# StairMaster gauntlet

## OWNER'S MANUAL

StairMaster
THE WORKOUT OF YOUR LIFE

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## CONGRATULATIONS...

You have purchased the finest and most innovative exercise machine available. It is designed to be durable and provide unequaled physical development. Please read this manual thoroughly, it provides you with very important information on operation and service and should be required reading for anyone responsible for operation or maintenance of the machine. Thank you for choosing the Gauntlet, you will find it to be a most popular and beneficial addition.

## SPECIFICATIONS

All specifications are for a fully assembled Gauntlet.

Physical:

| | |
|---|---|
| Length | 51.0 inches |
| Width | 32.0 inches |
| Height | 79.5 inches |
| Weight | 391 pounds |

Electrical:

| | |
|---|---|
| Voltage | 110 VAC |
| Current | 0.5 amps |
| Power Consumption | 55watts |
| Frequency | 50/60 Hz |

The wall plug-in power supply provides 12 VDC at 2.5 amps to power the console. The low voltage eliminates the danger of electrical shock as long as the power supply is located away from the machine and not exposed to perspiration. Custom length DC cables, brackets for multiple power supplies, and other options are available from StairMaster.

## INSTALLATION

The Gauntlet unit comes fully assembled, pre-lubricated and ready for use.

**DOOR WIDTHS:** The Gauntlet is designed to pass through a minimum width door of 32". If a door is somewhat less than 32", it may be necessary to remove the handrails to provide adequate clearance. This is a difficult procedure and should not be done unless absolutely necessary. (If necessary, first consult a factory service representative).

**CEILING HEIGHT:** 8 1/2' to 9' is needed for proper use of the Gauntlet.

**WHEELS:** Temporary wheels are already installed in the center of gravity position. Balance the unit on the wheels and move slowly to the desired location. The wheels must now be removed. To do so, tilt the unit forward until the wheels are slightly off the floor, remove the pin located just right of center axle by grasping and pulling outward. Grasp each wheel and collapse axle inward, remove wheel assembly from both right and left sides of support legs. Store wheel assembly for future use.

**LEVELING:** Only the rear casters are adjustable. Adjust both casters in as far as possible, then back out as necessary to obtain a level position.

# PROPER CLIMBING TECHNIQUES

This chapter precedes the introduction because development of a satisfactory climbing technique is of absolute importance.

- Never pull or push on the handrails. Pulling on the handrails will increase the work being done by the user resulting in a calorie count lower than the actual work that was performed and can cause premature wear of machine components. On the other hand pushing on the handrails will cause the calorie count to indicate higher than actual. Caution, beginning users may have a tendency to support their weight on the handrails instead of keeping up with the machine. The handrails are intended to stabilize users, not to support them.
- While climbing on the machine, stand straight and relax as much as possible.
- Climb fast enough to stay in the middle of the staircase.

# INTRODUCTION

The StairMaster Gauntlet is a vertical climbing machine providing an aerobic workout equivalent to climbing stairs, without the inertia loads and skeletal trauma which may be associated with some aerobic activities including conventional stair climbing. The machine is computer controlled to offer automated timed workouts from five minutes to forty-five minutes as selected by the owner. There are eight preprogrammed workouts available with ten levels each. In addition there is a manual workout so the user may pace himself or experiment with the various speeds. There are also ten user programmable workouts which are addressed with the special features. All programs feature computer controlled speeds from 4 METs to 17 METs (approximately 26 steps/minute to 138 steps/minute). The computer displays calories burned, average MET rate, floors climbed, and equivalent miles at the conclusion of the exercise. The user should familiarize himself with the warnings, and at least the functions of the computer overlay and display area before attempting an exercise. It is also recommended that the first time user start with a manual exercise to develop a climbing technique (see Section on Proper Climbing Technique) and become familiar with the electronics. Many special features are included in the Gauntlet such as the exciting Roller Coaster Program, three color display, Run/Stop safety switch conveniently located on right handrail,molded step tread is replaceable without gluing, inverted hinges on steps for better appearance and reduced corrosion, and alternator load eliminates brake adjustments. The following is an explanation of terms used throughout this manual.

CALORIES... The calorie summary at the end of the exercise displays the total number of calories burned. Accurate calorie calculations are difficult because of such variables as post exercise metabolic influence etc. In our attempt to be as precise as possible with this calculation, you may find the Gauntlet calorie calculation to be conservative when compared to the occasional exaggerated calorie calculations of other equipment.

- MET... 1 MET equals the amount of oxygen you consume at rest. The displayed MET is the multiple of the resting MET. Example... If you are exercising at 8 METs, you are using eight times the amount of oxygen you would at rest. To

be precise, one MET equals 3.5 milliliters of oxygen per kilogram of body weight per minute.

- AVERAGE MET... The value obtained by averaging the MET rates of all 30 exercise intervals including the warm up and cool down.

- FLOORS... Since step height on the Gauntlet is variable, the calculation of floors is based on total work performed and expressed as one floor equaling the amount of work required to climb 16 eight inch steps or 10.2 feet.

- MILES... 1 mile is equivalent to 48 floors climbed. This calculation is based on standard work equivalents.

All Gauntlet calculations are directly equivalent to other StairMaster products.

## WARNINGS

Anyone not accustomed to serious exercise should always consult a doctor before using any exercise device including Gauntlet.

Definitely do not allow anyone with a history of heart trouble or high blood pressure to use Gauntlet except by doctor's prescription or consent.

Be cautious of overweight people using Gauntlet for the first time even though they may have no history of physical difficulty, they may assume it to be far less difficult than it is, resulting in over exertion.

When using Gauntlet for the first time one should remain in the lower speeds until confident before trying the faster speed selections.

Speed and duration of exercise should always be subject to how a person feels, apparent heart rate or any other external influence should never over ride one's own judgement when exercising on the Gauntlet.

Do not use, adjust, or operate StairMaster exercise equipment without proper instruction by owner authorized personnel.

Persons wearing eyeglasses may have more difficulty getting used to the machine and should be given extra attention until familiar with the Gauntlet.

Do not allow small children to play unattended near the Gauntlet, especially near the moving staircase. Serious injury could result from an infant or small child's fascination with the moving components of the exercise machine.

Never exercise alone if infants or small children are around, it is difficult to observe children's actions from the exercise position.

Keep hands and feet away from moving parts while machine is in use. Never attempt to repair or adjust machine while in use.

Do not operate equipment with loose or damaged parts. Notify owner or authorized personnel of any problems with equipment.

Although the equipment manufactured by our company has been thoroughly inspected prior to shipment, proper installation and regular maintenance are required for safety. Maintenance of the exercise equipment is the responsibility of the equipment owner and not of StairMaster or its distributors.

StairMaster recommends before initiating any exercise program, that the user obtain a complete physical examination from a medical doctor, and enlist the aid of the doctor in developing an exercise program suitable for user's current health status.

Failure to comply with these instructions may result in personal injury.

## BENEFITS

1. MET and other data electronically computed by precise formulas based on the classic work formula of weight and distance. No other ergometric device so accurately employs this physical equation for the purpose of expressing work and associated physiological projections. (All formulas confirmed accurate by several independent studies).

2. When desired, the Gauntlet can produce the quickest rise in heart rate and vo/2 of any device, yet its wide range of speeds can accommodate the infirm or poorly conditioned with equal ease.

3. MET levels are directly proportional to speed since work output is weight dependent, MET levels remain the same for anyone regardless of body weight at a given speed. On Gauntlet, MET levels range from 4-17 METs. This feature allows direct comparison, when desired, between individuals of similar demographics but with different weights, when tested under identical speed conditions, such as athletic teams, military recruits, etc.

4. The Gauntlet never needs calibration since the resistance is body weight, not frictional devices which will wear out. Speed is computer checked 100's of times per second, so calculations are constantly updated and always accurate.

5. Due to the large muscle mass used when exercising on the Gauntlet, it is possible for subjects to reach met levels impossible or impractical to achieve on other equipment.

6. There are no inertia or shock loads to stress joints, ligaments or muscles as is the case with other popular forms of exercise.

7. There are no weight limits on Gauntlet. It has been operationally tested at weight loads exceeding 500 lbs.

8. No RF interference is generated by the mechanics of the Gauntlet because there are no electrical motors. The stair case is powered by body weight and speed controlled by an electromechanical braking system.

## COMPUTER BASICS

The purpose of the computer console is to provide automation of the workout and a "friendly" method for obtaining necessary data and displaying workout results. Before your initial exercise on the Gauntlet, it is a good idea to become familiar with the computer console and its operation. There are three areas of the console which provide the user interface to the system; the keypad which allows data entry and program selection, the display area which provides information to the user either by charting workout progress or providing written questions and statements, and lastly the interval timer which displays time remaining in the current exercise interval.

The computer console has four operational modes:

### 1. Attract Mode

This is the machine's idle time and is characterized by either the simulated EKG or a scrolling message in the display area. Pressing the reset button from any other mode will return the computer to the attract mode as will allowing the timer to time-out in a rest or when answering a question.

## 2. Data Entry

This is the phase of the program where the user must input information the computer needs to control speed and accurately calculate statistics. This mode is entered only from the attract mode by pressing reset or by stepping on one of the steps. The first question asked is "ENTER WEIGHT". To respond simply press the appropriate numbers on the keypad followed by [ENTER]. The range for weight is 1 to 999 pounds. This is used to calculate the calories burned during the exercise. The next question is "SELECT PROGRAM". There are nine exercise programs to chose from in the top three rows of the keypad. The outlines on the keys correspond to the relative speed levels of the particular program. If manual is selected,the computer has completed the data entry, if not, then it will prompt with "ENTER LEVEL" and wait for an entry between 1 and 10 with 1 being the easiest workout.

## 3. Exercise

The exercise portion of the program will always follow the data entry. The exercise will start with a prompt which rotates through "START EXERCISE", length of workout, and an outline of the workout unless its "Roller Coaster" or "manual". Once the steps start moving the prompt disappears and the workout is displayed. The program will be held at this point until the Run/Stop button is pressed. The workout is divided into 30 intervals, each one lasting 30 seconds (assuming a 15 minute workout, otherwise they will represent 1/30th of the actual workout). The flashing column is the current interval and the interval timer shows time remaining in that interval. The speed is represented by the height of the column of dots, the bottom dot represents a 4 MET speed and all the dots of a column represent a 17 MET speed. The MET equivalent for each row of dots is shown on the left hand side of the display area. The exercise will allow a single rest period of two minutes. If the rest period expires or a second rest is attempted the computer will revert to the attract mode and the summary data will be lost. The staircase may be slowed to a near stop at any time by pressing the Run/Stop button on the right handrail.

## 4. Exercise Summary and Goal Complete

The exercise summary is automatically displayed after the last interval is completed. The summary will display calories burned, average MET rate, floors climbed and equivalent miles. Each new display is accompanied by a ringing sound to alert the user to the new display. Following the summary is a goal complete message or the jackpot display depending on the owner selected option. The computer will return to the attract mode after completing the summary and goal complete.

# OPERATION

Before operating the machine, verify power is available to the machine by observing either the simulated EKG or scrolling message in the display area. Be sure to read the earlier section on proper climbing technique and remember the basics. Relax, stand up straight and keep up with the machine.

The staircase will continue moving slowly until programing is completed and the Run/Stop Button on the right handrail is pressed.

To initiate a program, start by stepping up onto the steps. They will start to fall slowly under your weight.. Spend a few seconds here getting used to the feel of the machine and get used to not pushing or pulling on the handrails.

Observe the display area with the message "ENTER WEIGHT" with an arrow pointing to the numeric keypad. Enter your weight on the keypad and press the enter key when it is correct. Entry errors may be erased by pressing the clear key.

The display area should now be prompting with "SELECT PROGRAM" and an arrow pointing towards the top three rows of the keypad. To familiarize yourself with the machine, selected the manual program.

Upon pressing the Run/Stop button, the steps move faster than before and you are now exercising at four METs. As you become comfortable on the machine try using the up and down arrows to adjust your speed (manual is the only program which allows speed changes with the arrow keys). The column flashing shows which interval is active and everything to the left of it shows a history of the completed intervals. If a preprogrammed workout had been selected, all intervals would be shown and the columns to the right of the flashing one would show the user what to expect. Continue through the entire workout and develop a feel for your abilities on the machine. After the last interval is complete, the console will produce a ringing sound and display calories burned for several seconds. This is followed by average MET rate, floors climbed, and miles ran, each accompanied by the same sound and displayed for the same length of time. Remember your average MET rate to use as a guide when selecting a level for one of the preprogrammed workouts (subtract four from your average MET level and use this as a level for one of the preprogrammed workouts. This is intended to give you a starting point. As you become experienced on the machine, adjust the level to suit your abilities).

## 1. Scrolling Message

When this option is in effect, the simulated EKG is replaced by a scrolling message which the owner has entered. This message may announce club specials, birthday greetings, prizes, etc. The option is automatically asserted when a message is entered but then can be disabled without loosing the message. There is also an optional teletype sound effect which may accompany the message.

Construct your message first on paper using the codes for letters, numbers, and symbols shown in the following chart. All codes are two digits. The computer will automatically accept and display the character after the second digit is pressed. If you make a mistake, pressing [CLEAR] will remove the last digit pressed or remove the characters from the display in reverse order if you continue to press [CLEAR]. It is not necessary to leave a space at the beginning or end of your message as the computer does this automatically. The message may contain up to 128 characters including spaces.

## 2. Character Table

**A=50 E=54 I=58 M=62 Q=66 U=70**

**B=51 F=55 J=59 N=63 R=67 V=71**

**C=52 G=56 K=60 O=64 S=68 W=72**

**D=53 H=57 L=61 P=65 T=69 X=73**

| | | | | |
|---|---|---|---|---|
| Y=74 | 2=02 | 7=07 | +=22 | '=27 |
| Z=75 | 3=03 | 8=08 | $=23 | *=28 |
| _=76 | 4=04 | 9=09 | .=24 | -=29 |
| 0=00 | 5=05 | !=20 | %=25 | #=30 |
| 1=01 | 6=06 | *=21 | ?=26 | |
| ♥=31 | :=32 | | | |

To program the message:

- Computer must be in the attract mode.
- Press 7607 followed by [ENTER]
- Note message appearing on display as it is entered.
- When message is complete, press [ENTER]
- Your message will now begin scrolling and the machine has returned to the attract mode.

Sample Message...EXERCISE CAN BE FUN,54,73,54,67,52,58,68
,54,76,52,50,63,76,51,54,76,55,70,63
[ENTER]

The following codes allow optional control of the scrolling message.

- press 2123 [ENTER] - This turns message off but retains the message in the computers memory. The simulated EKG will be displayed.
- press 2121 [ENTER] - This turns the message back on if there is one in memory.
- press 40 [ENTER] - turns the teletype sound on.
- press 41 [ENTER] - turns the teletype sound off.

Just as with the EKG display, pressing [RESET] or moving a step will put the machine into the data entry mode.

## 3. Changing the Workout Time

The standard workout time is 15 minutes for all programs excluding custom programs. This time is the sum of all 30 interval times shown by the workout display. Each column in a standard 15 minute workout represents a 30 second interval. Each interval time is adjusted to 1/30th of the total time if a new time is selected. The workout length may be adjusted by use of this option to any number of minutes between 5 and 45. The new time remains in effect for all standard programs until it is modified again. We recommend that this code not be public knowledge and that programs remain at 15 minutes unless otherwise needed.

To change the time:

- The computer must be in the attract mode.
- Press 1010 [ENTER]
- Enter the desired time (one or two digits), press [ENTER]

The program will return to the attract mode and the interval timer will reflect the proper time to achieve the new workout time. This time setting feature does not affect the length of any custom programs selected.

## 4. Custom Programs

Custom programs are user designed workouts retained in the computers memory. After entering the code to access custom programs, the computer will prompt

for a program number 1 to 10 (there are ten custom programs). A workout time is programmed along with the 30 MET levels. There are two parts to this section, one on inputting the programs and one section on using the program. We suggest that the users know the codes to access the programs but not the codes to modify them to prevent tampering.

To program a workout:

- Computer must be in the attract mode.
- Press 1650 [ENTER]
- "ENTER PROGRAM" will appear on the display.
- Enter the number of the program you wish to modify, press [ENTER]
- If the program number entered has not been programmed, you will see a solid row of dots representing 4 METs for all intervals, otherwise the previous program will appear and can either be modified or completely written over.
- The flashing dot or column is the one you can now modify. Use speed arrows to move column up or down, use [ENTER] to move cursor to the right and [CLEAR] to move cursor to the left.
- When all the columns are correctly programmed, press [RESET] to save the program.
- "ENTER TIME" will appear on the display.
- Enter the desired time between 1 and 45 minutes. It should be noted that unlike standard programs, custom programs allow the time to go down to one minute.
- Press [ENTER]

Your program has now been saved and the machine will return to the attract mode.

Using custom programs:

- Press 4101 [ENTER]
- Enter the desired program number from 1 to 10 and press [ENTER]
- Continue as with a standard exercise program.

Note: You may only select a number that has been previously programmed Otherwise the computer will ask you to reselect the program number.

## 5. Jackpot Option

At the end of the exercise summary (at workout completion), there is a goal complete message. This message may be replaced by a Las Vegas style slot machine. When the wheels of the slots stop turning, the window will spell out either "THE END" or "YOU WIN". The odds of winning may be programmed anywhere between 1 in 5 to 1 in 9,999. The computer will then randomly select a winner and display "YOU WIN" instead of the usual "THE END". After displaying "YOU WIN", the computer will wait for the reset button to be pressed and then display the current odds. This allows the owner to confirm there has been no tampering. The odds are modified by the computer to allow a lengthy workout to have the same win potential as several short workouts. The entered odds are based on the standard 15 minute workout.

The jackpot option remains in effect until disabled by entering zero odds. If there is only one prize, remember to disable the op-

tion when there is a winner. StairMaster and it's distributors assume no liability stemming from the use of the jackpot option. Use of this option may be governed by laws or ordinances in your area.

To turn the jackpot option on, program odds of 5 or more. To turn off the option and return to the standard goal completion message at the end of the summary, program odds to zero.

Enter Odds:

- Computer must be in the attract mode.
- Press 8089 [ENTER]
- "ENTER ODDS" will appear on the screen.
- Enter odds between 5 and 9,999 or enter zero to disable the option. Press [ENTER]
- The computer automatically returns to the attract mode.

When the computer has a winner, the "YOU WIN" display will remain active until [RESET] is pressed. The odds will display after [RESET] until it is pressed a second time. This is to give the owner a chance to verify the win.

Other jackpot codes:

- Press 3121 [ENTER], to display the current odds. [RESET] will return the computer to the attract mode.
- Press 8089 [ENTER], 0 [ENTER] to disable the jackpot option.

## 6. Display Check

The display check is intended as a factory test, but it gives the owner the opportunity to test the display if there is some doubt as to whether all the dots are working.

To perform a display check:

- The computer must be in the attract mode
- Press the up speed arrow followed by 15 [ENTER]
- The display will say "DISPLAY CHECK" for a few seconds, and then turn on all of the yellow dots. The other colors may be tested as follows:

1. Red dots
2. Green dots
3. Yellow dots
0. No dots

- Press [RESET] to terminate the display check.

## 7. Code Summary

- Scrolling Message Codes:

| | |
|---|---|
| Program message | 7607 |
| Message on | 2121 |
| Message off | 2123 |
| Teletype sound on | 40 |
| Teletype sound off | 41 |

- Workout Time Code:

| | |
|---|---|
| Change workout time | 1010 |

• Custom Workout Codes:

Programming custom workouts.....1650
Using custom workouts.....4101

• Jackpot Codes:

Set odds or disable option.....8089
Display current odds.....3121

• Display Check:

Start test.....UP ARROW-15

VOLUME CONTROL

The volume is set at the factory but may be adjusted by the owner. To set the volume, use a small flat blade screw driver to adjust the volume control through the hole in the bottom of the console. Clockwise rotation increases the volume (facing the bottom of the console).

# THEORY OF OPERATION

The Gauntlet is not motor driven. The electrical supply to the unit is necessary only for reliable and consistent operation of the electronic console. This feature also allows the electronics to be viewed when the machine is not being used as opposed to some other equipment which must be in use to provide an active and viewable display. The body weight of the user provides kinetic energy used for speed control and resistance. This is accomplished by a drive system which sums the oscillating motion of the steps into a continuous rotary motion. This rotary motion is directed to a gearbox which in turn drives an alternator at sufficient RPM to provide a smooth, reliable means of speed control. Excess electrical energy created during this process is dissipated in an external electrical resistor in the form of heat. In summary, the work being performed by the user (kinetic energy) is converted to electrical energy, which is then converted and dissipated as heat. The size of the electrical load is controlled on the field side of the alternator. This manages the energy at low current and limits the heat producing components to the load resistor which is designed to dissipate heat well in excess of the Gauntlet's requirements.

# MAINTENANCE

## 1. Removal Of Side Panels

1. Side panels are attached magnetically and are kept in proper alignment by two screws located at the top extreme ends of each side panel. To remove panel, remove screw and lift panel at any convenient point until magnetic contact is broken, hold panel securely and pull outward.

2. To re-install, align holes in top ends of panel with alignment holes before allowing panel to make magnetic contact. Once panel is placed over holes, press panel into place until magnetic contact is re-established around the entire perimeter of the panel and re-install screws.

## 2. Bearing and Stepshaft Replacement

1. Follow side panel removal procedure and remove side panels.

2. Rotate steps until the desired step is located midway between top and bottom axles underneath machine.

3. It will be necessary to have a person the opposite side of the machine to hold the nut on the other end of the stepshaft while unscrewing nut.

4. Unscrew nut, remove bearing and washer.

5. Using rubber mallet, tap stepshaft through chain until enough length is exposed on the opposite side to pull the stepshaft completely free from step.

6. Note: Washers located between the step and chain on either side will fall free when stepshaft is removed. Be sure to retain the washer to re-insert when stepshaft is re-assembled.

7. Remove remaining bearing and washer.

8. To re-assemble follow reverse procedure.

## 4. Step Removal

1. Follow bearing and stepshaft replacement procedure to remove stepshafts.

2. Remove one step at a time, rotating steps in a clockwise rotation as viewed from the left side of machine.

3. Repeat above procedure until all steps are removed.

## 5. Chain Removal

1. Follow procedure for removing steps, and remove all steps.

2. Loosen screws on bottom axle.

3. Loosen nuts. This will allow chains on either side to loosen.

4. Remove master links and chain.

## 6. Drive Chain Removal

1. Remove master link.

2. Lift idler arm and remove chain.

## 7. Sprocket Removal

1. Follow procedure for removing steps and chains and remove both.

2. Loosen shaft set screws in pillow block.

3. Remove pillow block nuts.

4. Sprocket assembly can then be removed.

5. Remove pillow block bearings from sprocket assembly.

## 8. Speed Reducer Removal

1. Loosen Alternator, Alternator Bracket and bolts put slack in Alternator-Reducer belt, lift belt off transmission hub,

2. Follow procedure for Drive Chain Removal and remove drive chain.

3. Remove transmission brace.

4. Remove bolts.

5. Pull Speed Reducer towards you.

6. Remove idler arm and Belt Hub.

7. Remove Roll Pin in sprocket hub and shaft to remove sprocket hub.

8. Remove spring.

## 9. Speed Reducer Installation

1. Install sprocket assembly onto Speed Reducer shaft. Note orientation. Tighten set screw on key.

2. Install idler arm, spring, and belt hub to the reducer, put roll pins thru sprocket hub and shaft.

3. Install Speed Reducer assembly on main frame using washers and bolts. Tighten bolts.

4. Assemble transmission brace to main frame and Speed Reducer.

5. Put Belt on Transmission. Tighten Alternator-Reducer Belt. Bolt to Alternator and Alternator Bracket.

## 10. Sprocket and Chain Assembly Installation

1. Assemble pillow block bearings to axles. Note: Set screws go to the outside. Do not tighten at this time.

2. Assemble bearing adjusters and sprocket assemblies to main frame studs. Do not tighten at this time. Upper sprocket assembly small sprocket goes to the left side of machine.

3. Tighten bearing adjuster set screws on top sprocket assembly until pillow block bearings are in the top most position. Then, back out set screw two turns on each bearing adjuster.

4. Using scale, center sprocket assembly between the main frame side rails.

5. Tighten nuts on both upper sprocket assembly pillow block bearings.

6. Leave lower sprocket assembly loose at this time.

7. Assemble chain assemblies to sprocket assemblies. Connect chain on one side with master link.

8. It is important at this time to insure that the holes for the stepshaft in the chain assemblies are directly in line with each other. To do this, pass a stepshaft thru the holes in the links of one chain to the holes in the links of the chain of the opposite side. Rotate the sprocket assembly until the shaft comes in contact with the sprocket teeth. If the chains are in alignment, the shaft will contact the sprocket teeth at exactly the same moment. If the chains are not in alignment, relocate the chain in the sprocket teeth until alignment occurs.

9. Assemble master link in chain assembly on opposite side.

10. Tighten bearing adjuster screws on bottom sprocket assembly until chains on either side are of equal tension. Note: Tighten until chain slack is removed. Do not tighten past this point.

11. Using scale, center bottom sprocket assembly between side rails, Tighten nuts on bottom pillow block bearings.

12. Tighten all set screws in pillow block bearings.

## 11. Stepshaft and Bearing Assembly

1. Note: Two people are required for the following procedure.

2. Working from underside of machine, position a step in place and pass a step shaft thru the links of one chain assembly, thru

the hinge of the front part of step, and on thru the links of the chain on the opposite side. This should suspend the step in place.

3. Position second step in place.

4. Insert step shaft thru the chain link. Install washer.

5. Connect the two step hinges together and push the shaft thru the step hinges.

6. When shaft emerges from step hinges on opposite side, install washer before pushing thru the chain links on the opposite chain.

7. Install washers and bearings on both ends of shaft.

8. Assemble nuts on either end of shaft and tighten. Note: Deformity of threads of one end of nut. This goes to the outside.

9. Tighten nuts until approximately one and one half threads are visible from end of shaft.

10. Repeat procedure until all steps are in place.

11. When all steps are in place there should be approximately 1 1/2 inch chain deflection.

## 12. Step Chain Adjustment

1. To tighten chain, loosen the two bearing retainer nuts on each of the two pillow block bearings located on either side of the unit. Just loosen slightly, do not remove these nuts.

2. Observe the adjustment set screw which seats against each of these bearings. A 3/16 inch Allen wrench is required to unscrew the screws.

3. Tighten these screws an equal amount on both sides until the correct chain tension is achieved.

4. Re-tighten bearings nuts.

5. To loosen chain follow the above procedure, except loosen set screws an equal amount on both sides until the required tension release is obtained.

## 13. Alternator Belt Adjustment/ Replacement

## 14. Machine Alignment

1. It is important for the longevity of the component parts of the machine that it be aligned properly.

2. To visually check the alignment of the machine, stand in front of the machine and obseRve The Steps And Chain As They Rotate Around The Lower Sprocket.

3. Note the shaft on either side of the machine as it initially engages the sprocket teeth. If the machine is misaligned, you will note that on one side, the step and the chain tend to separate when the shaft engages the tooth. On the other side the step and the chain will tend to come together.

4. To align the machine, loosen the set screws in the bottom pillow blocks. If the chain and the step tend to separate on the left side of the machine, move the sprocket assembly shaft slightly to the right. If the chain and the step tend to separate on the right side, move the sprocket assembly to the left.

5. Movement of sprocket assembly can be accomplished by tapping the end of the sprocket assembly shaft at the pillow block bearing.

6. Note: It may be necessary to move both the top and bottom sprocket assembly to achieve alignment. Follow the same procedure as above to move upper sprocket assembly.

7. Re-tighten set screws.

8. When the machine is properly aligned you will see a very small or no amount of separation between steps and chain as the steps rotate around the bottom sprocket assembly.

## LUBRICATION

1. STEPSHAFTS AND HINGES WITH WD40, 1-3 TIMES PER WEEK

2. CHAINS WITH SAE 30 WT.MOTOR OIL, 1 TIME LIGHTLY PER MONTH

NOTE: 1. Lubrication frequency will vary with the amount of use.

2. People using the Gauntlet tend to perspire heavily. Perspiration will rust metal rapidly. Therefore, it is important that the lubrication and periodic cleaning requirements of the machine be observed.

3. The stepshafts are most effectively lubricated from a position in front of the unit. Rotate each step into position and attach the red tube to the nozzle of your WD-40 to direct the lubrication only on the hinge area.

NOTE: Do not spray lubricant onto the rubber step, as this will create a potentially dangerous condition.

4. The inner hinge should be lubricated with WD-40 by removing the magnetic side shields and spraying each step individually from inside the unit. The steps can be moved from the outside by pushing the step in the opposite direction (clockwise) of it normal function.

## CLEANING PROCEDURE

1. Clean the machine as often as usage dictates. This may be done with any acceptable cleaner and soft cloth. Be especially attentive to cleaning the step hinges as perspiration tend to accumulate here, leading to eventual cosmetic corrosion.

# TROUBLESHOOTING

Electrical problems are limited to four areas; the console, the power supply, the cabling, and the alternator. The purpose of this section is to help identify problems. We do not recommend user servicing of the console. Consult panel removal in Maintenance section for procedures dealing with the load resistors or the alternator.

## 1. Electronic

Symptom:

No display or sound on power up.

Probable Causes:

Electrical power not available at wall outlet. Plug a known good device into the outlet (i.e. a lamp, radio etc.). If outlet is not active, use a good outlet or call an electrician.

Power supply may be bad. Use a volt meter to verify power at coaxial plug on the power supply cable. Voltage should read between 12 and 15 volts. If supply is bad, order a replacement from StairMaster.

To verify the cable has not been damaged, disconnect the gray cable at console and measure voltage between pins 5 and 4 of the connector (the pins are labeled on the face of the connector). It should also indicate between 12 and 15 volts.

The only part left is the electronics console. If possible, swap consoles from another machine to verify the problem.

| | |
|---|---|
| Console display has several dots lit but doesn't function. | Momentarily unplug the machine. Upon plugging back in, if the console operates properly, the symptom was caused by a problem with the 110 VAC power from the electric company. If this occurs frequently, it would be a good idea to try the machine on a different electrical circuit.<br><br>If the above does not resolve the symptom, the electronics console is most likely the problem. If possible, swap consoles from another machine to verify the problem. |
| Machine will not speed control. The speed keeps increasing beyond speed shown. | The load resistor may have malfunctioned. Check for continuity between the +BAT terminal of the alternator and ground. The resistance will read zero ohms on most meters (0.5 ohms actual resistance).<br><br>The console may also cause this problem. Swap consoles if possible.<br><br>The conductor in the gray cable may not be continuous. Use an ohm meter to check for continuity from the field terminal of the alternator to pin 2 of the connector (pin numbers are shown on the face of the connector). |
| Machine will not speed control. Runs slow all the time. | The electronic console has failed, swap consoles if possible. |

| | |
|---|---|
| The console operates properly up to the start exercise display but will not continue into the exercise. | The conductor in the gray cable may not be continuous. Use a an ohm meter to check for continuity from the stator terminal of the alternator to pin 3 of the connector (pin numbers are shown on the face of the connector).<br><br>The Run/Stop button may have failed. The self test feature in the console will identify this problem. In the attract mode press 107 [ENTER], the console will respond by displaying "ENTER PROGRAM". Press 3 to start the switch test. The bottom row of lights will indicate the status of each switch on the keypad and the Run/Stop button. The far right LED should go out if the button is pressed. If it doesn't go out, check to be sure the cable is securely plugged into the console. If the cable is plugged in, order a new Run/Stop switch from StairMaster Service. |

## 2. Mechanical

| Symptom: | Probable Cause: |
|---|---|
| Popping sound coming from chain and sprocket area | Steps mis-aligned (See machine alignment procedure) |
| Steps move in a jerky or erratic motion | Speed Reducer remove and replace (see Speed Reducer removal) |
| Grinding noise coming from the machine when in operation | |

| | |
|---|---|
| | A. Broken Stepshaft (See Bearing & Stepshaft Replacement) |
| | B. Speed Reducer remove and replace (See Speed Reducer removal) |
| | C. Stepshaft Bearing off (See Bearing & Stepshaft Replacement) |
| Steps will not move | A. Remove and replace Speed Reducer (See Speed Reducer Removal) |
| | B. Step, Chain or Bearing obstruction Check and remove foreign object |
| Squeaking sound coming from step area | Unlubricated shaft and hinge (See lubrication procedure) |

# GAUNTLET PARTS LIST

** Parts and prices are subject to change without notice

| Part # | Part Description |
|---|---|
| SM20675 | (CS)ADAPTER.HANDRAIL |
| SM22934 | (CS)ASSY.RELAY/RESISTOR.GAUNT. |
| SM10753 | (CS)POWER CONNECTOR ASSY. 12/ |
| SM20103 | (CS)SPACER.HANDRAIL.PLASTIC |
| SM20859 | ADAPTER.POWER CORD.3 PRONG |
| SM21164 | ALT. ASSY. GAUNT/STEP.PRESTOLI |
| SM20693 | ARM.IDLER |
| SM10754 | ASSY.CABLE CONSOLE. NEW RELAY |
| SM23082 | BEARING. 608 2Z |
| SM10037-03 | BEARING.ADJUSTER.STEPMILL. W/B |
| SM20012 | BEARING.PILLOW BLOCK |
| SM22065 | BOLT..500-13 UNCX3.75.HEX HD |
| SM10059 | BRACE.TRANS. |
| SM10860 | BRACKET TRANSMISSION 7000PT |
| SM20547 | BRACKET.TRANS.. OUT |
| SM10395 | CABLE.D.C 12FT |
| SM10396 | CABLE.D.C 16FT |
| SM10397 | CABLE.D.C 20FT |
| SM10398 | CABLE.D.C 24FT |
| SM10452 | CABLE.D.C..8FT |
| SM10195 | CHAIN ASSY.#40 (NEW) |
| SM20511 | CONNECTOR. R/R. 3-PIN. MOLEX |
| SM20513 | CONNECTOR. R/R. 6-PIN. MOLEX |
| SM20509 | CONNECTOR.TUBING |
| SM20047 | COTTER.HAIRPIN.PLATED |
| SM20508 | FASTNER.PUSH NUT |
| SM20022 | TAPE.MAGNETIC |
| SM20292 | GROMMET.1/4 ID.1/16WALL |
| SM21329 | H.S. GEAR ASSY.BISON |
| SM20804 | HANDGRIP. MANDREL FORMED |
| SM21147 | INSTRUCTION.SHEET GAUNT.RETRO. |
| SM22190 | KNOB.CONSOLE..250-20x2.00 STUD |
| SM21330 | L.S. GEAR ASSY.BISON |
| SM20017 | LEG LEVELER |
| SM20157 | LINK.MASTER.#40 |
| SM25305 | LINK.MASTER.#40.V2 |
| SM10205-03 | LOWER SPRKT ASSY - 7000PT |
| SM22032 | NUT. 5/16-18 NC NYLOCK |
| SM22042 | NUT.1/2-13 NC NYLON INSERT |
| SM22092 | NUT.1/2-13 NC NYLON INSERT |
| SM22036 | NUT.1/4-20 NC NYLON INSERT |
| SM22029 | NUT.3/8-16.NYLON INSERT |
| SM22018 | NUT.5/16-18 |
| SM22110 | NUT.8-32 NC HEX MACH. |
| SM22063 | NUT.LOCK.5/16-24.STEP SHAFT |
| SM20466 | PIN.ROLL.1/8 X 1-1/2 S.S. |
| SM20682 | PLATE.BEARING |
| SM20018 | PLUG.BUTTON |
| SM10887 | POWER CONNECTOR ASSY. |

# GAUNTLET PARTS LIST

| | |
|---|---|
| SM20761 | POWER CORD |
| SM21097 | POWER CORD. 220V. SWISS |
| SM20633 | POWER CORD. AUST. |
| SM21096 | POWER CORD. ENGLISH |
| SM21098 | POWER CORD. ITALIAN |
| SM20507 | POWER CORD.EUROPEAN |
| SM24379 | POWER SUPPLY.PS-5.2-PIN |
| SM20208K | SM STEPMILL POLY-V UPGRADE KIT |
| SM22072 | SCREW. 5/16-24 NF X 3/8 HEX |
| SM22028 | SCREW..250-20 NC X .63 HEX |
| SM22026 | SCREW..250-20 NC X 1.0 HEX HD |
| SM22093 | SCREW..312-18X.75.HEX HD |
| SM22043 | SCREW..500-13 NC X 2.0 HEX HD |
| SM22081 | SCREW.1/4-20 NC X 3 PHIL |
| SM22139 | SCREW.1/4-20 X 1/2 SELF TAP |
| SM22060 | SCREW.10-32X3/8.OLD STEP SHAFT |
| SM22039 | SCREW.3/8-16 NC X 1 HEX |
| SM22126 | SCREW.4 4 X 3/8 PHIL. |
| SM22071 | SCREW.5/16-18 NC X 1 HEX |
| SM22146 | SCREW.5/16-18 X 1-1/4 HEX |
| SM22014 | SCREW.6-32 NC X 3/8 PHIL |
| SM22015 | SCREW.6-32 NC X 5/8 PHIL. |
| SM22054 | SCREW.8 X 1/2 TYPE A SLOT HEX |
| SM22108 | SCREW.8-32 NC X 5/8 SLOT |
| SM22037 | SCREW.SET 1/4-20 NC X 3/8 |
| SM20184 | SEALS.BISON TRANSMISSION (CS) |
| SM20762 | SHAFT.STEP 5/16 (OLD) |
| SM22181K | SM TOUCH UP PAINT KIT, BLACK |
| SM20114 | SPACER. ALTERNATOR |
| SM20054 | SPRING.IDLER ARM |
| SM20007 | SPROCKET.IDLER |
| SM20034 | STUD.3/8-16NC X 2-1/4 |
| SM20001 | TRANSMISSION |
| SM20541 | TREAD.STEP.RUBBER |
| SM20423 | TYRAP.1/8 X 7.515 |
| SM10200 | UPPER SPRKT ASSY GAUNT/STEPMIL |
| SM22109 | WASHER.#8 INT. TOOTH LOCK |
| SM22091 | WASHER.1/2 SAE FLAT |
| SM22046 | WASHER.1/2 STD. FLAT |
| SM22027 | WASHER.1/4 MED. LOCK |
| SM22031 | WASHER.1/4 X 1 OD FLAT |
| SM22030 | WASHER.3/8 USS FLAT - ZINC |
| SM22075 | WASHER.5/16 FLAT |
| SM22128 | WASHER.STEP SHAFT 5/16 FLAT |
| SM20528 | WASHER.WAVE SEASTROM |
| SM20036 | WHEEL.TRANSPORT |