

MOMENTUM 3400 CE/3800 RC OWNER'S MANUAL



StairMaster
THE RESULTS YOU WANT™

C40 OWNER'S MANUAL



StairMaster®



Printed in the United States.
© 2001 StairMaster Health & Fitness Products, Inc.
All rights reserved.

Corporate Headquarters
12421 Willows Road N.E., Suite 100
Kirkland, WA 98034

(800) 635-2936
(425) 823-1825
Fax (425) 823-9490
www.stairmaster.com

P/N 25559-A

© 2001 StairMaster Health & Fitness Products, Inc. StairMaster is a registered trademark of StairMaster Health & Fitness Products, Inc. in the United States and other countries. StairMaster is a Rutledge Capital company.

WARRANTY

This is to certify that the StairMaster® Momentum systems cycle ergometer 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 the date of purchase, any part of the StairMaster Momentum systems cycle ergometer should fail to operate properly (except any accessories or the battery), contact our Customer Service Department to report the problem. International customers should contact their local distributor. When calling, please be prepared to provide our customer service representative with the following information:

- Your name, shipping address, and telephone number;
- The model number of the inoperable unit;
- The serial number of the inoperable unit (located on the frame);
- 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 Materials Authorization (RMA) prior to shipment.
- StairMaster Health & Fitness Products, Inc. will incur all freight (i.e., shipping and handling) 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.
- The customer is responsible for freight charges on warranty parts for products that are more than 45 days old. Customers will not be responsible for the return shipment of the inoperable parts (see below).
- Some inoperable warranty parts must be promptly returned to our Customer Service Department. We will pay the shipping cost for the inoperable warranty 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 StairMaster Momentum systems cycle ergometer, 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® Momentum systems cycle ergometer is a safe and effective way to develop aerobic fitness while conditioning the major muscles of the lower body. In order to get the best results, and to keep your machine in peak operating condition, you should carefully read and follow the guidelines presented in this manual.

WHAT IS IN THIS MANUAL?

This manual includes sections on safety, installation, operating instructions, preventive maintenance, and detailed information on troubleshooting and repair procedures. An appendix at the end of the manual provides important phone numbers and drawings.

WHAT IS THE STAIRMASTER STRATUS CYCLE ERGOMETER?

The Momentum systems cycle ergometers have 20 levels of intensity for each exercise program. The Momentum uses a variable resistance system to maintain constant power within any given intensity level. The resistance decreases as you pedal faster and increases as you pedal slower. The variable resistance system ensures you will do the same amount of work regardless of how fast or slow you pedal.

WHAT IS THE BATTERY CHARGER USED FOR?

Plug in the battery charger only to recharge a weak battery. Exercising on the Momentum cycle while the battery charger is connected will not damage the machine, but will affect the power output (watts) statistics.



CONTENTS

SAFETY GUIDELINES	1
INTRODUCTION	3
INSTALLATION INSTRUCTIONS	5
BASIC OPERATING INSTRUCTIONS	6
Adjustments	6
Seat Height Adjustment on the Momentum 3400 CE	6
Seat Adjustment on the Momentum 3800 RC	6
Foot Strap Adjustment on the Momentum 3400 CE	7
Basic Instructions For First-Time Users	8
Begin Exercising	8
Rest Periods	9
Cool down	9
GENERAL EXERCISE GUIDELINES	10
Setting a Goal	10
Flexibility Training	10
Exercise Principles	11
HEART RATE MONITORING	12
Heart Rate Input	12
Locked/Non-locked Option	12
Error Messages	13
TELEMETRY HEART RATE	14
Using The Transmitter Belt	14
Maintaining The Transmitter Belt	15
CONTACT HEART RATE	16
Contact Heart Rate	16
Using The Contact Heart Rate	16
MOMENTUM SYSTEMS CONSOLE	17
Display Window	17
Numeric Keypad	17
Entertainment Keypad	17

CONTENTS

Intensity Level Keys	17
Stop Key	17
Workout Statistics	19
Exercise Program Keypad	20
The Quick Start Program	20
The Manual Program	20
The Fat Burner Program	21
The Aerobic Training Program	21
The Speed Intervals Program	21
The Constant Heart Rate Program	22
The Fitness Test Programs	23
Understanding Submaximal Exercise Testing	23
Pretest Screening	25
The StairMaster® Submaximal Fit Test	25
Turning on the StairMaster Fitness Test	28
Console Codes	29
Custom Codes	29
Machine Status Codes	31
Diagnostic Codes	31
Configuration Codes	33
Fitness Testing Codes	33

MAINTENANCE INSTRUCTIONS 34

Helpful Hints	34
Tool List	34
Maintenance Records	34
Resetting The Maintenance Timer	35
Preventive Maintenance	35
Cleaning	35
Weekly Inspection	36
Monthly Inspection	36

TROUBLESHOOTING GUIDELINES 39

General Troubleshooting Guidelines	39
Systematic Electrical Troubleshooting	39
Systematic Mechanical Troubleshooting	42
Console Diagnostic Tests	43
Diagnostic Codes	43



CONTENTS

Display Test	43
Keypad Test	43
Serial Port Test	44
Alternator Test	44
Tach Test	45
Error Reporting	45
Contact Heart Rate	46
Telemetry (Polar®) Heart Rate Test	47

PARTS REMOVAL AND REPLACEMENT 48

Alternator	48
Covers	49
Console	50
Handlebar Assembly (3400 CE)	50
Seat (3300 CE)	51
Seat (3800 RC)	52
Seat Post (3400 CE)	53
Seat Handle (3400 CE)	54
Seat Track (3800 RC)	54
High Torque Drive (HTD) Belt	55
Poly-V Belt	55
Intermediate Poly-V Pulley Assembly	56
Pedals	57
Crank and Bottom Bracket Assembly	58

GROUNDING INSTRUCTIONS 60

NOTICE OF FCC COMPLIANCE 61

APPENDICES

Important Phone Numbers	62
Battery Recycling Centers	63
Figures 8 - 21	65

LIST OF TABLES

Table 1: Dimensions of the Momentum Cycle Ergometer	4
Table 2: Fitness Rating Norms(VO_{2max})	28
Table 3: Preventive Maintenance Schedule	38

LIST OF ILLUSTRATIONS

Figure 1: Major Parts, 3400 CE	3
Figure 2: Major Parts, 3800 RC	4
Figure 3: Leg Levelers	5
Figure 4: Transmitter Belt	15
Figure 5: Momentum Systems Console	17
Figure 6: StairMaster® Fitness Protocol	27
Figure 7: Grounding System	60
Figure 8: Cover Fasteners	65
Figure 9: Cover Fastener Location, 3400 CE	66
Figure 10: Cover Fastener Location, 3800 RC	67
Figure 11: Right Side View, 3400 CE	68
Figure 12: Right Side View, 3800 RC	69
Figure 13: Seat Post Assembly, 3400 CE	70
Figure 14: Seat Assembly, 3800 RC	71
Figure 15: Seat Track Assembly, 3800 RC	72
Figure 16: Intermediate Poly-V Assembly	73
Figure 17: Crank Assembly	74
Figure 18: Alternator/Flywheel Assembly	75
Figure 19: Wire Connections	76
Figure 20: Power Control Board Plug-ins	77
Figure 21: Wiring Diagram	78

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 electrical 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 electrical 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. Unplug from outlet when not in use.
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, or outdoors.



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.
5. Do not use the external power supply if it has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged, or dropped into water. Contact our Customer Service Department to arrange for the return of damaged parts.
6. Connect the external power supply to a properly grounded AC wall outlet; refer to the “Grounding Instructions” section. Keep all cords away from heated surfaces.
7. To disconnect the external power supply, remove the plug from the AC wall outlet.
8. Never drop or insert any object into any opening on the machine.
9. Do not operate where aerosol (spray) products are being used.
10. Always wear insulated gloves when handling batteries.
11. Do not crush, incinerate, or dismantle the battery. The electrolyte contains sulfuric acid which can cause serious damage to eyes and skin. Should this occur, flush profusely with water and seek medical attention.
12. 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

INTRODUCTION

Before leaving the StairMaster manufacturing facility in Tulsa, Oklahoma, your StairMaster® Momentum cycle ergometer was thoroughly inspected and tested to ensure proper operation. The major parts of the StairMaster Momentum 3400 CE and 3800 RC are shown in Figures 1 and 2.

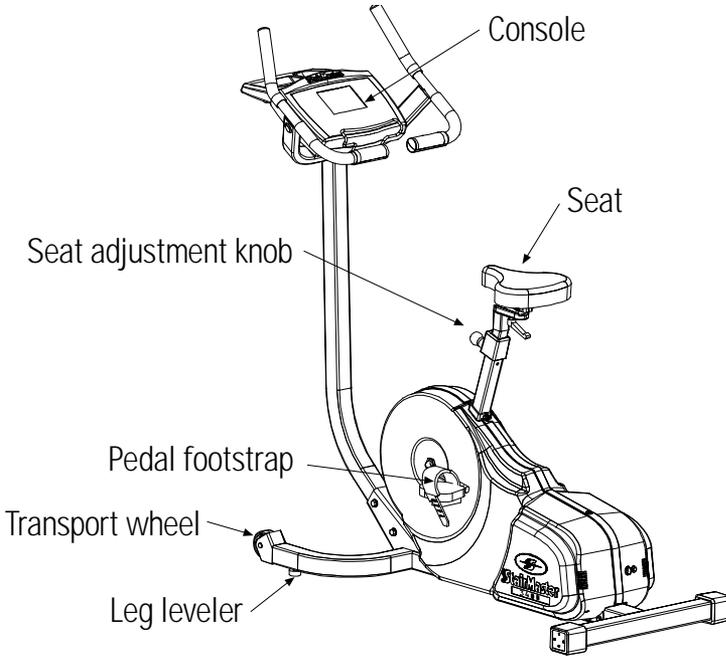


Figure 1: Major Parts, 3400 CE

INTRODUCTION

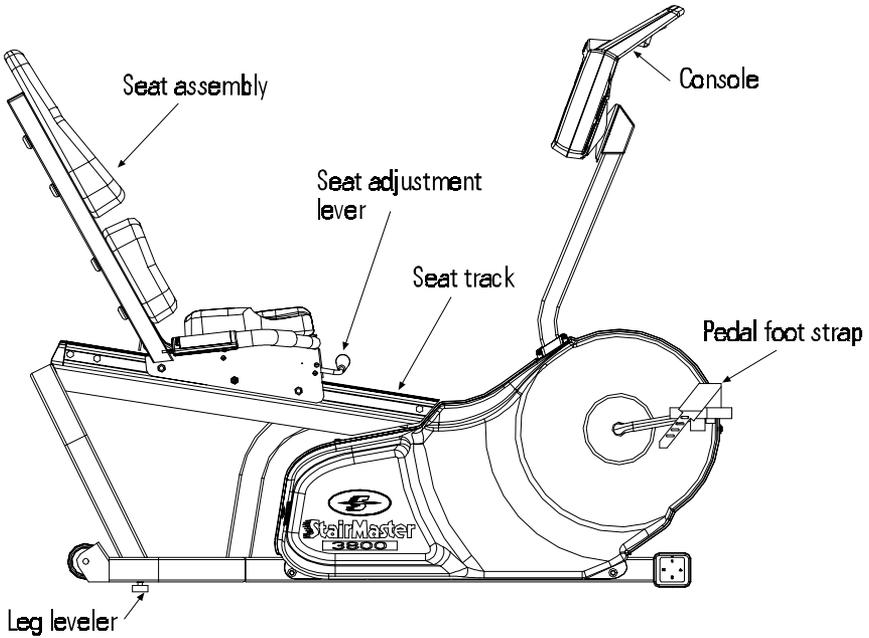


Figure 2: Major Parts, 3800 RC

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 drive chain is located on the right side of the machine. The dimensions of the machine are listed in Table 1.

Table 1. Dimensions of the Momentum Cycle Ergometer

	3400 CE	3800 RC
Length	60.5 inches (154 cm)	59 inches (150 cm)
Width	23.5 inches (60 cm)	23.5 inches (60 cm)
Height	57.75 inches (147 cm)	47.25 inches (120 cm)
Weight	125 pounds (57 kg)	157 pounds (71 kg)

INSTALLATION INSTRUCTIONS

Assemble your machine before use. Machines shipped outside the United States need to be uncrated before they can be assembled; refer to the “Uncrating Instructions” included with your machine for the details.

1. Remove all shipping material and the battery charger from the machine. **The battery charger is only used to recharge a low battery.**
2. Make sure the machine is level before you use it for the first time. Adjust the leg levelers as necessary to level the machine (see below).

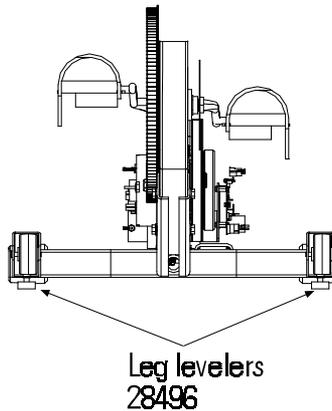


Figure 3: Leg levelers

3. Pedal the cycle to turn on the console. Watch the console, it should display the machine type and then show “SELECT WORKOUT.” If the console does not, connect the battery charger to the machine and then plug it into an electrical outlet. If the console powers up, your battery is low and needs to be charged. Leave the battery charger connected to the machine for 24 to 48 hours to charge the battery. It is okay to use the machine with the battery charger connected.
4. If the console still does not power up correctly, contact our Customer Service Department. Refer to the Appendix for the appropriate phone number.

BASIC OPERATING INSTRUCTIONS

ADJUSTMENTS

You should check two adjustments before using your StairMaster® Momentum systems cycle ergometer: the seat and the pedal foot strap length.

Seat Height Adjustment on the Momentum 3400 CE

Sit on the seat. Put both feet onto the pedals and into the foot straps. Pedal slowly and then stop when one leg is extended and your foot is as close to the floor as possible. The knee of the extended leg should be slightly bent when the sole of your foot is parallel to the floor. If you need to adjust the seat height, get off the bike and stand to one side. The seat adjustment knob is located on the frame tube just below the front part of the seat. Hold onto the seat with one hand and pull out on the seat adjustment knob with your other hand. You may need to lift up on the seat to disengage the seat pin. Lower or raise the seat as necessary.



WARNING

TO ELIMINATE THE RISK OF INJURY, DO NOT ADJUST THE SEAT HEIGHT WHILE SITTING ON THE MOMENTUM 3400 CE CYCLE ERGOMETER. MAKE SURE THAT THE SEAT ADJUSTMENT PIN COMPLETELY ENGAGES THE HOLE IN THE SEAT POST BEFORE REMOUNTING THE BIKE.

Seat Adjustment on the Momentum 3800 RC

Sit on the seat. Put both feet onto the pedals and into the foot straps. Pedal slowly and then stop when one leg is extended. The knee of the extended leg should be slightly bent. The seat adjustment lever is in front of the seat base. Remain seated and keep your feet on the pedals. Pull up on the lever and slide forward or backward as necessary. Release the lever and make sure the seat is locked in place by trying to move the seat forward and backward.



BASIC OPERATING INSTRUCTIONS

Foot strap Adjustment

To ensure your feet are properly secured to the pedals, you need to check the position of the foot straps. Position your foot so that the ball of your foot is over the pedal spindle. The pedal foot straps should be tight enough to secure your feet to the pedals but not so tight so as to cut off the circulation. If you need to adjust the foot strap length, get off the bike and stand to one side. There are two adjusting holes on the inside foot strap mount and four holes on the outside foot strap mount. Most shoes can be accommodated by adjusting the outside mounting holes. To make the necessary adjustments, grasp the pedal with one hand and the outside end of the foot strap with your other hand. Carefully pull the outside end of the foot strap off the tab on the pedal. Insert the proper hole of the foot strap onto the pedal tab. If you need to make additional adjustments, repeat the process with the inside mounting holes of the foot strap.

BASIC OPERATING INSTRUCTIONS

BASIC INSTRUCTIONS FOR FIRST-TIME USERS

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



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. Position yourself comfortably on the bike and begin pedaling.
3. 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.
4. 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].
5. The console will prompt you to enter your intensity level. Enter your desired intensity level. Correct entry errors by pressing [CLEAR] before you press [ENTER].
6. The console will prompt you to enter the workout time in one minute increments between 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.

Begin Exercising

7. As you become comfortable with exercise motion, press [LEVEL: ^] and [LEVEL: v] to adjust your cycling speed.



BASIC OPERATING INSTRUCTIONS

8. Select an intensity level that allows you to stay at a comfortable pace. Harder is not always better. Exercise at a level that is consistent with your fitness level.

Rest Periods

9. You can stop and rest as many times as necessary for up to one minute for each rest period during all programs. To stop, either press [STOP] or step off the machine. Follow the onscreen prompt to continue your work out after a rest period.

Cool Down

10. When you are finished with your workout, the machine will slow down and the messages "GOAL ATTAINED", and then "COOL DOWN" will be displayed. You can cool down on the machine by continuing to pedal at a low intensity. The console timer will continue to count up from the selected time to the console's set maximum time, and the intensity level will default to level 1. For example, if the console's time limit was set for 60 minutes and you entered a 45 minute workout session, the cool down period would last for 15 minutes, or until you stepped off the machine. If no time limit is set on the console, the timer will count up to 99, return to 0, and start counting up again. Press [STOP] to end the cool down, or step off the machine. If the machine is idle for one minute during the cool down, it will turn off.
11. You can also cool down by getting off the machine walking or stretching for at least five minutes.



GENERAL EXERCISE GUIDELINES

SETTING A GOAL

The first step to a successful exercise program is to set realistic goals and objectives. Are you wanting an exercise program that is geared to build muscle, maintain muscle tone, or lose weight? In order to ensure that you fully receive all the benefits of a sound exercise program, you need to first identify the existence (if any) of risk factors that may influence the design of your exercise program. Based upon a comprehensive analysis of your personal exercise needs and interests, you should then develop (or have developed for you by a competent or trained professional) an individualized program of exercise that is enjoyable, easy, and yet challenging. Your greatest health benefit will come from a lifestyle change that encourages a lifetime of physical activity.

One way to guarantee success in reaching your goal is to eat correctly. A well-rounded diet provides the proteins, carbohydrates, fats, vitamins, minerals, and water necessary for good health. If you are unsure of your dietary needs, seek the advise of your physician, an exercise professional, or visit your local bookstore for more information on nutrition.

FLEXIBILITY TRAINING*

Achieving and maintaining an adequate range of motion should always be objectives of a comprehensive exercise program. The warm-up phase of your exercise session should include some type of light warm-up activity to increase both your heart rate and your body temperature, which is then followed by flexibility exercises that are specifically designed to stretch the musculature around your body's major skeletal joints. Attempting to stretch a cold muscle can be dangerous to the soft tissues surrounding the muscle. No matter how controlled the movement, forcing a muscle through a full range of motion (and beyond) without appropriately warming up is both unsafe and counterproductive.

A general exercise program for achieving and maintaining flexibility should adhere to the following guidelines:

- Frequency - daily
- Intensity - to a position of mild discomfort
- Duration - 10-30 seconds for each stretch

GENERAL EXERCISE GUIDELINES

- Repetitions - 2-6 for each stretch
- Type - static, with a major emphasis on the low back and hamstrings area because of the high prevalence of low-back pain syndrome in our society.

EXERCISE PRINCIPLES*

The American College of Sports Medicine has developed a position paper concerning exercise programs for healthy adults and the need for guidelines. The following recommendations concern the quantity and quality of (exercise) training for developing and maintaining cardiorespiratory fitness in a healthy adult:

- Frequency -3 to 5 days per week
- Intensity -50% - 85% of maximum oxygen uptake ($VO_{2\max}$)
- Duration -20 to 60 minutes of continuous aerobic activity
- Mode of Activity -Any activity that uses the large muscle groups, that can be maintained continuously, and is rhythmical and aerobic in nature.
- Rate of Progression -Initial Conditioning - 4 to 6 weeks; low-end intensity (40% - 60% $VO_{2\max}$); low-end duration (15 to 20 minutes).
-Improvement Stage - 6 weeks to 6 months; moderate intensity; moderate duration.
-Maintenance Stage - 6 months plus; moderate to high intensity; moderate to high duration.

*Note: Some of the material contained in this section is adapted from *The StairMaster® Fitness Handbook 2nd Ed.*, James A Peterson, and Cedric X. Bryant (editors), Sagamore Publishing, 1995.



HEART RATE MONITORING

HEART RATE INPUT

Contact heart rate and telemetry (e.g., Polar®) heart rate signal detection is available. The default heart rate input option is "BOTH LOCKED." If a telemetry signal is detected first, contact heart rate signals are inhibited from being detected throughout the rest of the workout session and vice-versa. There is also 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. The duration of this shorter, initial "lock out" period differs between telemetry and contact heart rate.

- 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.
- Contact heart rate - after the initial contact sensor signal is detected, the console will enter a validation phase requiring a good heart beat signal within 10 to 15 seconds, or until the system acquires a valid signal. During the validation phase, the console will not recognize telemetry heart rate signals. The console will display a beating double heart icon that has the inner heart colored in white while searching for a valid signal.

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.

HEART RATE MONITORING

2. There are four options to handle heart rate input signals. Press the [SELECT] key to scroll through the options until you find the one option that suits your needs. Press the [ENTER] key to select that option.

“ BOTH LOCKED ” - allows either telemetry or contact heart rate signals to be detected. Once the console has detected a valid input signal it will lock out the opposite type of signal for the duration of the workout session. For example, if you start out using contact heart rate then you are limited to using only contact heart rate during your workout session, even if the signal is lost while performing the workout, and vice-versa.

“ EITHER INPUT ” - allows either telemetry or contact heart rate signals to be detected. Does not lock out a particular input signal for the entire workout. This option will detect either input signal during a workout session, but only one at a time, and only until the other signal terminates.

“ TELEMETRY ONLY ” - locks out contact heart rate signals and will only detect telemetry signals.

“ HAND ONLY ” - locks out telemetry signals and will only detect contact heart rate signals.

“ 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 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 during the program. For these programs, ensure that neither the “BOTH HR OFF” or the “HAND ONLY” option is set as a default option.

“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.

TELEMETRY HEART RATE

“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.

TELEMETRY HEART RATE

The StairMaster® Momentum 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

TELEMETRY HEART RATE

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. 12-13).

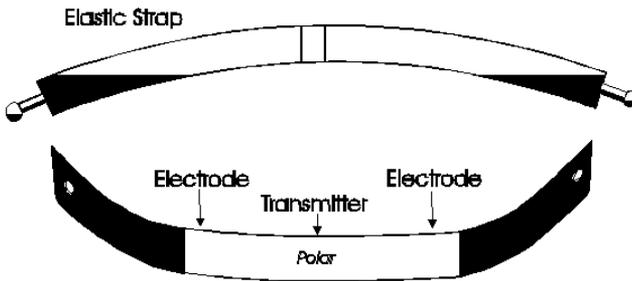


Figure 4: Transmitter Belt

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	



CONTACT HEART RATE

CONTACT HEART RATE

The StairMaster® Momentum features a digitized contact heart rate monitoring system. Through the use of stainless steel sensors built into the upper handles and sophisticated software, heart rate can be checked at any time during a workout. The heart rate is displayed on the console.

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

Using Contact Heart Rate

Contact heart rate input signals are acquired only during contact between your hands and the stainless steel sensors on the handrails. To use the contact heart rate feature, place your hands around the handles so that your hands touch both the top and the bottom of the sensors. After the initial contact heart rate signal is detected, the console will enter a validation phase requiring a good heart beat signal within 10 to 15 seconds, or until the system acquires a valid signal. During the validation phase the console will not recognize telemetry heart rate signals. The console will display a beating double heart icon that has the inner heart colored in while searching for a valid signal. If, during exercise, the heart rate displayed is erratic, it may be helpful to remove your hands from the handles, wipe them and place them back on the handles. In all programs, the heart rate is shown automatically in the display window the first time the sensors are touched.

MOMENTUM SYSTEMS CONSOLE

The StairMaster® Momentum systems 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).

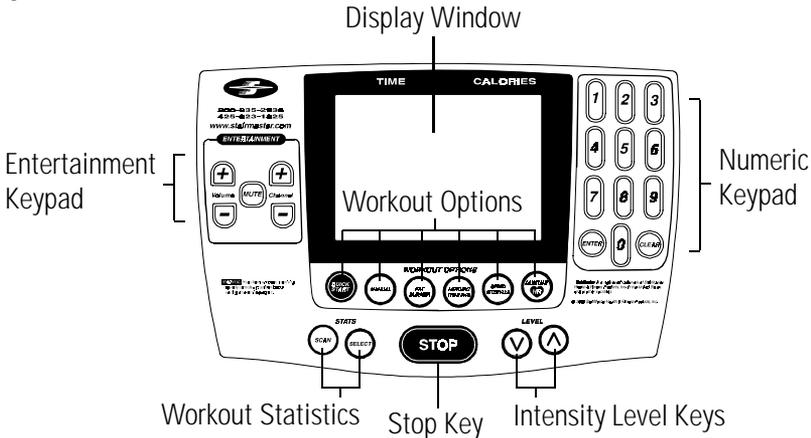


Figure 5: Momentum Systems Console

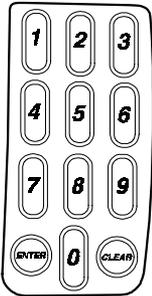
DISPLAY WINDOW



- **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.

MOMENTUM SYSTEMS CONSOLE

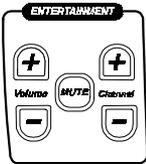
NUMERIC KEYPAD



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 Momentum cycles come 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



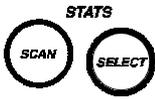
The exercise intensity level may be changed at any time during a workout. Pressing the [∨] key decreases the intensity and pressing the [∧] key increases the intensity.

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. Pressing the [SCAN] key will prompt the console to cycle through the following statistics:

- **Distance** - Provides a cumulative total of the equivalent distance, in miles (or kilometers if your console is set to metric units), you would have traveled while riding a bicycle outdoors at the same relative intensity.
- **Calories/Hour** - Provides a running total of the number of Calories burned during a workout.
- **RPM** - Displays the revolutions per minute.
- **Speed** - Displays the equivalent speed, in miles per hour (or kilometers per hour if your console is set to metric units), you would be traveling on a bicycle outdoors while riding at the same relative intensity.
- **Intensity Level** - Shows the current 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.



MOMENTUM SYSTEMS CONSOLE

EXERCISE PROGRAM KEYPAD

The exercise keypad is located below the display and to the left of the function keypad. While the console is in the "SELECT WORKOUT" mode, press one of the exercise program keys to preview the desired workout. There are six workout programs with the following standard defaults (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, and then return to 0.
- **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 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

MOMENTUM SYSTEMS CONSOLE

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



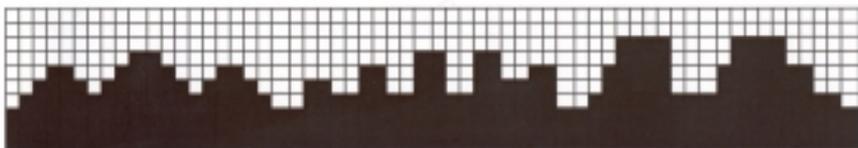
The Fat Burner Program

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.

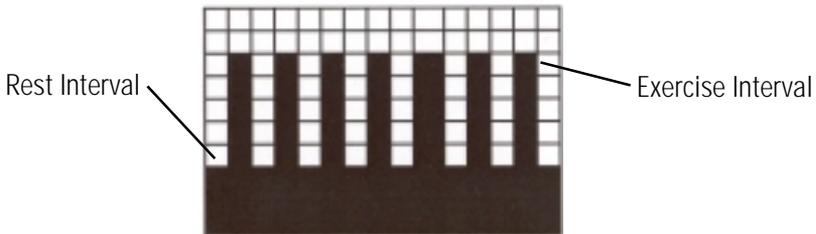


The Speed Intervals Program

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

MOMENTUM SYSTEMS CONSOLE

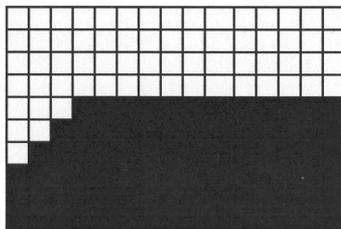
during an EXERCISE interval. The intensity level shown during an EXERCISE interval is indicative of your current speed. However, the current speed during a REST interval is equal to a scaled percentage of the displayed intensity level. Note that the program profile does not change at any time during 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: $220 - (\text{Age}) \times .70$. 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 PROGRAMS

Understanding Submaximal Exercise Testing

Before using the StairMaster® Momentum 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

MOMENTUM SYSTEMS CONSOLE

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



MOMENTUM SYSTEMS CONSOLE

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



MOMENTUM SYSTEMS CONSOLE

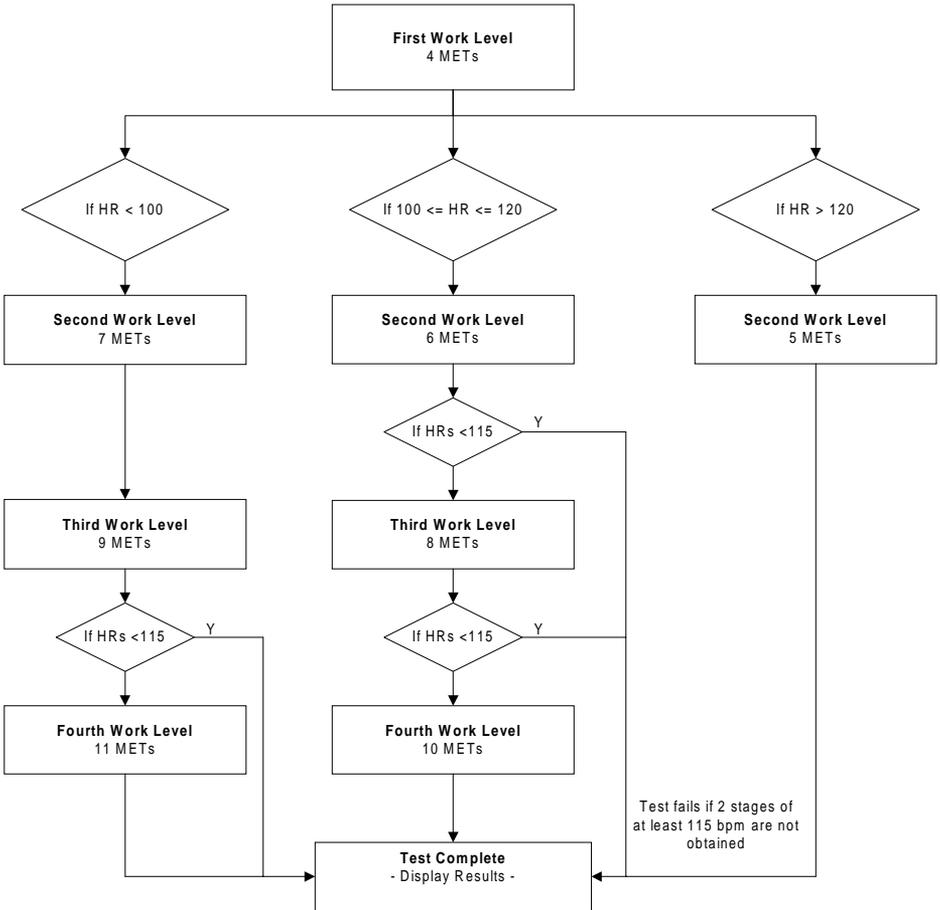
heart rate response to the warmup. The test is designed to raise the steady-state heart rate of the subject to 115 to 150 beats/min for two consecutive stages. It is important to remember that two consecutive heart rate measurements must be obtained in the 115 to 150 beats/min range to predict $\text{VO}_{2\text{max}}$. 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 115 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 $\text{VO}_{2\text{max}}$ 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 115 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



MOMENTUM SYSTEMS CONSOLE

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

<u>MEN</u>					
<u>Age</u>	<u>High</u>	<u>Good</u>	<u>Average</u>	<u>Fair</u>	<u>Low</u>
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
<u>WOMEN</u>					
<u>Age</u>	<u>High</u>	<u>Good</u>	<u>Average</u>	<u>Fair</u>	<u>Low</u>
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

Turning on the StairMaster® Fitness Test

The StairMaster fitness test may be taken using either a chest strap (telemetry), or by using the specialized contact heart rate grips.

1. Press [^], [9], [0], [ENTER], on the console keypad. Make sure to press in the middle of each key and be aware that the corresponding numbers will not show in the console display.
2. The console will prompt you to "BEGIN FIT TEST." Follow the onscreen prompts. The test can be stopped at any time by pressing [STOP].

MOMENTUM SYSTEMS CONSOLE

CONSOLE CODES

There are 5 groups of different codes; Customization [codes start with 3], Machine Status [codes start with 4], Diagnostic [codes start with 6 or 7], Configuration [codes start with 8], and Fitness Testing [codes start with 9]. 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 ^], [first number of code], [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 v] 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 [^] [first number of code], [second number of code], [ENTER] selects that item directly.
- Pressing [CLEAR] exits any of the special access modes.

Custom Codes

[^] [3] [0] Change workout time limit	5 - 99 minutes, or no time limit
[^] [3] [1] Change units	USA or Metric
[^] [3] [2] Choose type of heart rate input	Telemetry or Hand
[^] [3] [3] - spare -	
[^] [3] [4] Choose console language	German, French, Spanish, Italian, Dutch, Swedish
[^] [3] [5] Change console contrast	Increase or decrease
[^] [3] [6] Change speed limit	Not applicable
[^] [3] [7] Turn clinical mode on or off	used to allow RPMs < 40
[^] [3] [8] - spare -	
[^] [3] [9] Reset to factory defaults	175 lbs., Intensity Level 3, 20 min., 30:1 Gear Ratio, English



MOMENTUM SYSTEMS CONSOLE

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 heart 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: v] keys to increase or decrease the contrast. The changed value will remain on exit.
6. Turn on the clinical mode when exercising at an RPM less than 50 watts. Press [LEVEL: ^], [3], [7]. The console will display "CLINICAL MODE." Press [ENTER]. The console will then display "OFF" or "ON." Press the [LEVEL: ^] or [LEVEL: v] key to alternate between the off and on options. Press [ENTER] to select the option.
7. 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."

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 "BIKE (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."

Diagnostic Codes

- [^][6][0] [ENTER] Test display **Screen alternates between all LCD segments turned on, and a representative program screen.**
- [^][6][1] [ENTER] Test keyboard **Pressing any key displays that key's name in the display window. Press [CLEAR] last to exit.**

MOMENTUM SYSTEMS CONSOLE

[^][6][2][ENTER] Test serial port *Performs a serial loop back test. Select the CSAFE RS-232 selection. You will need a loop-back test **cable** (PN 040051-001) inserted into the appropriate connector port to successfully run this test. Console will display either "PASS" or "FAIL."*

[^][6][3][ENTER] Test alternator *Verifies the alternator field routines through the console. Position yourself on the machine and press [^] for "field on." After exercising briefly you should build up resistance. For "field off" press [v].*

[^][6][4][ENTER] N/A

[^][6][5][ENTER] N/A

[^][6][6][ENTER] Test tach response *Start exercising on the machine. The console should regulate the alternator resistance based on the tach signal to maintain approx. 2,000 RPMs while you are exercising. If not, there is a possible problem in the AC tap or field circuit - check the alternator, the AC tap wire, the field wire, the diode, the terminal posts, and the main **cable**.*

[^][7][0][ENTER] Display Error Log *The console will report various error messages in the display window. The total amount of errors will be displayed in the upper right 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 you press 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 you restart the program unless power has been turned off and then back on.*

[^][7][1][ENTER] Reset Service Time *Reset the maintenance timer after service to 0 hrs. Press [CLEAR] to exit.*

[^][7][2-9] *- spare -*



MOMENTUM SYSTEMS CONSOLE

Configuration Codes

- | | | |
|--------------------------|--|-------------------------------|
| [^][8][0][ENTER] | Change Machine | <i>Change machine type</i> |
| [^][8][1][ENTER] | Change Bike Gear
<i>ratio from 30:1 to 24:1</i> | <i>Change production gear</i> |
| [^][8][2-9] | - spare - | |

Fitness Testing Codes

- | | | |
|--------------------------|---------------------------|----------------------|
| [^][9][0][ENTER] | StairMaster® Fitness Test | <i>See pg. 23-28</i> |
| [^][9][1][ENTER] | N/A | |
| [^][9][2][ENTER] | N/A | |



MAINTENANCE INSTRUCTIONS

HELPFUL HINTS

If you keep your StairMaster® Momentum systems cycle ergometer properly serviced and in good condition, it will operate more efficiently and last longer. It is strongly recommended that you adhere to the maintenance service guidelines presented in this Owner's Manual. Read all maintenance instructions thoroughly before beginning work. In some instances, the use of an assistant is recommended to perform the necessary task efficiently. Upon receiving your new Momentum systems cycle ergometer, use a soft, clean towel to wipe off the dust that may have accumulated during shipping. Your new machine will require minor assembly. Refer to the "Installation Instructions" section of this manual for details. All references to the right or the left side and to the front or the back of the Momentum systems cycle ergometer are made as if you were sitting on the machine ready to exercise.

TOOL LIST

The following tools are needed to perform service and maintenance on the Momentum systems cycle ergometer:

- shop goggles or other eye protection
- locking pliers
- snap ring pliers, external snap rings
- combination wrenches (sizes 7/16" to 3/4")
- adjustable wrench
- 2-mm cone wrench
- allen wrenches (T-handled and L-bend)
- socket set or nut driver set (sizes 1/4" to 3/4")
- standard screwdriver
- volt-ohm meter
- phillips screwdriver
- adjustable pliers
- alligator clips
- 15-mm cone wrench

MAINTENANCE RECORDS

The console on the Momentum systems cycle ergometer will keep track of important usage data on the machine. While the console displays "SELECT WORKOUT", enter the following codes to retrieve usage data:

- [^][4][0] Machine run time in hours

NOTE: The console may display several hours of use when your

MAINTENANCE INSTRUCTIONS

machine first arrives due to testing at the manufacturing facility.

- [^] [4] [1] Number of workouts
- [^] [4] [2] Distance traveled
- [^] [4] [3] Software revision number
- [^] [4] [4] Machine type
- [^] [4] [5] **-N/A-**
- [^] [4] [6] Machine *maintenance* run time in hours since last cleared

NOTE: There are 2 timers in the console; one for machine run time total and one for tracking machine run time since last serviced.

Resetting the Maintenance Hour Timer

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.

PREVENTIVE MAINTENANCE

The procedures for performing recommended preventive maintenance on the Momentum systems cycle ergometer are summarized in Table 5.

Cleaning

1. DO NOT USE GLASS CLEANER OR ANY OTHER HOUSEHOLD CLEANERS ON THE CONSOLE. Clean the console daily with a water-dampened cloth and wipe dry after cleaning.
2. Clean the exterior covers, the pedals, and the seat on a weekly basis using either soap and water or a diluted, non-mineral based household cleaner such as Fantastic®.

MAINTENANCE INSTRUCTIONS

Weekly Inspection

1. **Frame:** Inspect the painted surfaces of the exposed frame for any rust, bubbling, or chips during the weekly cleaning. The salt in perspiration will damage unpainted surfaces. Repair the damaged area with a touch-up paint kit provided by StairMaster® Health & Fitness Products, Inc. (part number 22181).
2. **Pedals:** Inspect the pedal foot straps at both the inside and outside attachment sites. Replace the foot straps if they are torn or ripped.
3. **Seat:**
3400 CE: Inspect the seat post and the seat adjustment pin. The seat post should slide up and down freely in the plastic collar with the adjustment pin pulled out. Clean the seat post of any accumulated grime with a clean rag. The seat adjustment pin should completely engage the holes in the seat post. If the seat adjustment pin spring action is sticky, apply a few drops of 30W motor oil, or the equivalent lubricant, to the pin shaft.
3800 RC: Inspect the seat assembly movement to ensure that the seat moves freely on the seat track. Note that the center wheel on each side of the seat assembly is eccentric. These wheels are adjustable by loosening the nut, turning the wheel to adjust the height, and then tightening the nut. If necessary, adjust these two wheels to allow the seat assembly to move freely on the seat track.

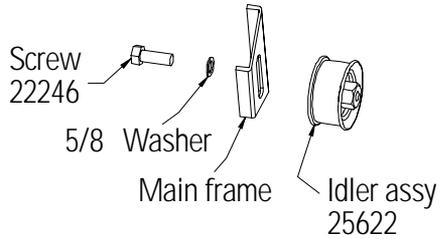
Monthly Inspection

1. **Pedal crank:** Inspect the crank bearings for either excessive play or tightness. Either condition will reduce the life of the bearings. Ensure the bearing clamps are tight. Refer to the "Part Removal and Replacement" section of this manual for the proper adjustment procedures.
2. **Belts:** Inspect the HTD and Poly-V belt for excessive wear. Adjust the belt tension if necessary.
HTD Belt: Adjust the HTD belt tension to allow 1/2" of belt deflection with fingertip pressure between the idler pulley and the HTD sprocket.

MAINTENANCE INSTRUCTIONS

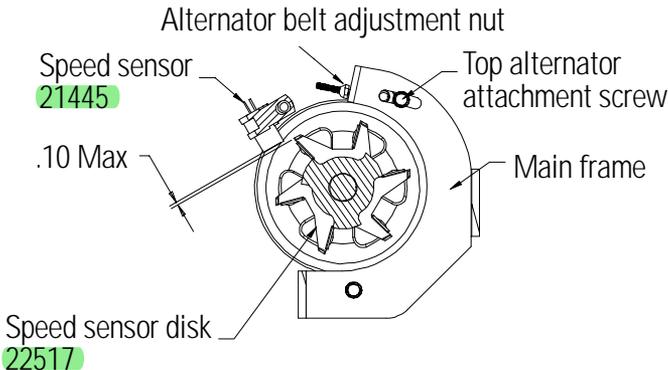
To adjust the tension:

- Loosen the idler assembly screw so that the idler pulley can slide up and down.
- Slide the idler pulley up or down to tighten or loosen the belt.
- Once in position, tighten the idler assembly screw.
- Verify the HTD belt tension.



Poly-V belt: Make sure the belt is centered on the pulleys. To adjust the tension:

- Loosen the top alternator attachment screw and the alternator adjustment nut. Pivot the alternator up or down as necessary to allow .25" (0.6 cm) of belt deflection with fingertip pressure at the center of the vertical portion of either side of the belt.
- Tighten the top alternator attachment screw and the alternator adjustment nut. Verify .25" (0.6 cm) of play in the belt and .10" gap between speed sensor and the speed sensor disk.



WARNING

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

MAINTENANCE INSTRUCTIONS

Table 5. Preventive Maintenance Schedule

PART	RECOMMENDED ACTION	FREQUENCY	CLEANER
Console	Wipe clean	Daily	Water
Covers	Wipe clean	Daily	Soap & water, diluted household cleaner
Seat	Clean	Each week, or after every 70 hours of use	Soap & water, diluted household cleaner
Pedals & footstraps	Clean & inspect	Each week, or after every 70 hours of use	Soap & water, diluted household cleaner
Seat post 3400 CE	Clean & inspect	Each week, or after every 70 hours of use	Clean, dry rag
Seat track 3800 RC	Clean & inspect	Each week, or after every 70 hours of use	Clean, dry rag
Crank bearings	Inspect	Each month, or 300 hours	N/A
Belts	Inspect	Each month, or 300 hours	N/A

GENERAL TROUBLESHOOTING GUIDELINES

This section outlines several tests to systematically identify and isolate problems with the electrical system and the drive train. This troubleshooting section is organized into three basic problem sections: Electrical System, Console Diagnostics, and the Drive Train. Perform the tests in exactly the same order as written. Refer to the "Parts Removal and Replacement" section of this manual for any disassembly and assembly instructions. To order a replacement part, or to get help with the troubleshooting process, contact the Customer Service Department of StairMaster Health & Fitness Products, Inc. at (800) 331-3578. International customers should contact their local distributor or call (425) 823-1825.

SYSTEMATIC ELECTRICAL TROUBLESHOOTING

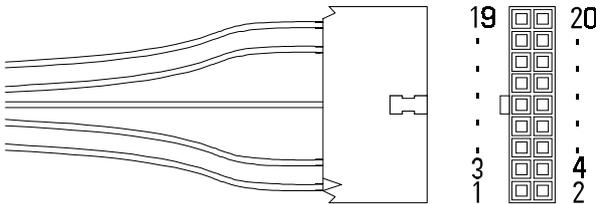
The electrical system of your Momentum systems cycle ergometer has five major components: the power control board, the alternator, the load resistor, the main cable assembly, and the console. In order to identify the component that is causing the problem, you must systematically test the entire system. You will need a Volt-Ohm meter (multimeter) and alligator clips to conduct portions of the following procedures. The console, battery, and power control board are not serviceable by the owner. If any of these parts are inoperable, they must be replaced. Attempted repairs to the console, battery, or the power control board will void the warranty.

1. Remove the side covers.
2. Test the battery connection at the power control board (PCB). Measure VDC between yellow test points 7 and 10 (near the battery connector) of the PCB for a minimum of 6.0 VDC. If the measured voltage is 6.0 VDC or more, skip to step 6.
3. Test the battery. Unplug the battery connector from the power control board and locate pin 2 and pin 3 in the end of the battery connector.
4. Use a voltmeter to verify that the voltage between pin 2 (negative) and pin 3 (positive) is a minimum of 6.0 VDC. Install the battery charger for at least 24 to 48 hours if the voltage measured is below 6.0 VDC. It is

SYSTEMATIC ELECTRICAL TROUBLESHOOTING

okay to use the machine with the battery charger connected. After 48 hours, repeat step 3 - 4. If the voltage measured is below 6.0 VDC then the battery is bad.

5. Plug the battery connector back into the power control board.
6. Test the main **cable**. Remove the four console knobs from the console. Gently lift the console up and disconnect the main **cable** from the back of the console. Have an assistant pedal the bike and while you test pins 1 and 10 of the main **cable** at the console connection for a minimum of 6.0 VDC.



7. Reconnect the main **cable** to the console.
8. Verify that the inductive switch is adjusted to within 1/32" (0.8 cm) of the speed sensor disk on the front of the alternator.
9. Test the inductive switch. Unplug the inductive switch **cable** from the power control board and test pins 1 and 2 for AC voltage while pedaling. VAC should increase with RPM.
10. Test the inductive switch PCB point. Plug the inductive switch back in. Use a voltmeter to verify that the AC voltage at yellow test points 10 and 12 of the PCB increases when RPM's increase (test point 10 is positive, test point 12 is negative).
11. Test the alternator. Unplug the alternator wiring connector from the PCB.
12. Connect alligator clips between the B+ terminal and the FLD terminal of the alternator.

SYSTEMATIC ELECTRICAL TROUBLESHOOTING

13. Pedal the cycle at a high RPM rate for 10-15 seconds or until you feel the resistance level change making it harder to pedal. If no resistance is felt then the alternator has a problem.
14. Test the diode. Unplug the diode from the FLD terminal of the alternator.
15. Use a voltmeter, set to Ohms to test the diode. A good diode will show a high resistance reading in one direction and a low resistance reading when the voltmeter leads are reversed.
16. Reconnect the diode to the FLD terminal of the alternator.
17. Reconnect the alternator wiring connector to the power control board.
18. Test the load resistor. Unplug the load resistor from the power control board and locate pin 1 and pin 2 at the end of the **cable**.
19. Use a voltmeter, set to Ohms to test the load resistor for a correct reading of 1/2 Ohm between pins 1 and 2.
20. Plug the load resistor back into the power control board.
21. Check the main **cable** assembly for continuity and cross check each wire in the **cable** to check for shorted wires. Call StairMaster® Customer Service at (800) 331-3578 for assistance. International customers should contact their local distributors.



SYSTEMATIC MECHANICAL TROUBLESHOOTING

SYSTEMATIC MECHANICAL TROUBLESHOOTING

These steps should be performed in exactly the order written. Refer to the "Parts Removal and Replacement" section of this manual for any disassembly and assembly instructions.

1. Remove the side covers.
2. Adjust the HTD belt so that the belt is positioned centered on the large HTD pulley and the idler pulley assembly. Verify that the belt is tensioned so that it is tight enough that it does not ride off, and loose enough that it doesn't bind the pulleys. Retest the machine if HTD belt adjustment was necessary.
3. Verify that the jam nut and bearing nut assemblies on the crank assembly are tight.
4. Spin the crank assembly with the belt removed and listen for any clicking or grinding noises. The crank should spin freely 4 or 5 revolutions. Resume troubleshooting at step 6 if no noises are heard.
5. Verify that the jam nut on the flywheel and the alternator is tight.
6. Adjust the speed sensor to .10" from the speed sensor disk.
7. Spin the alternator/flywheel assembly and listen for clicking and/or grinding noises.
8. With the Poly-v belt removed, inspect the Poly-V pulley for excess wear and spin the pulley to check the Poly-V bearings.
9. Disassemble the intermediate shaft assembly and inspect the intermediate shaft for wear.
10. Inspect the Poly-V belt for wear.
11. Contact our Customer Service Department or your local distributor for assistance. Refer to the Appendix for the appropriate phone number.

CONSOLE DIAGNOSTIC TESTS

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 Momentum 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 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], to start the test.



CONSOLE DIAGNOSTIC TESTS

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 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], [ENTER] to start the test.
3. 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 2000 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 2000 RPMs (+/- 200). If the tach signal picked up by the console is less then 1900 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.

CONSOLE DIAGNOSTIC TESTS

Contact Heart Rate Test

The contact heart rate system is made up of the console and the contact heart rate sensor handles. Remember that even when operating properly, the contact Heart Rate system will not work for everyone. If you suspect you have a problem with your system, have someone else try it before performing the following troubleshooting steps:

1. With the console showing "SELECT WORKOUT", place your hands on the sensor handles using a relaxed grip, and remain still. After approximately 10 seconds a flashing ♥ should be displayed on the console, followed by your heart rate in beats per minute. If your heart rate does not appear, continue on to the next step.
2. Verify that the console software has been set up to receive contact heart rate (see heart rate monitoring section of this manual).
3. If the telemetry (Polar®) receiver located in the console is receiving interfering signals, the contact heart rate system may be inhibited. Take your hands off the handle sensors for about 20 seconds and watch the heart display. If it flashes on and off, the telemetry heart rate is picking up interfering signals, and the machine must be moved away from the source of the interference or the telemetry heart rate input must be disabled (see heart rate monitoring section of this manual).
4. Remove the console knobs from the back of the console, lift the console up, and disconnect both the main cable and the small hand grip sensor cable from the console. Use an Ohmmeter to check for continuity between the hand grip sensors and the small cable connector. If the handles are working, each steel sensor should be connected to one wire on the cable connector, with less than 15 ohms showing on the ohmmeter.
5. If possible, replace or exchange your console with a console that you know is working and retest the machine.
6. If the problem still persists, contact the Customer Service Department at 800-331-3578.

Telemetry (Polar®) Heart Rate Test

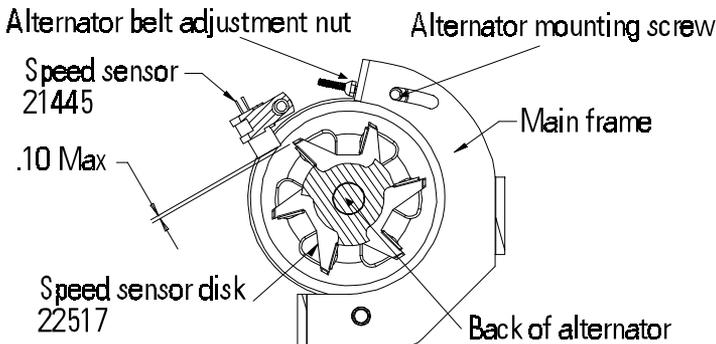
The telemetry heart rate system is made up of the console, the heart rate receiver, and the chest strap (available separately). You can test each component by performing the following steps:

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. External interference caused by nearby televisions, personal CD players, or air conditioners may also inhibit the telemetry heart rate pickup. Move the machine away from interference sources if possible.
6. If possible, replace or exchange your console with a console that you know is working and retest the machine.
7. Visually check that the heart rate receiver is positioned correctly in the neck cover. The heart rate receiver jack should point down. Ensure that the heart rate receiver is connected to the console, and that the connection is not loose. If possible, swap the heart rate receiver with one from a machine that is working.

PARTS REMOVAL AND REPLACEMENT

ALTERNATOR

1. Remove the side covers. Mark (by color) the location of each wire attached to the alternator (see Wire Connections figure). Remove the wires from the alternator.
2. Loosen and remove the alternator mounting screw on the slotted brace.
3. Loosen the alternator adjustment nut and pivot the alternator down to loosen the alternator (poly-v) belt.
4. Remove the forward end of the belt from the poly-v pulley and then extract the back end of the belt from the alternator pulley. You may to twist the belt slightly during removal.
5. Remove the alternator assembly (pn 25815) from the frame. The flywheel is part of the alternator assembly.
6. Reverse the removal procedures to install the new alternator. Be sure to verify the wiring against the Wire Connections Diagram.
7. Pivot the alternator up or down as necessary to allow 1/4" (0.6 cm) of belt deflection with finger tip pressure at the center of the vertical portion of either side of the belt.
8. Tighten the alternator mounting screw and alternator adjustment nut. Verify that the speed sensor is no farther away from the speed sensor disk than .10".



PARTS REMOVAL AND REPLACEMENT

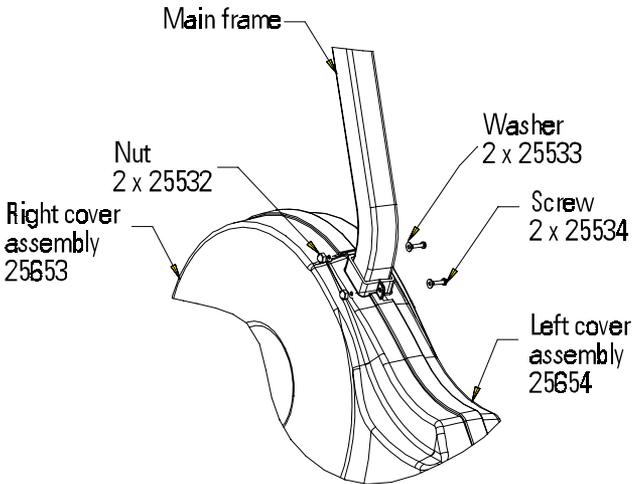
COVERS



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

The Momentum 3400 CE / 3800 RC cycle ergometer is protected by two large side covers.

1. If connected, disconnect the battery charger from the connector located on the back right side cover.
2. Use a phillips screwdriver to remove the screws, washers, and nuts from the side covers by the seat post.



3. The side covers are held in place with seven reusable fasteners. Use the fastener removal tool (included with each machine) to remove the fasteners. Slide either end of the fastener removal tool under the edge of the inner head pin and pull the pin out about halfway. The inner head pin should not be pulled out of its base. Remove the fastener from the cover and set aside.

PARTS REMOVAL AND REPLACEMENT

4. Move the crank to about the eleven o'clock position on the left side to get the left side cover over the crank and off the machine. Once the left cover is off the frame, move the cranks to the one o'clock position on the right side and remove the right cover.
5. To reinstall the cover fasteners, insert the fastener base through the cover and into the frame. When the base is in place, push the head pin in all the way to secure the fastener. If necessary, connect the battery charger to the power connector once the side covers are attached.

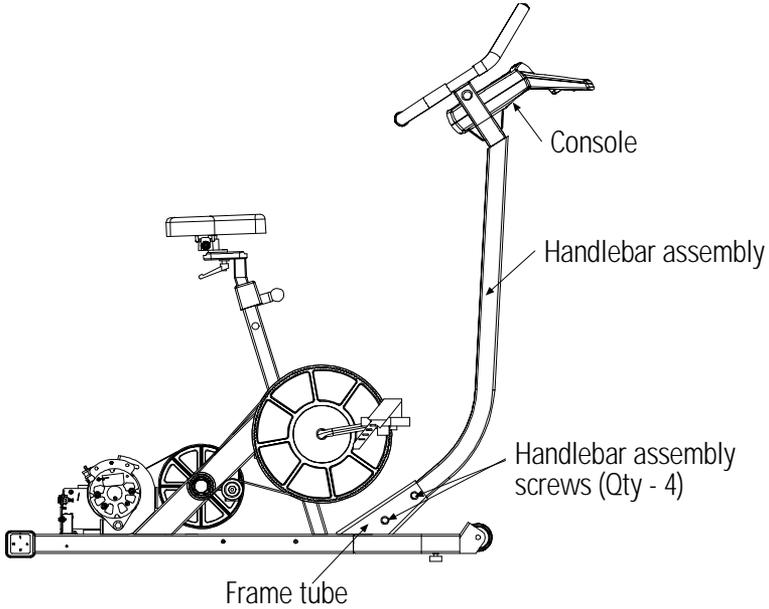
CONSOLE

1. Unscrew the four console mounting knobs from the back of the console.
2. Gently lift the console up a few inches and disconnect the main **cable** and contact heart rate **cables** from the back of the console. Remove the console from the machine.
3. Reverse the steps to reinstall the console.

HANDLEBAR ASSEMBLY (3400 CE)

1. Remove the console.
2. Tilt the machine back and rest it on its seat, upside down. The handle bars should now be in the air and allow easy access to the mounting screws and the main **cable** .
3. Gently pull the main **cable** out from the frame tube. The main **cable** is sectioned into two parts with quick release connectors attached. Disconnect each section of main **cable** to allow removal of handlebars.
4. Loosen and remove the four screws and flat washers from the main frame.
5. Hold onto the handlebars and pull the handlebar assembly out from the main frame.

PARTS REMOVAL AND REPLACEMENT

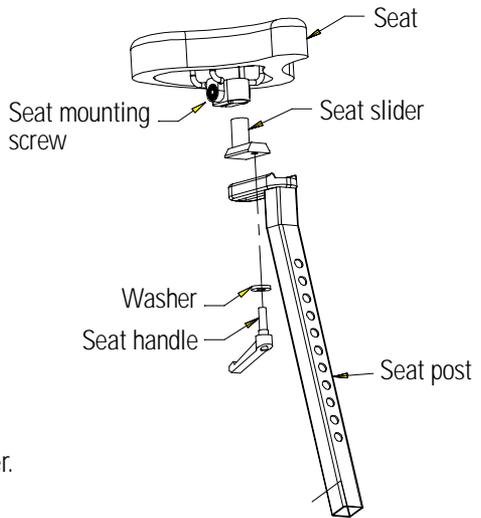


6. Reinstall in the reverse order.

SEAT

3300 CE

1. Rotate the seat handle counter clockwise and remove the seat handle and washer from the seat slider.
2. Loosen the seat mounting screw and separate the seat from the seat slider.
3. Reinstall in the reverse order.





PARTS REMOVAL AND REPLACEMENT

3900 RC

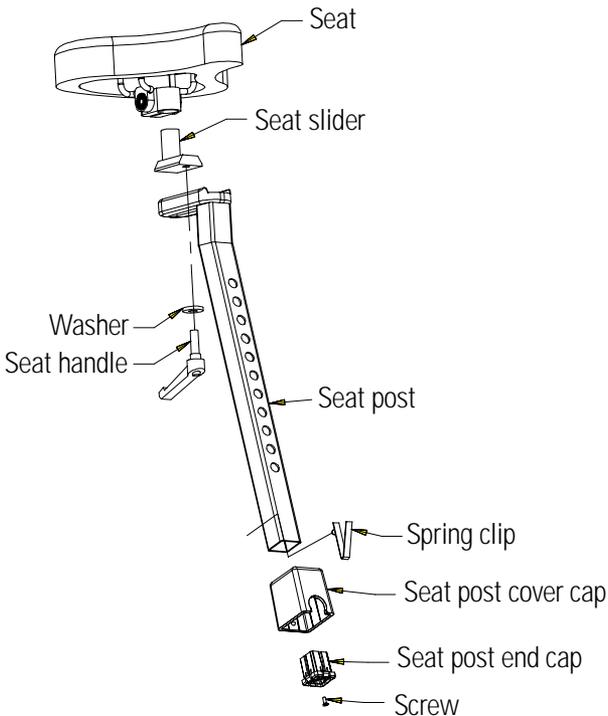
The seat pads can be removed while the seat is in the seat track. Pop off the finishing cap with a flat blade screwdriver, and then loosen and remove the four mounting bolts from each seat pad and lift the pad free. To remove the seat from the seat track:

1. Loosen and remove the nyloc nut and flat washer from the rear of the seat track. Remove the bolt.
2. Remove the seat track cover.
3. Lift the seat adjustment handle and slide the seat to the rear and off the track.
4. To reinstall the seat, line up the front guide wheels with the seat track. Carefully slide the seat forward while holding up on the seat adjustment handle until all six wheels are in the seat track.
5. Verify proper operation of the seat adjustment handle before installing the seat track cover.
6. Install the bolt through the seat track and track cover. Install and securely tighten the flat washer and the nyloc nut.
7. The seat track play can be adjusted by loosening the nut on both center wheels of the seat assembly while using a standard screwdriver to turn the bolt. Ideally, the seat should slide easily without excessive side play. Tighten the nuts after the wheels are adjusted.

PARTS REMOVAL AND REPLACEMENT

SEAT POST (3400 CE)

1. Unsnap the seat post cover cap from the frame by pulling up on the bottom edges of the cover cap. Allow the seat post cover cap to rest freely on the seat post.
2. Rotate the seat handle counterclockwise to until it is unthreaded from the seat.
3. Remove the seat and seat slider from the seat post.
4. Pull the seat adjustment knob out, lift the seat post up, and remove the seat post from the frame.
5. Reverse the steps to reinstall the seat post in the frame.



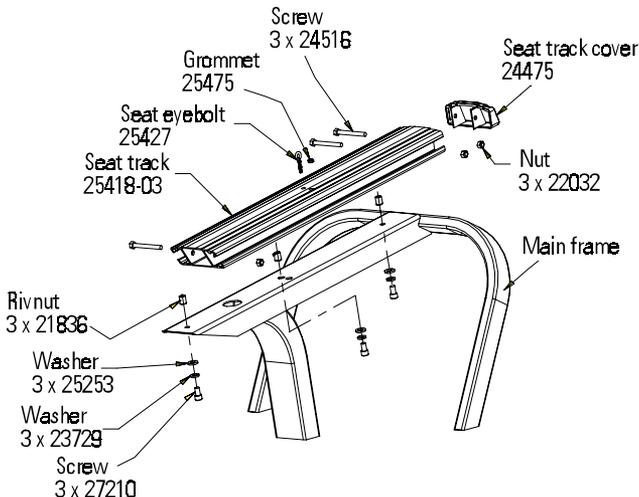
PARTS REMOVAL AND REPLACEMENT

SEAT HANDLE (3400 CE)

1. Rotate the seat handle counterclockwise until it is unthreaded from the seat. Remove the seat handle and washer from the seat slider.
2. On the replacement handle, apply a thin layer of grease on the threads from half way to the end of the threads. Install the washer on the handle and thread the new handle halfway into the seat. Position the seat in the desired location. Rotate the handle clockwise to secure the seat.
3. Ensure that the handle does not stick out to the right or left. The handle is spring loaded so that you can properly align the frame and the handle. Simply pull out on the handle and rotate it for correct alignment.

SEAT TRACK (3800 RC)

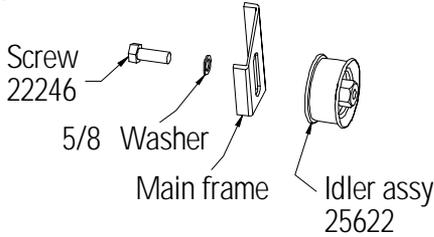
1. Remove the side covers and remove the seat assembly from the seat track.
2. Using a 5/16" allen wrench, loosen and remove the three screws and six washers that fasten the seat track to the main frame. Remove the seat track from the frame. Reverse the steps to reinstall the seat track.



PARTS REMOVAL AND REPLACEMENT

HIGH TORQUE DRIVE (HTD) BELT

1. Remove both side covers.
2. Loosen the idler assembly screw and slide the pulley down, loosening the belt.



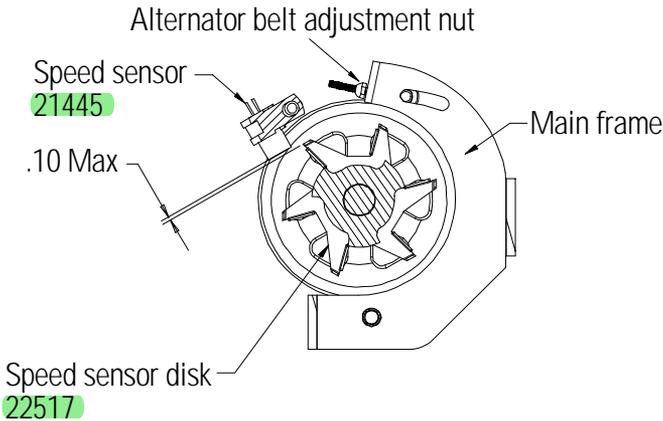
3. Pull the belt off the large HTD sprocket slide it over the right crank arm. Remove the belt from the small HTD sprocket.
4. Reverse the steps to install the belt.
5. Check the tension in the drive belt.
6. To adjust the belt tension, slide the idler pulley up or down as necessary. Tighten the idler assembly nut and recheck the belt tension. Readjust the belt tension if necessary.
7. Reinstall the covers.

POLY-V BELT

1. Loosen the alternator adjustment nut and the alternator mounting screw. Pivot the alternator down to loosen the poly-v belt.
2. Remove the forward end of the belt from the poly-v pulley and then extract the back end of the belt from the alternator pulley. You may twist the belt slightly during removal.
3. Center the new belt on the two pulleys and pivot the alternator up as necessary to allow .25" (0.6 cm) of belt deflection with fingertip pressure at the center of the vertical portion of either side of the belt.

PARTS REMOVAL AND REPLACEMENT

4. Tighten the alternator mounting screw and alternator adjustment nut. Verify .25" (0.6 cm) of play in the belt and .10" gap between speed sensor and the speed sensor disk.

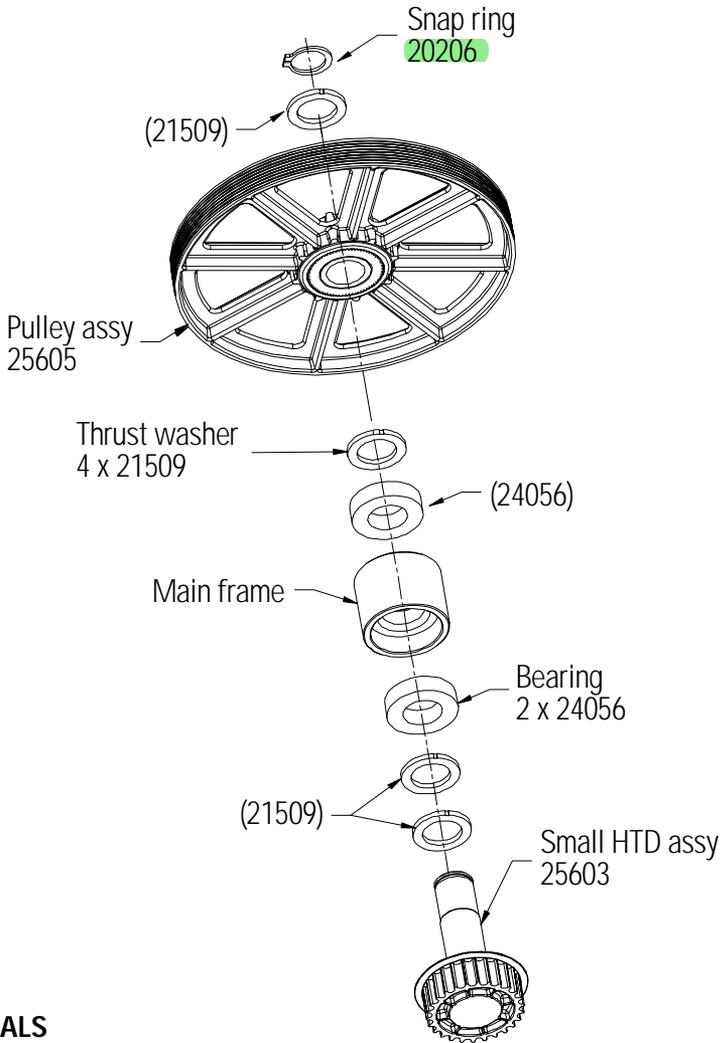


INTERMEDIATE POLY-V PULLEY ASSEMBLY

1. Remove the side covers.
2. Remove the poly-v belt and then the HTD belt.
3. Remove the snap ring from the small HTD assembly shaft. Remove the poly-v pulley and two thrust washers from the small HTD assembly shaft.
4. Inspect the poly-v pulley bearings for smoothness of operation. Replace the poly-v pulley necessary.
5. From the right side, rotate and pull the small HTD assembly shaft out from the main frame. Remove the two thrust washers from the shaft. Inspect the shaft for signs of wear or scoring. Replace the small HTD assembly shaft if it is excessively worn.
6. Inspect the bearings in the main frame for signs of wear and damage. Replace a damaged bearing.

PARTS REMOVAL AND REPLACEMENT

7. Reverse the steps to reinstall the parts.



PEDALS

1. Use a 15-mm pedal wrench or a 5/8" open end wrench to loosen and remove the pedals from the crank.
2. The pedal on the left side of the crank has reverse threads. Turn the wrench on the left pedal clockwise to loosen it. Turn the wrench on the right pedal clockwise to tighten it.



PARTS REMOVAL AND REPLACEMENT

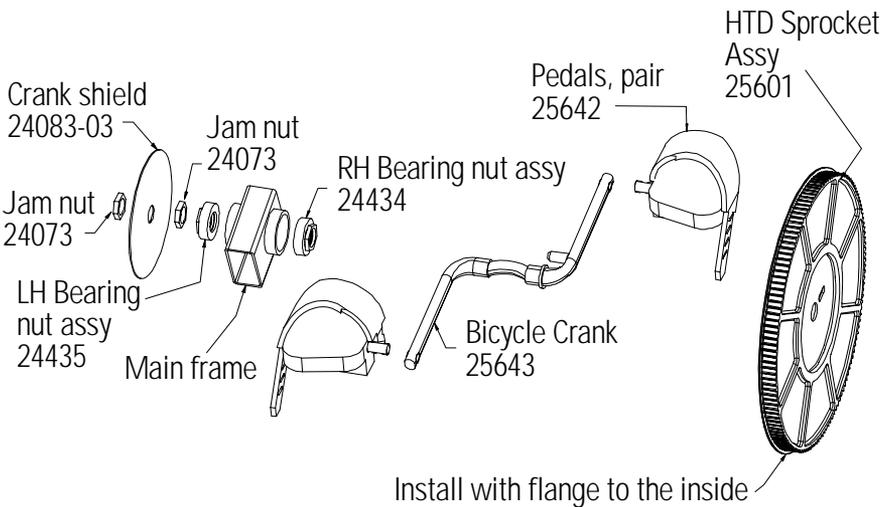
3. Apply a small amount of multi-purpose grease to the threads of the pedal spindle before reinstalling the pedals on the crank.

CRANK AND BOTTOM BRACKET ASSEMBLY

1. Remove the side covers.
2. Remove the HTD belt.
3. Remove the left pedal.
4. Loosen and remove the bottom bracket jam nut located on the left side of the crank. This nut has reverse threads; loosen it by turning it clockwise.
5. Remove the round, metal crank shield and the spacer from the left side of the crank.
6. The left bearing nut assembly can be removed from the crank with a 15-mm cone wrench. This nut has reverse threads; loosen and remove it by turning it clockwise.
7. Slide the crank out of the frame to the right.
8. The right bearing nut assembly can be removed from the crank with a 32-mm cone wrench.
9. Inspect the bearings for smoothness of operation. Replace the bearings if necessary.
10. Ensure that the right bearing nut assembly is tight against the large HTD pulley before reinstalling the crank into the frame. The outside edge of the bearing nut assembly should be flush with edge of the main frame (bottom bracket) when the crank is installed.
11. Install the left bearing nut assembly onto the crank and tighten it so the outside edge of the bearing nut assembly is flush with the bottom bracket. Do not overtighten the nut; the crank should spin freely.

PARTS REMOVAL AND REPLACEMENT

13. Install the round, metal crank shield, the jam nut and the pedal onto the left side of the crank. Remember, the jam nut and the pedal have reverse threads (tighten them in the counterclockwise direction).
14. Adjust the side play in the crank by tightening or loosening the left side bearing nut with a 32-mm cone wrench. The crank should spin freely without binding. When the crank is properly adjusted, hold the left side bearing nut with the cone wrench and tighten the jam nut securely. Recheck the crank adjustment after tightening the jam nut.
16. Install the belt and test that the machine functions properly.
17. Reinstall the side covers.



GROUNDING INSTRUCTIONS

The StairMaster® Momentum systems cycle ergometer must be grounded. If it should malfunction or break down, grounding provides the path of least resistance for the electric current, thereby reducing the risk of electric shock. This machine is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.



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

The Momentum systems cycle ergometer is designed for use on a nominal 120-volt circuit, and has a grounding plug that looks like the plug illustrated below. No adapter should be used with this product.

* This may vary for International power supplies.

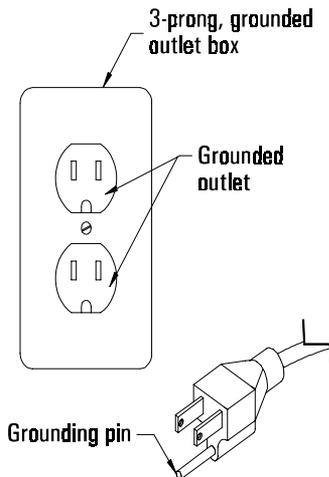


Figure 7: Grounding System

NOTICE OF FCC COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference 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 établies 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

BATTERY RECYCLING CENTERS

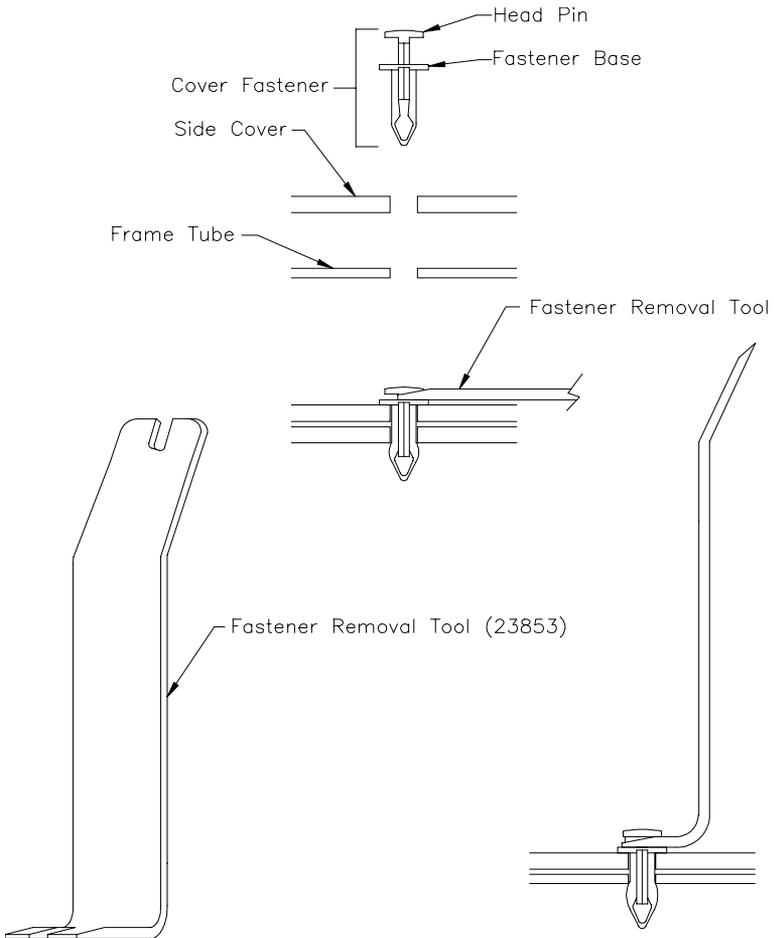
After installing a new battery, you will need to properly dispose of (recycle) your old lead-acid battery. Most federal and state regulations require lead-acid batteries be recycled. Do not throw away old batteries. Lead is a heavy metal and is toxic to living organisms. Contact the nearest Yuasa-Exide, Inc. recycling center from the list below to get information on the proper disposal of your old lead-acid battery.

STATE	ADDRESS	PHONE NUMBER
Alabama	906 40th St. Birmingham, AL 35222	(205) 591-0606
California, Northern	3470 Depot Rd. Hayward, CA 94545	(510) 887-8080
California, Southern	1250 Bixby Dr. City of Industry, CA 91745	(818) 333-3060
Colorado	12860 W. Cedar Dr. Suite 106A Lakewood, CO 80228	(303) 763-5833
Florida	11310 Satellite Blvd. Orlando, FL 32821	(407) 857-9234
Georgia	1721-C Oakbrook Dr. NE Norcross, GA 30093	(404) 446-8663
Illinois	5303 Ninth Ave Countryside, IL 60525	(708) 352-3665
Maryland	899 Airport Rd. Ste E Glen Burnie, MD 21061	(410) 768-5586
Massachusetts	13 Wheeling Ave. Woburn, MA 01801	(617) 932-6570
Michigan, Southeast	2760 Auburn Rd. Auburn Hills, MI 48326	
Michigan, West	2882 Remico St. SW Grandville, MI 49418	(616) 531-1120
Minnesota	1900 Oakcrest Ave. Ste 5 Roseville, MN 55113	(612) 631-2150
Missouri	5328 Winner Rd. Kansas City, MO 64127	(816) 231-1414 (816) 231-0685
New Hampshire	17 Clinton Dr. Hollis, NH 03049	(603) 886-5900

BATTERY RECYCLING CENTERS

STATE	ADDRESS	PHONE NUMBER
New Jersey	131 Industrial Ave. Hasbrouck Hgts., NJ 07604	(201) 641-5900
New York	26 Corporate Circle E. Syracuse, NY 13057	(315) 437-1788
Ohio, Central	Rickenbacker ANG Bldg. 1073 Columbus, OH 43217	(513) 851-3838
Ohio, North	2635 Hamilton Ave. Cleveland, OH 44114	(216) 241-6231
Ohio, Southwest	540 Northland Blvd. Cincinnati, OH 45240	(216) 241-6231
Pennsylvania, East	3000 Montrose Ave. Laureldale, PA 19605	(215) 921-4480
Pennsylvania, East	320 Constance Dr. Warminster, PA 18974	(215) 443-0912
Pennsylvania, West	920 Vista Park Rd. Pittsburgh, PA 15205	(412) 788-1613
Tennessee	3356 Democrat Rd. Memphis, TN 38118	(901) 365-6944
Texas, Northeast	11420 Ferrell Dr. Ste 300 Dallas, TX 75234	(214) 869-1855
Texas, South	4738 Cotton Belt San Antonio, TX 78219	(210) 661-5497
Texas, Southeast	4301 S. Pinemont Ste 114 Houston, TX 77041	(713) 690-8700
Washington	660 Industry Dr. Tukwila, WA 98188	(425) 575-3090
West Virginia	P.O. Box 1666 Rte. 2, Box 1 Bluefield, WV 24701	(304) 327-3594

Figure 8: Cover Fasteners



FIGURES

Figure 9: Cover Fastener Locations, 3400 CE

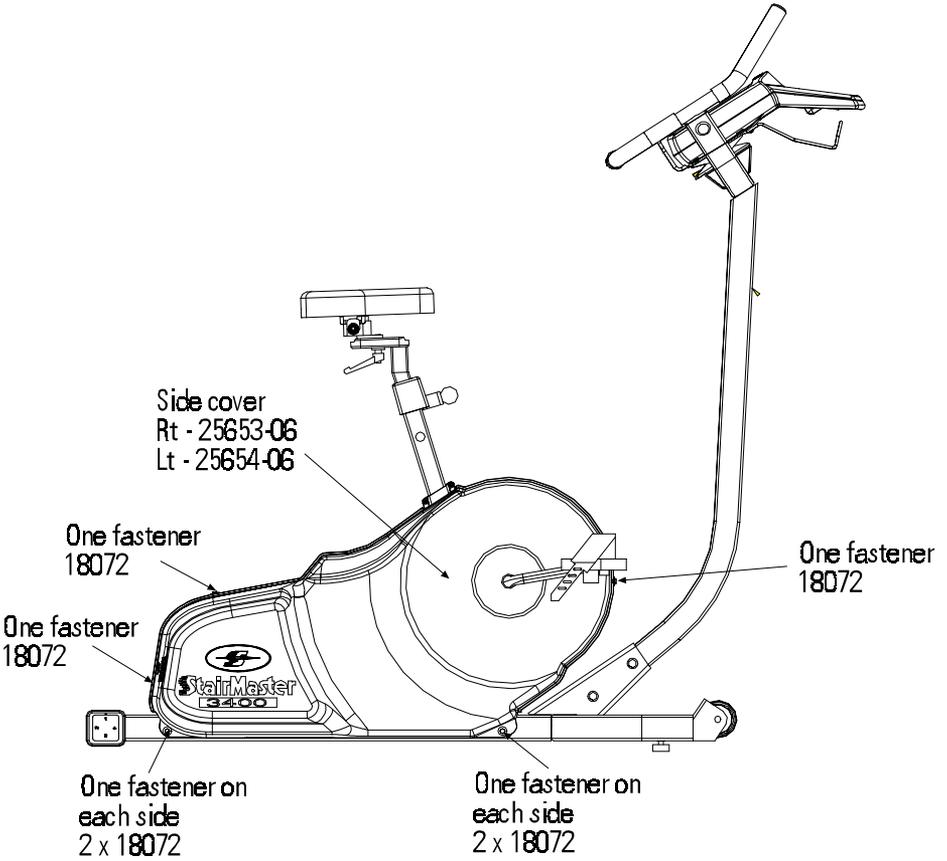
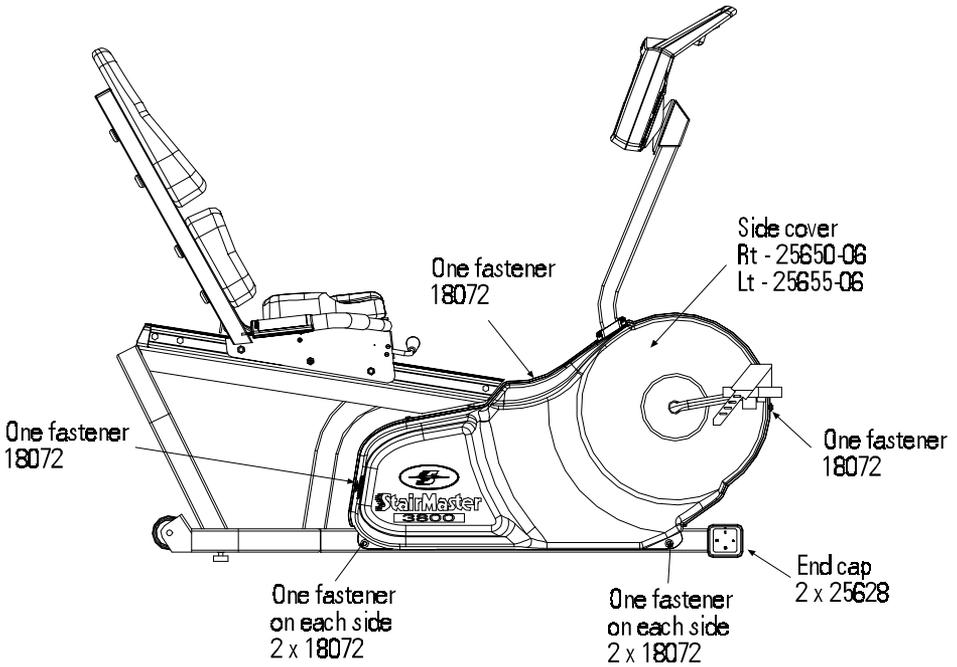


Figure 10: Cover Fastener Location, 3800 RC



FIGURES

Figure 11: Right Side View, 3400 CE

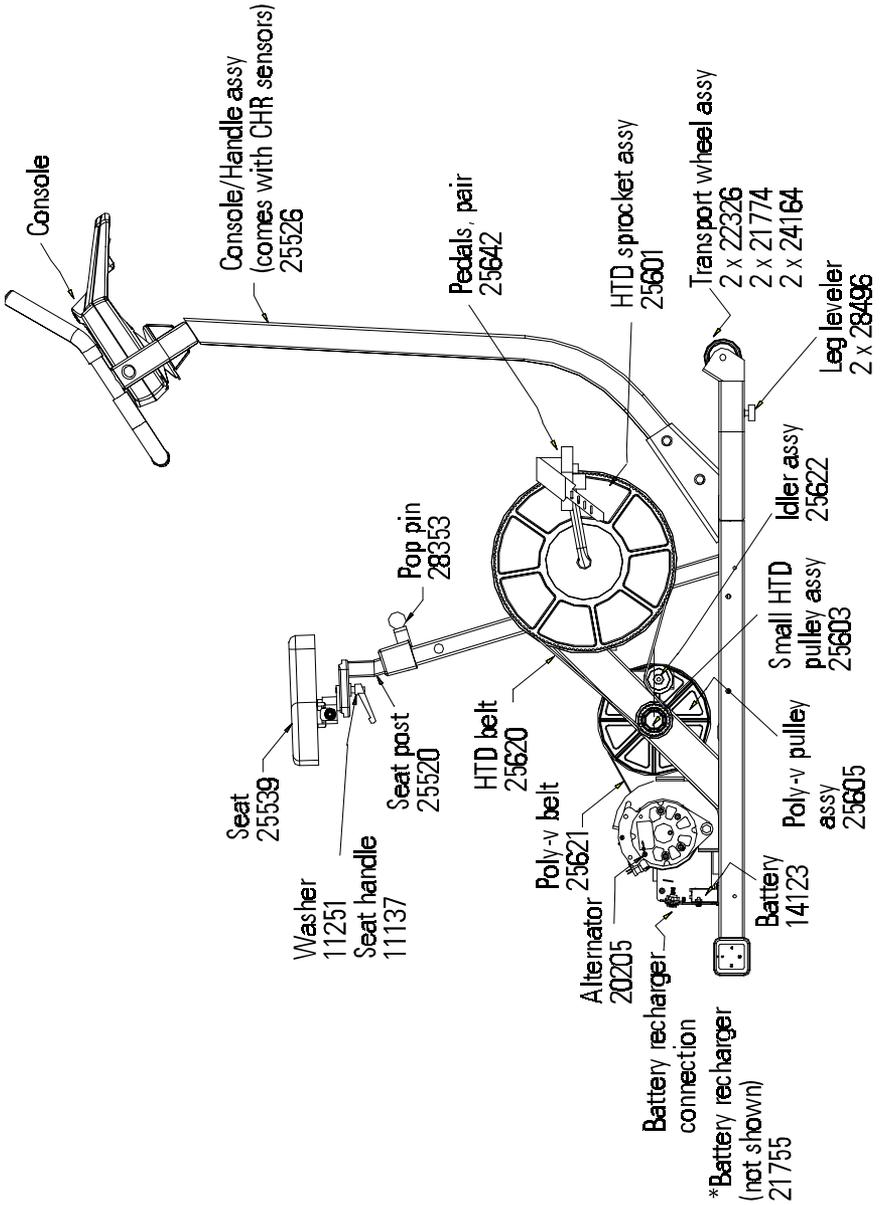
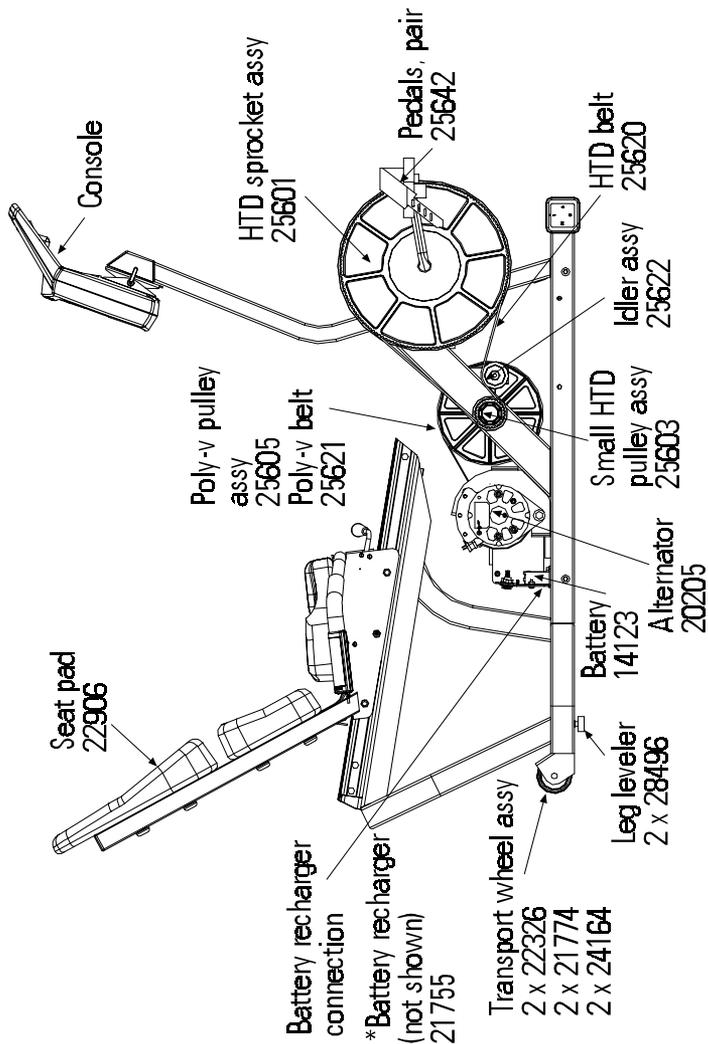


Figure 12: Right Side View, 3800 RC



FIGURES

Figure 13: Seat Post Assembly, 3400 CE

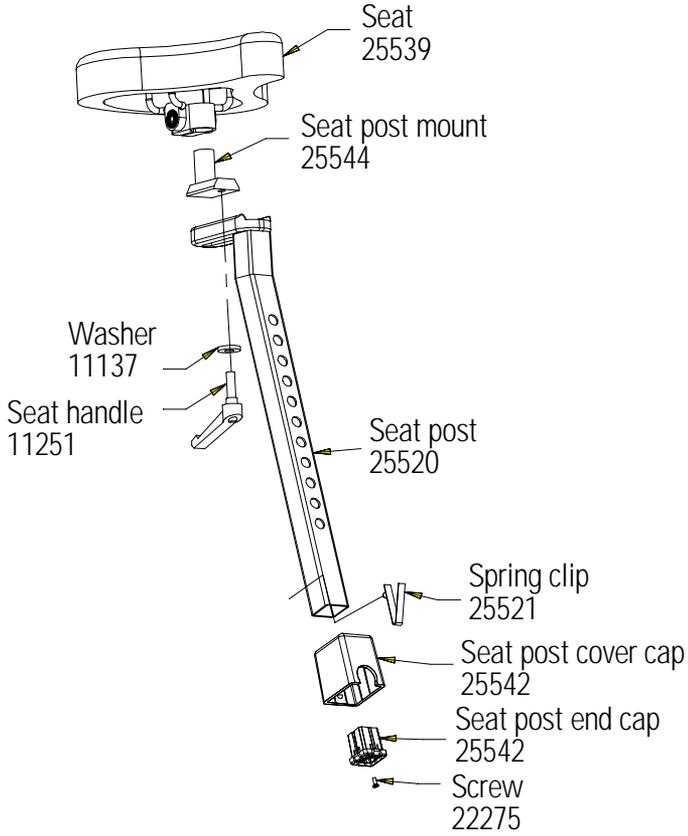
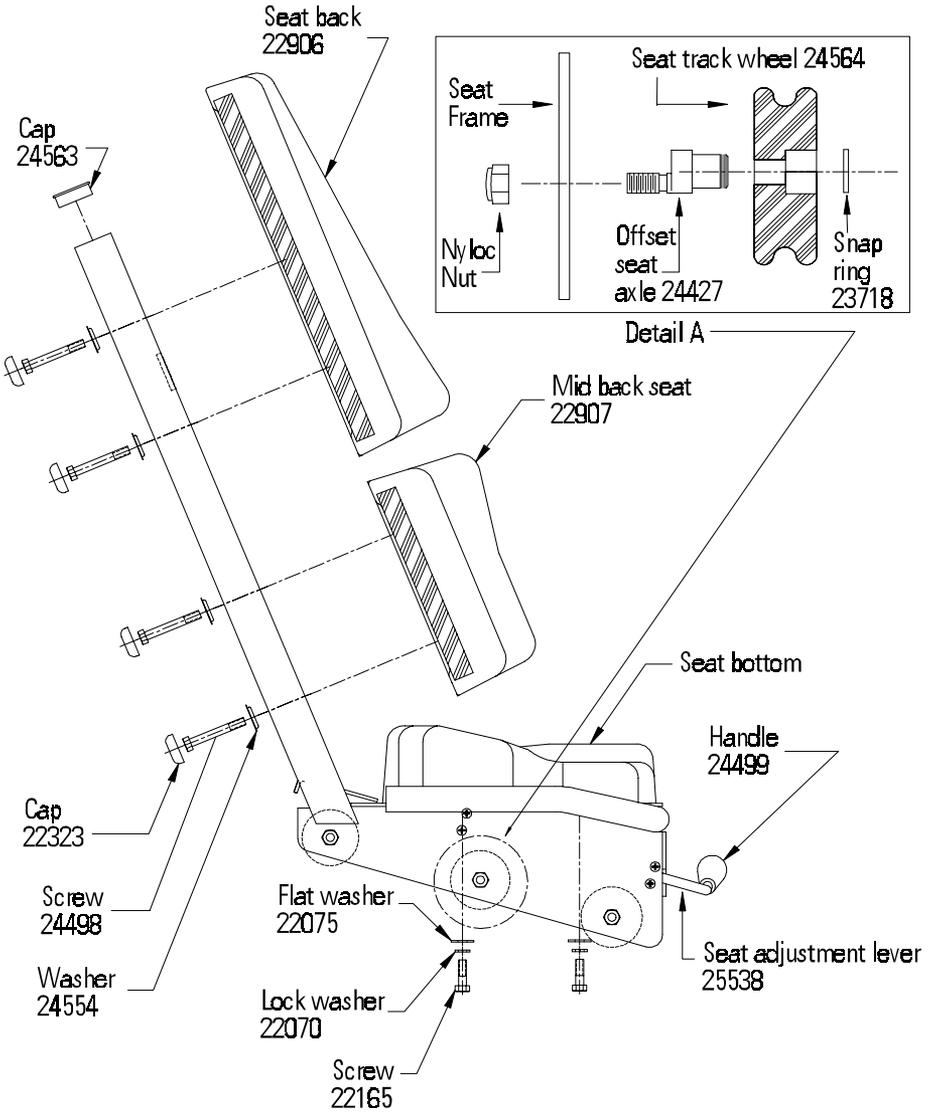


Figure 14: Seat Assembly, 3800 RC



FIGURES

Figure 15: Seat Track Assembly, 3800 RC

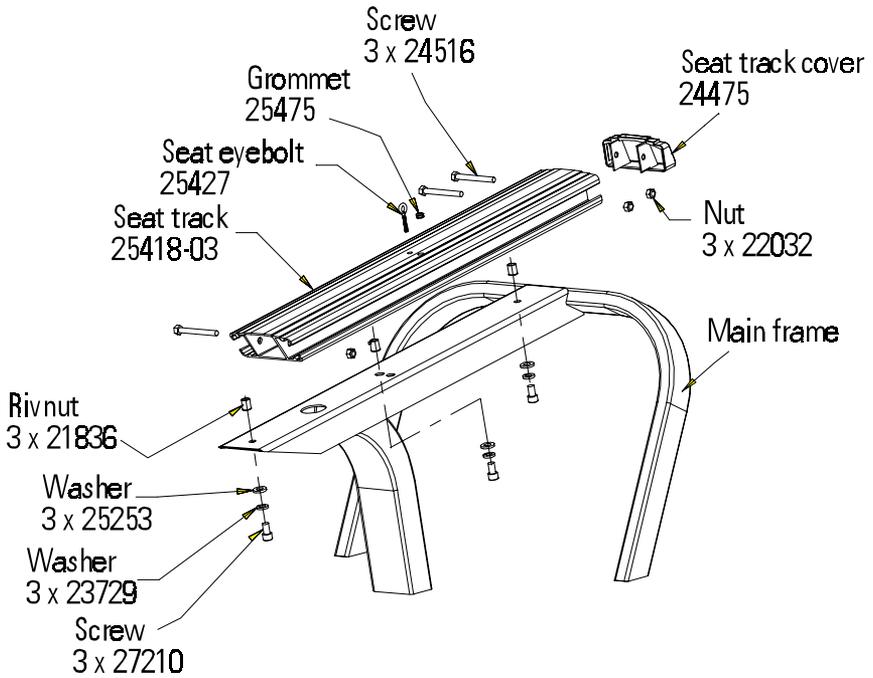
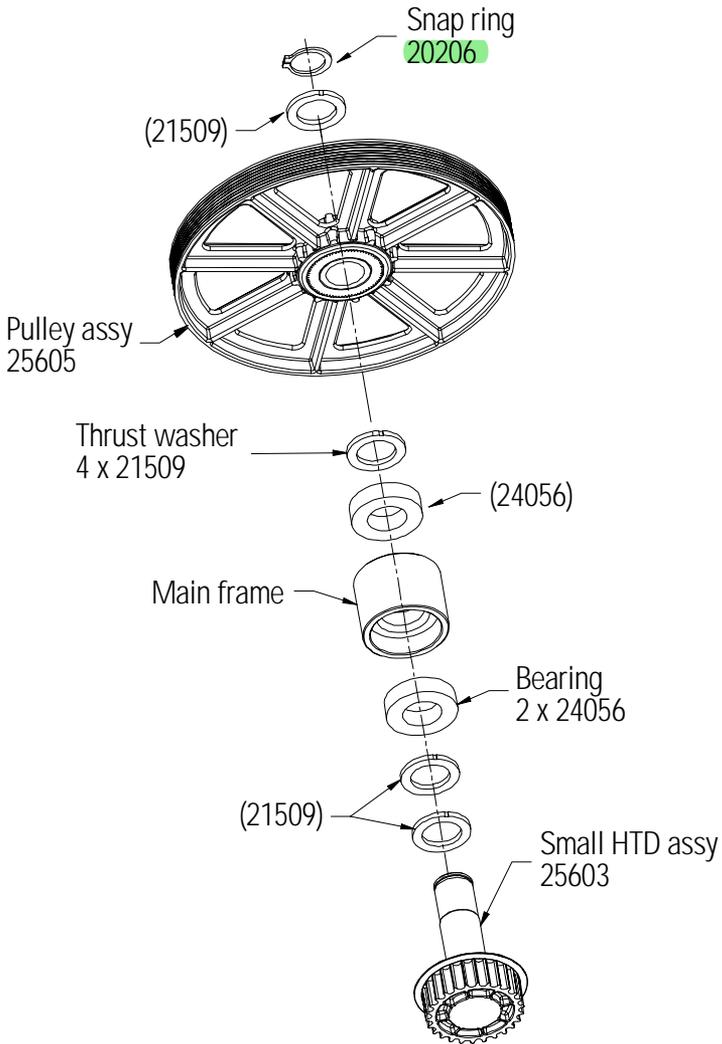


Figure 16: Intermediate Poly-V Assembly



FIGURES

Figure 17: Crank Assembly

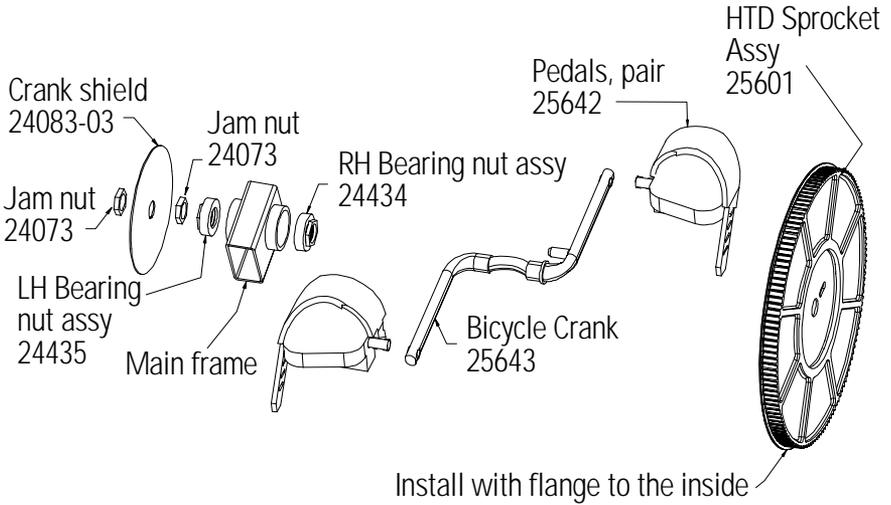
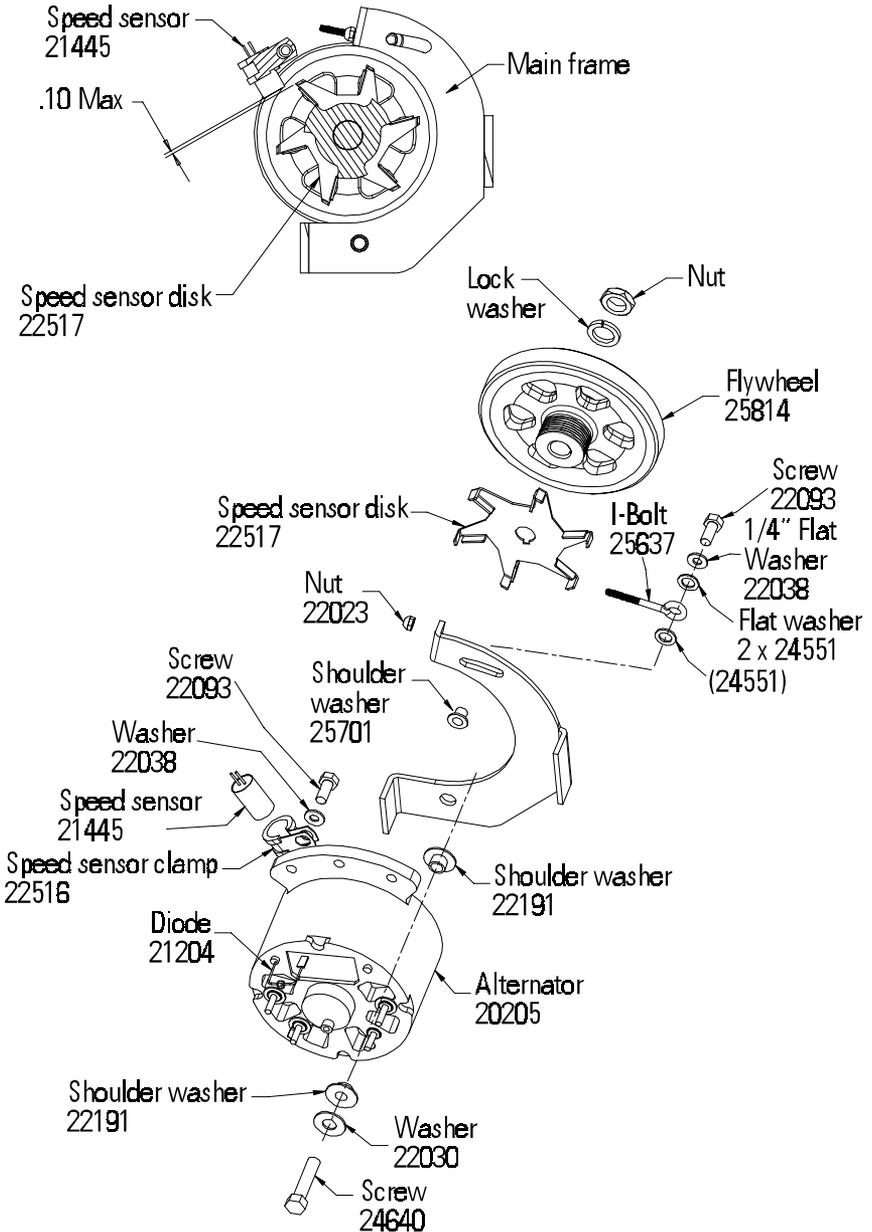


Figure 18: Alternator/Flywheel Assembly



FIGURES

Figure 19: Wire Connections

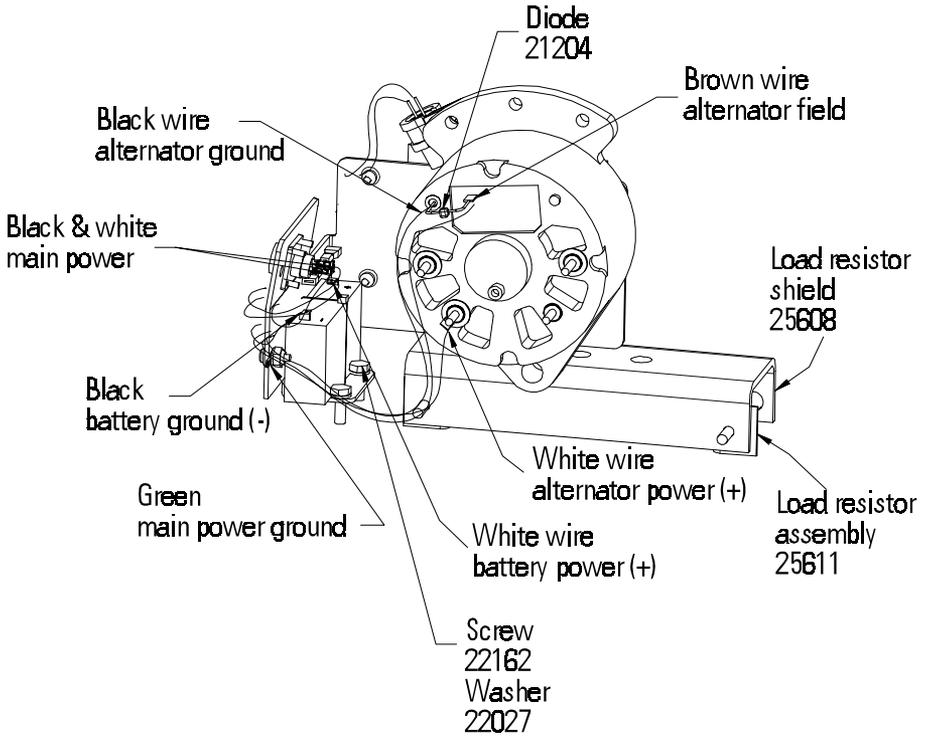
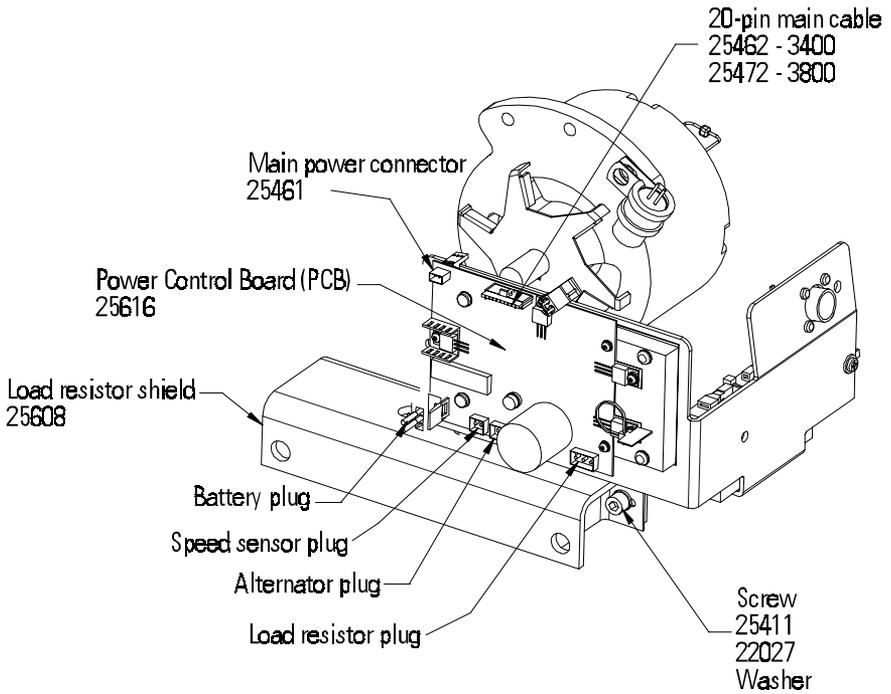


Figure 20: Power Control Board Plug Ins



FIGURES

Figure 21: Wiring Diagram

