2,000 RPMs will be shown in the upper left corner of the display window. The actual tach picked up by the console will be shown in the upper right corner of the display window.

2. Start stepping on the pedals. The number in the right hand corner of the console should increase to 2,000 RPMs (+/- 200). If the tach signal picked up by the console is less then 1,900 RPMs then there is a problem in the AC tach circuit - either with the console software, alternator (check the AC tach wire, the field wire, the diode, and the terminal posts), or the main cable.

Error Reporting

The console will display various error messages in the display window. The total amount of errors will be displayed in the upper right numeric window. Note that only the highest priority reported error will be displayed. Errors are handled in two ways. One as a non-fatal "WARNING" which will display the text message but continue system operation until the user presses the [CLEAR] key. The second way is as a fatal "ERROR" which will stop the exercise and return the system to an idle intensity state. The console will display the error text and not let the user restart the programs unless power has been turned off and then back on.

The following microprocessor errors require a console replacement; ALU ERROR, TIMER ERROR, and STATIC RAM ERROR.

Resetting the power may clear the following microprocessor errors; EEPROM ERROR, and PROGRAM ERROR. If resetting the power doesn't work, the console may need to be replaced.

The Telemetry (Polar®) Heart Rate Test

The telemetry heart rate system is made up of the console, the heart rate receiver, and the chest strap (available separately). You can test each component by performing the following steps:

1. You will need to put a chest strap on in order to test the telemetry heart rate. Before you put on the chest strap, wet the two contact patches. Secure the chest strap as high under your pectoral muscles (chest) as is comfortable. The chest strap should fit snugly, comfortably, and allow normal breathing.

2. A flashing ♥ should be displayed on the console. Your heart rate, in beats per minute, will show next to the heart icon. If the heart icon does not show, or if your heart rate is not displayed on the console then you have a problem with either the console, chest strap, or heart rate receiver.

3. Verify that the console software has been set up to receive telemetry (see the heart rate monitoring section of this manual). Note that holding the contact heart rate sensors (if enabled) can inhibit the telemetry heart rate input from working.

4. Test your chest strap with a machine that you know is working, or with a heart rate watch that you know is working.

5. If possible, replace or exchange your console with a machine that you know is working and retest the machine.

6. Excess false heart rate detection: the telemetry receiver located in the console is susceptible to mechanical vibration as well as external electrical interference. Hitting the console or the frame may momentarily cause errant heart beat detection - this is normal. If excessive false heart beats appear only during workouts, check that the console cable is not curled up behind the console. Pull as much of the cable down and away from the console as possible. False heart beats while the machine is idle are most likely due to external interference. Try plugging the machine into a different outlet, or moving it to a new location.

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 steps in the order listed below. Refer to the appropriate "Parts Removal and Replacement" section of this manual for all disassembly and assembly instructions.

1. Ensure the weight stack guide rods are properly lubricated. Refer to the general maintenance section for instructions.

2. Remove the seat, seat tray, left side cover and right rear cover.

3. Remove the alternator Poly-V belt and inspect the belt for cracks and/or fraying. Replace the belt if it is worn.

4. 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.

5. Remove the HTD belt and inspect the belt for cracks and/or fraying. Replace the belt if it is worn (see Figure 8).

6. Spin the 8-inch Poly-V pulley on the pivot adjustment assembly (see Figure 8). The pulley should spin freely without any clicking or grinding. Replace the pivot adjustment assembly if any noises are heard.

7. Rotate the HTD pulley of the lower reduction shaft assembly by hand (see Figures 8 and 24). The pulley should rotate freely without any clicking or grinding. Remove the drive chain, then disassemble and inspect the lower reduction shaft assembly if any noises are heard (see Figure 24).

8. Remove the step chains and inspect the chains for frozen links. Flex each link up and down, each link should move freely. Replace a chain if any frozen links are found. Do not reinstall the chains.

9. Rotate the clutch sprockets (see Figure 17). 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.

10. Inspect the full length of the weight stack belt for fraying and verify that the belt is routed correctly over all of the weight stack belt idler pulleys (see Figure 17).

11. Check the pedal arm shaft and pedal arm bushings by removing both pedal arms. Inspect the shaft and bushings for signs of wear and corrosion. Clean corrosion off the pedal arm shaft with fine steel wool and replace any worn bushings before reassembling. DO NOT SAND THE PEDAL ARM SHAFT.

12. Replace all parts, ensuring proper tension of the alternator and drive reduction belts. Lubricate the drive and pedal chains.

PARTS REMOVAL AND REPLACEMENT

ALTERNATOR

1. Unscrew the DC power cable from the connector located inside the lower corner of the right rear cover.

2. Remove the left side cover.

3. Note the origin and color of each wire at the alternator terminals (see Wiring Diagram 1). Remove the wires.

4. Remove the alternator Poly-V belt.

5. Remove the nut at the frame pivot and the bolt at the brace (see Figure 31).

6. Remove the alternator.

7. To install the new alternator, reverse these procedures. The alternator Poly-V belt is tensioned properly when the center of either side of the belt can be deflected 1/4" (0.6 cm) from its center line with fingertip pressure (see Figure 10).

8. Connect the DC power cable before you install the side cover. If the console does not power up, check your wiring against the Wiring Diagram 1.

9. If the console powers up, reattach the side cover.

ALTERNATOR POLY-V BELT

⚠ WARNING

THE BELTS MUST BE TENSIONED SO THAT THE CENTER OF EITHER SIDE CAN BE DEFLECTED 1/4" (0.6 CM) FROM ITS CENTER LINE WITH FINGERTIP PRESSURE. A TIGHT BELT MAY CAUSE SLOW AND SLUGGISH OPERATION; A LOOSE BELT WILL CAUSE EXCESSIVE NOISE AND BELT WEAR.

1. Remove the seat and seat tray.

2. Loosen the adjustment bolt that mounts the alternator to the slotted alternator brace. Rotate the alternator downward.

3. Remove the Poly-V belt.

4. Install the new belt and center it on the pulleys.

5. Pivot the alternator up or down as necessary to allow 1/4" (0.6 cm) of belt deflection using a fingertip in either direction (see Figure 10).

6. Tighten the alternator adjustment bolt. Verify 1/4" (0.6 cm) of play in the belt.

7. Reattach the seat tray and seat.

CHAIN TENSIONING IDLER SPROCKET ASSEMBLY

1. Remove the left side and right rear covers.

2. Remove the drive chain.

3. Remove the idler sprocket.

4. Apply downward pressure on the spring assembly cap and remove the snap ring from the top of the assembly shaft (see Figure 28).

⚠ WARNING

TO REDUCE THE RISK OF EYE INJURY, WEAR EYE PROTECTION WHEN REMOVING SNAP RINGS. THE PARTS IN THIS ASSEMBLY ARE UNDER CONSIDERABLE PRESSURE. MAKE SURE THAT YOUR FINGERS ARE OUT OF THE WAY WHEN REMOVING THE SNAP RING.

5. Remove the spring cap washer and the spring from the shaft. Replace worn parts.

6. The guide bolt on the idler sprocket bracket should be loosely secured.

7. Support the bottom of the assembly shaft with your fingers and reattach the snap ring. Reverse these procedures to complete the reassembly.

CONSOLE

1. Loosen and remove the four mounting knobs and lock washers from the back of the console (see Figure 12).

2. Disconnect the main cable connector from the back of the console.

3. To install, reconnect the main cable connector into the receptacle on the console. Insert the cable into the wire saddles on the mounting arm.

4. To install the console, align the holes in the mounting plate with the holes in back of the console. Insert and tighten the four lock washers and mounting knobs.

CONSOLE MOUNTING ARM

1. Remove the console.

2. Loosen and remove the bolts, lock washers and flat washers (see Figure 12).

3. To install the mounting arm, first align the holes in the frame with the holes in the console mounting arm flange.

4. Insert each bolt with a lock washer and a flat washer and tighten the bolts securely.

5. Reinstall the console.

COVERS

WARNING

DO NOT OPERATE THE MACHINE WHILE THE SIDE COVERS ARE REMOVED. DO NOT DEPRESS OR RAISE THE PEDALS WHILE ANYONE'S HANDS ARE INSIDE THE MACHINE. DO NOT WEAR LOOSE CLOTHING OR NECKTIES WHILE WORKING ON THIS MACHINE WITH THE SIDE COVERS REMOVED. GEARS, SPROCKETS, CHAINS AND BELTS OPERATE AT HIGH SPEEDS AND HAVE THE POTENTIAL TO INFLICT SERIOUS BODILY INJURY.

Cover Fasteners

There are three types of covers: side covers, a seat tray, and weight stack covers. All covers are held in place with reusable, plastic fasteners (see Figure 13 for their location). To remove the fasteners (see Figure 14):

1. Slide either end of the fastener removal tool under the edge of the pin head and pull the pin out about halfway. The pin should not be removed. You may now pull the cover away from the frame. DO NOT use the fastener removal tool or any other sharp tool to pry out the fastener base because you may damage the covers.

2. To reinstall the fastener, insert the base of the fastener through the cover and into the frame. When the base is in place, push the pin in all the way to secure the fastener.

Seat Tray

1. Lift off the seat.

2. Remove the two fasteners on top of the seat tray.

3. Reinstall the seat tray with both fasteners and then set the seat into the four mounting holes.

PARTS REMOVAL AND REPLACEMENT

Left Side Cover

1. Remove the seat and the seat tray.

2. Remove the five fasteners along the back seam.

3. Remove the three fasteners on the left front (the two between the pedal arms and the seat and the one on the lower left side).

4. Remove the fastener located on the right front cover. Pull the left side cover off.

5. To reinstall the left side cover, line up the holes in the cover with the holes in the frame and insert the fasteners.

6. Reinstall the seat and the seat tray.

Right Side Covers

There are two right side covers—one in the rear and one in the front. As a general rule, the right rear cover is removed only if more extensive maintenance is required. Under very special circumstances only will the right front cover have to be removed.

1. Remove the seat and the seat tray.

2. Remove the left side cover.

3. Remove the five fasteners on the middle seam located on the right side of the machine. The right rear cover can then be removed by pivoting its top portion toward the rear of the machine.

4. Remove the fastener located on the right front cover. Remove the right front cover. Note: The bottom front cover which is located on the vertical post between the pedal arms should be left in place.

5. Reinstall the right side covers in the reverse order that you removed

them. To install the middle seam fasteners (see Figure 13), reach inside from the front right below the pedal arms and support the seam while installing the bottom three fasteners. Next, reach in from the left side to support the covers while installing the top two fasteners.

6. Install the left side cover, then the seat tray and seat.

7. The front face of the right front cover goes in front of the right pedal arm stop (see Figure 15).

Weight Stack Covers

1. Remove the fasteners securing the weight stack covers to the frame (remove the top middle fastener last) and take off the covers. The fasteners are located around the perimeter of the covers, 11 on each side. For some maintenance, it may be necessary to expose the outside of the weight stack; the inside weight stack cover will rarely need to be removed.

2. Reinstalling the weight stack covers requires that you perform the same procedures for removing these covers—only in reverse.

PARTS REMOVAL AND REPLACEMENT

DRIVE CHAIN

1. Remove the left side and right rear covers.

2. Place the open end of a 3/4" combination wrench under the idler spring bracket (the spring assembly under the lower right idler sprocket). Pry up on the bracket to slacken the chain. While supporting the idler sprocket assembly, slide the chain off the upper left idler sprocket. Remove the chain from the remaining sprockets.

⚠ WARNING

UPON INSTALLATION, MAKE SURE THE CLOSED END OF THE MASTER LINK RETAINING PLATE IS FACING THE DRIVE DIRECTION OR THE MASTER LINK MAY COME OFF DURING OPERATION.

3. When installing the chain, perform the following steps (see Figure 22).

   - Install the chain on the top left sprocket.
   - Install the chain on the bottom left sprocket.
   - Thread the chain through the floating pulley sprockets.
   - Install the chain on the top right sprocket.
   - While prying up on the idler sprocket bracket, install the chain on the bottom right sprocket.

4. Lubricate the new chain and reattach the covers.

DRIVE CHAIN DAMPER STRAP

1. Remove the left side and right rear covers.

2. The drive chain damper strap is located between the alternator and the pivot pulley assembly on the right side of the rear vertical frame rail (see Figure 9).

3. Loosen the nuts and remove the mounting bolts.

4. Replace the strap and adjust the strap so it is slightly (barely) in contact with the drive chain.

5. Reattach the left side and right rear covers.

DRIVE CHAIN IDLER SPROCKET

1. Remove the left and right side covers.

2. Remove the drive chain.

3. Inspect the idler sprocket. It should spin freely and the teeth should be uniform. Any damaged sprocket should be replaced.

4. Remove the snap ring securing the damaged sprocket to its shaft.

5. Pull off the damaged sprocket and replace it with a new sprocket.

WARNING

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

6. Reinstall the drive chain and reattach the side covers.

PARTS REMOVAL AND REPLACEMENT

DRIVE HUB ASSEMBLY

1. Remove the drive shaft assembly.

2. The hub assembly is held in place by eight one-inch (2.5 cm) bolts (four bolts on each side). Loosen and remove the bolts and slide the housing out of the frame (see Figure 23).

3. Replace the hub assembly if the bearings are worn.

4. Reinstall the housing and the drive shaft assembly.

5. Reattach the side covers.

DRIVE SHAFT ASSEMBLY

1. Remove the left side and right rear covers.

2. Have an assistant support the pedal arms while you detach both pedal arm springs from the frame pin. Lift the pedal arm chains off the sprockets and lower the pedal arms to the ground.

3. Remove the drive chain.

4. Remove the snap ring from the left end of the drive shaft.

WARNING

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

5. Remove the sprocket and other small parts from the left side of the hub assembly (see Figure 23).

6. Slide the drive shaft to the right, out of the drive hub assembly.

7. Inspect the shaft and the bearings for excess wear or pitting. The bearings should spin freely. Replace worn parts if necessary.

8. Two sprockets are located on the right side of the shaft: a 30-tooth drive sprocket and the smaller clutch sprocket. To remove the clutch sprocket, slide it off the left side of the shaft.

9. Remove the 30-tooth sprocket by removing the snap ring from the right end of the shaft. Unscrew the allen head set screws located on the inside flange of the drive sprocket.

⚠ WARNING

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

10. To reinstall the drive shaft, carefully reverse the disassembling procedures. Install the drive shaft from the right side.

⚠ WARNING

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

FLOATING PULLEY ASSEMBLY

1. Remove the right and left side covers.

2. Detach the weight stack belt at the frame junction.

3. Remove the drive chain.

4. Remove the floating pulley assembly (see Figure 26).

5. Reverse the removal procedures to install. Make sure that the drive chain and weight stack belt are routed properly.

6. Reattach the side covers.

PARTS REMOVAL AND REPLACEMENT

FLOATING PULLEY ASSEMBLY BELT IDLER PULLEY

1. Remove the weight selector pin, lift the first three plates to create slack in the weight stack belt and remove the belt from the top two idler pulleys. Set the plates back down onto the stack.

2. Loosen the nut and remove the bolt securing the idler pulley to the assembly (see Figure 26).

3. Reinstall the idler pulley in the reverse order of the removal procedures.

FLOATING PULLEY ASSEMBLY IDLER SPROCKET

1. Remove the floating pulley assembly.

2. Loosen and remove the nut and bolt securing the sprockets to the assembly (see Figure 26).

3. Replace the sprocket and tighten the nut and bolt.

4. Reinstall the floating pulley assembly.

HAND GRIPS

1. Slide the old grip off the handle. Do not use a knife as you may damage the handle.

2. Apply water onto the handle and slide on the new grip.

HANDLE ASSEMBLY

1. Lift the seat off of the machine.

2. Remove the two fasteners on the seat tray. Lift the seat tray off the machine.

3. Loosen and remove the nyloc nuts (see Figure 11). Remove both handles from the frame.

4. Reinstall the handles in the reverse order.

HTD BELT

1. Remove the seat, seat tray and the left side cover.

2. Remove the alternator Poly-V belt.

3. Use an allen wrench to loosen the pivot assembly mounting bolts. Rotate the assembly downward.

4. Remove the HTD belt.

5. Install the new belt and adjust to proper tension. Pivot the bracket up or down as necessary to allow 1/4" (0.6 cm) of play (see Figure 10).

6. Tighten the mounting bolts. Install and adjust the alternator Poly-V belt.

7. Reattach the left side cover, seat tray and seat.

HTD SPROCKET

1. Remove the lower reduction shaft assembly from the frame (see Figure 24).

2. Punch out the roll pin and remove the sprocket from the shaft.

3. When reinstalling the sprocket, use a new roll pin.

4. Reinstall the shaft.

5. Adjust the HTD and the alternator Poly-V belts (see the "Alternator Poly-V Belt" and "HTD Belt" sections for tensioning instructions). Adjust the HTD belt first, then the alternatorPoly-V belt.

6. Reattach the side covers.

LOAD RESISTOR

1. Remove the left side cover and locate the load resistor (see Figure 8).

2. Label the load resistor wires and remove them from the terminals on the ends of the resistor (see Wiring Diagram 1).

3. Remove the resistor mounting screws (see Figure 31).

4. Reinstall the resistor to the frame and reconnect the wires.

LOWER REDUCTION SHAFT AND BEARINGS

1. Remove the right rear and left side covers.

2. Loosen and remove the alternator reduction and the drive reduction belts.

3. Remove the drive chain.

4. Remove the nut on the right side of the shaft (see Figure 24).

5. Unscrew the allen head set screws on the outside flange of the 16-tooth sprocket. Remove the sprocket and the key.

6. Slide the shaft out to the left.

7. The bearings can now be slid off the shaft. Inspect the bearings for excess play or roughness. Replace the bearings, if necessary. Install the shaft in the reverse order of the removal procedures.

8. Adjust the alternator Poly-V and HTD belts (see the "Alternator Poly-V Belt" and "HTD Belt" sections for tensioning instructions). Adjust the HTD belt first, then the alternator Poly-V belt.

9. Reattach the side covers.

MAIN CABLE

1. Remove the left side cover, the outside weight stack cover, and the console.

2. Note and mark (by color) the location of each wire attached to the alternator (see Wiring Diagram 1).

3. Detach the wires from the alternator. Disconnect the power connector.

4. Disconnect the main cable from the console.

5. Remove the main cable from the wire saddles (see Figure 30).

6. Tie a length of string about five feet long to the console connection of the old cable and to the lower end of the new main cable.

7. Pull the old cable out of the frame arch and feed the new cable through the upper hole in the frame. Be careful to retain the rubber grommets.

8. When the wire ends of the new cable reach the lower hole, untie the string and pull the cable through. Be sure to seat the rubber grommets into the holes in the frame to prevent damage to the cable.

9. Insert the main cable into the wire saddles.

10. Crimp a wiring lug onto each bared wire end and attach the wires to the proper alternator terminals (see Wiring Diagram 1). Attach the wires to the alternator case or adjusting bracket with a wire tie to protect them from being damaged by moving parts.

11. Reconnect the power connector junction box.

12. Attach the connector at the upper end of the main cable to the console and take a test run.

13. If the machine operates properly, these steps complete the replacement procedure. If the console does not power up, check your wiring against Wiring Diagram 1.

14. Reattach the side and weight stack covers.

PEDAL

1. Use an allen wrench and an open-end wrench to remove the two bolts, the nuts and the washers.

2. Remove the pedal (see Figure 29).

3. To install the pedal, slide the pedal over the end of the pedal arm.

4. Reinstall the hardware, being careful not to over tighten the bolts.

PEDAL ARM

1. Remove the side cover(s).

2. Support the pedal arm and remove the pedal arm spring.

3. Remove the snap ring from the pedal arm mounting post (see Figure 33).

WARNING

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

4. Slide or gently tap the pedal arm off the mounting post.

5. Remove the master link from the pedal arm chain connection.

6. Clean the pedal arm mounting post before reassembling. DO NOT SAND THE SHAFT.

7. To reinstall the pedal arm, reverse these procedures.

8. Adjust the shock mounts so that both pedals are lined up (refer to the shock mount section).

PEDAL ARM CHAIN

1. Remove the left side cover (and the right rear cover if necessary).

2. While an assistant supports the pedal arm, detach the pedal arm spring from the frame.

3. Lift the pedal arm chain off the clutch sprocket. Lower the pedal arm to the floor.

4. Remove both master link retaining plates using a standard screwdriver (see Figure 21). Use the flat of the screwdriver to push the retaining plate off the pins.

5. To reinstall the chain, reverse the procedures.

6. Lubricate the chain before reattaching the cover(s).

PARTS REMOVAL AND REPLACEMENT

PEDAL ARM RETURN SPRING

1. Remove the left (and right rear as needed) side cover.

2. While an assistant supports the pedal arm, detach the pedal arm spring from the frame (see Figure 10).

3. Lift the pedal arm chain off the clutch sprocket. Lower the pedal arm to the floor.

4. Remove the other end of the spring from the double-pitch master link.

5. Ensure that the pedal arm chain passes over the clutch sprocket. Support the pedal arms and reconnect the end of the spring to the spring hanger .

6. Reattach the side covers.

PIVOT ASSEMBLY

1. Remove the right rear and left side covers.

2. Loosen the alternator reduction and the drive reduction belts.

3. Remove the two lower snap rings, pivot adjustment shaft, and two upper bolts (see Figures 8 and 25).

WARNING

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

4. Spin the shaft and inspect the bearings for excess play or roughness. The shaft should turn freely. Replace the pivot assembly, if necessary.

5. To reassemble the pivot pulley shaft and bearings, reverse these procedures.

6. Adjust the HTD and the alternator Poly-V belts (see the "Alternator Poly-V Belt" and "HTD Belt" sections for tensioning instructions). Adjust the HTD belt first, then the alternator Poly-V belt.

7. Reattach the right rear and left side covers.

SELECTOR ROD

1. Remove the outside weight stack cover.

2. Remove the weight selector pin, lift the first three plates to create slack in the weight stack belt and remove the belt from the top two idler pulleys. Set the plates back down onto the stack.

3. Punch out the roll pin in the third weight plate and remove the selector rod from the weight stack (see Figure 19).

4. Punch out the roll pin securing the weight stack belt connector plates to the selector rod.

5. Install the new selector rod by reversing the steps.

SHOCK MOUNT

1. Remove the side cover(s).

2. Have an assistant depress and hold the pedal arm down.

3. Loosen the locking set screw and unscrew the shock mount (see Figure 9).

4. Screw in the new shock mount. Tighten the set screw so that it just comes into contact with the shock mount screw.

5. Release the pedal arm.

6. The ends of the pedals should be even. Adjust the pedal arm height by rotating the shock mount clockwise (to lower the pedal arm) or counterclockwise (to raise the pedal arm).

7. Tighten the set screw. Reattach the side cover.

UPPER SPRING STOP ASSEMBLY

1. Remove the left side cover.

2. Use a combination wrench and an allen wrench to loosen and remove the shoulder bolt (see Figure 27) from the threaded shaft.

3. Examine the shoulder bolt and bronze bushing for excessive radial play. Punch out the old bushing and replace if necessary. Tighten the shoulder bolt all the way to the shoulder; no other adjustment is necessary.

4. Reattach the left side cover.

WEIGHT PLATE

1. Remove the outside weight stack cover.

2. Remove the selector rod.

3. Remove one of the two guide rods.

⚠ WARNING

TO REDUCE THE RISK OF PERSONAL INJURY, NEVER PULL MORE THAN ONE GUIDE ROD OUT OF THE WEIGHT STACK AT ANY GIVEN TIME. REMOVING BOTH GUIDE RODS FROM THE WEIGHT STACK MAY CAUSE THE WEIGHT STACK TO FALL.

4. Pivot the weight plate out of the stack and put the new weight plate in place. Replace the guide rod which was previously removed.

5. Remove the other guide rod and take out the plate. Pivot the new plate into place and reinstall the guide rod.

6. Reinstall the weight stack cover.

WEIGHT STACK BELT

1. Remove the left and right side covers and the outside weight stack cover.

2. Lift the top three weight plates four to five inches above the fourth weight plate. Insert the weight stack pin through the hole in the fourth plate and through a hole in the selector rod to create slack in the weight stack belt.

3. Use two wrenches to loosen the four nuts on the weight stack belt connector plates at the weight stack end (see Figure 16).

4. Pull the belt from the frame junction to remove the belt from its track (see Figure 17).

5. Loosen the four bolts on the connector plate at the frame junction of the belt. Remove the old belt.

6. Insert ~1" (2.5 cm) of the new belt in between the plate and the frame at the frame junction. Tighten the bolts securely and evenly; the plates should be parallel.

7. Thread the belt over the floating pulley assembly idler pulley and under the next idler pulley. The belt goes between the retaining pins and the pulley (see Figure 17).

8. Push the belt through the belt guard tube. Thread the belt under the next idler pulley (and between the retaining pin).

9. Insert ~1" (2.5 cm) of the new belt in between the weight stack connector plates. Tighten the nuts securely, but make sure the gap between the plates is parallel.

10. Lower the weight stack. Ensure that the belt is properly seated in all five idler pulleys with the proper twist between the top and bottom idler pulleys.

11. The belt should be taut, with the spring of the lower spring stop slightly compressed ~3/4" (2 cm), and the top three weight plates resting on the top of the fourth weight plate. If the belt is tensioned properly, skip step #12.

12. If necessary, adjust the portion of the belt between the connector plates at the weight stack and trim off the excess belt.

13. Reattach the covers.

WEIGHT STACK BELT IDLER PULLEY

1. Remove the covers—the outside weight stack cover and the left and right side covers—as needed.

2. Lift the top three weight plates 4-5" (10-12.5 cm) above the fourth weight plate. Insert the weight stack pin through the hole in the fourth plate and through the selector rod hole to create slack in the weight stack belt.

3. After you have identified the damaged idler pulley, remove the snap ring securing it to its shaft and slide the pulley off.

WARNING

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

4. Install the new pulley.

5. Remove the weight stack pin and carefully lower the top three plates of the weight stack. Ensure the weight stack belt is seated properly in the pulleys (see Figure 17).

6. Reattach the covers.

WEIGHT STACK GUIDE ROD

1. Remove the outside weight stack cover.

2. Loosen the nuts and remove the bolts at the top of the guide rods (see Figure 18).

3. Pull one guide rod (only) out of the weight stack and replace it before pulling out the other guide rod.

WARNING

TO REDUCE THE RISK OF PERSONAL INJURY, NEVER PULL MORE THAN ONE GUIDE ROD OUT OF THE WEIGHT STACK AT ANY GIVEN TIME. REMOVING BOTH GUIDE RODS FROM THE WEIGHT STACK MAY CAUSE THE WEIGHT STACK TO FALL.

GROUNDING INSTRUCTIONS

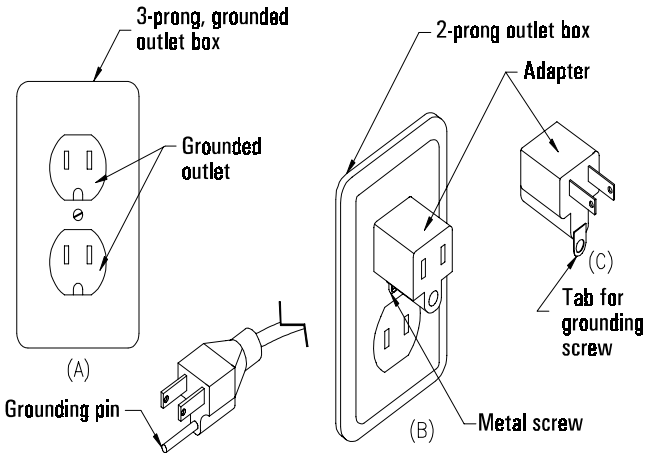
The machine must be grounded if you are using the external power supply or the battery charger. Grounding provides the path of least resistance for the electric current, thereby reducing the risk of electric shock. The power supply or battery charger must be plugged into an appropriate outlet that is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

⚠ DANGER

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 and the battery charger is shown in sketch A below*. 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.



Grounding System

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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® HEALTH & FITNESS PRODUCTS, INC. COULD VOID THE USER'S AUTHORITY TO OPERATE THIS EQUIPMENT.

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 etablies pour les bruits radioélectriques applicables aux appareils numériques de la Class B prescrites dans les 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® Health & Fitness 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
www.stairmaster.com

CUSTOMER SERVICE
12421 Willows Road NE, Suite 100
Kirkland, WA 98034
(800) 331-3578
FAX: (425) 814-0601
E-mail: customerservice@stairmaster.com

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
E-Mail: intlservice@stairmaster.com

ASIA PACIFIC HEADQUARTERS
Telephone/Fax:+81-45-590-5686
E-mail: stairintl@aol.com

EUROPE: HEADQUARTERS
+41-91-827-3801
FAX: +41-91-827-8902
E-Mail: stairmasterch@swissonline.ch

GERMANY: HEADQUARTERS
+49-2204/610-27
FAX: +49-2204/628-90
E-Mail: stairmaster.de@t-online.de

U.K.: HEADQUARTERS
+44-1908/267-345
FAX: 44-1908/267-346
E-mail: stairmasteruk@msn.com

Figure 7: Parts Needing Periodic Lubrication

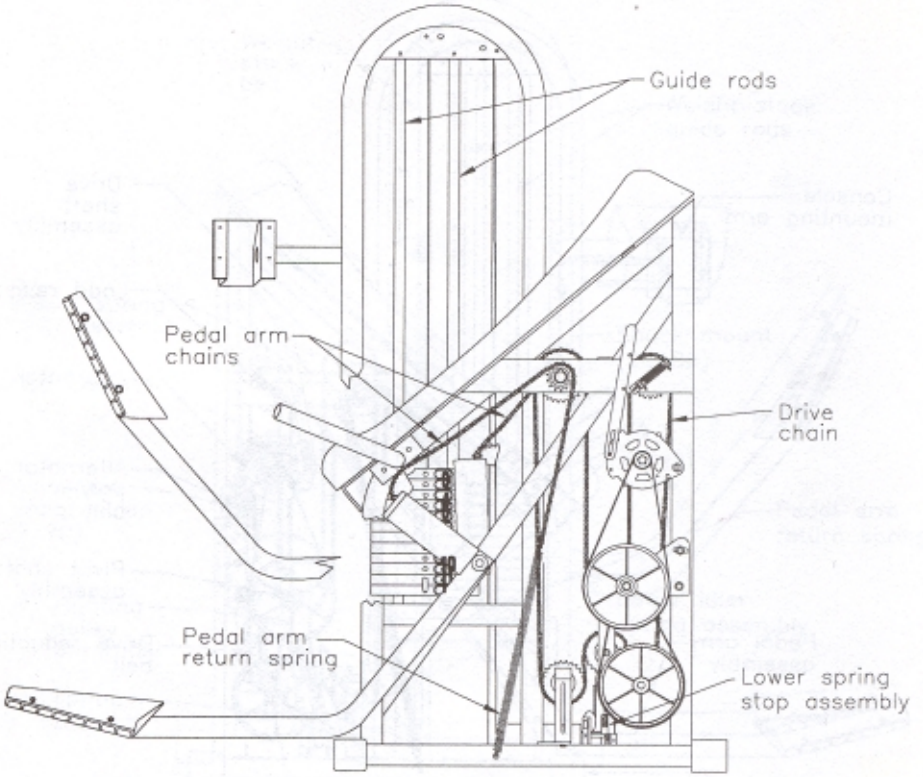


Figure 7: Parts Needing Periodic Lubrication

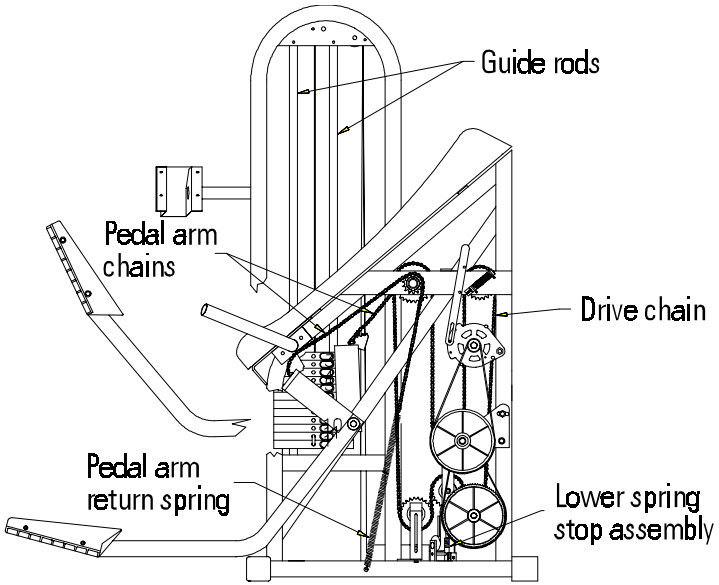


Figure 8: Left Side View

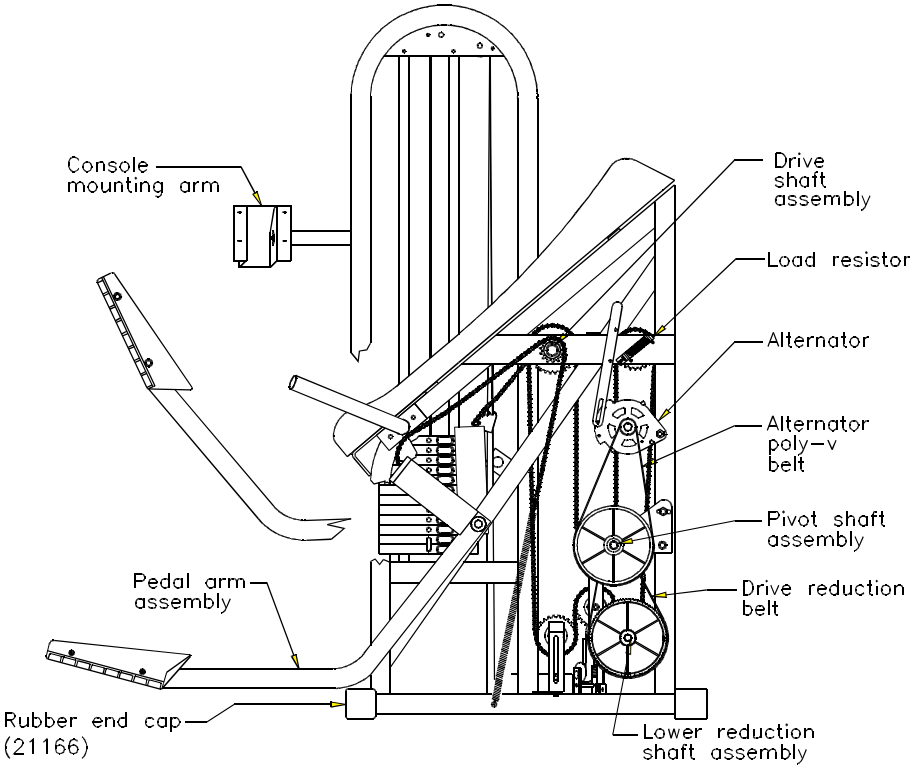


Figure 9: Right Side View

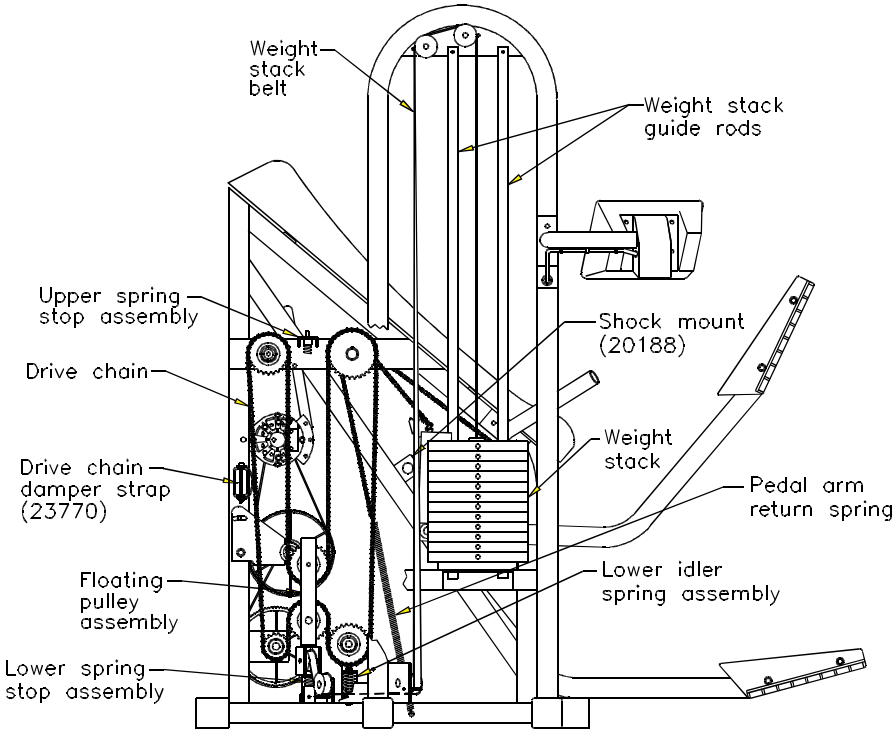


Figure 10: Reduction Belt Tension

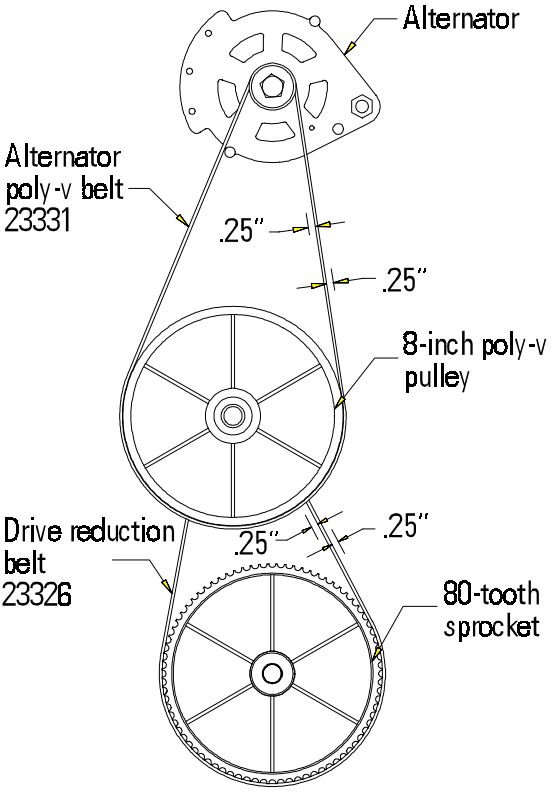


Figure 11: Handle Assembly, Top View with Seat and Seat Tray Removed

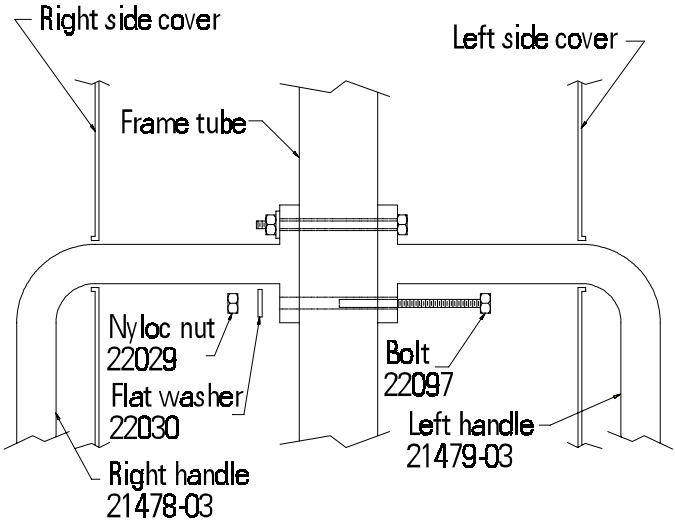


Figure 12: Console Assembly

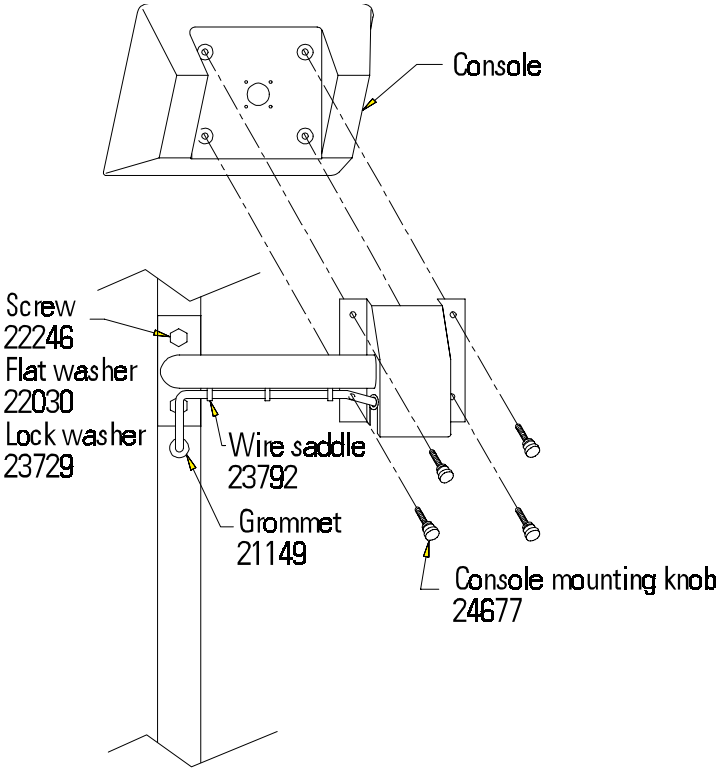
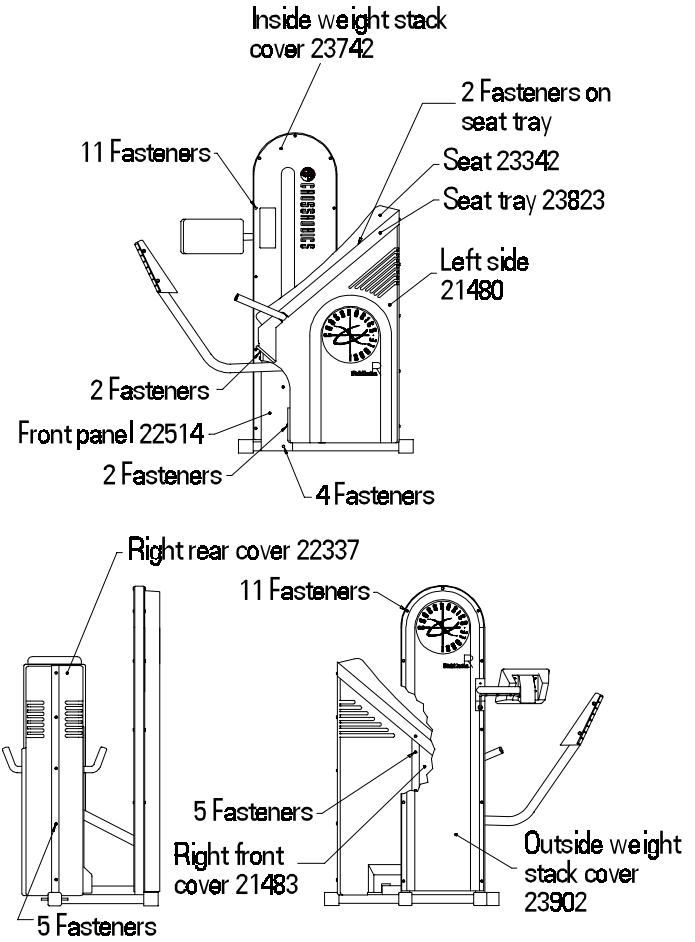


Figure 13: Cover Fastener Location



Note: there are a total of 43 fasteners 22086

Figure 14: Cover Fasteners

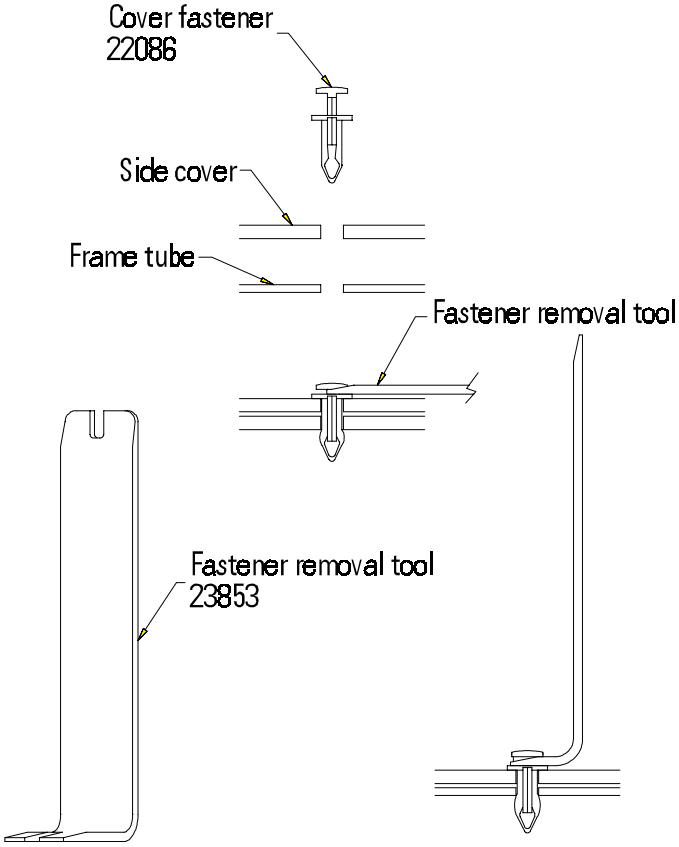


Figure 15: Top View of the Cover Seams

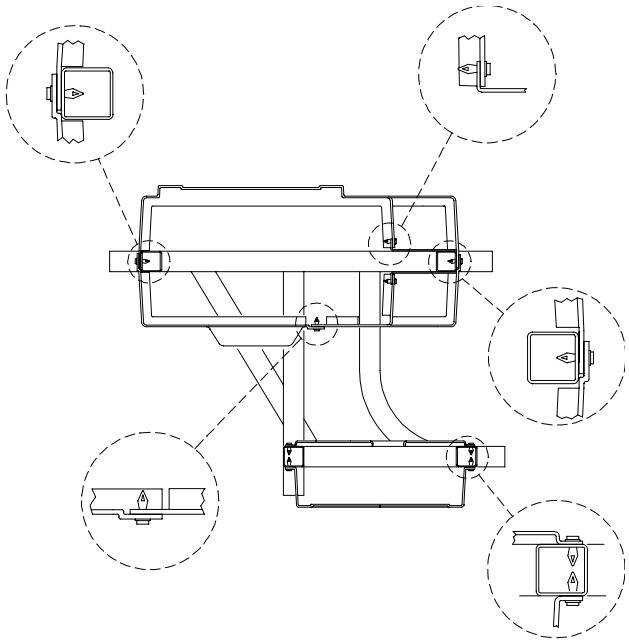


Figure 16: Weight Stack Belt Assembly

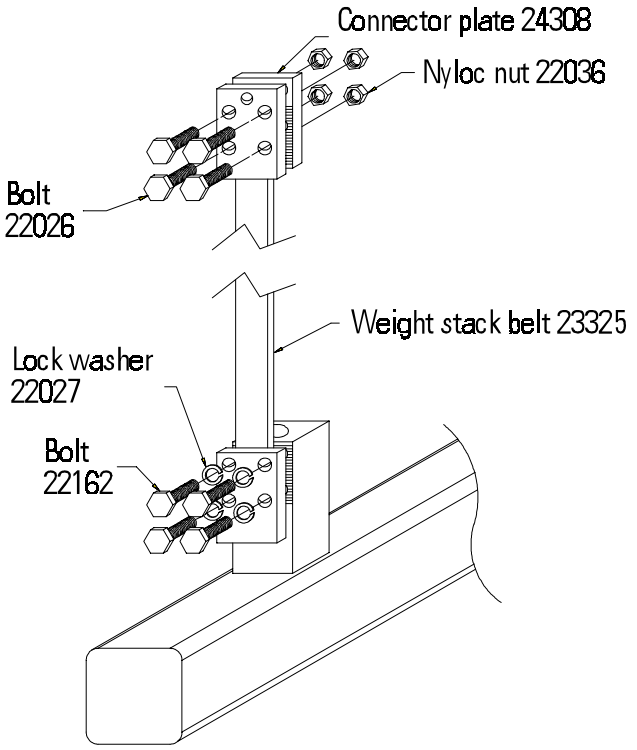


Figure 17: Weight Stack Belt Path

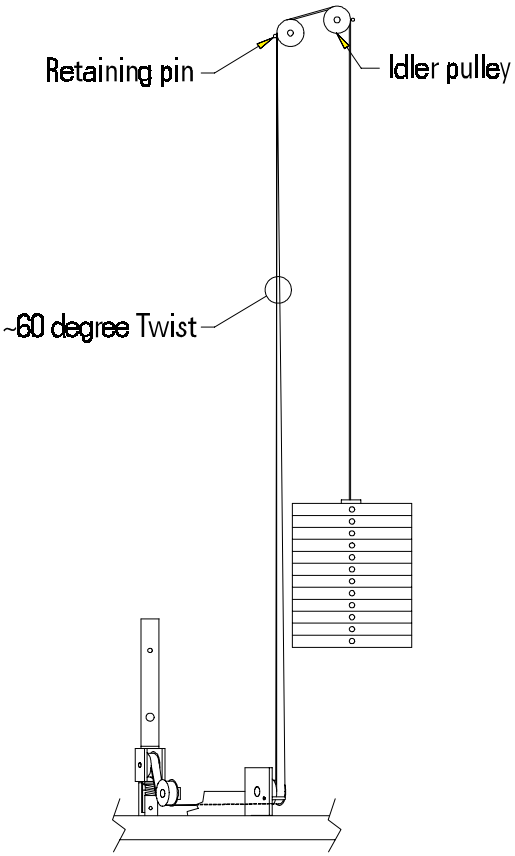


Figure 18: Guide Rod Assembly

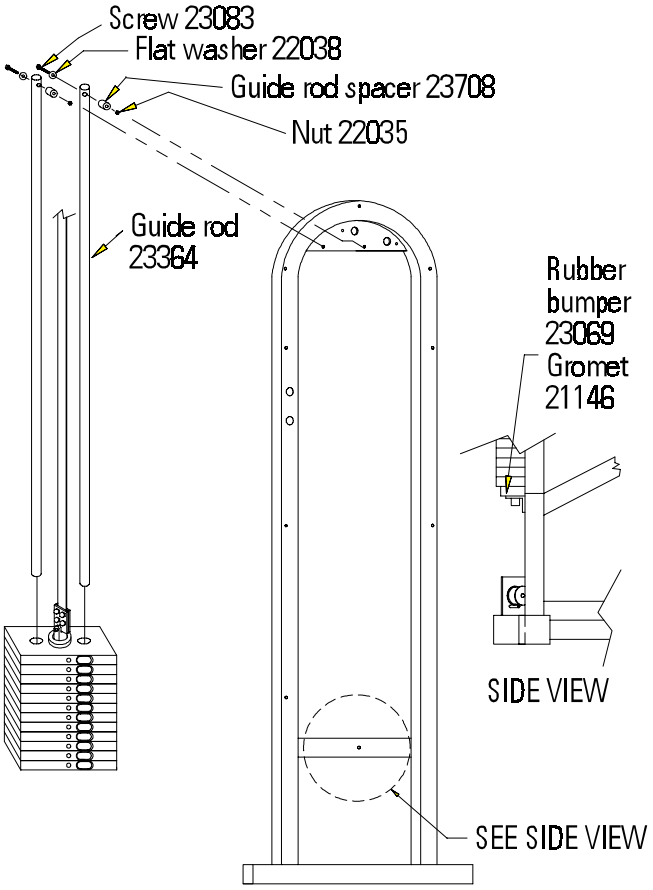


Figure 19: Weight Stack Assembly

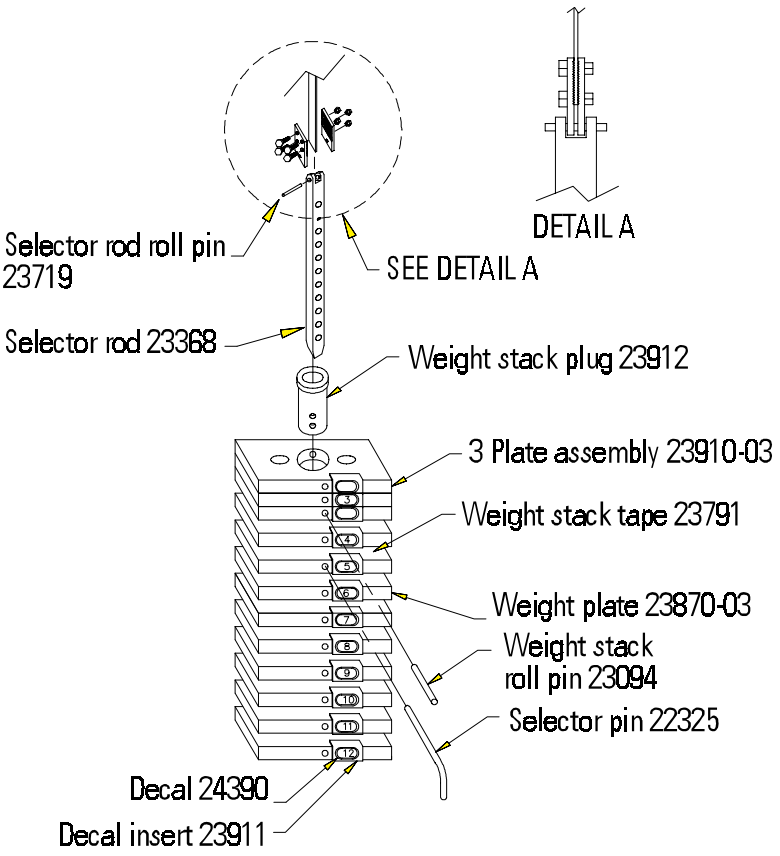


Figure 20: Pedal Arm Spring Assembly

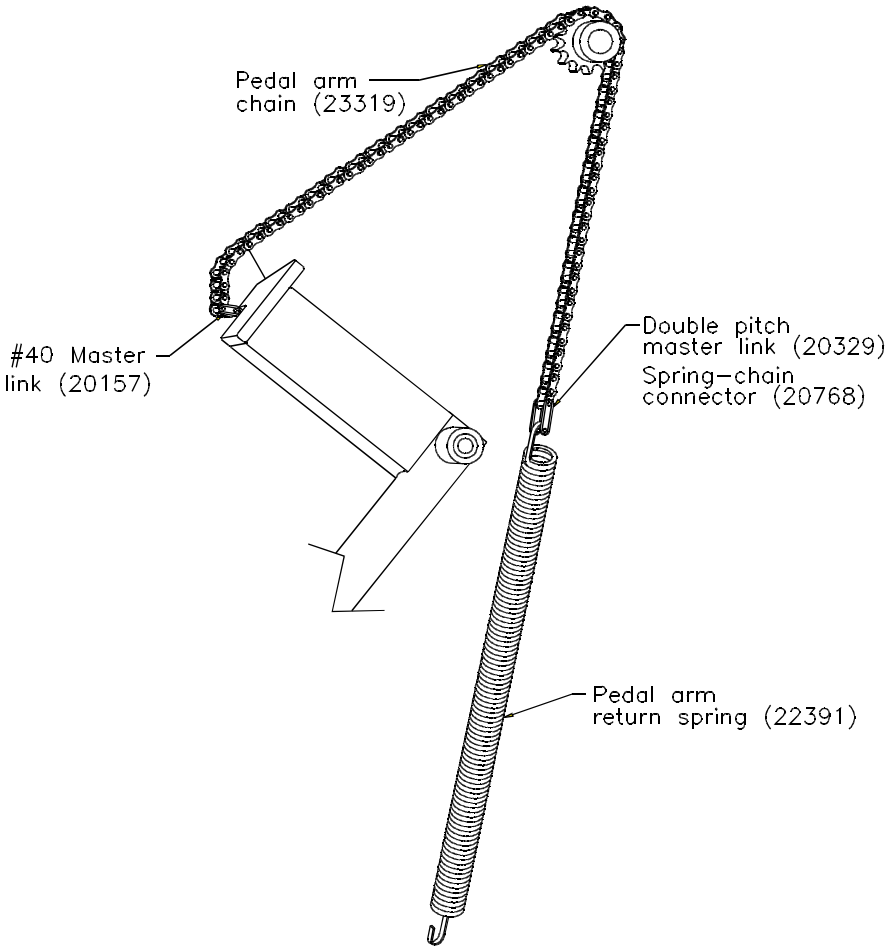


Figure 21: Master Link

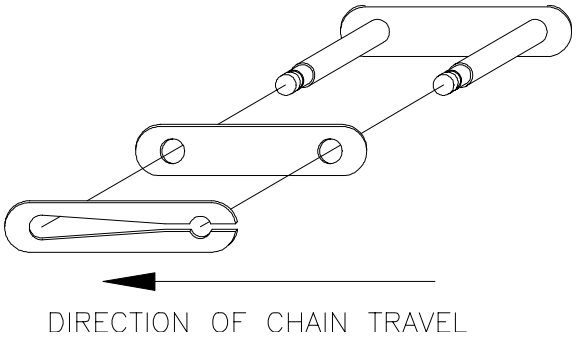


Figure 22: Drive Chain Assembly

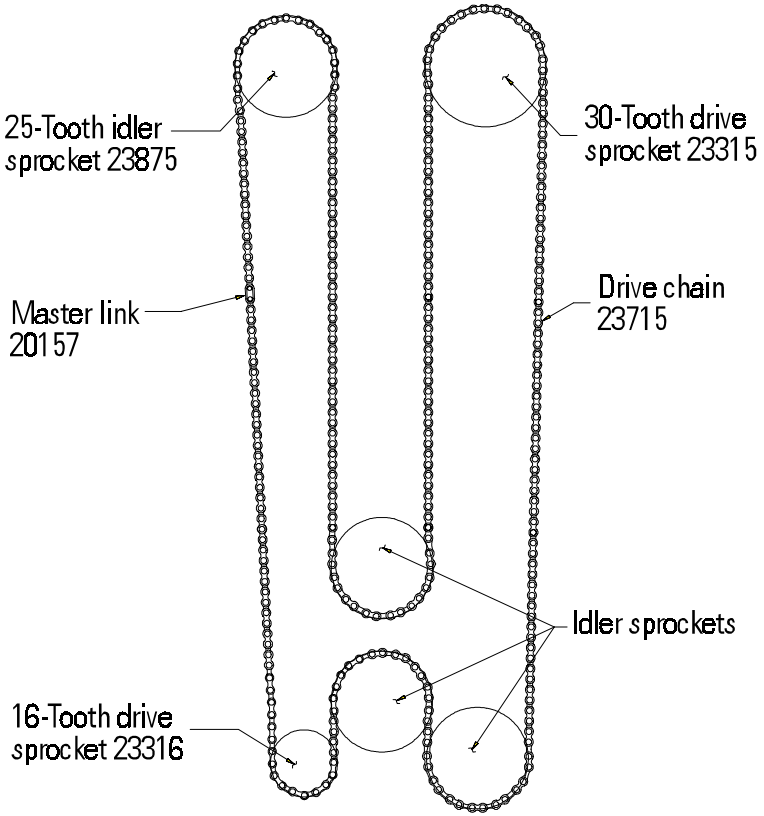


Figure 23: Drive Shaft Assembly

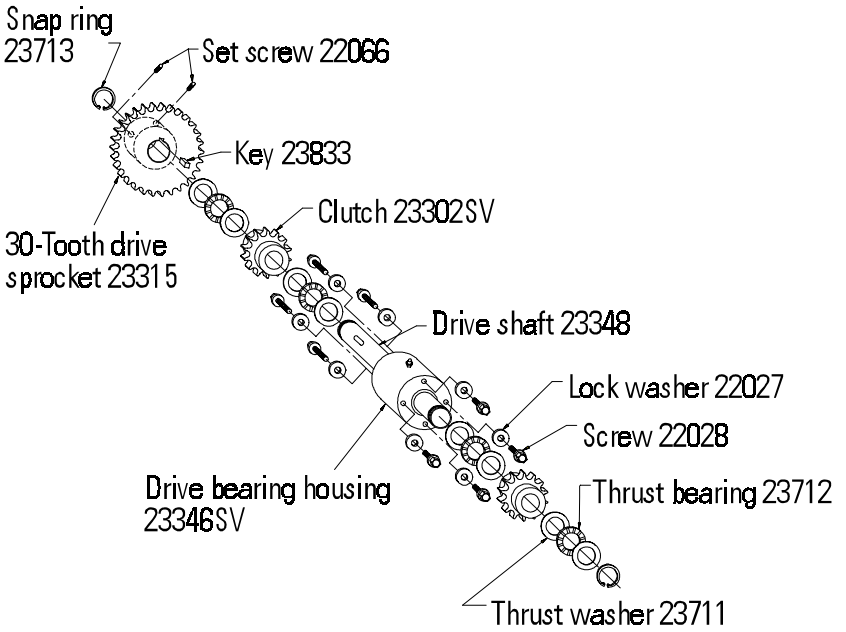


Figure 24: Lower Reduction Shaft Assembly

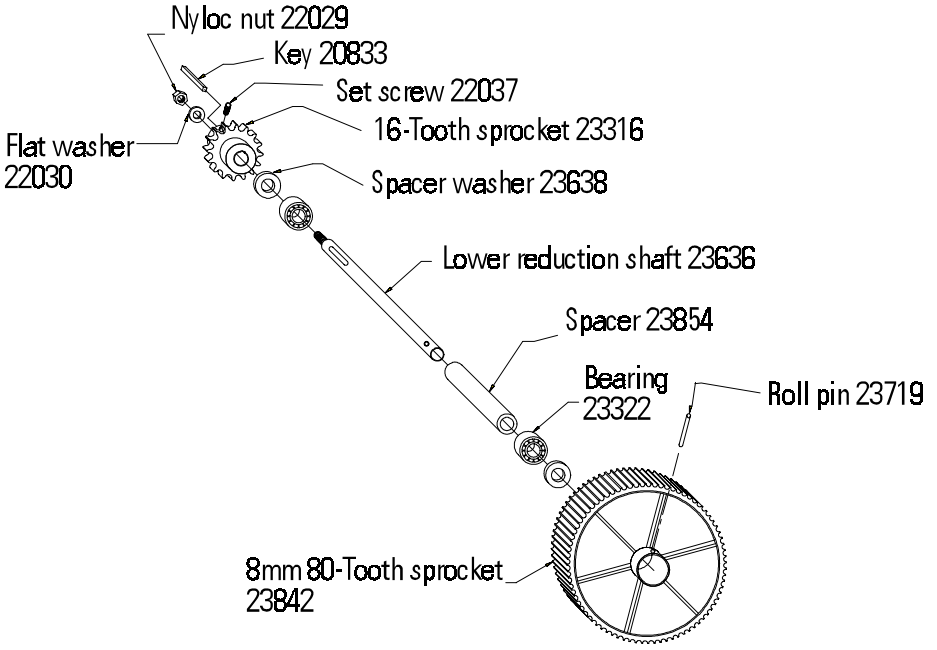


Figure 25: Pivot Assembly

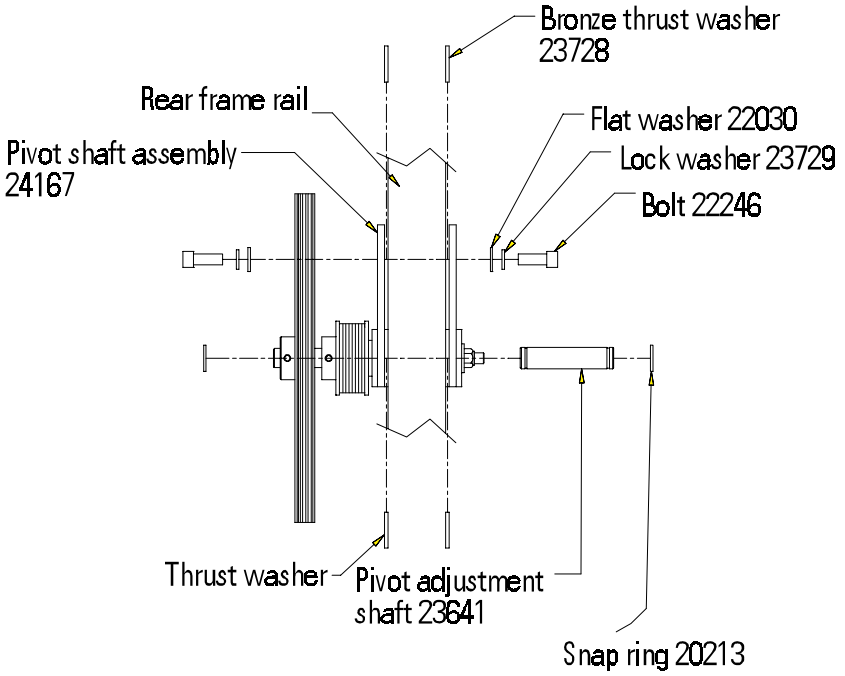


Figure 26: Floating Pulley Assembly

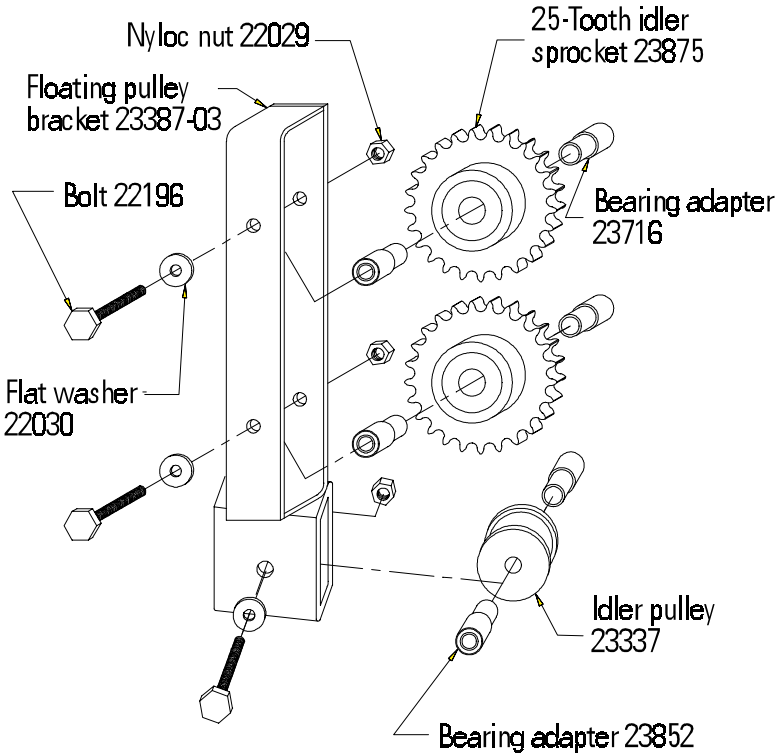


Figure 27: Upper Spring Stop Assembly

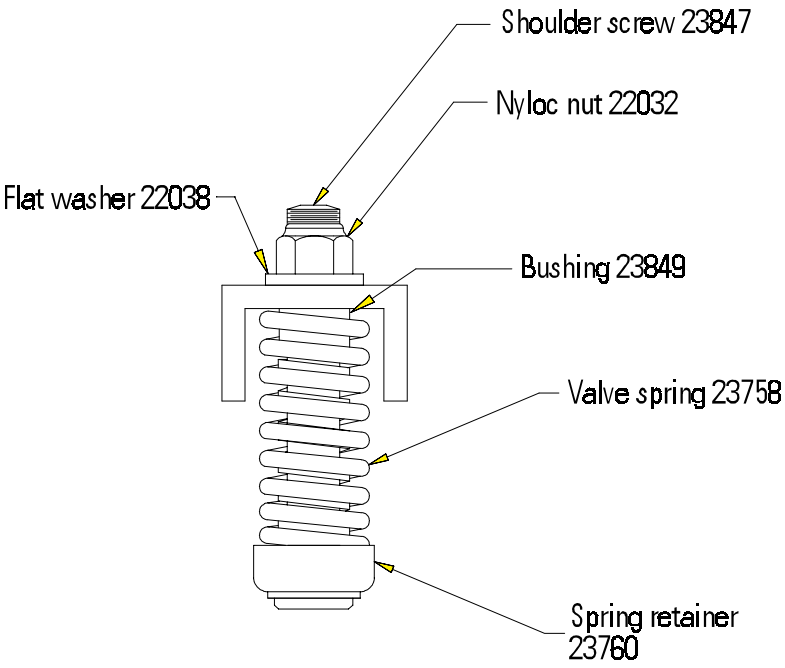


Figure 28: Chain Tensioning Idler Sprocket Assembly

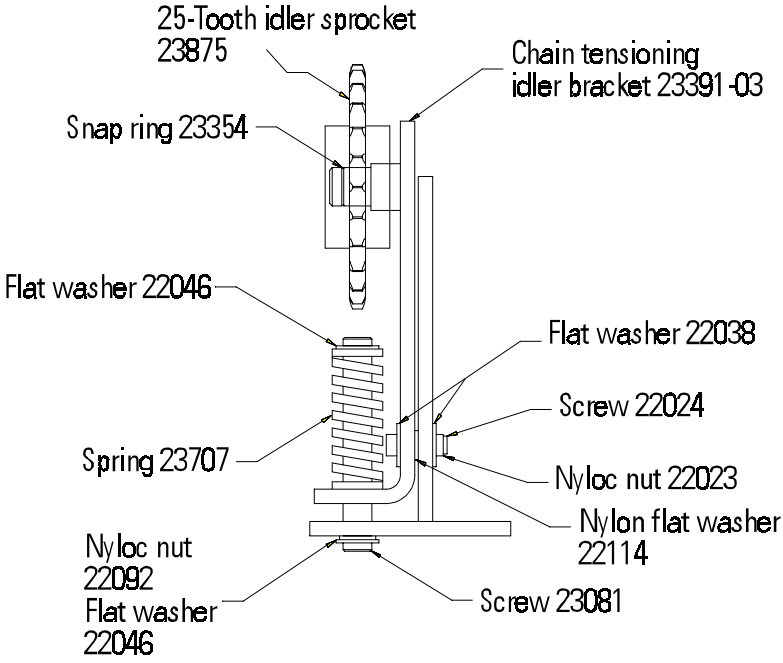


Figure 29: Left Pedal Arm Assembly

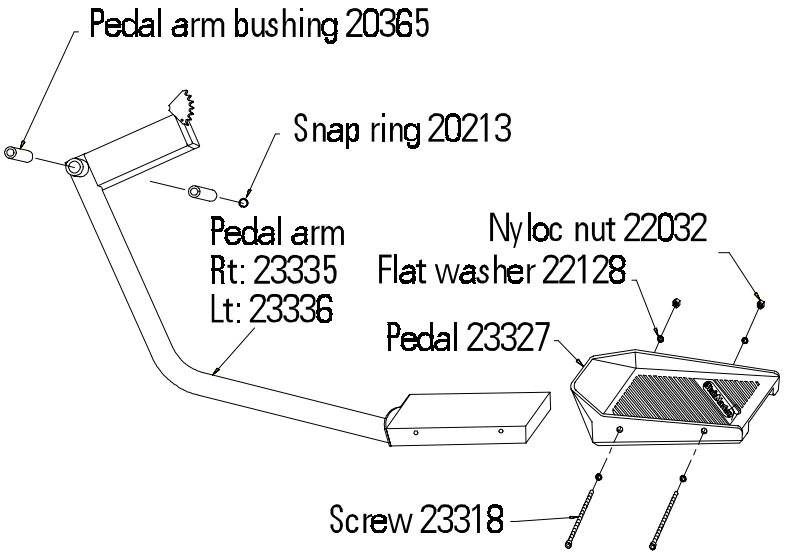


Figure 30: Main Cable Routing Diagram

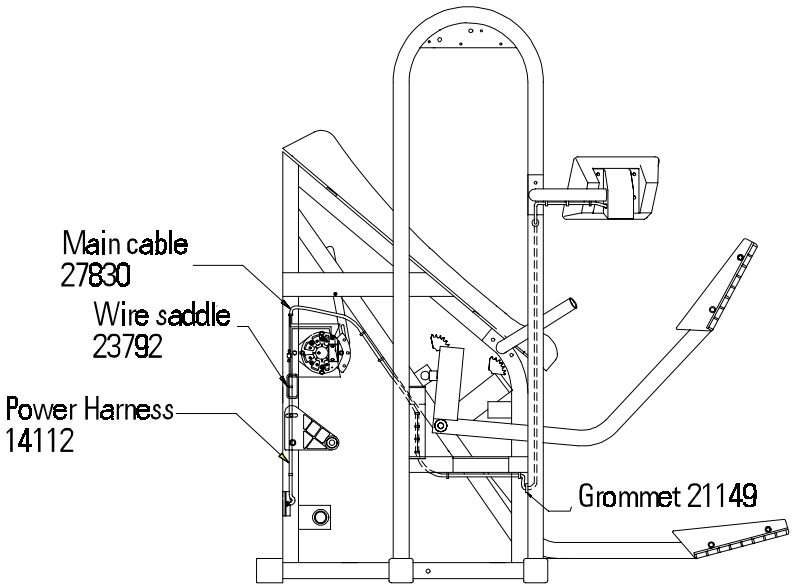
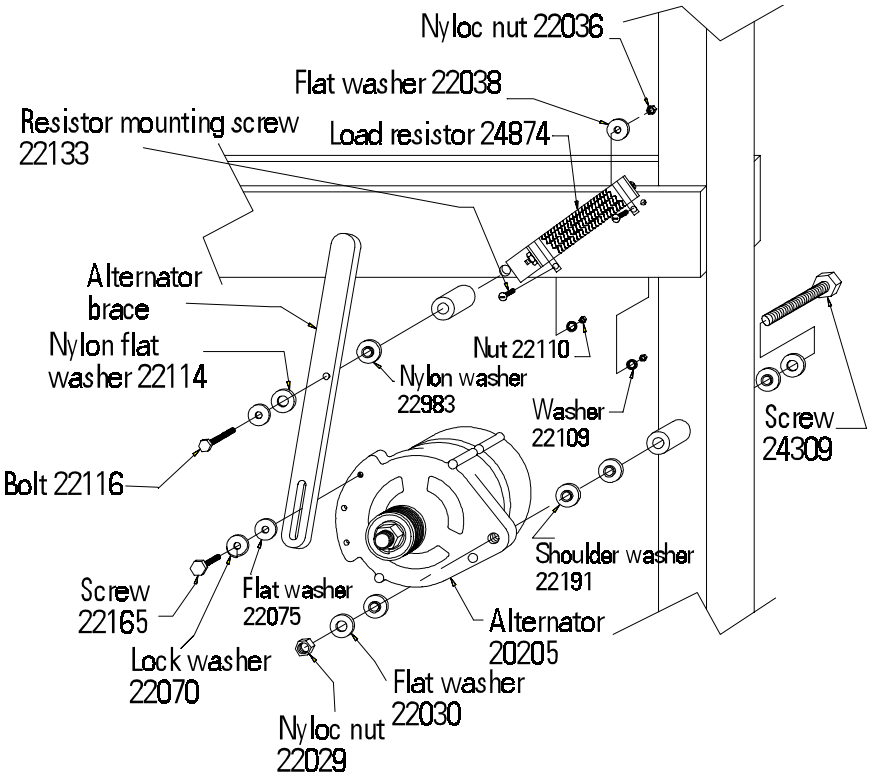


Figure 31: Alternator and Resistor Mounting



Wiring Diagram 1: Main Cable Assembly Connections