Be Strong.™

HR ClubTrack Plus
Owner's Manual

P/N 001-7166 Rev A

INTRODUCTION

Thank you for purchasing the Quinton® Treadmill by Nautilus, Inc.. For more than 30 years Nautilus, Inc. has been producing the world's finest fitness equipment used in health clubs and homes around the globe. We hope this product exceeds your expectations and is a valuable tool for your facility.

Please carefully read through this manual to familiarize yourself with the operation of your new treadmill. Doing so will help to insure that your users get the most out of your treadmill, enjoying safe and effective workouts in the many miles ahead.

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GENERAL GUIDELINES FOR SAFE OPERATION

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

WARNING Do not begin an exercise program without first consulting a physician.

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.

WARNING Secure long hair and loose clothing before use.

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

When using electrical equipment, always follow these basic precautions:

IMPORTANT SAFETY INSTRUCTIONS

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: Read this manual in full before operating the treadmill. Failure to follow these guidelines can produce a serious or possibly fatal electrical shock hazard or other serious injury. Consult a qualified electrician as required.

1. The controller Stop Key does not turn off the electrical current to the treadmill. The treadmill continues to draw power, even when the controller is off. To avoid electric shock, do not remove treadmill hood or place hands beneath the treadmill while the treadmill is plugged into a power source.
2. Do not start the treadmill when someone else is standing on the belt.
3. Keep speed and incline at the lowest settings when someone is getting on and off the treadmill.
4. Keep the area underneath and around the treadmill clear.
5. Never position the treadmill with the back end (direction of belt travel) facing a wall or any other objects such as furniture or other pieces of fitness equipment. Failure to do so can prevent safe exit of the treadmill in an emergency situation such as falling. Allow a minimum of four feet behind the treadmill and any objects.
6. Before each use of this equipment, check the power receptacle for signs of damage. Do not operate the equipment if the integrity of this item is in question.
7. To avoid potential safety and electrical problems, replace with manufacturers' specified parts only.
8. This equipment is classified Class I, Type B, ordinary equipment. Not protected against fluid ingress. Rated for continuous operation. Do not operate this equipment in the presence of flammable anesthetic mixtures.
9. Do not let liquid enter the controller. If it does, the controller must be inspected and tested for safety by an approved technician before it can be used again.
10. Increased risk due to leakage current can result if this equipment is not grounded properly.
11. The treadmill must be on an appropriate, dedicated electrical circuit. Nothing else should be connected to the circuit.
12. Do not stand on treadmill hood or front trim cover.
13. Close supervision is necessary whenever the machine is used by or near children, invalids, or disabled persons.

Failure to follow the conditions set forth below shall limit, to the extent allowed by law, Nautilus Inc. responsibility for the safety, reliability, and performance of this equipment.

- The operator manual must be read in full by each owner and trainer before the product is first used. Each user must be instructed in the proper use of the treadmill and its accessories.

  Do not remove the treadmill hood: dangerous voltages are present. Components are serviceable only by qualified service personnel.

- The electrical wiring within the treadmill setting and the electrical installation of the treadmill must comply with the applicable local or provincial requirements.
- The equipment must be used in accordance with the instructions for use.
- For further information or instruction on use, maintenance or specifications, please contact your Authorized Nautilus® Fitness Dealer or Service Technician.

Receiving

When the carrier delivers your order, verify that the number of items received equals the number listed on the freight bill or express receipt.

Inspect the containers for damage. Itemize discrepancies and damage on the waybill and have the agent sign it. Failure to describe external evidence of loss adequately may result in the carrier refusing to honor your claim. Do not discard the packing materials until you have verified physical condition and proper operation.

Installation Notice

The treadmill and controller must be installed correctly before being used. Nautilus, Inc. recommends that you contact your treadmill dealer or sales representative when your equipment arrives. The representative will help unpack, install, and demonstrate it to ensure that:

- equipment is free from shipping damage.
- the treadmill is connected correctly to the appropriate AC power source.
- installation and operation are in accordance with Nautilus, Inc. standards.

Incorrect installation by unauthorized personnel can lead to equipment damage and may void the warranty.

WARNING **The treadmill must be on a dedicated branch circuit. No other device should be connected to that circuit.**

Excessive risk current (leakage) can result if the equipment is not properly grounded.

Failure to follow these guidelines will produce a serious or possibly fatal electrical shock hazard. Consult a qualified electrician as required.

Site Requirements

The treadmill requires a dedicated AC power line. To ensure electrical safety, the treadmill is equipped with a three-wire power cord and three-pronged plug. To maintain ground reliability, the plug must be connected to an equivalent receptacle.

The treadmill is designed to operate in a typical fitness environment with adequate heat dissipation (1850 Watts maximum). Place the treadmill on a flat surface, free of moisture and debris. Maintain a minimum clearance of 1.5 feet on each side and 6 feet at the rear.

Installation

If you choose to install your treadmill without the assistance of your Nautilus, Inc. representative, follow the procedure given below:

Tools:

- Phillips screwdriver (12 in length preferable)
- small flat-blade screwdriver
- 1/2-in hex socket wrench, torque wrench if available.

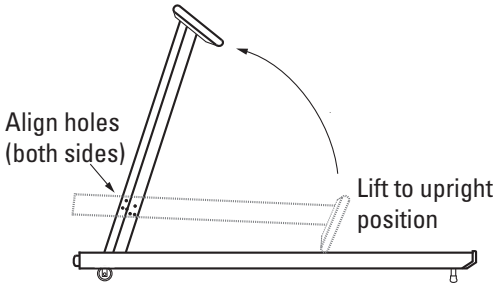


Figure 1

1. Grasp the controller uprights and pivot into position (Figure 1).

2. Align the holes in the base of the uprights with the holes in the upright brackets; there are three holes in the bracket (Figure 1a). Fasten the uprights into place with the hardware supplied with the treadmill: 5/16" -18 x 7/23" hex bolt, 5/16" lock washer, and 5/16" flat washer.

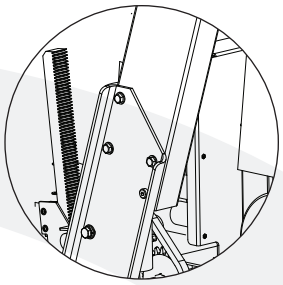


Figure 1a

3. Tighten each bolt securely with the 1/2" socket wrench. Tighten to 200 in/lb. **Do not overtighten**.

4. Remove the treadmill hood and hood cover from the two boxes. Position the hood on the treadmill deck and tilt as shown (Figure 2).

5. Slide the hood forward while holding it in the tilted position. (Spread the hood apart slightly to clear the upright.)

6. Lower the hood, aligning the slots in the bottom of the hood with the screws in the side rails.

7. With the screws engaged in the slots, slide the hood forward approximately 1/2" and tighten it in place.

8. Align the two holes inside the front of the hood with the holes in the side rail. Install a star washer onto the two 1/4" -20 x 1" in Phillips-head screws supplied with the treadmill, then use the screw to fasten the hood to the frame.

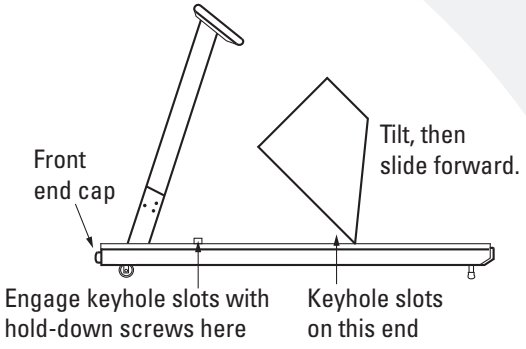


Figure 2

Due to regulatory requirements in some countries, your treadmill may have a grounding bracket attached to each upright. Use the two #10 self tapping screws provided to connect the brackets to the treadmill hood.

9. To install the hood cover, place the cover over the tab on the hood (Figure 3).

10. Lower the hood cover to align the three screw holes at the bottom of the cover. Fasten the cover using the three 1/4" - 20 x 7/8" button head screws, flat washers, and star washers supplied. To ensure proper grounding, stack the hardware so that the star washer is against the hood cover.

11. Align the holes in the hood with those in the hood cover. Install three #8 black Phillips screws and tighten securely.

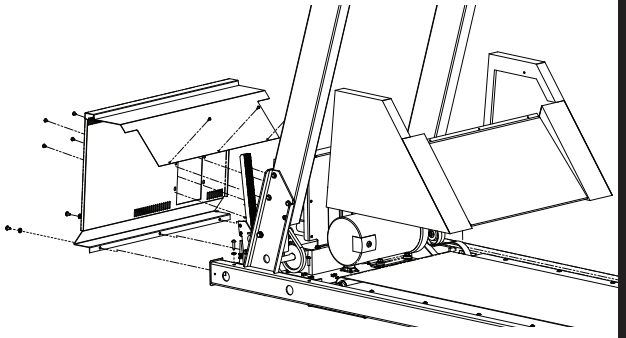


Figure 3

12. Install the four #10 screws and external star washers in the front of the hood cover to secure it to the power input plate.

13. Install the two front-end caps (included) on the front ends of the treadmill frame (Figure 2).

14. Verify that the voltage for the power source matches the voltage on the nameplate on the front of the treadmill hood, then plug in the power cord.

15. To connect the treadmill to a computer, plug an RJ-45 telephone cable into the serial connector on the rear panel of the controller, then into the input connector on the computer.

Turning On the Power

The circuit breaker on the front of the treadmill hood controls the power to the treadmill. The circuit breaker must be set to ON for the treadmill to run.

IMPORTANT **Turn off treadmill circuit breaker before connecting or disconnecting treadmill to outlet.**

Testing the Treadmill and Controller

1. Test all operational functions, including speed, grade, timer, heart rate control, intervals, parameters, all limit controls, and serial communication.

2. With the power switch set to **ON** and the console display at the opening message, "**Nautilus Cardio**", press the **Quick Start** key. Verify that the treadmill accelerates gradually to minimum speed.

4. Press and hold the **Incline Down** key until the treadmill reaches zero grade.

5. Press the **Speed Up** key until the treadmill is running at maximum speed and grade.

6. Let the treadmill run for 15 minutes.

7. Watch the walking belt carefully to ensure that it does not drift left or right. Listen for unusual noises, such as squeals or squeaks.

8. Walk on the moving belt and verify proper operation at representative speeds and grades. If the walk belt slips, but the front roller turns, adjust the walk belt tension.

9. Check operating limit controls (access, time, speed).

10. Check menu displays and functionality.

10. When the test is finished,

a. Press **Incline Down Arrow** until the treadmill is at zero grade.

b. Press **Stop**.

If the treadmill does not run smoothly, contact your Nautilus, Inc. sales representative before using it.

Understanding the Display and Controls

The treadmill display is a computerized panel used to operate the treadmill and see all workout data and operational status. You should familiarize yourself with the operation of the treadmill and the location of all keys before beginning use.

Limited Access Control/Magnetic Safety Stop

Limited-access control lets you restrict treadmill use to authorized personnel. It also lets you stop the treadmill in an emergency. The magnetically-activated control is located on the bottom of the display as shown. The limited-access control is deactivated on machines shipped from the factory.

Magnetic Safety Stop Activation

To activate the limited-access control and restrict access, place the magnetic safety stop cord supplied with the treadmill in the designated area located below the display.

The magnet will activate the control. If you remove the key, the treadmill belt will stop and the controller will not respond to any key presses. Accumulated values will remain on the display until you turn off the power, or press [Clear].

The console will display a message, REPLACE MAGNET when you remove the magnetic key from its designated area. You must replace the key or deactivate the control to start the walk belt.

Magnetic Safety Stop Deactivation

To deactivate the Safety Stop Cord and permit unrestricted access of the treadmill follow the steps below.

1. With the magnet key in place and the display at the opening message, SELECT WORKOUT, or, if the magnet key is removed and the display reads, REPLACE MAGNET, press [Speed UP], [3], [ENTER]. The display will read "CUSTOMIZE". Use the [Speed UP] or [Speed DOWN] keys to scroll through the options until the console displays ENABLE MAGKEY.

2. Press [ENTER], and the display will either read ON or OFF. Press [SPEED +] or [SPEED -] to toggle between ON and OFF. With OFF displayed, press

[ENTER] to select OFF.

3. The display will show UPDATING for a few seconds, then display the OFF setting.

4. Next, turn off the power to the treadmill from the circuit breaker switch. The circuit breaker switch is located on the bottom front panel of the treadmill.

5. With the power to the treadmill off, remove the magnet key. Then, turn the power to the treadmill back ON at the circuit breaker switch.

6. The display will show the SELECT WORKOUT screen. The limited access control remains inactive, granting unrestricted access, until you turn the magnetic key option back on, or place the magnet back in its designated area.

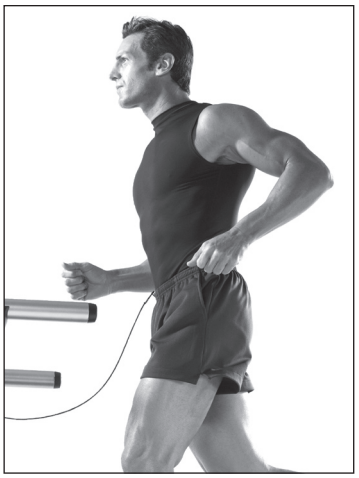
IMPORTANT **If at any time the safety key is put back in place THE SAFETY CORD FEATURE REACTIVATES AUTOMATICALLY and must be turned off again using the above steps.**

Emergency Stop Magnet

Guidelines For Getting On and Off the Treadmill

Instruct each user in the following guidelines for getting on and off the treadmill.

1. The walking belt should be moving at minimum speed before the user steps onto the treadmill.
2. Stand next to the treadmill and place both hands on the front handrail.
3. Straddle the walking belt or step onto the side of the deck. Step onto the moving belt and begin walking.
4. (Optional) To get the feel of the moving belt place the foot nearest the treadmill on the walking belt and let it move backwards. Lift it and repeat several times until comfortable with the treadmill speed.
5. When walking comfortably on the treadmill, let go of the handrail.
6. While walking on the treadmill:
    - Face forward. Avoid looking down at the walking belt.
    - Maintain speed by keeping a consistent distance from the handrail.
    - Adjust the speed and incline as desired. Hold the handrail as the speed and incline change.
7. Before stepping off the treadmill, place one hand on the handrail, wait for the belt to stop, then step off.



Attach magnetic safety cord onto clothing as shown.

Treadmill Display Functions

The following describes the display functions and specifications for the Quinton® Treadmill by Nautilus - HR ClubTrack Plus.

Incline — The treadmill incline is displayed in percentage of elevation. The HR ClubTrack® Plus Treadmill has an incline range of 0 to 15%.

Time — The selected workout time is displayed in the upper left section of the display window. In most of the workouts, the timer will count down, in minutes and seconds, until the workout is finished or stopped. If (0) is entered in the (MANUAL) or (HR ZONE TRAINER) workout, the timer will count up.

Interval Time — The interval time is displayed in the lower display, upper left area. The interval timer counts down the remaining time within each interval.

Speed — The treadmill speed is displayed in miles per hour (or kilometers per hour). HR ClubTrack® Plus Treadmill has a speed operation range of 0.5 mph to 12 mph (0.8 kph to 19.2 kph).

Heart Rate — Current heart rate is displayed next to the heart icon, in beats per minute, in the lower display, upper right area.

Percentage of Maximum Heart Rate — An approximation of maximal heart rate is calculated based on the latest American College of Sports Medicine predictive equation.

See the Heart Training programs starting on page 15 for more information.

Distance — Provides a cumulative total of the equivalent distance, in miles (or kilometers if your display is set to metric units), you have traveled.

Calories — Provides a current total of the number of calories burned during a workout. Note: this number is only an approximation as a user's caloric expenditure will vary significantly based on a persons age, gender, weight and metabolism.

Calories/Hour — Provides the rate at which calories are burned per hour at the current speed and incline.

Pace — Displays the walking/running pace in minutes per mile (or minutes per kilometer), or the time it will take you to complete one mile (or one kilometer) at your current rate. Pace is shown in the top text line.

Watts — During a workout, this statistic displays the power output at the

current speed and incline, displayed in watts (746 watts = 1 hp).

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, the display shows the current MET level. During the workout summary, the average MET level is displayed.

Treadmill Display Definitions

Workout Profile — The dot-matrix area of the display shows the actual course profile of the selected exercise program. The taller the column, the higher the incline and/or speed for that interval. The flashing column shows your current interval.

Display LOCK / UNLOCK - Statistics Key — During the exercise program, the Display LOCK / UNLOCK key is used to track workout statistics which are shown in the text line of the display window. When a workout is started, the display is in an unlocked mode and the various exercise statistics will scroll in order. Press the [**DISPLAY**] key once to turn off the scan feature and show the current statistic in the display window. Press the [**DISPLAY**] key a second time and the scan feature will turn back on to scroll through the different statistics.

When in the Display Unlock mode, the console will cycle through the following statistics in order: **Distance, Calories/Hour, Watts, METs, Target Heart Rate.**

At the completion of a workout, the statistic averages are calculated based on the accumulation of data during the workout program..

Quick Start Key — The Quick Start Key provides an immediate start to a workout session without having to provide any user information.

Stop Key — Press the STOP Key any time you want to pause the workout program for up to one minute. Press the STOP Key a second time, or press (1), and the workout statistics will be displayed, then the console will return to the "SELECT WORKOUT" prompt.

Numeric Keypad (0-9) — The numeric keypad is located on the right side of the console. During program setup, this keypad allows you to quickly enter requested information such as time, age, speed, incline , weight, and heart rate.

TREADMILL DISPLAY DEFINITIONS

Enter – The ENTER Key confirms workout selections and stores the information used by the console to calculate workout statistics.

Clear – During data entry, the CLEAR Key erases information from the console memory and backs up to the previous data entry prompt.

Incline Up & Down Keys — The treadmill incline may be changed at any time during a workout. Pressing the INCLINE UP key increases the incline and pressing the INCLINE DOWN key decreases the incline. The treadmill incline increases or decreases by increments of 0.5%.

Speed Faster & Slower Key — The treadmill belt speed may be changed at any time during a workout. Pressing the SPEED DOWN Key decreases the belt speed and pressing the SPEED UP key increases the belt speed. The belt speed increases or decreases by increments of 0.1 MPH (0.15 KM/H).

IMPORTANT **It is important to know that the speed change up or down is not immediate. Speed will gradually increase or decrease so be sure to allow the treadmill to adjust to a new speed before changing again to avoid overshooting your desired speed.**

Workout Programs

The workout program keypad is located to the left of the display. There are six workout program keys, including a More Workouts key with multiple advanced program options.

While the console is in the SELECT WORKOUT mode, press the treadmill workout key to preview the desired workout. After selecting the desired workout, simply follow the prompts to enter the required user data for that program.

When entering data, the user can select the standard default values by pressing [ENTER] at the display prompt without first typing data. This will set up the console with the following default data:

- Weight – 175 lbs.
- Speed – 2.0 mph in Fat Burner, Calorie Burner or HR Zone Trainer. 1.0 mph in Manual.
- Age (HR Zone Trainer program only) – 40 years
- Workout Time – The default time in the programmed workouts and Quick Start is 20 minutes. The Manual and HR Zone Trainer programs do not have a specified default time. In this program, the console timer will count up to the maximum time of 99 minutes.

Once you have selected a program, follow the console prompts.

- **ENTER BODY WEIGHT** – type in your body weight in pounds (or kilograms if your console is set to metric units).
- **ENTER SPEED** – type in your desired speed. The HR ClubTrack® Plus Treadmill has a speed range of 0.5 mph – 12 mph.
- **ENTER TIME 5 - 99** – select the workout duration in one minute increments from five to 99.

Program Overview

The Quinton® Treadmill by Nautilus - HR ClubTrack Plus has a wide variety of programming options with a great amount of flexibility to allow anyone of any fitness level to use.

The Quick Start Feature

Provides an immediate start from the intro display, without having to enter any user information. This program uses the standard default settings to calculate calories burned during a workout session.

To use the Quick Start program:

1. Press the [QUICK START] key. A message, ENJOY WORKOUT is displayed, the workout begins with exercise statistics accumulating.

2. During the workout:

    - Speed may be changed at any time during the workout by pressing the [SPEED UP] key to increase the speed, or the [SPEED DOWN] key to decrease the speed. The new speed will continue through the rest of the workout until changed using the Speed keys.

    - Incline may be changed at any time during the workout by pressing the [Incline: UP] key to increase the incline, or the [Incline: DOWN] key to decrease the incline. The new incline will continue through the rest of the workout until changed using the Incline keys.

3. Press [STOP] to pause the workout. Press [STOP] again to end the workout. The workout statistics will be displayed, and then the console will revert back to the SELECT WORKOUT message.

The Manual Program

The Manual Program allows you to control the speed and incline of the treadmill during the workout, while accurately calculating exercise statistics based on your weight. The default speed is 1.0 mph unless changed during the data entry mode. The incline is 0%. The workout profile in the display window is divided into 30 equal intervals within the selected workout time. The profile is based on the MET level, with every 1 MET equating to one vertical bar. MET level is based on a combination of incline and speed.

To use the Manual program:

1. Press the [MANUAL] key. The message, MANUAL WORKOUT will be displayed in the text line and the workout profile displayed in the lower display.

2. The console will display ENTER WEIGHT - LBS (or ENTER WEIGHT – KG if in Metric mode). Enter your weight using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

    - Your weight is used to calculate the number of calories burned for each minute of exercise and the total number of calories burned for the exercise session.

3. The console will display ENTER SPEED - MPH (or ENTER SPEED – KMH if in Metric mode). Enter the desired speed using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

4. Next, the console will display ENTER TIME 5 – 99. Enter the desired time and press [ENTER]. Or, press [ENTER] to select the default time.

    If you press [0], then the timer will count-up from 0:00 to the maximum time of 99:00.

5. The console will display ENJOY WORKOUT and the timer will begin.

    - Speed may be changed at any time during the workout by pressing the [SPEED UP] key to increase the speed, or the [SPEED DOWN] key to decrease the speed. The new speed will continue through the rest of the workout until changed using the Speed keys.

    - Incline may be changed at any time during the workout by pressing the [Incline: UP] key to increase the incline, or the [Incline: DOWN] key to decrease the incline. The new incline will continue through the rest of the workout until changed using the Incline keys.

6. Press [STOP] to end the workout. The workout statistics will be displayed, and then the console will revert back to the SELECT WORKOUT message.

The Custom Intervals Program

In the Custom Intervals workout, users can create a custom interval program by entering Rest Speed and Time, Work Speed and Time, and total # of intervals.

To use the Custom Intervals Program:

1. Press the MORE WORKOUTS key. Then, use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "CUSTOM INTERVALS", press [ENTER] to accept.

2. The console will then display "ENTER WEIGHT – LBS" (or "ENTER WEIGHT – KG" if in Metric mode). Enter your weight using the numeric keypad and press (ENTER). Or, press [ENTER] to accept the default value.

3. The console will display "ENTER WORK SPEED – MPH" (or "ENTER WORK SPEED – KMH" if in Metric mode). Enter the desired work speed using the numeric keypad and press (ENTER). Or, press [ENTER] to accept the default value.

4. The console will then display "ENTER WORK TIME". Enter the desired time up to 9:59 and press (ENTER). Or, press [ENTER] to accept the default value.

5. The console will display "ENTER REST SPEED - MPH" (or "ENTER REST SPEED – KMH" if in Metric mode). Enter the desired rest speed using the numeric keypad and press (ENTER). Or, press [ENTER] to accept the default value.

6. The console will then display "ENTER REST TIME". Enter the desired time up to 9:59 and press (ENTER). Or, press [ENTER] to accept the default value.

7. The console will display "# OF INTERVALS". Enter the desired number of intervals, up to 15, using the numeric keypad and press (ENTER). Or, press [ENTER] to accept the default value.

8. The console will display "ENJOY WORKOUT" and the timer will begin.

- Speed may be changed at any time during the workout by pressing the [SPEED UP] key to increase the resistance, or the [SPEED DOWN] key to decrease the speed. Any changes to the speed will only change the speed in the current rest or work phase. To change the speed of the work phase, you must change the speed during a work phase. To change the speed of the rest phase, you must change the speed during a rest phase. Changing the speed will not change the look of the remaining profile; however, the new speed will continue through the rest of the workout.

- Incline may be changed at any time during the workout by pressing the [Incline: UP] key to increase the incline, or the [Incline: DOWN] key to decrease the incline. Any changes to the incline will only change the

incline in the current rest or work phase. To change the incline of the work phase, you must change the incline during a work phase. To change the incline of the rest phase, you must change the incline during a rest phase. Changing the incline will not change the look of the remaining profile; however, the new incline will continue through the rest of the workout.

Heart Rate (HR) Zone Trainer Program

WARNING

User should consult a physician to determine an appropriate target heart rate in which to exercise in based on age, weight and physical condition. While Nautilus provides some target heart rate ranges, these are only approximations and should not be viewed as a medical recommendation.

The Heart Rate Zone Trainer program allows you to exercise at a selected target heart rate by automatically varying the intensity level (speed or incline) during the workout. The default target heart rate is equal to 70% of your maximum heart rate which is calculated by the following equation: Max HR = 215 – (.75 * Age). Target HR = Max HR * .7. To choose a different target heart rate (between 100 and 180 beats per minute) at any time during the workout, use the numeric keypad to enter the new target heart rate, followed by the [ENTER] key.

To use the HR Zone Trainer program:

1. For best results, use a telemetry heart rate chest belt. However, you can also use the contact HR grips located on the ergo bar in front of the console. If you use contact HR, speed will be limited to a maximum of 4.5 mph. Further, HR Control will be limited to Incline changes only.

If you are using the telemetry HR method, put the chest strap on. Remember to wet the electrodes underneath the chest strap. The console must detect a heart rate signal to allow selection of the HR Zone Trainer program.

If you will be using contact HR, then place your hands on the contact HR grips below the console.

2. Press the MORE WORKOUTS key. Then, use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays “HR ZONE TRAINER”, press [ENTER] to accept.

3. The console will display “ENTER WEIGHT - LBS” (or “ENTER WEIGHT - KG” if in Metric mode). Enter your weight using the numeric keypad and press [ENTER].

Or, press [ENTER] to accept the default value.

- Your weight is used to calculate the number of calories burned for each minute of exercise and the total number of calories burned for the exercise session.

4. The console will display “ENTER AGE 10 - 99.” Enter your age using the numeric keypad and press [ENTER].

Or, press [ENTER] to accept the default value of 40 years old.

5. The console will display "TARGET HR." A suggested target heart rate will be displayed, based on your age. Press [ENTER] to accept the calculated target heart rate, or enter a different target heart rate using the numeric keypad and then press [ENTER].

Or, press [ENTER] to accept the default value.

The target heart rate selected by the console is based on age, and is equal to 70% of your maximum heart rate which is calculated by the following equation: Max HR = 215 – (.75 * Age). Target HR = Max HR * .7. If desired, change the target heart rate at this point by using the numeric keypad to enter the new target heart rate, and then press [ENTER].

•During a workout, change to a new target heart rate that is between 100 and 180 beats per minute at any time during a workout by using the numeric keypad to enter the new target heart rate, and then pressing [ENTER].

7. The console will display "ENTER SPEED – MPH" or ("ENTER SPEED – KMH" if in Metric mode). Enter the desired speed using the numeric keypad and press (ENTER). Or, press "ENTER" to accept the default value.

8. The console will display "HR CONTROL MODE, 1 – SPEED, 2 – INCLINE" (only when using telemetry HR – if using contact HR, skip to step 9). Enter the desired form of HR Control by pressing 1 for SPEED or 2 for INCLINE. Or, press (ENTER) to accept the default value. If contact HR is being used, then this message is skipped and INCLINE control is automatically selected.

9. The console will display "ENTER TIME 5-99." Enter the desired time and press [ENTER]. Or, press [ENTER] to accept the default value.

10. The console will display "ENJOY WORKOUT" and the timer will begin.

The following messages may be displayed during a workout:

•"CHECK HR BELT" - Indicates that the telemetry heart rate signal has been missing for the last 30 seconds.

•"HOLD HR SENSORS" – Indicates that the contact heart rate signal has been missing for the last 30 seconds.

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

•"HR MODE DISABLED" – No heart rate signal is allowed due to the set up option that was chosen. Heart rate monitoring is not possible. To change HR option, refer to the HR Priority section of this manual.

To change your target heart rate during the workout:

•To change your target heart rate during the workout, use the numeric keypad to enter the desired target heart rate and press ENTER to accept. The new target heart rate will be used and the intensity level will change automatically to achieve the new target heart rate.

11. Press [STOP] to end the workout. The workout statistics will be displayed, and then the console will revert back to the "SELECT WORKOUT" message.

HR Intervals Program

The HR Intervals program allows the user to define an exercise Target HR, time at exercise Target HR, rest Target HR, time at rest Target HR and total exercise time. This program will change the intensity level by increasing or decreasing the speed or incline to keep the user in their defined Target HR zones.

To use the HR Intervals Program:

1. Press the MORE WORKOUTS key. Then use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "HR INTERVALS", press [ENTER] to accept.

2. The console will then display "ENTER WEIGHT – LBS" (or "ENTER WEIGHT – KG" if in Metric mode). Enter your weight using the numeric keypad and press (ENTER). Or, press [ENTER] to accept the default value.

3. The console will display "ENTER AGE 10 - 99." Enter your age using the numeric keypad. Or, press [ENTER] to accept the default value of 40 years old.

4. The console will then display "ENTER WORK TARGET HR". Enter the desired Target HR using the numeric keypad and press (ENTER). Or, press [ENTER] to accept the default value.

5. The console will display "WORK TARGET HR." A suggested target heart rate will be displayed, based on your age. Press [ENTER] to accept the calculated target heart rate, or enter a different target heart rate using the numeric keypad and then press [ENTER].

Or, press [ENTER] to accept the default value.

- The target heart rate selected by the console is based on age, and is equal to 80% of your maximum heart rate which is calculated by the following equation: Max HR = 215 – (.75 * Age). Target HR = Max HR * .8. If desired, change the target heart rate at this point by using the numeric keypad to enter the new target heart rate, and then press [ENTER].

- During a workout, change to a new target heart rate that is between 100 and 180 beats per minute at any time by using the numeric keypad to enter the new target heart rate, and then pressing [ENTER].

6. The console will display "ENTER WORK TIME". This is the amount of time you want to exercise in the work

target heart rate zone. Entire desired work time using the numeric keypad and press (ENTER). Or, press (ENTER) to accept the default value.

7. The console will then display "REST TARGET HR". A suggested target heart rate will be displayed, based on your age. Press (ENTER) to accept the calculated target heart rate, or enter a different target heart rate using the numeric keypad and then press (ENTER). Or, press (ENTER) to accept the default value.

The target heart rate selected by the console is based on age, and is equal to 65% of your maximum heart rate which is calculated by the following equation: Max HR = 215 – (.75 * Age). Target HR = Max HR * .65. If desired, change the target heart rate at this point by using the numeric keypad to enter the new target heart rate, and then press [ENTER].

9. The console will display "ENTER REST TIME". This is the amount of time you want to exercise in the rest target heart rate zone. Enter desired rest time using the numeric keypad and press (ENTER). Or press (ENTER) to accept the default value.

10. The console will display "ENTER SPEED – MPH" (or "ENTER SPEED – KMH" if in Metric mode). Enter the desired speed using the numeric keypad and press (ENTER). Or, press [ENTER] to accept the default value.

11. The console will display "HR CONTROL MODE, 1 – SPEED, 2 – INCLINE". Enter the desired form of HR Control by pressing 1 for SPEED or 2 for INCLINE. Or, press (ENTER) to accept the default value. If contact HR is used, then this message is skipped and Incline control will be automatically selected.

12. The console will then display "ENTER TIME". Enter desired total workout time using the numeric keypad and press "ENTER". Or, press (ENTER) to accept the default value.

13. The console will display "ENJOY WORKOUT" and the timer will begin.

The Fat Burner Program

The Fat Burner program is a 30 interval workout designed with moderate changes in the incline designed to stimulate fat store assimilation for users on a weight control program. The profile in the center display indicates the relative intensity. Any changes to the intensity level will not change the look of the remaining profile; however, the new intensity level will continue through the rest of the workout.

To use the Fat Burner program:

1. Press the MORE WORKOUTS key. Then, use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "FAT BURNER", press [ENTER] to accept.

2. The console will display "ENTER WEIGHT - LBS" (or "ENTER WEIGHT - KG" if in Metric mode). Enter your weight using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

- Your weight is used to calculate the number of calories burned for each minute of exercise and the total

number of calories burned for the exercise session.

3. The console will display "ENTER SPEED – MPH" (or "ENTER SPEED – KMH" if in Metric mode). Enter the desired speed using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

4. Next, the console will display "ENTER TIME 5 – 99". Enter the desired time and press [ENTER]. Or, press [ENTER] to select the default time.

5. The console will display "ENJOY WORKOUT" and the timer will begin.

- Speed may be changed at any time during the workout by pressing the [SPEED UP] key to increase the speed, or the [SPEED DOWN] key to decrease the speed. The new speed will continue through the rest of the workout until changed using the Speed keys.
- Incline may be changed at any time during the workout by pressing the [Incline: UP] key to increase the incline, or the [Incline: DOWN] key to decrease the incline. The new incline will continue through the rest of the workout until changed using the Incline keys.

The Calorie Burner Program

The Calorie Burner program is a 30 interval workout designed for users wanting to increase their aerobic capacity. The changes of intensity in the program are greater than the changes in the Fat Burner program, and are designed specifically to tax the cardiorespiratory system. The profile in the center display indicates relative intensity. Any changes to the intensity level will not change the look of the remaining profile; however, the new intensity level will continue through the rest of the workout.

To use the Calorie Burner program:

1. Press the MORE WORKOUTS key. Then, use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "CALORIE BURNER", press [ENTER] to accept.

2. The console will display "ENTER WEIGHT - LBS" (or "ENTER WEIGHT - KG" if in Metric mode). Enter your weight using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

- Your weight is used to calculate the number of calories burned for each minute of exercise and the total number of calories burned for the exercise session.

3. The console will display "ENTER SPEED - MPH" or ("ENTER SPEED – KMH" if in Metric mode). Enter the desired speed using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

4. Next, the console will display "ENTER TIME 5 – 99". Enter the desired time and press [ENTER]. Or, press [ENTER] to select the default time.

5. The console will display "ENJOY WORKOUT" and the timer will begin.

- Speed may be changed at any time during the workout by pressing the [SPEED UP] key to increase the speed,

or the [SPEED DOWN] key to decrease the speed. The new speed will continue through the rest of the workout until changed using the Speed keys.

- Incline may be changed at any time during the workout by pressing the [Incline: UP] key to increase the incline, or the [Incline: DOWN] key to decrease the incline. The new incline will continue through the rest of the workout until changed using the Incline keys.

6. Press [STOP] to end the workout. The workout statistics will be displayed, and then the console will revert back to the "SELECT WORKOUT" message.

Distance Goal

1. Press the MORE WORKOUTS key. Then, use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "DISTANCE GOAL", press [ENTER] to accept.

2. The console will display "ENTER WEIGHT - LBS" (or "ENTER WEIGHT - KG" if in Metric mode). Enter your weight using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

- Your weight is used to calculate the number of calories burned for each minute of exercise and the total number of calories burned for the exercise session.

3. The console will display "ENTER SPEED - MPH" or ("ENTER SPEED – KMH" if in Metric mode). Enter the desired speed using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

4. Next, the console will display "ENTER DISTANCE – MILES" (or "ENTER DISTANCE – KM" if in Metric mode). Enter the desired distance and press [ENTER]. Or, press [ENTER] to select the default distance (2 miles/3.2 km).

5. The console will display "ENJOY WORKOUT" and the timer will begin.

- Speed may be changed at any time during the workout by pressing the [SPEED UP] key to increase the speed, or the [SPEED DOWN] key to decrease the speed. The new speed will continue through the rest of the workout until changed using the Speed keys.

- Incline may be changed at any time during the workout by pressing the [Incline: UP] key to increase the incline, or the [Incline: DOWN] key to decrease the incline. The new incline will continue through the rest of the workout until changed using the Incline keys.

Calorie Goal

1. Press the MORE WORKOUTS key. Then, use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "CALORIE GOAL", press [ENTER] to accept.

2. The console will display "ENTER WEIGHT - LBS" (or "ENTER WEIGHT - KG" if in Metric mode). Enter your weight using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

- Your weight is used to calculate the number of calories burned for each minute of exercise and the total number of

calories burned for the exercise session.

3. The console will display “ENTER SPEED - MPH” or (“ENTER SPEED – KMH” if in Metric mode). Enter the desired speed using the numeric keypad and press [ENTER]. Or, press [ENTER] to accept the default value.

4.Next, the console will display “ENTER CALORIE GOAL”. Enter the desired calorie goal and press [ENTER]. Or, press [ENTER] to select the default goal (350 calories).

5. The console will display “ENJOY WORKOUT” and the timer will begin.

- Speed may be changed at any time during the workout by pressing the [SPEED UP] key to increase the speed, or the [SPEED DOWN] key to decrease the speed. The new speed will continue through the rest of the workout until changed using the Speed keys.
- Incline may be changed at any time during the workout by pressing the [Incline: UP] key to increase the incline, or the [Incline: DOWN] key to decrease the incline. The new incline will continue through the rest of the workout until changed using the Incline keys.

Random Play Workout

The Random Play Workout is a program that randomly changes the intensity throughout the workout time.

1. Press the MORE WORKOUTS key. Then use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays “RANDOM PLAY”, press [ENTER] to accept.

2. The console will then display “ENTER WEIGHT – LBS” (or “ENTER WEIGHT – KG” if in Metric mode). Enter your weight using the numeric keypad and press (ENTER). Or, press [ENTER] to accept the default value.

3. The console will display “ENTER SPEED – MPH” (or “ENTER SPEED – KMH” if in Metric mode). Enter the desired workout speed using the numeric keypad and press (ENTER). Or, press [ENTER] to accept the default value.

4. The console will then display “ENTER TIME”. Enter the desired time and press (ENTER). Or, press [ENTER] to accept the default value.

5. The console will display “ENJOY WORKOUT” and the timer will begin.

The Nautilus Fit Test Program

Understanding Sub-maximal Exercise Testing

Before using the Quinton® Treadmill by Nautilus - HR ClubTrack Plus Treadmill for sub-maximal exercise testing, it should be noted that all sub-maximal 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 sub-maximal 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 sub-maximal heart rates obtained be between 115 and 150 beats per minute, because it is within this heart rate range that a linear relationship tends to exist between heart rate and oxygen uptake or workload for most adults. When the heart rate is less than 115, many external factors (e.g., talking, laughing, apprehension, etc.) can greatly influence heart rate. Once the heart rate reaches a level between 115 and 150, external factors no longer influence heart rate, and a linear relationship exists. As the heart rate rises above 150, the heart-rate/oxygen uptake relationship becomes curvilinear.

The third assumption involves maximal heart rate. Maximal heart rate is the greatest heart rate that can be measured when an individual is exercising to the point of volitional fatigue (i.e., exhaustion) during a graded exercise test. The HR ClubTrack® Plus Treadmill uses the most current published equation developed to estimate the average maximal heart rate as follows:

- **Maximal heart rate = 215 minus (0.75 x age)**

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

Pretest Screening

Prior to any exercise test (maximal or sub-maximal), 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 sub-maximal 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?

Nautilus Sub-maximal Fit Test

The Nautilus® Fit Test is a program that estimates maximal aerobic capacity based on heart-rate response to sub-maximal exercise.

The Nautilus® branching protocol is a series of 3-minute stages of continuous exercise at increasing intensity. The first stage is a warm-up at approximately 4 METs. The intensity of the remaining stages is based on the heart rate response to the warm-up. The test is designed to raise the steady state heart rate of the subject to at least 115 beats/minute. It is important to remember that two consecutive heart rate measurements must be obtained above 115 beats/minute to predict $VO_{2\,max}$. The test typically lasts from 6 to 15 minutes. The test will terminate if the heart rate does not continue to rise from state to stage.

In the Nautilus® protocol, each work rate is performed for 3 minutes, with heart rates recorded during the final 4 seconds of the second and third 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 two to four stages until two steady state heart rates above 115 beats/min are obtained in two 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 VO2max 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 two consecutive heart rate measurements are obtained above 115 beats/min range, then the test ends successfully and the results are displayed. 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.

To use the Fitness Test program:

1. Put the chest strap on. Remember to wet underneath the chest strap, over the electrodes. For test accuracy, use of a telemetry chest strap is required.

2. Press the [MORE WORKOUTS] key. Then use the Speed or Incline UP or DOWN keys to scroll through the program options. When the console displays NAUTILUS FIT TEST, press [ENTER] to select.

3. The console will then display ENTER WEIGHT - LBS (or ENTER WEIGHT - KG if in Metric mode). Enter your weight using the numeric key keypad.

4. The console will display ENTER AGE 10 -99. Enter your age using the numeric keypad.

5. The console will display ENTER GENDER / 1 - MALE / 2 - FEMALE. Enter your gender code using the numeric keypad.

6. The console will display BEGIN FIT TEST. Follow the on screen prompts. The following messages may be displayed during a
   fitness test:

   - CHECK HR BELT - Indicates that the heart rate signal has been missing for the last 30 seconds.

7. The test will be terminated early, and the messages TEST TERMINATED / TRY AGAIN LATER will be displayed if

   - The user stops exercising at any point during the test.
   - The [STOP] key is pressed.
   - The heart rate response to each work level is the same or less than the previous work level.
   - The heart rate never reaches 115 beats/minute.
   - The heart rate continues to rise after the
     fifth minute.

8. The test is complete when two consecutive steady-state heart rates are obtained above 115 beats/minute. The test can be as short as 6 minutes, or as long as 15 minutes.

   - No cool down is done at the end of the test.

9. The estimated maximal aerobic capacity is displayed in METs, and $VO_{2\,max}$. The results are compared to normative values of the same age and gender 1 (see below), and given a fitness rating of Low, Fair, Average, Good, or High.

Fitness Rating Norms (VO2max)

	AGE	20 – 29	30 – 39	40 – 49	50 – 59	60 +
Men	High	51.4 +	50.4 +	48.2 +	45.3 +	42.5 +
	Good	51.3 – 46.8	50.3 – 44.6	48.1 – 41.8	45.2 – 38.5	42.4 – 35.3
	Average	46.7 – 42.5	44.5 – 41.0	41.7 – 38.1	38.4 – 35.2	35.2 – 31.8
	Fair	42.4 – 39.5	40.9 – 37.4	38.0 – 35.1	35.1 – 32.3	31.7 – 28.7
	Low	39.4 or less	37.3 or less	35.0 or less	32.2 or less	28.6 or less
Women	High	44.2 +	41.0 +	39.5 +	35.2 +	35.2 +
	Good	44.1 – 38.1	40.9 – 36.7	39.4 – 33.8	35.1 – 30.9	35.1 – 29.4
	Average	38.0 – 35.2	36.6 – 33.8	33.7 – 30.9	30.8 – 28.2	29.3 – 25.8
	Fair	35.1 – 32.3	33.7 – 30.5	30.8 – 28.3	28.1 – 25.5	25.7 – 23.8
	Low	32.2 or less	30.4 or less	28.2 or less	25.4 or less	23.7 or less

1 The American College of Sports Medicine, Guidelines for Exercise Testing and Prescription, 6th Edition, Lippincott WIlliams & WIlkins, Philidelphia, PA, 2000, p. 77.

Firefighter Fit Test (Gerkin Test)

The Firefighter Fit Test has a total of 16 stages lasting one minute each. The first 3 stages are a warm-up set with a speed of 3 mph and 0% incline. The following stages increase speed or incline from the previous stage. When the test terminates, the "Cool Down" mode will be entered. The "Cool Down" mode will set the speed to 1 mph and the incline to 0%.

To use the Firefighter Fit Test program:

1. Put the chest strap on. Remember to wet the underneath of the chest strap, over the electrodes.

2. Press MORE WORKOUTS key. Then use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "GERKIN TEST", press [ENTER] to select.

3. The console will then display "ENTER WEIGHT - LBS" (or "ENTER WEIGHT - KG" if in Metric mode). Enter your weight using the numeric key keypad and press [ENTER].

4. The console will display "ENTER AGE 10 - 99." Enter your age using the numeric keypad and press [ENTER].

5. The console will display "ENTER GENDER / 1 - MALE / 2 - FEMALE. Enter your gender code using the numeric keypad and press [ENTER].

6. The console will display "PRESS START". Press the [START] key to begin the test. Follow the onscreen prompts. The first 3 stages represent a 3-minute warm-up at 3 mph and 0% incline. The exercise time does not start until the warm-up is completed. At the beginning of the test, the timer will count up from 0:00.

The following messages may be displayed during a fitness test:

- "CHECK HR BELT" - Indicates that the heart rate signal has been missing for the last 30 seconds.

7. The test will be terminated early, and the messages "TEST TERMINATED / TRY AGAIN LATER" will be displayed if:

- The user stops exercising at any point during the test.
- The [STOP] key is pressed.
- 85% of the age predicted maximum heart rate is achieved.
- If after the 16 stages have been completed, the age predicted heart rate has not been achieved.
- The heart rate response to each work level must be greater than the heart rate response to the last level.

8. The test is complete when the subject's HR reaches 85% of their age-predicted maximum HR according to the following formula:

Max Heart Rate (MaxHR) = 215 – {0.75 * Age}

Target Test Heart Rate = 0.85 * Max Heart Rate

9. Following the test, the program enters cool down, the treadmill speed decreases to 1 mph and incline to 0%. The subject's heart rate is measured at the end of one minute.

10. At the end of the 1 minute Cool Down, the "Test Complete" message is displayed and the test statistics are scrolled twice as follows:

- Total Exercise Time
- Target Heart Rate
- Target Speed
- Target Incline
- Target METs
- Recovery Heart Rate

The Military Fit Test

The Military Fit Tests allow the user to select one of four military physical readiness tests: Air Force PFT, Army PFT, Marine PFT and Navy PRT.

Air Force Physical Fitness Test (PFT)

The Air Force PFT on the treadmill is a 1.5 mile run. The time that it takes for the subject to complete the 1.5 miles is compared to the table and a component point total is given.

The test is comprised of up to a 3 minute warm-up followed by the test session. During the warm-up period, the subject can press the START or QUICK START key at any time to begin the test session. During the warm-up, the subject can adjust incline or speed as desired. If the START or QUICK START key is not pressed during the warm-up, then, at the end of the 3 minutes, the test automatically enters the test session.

At the start of the test session, the treadmill incline goes to 1% incline and stays in that position. The subject cannot change the incline. The subject changes the speed of the treadmill as desired to complete the test as quickly as possible. At the beginning of the test session, the time and distance begin to accumulate from 0.

When 1.5 miles is achieved, the time stops accumulating, and the treadmill enters the Cool Down state. During Cool Down and after the STOP key is pressed, the test summary is scrolled, displaying the test time in minutes and seconds, and the component point value associated with the test time based on sex and age group.

To use the Air Force PFT:

1. Press MORE WORKOUTS key. Then use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "MILITARY TESTS", press [ENTER] to select.

2. Use the SPEED UP or DOWN keys to scroll through the Military Fit Test options. When the console displays "AIR FORCE PFT", press [ENTER] to select.

3. The console will display "ENTER AGE 10 - 99." Enter your age using the numeric keypad and press [ENTER].

4. The console will display "ENTER GENDER / 1 - MALE / 2 - FEMALE. Enter your gender code using the numeric keypad and press [ENTER].

5. Press the [START] key to begin the test. The console will display "3 MINUTE WARM-UP."

6. At the end of 3 minutes or if the [START] key is pressed, the console will display "BEGIN TEST" and the test session will begin.

7. The test is complete when the subject achieves 1.5 miles.

8. Following the test, the program enters the Cool Down state and the test time is displayed.

Army Physical Fitness Test (PFT)

The Army PFT on the treadmill is a 2.0 mile run. The time that it takes for the subject to complete the 2 miles is compared to the table and a component point total is given.

The test is comprised of up to a 3 minute warm-up followed by the test session. During the warm-up period, the subject can press the START or QUICK START key at any time to begin the test session. During the warm-up, the subject can adjust incline or speed as desired. If the START or QUICK START key is not pressed during the warm-up, then, at the end of the 3 minutes, the test automatically enters the test session.

At the start of the test session, the treadmill incline goes to 1% incline and stays in that position. The subject

cannot change the incline. The subject changes the speed of the treadmill as desired to complete the test as quickly as possible. At the beginning of the test session, the time and distance begin to accumulate from 0.

When 2.0 miles is achieved, the time stops accumulating, and the treadmill enters the Cool Down state. During Cool Down and after the STOP key is pressed, the test summary is scrolled, displaying the test time in minutes and seconds, and the component point value associated with the test time based on sex and age group.

To use the Army PFT:

1. Press MORE WORKOUTS key. Then use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "MILITARY TESTS", press [ENTER] to select.

2. Use the SPEED UP or DOWN keys to scroll through the Military Fit Test options. When the console displays "ARMY PFT", press [ENTER] to select.

3. The console will display "ENTER AGE 10 - 99." Enter your age using the numeric keypad and press [ENTER].

4. The console will display "ENTER GENDER / 1 - MALE / 2 - FEMALE. Enter your gender code using the numeric keypad and press [ENTER].

5. Press the [START] key to begin the test. The console will display "3 MINUTE WARM-UP."

6. At the end of 3 minutes or if the [START] key is pressed, the console will display "BEGIN TEST" and the test session will begin.

7. The test is complete when the subject achieves 2.0 miles.

8. Following the test, the program enters the Cool Down state and the test time is displayed.

Marine Physical Fitness Test (PFT)

The Marine PFT on the treadmill is a 3.0 mile run. The time that it takes for the subject to complete the 3 miles is compared to the table and a component point total is given.

The test is comprised of up to a 3 minute warm-up followed by the test session. During the warm-up period, the subject can press the START or QUICK START key at any time to begin the test session. During the warm-up, the subject can adjust incline or speed as desired. If the START or QUICK START key is not pressed during the warm-up, then, at the end of the 3 minutes, the test automatically enters the test session.

At the start of the test session, the treadmill incline goes to 1% incline and stays in that position. The subject cannot change the incline. The subject changes the speed of the treadmill as desired to complete the test as quickly as possible. At the beginning of the test session, the time and distance begin to accumulate from 0.

When 3.0 miles is achieved, the time stops accumulating, and the treadmill enters the Cool Down state. During Cool Down and after the STOP key is pressed, the test summary is scrolled, displaying the test time in minutes and seconds, and the component point value associated with the test time based on sex and age group.

To use the Marine PFT:

1. Press MORE WORKOUTS key. Then use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "MILITARY TESTS", press [ENTER] to select.

2. Use the SPEED UP or DOWN keys to scroll through the Military Fit Test options. When the console displays "MARINE PFT", press [ENTER] to select.

3. The console will display "ENTER AGE 10 - 99." Enter your age using the numeric keypad and press [ENTER].

4. The console will display "ENTER GENDER / 1 - MALE / 2 - FEMALE. Enter your gender code using the numeric keypad and press [ENTER].

5. Press the [START] key to begin the test. The console will display "3 MINUTE WARM-UP."

6. At the end of 3 minutes or if the [START] key is pressed, the console will display "BEGIN TEST" and the test session will begin.

7. The test is complete when the subject achieves 3.0 miles.

8. Following the test, the program enters the Cool Down state and the test time is displayed.

Navy Physical Readiness Test (PRT)

The Navy PRT on the treadmill is a 1.5 mile run. The time that it takes for the subject to complete the 1.5 miles is compared to the table and a component point total is given.

The test is comprised of up to a 3 minute warm-up followed by the test session. During the warm-up period, the subject can press the START or QUICK START key at any time to begin the test session. During the warm-up, the subject can adjust incline or speed as desired. If the START or QUICK START key is not pressed during the warm-up, then, at the end of the 3 minutes, the test automatically enters the test session.

At the start of the test session, the treadmill incline goes to 1% incline and stays in that position. The subject cannot change the incline. The subject changes the speed of the treadmill as desired to complete the test as quickly as possible. At the beginning of the test session, the time and distance begin to accumulate from 0.

When 1.5 miles is achieved, the time stops accumulating, and the treadmill enters the Cool Down state. During Cool Down and after the STOP key is pressed, the test summary is scrolled, displaying the test time in minutes and seconds, and the component point value associated with the test time based on sex and age group.

To use the Navy PRT:

1. Press MORE WORKOUTS key. Then use the SPEED or INCLINE UP or DOWN keys to scroll through the program options. When the console displays "MILITARY TESTS", press [ENTER] to select.

2. Use the SPEED UP or DOWN keys to scroll through the Military Fit Test options. When the console displays "NAVY PRT", press [ENTER] to select.

3. The console will display "ENTER AGE 10 - 99." Enter your age using the numeric keypad and press [ENTER].

4. The console will display "ENTER GENDER / 1 - MALE / 2 - FEMALE. Enter your gender code using the numeric keypad and press [ENTER].

5. Press the [START] key to begin the test. The console will display "3 MINUTE WARM-UP."

6. At the end of 3 minutes or if the [START] key is pressed, the console will display "BEGIN TEST" and the test session will begin.

7. The test is complete when the subject achieves 1.5 miles.

8. Following the test, the program enters the Cool Down state and the test time is displayed.

Options During a Workout

After the message, "Enjoy Workout", is displayed, your workout statistics will begin to accumulate. The exercise statistics include, in order:

Incline

Speed

Calories / Hour

Distance

Vertical Climbed

Power in watts

METs

Target Heart Rate (in Heart Rate Control programs only)

The 20 x 30 brickyard in the lower half of the display will show the exercise profile of the workout program selected. Each column represents an equal portion of the total workout and the flashing column will advance across the brickyard as you progress through your workout.

Changing Speed, Incline or Target Heart Rate During a Workout

- The speed may be changed at any time during the workout by pressing the [SPEED UP] key to increase the speed, or the [SPEED DOWN] key to decrease the speed. The console will display SPEED – MPH, or (SPEED – KMH if in Metric mode).
- During the workout, the incline may be changed at any time by pressing the [Incline: UP] key to increase the incline, or the [Incline: Down] to decrease the incline. The console will display INCLINE.
- **In Heart Rate Control programs**, you can use the numeric keys to change the Target Heart Rate. If the user presses a numeric key in a Heart Rate Control program, then the message line will display TARGET HR.

  Once you enter your desired target heart rate, press [ENTER] to accept, and the console will gradually change the speed and/or incline to move you to the new target heart rate.

Pausing Your Workout

The program automatically enters the PAUSE state from a workout when the STOP key is pressed. The workout will be suspended, and the program will display the following alternating messages every 3 seconds for up to 1 minute, WORKOUT PAUSED, PRESS STOP OR, PRESS START.

When the program enters a PAUSE state, the interval timer begins to count down from 1 minute to show you the time remaining in the pause condition.

To leave the PAUSE state:

- At the end of the one minute count down, the current workout ends, the accumulated exercise statistics are scrolled, and the program returns to the opening message.
- If the user presses STOP or CLEAR or [1], then the program ends, the accumulated exercise statistics are scrolled, and the program returns to the opening message.
- If the user presses the [2] key, then the workout proceeds from where it was suspended.

End of Your Workout

The program is at the end of the workout when the workout time is completed, or from the PAUSE state when the STOP key is pressed. At this point, each workout statistic is scrolled with averages calculated and displayed for Incline, Speed, Distance, Calories/Hour, Watts, METs, and Heart Rate.

HEART RATE MONITORING

Telemetry (e.g. using a Polar® or Polar-compatible transmitter belt). A Polar-compatible heart rate chest belt transmits the heart beat signal to the receiver in the display. The display shows the heart rate in beats per minute and uses the heart rate value in heart rate control mode.

Heart rate monitoring helps users monitor their levels of exertion by displaying the heart rate during exercise. There are two methods of monitoring heart rate on the HR ClubTrack Plus Treadmill:

Telemetry Heart Rate

The telemetry heart rate monitoring system consists of the receiver, located in the display, 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 far right decimal point in the Heart Rate Display pulses to indicate that the display is receiving a valid signal. A microprocessor in the controller calculates the heart rate and shows it, in beats per minute, on the display.

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.

After the initial heart rate signal is detected, the display 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.

If your heart rate is not being displayed, try the following:

- Move closer to the display.
- Tighten the elastic band on 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.

WARNING!

Pacemaker users should not use the telemetry transmitter without first consulting with their doctor.

Maintaining the Transmitter Belt

Clean the chest belt regularly with mild soap and water, then dry thoroughly – residual sweat and moisture keeps the transmitter active and will 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. Replacement belts can be purchased from an Authorized Nautilus® Fitness Retailer or at www.nautilus.com.

The HR ClubTrack® Plus offers telemetry (e.g., Polar) heart rate signal detection only (contact heart rate is not available). Heart rate priority defaults to telemetry, unless HAND ONLY or BOTH HR OFF options are selected. Then, telemetry signals are locked out. To detect a telemetry signal, select one of the following options: EITHER INPUT, LOCKED INPUTS, or TELEMETRY ONLY.

Locked/Non-Locked Heart Rate Signal Options

When the EITHER INPUT option is selected the heart rate source signal is not fixed during the workout session

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

2. There are five options to handle heart rate input signals. Press the [SPEED UP] and [SPEED DOWN] keys to scroll through the options until you find the option that you want. Press the [ENTER] key to select that option.

   The options are as follows:

   LOCKED INPUTS – 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.

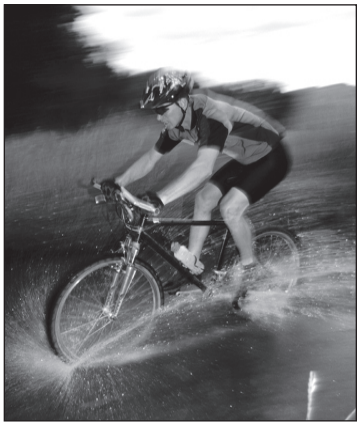
   EITHER INPUT – allows either telemetry or contact heart rate signals to be detected. Does not lock out a particular input signal for the entire workout. This option will detect either input signal during a workout session, but only one at a time, and only until the other signal terminates.

   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 heart rate signal. Used in rare situations where there is excessive interference with the heart rate signals.

   - During workouts where heart rate is necessary, such as the HR Zone Trainer and the Fitness Test, the console will pick up telemetry heart rate signals so that the programs are not disabled.



No single fitness program is suitable for all. All fitness programs should be designed by fitness professionals who are trained to tailor the program to the individual goals and fitness levels of each client. The following information on exercise intensity, duration, and frequency is based on averages and is included here only as a guideline for use by fitness professionals. Programs should be altered for comfort and safety when necessary.

Exercise and Health

It is not a secret that lack of exercise is increasingly becoming a major health issue. Obesity is on the rise, and being overweight can contribute to an increased risk in heart attack, diabetes, high blood pressure and other life threatening illnesses.

Most people do not get enough activity during the day to make up for the time they spend at their desks, driving their cars or sitting in front of their televisions. We have learned that exercising is not simply something we must do to look good and have a great body. Exercise is a requirement for health, and overall wellness, not to mention it can help you feel great!

The good news is that we are seeing more and more research that indicates we don't have to work out intensely to see the benefits. Sure, it is great if you can workout for 30-40 minutes at a time, five days a week. But it is not essential. Shorter bouts of exercise can have a great effect (especially if you are just starting out), and a little bit of exercise at a time is much better than none at all.

And what is really exciting is that research indicates that whether you are young or old, people who workout at light to moderate intensities may have an easier time sticking to their exercise programs than those people who work out harder and more often.

So, you do not need to be an athlete or a fitness "die-hard" to benefit from exercise… you just need to get started, work out at levels that are comfortable and enjoyable to you and stick with it!

Steps to Getting Started

Once you have made the commitment to start an exercising program, here are some suggestions that may help you stay motivated.

The first step is the most difficult. Any new habit is difficult to establish at first, but it can be done. Be patient, and plan to start slow and easy. Less is more when you are first starting out… don't overdo it!

Get a physical exam. If you have been inactive for several years or new to an exercise program, be sure to ask your doctor before beginning any exercise program. Especially if you are over 30, have health problems or have a history of heart disease in your family.

Find an exercise buddy. Research has shown that starting an exercise program with someone can increase your chances of sticking to it. If you have a buddy that is also starting a program, you can encourage, motivate and challenge each other.

Make fitness a part of your schedule. Include it in your daily planner just as you would any other appointment. Plan ahead for the week so that you can be sure to fit it in. Even if you are pressed for time one day, a little exercise is better than none at all. Do what you can to fit it in, even if you have less time than you hoped for.

Use positive affirmations. Affirmations will help you program your subconscious to accept new beliefs. Saying to yourself a couple of times a day, "I am living a healthier lifestyle by exercising several times per week at home," can help you stay on track.

Set goals. Setting goals can be helpful in keeping you motivated, but remember to keep them realistic. Short-term and long-term goals can make this easier. How many days do you want to exercise this week? How many workouts would you like to have done in 90 days or a year?

Components of Fitness

Over the past 25 years, many people have focused on walking, running, cycling, swimming and other types of aerobic activity as their only means of exercise.

However, we have learned that two other components of fitness are just as important. These other two components are muscle strength and flexibility. So in addition to having a strong heart and lungs, we also need to be able to pick up a full bag of groceries and tie our shoes without having to sit down.

When developing a fitness program, it is only appropriate that you develop all three components in order to achieve balanced overall fitness. Let's take a look at all three components:

Cardiovascular Fitness is training the heart and lungs to be stronger and deliver more oxygen throughout your body with less effort. It can help reduce the risk of heart disease, and help you manage your weight. It is the cornerstone of fitness, and can be achieved in many ways such as walking or running on the treadmill or outdoors, climbing stairs, cycling, using a StairMaster® stepper or swimming in the pool or ocean.

For many years, it was suggested that moderate level cardiovascular activity (activities that make you sweat and breathe and a moderate pace) should be done 3 – 4 days a week for 15 – 45 minutes at a time. It is now recommended that you attempt to do some cardiovascular activity EVERY day, if possible.

The good news is that the cardiovascular activity does not need to be moderately intensive everyday, nor does it need to be sustained for 15 – 45 minutes at a time.

So while it is ideal to challenge your heart and lungs by doing something like a strong power walk every other day for 15 – 45 minutes, it is more important to make sure you do at least a little bit of cardiovascular activity every day, even if you don't do it for very long or very intensely.

For example, you might try using a Nautilus® treadmill for a scheduled, moderate level workout for 20 – 30 minutes on Monday, Wednesday, Friday and Sunday (see the intensity monitoring section for further details on how hard to workout). On the other days, you might try going for a leisurely stroll 10 minutes in the morning and in the evening (or whenever you can fit it in).

Whatever you do, just make sure you get your body moving, and your heart and lungs pumping for some period of time every day.

Muscular Strength is training your muscles to remain strong using resistance such as Nautilus® strength machines, dumbbells, elastic tubing or your body weight. In the past decade, we have learned that building or maintaining muscular strength is extremely important for a balanced fitness program. And it is especially important as we get older.

We have learned through a variety of studies that those individuals who just train aerobically (without strength training) do maintain their cardiovascular endurance over the years, but they generally lose lean muscle mass as they get older. However, those individuals who combine strength training and cardiovascular training can maintain their lean body mass as they get older. What this means is that if you just do cardiovascular activity, your body will naturally lose muscle mass as you get older, and that means that you will actually get "fatter" as you age, unless you incorporate strength training.

We have also learned that consistent strength training helps maintain bone and muscle mass as we get older. For women, strength training (along with cardiovascular training) may also protect against post-menopausal bone loss and osteoporosis in their later years.

And strength training is not complicated. It is recommended that you do 8 – 12 repetitions of 8 – 10 major muscle groups at least 2 days a week. However, you don't have to do all these exercises at once. You can break them up into shorter workouts throughout the day. For example, you can do just upper body exercises in the morning, and your lower body exercises in the evening. Or, you can alternate strength exercises with cardiovascular exercise (often known as circuit training) by switching back and forth every couple of minutes.

Flexibility is being able to bend, reach, twist and turn with comfort and ease as we perform daily tasks, play or exercise. It is perhaps the most ignored component of fitness, but certainly the easiest one to incorporate into our daily lives because it can be done anywhere and almost at any time.

To maintain your flexibility, you simply need to stretch. This could be as simple as reaching for your toes, or reaching overhead when you wake up in the morning. Or maybe you enjoy it so much that you would be interested in trying the Nautilus® yoga workout video. You can even incorporate stretching into your strength training workouts by stretching the muscles you have used immediately after you have completed your exercise set.

Like cardiovascular training, it is recommended that you stretch every day. However, you do not need to create a formalized program. You can simply make sure that you stretch your major muscle groups throughout the day. Make sure you include your thighs, calves, hamstrings, back, chest, neck and shoulders.

Do what feels good, but also remember to mix it up. Don't just do traditional "reach and hold" stretches. Also, try gently moving through a range of motion that is comfortable to you. For example, you don't have to stretch your neck simply by pulling on your head with your hand. You can also just rotate the neck slowly around and look side to side.

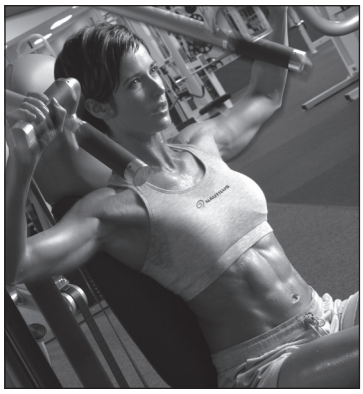
Nutrition

Of course, every good health and fitness program will also include a good nutrition component. Good nutrition is likely the most important factor in maintaining ideal body weight and managing weight loss.

There are a variety of schools of thought regarding which nutrition program, diet or eating plan is best. While we do not promote or endorse any particular one, here are some things to consider that will help you get on the road to a healthy diet:

Understand caloric balance. How many Calories you intake, and how many Calories you burn off will determine whether you will gain or lose weight day to day. It is impossible to achieve weight loss without some sort of "Caloric deficit" that can be obtained through cutting Calories, or burning off more than you take in. The wisest approach is to do a little of both – cutting Calories and exercising. It is the only proven long-term weight management program that is successful. You should ensure that you are consuming at least 1,200 Calories per day total. A total weight loss of no more than 2 pounds per week is recommended for long-term weight management.

Eat a variety of foods. Regardless of your eating plan, you should be sure to include a variety of foods in your diet, maximizing your intake of fruits and vegetables whenever possible. Colorful meals and snacks that are divided amongst the 4 food groups will ensure that you obtain the nutrients needed for your body to function at optimal levels. Any diet that focuses on just one food group source or processed foods can be unhealthy in the long run, and should be avoided. Don't focus too much on any particular meal or snack, but rather on your overall intake of a variety of different foods during any given day.



Drink water. Our bodies are made up of over 70% water, and most of us don't drink enough. Carry water with you everywhere you go, and drink as often as you can. This helps the body function at optimum levels, and can significantly help with weight management.

Eat more often and be mindful of your portions. Research has shown that it can be helpful to eat smaller meals more often versus 3 larger meals a day if you are looking to promote healthy weight maintenance or weight loss. And we have discovered that many portions we eat are much larger than necessary, and can be laden with Calories. So, try snacking more and not eating so many large meals, and share your snacks or food with others (or break your portions in half) to help manage your Caloric intake.

Monitoring Your Intensity

When you are doing cardiovascular workouts, it is important that you work at the appropriate intensities when you are first starting out. It is also important that you workout at a variety of intensities after you have built a fitness base.

Research in recent years has indicated that one of the best ways to monitor your cardiovascular intensity is to pay close attention to how you are feeling when you workout. Most individuals can do a very good job of choosing the correct intensities if they simply categorize how they feel into one of four intensity "zones."

These zones could be described the following ways:

Zone 1	**• Easy • Warm-up • Cool-down**
Zone 2	**• Challenging, but comfortable • Steady endurance pace**
Zone 3	**• Challenging, and slightly uncomfortable • Race pace • Borderline out of breath**
Zone 4	**• Breathless • Not maximum, but winded • Can't keep the pace for very long**

When you are first starting out, you should exclusively work in the Zone 1 and Zone 2 intensities. After a few weeks, you can occasionally incorporate Zone 3 and Zone 4 intensities for short periods of time. Remember, when you begin to incorporate Zone 3 and Zone 4 intensities, you will find that you will likely have to drop down to Zone 1 intensities shortly thereafter as brief recovery periods.

For variety, you can spend a little bit of time in each of the four Zones during one workout, and then spend your time in just one Zone during the next workout.

Prenatal woman should always remain at Zone 1 and Zone 2 intensities, and anyone unaware of their current medical condition should also avoid Zone 3 and Zone 4 without prior clearance from their doctor.

These Zones can be translated into target heart rate numbers if your fitness product has a grip or telemetric heart rate counter. Research has shown the best way to do this is not to establish heart rate numbers based upon age, but rather based upon how you feel.

The following chart will allow you to log your heart rate numbers based upon how you feel when working out. Simply log the heart rate numbers you find when you feel you are working at each of the specific intensities.

Zone	Description of Workout Intensity	Approximate Percentage of Maximum Heart Rate	Log Your Heart Rate	Your Heart Rate
1	• Easy • Warm-up • Cool-down	50% – 65%	Enter the heart rate you get when you are working in Zone 1 ▶	
2	• Challenging, but comfortable • Steady endurance pace	65% – 75%	Enter the heart rate you get when you are working in Zone 2 ▶	
3	• Challenging, and slightly uncomfortable • Race pace • Borderline out of breath	75% – 85%	Enter the heart rate you get when you are working in Zone 3 ▶	
4	• Breathless • Not maximum, but winded • Can't keep the pace for very long	85% – 90%	Enter the heart rate you get when you are working in Zone 4 ▶	

As you get in better shape, the heart rate number you obtain for each zone will get higher and higher, which means your heart is able to handle higher intensities. Or you may find that your numbers don't change, but you are able to stay in Zone 3 and Zone 4 longer than you used to.

Don't get too attached to any specific number or target heart rate. If you train properly, you will notice numbers that used to be difficult have now become easier. You will also notice that if you are sick or over-tired, you may find that numbers that usually feel fairly easy are one day much harder, and it is a good sign to take a break. If you notice that numbers that are usually very challenging are one day fairly easy, then it is a good time to push yourself.

Listening to your body, and using your heart rate numbers (when available) will enable you to keep track of your intensity and see your progress as you train.

Beating The Dropout Odds

The Surgeon General's Report on Physical Activity and Health summarizes a few main points:

1. Regular physical activity offers substantial improvements in health and well-being for a majority of Americans.

2. If you exercise regularly, you'll reduce your risk of heart attack, cancer, diabetes, high blood pressure, osteoporosis and even the common cold.

3. Regular exercise, regardless of the intensity, can help you control stress, sleep problems and depression.

The benefits of exercise and activity are AMAZING! And yet, only 22 percent of Americans engage in exercise for 20 minutes a day. And even among individuals who begin exercise programs, the dropout rate is about 50 percent.

So, how do you beat these odds? The answer appears to be in how your start and maintain your exercise program as well as how you create a habit of exercise.

Why are you starting an exercise program? For most individuals, it is to lose weight and look better, which are great reasons. However, since changes in your body shape and size can be gradual, and won't happen overnight, it is important to focus on other benefits so that you will remain motivated.

Thrive on the energy that exercise gives you. Watch your health risks scores go down. Pay attention to how much easier everyday activity is. Notice how much better you are sleeping. These kinds of additional benefits will continue to keep you motivated if you make them just as important to you as weight loss.

Additionally, try not to view exercise as punishment. Look at it as an investment in your health. If you don't feel motivated to workout one day, think of something that is appealing to you that is active, and change your workout. Try not to let your workout become routine or mundane, and always remember that some exercise is better than none at all. So, if you feel you are not motivated to continue, stop your workout early, or skip a day. It just might be the thing you need to get you excited about your next workout.

Possibly the most important thing is to keep progressing your exercise program slowly. Big increases in time or intensity can set you up for injury, and cause you to drop out. Unless you are a world-class athlete, there is no reason to workout at world-class levels. Remember to give yourself some days off and get proper rest.

Finally, try to anticipate lapses. If you are traveling, or your schedule is becoming busier, and you are fearful you may get off track, try planning ahead. For example, book a hotel that has a workout facility or change up your workout so that you keep your interest high and your boredom low. The bottom line is you must be creative and innovative to keep up your fitness program. With some imagination and planning, it is easy to do.

Suggested Reading:

The Complete Home Fitness Handbook by Edmund Burke, Human Kinetics Publisher.

Full Body Flexibility by Jay Blahnik, Human Kinetics Publisher.

Building Strength and Stamina by Wayne Wescott, PhD, Human Kinetics Publisher.

Cross-Training for Dummies by Tony Ryan and Martica Heaner, For Dummies Publisher.

There are 4 groups of console codes as follows: Customization (codes starting with 2 or 3), Machine Status (codes starting with 4), Diagnostic (codes starting with 6 or 7), and Configuration (codes starting with 8). Each group of codes is defined below. To access these console codes and the options within each group, follow the instructions for each section.

Customizing the HR ClubTrack Plus Treadmill

You can customize several parameters on the HR ClubTrack Plus to conform to your individual requirements, including changing the workout default values and setting custom parameters such as time limits, changing screen contrast, changing language, and changing units.

To change the workout default values:

1. Press [SPEED UP], [2], [ENTER]. The console will display DEFAULTS.

2. Press [SPEED UP] or [SPEED DOWN] to scan through the default choices. Select the option you want to change by pressing [ENTER]. Then, use the [SPEED UP] or [SPEED DOWN] keys to view the choices for the selected option. Press [ENTER] to accept the choice for that option.

   The default options are as follows:

   Change default weight

   Use the numeric keypad or [SPEED UP] or [SPEED DOWN] keys to change the desired default weight for your facility. Press [ENTER] to accept the new value.

   Change default workout time

   Use the numeric keypad or [SPEED UP] or [SPEED DOWN] keys to change the desired default workout time between 10 and 99 minutes. Press [ENTER] to accept the new value.

   Change default age

   Use the numeric keypad or [SPEED UP] or [SPEED DOWN] keys to change the desired default age used to calculate target heart rate. Valid age range is between 10 and 99 minutes. Press [ENTER] to accept the new value.

   Change default % Target HR

   Use the numeric keypad or [SPEED UP] or [SPEED DOWN] keys to change the desired target HR value based on maximum HR. This is used to calculate the target heart rate value based on the % of maximum HR. Valid target HR % is between 40 and 90%. Press [ENTER] to accept the new value.

   Change default Speed

   Use the numeric keypad or [SPEED UP] or [SPEED DOWN] keys to change the desired default speed for your facility. Valid speed range is 0.5 - 12 mph (0.8 - 19.2 kph) Press [ENTER] to accept the new value.

   Change Quick Start start speed

   Use the numeric keypad or [SPEED UP or DOWN] keys to change the desired start speed for the Quick Start feature. Valid speed values are either 0.5 mph or 1.0 mph. (0.8 kph or 1.6 kph).

To customize the console for your use:

1. Press [SPEED UP], [3], [ENTER]. The console will display “CUSTOMIZE.”

2. Press [SPEED UP or DOWN] to scan through the customize choices. Select the option you

want to change by pressing [ENTER]. Then, use the [SPEED UP or DOWN] keys to view the choices for the selected option. Press [ENTER] to accept the choice for that option.

The customize options are as follows:

Max time limit

- Use the numeric keypad to enter the desired time limit between 5 and 99 minutes. Press [ENTER] to accept the new time limit.

Change default Cool Down Time

- Use the numeric keypad or [SPEED UP or DOWN] keys to change the desired default cool down time between 1 and 10 minutes. Press [ENTER] to accept the new value.

Change units

- Use the [SPEED UP or DOWN] keys to toggle between USA units and Metric units. Press [ENTER] to select your option.

Choose the type of heart rate input.

- See Heart Rate Priority in the previous section for details of the choices.

Select Stats

Use the [Speed UP or DOWN] keys to view the choices (Vertical Feet, Calories/Hour, Watts and METs). Press [ENTER] to select your option. Press [SPEED UP or DOWN] to toggle between ON and OFF. Press [ENTER] to confirm your selection.

Choose console language

- Use the [SPEED UP or DOWN] keys to view the choices (English, German, French, Spanish, Italian, Dutch, Swedish, Japanese). Press [ENTER] to select your option.

Adjust upper LCD screen contrast

- Use the [SPEED UP or DOWN] keys to increase or decrease the contrast level of the upper LCD. Press [ENTER] to select your option.

Adjust lower LCD screen contrast

- Use the [SPEED UP or DOWN] keys to increase or decrease the contrast level of the upper LCD. Press [ENTER] to select your option.

Change Max Speed

- Use the numeric keypad or the [SPEED UP or DOWN] keys to change the desired max speed for your facility. Valid speed range is 0.5 mph – 12 mph (0.8 – 19.2 kph).

Enable Mag Key

Use the [SPEED UP or DOWN] keys to enable or disable the Magnetic Safety Stop feature. Press [ENTER] to select your option.

Auto Stop

- Use the [SPEED UP or DOWN] keys to enable or disable the Auto Stop feature. Press [ENTER] to select your option.

Reset Defaults

- This code will reset all exercise parameters to the factory defaults. Press [ENTER], to accept the default values.

3. To exit "CUSTOMIZE", press the [CLEAR] key.

Machine Status Codes

To view maintenance information such as the run time in hours, number of workouts and distance, as well a machine type and software revision:

1. Press [SPEED UP], [4], [ENTER]. The console will display "MACHINE STATUS".
2. Press [SPEED UP or DOWN] to scan through the choices. Select the option you want to view by pressing [ENTER]. Press [CLEAR] to exit the machine status codes.

The machine status options are as follows:

Machine run time in hours

• Display the machine run time in hours. The console will display "RUN HOURS #####".

Number of workouts

• Display the number of times a workout key has been pressed. The console will display "WORKOUTS ####".

Distance traveled

• Display the total distance traveled in miles (or kms if console is set to Metric units) . The console will display "DISTANCE #####".

Software revision

• Display the console software revision number. The console will display "CONS 41376-###".

Machine type

• Display the machine type the console is currently configured to. The console will display "Quinton Fitness by Nautilus" or other machine type.

TM Drive version

• Display the treadmill drive version. The console will display " # "

Machine run time in hours since last cleared (used for maintenance)

• Display the machine run time since last cleared. The console will display "MAINT HOURS #####". This will provide the number of hours between service or maintenance calls. The machine run time is reset to zero in the following Diagnostics section.

3. To exit "MACHINE STATUS", press the [CLEAR] key.

Diagnostic Codes

Diagnostic codes are used to test various components of the machine such as the display, keyboard, serial port, alternator, and tachometer, as well as viewing the error log information and resetting the time between service or maintenance calls. To run diagnostics and view diagnostic information:

1. Press [SPEED UP], [6], [ENTER]. The console will display "DIAGNOSTICS".
2. Press [SPEED UP or DOWN] to scan through the choices. Select the option you want to view by pressing [ENTER].

The diagnostic options are as follows:

Test display

- To test the LCD display, press [ENTER] when the message, "DISPLAY TEST" is displayed. The console screen alternates turning on all LCD segments and a representative program screen. Verify that all LCD segments turn on.

Test keyboard

- To test all the keys on the keyboard, press [ENTER] when the message, "KEY TEST" is displayed. Then, press any key on the keyboard and that key's name will be displayed in the text line. Press [CLEAR] as the last key to exit this test.

Test serial port

- To test the serial port, press [ENTER] when the message, "SERIAL TESTS" is displayed. This test 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".

3. To exit "DIAGNOSTICS", press the [CLEAR] key.

3. To review the error log and reset the service timer, press [SPEED UP], [7], [ENTER]. The console will display "DIAGNOSTICS2". Press [SPEED UP or DOWN] to scan through the choices. Select the option you want by pressing [ENTER].

Error log

- To display the machine's error log, press [ENTER] when the message, "ERROR LOG", is displayed. 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. First, 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 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.

Reset service time

- To reset the time between service or maintenance calls, press [ENTER] when the message, "MAINT HOURS" is displayed. Selecting this code will reset the maintenance timer to 0 hours.

3. To exit "DIAGNOSTICS2", press the [CLEAR] key.

HELPFUL HINTS

If you keep your Nautilus treadmill properly maintained and serviced, it will operate more efficiently and last longer. Read all maintenance instructions thoroughly before beginning work. In some cases, an assistant is required to perform the necessary tasks. All references to the right or left side and to the front or back are made as if you were on the machine ready to exercise.

MAINTENANCE RECORDS

For ease of maintenance the HR ClubTrack® Plus console will keep track of hours, number of workouts, time between last servicing, etc. You can quickly access any of the custom menus by pressing [SPEED UP], [4], [ENTER]. The console will then display MACHINE STATUS. Use the [SPEED UP] and [SPEED DOWN] keys to scroll through the options. For details, refer to the Machine Status Console Codes in the previous section.

RESETTING THE MAINTENANCE HOUR TIMER

After each maintenance period reset the counter. Press [SPEED UP], [7], [ENTER]. Then use the Speed keys to scroll through the options. When MAINT HOURS is displayed, press [ENTER]. The console will display RESET SERVICE. Press [ENTER]. The console wil display DONE. Press [CLEAR] to return to the opening screen.

INITIAL SERVICE

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

Cleaning

1. DO NOT USE GLASS CLEANERS 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 of the machine daily using soap and water or a diluted, non-mineral based household cleaner such as Fantastic®.
3. Elevate the treadmill to maximum incline and vacuum the floor under weekly it to prevent excess dust and dirt from interfering with operation.
4. Depending upon the treadmill environment, dust and or lint can accumulate under the hood. Periodic internal cleaning should be done by a qualified service personnel.

Inspection

1. Frame: Inspect the frame for any rust, bubbling, or paint chips during the weekly cleaning. The salt in perspiration can damage the unpainted surfaces. Repair the damaged area with a touch-up paint kit purchased from Nautilus (call Customer Service for order information).
2. Inspect the power cord and walking belt for wear.
3. Check the position of the walking belt; be sure it is not rubbing against the frame. The belt should be evenly spaced on the deck within 0.25 inch; adjust if necessary.
4. Remove potential hazards from the treadmill area.

WARNING DRY MOP THE DECK UNDER THE BELT ONLY. DO NOT ADD ANY LUBRICANTS. ADDING LUBRICANTS CAN RUIN THE PROPRIETARY FRICTION-CONTROL SURFACE.

DO NOT USE DETERGENTS OR CLEANING AGENTS ON ANY PART OF THE DECK.

DO NOT LET LIQUID ENTER THE TREADMILL OR DISPLAY.

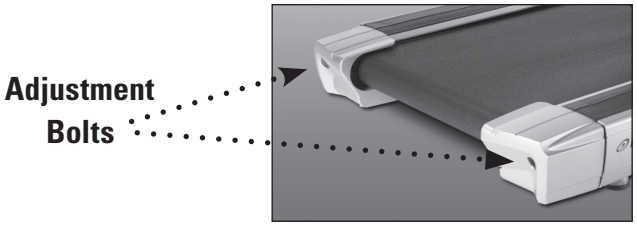
WARNING DO NOT REMOVE THE TREADMILL HOOD: DANGEROUS VOLTAGES ARE PRESENT. COMPONENTS ARE SERVICEABLE ONLY BY QUALIFIED SERVICE PERSONNEL.

Treadmill Belt Adjustments

WARNING SECURE LONG HAIR AND LOOSE CLOTHING BEFORE WORKING NEAR THE TREADMILL WALKING SURFACE OR PULLEYS.

As the treadmill walking belt stretches through use it will become necessary to tension the belt. This often occurs within the first few months of use. Adjust the belt tension whenever the belt slips or moves unsteadily during operation. The belt tension is adjusted by moving the rear roller of the treadmill back to reduce slack. This is accomplished by turning the adjustment bolts located on the back of the treadmill.

IMPORTANT Do not over tighten walking belt! The belt need only be tight enough to prevent it from slipping during use. Excessive belt tension will decrease belt life and can damage the treadmill rollers and drive system.



1. Using a 1/2" socket, turn the left and right adjusting bolts clockwise 1/2 turn. Use care to make each adjustment equal to insure proper belt alignment.
2. Test the belt by running on the belt at about 4 MPH. Hold the handrail lightly and resist the belt movement with your feet. If walking belt slips, repeat step 1.

Belt Tracking

Perform this procedure whenever the belt moves to one side or the other. Stay off the belt when adjusting the tracking.

1. Start the treadmill at minimum speed and incline.
2. Increase speed to 5 mph and make the following adjustment. The figure above shows the location of the bolts:
   a. If the belt moves to the right, turn the right tension bolt 1/4-turn clockwise.
   b. If the belt moves to the left, turn the left tension bolt 1/4-turn clockwise.
3. After making an initial adjustment, run the treadmill for five minutes and observe how the belt tracks. If the belt continues to move away from the center, adjust the appropriate side as in Step 2 until properly centered.

IMPORTANT Do not over tighten walking belt! The belt need only be tight enough to prevent it from slipping during use. Excessive belt tension will decrease belt life and can damage the treadmill rollers and drive system.

Belt Replacement

If the walking belt becomes worn from heavy usage, it may need to be replaced. Call an Authorized Nautilus® Fitness Dealer or a Service Technician to obtain service.

Moving and Storage of Treadmill

IMPORTANT Treadmill is extremely heavy and awkward and requires two people to safely move!

1. Set the treadmill to maximum incline.
2. To avoid electrical shock, turn off the power switch on the treadmill, then remove the treadmill power cord from the power source before moving the treadmill.

WARNING AS LONG AS THE TREADMILL IS PLUGGED INTO A POWERED OUTLET AND THE TREADMILL CIRCUIT BREAKER IS ON, THE UNIT IS RECEIVING POWER, EVEN IF THE DISPLAY IS TURNED OFF.

3. Together, lift the rear of the treadmill, then roll it to the new site using the wheels on the front of the treadmill.

When storing for prolonged periods, cover the treadmill with a dust cover. Do not store in damp areas. Do not store the treadmill on its end as it could fall on someone.

Using After Storage Period

Before using the treadmill again after moving or storage, check the power cord and all attachments to be sure they are undamaged and securely connected, then test the system for proper operation.

All Nautilus, Inc. exercise products are warranted to the commercial market purchaser to be free from defects in materials and workmanship. Warranty coverage valid to the original purchaser only and proof of the purchase will be required. Any product sold or placed in an application not recommended by Nautilus, Inc. will void any warranty coverage set forth by Nautilus, Inc. warranty policies and procedures.

Time Period

15 -Years - Frame and AC-motor
3 - Years- Mechanical and electrical parts
1-Year- Labor
1 Year - Wear items

What this warranty does not cover

1. Any damage, failure or loss caused by accident, misuse, neglect, abuse, improper assembly, improper maintenance or failure follow instructions or warnings in Owner's Manual.

2. Use of product in a manner or environment for which it was not designed.

Limitations

The foregoing warranties are in lieu of and exclude all other warranties not expressly set forth herein, whether expressed or implied by operation of law or otherwise, including, but not limited to, warranties of merchantability or fitness for a particular purpose. Nautilus, Inc. shall in no event be liable for incidental or consequential losses, damages or expenses in connection with its exercise products. Nautilus, Inc. liability hereunder is expressly limited to the replacement of goods not complying with this warranty or, at Nautilus, Inc. election, to the replacement amount of the purchase price of the exercise product in question. Some states do not permit the exclusion or limitation of implied warranties or incidental or consequential damages, so the preceding limitations and exclusions may not apply to you.

Procedures

Warranty service will in most cases be performed by an authorized Nautilus® Fitness Dealer or Service Technician. The original purchaser must provide proof of purchase. Service calls and/or transportation to and from the Nautilus® Dealer is the responsibility of the purchaser.

1. Nautilus, Inc. will have the option to repair or replace any exercise product, which requires service.

2. Nautilus, Inc. will replace any equipment frame that is structurally defective with a new frame or replace the unit with a unit of equal value.

3. Nautilus, Inc. is not responsible for dealer labor charges for the component changeovers completed after the labor related warranty period stated herein.

4. If you elect to repair an exercise product or part yourself, using the services of someone other than an authorized Nautilus Fitness Dealer or Service Technician, or use a replacement part not supplied by Nautilus, Inc., Nautilus, Inc. shall not be liable for any cost, damage, failure or loss caused by the use of such unauthorized service or parts.

CONTACTING NAUTILUS, INC.

If you need assistance, please have both the serial number of your machine and the date of purchase available when you contact the appropriate Nautilus, Inc. office listed below.

OFFICES IN THE UNITED STATES:

E-mail: customerservice@nautilus.com

TECHNICAL/CUSTOMER SERVICE
Phone: 800-NAUTILUS (800-628-8458)
Fax: (877) 686-6466
E-mail: cstech@nautilus.com

CORPORATE HEADQUARTERS
Nautilus, Inc.
World Headquarters
16400 SE Nautilus Drive
Vancouver, Washington, USA 98683
Phone: (800) NAUTILUS (800) 628-8458

INTERNATIONAL OFFICES:

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

INTERNATIONAL CUSTOMER SERVICE
Nautilus International S.A.
Rue Jean Prouvé
1762 Givisiez / Switzerland
Tel: (41) (26) 460 77 77
Fax: (41) (26) 460 77 70
E-mail: technics@nautilus.com

GERMANY and AUSTRIA
Nautilus Deutschland GmbH
Albin-Köbis-Str. 4
51147 Köln
Tel.: (49) 02203 2020 0
Fax: (49) 02203 2020 45 45

ITALY
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The Nautilus, Inc. World Headquarters, 16400 SE Nautilus Drive, Vancouver, WA 98683
1 800-NAUTILUS www.nautilus.com

PN 001-7166 Rev A (08/17/2007)

Service Manual

ClubTrack® 510, ClubTrack® 510 Plus®
ClubTrack® 612, ClubTrack® 612 Plus®

Quinton™
FITNESS EQUIPMENT

P/N 000448-831 Rev New

The general quality system at Quinton Instrument Company is certified by British Standards Institution (BSI) to ISO 9001/EN 46001 standards under Certificate Number 0357.

This is the CE marking of conformity indicating that the device having this symbol on its immediate label meets the applicable requirements of the European Machinery, Low Voltage, and EMC Directives.

P/N 000448-831 Rev New

Visit our web site at **www.quinton.com**

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Phone 425-402-2000 Fax 425-402-2009

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INTERNATIONAL SALES
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Preface

This manual contains information for servicing and repairing the following Quinton® ClubTrack® treadmills to the module level:

ClubTrack® 510	P/N 00448
ClubTrack® 510 Plus®	P/N 00458
ClubTrack® 612	P/N 00456
ClubTrack® 612 Plus®	P/N 00457

The manual covers domestic and international versions of the treadmills, which are differentiated by dash number—see Appendix C, *Part Numbers*.

The manual is designed for Quinton-authorized service personnel with proper training. There are no user-serviceable parts in the treadmills. Any attempt by non-Quinton-trained personnel to service the treadmill may void the warranty. For service information, call Quinton Technical Service: 1-800-426-0538.

Before servicing the treadmill, read the safety requirements listed in Appendix A.

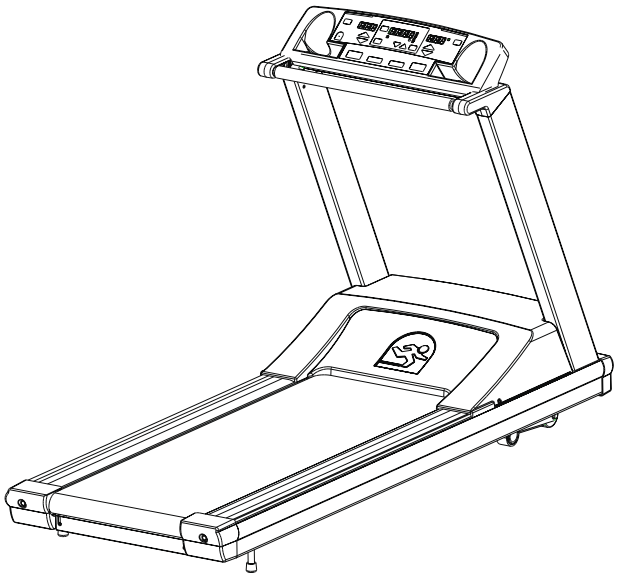
- Do not use this manual when servicing Series 90™, Q-Series™, ClubTrack 3.0™, or ClubTrack Hyperdrive™ treadmills.

1

Overview

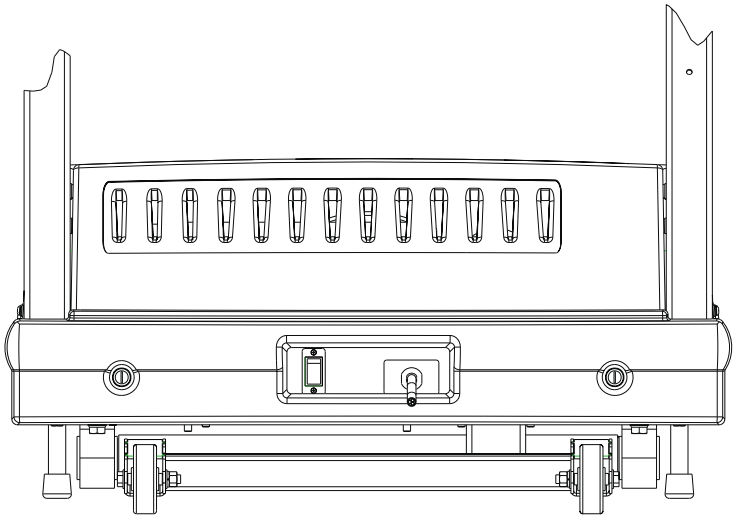
Quinton's ClubTrack series of treadmills are motorized treadmills with built-in controllers and are designed for fitness exercise. The series includes the ClubTrack 510 (P/N 00448), ClubTrack 510 Plus (P/N 00458), ClubTrack 612 (P/N 00456), and ClubTrack 612 Plus (P/N 00457). The ClubTrack Plus models add heart rate control, interval programming, and a computer interface.

See the Appendix of the applicable operator manual for installation requirements.

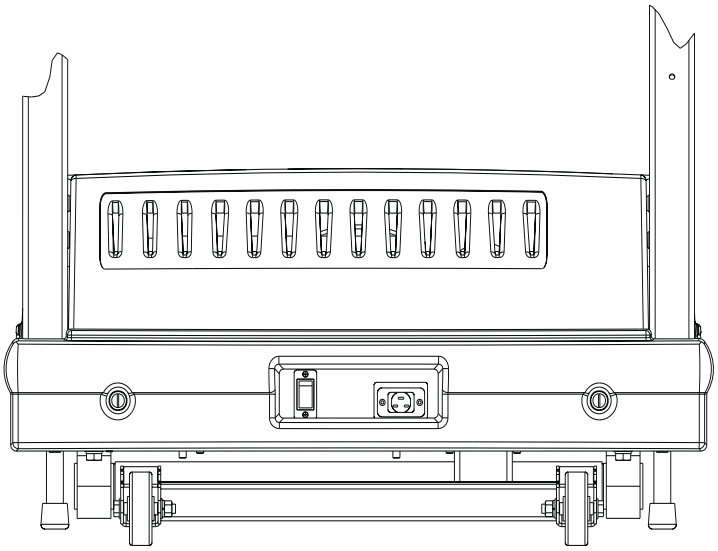


Treadmill

Configuration Plate



Domestic Configuration



International Configuration

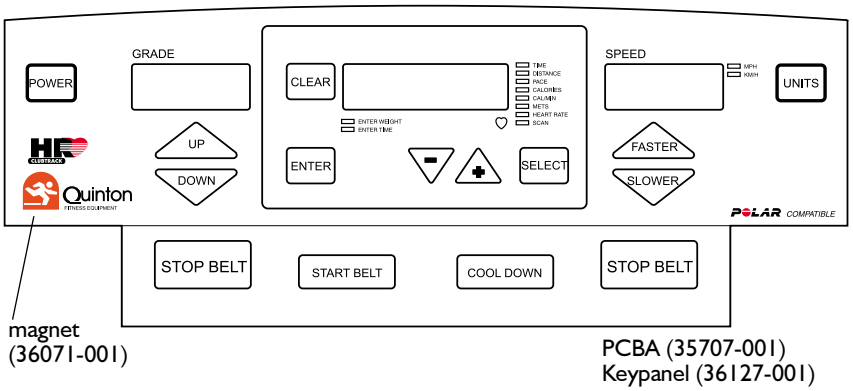
Power

The circuit breaker on the front of the treadmill hood controls the power to the treadmill. The circuit breaker must be set to ON for the treadmill to run.

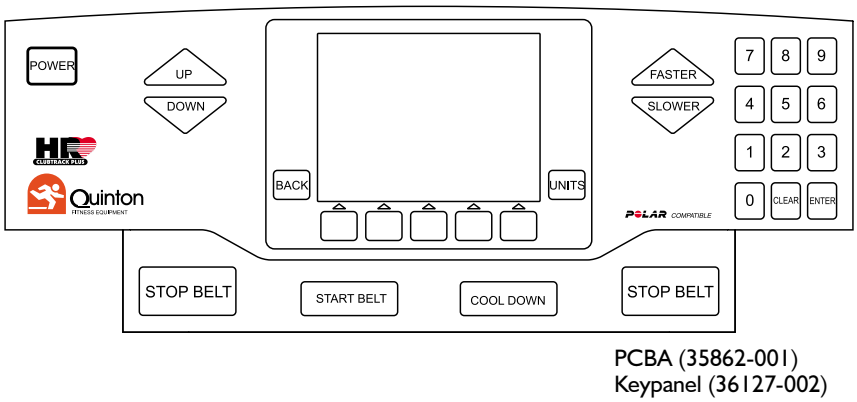
- Turn off the circuit breaker before connecting or disconnecting the treadmill from the wall outlet.

Operation

The controller, which is mounted above the front handrail, is a computerized panel used to operate the treadmill. All commands, including power, are entered by pressing a soft-touch key on the panel. Visual indicators and displays show the operational status and exercise results.



ClubTrack 510 and ClubTrack 612



ClubTrack 510 Plus and ClubTrack 612 Plus

2

Theory of Operation

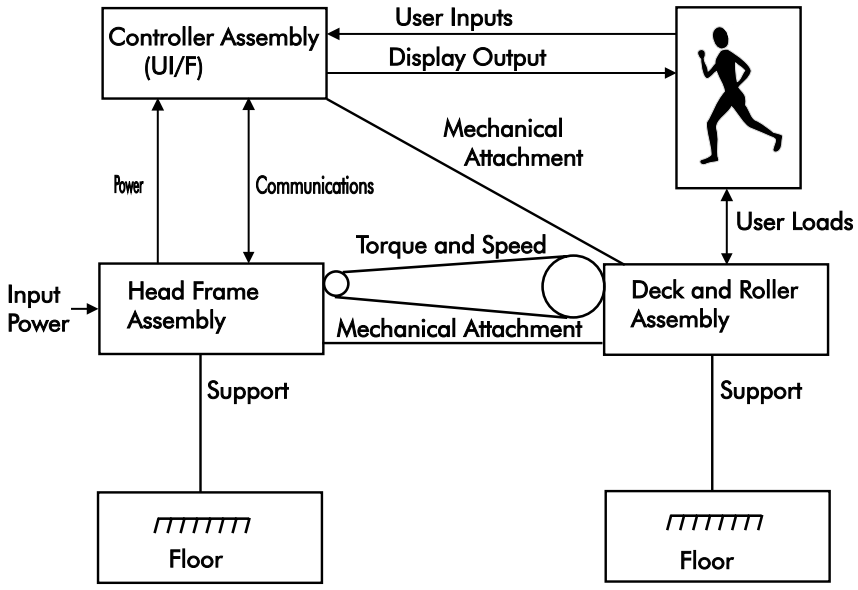
Overview

The treadmill consists of three major assemblies: controller, headframe, and deck and roller.

Controller Assembly

The controller assembly, which is mechanically attached to the deck, is the user interface. The user presses a key on the controller to enter a command. The controller

- processes the user-entered information
- displays all exercise data
- sends commands to the head frame assembly.



Treadmill Subassemblies

Headframe Assembly

The headframe assembly includes the drive and grade systems and the electronics that drive these systems. A three-phase AC motor

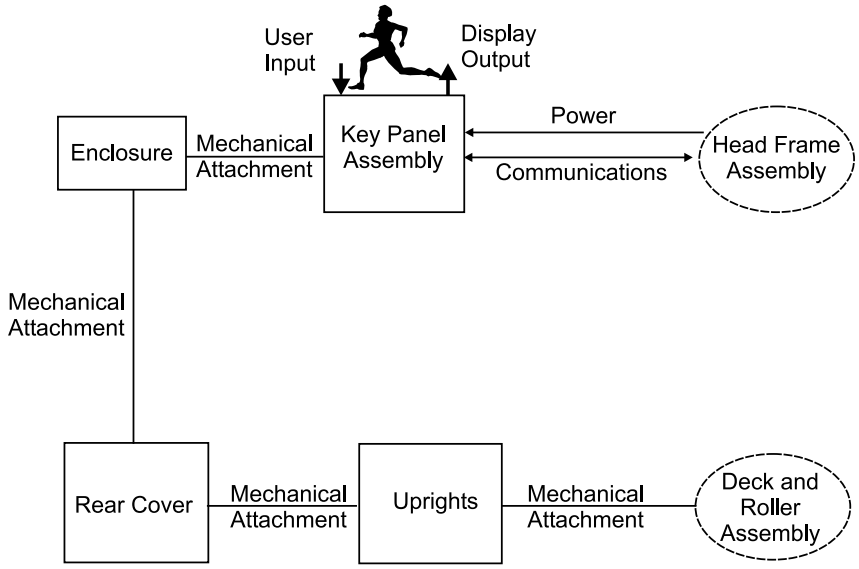
drives the walk belt by supplying torque and speed to the drive pulley through a drive belt. An AC actuator drives the front of the treadmill up and down to simulate hills. The headframe assembly receives speed and grade commands from the controller.

Deck and Roller Assembly

The deck and roller assembly is attached to the headframe and supports the rear of the treadmill. It provides the platform for the walk belt. The drive belt supplies torque to the walk belt through the drive roller pulley.

Controller Assembly

The controller assembly consists of a keypanel and PCBA mounted in an enclosure. The enclosure is removable from the rear panel, which mounts to the uprights.



Controller Subassemblies

Keypanel

The keypanel assembly consists of a membrane key or switch panel permanently bonded to the enclosure. The PCBA then mounts to the enclosure with an EMI shield. The keypanel and PCBA are connected through a flexible cable that is part of the keypanel. A keypanel connector mates to a PCBA connector.

User Inputs

The user enters all control commands through the keypanel. The controller scans the membrane switches on the keypanel. The controller PCBA interprets switch closure, updates the displayed values, and sends control commands to the drive board.

Output Displays

The controller assembly uses LED displays mounted on the controller PCBA. These displays show pertinent treadmill information including target speed and grade and accumulated exercise information. The ClubTrack 510/612 Plus and display data on an LCD screen.

Additional Functions

The controller assembly also:

- performs an electronic self-test when the treadmill is turned on
- provides a special mode for manufacturing and service testing
- includes circuitry for the magnetic access switch.

Controller to Treadmill Interface

The controller communicates with the treadmill drive board through a standard RS422 interface. The controller sends commands to the treadmill drive board and receives acknowledge and status statements from the treadmill drive board. The controller uses 12 VDC power from the treadmill drive board as the power source for all circuitry and for the LED displays.

ClubTrack Plus Interface

An RJ-45 interface connector on the rear of the ClubTrack 510/612 Plus treadmills permits connecting the treadmill to a computer for exercise monitoring. The interface complies with the industry standard CSAFE communications protocol. Consult Quinton's web site www.quinton.com, Fitness Products, for an internet link to the CSAFE specifications.

Headframe Assembly

The headframe assembly consists of the following components:

- Input power module
- Drive board assembly
- Drive motor assembly
- Grade actuator assembly
- Grade system consisting of a swing arm and associated bearings

Input Power Module

The input power module receives line power from the power outlet. When sold for use in the United States and Canada, these treadmills use 115 VAC power. When sold for use in Europe and the United Kingdom, the treadmills use 230 VAC power.

Drive Board

The treadmill drive board uses line power to develop 300 VDC which is then used to create three-phase power for the drive motor assembly. The frequency of the three-phase signal sent to the drive motor determines the drive motor rotational speed. The motor current draw is a function of the torque load placed on the motor through the deck assembly by the user.

The drive board switches 110 VAC or 220 VAC power to drive the grade actuator. Two Triacs drive the grade actuator: one in the direction of increasing grade, the other in the direction of decreasing grade.

Drive Motor Assembly

The drive motor, which is driven by the drive board, delivers variable-speed power to the front roller of the treadmill through a poly-V belt and a set of speed reduction pulleys. A flywheel, integral to the motor poly-V pulley, is used to average the pulsing runner loads.

Grade Motor Assembly and System

The grade actuator drives the grade swing arm, which raises and lowers the front of the treadmill.

A grade potentiometer inside the actuator is used to sense the actual treadmill grade for the grade system feedback. The grade pot is an integral part of the actuator.

Deck and Roller Assembly

The deck and roller assembly provides the running surface for the user. This surface consists of a movable, flexible walk belt supported by a semi-rigid platform. The platform is supported by aluminum side rails.

A poly-V-belt, coupled through a pulley to the drive motor, drives the front roller. The front roller uses friction to drive the walk belt. A rear roller, acting as an idler pulley, tensions the walk belt. Both rollers are mounted to the support structure.

Heart Rate Monitoring—Wireless

The heart rate monitoring function is a wireless system based on existing hardware purchased from POLAR Electro, Inc. The system consists of a transmitter worn on the chest of the user and a receiver mounted inside the controller enclosure. Electronics inside the belt sense electrical energy on the skin during a heart contraction. The transmitter emits a short electrical field burst. At the receiver, the burst is transformed into a digital signal that is monitored by the controller microprocessor. The microprocessor

measures the time between digital pulses, then calculates and displays beats per minute.

Transmitter

The transmitter is imbedded inside the chest belt and begins transmitting as soon as it detects the user's heart beat. Transmission frequency is approximately 5kHz. The transmitter turns off when the user removes it. A battery inside the belt powers the transmitter. When the battery becomes discharged, the belt may be exchanged, for an exchange fee, through Polar.

Receiver

The receiver PCBA is mounted to the controller PCBA.

- Reception range is approximately 3 ft (1m).
- Proximity to electric motors, monitors, power supplies, T.V., etc. can cause directional and attenuating interference.

Microprocessor

The microprocessor calculates the heart rate and displays it in the multifunction display.

Heart Rate Monitoring—Handgrip

The handgrip heart rate monitoring device is a contact electrode system that uses ECG (electrocardiogram) signals from the user's hands to sense and display the heart rate. The signals are carried from the electrodes mounted on the handrail to a heart rate processing board. A cable then takes this information and brings it to the controller PCBA.

On 510 and 612 Plus models, if a Polar chest strap signal is detected at the start of a workout, the handgrip input will be ignored for the duration of the workout.

- ➤ Heart rate control is available only with the Polar chest strap.

The handgrip heart rate system works well for most people. However, some individuals will not get good results from this system due to physiological differences which cause low electrical signals at the hands. These people should use the Polar chest strap method of monitoring. The handgrip system is effective for walking, but the Polar chest strap should be used for running.

3

Troubleshooting

The tables and flow charts in this chapter cover the following potential problems:

- electrical problems: power, cable connections
- electronic problems: PCB, test points, signals
- mechanical problems: noise, vibration, grade, speed, belts

See Chapter 4 for repair and replacement procedures.

Tools

These tools may be needed:

- Flat blade screwdriver
- 10mm hex socket wrench
- 13mm hex socket wrench
- 4mm hex key (Allen wrench)
- stethoscope
- Ohm meter

Warning

High voltage is present under the hood when the treadmill is plugged into a power source; residual high voltage remains for a few minutes after the power is removed. Turn off the treadmill circuit breaker, then unplug the treadmill from the power source before removing the hood. Use extreme caution at all times when the hood is removed.

Secure loose clothing, jewelry, and long hair before working near treadmill parts.

Never place your fingers near rotating parts.

Do not start the walking belt when someone is on the treadmill.

Electrical Problems

Use the following table when:

- The treadmill will not start.
- There is no display on the controller.
- The treadmill stops unexpectedly.

Possible Cause	Action
Treadmill not plugged in	Plug power cord into appropriate outlet.
Power not on	Press the **Power** key on controller.
Limited access control activated, but magnet not in place	ClubTrack 510/612: Place magnet on Quinton logo, then press **Power** twice (off/on). To disable the control, remove magnet, then press **+**, **-**, and **Power** simultaneously. ClubTrack 510/612 Plus: Place magnet on Quinton logo, then press and hold the right-hand function key and press **Power**.
Circuit breaker on treadmill set to OFF	Set treadmill circuit breaker to ON.
Building circuit breaker tripped	Contact building maintenance to reset circuit breaker. If circuit breaker trips again, 1. Check outlet voltage. If necessary, verify that the power at the outlet and at the breaker is the correct rating for the treadmill. 2. Replace the configuration plate (faulty in-rush limiter).
Power cord damaged	Remove cord from outlet and replace
Blown fuse in treadmill	If F1, F3, or F4 are blown: 1. Unplug the treadmill. 2. Unplug the plugs at J2 and J3 of the Treadmill Voltage Configuration PCBA. 3. Measure the primary transformer windings for continuity. • Configuration Plate (P/N 035960) Transformer: Pins 1-2: approximately 24 ohms Pins 5-6: approximately 24 ohms • PCBA (P/N 036028) Transformer: Pins 1-3: approximately 165 ohms Pins 4-6: approximately 200 ohms 4. Replace fuses and if fuses blow again, replace the Configuration Plate Assembly, Treadmill Drive PCBA, or Linear Actuator as indicated.
	If F1 or F2 are blown: 1. Inspect the Linear Actuator (P/N 035853) and ensure that no parts are jammed (e.g. acme thread or grade arm in grade change assembly). 2. Replace fuses and if fuses blow again, replace the Configuration Plate Assembly, Treadmill Drive PCBA, or Linear Actuator as indicated.
Control cable between VSD* and controller faulty	Check for bent or broken pins. Replace control cable. Check cable for continuity and shorts.
VSD failure	Replace VSD if necessary.
Controller failure	Replace controller circuit board.

Possible Cause	Action
Configuration plate connection faulty	Check configuration plate connections; reattach or crimp as required. If problem persists, replace configuration plate.
Treadmill stops during run; **Stop Belt** has not been pressed. No error message appears	Look for loose ground wires. Reconnect and secure if loose.
LCD screen test failure	Replace LCD (p/n 35259-002), repeat test. If test fails again, replace PCBA.
HR ClubTrack Plus LCD does not come on	If the LEDs are on and the treadmill is functioning normally, check the LCD connector. If problem persists, replace the controller PCBA.
External RS232 port failure	Perform loop-back test. If test fails, replace PCBA.
* VSD (variable speed drive): circuit board assembly that controls the motor	

Electronic Problems

Error Codes

The treadmill performs an electronic self-test each time that it is powered up. If a problem is detected during either power-up or operation, an error code appears on the display. Note the code recorded by the owner, then reference the table of error codes.

If you replace a faulty PCB Assembly, return it to the factory and note the error code.

Code	Indication	Recommended Action
E001	Variable speed drive (VSD) microprocessor chip failure	Replace VSD
E002	VSD microprocessor EPROM/SRAM failure	Replace VSD
E004	VSD A/D failure	Replace VSD
E101	Controller PCBA microprocessor failure	Replace controller
E102	Controller PCBA EPROM failure	Replace controller
E103	Controller PCBA interrupt failure	Replace controller
E104	Communication Packet Checksum Fault	Clear the error by pressing **Clear** or **Power**. Attempt to operate the treadmill again. If error persists, replace VSD.

Code	Indication	Recommended Action
E105	Controller PCBA NVRAM failure	Re-initialize NVRAM: 1. Press **Stop**, **Faster**, and **Slower** to enter Service Mode 2. Press **Stop** and **Cool Down** to reinitialize (For HR ClubTrack Plus, press the *NV PROGRAM LOAD TEST* key and proceed to step 4) 3. Press **Clear** 4. Reconfigure controller (HR Plus, adjust the contrast after reconfiguring) If error E105 persists, replace controller
E107	External UART Error	Replace the controller. Treadmill may be operated without CSAFE capability in the interim.
E201	Grade Over Limit fault	1. Use **Up** or **Down** arrows to bring grade into range 2. If error persists, replace grade actuator or VSD. Note: belt and display may continue to be used during fault conditions by pressing **Clear**
E202	Speed error. A software check of redundant speed variables has indicated a disagreement and the microprocessor will shut down the treadmill.	Clear the error by pressing Clear or Power. Attempt to operate the treadmill again. If error persists, replace the VSD board.
E203	High Motor Overload caused by one of the following: 1. Runner heavier than weight/speed envelope in conjunction with significant deck wear 2. Motor lead disconnected or loose 3. Electrical failure on the drive electronics 4. Motor blocked by obstruction	 1. Restrict use to people within the weight/speed specifications and check deck wear; replace if necessary 2. Check the motor leads to ensure all leads are connected. One loose or disconnected lead will cause the overload 3. Replace VSD 4. Remove the obstruction
E204	VSD and controller not communicating	Verify cable connections at both ends. Check for bent or broken pins; replace if required. If error persists, replace VSD or controller as necessary.

Code	Indication	Recommended Action
E205	Software tachometer fault	Clear the error by pressing Clear or Power. Attempt to operate the treadmill again. If error persists, replace VSD board.
E206	Controller or VSD performs inadvertent reset	Verify wire grounding system is intact.
E207	Moderate Drive Overcurrent 1. Runner heavier than weight/speed envelope 2. Deck wear	 1. Restrict use to people within the weight/speed specifications 2. Check deck wear/replace if necessary
E208	Drive Under Current	Replace VSD
E209	Motor Drive Switch Failure	Replace VSD
E210	Motor Current Sense Fault	Replace VSD
E211	Grade Position Detection Fault	Clear the error by pressing **Clear** or **Power**. Attempt to operate the treadmill again. If error persists, replace VSD or grade motor. Belt and display may continue to be used during fault conditions by pressing **Clear**.
E212	Configuration Fault	1. Enter Service Mode 2. Change Configuration Code as appropriate. See "Configuring the Controller" on page -23. 3. Press **Enter** 4. If error persists, replace configuration assembly
E213	Circuit breaker tripped or power lost while belt was moving	For Device History Information only.
EPHI	VSD ABS voltage is too high. Line voltage is too high. VSD board failure	Refer to EPHI error code flow chart elsewhere in this chapter.
EPLO	VSD ABS voltage is too low. Line voltage is too low. Transformer connection is bad. Transformer failure. VSD board failure	Refer to EPLO error code flow chart elsewhere in this chapter.

Service Mode

The treadmill provides a service mode for troubleshooting the electronics. To enter the service mode, press **Stop Belt**, **Faster**, and **Slower** simultaneously. P000 appears in the **Select** display, indicating that no key is pressed. In the ClubTrack Plus, the display shows the state.

To exit the service mode, press and release the same three keys simultaneously or press **Power** twice to power up into normal mode.

- In service mode, the ClubTrack Plus screen lists the tests described below. To perform a test, press the softkey corresponding to the test name, rather than pressing the indicated key combinations. Press **Exit** to leave service mode.

Controller Keys

To test the keys on the key panel:

1. Enter the service mode. If a key has shorted, **P555** appears in the *Select* display.
2. Using the table below, press each key in succession to display the appropriate code in the Select display (the HR ClubTrack Plus displays text instead of code). **P000** should reappear when you release each key.

Key	Code	Key	Code
No key pressed	P000	Enter	P007
Shorted key(s)	PSSS	Select	P007
Clear	P001	Start Belt	P009
Up	P002	Units	P010
Down	P003	Cool Down	P013
Stop Belt	P004	Faster	P014
Input +	P005	Slower	P015
Input —	P006		

Displays (ClubTrack 510/612 only)

To test the displays on the key panel:

1. Enter the service mode.
2. Simultaneously press **Stop Belt**, **Grade Up**, and **Grade Down**.
3. The display cycles through one digit at a time in each display, starting from left to right across the panel. Each digit displays the number **8** and the associated decimal point for one second, then turns off as the next one lights up.
4. When this is completed, the LEDs light up individually, starting from the top. The Select LEDs illuminate first, followed by the Units LEDs.
5. After the LEDs are tested, all the digits in all three displays simultaneously count up from 0 through 9. (No decimal points light during this count.)

Error Log (Plus Models only)

This feature records any error condition and the distances (in miles) when the error occurred. In case of multiple errors, only one is logged. If the distance has not been incremented from the last error, new errors will not be logged until the belt has been started and stopped (stopping logs the distance). The display will log eight of the most recent events from the top down. When the ninth error occurs, it will overwrite the top event, on back over the previous eight.

You can clear the Error Log during a service visit by pressing **Clear Log** in the Log screen. After clearing the log, the screen will return to the prior menu.

Pressing **Return** does not affect the Log but will return you to the previous menu.

Speed/Grade (Open-Loop Mode, ClubTrack 510/612 only)

In Service mode, the treadmill operates as in open-loop mode, which is used to verify treadmill speed or grade. In this mode, the treadmill displays the actual speed or grade, rather than the target speed or grade.

Approximate speed and grade ranges:

Treadmill Model	Speed Range	Grade Range
ClubTrack 510/510 Plus	1.0 to 10.0 mph (1.6 to 16 km/h)	0 to 12%, 0 to 6.84°
ClubTrack 612/612 Plus	1.0 to 12.0 mph (1.6 to 19.3 km/h)	0 to 15%, 0 to 8.53°

Speed (Direct Speed Control)

1. Enter the service mode.
2. Press **Up**, **Faster**, and **Slower** simultaneously to enter open-loop speed mode.
3. Press **Stop Belt**, **Faster**, and **Slower** simultaneously to exit the service mode; do not press the **Power** key.
4. Ensure that no one is standing on the walking belt, then press Start Belt.
5. Press and hold Faster or Slower to change the speed.
6. When testing is finished, press Clear, or press Power twice to exit open-loop mode.

Grade

1. Enter the service mode.
2. Press **Faster**, **Up**, and **Down** simultaneously to enter open-loop grade mode.

3. Press **Stop Belt**, **Faster**, and **Slower** simultaneously to exit the service mode; do not press the **Power** key.
4. Press and hold **Up** or **Down** to change grade.
5. When testing is finished, press **Clear**, or press **Power** twice to exit open-loop mode.

Actual Grade (Plus Models only)

In Service mode, the treadmill displays actual grade rather than the target grade.

LCD Display Test (Plus Models only)

The LCD display test verifies that the display and its electronics are functioning correctly. If any one of the six tests fails, see *Electrical Problems* troubleshooting table, page 3-2.

Select the *LCD Display Test* to begin the series of six tests. To progress from one test to the next, select **Next**.

1. Display Limits Test

A box appears with a one-pixel border between the outer edge of the box and the edge of the display. A single horizontal and vertical line intersects the box. If the box does not appear as described, the test has failed.

2. All pixels ON

The entire display should appear white. A corrupted pixel would be black.

3. All pixels OFF

The entire display should be off or dark. A corrupted pixel would be white.

4. Contrast

The contrast changes smoothly from maximum contrast to minimum. Large jumps in contrast could indicate a failure in the contrast circuit or LCD.

5. Fluorescent tube brightness test

The tube adjusts to its three possible states, going from bright to dim to off, then back to bright. The sequence continues until you press the MENU key.

6. Fonts

The screen displays the alphabet. Garbled characters indicate an electronics or LCD problem.

LCD Contrast (Plus Models only)

Select the *LCD Contrast* key. After adjusting, press **Enter** to store the selected value. The setting remains when the treadmill is turned off. Always adjust the screen contrast after performing the NV

PROGRAM LOAD test—the load test resets the contrast to the default value.

LCD Brightness

The LCD brightness is not adjustable.

External RS232 Port Test (Plus Models only)

The controller automatically tests the RS232 chip during power up using an internal loop-back test. To test further, connect an external loop-back connector, then select the RS232 Port Test key. The loop back connects the transmit out to the receive in, allowing the controller to verify proper operation through the external connector. As the test progresses, the LCD displays a series of numbers. **FAIL** appears if an error occurs. Remove the loop-back connector after the test is finished.

Program Loop (Plus Models only)

For long term testing of grade and speed changes, the system may be put into a continuous running program course.

1. Press **Stop**, **Faster**, and **Slower** simultaneously to enter Service Mode.
2. Continue to press **Next** until **Prog Loop** appears, then select the button.
3. Press **Return** to return to Service screens.
4. Press **Exit** to leave Service Mode.
5. Select a Workout Program based on time, and start the course. The treadmill will continue to loop (or be in this mode) until **Power** is pressed.

Clearing Nonvolatile RAM

This will correct E105 errors, clear accumulated Time and Distance, Error Log, custom programs, and the custom introduction screen.

ClubTrack Models

1. Press **Stop**, **Faster**, and **Slower** simultaneously to enter Service Mode (screen will display P000).
2. Press **Stop** and **Cool Down** to clear and initialize ALL updateable parameters.
3. Reconfigure the controller to CP3 (612) or CP10 (510)
   - Press **Stop Belt** and **+** simultaneously to increase the configuration number

- Press **Stop Belt** and **–** simultaneously to decrease the configuration.

4. When finished, press **Select** or **Enter** to store the configuration.
5. Press **Stop**, **Faster**, and **Slower** simultaneously to leave Service Mode.

ClubTrack Plus Models

1. Press **Stop**, **Faster**, and **Slower** simultaneously to enter Service Mode.
2. Continue to press **Next** until **NVR Load** appears, then select it.
3. Press **Exit** to leave Service Mode.

Viewing the Drive Revision Number

ClubTrack Models

1. Press **Stop**, **Faster**, and **Slower** simultaneously to enter Service Mode (screen will display P000).
2. Press **Stop Belt** and **Down** simultaneously to view the code revision number.
3. Press **Stop**, **Faster**, and **Slower** simultaneously to leave Service Mode.

ClubTrack Plus Models

1. Press **Stop**, **Faster**, and **Slower** simultaneously to enter Service Mode.
2. Continue to press **Next** until **Drive Revision** appears, then select it.
3. Press **Return** to return to the Service screens.
4. Press **Exit** to exit Service Mode.

Viewing the Controller Revision Number

ClubTrack Models

1. Press **Stop**, **Faster**, and **Slower** simultaneously to enter Service Mode (screen will display P000).
2. Press **Stop Belt** and **Down** simultaneously to view the code revision number.
3. Press **Stop**, **Faster**, and **Slower** simultaneously to leave Service Mode.

ClubTrack Plus Models

1. Press **Stop**, **Faster**, and **Slower** simultaneously to enter Service Mode.
2. Continue to press **Next** until **Controller Revision** appears, then select it.
3. Press **Return** to return to the Service screens.
4. Press **Exit** to exit Service Mode.

Treadmill	Configuration No.
ClubTrack 612	CP3
ClubTrack 612 Plus	CP3
ClubTrack 510	CP10
ClubTrack 510 Plus	CP10
No configuration	CP--

Testing Pin Signals on the Communications Cable

Communication cable problems can cause an E204 error message. Use an ohmmeter to test for the following conditions:

1. Check each wire for continuity from one end of the cable to the other.
2. Check each wire for a short to another wire.
3. Check each wire for a short to the metal connector housing at the drive end.

Signals on Control Cable Pins

Pin No. VSD (J12)	Pin No. DPU (J1)	Signal
1	1	T+ (Transmit +)
2	2	T– (Transmit –)
3	3	R+ (Receive +)
4	4	R– (Receive –)
5	5	GND (Ground)
6	6	N/C
7	7	GND (Ground)
8	8	+12 VDC
9	9	+12 VDC

➤ Note: J12 is a D-sub connector. J1 is a MASCON connector.

Heart Rate Monitoring

The Polar telemetry system for heart rate detection and transmission has been time-tested and shown to be accurate and reliable; however, there is a small percentage of people for whom the system will not work. If all the steps in the following table are performed and the belt and controller appear to be operating correctly, the user's heart rate may not be detectable by the system.

- The handgrip system will work well for most people. However, some will not get good results from this system. These users should opt for the Polar telemetry (chest strap) method of monitoring.

Problem	Possible Cause	Remedy
Heart rate reading is erratic or absent.	**Wireless (telemetry)** Poor electrode contact	1. Be sure that the logo on the belt is facing out, that the belt is tight enough, and that the electrodes are flat against the skin. 2. Moisten the electrodes again. 3. Be sure the receiver is within range—30 inch (81 cm). 4. Wash belt.
	Handgrip Hand movement during exercise	1. Reduce hand movement during exercise
Heart rate is erratic or above 200.	**Wireless (telemetry)** 1. HRM treadmills too close together.	1. Move the treadmills at least 18 inch (46 cm) apart.
	2. Interference from electromagnetic signals (e.g., other belt transmitters, T.V., motors, computers, and such).	2. Move the treadmill away from the source of interference.
	Handgrip Interference with Wireless HR system preventing use of handgrips.	1. Move the treadmill away from the source of interference.

Problem	Possible Cause	Remedy
No signal on controller	**Wireless (telemetry)**	
	1. No electrode contact	1. Reposition chest belt, re-wet electrodes.
	2. Faulty chest belt	2. Test signal using different belt transmitter or a pulse simulator; replace old belt if faulty.
	3. Faulty receiver	3. Test the belt transmitter using a different receiver. If transmitter is working correctly, replace receiver.
	Handgrip	
	1. Poor handrail contact.	1. Reposition hands on handrail
	2. Temporarily disabled electronics.	2. Power treadmill off, then back on from main power switch on back of treadmill.
	3. Loose wire harnesses	3. Check handrail and interface wire harnesses for snug fit into connectors.
	4. Faulty Handgrip module	4. Replace module

Testing Wireless System Heart Rate Accuracy

Use a pulse simulator (P/N 34198-008) and a Polar watch receiver (P/N 34198-009) to test the accuracy of the controller's heart rate function.

1. Turn on the pulse simulator. The LED on the front of the simulator will blink in synch with the signal.
2. Place the Polar watch receiver next to the pulse simulator to begin receiving. The watch will display the digital heart rate.
3. Check the rate displayed on the watch against the rate displayed on the controller. If the controller differs by five beats, replace the receiver (P/N 34295) and retest. If the problem remains, replace the controller assembly (P/N 34297).

Testing Handgrip Heart Rate Accuracy

The handgrip accuracy can best be tested at the Quinton factory with the use of specialized equipment. You can, however, perform a simple check by placing your hands on the Handgrip sensors while standing still. Allow thirty seconds to obtain a stable reading. Compare this to your pulse rate taken manually immediately after.

Mechanical Problems

Mechanical problems can include noise and vibration caused by loose or worn parts. Use the following tables to diagnose mechanical failures.

Walk Belt

Problem	Possible Cause	Action
Belt stops and an overcurrent error code appears.	1. Heavy runner increased the resistance on belt. 2. Runner holding handrail stopped belt movement for more than two seconds. 3. Worn deck	1. Do not exceed weight envelope (see *Specifications*). 2. Do not resist belt for more than two seconds. 3. Turn over or replace deck.
Walk belt slipping	1. Improper walk belt tension. 2. Incorrect drive belt tension or drive belt worn.	1. Adjust walk belt tension. 2. Check drive motor belt. Adjust tensioner or replace drive belt if necessary.
Walk belt not tracking	Belt misaligned or tracking adjustment bolt overtightened.	Adjust tracking.
Walk belt worn	Various	Replace belt and deck.
Walk deck worn	Various	Replace belt and deck.

Drive Belt

Problem	Possible Cause	Action
Belt showing abnormal wear	Drive motor belt (poly-V belt) slipping	Check belt alignment. Adjust drive belt tensioner. Replace drive belt if necessary.

Treadmill Noise

Noise	Possible Cause	Action
Knocking or thumping. Rate increases or decreases with walking belt speed.	Front or rear roller (pulley) assembly bearings	Isolate* and replace roller assembly
Squealing (similar to loose automobile fan belt)	Drive belt loose	Adjust belt tension. Replace belt if necessary
Knocking at high rate	Idler pulley	Replace idler assembly
Low thumping noise with each revolution of walking belt	Belt seam needs breaking in	Noise should decrease after 2-4 weeks of operation (new belt only)

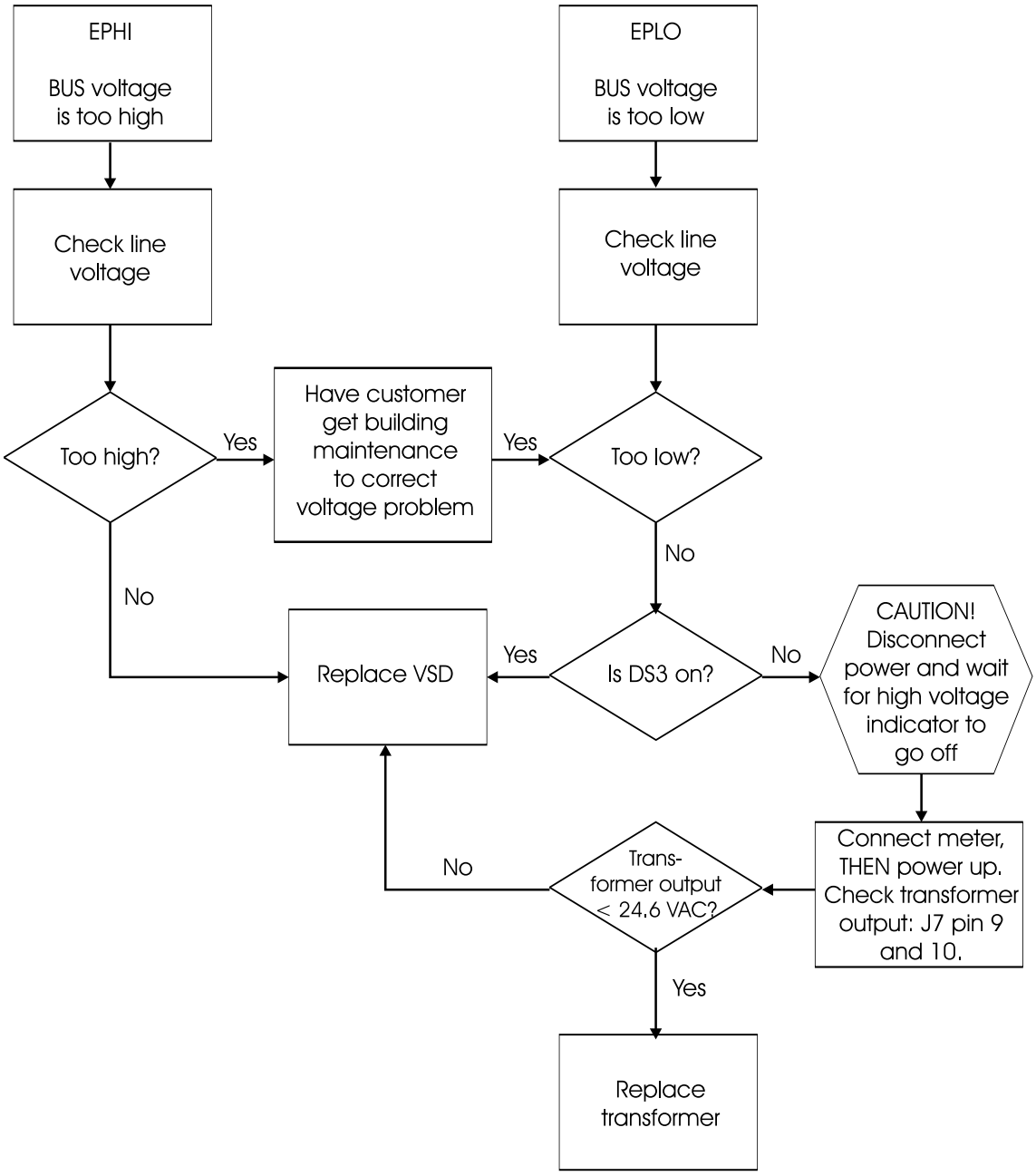
* The rate of bearing noise can help determine which bearing is at fault. The number of knocks per minute varies with treadmill speed because the roller speeds change as the belt speed changes. Use a stethoscope with a tube-like end, or a piece of hose about two feet long, to isolate bearing noise. Hold one end of the hose near the suspected bearing and the other end near your ear. Compare several bearings to determine which is the faulty one.

Flow Charts

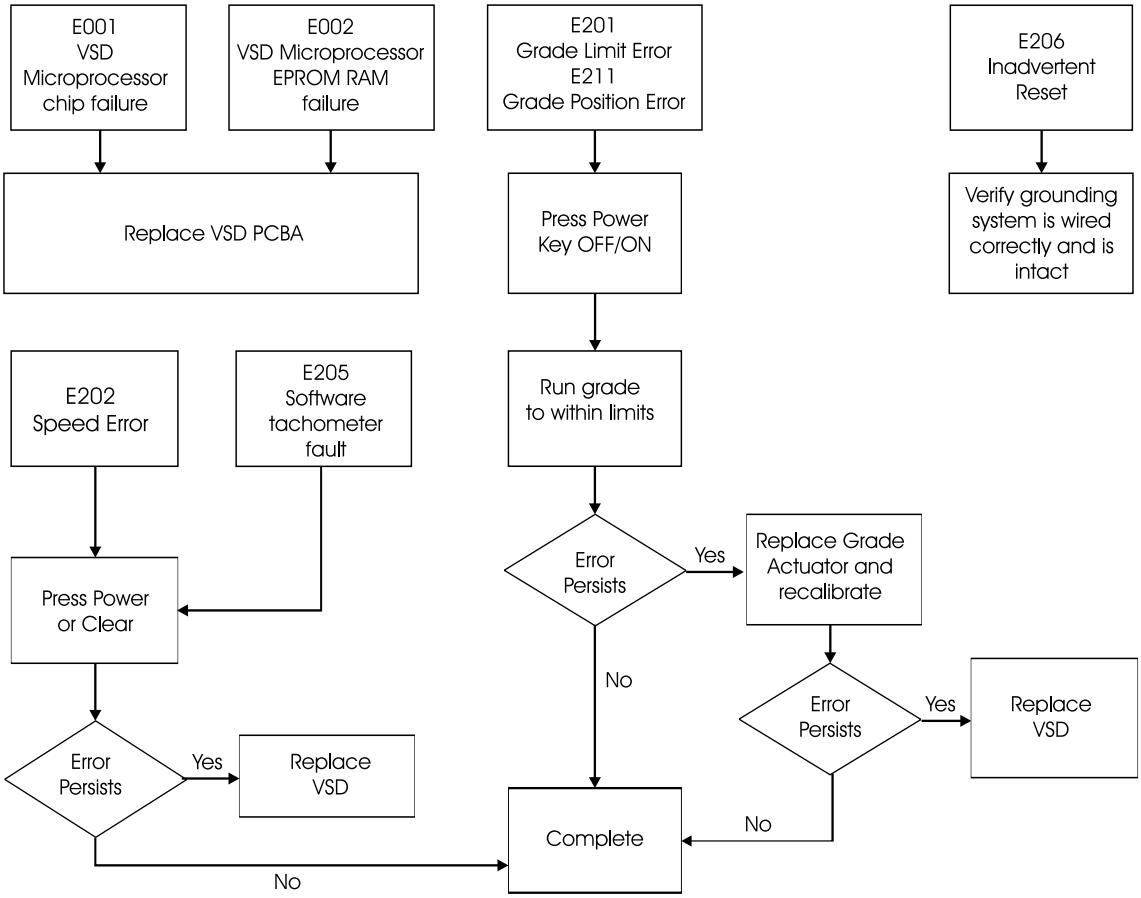
Use the following flow charts for step-by-step troubleshooting.

- For Plus models, use the error log to determine recent errors. See "Error Log (Plus Models only)" on page 3-7

Error Code Flow Chart: EPHI and EPLO

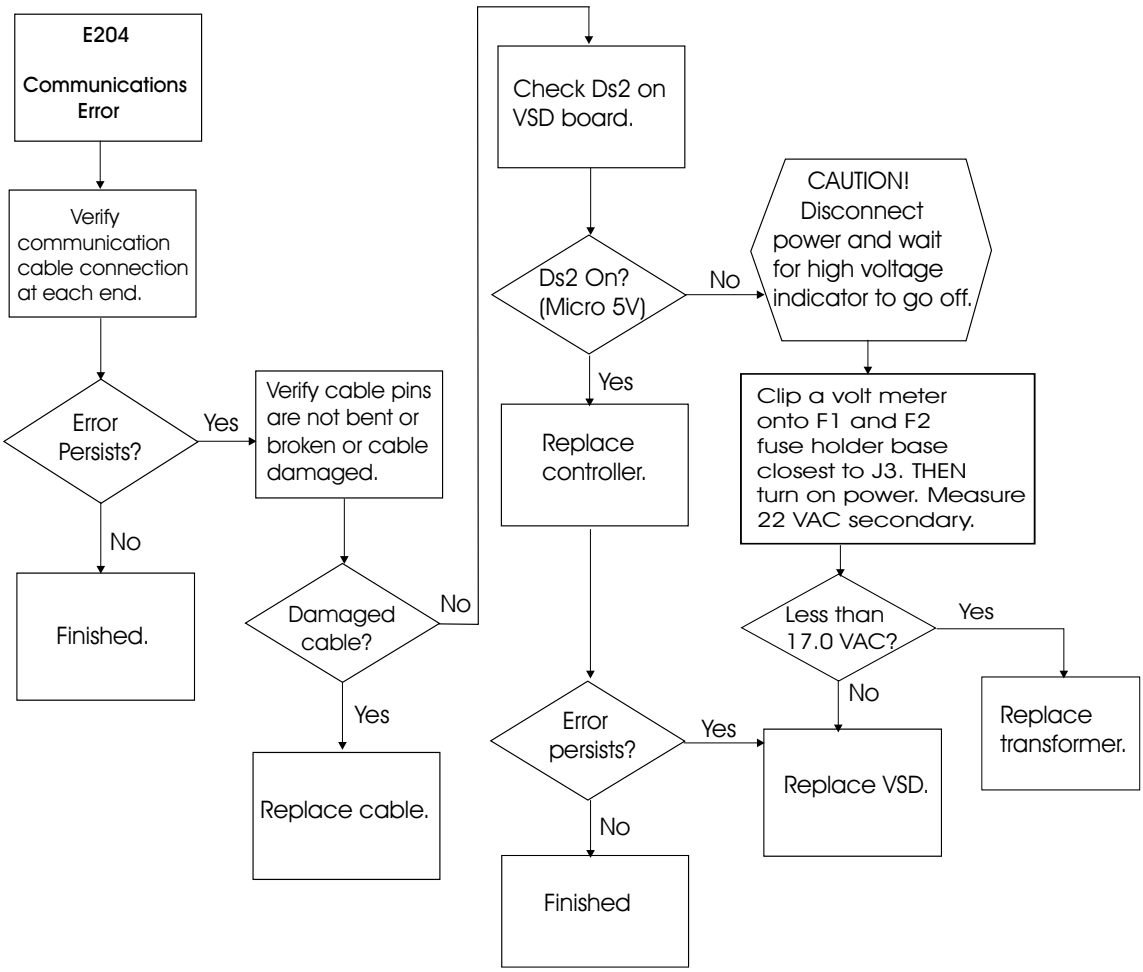


BUS Voltage


E001
VSD
Microprocessor
chip failure
E002
VSD Microprocessor
EPROM RAM
failure
E201
Grade Limit Error
E211
Grade Position Error
E206
Inadvertent
Reset
Replace VSD PCBA
Press Power
Key OFF/ON
Verify grounding
system is wired
correctly and is
intact
E202
Speed Error
E205
Software
tachometer
fault
Run grade
to within limits
Error
Persists
Yes
Replace Grade
Actuator and
recalibrate
Press Power
or Clear
No
Error
Persists
Yes
Replace
VSD
Error
Persists
Yes
Replace
VSD
Complete
No
No

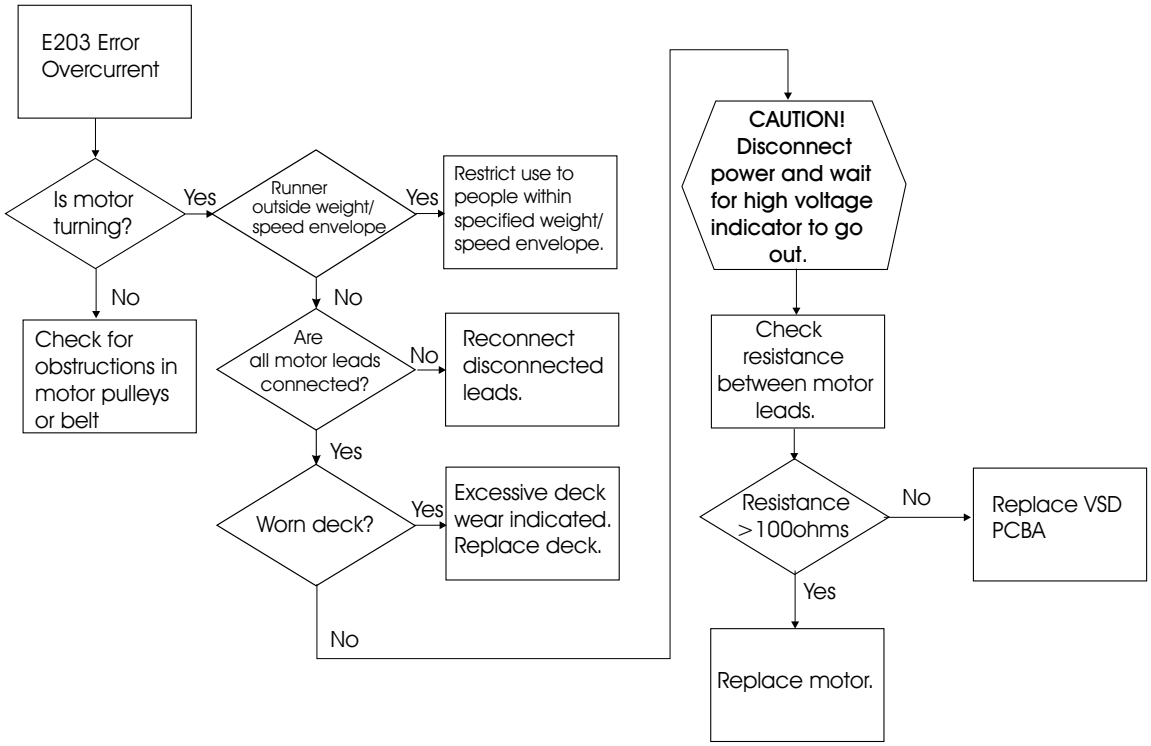
VSD Board

Error Code Flow Chart: E204



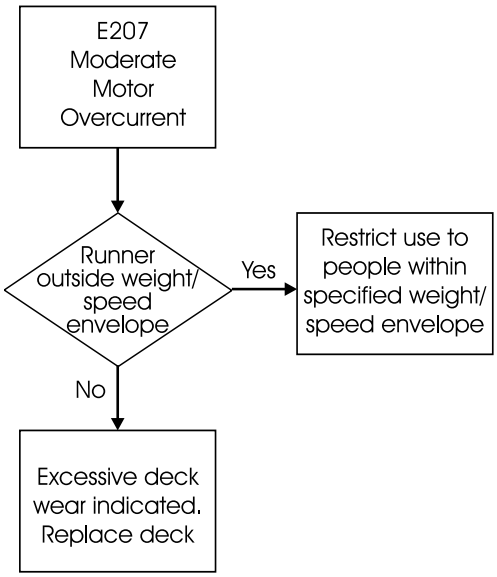
Communications Link

Error Code Flow Chart: E203

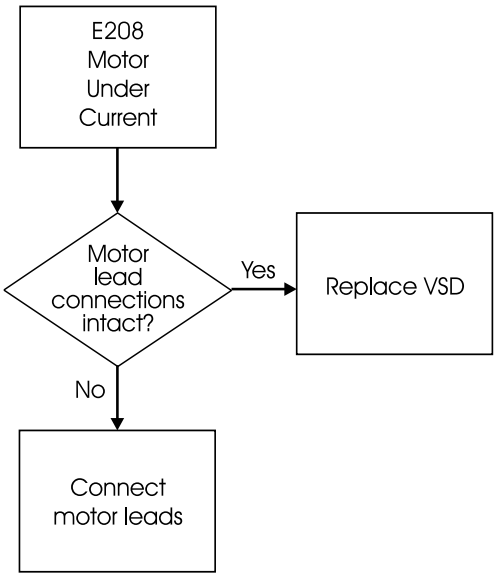


Motor Overcurrent

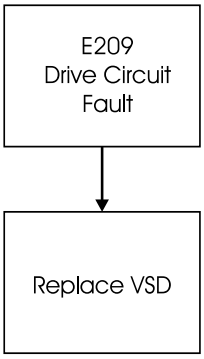
Error Code Flow Charts: E207, E208, E209, E210



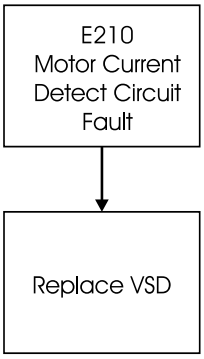
Moderate Motor Overcurrent



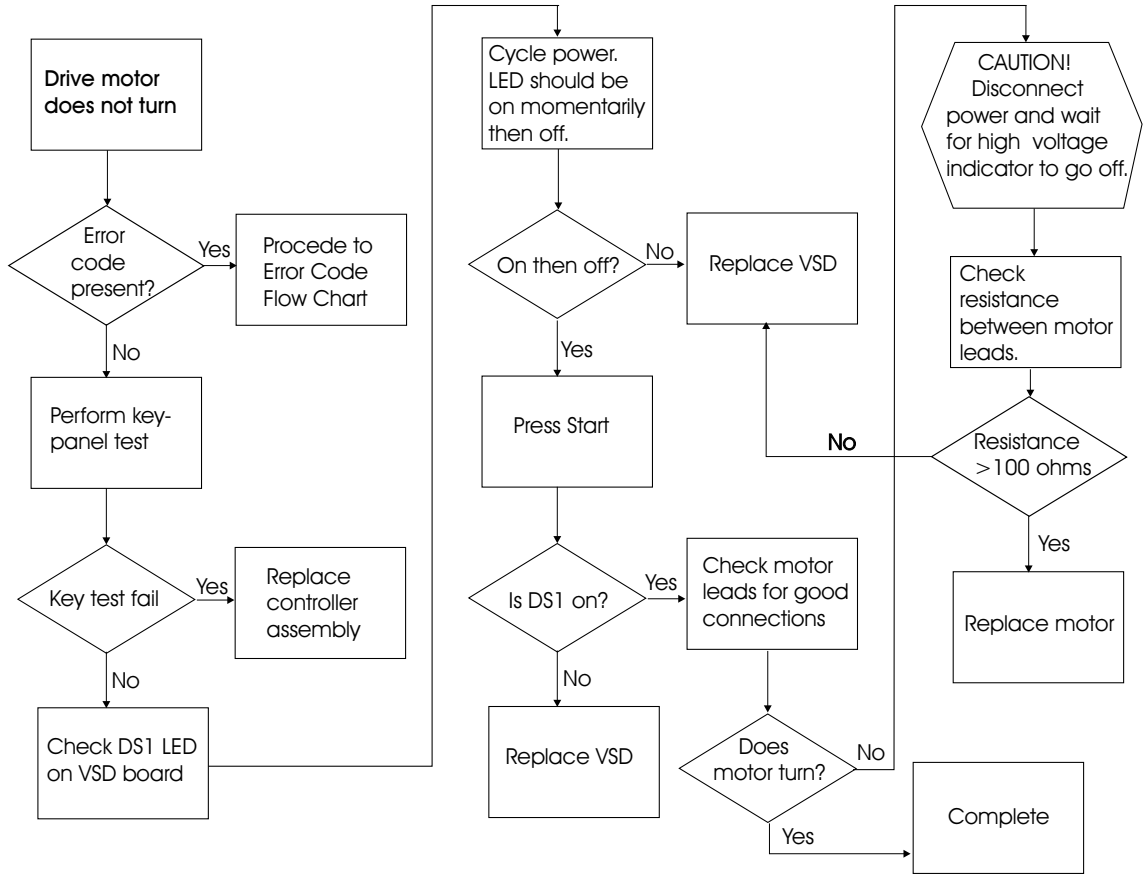
Moderate Motor Undercurrent



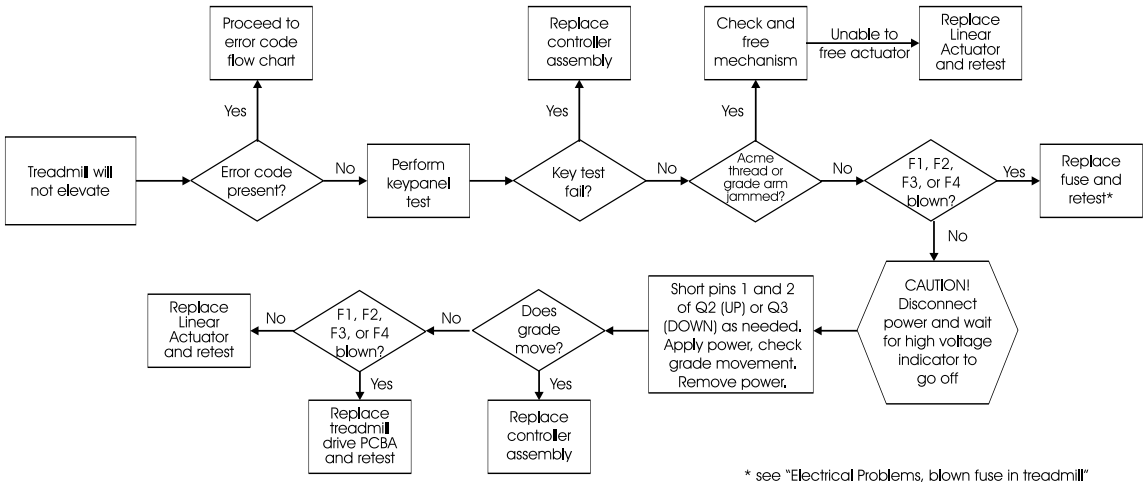
Drive Circuit Fault



Drive Current Detect Fault



Drive Motor



Grade Problems

4

Repair/Replacement and Calibration

The procedures that follow apply to the ClubTrack 510, ClubTrack 510 Plus, ClubTrack 612, and ClubTrack 612 Plus treadmills. The PCB assemblies are field-replaceable modules; no procedures are included for component-level repair. This includes:

- variable speed drive (VSD)
- heart rate monitor (HRM) used with the ClubTrack models
- heart rate control (HRC) used with ClubTrack Plus models

This section is designed only for Quinton-authorized service personnel with proper training. There are no user-serviceable parts in the treadmills. Any attempt by non-Quinton-trained personnel to service the treadmill may void the warranty. For service information, call Quinton Technical Service: 1-800-426-0538.

Before servicing the treadmill, read the safety requirements listed in Appendix A.

Cautions/Warnings

Electrical

Warning

High voltage is present beneath the treadmill hood while the treadmill is connected to a power source. Residual high voltage remains for a few minutes after power is removed. To prevent high-voltage electrical shock:

- **unplug the power cord and use caution every time you remove the hood.**
- **before working on or around any electrical or mechanical component under the hood, wait at least two minutes from the time you unplug the power cord and be sure the red LEDs on the VSD board are off.**

Turn off the circuit breaker on the treadmill before connecting or disconnecting the treadmill to the wall outlet.

The controller does not turn off electrical current to the treadmill.

Be sure treadmill area is free of liquid spills before removing hood.

Burns

Warning

Allow pulleys, motor, and other treadmill parts to cool sufficiently before touching them.

Unplug the treadmill immediately if signs of overheating occur.

Mechanical

Warning

Be sure the treadmill power cord is unplugged before working with grade components, belts, and pulleys.

Secure long hair, loose clothing, and jewelry before working near the treadmill, particularly near walking surfaces and rotating parts.

Before running the treadmill, check for worn parts which could break loose during service or operation.

Keep fingers away from rotating parts.

To avoid eye contaminants, clean away dust and debris from moving parts before servicing.

Beware of sharp edges when replacing worn parts.

Do not start the walk belt when someone is on the treadmill.

Improper lifting can cause back strain. It also can cause injury to others if the treadmill is dropped. Lifting the treadmill requires at least two people.

Tools

- Phillips and flat blade screwdrivers
- Hex socket wrenches: 10mm, 13mm, 14mm, 16mm
- 4mm hex key (Allen wrench)
- 6mm nut driver
- Heyco® strain relief pliers for replacing hard-wired power cord
- 13mm open-end wrench
- 10mm wrench
- Frequency counter
- Tachometer
- Wooden blocks (2" x 4" x 6" long)
- Belt tension calipers P/N 30113-001 (optional)
- Masking tape or heavy pencil

  ➤ Although some procedures are used for several applications (removing the hood, for example), each procedure is explained only once. Reference procedures under their headings for subsequent applications.

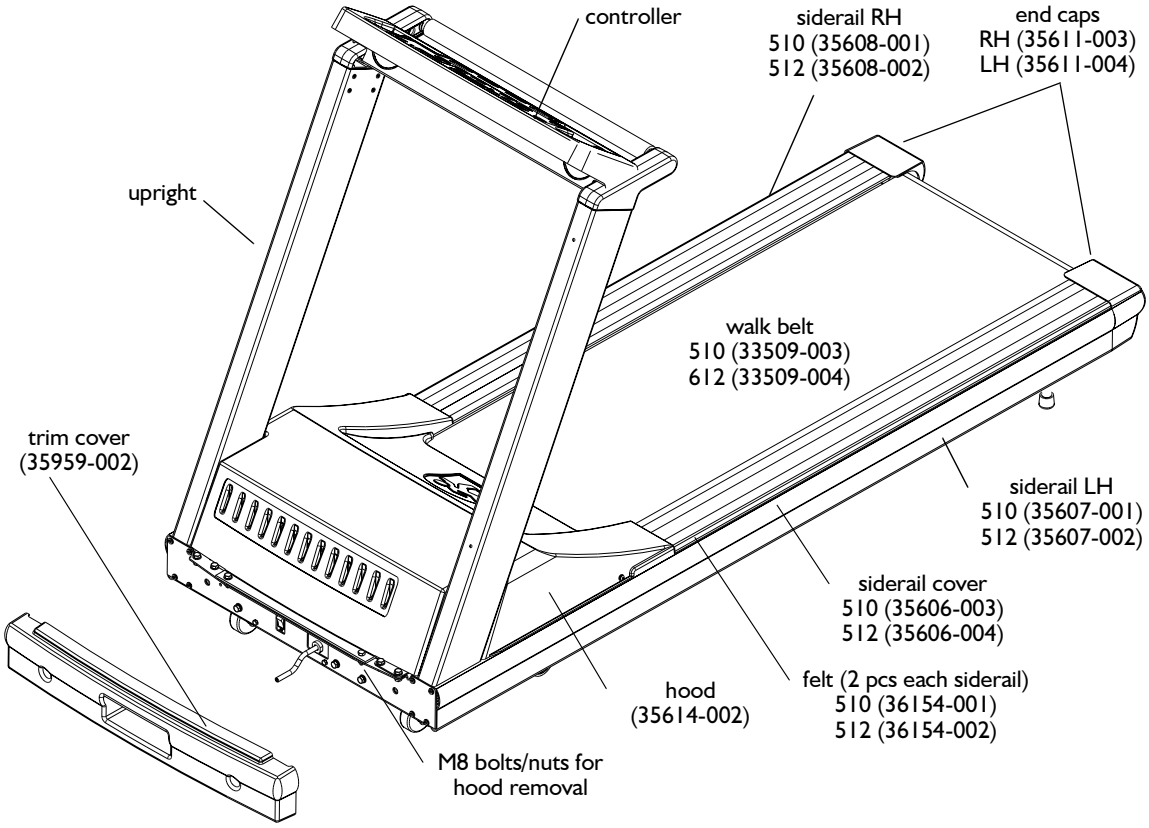
  ➤ All references to front, rear, left, and right are given as though you were facing the controller while walking on the deck.

Field Functional Tests

You *must* perform a field functional test after any of the procedures in this chapter are performed. The applicable test is specified after each section in this chapter. Appendix D, Field Functional Tests, contains complete test instructions.

Warning

The VSD PCBA generates high voltage, which is present whenever DS4 and DS5 are illuminated. Do not touch the VSD PCBA until DS4 and DS5 have gone out. Resistors on the PCBA bleed off the high voltage in approximately two minutes.



Removing Treadmill Hood

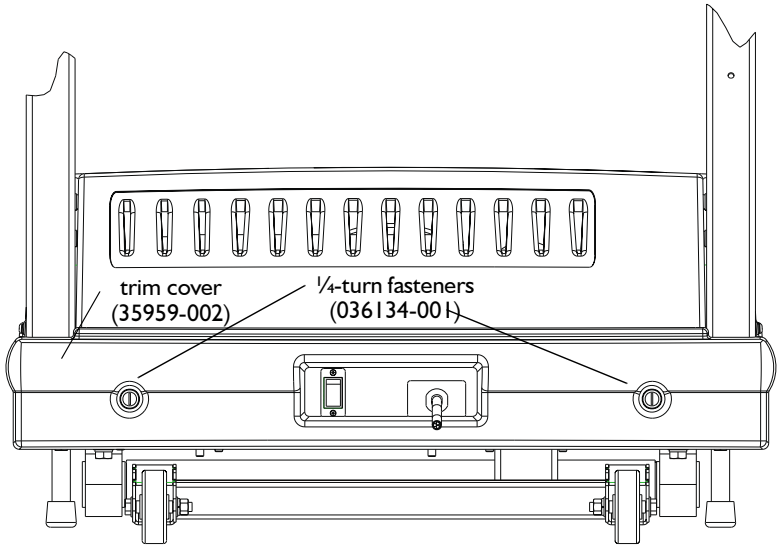
1. For your convenience in working, elevate the treadmill to its maximum height if possible.
2. Turn off the circuit breaker on the treadmill and unplug the treadmill from the power outlet.

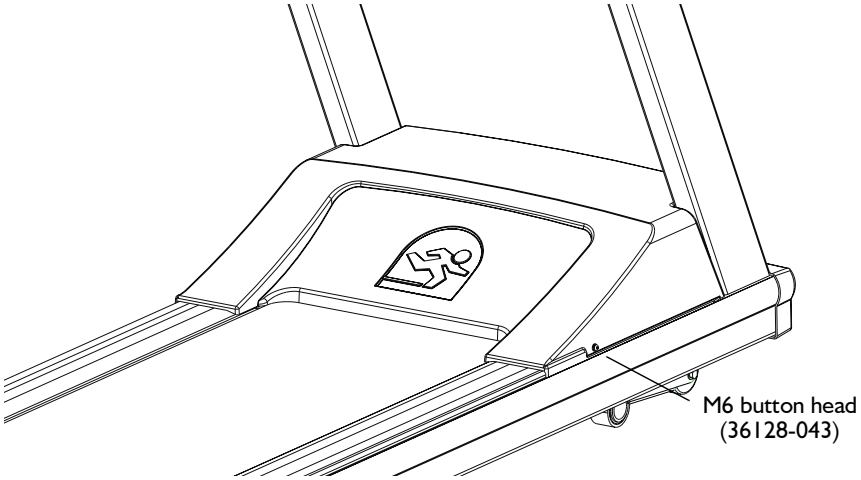
Warning

To prevent high voltage electrical shock: Before working on or around any electrical or mechanical component under the hood, wait at least two minutes from the time you unplug the power cord.

International units: Disconnect the power cord from the configuration plate.

3. Use a flat blade screwdriver to turn the two ¼-turn fasteners on the front trim cover.
4. Remove the two 8mm bolts/nuts/washers located under the front trim cover at the front of the hood.
5. Remove the two M6 button head screws located on the side of the hood





6. Grasp the hood cover at the front and back center. Pull and lift to remove.
   - Recommended: vacuum hood area before replacing hood and applying power. Be careful near VSD card cage. Do not damage VSD board.
7. To replace the hood, follow steps 3-6 in reverse order.

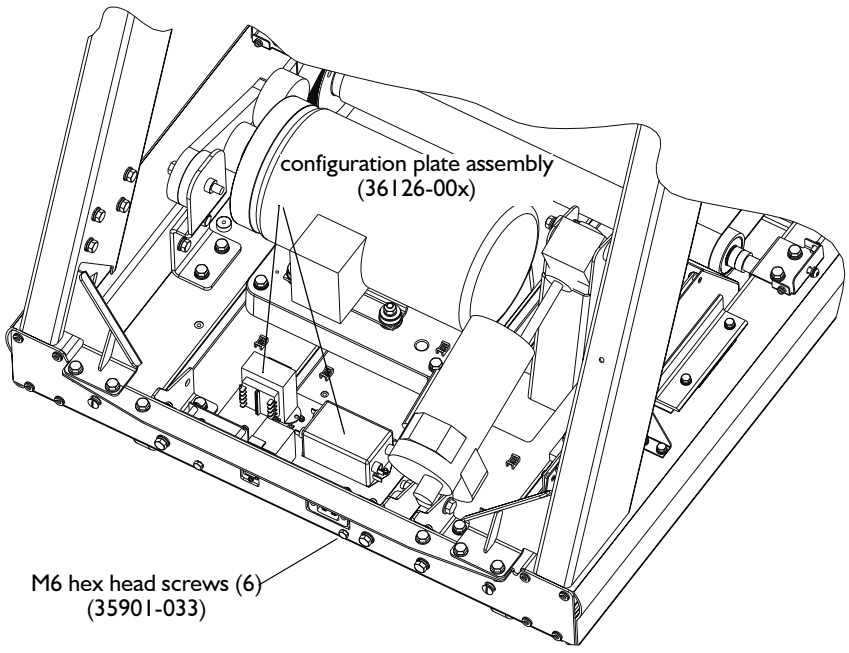
Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 1. See Appendix D, *Field Functional Tests*, for specific instructions.

Replacing the Configuration Plate Assembly

On North American units, the configuration plate module includes the power cord, which is attached to the plate. On international units, the power cord is removable and is not part of the configuration plate module.

1. Turn off the treadmill circuit breaker, then remove the power cord from the power outlet.
2. Remove the hood as previously described.
3. Remove the two 6mm hex head screws that attach the power cord ground wires to the headframe. (They are located in the center of the headframe. The ground is marked with a ground symbol.)
4. Unplug the connectors from the VSD board (North American units: 3 wires (115v) or 2 wires (230v)), International units: 2 wires). Note the wire colors and connection points.
5. Remove the four 6mm hex-head screws holding the configuration plate to the front of the headframe and two 6mm hex head screws holding the configuration plate to the bottom of the headframe.
6. Replace the configuration plate module following Steps 2 through 5 in reverse order.



Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 2. See Appendix D, Field Functional Tests for specific instructions.

Replacing the Power Cord

Hard-wired Cords

Tools: Heyco strain relief hand pliers

1. Remove the configuration plate assembly as described above.
2. Use strain relief pliers to squeeze the strain relief on the power cord and pull it free of the configuration plate.
3. Clip the power cord wire ties.
4. Remove the two hex nuts holding the power cord to the line filter: the hex nuts are behind the configuration plate, down and to the right.
5. Remove the groundwire.
6. Pull the power cord out of the configuration plate.
7. Feed the new cord into the configuration plate and reverse the procedure by following Steps 4 through 1.
    - Connect the white wire to the far neutral connector of the line filter.
    - Connect the black wire to the near (line) connector of the line filter.
    - Connect the green wire to the ground connector of the line filter.

Detachable Cords

(International units): Unplug the power cord from the connector on the configuration plate and plug in the new cord.

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 2. See Appendix D, Field Functional Tests for specific instructions.

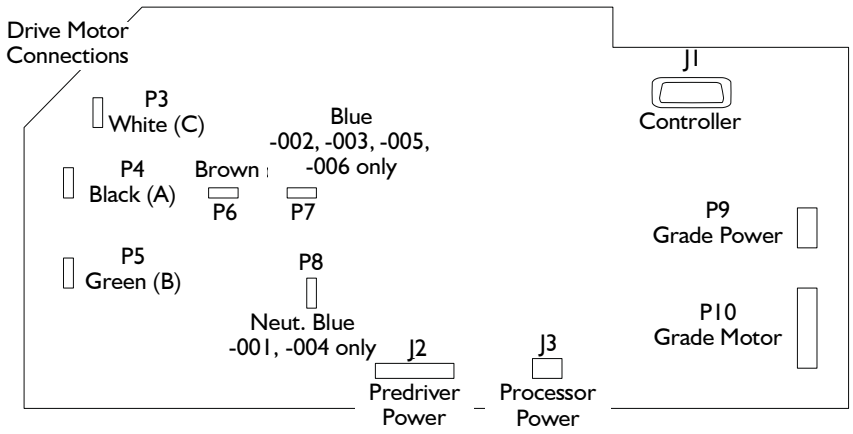
Replacing the VSD Board/Bracket Assembly

The VSD board is installed on a bracket located on the side of the treadmill.

1. Turn off the controller and the treadmill circuit breaker, then unplug the power cord from the power outlet.
2. Remove the hood as previously described.

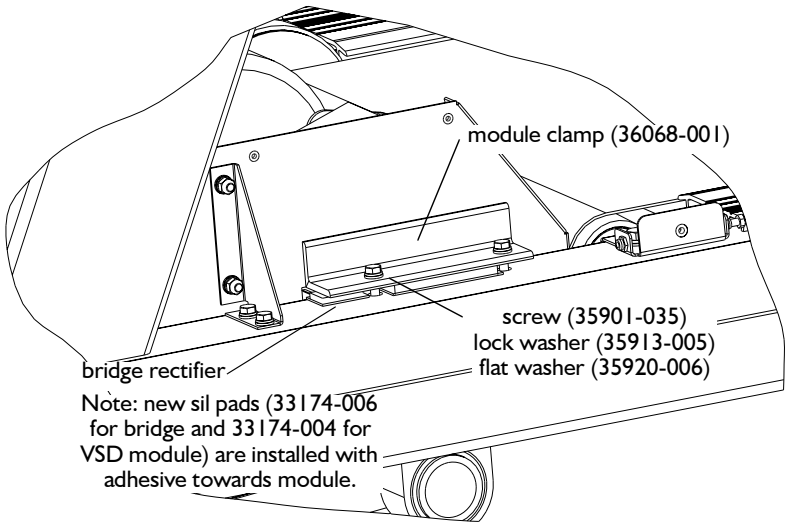
Warning

To prevent high voltage electrical shock: Before working on or around any electrical or mechanical component under the hood, wait at least two minutes from the time you unplug the power cord and be sure the red LEDs on the VSD board are off.



PCB Assembly - Treadmill Drive (036028

3. Disconnect the controller cable (J1) from the VSD board.
   - IMPORTANT: In the following steps, note the connection points and the colors of the wires as you remove them from the VSD board. All of the wires are harnessed. Reference wiring schematic.
4. Unplug the grade power and grade motor connectors (P9 and P10) from the VSD board.
5. Unplug the predriver power (J2) and processor power (J3) connectors.
6. Unplug the AC power connections (P6 and P7 (230V units) or P8 (115V units)).
7. Unplug the drive motor wires (P3, P4, P5).
8. Remove the two M6 screws that hold the switch module clamp to the side rail and remove the clamp.



9. Remove the six M6 screws holding the card cage.
10. Remove the angle support bracket from the VSD board/bracket assembly.
11. Remove the VSD/card cage assembly and return it to Quinton.
12. Replace the sil pad for the switching module before installing the new assembly.
13. Reassemble in reverse order.

Caution

Use caution when reassembling the hold-down plate for the switching module. Alternate torquing the screws just until the split lock washer is compressed. Over-torquing the screws will damage the module.

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 2. See Appendix D, *Field Functional Tests* for specific instructions.

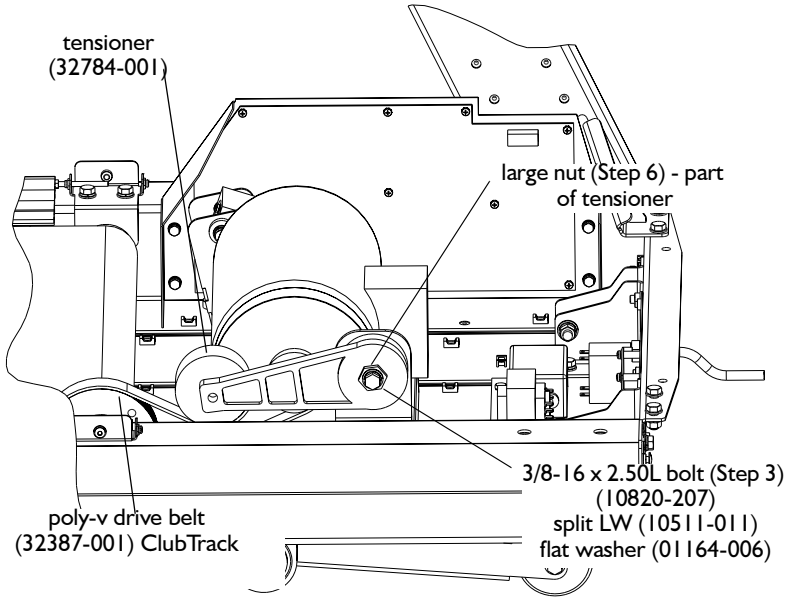
Replacing the Tensioner

The tensioner may need to be replaced if the poly-V belt slips, if the idler pulley bearing makes noise, or if the tensioner roller is damaged.

Warning

Do not attempt to disassemble the tensioner. The internal springs are tightly compressed and could cause injury if released.

1. Turn off the controller and the treadmill circuit breaker, then unplug the power cord from the power outlet.



2. Remove the hood as previously described.
3. Use a 14mm or 9/16 inch hex wrench to remove the 3/8-inch bolt from the tensioner. Remove and discard the old tensioner.
4. Be sure the belt is centered on the pulleys.
5. Place the new tensioner onto the headframe in the same position as before and loosely bolt it to the headframe.
6. Use either a 24mm or 15/16-inch open-end wrench or a large adjustable wrench to turn the large nut on the tensioner counter- clockwise; put tension on the poly-V belt until the two lines on the tensioner line up. Tighten the 3/8-inch bolt to 19 foot- pounds torque.
7. Replace the hood.

Field Functional Test

To verify that the treadmill is operating properly, perform the following functional tests:

Test Speed Operation

1. Place a chalk mark or piece of tape on the walk belt across the direction of travel.
2. Place another mark or piece of tape on the top of the siderail cover.
3. Start the walk belt and increase its speed to 4.0 mph.
4. Count how many times the belt rotates in 2 minutes. This should be 70 ± 3 revolutions for ClubTrack 510 models and 65± 3 revolutions for ClubTrack 612 models.
5. Increase the walk belt speed to 10.0 mph.

6. Count the number of belt revolutions in 2 minutes. This should be 175 ± 3 revolutions for ClubTrack 510 models and 161± 3 revolutions for ClubTrack 612 models.

   ▸ If any of the measurements are not accurate, refer to *Replacing the Tensioner* and/or *Adjusting the Walk Belt* in this chapter.

7. Ensure that the speed will traverse from minimum to maximum and back.

Walk Belt Test Procedure

1. With the walk belt speed at minimum, walk on the treadmill.
2. Grasp the handrail and resist the motion of the walk belt. If slippage is detected, determine if the walk belt or poly-V drive belt is the cause. Correct as necessary.
3. Stop the walk belt.

Shut Down the Treadmill

Turn off the circuit breaker, disconnect the power cord from the outlet, and place the treadmill back in service.

Replacing the Poly-V Drive Belt

1. Remove the hood as previously described.

Caution

The drive belt tensioner is spring loaded. Do not let it snap closed after removing the drive belt.

2. Loosen the belt tensioner by turning the -inch mounting bolt counter-clockwise, then pivot the tensioner away from the belt.
3. Remove the drive belt from the drive motor pulley.
4. Use a 13mm socket wrench to remove the end cap from each siderail.
5. Use a 13mm wrench to remove the four 2mm hex bolts that hold the two front-roller retainers to the frame. There are two bolts on each side of the roller assembly.
6. Slide the drive roller assembly to the left and remove the poly-V belt from the right side of the roller.

7. Replace with a new belt, then remount the front drive roller assembly. (When replacing the poly-V belt, be sure the belt is centered on the pulleys.)

Installing the Front Shaft Retainer

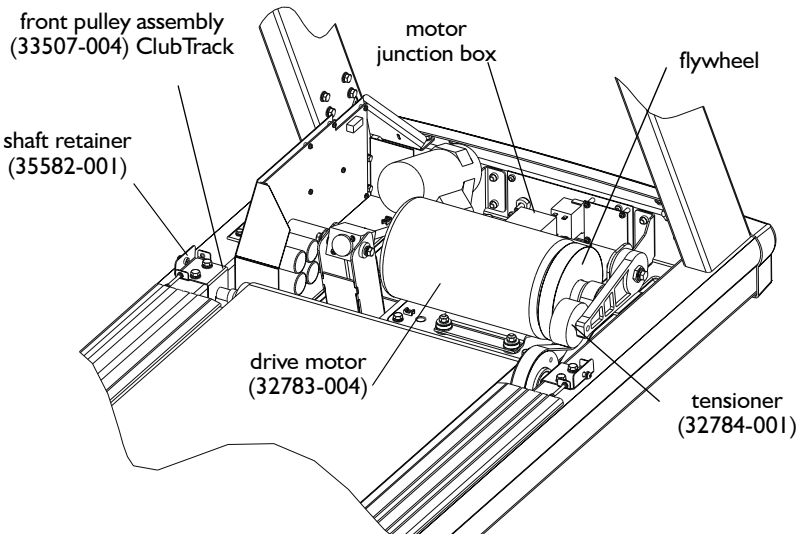
1. Install retainer. Be sure to center the shaft such that the retainer engages the grooves provided.
2. Assemble the treadmill following Steps 1-6 above in reverse order.
3. Tension the drive belt as described in Replacing the Tensioner.
4. Set the walk belt tension and tracking.

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 3. See Appendix D, Field Functional Tests, for specific instructions.

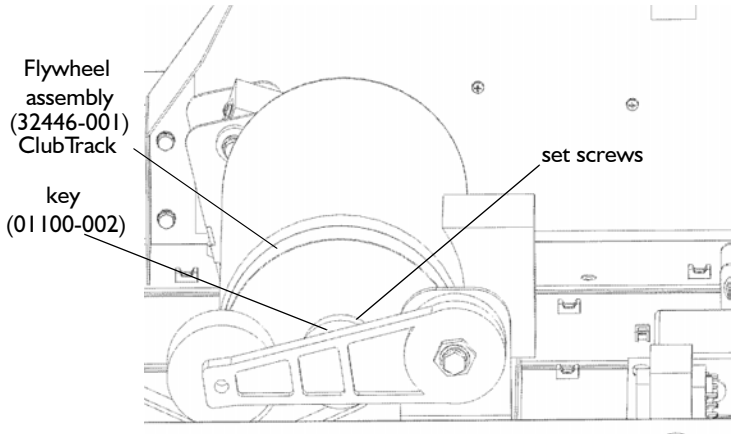
Replacing the Drive Motor

Replace the drive motor when the motor is inoperative: see Drive Motor flow chart in Chapter 3, *Troubleshooting*.



1. Turn off the treadmill circuit breaker and remove the power cord from the power outlet.
2. Remove the treadmill hood as previously described.
3. Release the drive belt tensioner and remove the poly-V belt from the motor drive pulley as previously described.
4. Cut the wire ties that hold the drive motor cable to the headframe and disconnect the motor cable at the VSD board.

5. Remove the four hex nuts that hold the motor mount on the headframe.
6. Pull the motor assembly off the headframe.
7. Using a 13mm open end wrench, remove the nuts and washers securing the motor. Note the arrangement of the isolator mounts.
8. Loosen the two set screws on the flywheel/drive pulley and remove. Use a gear puller to pull the flywheel off the motor shaft.



9. Reinstall the flywheel onto the motor shaft and loosely tighten the setscrews.
10. Replace the motor by following Steps 4 through 8 in reverse order. Use Loctite 242 adhesive on the motor mount studs before installing new motor mounting nuts.

Caution

Tighten the motor mounting nuts until the lock washer flattens, then turn the nut ½ turn. Do not overtighten the nut.

The new motor and flywheel assembly must be aligned with the front roller drive pulley. Use a straight-edged ruler placed on the outside of the front roller drive pulley to align the outside face of the motor drive pulley to within 0.020 inch (½mm). Tighten the set screws.

11. Replace the poly-V belt as previously described.
12. Replace the hood assembly as previously described.

Field Functional Test

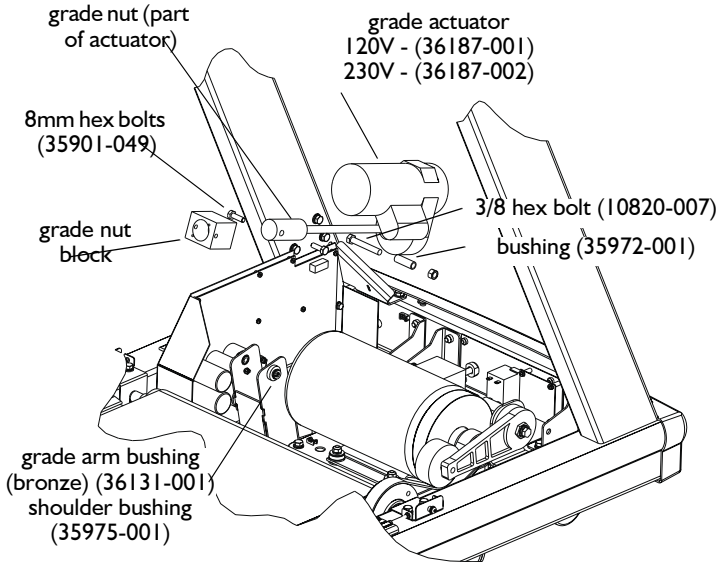
To verify that the treadmill is operating properly, perform Field Test No. 3. See Appendix D, Field Functional Tests for specific instructions.

Replacing the Grade Actuator

- Place a clean sheet of cardboard or a clean rag on the treadmill deck before starting this procedure.

Do not elevate the treadmill.

1. Block the treadmill headframe securely with wooden blocks to ensure that the treadmill will not drop when you remove the grade actuator.
2. Turn off the power and remove the hood as described.
3. Disconnect the grade actuator connector from the VSD board (P10).
4. Remove the two 8mm hex bolts securing the grade arm bearings to the block at the end of the screw on the grade actuator. Be careful, as the grade arm will swing free when these bolts are removed.
5. Remove the shoulder bushings from the grade arm and set aside, noting the location of flats for preventing rotation.
6. Remove the 3/8 locknut and bolt from the grade actuator mounting at the headframe end and remove the actuator. Withdraw the cylindrical bushing from the bearing in the end of the actuator.
7. Spin the block containing the actuator nut off the end of the screw. Using a Phillips screwdriver, remove the M4 screws, lock washers, and flat washers securing the grade nut.
8. Replace the grade actuator, following steps 2 through 7 in reverse order. When re-installing the bronze bearings, be sure to clean all mating surfaces and lubricate bearings with automotive wheel bearing grease prior to installation. Prior to installing the grade arm bearings as described in step 4, perform the procedure described below to calibrate the grade system. Apply a small amount of grease to the screw after installation.



Calibrating the Grade System

This procedure assumes the starting point is with the grade arm bearings removed (actuator is free at the actuator nut). If this is not the case, perform steps 1 through 4 of the procedure for Replacing the Grade Actuator.

1. Position the grade actuator in such a way that if the screw turns, no harm will come. Plug the treadmill in, turn the circuit breaker on, and use the Up or Down keys on the controller to set the grade at 0%. If an E201 error is encountered, this indicates the grade pot is reporting an out of range error and pressing the appropriate key to move the actuator back in range will clear the error. Turn off the circuit breaker and unplug the treadmill. Allow 2 minutes for the voltage on the VSD board to bleed down before resuming work on the treadmill.
2. Level the treadmill by placing suitable blocking under the headframe. Use either a level on the side rail, by measuring the distance to the bottom of the side rails at both ends, or by placing a pair of 3/8-inch thick spacers under the large grade swingarm bearing mounts under the treadmill.
3. Screw the grade nut block assembly onto the screw until the holes in the block line up with the holes in the grade arm. Install the grade arm shoulder bushings, bearings, and M8 hex bolts, flat, and lock washers. Torque to 180-220 in-lb.

Warning

High voltage is present when the treadmill is plugged into a power source. Secure loose hair, clothing, and jewelry before working near rotating machinery.

Verify that:

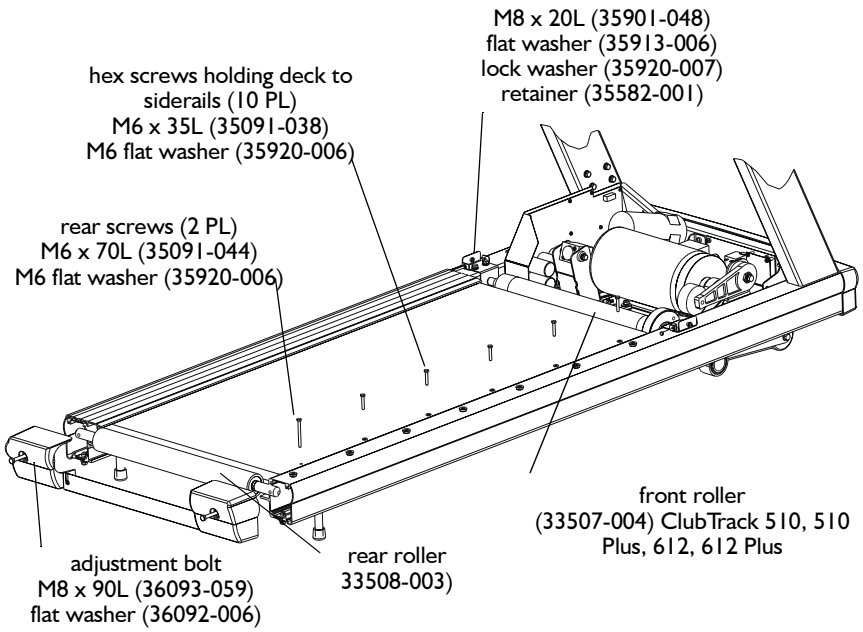
a. it operates over the full range of 0-15% (0-12% for ClubTrack 510).

b. there is no binding when it moves up or down.

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 4. See Appendix D, Field Functional Tests, for specific instructions.

Walk Deck Assembly



Replacing the Rollers

1. Turn off the treadmill circuit breaker and unplug the power cord. Remove the hood as previously described.
2. Remove the poly-V belt as described previously.
3. Loosen tension on the walk belt. Remove the endcaps completely.
4. Pull the walk belt towards the rear of the deck, then slide the rear roller assembly out from between the walk belt toward the side of the treadmill.
5. Lift the front roller out from under the walk belt.
6. Replace the rollers and reassemble the treadmill following Steps 1-4 in reverse order. See Installing the Front Shaft earlier in this chapter.
   - If the adjusting bolts will not thread into the shaft, check the part number of the replacement bolt. This shaft has metric threads.
7. Adjust the walk belt tension and tracking.

Field Functional Test

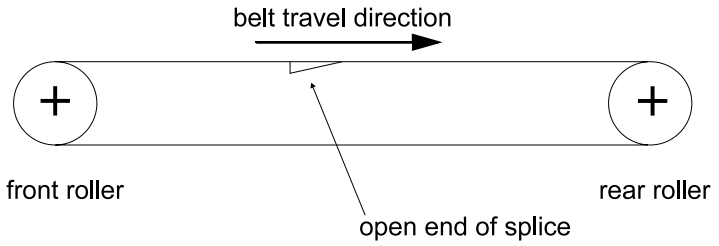
To verify proper operation, perform Field Test No. 3. See Appendix D, Field Functional Tests, for specific instructions.

Replacing the Walk Belt or Deck

- All instructions are given as if you were exercising on the treadmill.

Whenever you install a new walk belt, you should install a new deck or turn over the existing deck (the deck is reversible). Inspect the compression mounts each time you replace the walk belt and replace if worn.

1. Raise the treadmill to its maximum height. Turn off the power, unplug the power cord, and remove the hood as previously described.
2. Remove the front and rear roller assemblies (see previous).
3. Grasp the left siderail cover at the rear of the treadmill, then pull it straight back to slide the cover off. Repeat for the right cover.
4. Remove the 12 screws that hold the deck to the siderails.
5. Remove the deck and belt.
6. Install a new belt with the logo side up, and reassemble the treadmill following Steps 1-6 in reverse order.
   - When you install a new belt, verify that the closed end of the splice on the walk belt hits the roller first as the belt rotates.



7. Adjust the belt tracking and tension.

Field Functional Test

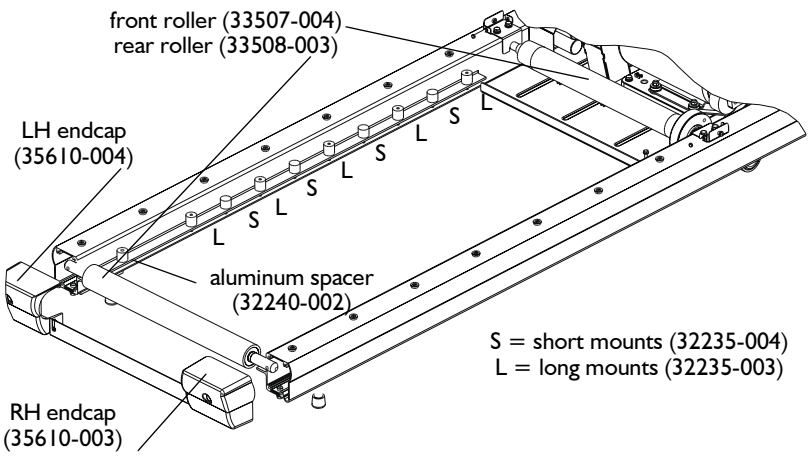
To verify that the treadmill is operating properly, perform Field Test No. 3. See Appendix D, Field Functional Tests, for specific instructions.

Replacing Compression Mounts

Inspect the compression mounts each time you change the walk belt. Replace the mounts if worn.

1. Remove the deck as previously described.
2. Locate and unscrew the compression mounts from the inside of each siderail; there are five long mounts and three short

mounts on each siderail. The front two mounts are attached with hex nuts underneath.



3. Unscrew the mounts from each siderail and replace.
4. Replace the deck as previously described. (Triple Flex Maintenance Kit p/n 33511-002)

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 3. See Appendix D, Field Functional Tests, for specific instructions.

Replacing the Deck

- The deck is reversible. You can turn it over if one side wears out. The walk belt must be replaced when the deck is turned over.

Follow Steps 1-7 in the previous section, Replacing the Walk Belt, to remove and replace the deck.

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 3. See Appendix D, *Field Functional Tests*, for specific instructions.

Adjusting the Walk Belt

Walk Belt Tension

Adjust the tension:

- whenever the belt slips or moves unsteadily during operation
- after installing a new walk belt.

Two adjustment methods are specified. Method 1 is preferred, but two belt tension calipers (Quinton P/N 30113-001) are required.

- Both adjustment screws must be completely slack before starting this procedure.

Method 1 (Calipers available)

1. Turn both tension adjustment screws clockwise until most of the slack is removed from the belt.
   - Do not stretch the walk belt at this point.
2. Position one caliper on each side of the belt, approximately 18 inches from the rear roller assembly.
3. Grasp the belt with one caliper clamp.
4. Pull the slack out of the belt with your fingers, then grasp the belt with the second clamp.
5. Repeat Steps 3 and 4 on the other side of the belt using the other caliper.
6. Set the dials of both calipers to zero.
7. Alternately tighten each tension adjustment screw in 0.1% increments until both sides read 0.4%. Ensure that the pointer is exactly on the line increment of the dial for each setting.

Caution

Do not overtighten the adjustment screws. Overtightening may damage the walk belt and roller assemblies.

8. Remove both gauges.
9. Adjust the walk belt tracking.

Method 2 (Calipers not available)

- Both adjustment screws must be completely slack before starting this procedure.

Use this method only if two belt adjustment calipers are not available. An accurate measuring device is required.

1. Turn both tension adjustment screws clockwise until most of the slack is removed from the belt. Do not stretch the walk belt.
2. Place two pieces of masking tape or two light pencil marks on the right edge of the belt exactly 50.000 inch apart.
3. Repeat Step 2 on the left edge of the belt.
4. Alternately turn the left and right adjustment screws one-half turn until the distance between the tape or pencil marks is 50.203 inch (±0.016) on both sides.

Caution

Do not overtighten the adjustment screws. Overtightening may damage the walk belt and roller assemblies.

5. Remove the tape.
6. Adjust the walk belt tracking.

Walk Belt Tracking

Adjust the tracking:

- whenever the belt moves to one side
- after installing a new walk belt
- each time you adjust the walk belt tension.

Warning

Do not stand on the belt when adjusting the tracking.

1. Adjust the walk belt tension as described on the previous page. Start the treadmill and let it run for at least one minute at minimum speed and grade. Do not start the treadmill when some one is on the walk belt.
2. Make the following adjustment to the *right* adjustment screw only:
   a. If the belt moves to the right, turn the screw ¼ turn *clockwise*.
   b. If the belt moves to the left, turn the screw ¼ turn *counter-clockwise*.
3. Run the treadmill for at least one minute to observe the belt tracking. Adjustments may take some time to become apparent.
4. Repeat Steps 3 and 4 as required.

Caution

Do not overtighten the adjustment screw. Overtightening may damage the walk belt and assemblies.

5. Increase the speed to 8 mph, then repeat Steps 3 and 4 as required.
6. Press **Stop Belt** to stop the treadmill, then press **Power** to turn it off.

Controller Assembly

The controller assembly includes the keypanel, the PCBA, and the enclosure that holds them to the treadmill:

The ClubTrack 510 and 612 use the heart rate monitor (HRM).

The ClubTrack 510 Plus and 612 Plus, use the heart rate controller (HRC).

You must configure the controller correctly after installing.

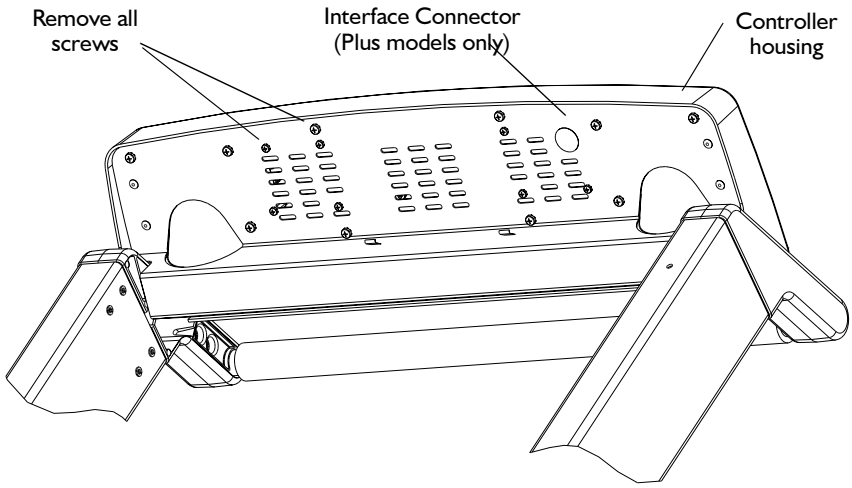
Removing the Enclosure

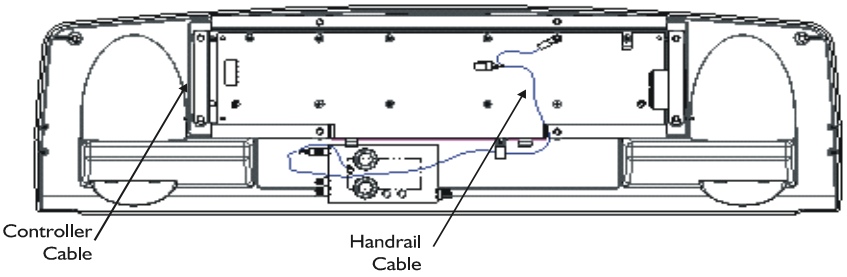
1. Turn the treadmill power off and disconnect the power cord from the power source.
2. Remove optional siderails if present.

Caution

While performing Steps 2-7, hold the enclosure securely, so that it does not fall while you are removing the screws and the handrail. Be careful not to scratch the uprights.

3. Use a Phillips screwdriver to remove the screws from the rear cover of the enclosure.





4. Lift the housing off the rear panel.
5. Disconnect the controller cable, located on the left side of the PCBA and the handrail cable at the small contact heartrate PCBA.
6. Reassemble following Steps 2-5 in reverse order.

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 5. See Appendix D, Field Functional Tests, for specific instructions.

Replacing the PCBA

ClubTrack 510/612

1. Turn off the treadmill and disconnect the power cord from the outlet.
2. Remove the controller assembly as described earlier.
3. Using a 6mm nutdriver or socket, remove the M4 hex spacers securing the PCBA. Using a Phillips screwdriver, remove the remaining screws, noting the location of the EMI ground clip and the handgrip module ground wire.
4. Disconnect the handgrip module interface cable.
5. Remove the PCBA, disconnecting the ribbon cable from the keypanel.
6. Replace the PCBA and reassemble, following steps 1-5 in reverse.

ClubTrack 510/612 Plus

1. Turn off the treadmill and disconnect the power cord from the outlet.
2. Remove the controller assembly as described earlier.
3. Using a 6mm nutdriver or socket, remove the M4 hex spacers securing the PCBA. using a Phillips screwdriver, remove the remaining screws, noting the location of the EMI ground clip and the handgrip module ground wire.
4. Disconnect the ribbon cable to the LCD display (at the top of the PCBA). Disengage the connector from the cable by sliding the outer connector housing away from the PCB. The housing will slide approximately 1/8 inch, then stop. Once the housing is in this position, the cable should extract without any resistance.
5. Disconnect the fluorescent tube wires (2 wire connector) from the PCBA.
6. Disconnect the handgrip module interface cable.
7. Remove the PCBA, disconnecting the ribbon cable from the keypanel.
8. Replace the PCBA and reassemble, following steps 1-7 in reverse.

Replacing the Handrail (Treadmills with Handgrip Heart Rate feature)

1. Turn off the treadmill and disconnect the power cord from the outlet.
2. Remove the controller assembly as described earlier.

3. Use a 10mm socket wrench to remove the four screws that hold the two plastic handrail retainers in place. Carefully pull the retainers out using a pair of pliers.
4. Rotate the handrail 1/4 turn away from the keypanel so the slots that the retainers fit into now face upwards.
5. Push the right side of the handrail all the way forward, toward the keypanel.
6. Pull the left side of the handrail out of the upright fitting to complete the removal.
7. To install the new handrail, begin by sliding the handrail cable into the long, thin slot at the end of the handrail tube.
8. Hold the handrail so that the cable protrudes from the left side, and rotate the handrail so that the long slots face the ceiling.
9. Push the right side of the handrail tube into the upright fitting and slide the handrail toward the keypanel, as far forward as possible.
10. The left side of the handrail should now slide forward easily. Be careful not to kink the cable or cut through its outer jacket.
11. Pull the right side of the handrail back away from the keypanel and slide the handrail to the right.
12. Rotate the handrail forward, so that the slots face directly away.
13. Remove the cable from the slot on the left side, so that it moves freely, and route it through the upright fitting.
14. Reinstall the plastic handrail retainers and the four screws.
15. Reinstall the controller assembly.

Replacing the Fluorescent Tube (Plus Models)

1. Remove the PCBA as described above (Replacing the PCBA).
2. Remove the EMI shield.
3. Remove the LCD display from the keypanel and place it face up.
4. Remove the single screw that holds the white plastic fluorescent tube housing together.
5. Remove the fluorescent tube (p/n 35428-001) and replace with new tube.
6. Reassemble in reverse order.

Replacing the Handgrip Heart Rate Module

1. Turn off the treadmill and disconnect the power cord from the outlet.
2. Remove the controller assembly as described earlier.
3. Note the orientation of the Handgrip Module within the controller assembly and connections to incoming cables. The four-pin connector in the corner of the module must be located to align with the cable from the handrail. Disconnect the cables.
4. The Handgrip Module is held down by recloseable fasteners. Use a wide-blade screwdriver to pry it from the controller housing.
5. Press the replacement Handgrip Module into place securely.
6. Reconnect cables and reassemble following steps 1 through 4 in reverse order.

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 5. See Appendix D, *Field Functional Tests*, for specific instructions.

Configuring the Controller

When you replace a controller, you must configure it to work with the specific treadmill. This must also be done after an E212 error.

Perform the following steps to configure the treadmill.

ClubTrack 510 and Clubtrack 612

1. Enter the service mode by simultaneously pressing **Stop Belt**, **Slower**, and **Faster**.
2. Select the configuration number by holding down **Stop Belt** and depress **Input +** or **Input -** until the correction configuration number appears in the display. Choose the appropriate configuration number from the following:

Treadmill	Configuration No.
ClubTrack 612	CP3
ClubTrack 510	CP10

3. Press **Select** to store the configuration.
4. Exit service mode by simultaneously pressing **Stop Belt**, **Faster**, and **Slower**.

ClubTrack 510 Plus and Clubtrack 612 Plus

1. Enter the service mode by simultaneously pressing **Stop Belt**, **Slower**, and **Faster**.
2. Press **F3** NVR Load.
3. Press the **Next** button three times.
4. Press **F5**, Select Configuration. Press **up arrow** until **CP10** is displayed for the ClubTrack 510 Plus or **CP3** is displayed for the ClubTrack 612 Plus.
5. Press **Exit** to exit the Service Mode and save the configuration.

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 1. See Appendix D, *Field Functional Tests*, for specific instructions.

Removing the Keypanel

To remove the keypanel:

1. Remove the PCBA following the above procedure.
2. Remove the 10 hex nuts that hold the keypanel to the enclosure.
3. Lift the keypanel off the enclosure.

Replacing the Controller Cable

1. Disconnect the power and remove the hood as previously described.
2. Remove the controller assembly as previously described
3. Cut any cable ties that fasten the controller cable to the headframe.
4. Remove the EMI ferrite from the cable.
5. Pull the cable up through the right upright to remove it.
6. Install a new cable (p/n 36033-001) following Steps 1-5 in reverse order.

Field Functional Test

To verify that the treadmill is operating properly, perform Field Test No. 5. See Appendix D, *Field Functional Tests*, for specific instructions.

Cumulative Use

The cumulative use feature lets you determine the amount of wear on the belt and motor by displaying the total distance or total time of use for each treadmill. This data can be useful for scheduling service.

- The cumulative time and distance are stored in the controller. Both values are zero if a new controller is installed. Loading a factory default program will reset the time and distance to zero.

ClubTrack 510/612

Distance

To determine the total distance on each treadmill:

1. Press **Power** to turn on the treadmill controller.
2. Simultaneously press **Stop** and **Slower**.
3. Multiply the number that appears in the multifunction display by 10 to obtain the cumulative total in miles or hours.
4. Record the mileage and the date for your records.
5. Press **Clear** to reset the display for operation.

Time

To determine the total time of treadmill use:

1. Press **Power** to turn on the treadmill controller.
2. Simultaneously press **Stop** and **Faster**.
3. Multiply the number that appears in the center display by 10 to obtain the total number of hours of operation.
4. Record the total time and the date for your records.
5. Press **Clear** to reset the display for operation.

ClubTrack 510/612 Plus

- In the Plus controllers, total time, total distance, and current distance are calculated and saved in the HRC; therefore, any controller replacement restarts the maintenance counters. Total time and distance are saved into non-volatile memory every time the stop belt function is activated.

To view cumulated time and distance, enter custom mode and select **Maintenance Information**. The screen shows the cumulative time and distance.

To open custom mode:

1. Turn the **Power** key off.
2. Press and hold the **Menu** key, then press **Power**.
3. Select **Maintenance Information**.

Limited Access Switch

If the limited access control is on, the treadmill will not operate unless the magnetic key is on the Quinton logo on the controller.

Disabling the Limited Access Switch

1. Remove the magnetic key and press **Power** to turn off the treadmill.
2. Simultaneously press and hold the **+**, **–**, and **Power** keys until the 8s on the display go off, then release the keys.

The control remains inactive, allowing unrestricted access, until you place the key over the logo again.

5

Preventive Maintenance

Warning

Before working on the treadmill or its components, turn off the treadmill circuit breaker and unplug the power cord.

High voltages remain under the treadmill hood for a few minutes even after the plug has been removed.

Secure long hair, loose clothing, and jewelry before working near the treadmill, particularly near the walking surface or pulleys.

Do not permit anyone to stand on the treadmill belt when it is started.

Recommended Service

With normal upkeep, no routine service is necessary. When service is required, repairs can be done to the modular level.

Routine Maintenance

Visual Inspection

Inspect the power cord and walking belt for wear.

- Check the position of the walking belt; be sure it is not rubbing against the frame. The belt should be centered on the deck within 0.25 inch; adjust if necessary.
- Check optional side handrails to be sure they are fastened securely.
- Remove potential hazards from the treadmill area.

Cleaning the Exterior

Follow these steps to clean the treadmill after servicing or as required:

1. Elevate the treadmill to maximum height and vacuum the floor under it to prevent excess dust and dirt from interfering with operation.
2. Use a damp sponge to wipe the exteriors and walking belt; do not soak surfaces. Dry all surfaces thoroughly.

Caution

Never wipe the deck under the belt, even when replacing a belt. Wiping can ruin the surface.

Do not use detergents or cleaning agents on any part of the deck.

Do not let liquid enter the interior of the treadmill or controller.

Vacuuming Under the Treadmill Hood

Accumulation of dust and dirt beneath the hood restricts the air flow needed to dissipate heat from the drive motor and VSD board. To prevent damage to components, periodically vacuum the mechanical drive and the area behind the VSD board.

Frequency

Usage and environment determine how much dust accumulates and how frequently you need to vacuum the components. Inspect the internal components at least every six months. Adjust the inspection schedule as needed.

Warning

To avoid electric shock, turn off the treadmill circuit breaker and unplug the treadmill before removing the hood. Before working near components, wait at least two minutes from the time you unplugged the power cord. Be sure the red LEDs on the VSD board are off.

Caution

Use extreme caution to avoid physical damage to the internal components. Avoid static discharge, which can damage the electronic components.

1. Remove the hood as previously described (Chapter 4).
2. Vacuum the areas behind the VSD cage (siderail side). Do not vacuum the VSD board.
3. Replace the hood.

Replacement Schedules

Replace belts if they are frayed or show excessive wear.

Heart Rate Monitoring

Cleaning

Clean the handrail and contact pads using a damp cloth or sponge. Dry all surfaces thoroughly.

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 as they can damage the electrodes permanently.

Battery

The estimated life of the belt transmitter is 2500 hours of use. For a replacement belt and for recycling the old transmitter belt, contact Polar Electro at 800/227-1314.

Storage

Store the belt in a warm, dry place away from direct sunlight. Do not store in plastic or other material that can trap moisture. Do not store in soap and water bath.

A

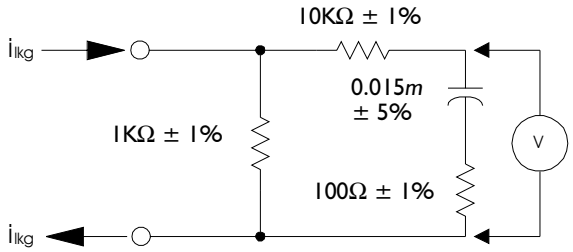
Safety Requirements

Read this manual in full before operating the treadmill.

- Do not start the treadmill when someone is standing on the belt.
- Keep speed and grade at the lowest settings when someone is getting on and off the treadmill.
- Keep the area underneath and around the treadmill clear.
- Before each use of this equipment, check the power receptacle for signs of damage. Do not operate the equipment if the integrity of these items is in question.
- To avoid potential safety and electrical problems, use parts and accessories that meet Quinton specifications.
- This equipment is classified Class I, Type B, ordinary equipment. Not protected against fluid ingress. Rated for continuous operation.
- Increased risk due to leakage current can result if this equipment is not grounded properly.
- The treadmill must be on an appropriate, dedicated electrical circuit. Nothing else should be connected to the circuit.
- **Failure to follow these guidelines can produce a serious or possibly fatal electrical shock hazard or other serious injury. Consult a qualified electrician as required.**

  ➤ Continuous A-weighted sound measurements taken over the speed range of an unloaded ClubTrack treadmill are less than 70dB(A).

  For systems to be used in the U.S.: The American standard for chassis leakage current of electromedical apparatus when measured by interruption of the power ground (earth) conductor is 300µA. The current ANSI standard, ANSI/AAMI ES1-1993, contains the limits. The standard is also shown in the National Fire Protection Association Standard for health care facilities, NFPA 99-1993. The leakage currents specified in the standards are for current frequencies up to 1 KHz. The AAMI standard test load provides the proper attenuation for frequencies above 1 KHz. This load circuit can be found in the referenced ANSI standard.



AAMI Standard Test Load (1mV=1uA)

Symbol Definitions

Quinton products display one or more of the following symbols and warning labels for your protection. No single product displays all symbols.

Caution	Attention: Consult accompanying documents		earth ground (protective)
	Off (power disconnected from mains)		Type B equipment - provides adequate protection against electric shock, particularly regarding allowable leakage current; reliability of the protective earth connection (when present)
	On (power connected to mains)		Type BF equipment - contains an F-type isolated patient applied part providing a high degree of protection against electric shock
	Alternating current		Type BF equipment with defibrillation protection
	High voltage		Type CF equipment - contains an F-type isolated patient applied part and provides a degree of protection against electric shock higher than that for type BF equipment regarding allowable leakage currents
	Earth ground (functional)		Type CF equipment with defibrillation protection
	Replace fuse only as marked		Fuse
	Mains power		Equipotentiality
	Starts treadmill walking belt		Stops treadmill walking belt

	Speeds up treadmill walking belt		Slows treadmill walking belt
	Increases grade of treadmill walking belt		Decreases grade of treadmill walking belt
Warning 	Warning	**T**	Timed fuse (slo-blo)
	Treadmill connection		Ergometer connection
Hz	Hertz	**V**	Volts
A	Amperes	**VA**	Volt Amperes

B

Specifications

ClubTrack 510/510 Plus (00448/00408) and ClubTrack 612/612 Plus (00456/00457)

PERFORMANCE		
	ClubTrack 510/510 Plus	**ClubTrack 612/612 Plus**
Maximum Rated Load	400 lb (181.4 kg)	400 lb (181.4 kg)
Belt Speed Range: ± 0.2 mph (continuously adjustable)	1.0 to 10 mph (1.6 to 16.0 km/h)	1.0 to 12 mph (1.6 to 19.3 km/h)
Rate of speed change (acceleration)	1.0 to 10 mph in 30 secs	1.0 to 12 mph in 35 secs
Grade range ± 0.5%	0 to 12%	0 to 15%
Rate of grade change	0 to 12% in 60 secs max with 320 lb user	0 to 15% in 60 secs max with 320 lb user
PHYSICAL		
Weight	345 lb (157 kg)	355 lb (161 kg)
Nominal walking surface	20 in. x 55 in.	20 in. x 60 in.
Treadmill dimensions width x length x height	31.5 in. x 83.0 in. x 51.5 in. (80.0 cm x 210.8 cm x 130.8 cm)	31.5 in. x 88.0 in. x 51.5 in. (80.0 cm x 223.5 cm x 130.8 cm)
Walking surface height from floor	7.75 in. (19.7 cm)	
Handrail height from walking surface	38.5 in. (97.8 cm)	
ENVIRONMENTAL		
Temperature	Operating: 50 to 90 °F (10 to 32 °C) Storage: -13 to 122 °F (-25 to 50 °C)	
Humidity (non-condensing)	Operating: 3 to 95% relative Storage: 3 to 95% relative ➤ Limited to 90 °F (32 °C) maximum dew point	
Atmospheric pressure	Operating: 8.60 to 15.0 psia, 445 to 775 mm Hg absolute Shipping & storage: 8.22 to 15.0 psia, 425 to 775 mm Hg absolute	

POWER REQUIREMENTS		
Dash Number	**Voltage/Hz**	**Current Draw in Amps**
-001, -005	99-132 V, 50/60 Hz	16
-002	198-264 V, 50/60 Hz	10
-003, -004, -006, -007, -008	198-264 V, 50/60 Hz	10
-009	90-132 V, 50/60 Hz	20
-010	180-264 V, 50/60 Hz	10

- -002 (Domestic 220V units) must be connected to 240V 60Hz center-tapped single phase or 208V 60Hz two-line polyphase power.

FUSE RATINGS	
F1	-001, -005, -009: 250Vac, 2.5A, IEC 127 (5 x 20mm) -002, -003, -004, -006, -007, -008, -010: 250Vac, 1.25A IEC 127 (5 x 20mm)
F2	-001, -005, -009: 250Vac, 2.0A, IEC 127 (5 x 20mm) -002, -003, -004, -006, -007, -008, -010: 250Vac, 1.0A IEC 127 (5 x 20mm)
F3, F4	-001, -005, -009: 250Vac, 0.5A, IEC 127 (5 x 20mm) -002, -003, -004, -006, -007, -008, -010: 250Vac, 0.25A IEC 127 (5 x 20mm)

ClubTrack 510/612 Controllers

SPEED (3-digit display)	
Units	Miles per hour (mph) or kilometers per hour (km/h)
Range	ClubTrack 510: 0 to 10 mph (0 to 16.0 km/h) ClubTrack 612: 0 to 12 mph (0 to 19.3 km/h)
Increment	0.1 mph
Rate of change	Two increments (or decrements) per second for the first three seconds, five per second thereafter until you either release the key or reach the high/low limit.
Accuracy	Within ± 0.2 mph (0.3 km/h) of actual speed during unchanging operation, 1 mph (1.6 km/h) during speed decrease. Shows target, not actual, speed during speed changes.
GRADE (3-digit display)	
Units	percent
Range	ClubTrack 510: 0 to 12% ClubTrack 612: 0 to 15%
Increment	0.5%
Rate of change	Two increments (or decrements) per second for the first three seconds, five per second thereafter until you either release the key or reach the high/low limit.
Accuracy	Within ± 0.5% actual grade during unchanging operation

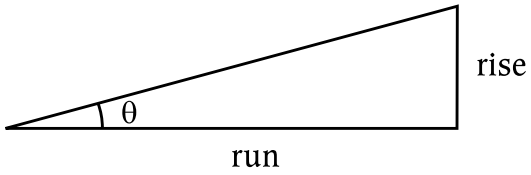
MULTI-FUNCTION DISPLAY (4-digit display—displays exercise parameters, weight, and error messages)	
Elapsed time or countdown timer	Units: min:sec Range: 00:00 to 99:59 Increment: 00:01
Elapsed distance	Units: miles or kilometers Range: 0 99.9 miles or kilometers Increment: 0.001 from 0 to 9.999 mi or km, 0.01 from 10.00 to 99.99 mi or km
Pace	Units: minutes:seconds per mile or minutes:seconds per kilometer Range: 5:00 to 60:00 min:sec/mi (3:07 to 37:16 min:sec/km) Increment: 00:01 Zero speed: when walk belt speed is zero, the pace display indicates "-.-"
Calories	Total calories expended Units: calories Range: 0.001 to 999.9 Increment: 0.001 from 0 to 9.999; 0.01 from 10 to 99.99; 0.1 from 100 to 999.9
Caloric rate	Caloric rate expenditure Units: calories/min Range: 0.001 999.9 Increment: 0.001 from 0 to 9.999; 0.01 from 10 99.99; 0.1 from 100 to 999.9
METS	Units: METS Range: 1.000 to 31.62 Increment: 0.001 from 1 to 9.999; 0.01 from 10.00 to 31.62
Heart rate	Units: beats per minute Range: 50-225 Increment: 1
Scan	Cycles through parameters, displaying each sequentially for 3 sec
Weight	Default: 150 lb to 68 kg Minimum: 30 lb or 13 kg Maximum: 400 lb (181 kg) Increment: 1 lb or 1 kg

ClubTrack 510/612 Plus Controllers

SPEED (3-digit display)	
Units	Miles per hour (mph) or kilometers per hour (km/h)
Range	ClubTrack 510 Plus: 0 to 10 mph (0 to 16.0 km/h) ClubTrack 612 Plus: 0 to 12 mph (0 to 19.3 km/h)
Increment	0.1 mph, 0.16 km/h
Accuracy	Within ± 0.2 mph (0.32 km/h) of actual speed during unchanging operation, 1 mph (1.6 km/h) during speed decrease. Shows target, not actual, speed during speed changes.
GRADE (3-digit display)	
Units	percent
Range	ClubTrack 510 Plus: 0 to 12% ClubTrack 612 Plus: 0 to 15%
Increment	0.5%
Accuracy	Within ± 0.5% actual grade during unchanging operation
LCD DISPLAY (4.75 in. x 3.61 in. area, 320 x 240 pixels resolution. Displays user prompts, graphs, weight, time, exercise parameters and stages, and error messages)	
Time	Units: min:sec Range: 00:00 to 99:59 Increment: 00:01
Elapsed distance	Units: miles or kilometers Range: 0 to 99.9 miles or kilometers Increment: 0.001 from 0 to 9.999 mi or km; 0.01 from 10.00 to 99.99 mi or km
Pace	Units: minutes:seconds per mile or minutes:seconds per kilometer Range: 5:00 to 99:59 min:sec/mi (3:07 to 99:59 min:sec/km) Increment: 00:1 Zero speed; when walk belt speed is zero, the pace display indicates “-.-”
Calories	Total calories expended or caloric rate expenditure Units: calories or calories/min Range: 0.001 to 999.9 Increment: 0.001 from 0 to 9.999; 0.01 from 10 to 99.99; 0.1 from 100 to 999.9
Caloric rate	0.001 to 999.9 cal/min
METS	Range: 0.001 to 999.9 Increment: 0.001 from 1 to 9.999; 01 from 10.00 to 99.990.1 from 100 to 999.9
Heart rate	Units: beats per minute (BPM) Range: 50-200, Increment: 1 BPM
Vertical feet	Range: 1 to 42,949 ft (13,091 m) Increment: 0.1 ft (0.1 m)
Watts	Range: 1 to 9999 Increment: 0.1 watt

Enter Weight	Default: 150 lb or 68 kg Minimum: 30 lb or 13 kg Maximum: 400 lb or 181 kg Increment: 1 lb or 1 kg
Enter Target Heart Rate	Default: 140 beats per minute (BPM) Minimum: 80 BPM Maximum: 200 BPM Increment: 1 BPM
Enter Exercise Time	Default: 20 min Minimum: 7 min Maximum: —:— (no limit or owner-set maximum) Increment: 1 min
Serial interface	RS-232 interface, complies with CSAFE standards for external communications.

Percent vs Angle Relationship for Treadmill Grade



$$\text{Grade} = \frac{\text{rise}}{\text{run}} \qquad \tan\theta = \frac{\text{rise}}{\text{run}}$$

$$\text{Grade} = \tan\theta$$
$$\theta = \arctan(\text{Grade})$$

Note: 15% grade $\Rightarrow$ grade = 0.15

Grade (%)	Angle (°)	Grade (%)	Angle (°)	Grade (%)	Angle (°)
0.0	0.00	5.0	2.86	10.0	5.71
0.5	0.29	5.5	3.15	10.5	5.99
1.0	0.57	6.0	3.43	11.0	6.28
1.5	0.86	6.5	3.72	11.5	6.56
2.0	1.15	7.0	4.00	12.0	6.84
2.5	1.43	7.5	4.29	12.5	7.13
3.0	1.72	8.0	4.57	13.0	7.41
3.5	2.00	8.5	4.86	13.5	7.69
4.0	2.29	9.0	5.14	14.0	7.97
4.5	2.58	9.5	5.43	14.5	8.25
5.0	2.86	10.0	5.71	15.0	8.53

C

Part Numbers

Final Assemblies

ITEM	PART NUMBER
ClubTrack 510 Fitness Treadmill	00448
ClubTrack 510 Plus Fitness Treadmill	00458
ClubTrack 612 Fitness Treadmill	00456
ClubTrack 612 Plus Fitness Treadmill	00457
The following dash numbers apply to all treadmill part numbers above	
English USA - 99-132V, 50/60 Hz, 20A	001
English USA - 198-250V, 50/60 Hz, 10A	002
German - 198-250V, 50/60 Hz, 10A	003
Spanish - 198-250V, 50/60 Hz, 10A	004
Spanish - 99-1320V, 50/60 Hz, 20A	005
English UK - 198-250V, 50/60 Hz, 10A	006
French - 198-250V, 50/60 Hz, 10A	007
Italian - 198-250V, 50/60 Hz, 10A	008
Japanese - 90-132V, 50/60 Hz, 20A	009
Japanese - 180-250V, 50/60 Hz, 10A	010

Operator and Service Manuals

PART NO.	DESCRIPTION
00448-84x	ClubTrack 510/510 Plus User Guide
00456-84x	ClubTrack 612/612 Plus User Guide
00448-83x	Service Manual (English language only)

x signified the number of the latest revision

Spares

ITEM	PART NO.
ELECTRICAL	
Power Cord	
North America	30610-004
Japan 100V	30610-004
U.K	30736-012
Germany	30736-015
France	30736-015
Spain	30736-015
Italy	30736-013
Japan 200V	30736-020
Strain Relief	01227-006
Configuration Plate	
510 120V domestic	036126-001
510 230V domestic	036126-002
510 230V international	036126-003
612 120V domestic	036126-004
612 230V domestic	036126-005
612 230V international	036126-006
PCBA Assy, Drive	36118-002
DRIVE	
Drive Motor Assy	32783-004
Flywheel Assembly	32446-001 (-003 CR Plus)
Drive Belt	32387-001 (-002 CR Plus)
Tensioner Assembly	32784-001
GRADE	
Grade Actuator Assembly	
120V	36187-001
220V	36187-002
Grade Wheel Kit	36125-001

DECK	
Deck 510 models 612 models	 30204-002 30204-003
Front Roller	33507-004 (-005 CR Plus)
Rear Roller Assy	33508-003
Walk belt 510 models 612 models	 33509-003 33509-004
Triple Flex Maintenance Kit	33511-002
Siderail Cover 510 models 612 models	 35606-003 35606-004
End Cap, Rear Left	35610-004
End Cap, Rear Right	35610-003
Left Handrail Kit	36147-001
Right Handrail Kit	36147-002
Left and Right Handrail Kit	36147-003
HARDWARE	
Spare Hardware	36123-001
Magnet	36071-001
Controller Cable	36033-001
Handgrip Module Spare with Fastener	036261-002
Handrail Assembly Spare, Handgrip HR	036261-002
Interface Cable, Handgrip Module to Controller PCBA	036424-001

Controllers

ClubTrack 510/612 (P/N 00448/00456)

PCBA	36188-001
Keypanel (assembled to housing) English German French Italian Spanish Japanese	 36127-001 36127-002 36127-004 36127-005 36127-003 36127-006

ClubTrack 510/612 Plus (P/N 00458/00457)

PCBA	36186-001
Keypanel (assembled to housing)	
English	36127-007
German	36127-008
French	36127-010
Italian	36127-011
Spanish	36127-009
Japanese	36127-012
Interface Cable RS-232	34721-001
Liquid Crystal Display (LCD)	35259-002
Fluorescent Tube (Backlight Assy)	35428-001

Accessories for Heart Rate Monitoring

Transmitter Belt	34198-003
Pulse Simulator	34198-008
Polar Favor Wrist Monitor	34198-009

- To avoid potential safety and electrical problems, use parts and accessories that meet Quinton specifications.

D

Field Functional Tests

Warning

The VSD PCBA generates high voltage which is present whenever DS4 and DS5 are illuminated: Never touch the PCBA when DS4 and DS5 are on. Bleeder resistors on the VSD PCBA bleed off the high voltage in approximately two minutes. Do not touch the VSD PCBA until DS4 and DS5 have gone out.

These procedures apply to Quinton ClubTrack 510, ClubTrack 510 Plus, ClubTrack 612, and ClubTrack 612 Plus treadmills. You may perform the complete test, or only the tests required after repair or replacement of parts as specified in Chapter 4, Repair/ Replacement and Calibration. Please read the entire chapter before starting. The appropriate test must be performed as verification whenever any of the procedures in Chapter 4 are used.

Complete Field Functional Test

- The following steps must be performed with the treadmill completely assembled, except as noted.

With the power cord connected to the correct outlet, turn on the circuit breaker.

A. Test the Controller Displays

ClubTrack 510/612

Observe the controller displays during initialization. For the ClubTrack 510 and 612, the normal sequence is:

- Seven segment displays show all 8s (888 8888 888).
- After 3 seconds, all displays go blank.
- Multi display briefly shows configuration code (0.0 CP.-x 0.0).
- Normal display is shown (00 150 00).

If the normal sequence does not occur, refer to the following table for possible causes.

Problem	Possible Cause	Solution
Seven segment displays lock up with all 8s and do not go blank.	ESD (static)	Make sure control panel is properly grounded. Check the following: • All star washers are installed • Continuity to ground on power cord plug • Less than two ohms neutral to ground at the power outlet
	Hall Effect Sensor (SW 1) and screw on key panel may have excessive clearance.	
	Hall Effect Sensor (SW 1) and screw on key panel may be misaligned	
	Microprocessor socket may be damaged.	Replace controller PCBA
	Microprocessor socket may be from non-approved vendor (McKenzie).	
Seven segment displays flash all 8s and then go blank and stay blank.	Limited-access switch is activated.	Deactivate limited-access switch (see user manual)

ClubTrack 510/612 Plus

For these models, the normal sequence is:

- LCD screen is all white.
- Introduction screen appears on LCD.
- Zero speed and the current grade appear on the segmented displays.

B. Test the Multi Display

Observe the center Multi display on the controller. If an error code is displayed, refer to Error Codes in Chapter 3, Troubleshooting.

C. Test the Controller Operation

Test the Controller Keys

1. To enter Service mode, press **Stop Belt+Faster+Slower**. **P000** appears in the Select display, indicating that no key is pressed.

   ▸ On the Plus models, the screen lists the tests described below. To perform a test, press the softkey next to the test name, rather than pressing the indicated key combinations.

2. Press and hold each key in succession to display the appropriate code in the Select display (the Plus models display text instead of code). **P000** should appear when you release each key.

Key	Code
No key pressed	P000
Shorted key(s)	P555
Clear	P001
Up	P002
Down	P003
Stop Belt	P004
Input+	P005
Input—	P006
Enter	P007
Select	P007
Start Belt	P009
Units	P010
Cool Down	P013
Faster	P014
Slower	P015

Test the Keypanel Displays

Press **Stop Belt+Up+Down**.

- The display cycles though one digit at a time in each display, starting from left to right across the panel. Each digit displays the number **8** and the associated decimal point for one second, then turns off as the next one lights up.
- When this is completed, the LEDs light up individually, starting from the top. The Select LEDs light up first, followed by the Units LEDs.
- After the LEDs are tested, all digits in all three displays simultaneously count up from 0 to 9 (no decimal points are illuminated during this count).

Test the Wireless Heart Rate Monitoring

Use a pulse simulator (P/N 34198-008) and a Polar watch receiver (P/N 34198-009) to test the accuracy of the controller's heart rate function.

1. Turn on the pulse simulator. The LED on the front of the simulator will blink in synch with the signal.
2. Place the Polar watch receiver next to the pulse simulator to begin receiving. The watch will display the digital heart rate.

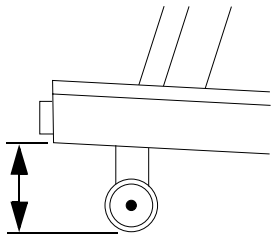
3. Check the rate displayed on the watch against the rate displayed on the controller. If the controller differs by five beats, replace the controller PCBA (ClubTrack 51/612, p/n 35707, and ClubTrack 510/612 Plus, p/n 35362).

Testing Handgrip Heart Rate Monitoring

The handgrip accuracy can best be tested at the Quinton factory with the use of specialized equipment. You can, however, perform a simple check by placing your hands on the Handgrip sensors while standing still. Allow thirty seconds to obtain a stable reading. Compare this to your pulse rate taken manually immediately after.

D. Test the Grade Operation

1. Remove the hood (refer to *Removing Treadmill Hood* in Chapter 4, *Repair/Replacement and Calibration*).
2. Ensure the controller displays 0.0% grade.
3. Measure the distance from the floor to the lower edge of the siderail at the rear support and at the front grade wheel. Both measurements should be the same ± 3/8 in. If they are not, refer to *Calibration Procedures* in Chapter 4, *Repair/ Replacement and Calibration*.
4. Increase the grade to 15.0% (12.0% for 510/510 Plus).
5. Measure the distance from the floor to the bottom front edge of the head. Refer to the following table for the correct measurement:

Treadmill	Measurement	
ClubTrack 510	12½ in. ± 3/8 in.	
ClubTrack 510 Plus		
ClubTrack 612	15 3/8 in. ± 3/8 in.	
ClubTrack 612 Plus		

6. Ensure that the grade will traverse from minimum to maximum and back.
7. Replace the hood (refer to *Removing Treadmill Hood* in Chapter 4, *Repair/Replacement and Calibration*).

E. Test Speed Operation

1. Place a chalk mark or piece of tape on the walk belt across the direction of travel.
2. Place another mark or piece of tape on the top of the siderail cover.
3. Start the walk belt and increase its speed to 4.0 mph.
4. Count how many times the belt rotates in two minutes.

- ClubTrack 510/510 Plus - this should be 70 ± 3 revolutions
- ClubTrack 612/612 Plus - this should be 65 ± 3 revolutions

5. Increase the walk belt speed to 10.0 mph.
6. Count the number of belt revolutions in 2 minutes. This should be 175 ± 3 revolutions for ClubTrack 510 models and 161± 3 revolutions for ClubTrack 612 models.

   ▸ If any of the measurements are not accurate, refer to *Replacing the Tensioner* and/or *Adjusting the Walk Belt* in this chapter.

7. Ensure that the speed will traverse from minimum to maximum and back.

F. Test the Deck Friction (ClubTrack 612/612 Plus)

1. Increase the treadmill grade to 15% (maximum).
2. Do not start the belt. Stand on the treadmill walk belt and push away from the handrail. The belt should begin rotating with little forward pressure and continue to rotate for several steps. If additional pressure is required to keep the belt moving, replace the belt and deck.

G. Test the Walk Belt Operation

1. With the walk belt speed at maximum, observe the tracking. If it needs adjustment, refer to Walk Belt Tracking in Chapter 4, Repair/Replacement and Calibration.
2. With the walk belt speed at 3.0 mph, walk on the treadmill.
3. Grasp the handrail and resist the motion of the walk belt. If any slippage is detected, refer to *Replacing the Tensione*r and/or *Adjusting the Walk Belt* in Chapter 4. *Repair/Replacement and Calibration*.
4. Stop the walk belt.

H. Shut Down the Treadmill

Turn the circuit breaker off, disconnect the power cord from the outlet, and place the treadmill back in service.

Field Test No. 1

The following steps must be performed with the treadmill completely assembled, except as noted.

With the power cord connected to the correct outlet, turn on the circuit breaker.

A. Test the Controller Displays

ClubTrack 510/612

Observe the controller displays during initialization. For the ClubTrack 510 and 612, the normal sequence is:

- Seven segment displays show all 8s (888 8888 888).
- After 3 seconds, all displays go blank.
- Multi display briefly shows configuration code (0.0 CP.-x 0.0).
- Normal display is shown (00 150 00).

If the normal sequence does not occur, refer to the following table for possible causes.

Problem	Possible Cause	Solution
Seven segment displays lock up with all 8s and do not go blank.	ESD (static)	Make sure control panel is properly grounded. Check the following: • All star washers are installed • Continuity to ground on power cord plug • Less than two ohms neutral to ground at the power outlet
	Hall Effect Sensor (SW 1) and screw on key panel may have excessive clearance.	
	Hall Effect Sensor (SW 1) and screw on key panel may be misaligned	
	Microprocessor socket may be damaged.	Replace controller PCBA
	Microprocessor socket may be from non-approved vendor (McKenzie).	
Seven segment displays flash all 8s and then go blank and stay blank.	Limited-access switch is activated.	Deactivate limited-access switch (see user manual)

ClubTrack 510/612 Plus

For these models, the normal sequence is:

- LCD screen is all white.
- Introduction screen appears on LCD.
- Zero speed and the current grade appear on the segmented displays.

B. Test the Multi Display

Observe the center Multi display on the controller. If an error code is displayed, refer to Error Codes in Chapter 3, Troubleshooting.

C. Shut Down the Treadmill

Turn the circuit breaker off, disconnect the power cord from the outlet, and place the treadmill back in service.

Field Test No. 2

> ➤ The following steps must be performed with the treadmill completely assembled, except as noted.

With the power cord connected to the correct outlet, turn on the circuit breaker.

A. Test the Controller Displays

ClubTrack 510/612

Observe the controller displays during initialization. For the ClubTrack 510 and 612, the normal sequence is:

- Seven segment displays show all 8s (888 8888 888).
- After 3 seconds, all displays go blank.
- Multi display briefly shows configuration code (0.0 CP.-x 0.0).
- Normal display is shown (00 150 00).

If the normal sequence does not occur, refer to the following table for possible causes.

Problem	Possible Cause	Solution
Seven segment displays lock up with all 8s and do not go blank.	ESD (static)	Make sure control panel is properly grounded. Check the following: • All star washers are installed • Continuity to ground on power cord plug • Less than two ohms neutral to ground at the power outlet
	Hall Effect Sensor (SW 1) and screw on key panel may have excessive clearance.	
	Hall Effect Sensor (SW 1) and screw on key panel may be misaligned	
	Microprocessor socket may be damaged.	Replace controller PCBA
	Microprocessor socket may be from non-approved vendor (McKenzie).	
Seven segment displays flash all 8s and then go blank and stay blank.	Limited-access switch is activated.	Deactivate limited-access switch (see user manual)

ClubTrack 510/612 Plus

For these models, the normal sequence is:

- LCD screen is all white.
- Introduction screen appears on LCD.
- Zero speed and the current grade appear on the segmented displays.

B. Test the Multi Display

Observe the center Multi display on the controller. If an error code is displayed, refer to Error Codes in Chapter 3, Troubleshooting.

C. Test the Grade

Ensure that the grade will traverse from minimum to maximum and back.

D. Test the Speed

Ensure that the speed traverses from minimum to maximum and back.

E. Shut Down the Treadmill

Turn the circuit breaker off, disconnect the power cord from the outlet, and place the treadmill back in service.

Field Test No. 3

> ➤ The following steps must be performed with the treadmill completely assembled, except as noted.

With the power cord connected to the correct outlet, turn on the circuit breaker.

A. Test Speed Operation

1. Place a chalk mark or piece of tape on the walk belt across the direction of travel.
2. Place another mark or piece of tape on the top of the siderail cover.
3. Start the walk belt and increase its speed to 4.0 mph.
4. Count how many times the belt rotates in two minutes.
   - ClubTrack 510/510 Plus - this should be 70 ± 3 revolutions
   - ClubTrack 612/612 Plus - this should be 65 ± 3 revolutions
5. Increase the walk belt speed to 10.0 mph.
6. Count the number of belt revolutions in 2 minutes. This should be 175 ± 3 revolutions for ClubTrack 510 models and 161± 3 revolutions for ClubTrack 612 models.

   > ➤ If any of the measurements are not accurate, refer to *Replacing the Tensioner* and/or *Adjusting the Walk Belt* in this chapter.

7. Ensure that the speed will traverse from minimum to maximum and back.

B. Test the Deck Friction

1. Increase the treadmill grade to 15% (maximum).
2. Do not start the belt. Stand on the treadmill walk belt and push away from the handrail. The belt should begin rotating with little forward pressure and continue to rotate for several steps. If additional pressure is required to keep the belt moving, replace the belt and deck.

C. Test the Walk Belt Operation

1. With the walk belt speed at minimum, observe the tracking. If it needs adjustment, refer to Walk Belt Tracking in Chapter 4, Repair/Replacement and Calibration.

2. With the walk belt speed at minimum, walk on the treadmill.
3. Grasp the handrail and resist the motion of the walk belt. If any slippage is detected, refer to *Replacing the Tensioner* and/or *Adjusting the Walk Belt* in Chapter 4, *Repair/Replacement and Calibration*.
4. Stop the walk belt.

D. Shut Down the Treadmill

Turn the circuit breaker off, disconnect the power cord from the outlet, and place the treadmill back in service.

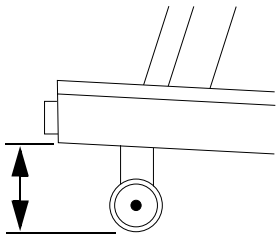
Field Test No. 4

The following steps must be performed with the treadmill completely assembled, except as noted.

With the power cord connected to the correct outlet, turn on the circuit breaker.

A. Test the Grade Operation

1. Remove the hood (refer to *Removing Treadmill Hood* in Chapter 4, *Repair/Replacement and Calibration*).
2. Ensure the controller displays 0.0% grade.
3. Measure the distance from the floor to the lower edge of the siderail at the rear support and at the front grade wheel. Both measurements should be the same ± 3/8 in. If they are not, refer to Calibration Procedures in Chapter 4, Repair/ Replacement and Calibration.
4. Increase the grade to 15.0% (12.0% for 510/510 Plus).
5. Measure the distance from the floor to the bottom front edge of the head. Refer to the following table for the correct measurement:

Treadmill	Measurement	
ClubTrack 510	12½ in. ± 3/8 in.	
ClubTrack 510 Plus		
ClubTrack 612	15 3/8 in. ± 3/8 in.	
ClubTrack 612 Plus		

6. Ensure that the grade will traverse from minimum to maximum and back.
7. Replace the hood (refer to *Removing Treadmill Hood* in Chapter 4, *Repair/Replacement and Calibration*).

B. Shut Down the Treadmill

Turn the circuit breaker off, disconnect the power cord from the outlet, and place the treadmill back in service.

Field Test No. 5

➤ The following steps must be performed with the treadmill completely assembled, except as noted.

A. Test the Controller Displays

ClubTrack 510/612

Observe the controller displays during initialization. For the ClubTrack 510 and 612, the normal sequence is:

- Seven segment displays show all 8s (888 8888 888).
- After 3 seconds, all displays go blank.
- Multi display briefly shows configuration code (0.0 CP.-x 0.0).
- Normal display is shown (00 150 00).

If the normal sequence does not occur, refer to the following table for possible causes.

Problem	Possible Cause	Solution
Seven segment displays lock up with all 8s and do not go blank.	ESD (static)	Make sure control panel is properly grounded. Check the following: • All star washers are installed • Continuity to ground on power cord plug • Less than two ohms neutral to ground at the power outlet
	Hall Effect Sensor (SW 1) and screw on key panel may have excessive clearance.	
	Hall Effect Sensor (SW 1) and screw on key panel may be misaligned	
	Microprocessor socket may be damaged.	Replace controller PCBA
	Microprocessor socket may be from non-approved vendor (McKenzie).	
Seven segment displays flash all 8s and then go blank and stay blank.	Limited-access switch is activated.	Deactivate limited-access switch (see user manual)

ClubTrack 510/612 Plus

For these models, the normal sequence is:

- LCD screen is all white.
- Introduction screen appears on LCD.
- Zero speed and the current grade appear on the segmented displays.

B. Test the Multi Display

Observe the center Multi display on the controller. If an error code is displayed, refer to Error Codes in Chapter 3, Troubleshooting.

C. Test the Controller Operation

Test the Controller Keys

1. To enter Service mode, press **Stop Belt+Faster+Slower**. **P000** appears in the Select display, indicating that no key is pressed.

   ▸ On the Plus models, the screen lists the tests described below. To perform a test, press the softkey next to the test name, rather than pressing the indicated key combinations.

2. Press and hold each key in succession to display the appropriate code in the Select display (the Plus models display text instead of code). **P000** should appear when you release each key.

Key	Code
No key pressed	P000
Shorted key(s)	P555
Clear	P001
Up	P002
Down	P003
Stop Belt	P004
Input+	P005
Input—	P006
Enter	P007
Select	P007
Start Belt	P009
Units	P010
Cool Down	P013
Faster	P014
Slower	P015

Test the Keypanel Displays

Press **Stop Belt+Up+Down**.

- The display cycles though one digit at a time in each display, starting from left to right across the panel. Each digit displays the number **8** and the associated decimal point for one second, then turns off as the next one lights up.
- When this is completed, the LEDs light up individually, starting from the top. The Select LEDs light up first, followed by the Units LEDs.
- After the LEDs are tested, all digits in all three displays simultaneously count up from 0 to 9 (no decimal points are illuminated during this count).

Test the Wireless Heart Rate Monitoring

Use a pulse simulator (P/N 34198-008) and a Polar watch receiver (P/N 34198-009) to test the accuracy of the controller's heart rate function.

1. Turn on the pulse simulator. The LED on the front of the simulator will blink in synch with the signal.
2. Place the Polar watch receiver next to the pulse simulator to begin receiving. The watch will display the digital heart rate.
3. Check the rate displayed on the watch against the rate displayed on the controller. If the controller differs by five beats, replace the controller PCBA (ClubTrack 510/612, p/n 35707, and ClubTrack 510/612 Plus, p/n 35362).

Testing Handgrip Heart Rate Monitoring

The handgrip accuracy can best be tested at the Quinton factory with the use of specialized equipment. You can, however, perform a simple check by placing your hands on the Handgrip sensors while standing still. Allow thirty seconds to obtain a stable reading. Compare this to your pulse rate taken manually immediately after.

D. Shut Down the Treadmill

Turn the circuit breaker off, disconnect the power cord from the outlet, and place the treadmill back in service.

E

Assembly Drawings

P/N	Assembly
35960	Configuration Plate Assembly
35805	Controller Assembly, ClubTrack 510/612 Plus
35806	Controller Assembly, ClubTrack 510/612
32783	Motor, Drive, AC Variable
35602	Final Mechanical Assembly/System Wiring

REVISIONS				
LTR	ZONE	DESCRIPTION	APPROVED	DATE

NOTES: UNLESS OTHERWISE SPECIFIED

1. ASSEMBLE PER QUINTON WORKMANSHIP STANDARDS MANUAL, WIRING DIAGRAM AND THIS DRAWING.
2. WRAP GRN/YEL WIRE OF POWER CORD (ITEM 12 OR 13) THROUGH FERRITE (ITEM 17) TWO TURNS AND SECURE WITH CABLE TIE (ITEM 34) AS SHOWN.
3. ORIENT ANCHOR (ITEM 33) AS SHOWN. SECURE WIRES AND HARNESS ASSEMBLES TO ANCHOR APPROXIMATELY AS INDICATED AND SECURE WITH CABLE TIE (ITEM 34) AS SHOWN.
4. ORIENT ANCHOR (ITEM 33) AS SHOWN.
5. TAG WITH PART NUMBER AND REVISION LETTER TO WHICH MANUFACTURED.

PRODUCTION

-006	-005	-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
3	4	4	3	4	4	34	001899-001	TIE, CABLE	.10 X 4.00L	
4	4	4	4	4	4	33	010561-001	ANCHOR, TIE	#8 MTG	
2	-	-	2	-	-	32	017439-051	SCREW, PN HD, PH, METRIC	M3 X 16	
2	2	2	2	2	2	31	017439-047	SCREW, PN HD, PH, METRIC	M3 X 5	
2	-	-	2	-	-	30	035908-002	NUT, HEX, ZINC PLATED, METRIC	M3	
4	2	2	4	2	2	29	035918-002	WASHER, EXTR STAR, ZINC, METRIC	M3	
2	-	-	2	-	-	28	035920-003	WASHER, FLAT, ZINC, METRIC	M3	
4	4	4	4	4	4	27	035913-004	WASHER, LOCK, ZINC, METRIC	M4	
4	4	4	4	4	4	26	035920-004	WASHER, FLAT, ZINC, METRIC	M4	
4	4	4	4	4	4	25	017439-066	SCREW, PN HD, PH, METRIC	M4 X 20	
8	8	8	8	8	8	24	035918-003	WASHER, EXTR STAR, ZINC, METRIC	M4	
8	8	8	8	8	8	23	035908-003	NUT, HEX, ZINC PLATED, METRIC	M4	
5	5	5	5	5	5	22	012029-006	WASHER, LOCK, INTERNAL STAR	#8	
1	-	-	1	-	-	21	036017-001	HARNESS ASSY, POWER INPUT		W1-W3
-006	-005	-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
QTY PER ASSY										

-006	-005	-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
1	1	1	1	1	1	20	035987-001	HARNESS ASSY, SHORTING PLUG		W1
1	1	1	1	1	1	19	036018-001	HARNESS ASSY, EMI FILTER GND		W1
1	1	1	1	1	1	18	035981-001	HARNESS ASSY, CIRCUIT BREAKER		W1-W4
-	1	1	-	1	1	17	031834-003	SUPPRESSOR, FERRITE BEAD		
-	1	1	-	1	1	16	001227-011	STRAIN RELIEF	CABLE	
1	-	-	1	-	-	15	031453-011	CONNECTOR LOCK		
1	-	-	1	-	-	14	031453-001	CONNECTOR, POWER INLET	16A IEC320	
-	1	-	-	1	-	13	030610-005	CORD, POWER	15A, 230V	
-	-	1	-	-	1	12	030610-004	CORD, POWER	20A, 115V	
1	1	-	-	-	-	11	035782-002	PCBA, T/M VOLTAGE CONFIGURATION	230V, 15%	
-	-	-	1	1	-	10	035782-001	PCBA, T/M VOLTAGE CONFIGURATION	230V, 12%	
-	-	1	-	-	-	9	035774-002	PCBA, T/M VOLTAGE CONFIGURATION	120V, 15%	
-	-	-	-	-	1	8	035774-001	PCBA, T/M VOLTAGE CONFIGURATION	120V, 12%	
1	1	1	1	1	1	7	036034-001	XFORMER ASSY, INSTITUTIONAL T/M	43VA, 115/230V, 50/60Hz, VDE	
1	1	-	1	1	-	6	031396-022	CIRCUIT BREAKER, 2 POLE	10A	
-	-	1	-	-	1	5	031396-023	CIRCUIT BREAKER, 2 POLE	20A	
1	-	-	1	-	-	4	032533-002	RFI NOISE FILTER	16A, 50/60Hz	
-	1	1	-	1	1	3	032533-001	RFI NOISE FILTER	20A, 50/60Hz	
1	-	-	1	-	-	2	035961-002	PLATE CONFIGURATION	510/612 INTERNATIONAL	
-	1	1	-	1	1	1	035961-001	PLATE CONFIGURATION	510/612 US	
							-006	PLATE ASSY, CONFIGURATION		
							-005	PLATE ASSY, CONFIGURATION		
							-004	PLATE ASSY, CONFIGURATION		
							-003	PLATE ASSY, CONFIGURATION		
							-002	PLATE ASSY, CONFIGURATION		
							-001	PLATE ASSY, CONFIGURATION		
-006	-005	-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
QTY PER ASSY							DO NOT SCALE DRAWING		PARTS LIST	

-006 -005 -004	035602	000456
-003 -002 -001		000448
PART NO.	NEXT ASSY NO.	END ITEM NO.
APPLICATION		

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS AND TOLERANCES PER ANSI Y14.5M-1982

TOL		
.XX	+	---
.XXX	+	---
ANGLE	+	---

NOTE: QUINTON CONFIDENTIAL — THIS SHEET CONTAINS

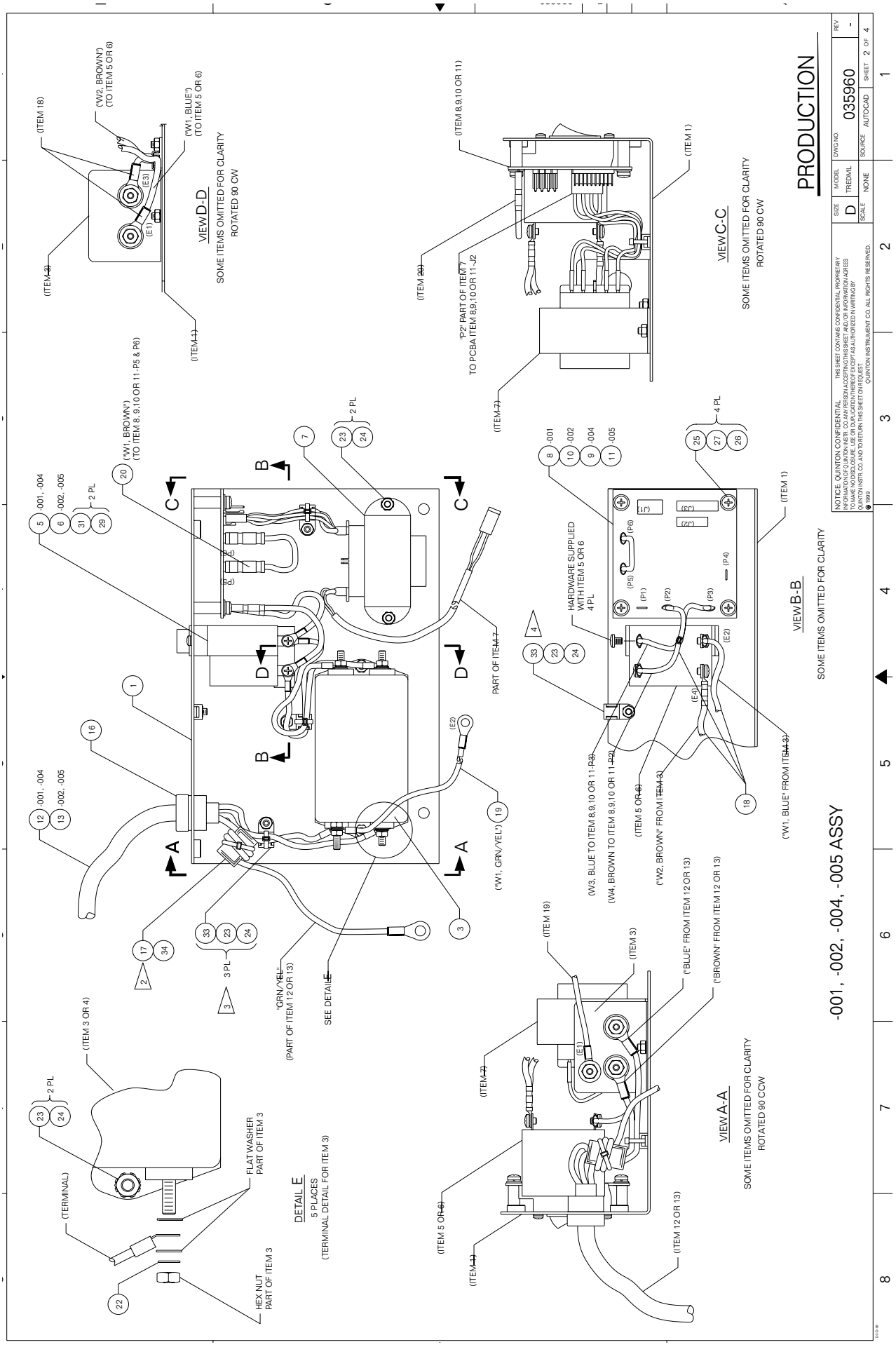
CLASS CODE:	VALUE CODE:	DIST. CODE:
PLAA	TREDML	-

DRAWN:	NAME	DATE
ENGR:	NAME-ENGR	DATE-ENGR
MFG ENGR:	NAME-MFG	DATE-MFG
QUAL ENGR:	NAME-QUAL	DATE-QUAL
COMPL ENGR:	-----	---
REG. AFFAIRS:	-----	---
OTHER-BOX	NAME-OTHER	DATE-OTHER

Quinton instrument co.
3303 MONTE VILLA PARKWAY
BOTHELL, WASHINGTON 98021-8906
425/402-2000

TITLE
TITLE1
PLATE ASSY, CONFIGURATION

SIZE	MODEL	DWG NO.	REV
D	TREDML	035960	-
SCALE 1/1	SOURCE AUTOCAD	SHEET 1 OF 4	


PRODUCTION
-001, -002, -004, -005 ASSY
VIEW D-D
SOME ITEMS OMITTED FOR CLARITY
ROTATED 90 CW
VIEW C-C
SOME ITEMS OMITTED FOR CLARITY
ROTATED 90 CW
VIEW B-B
SOME ITEMS OMITTED FOR CLARITY
VIEW A-A
SOME ITEMS OMITTED FOR CLARITY
ROTATED 90 CCW
DETAIL E
5 PLACES
(TERMINAL DETAIL FOR ITEM 3)
SEE DETAIL E
HARDWARE SUPPLIED
WITH ITEM 5 OR 6
4 PL
PART OF ITEM 7
FLAT WASHER
PART OF ITEM 3
HEX NUT
PART OF ITEM 3
(TERMINAL)
(ITEM 3 OR 4)
(ITEM 19)
(ITEM 3)
(ITEM 2)
(ITEM 1)
(ITEM 18)
(ITEM 20)
(ITEM 8,9,10 OR 11)
(ITEM 5 OR 6)
(ITEM 12 OR 13)
(ITEM 11)
("W1, BLUE") (TO ITEM 5 OR 6)
("W2, BROWN") (TO ITEM 5 OR 6)
("W1, BROWN") (TO ITEM 8, 9,10 OR 11-P5 & P6)
("W1, GRN/YEL") (PART OF ITEM 12 OR 13)
("W3, BLUE TO ITEM 8,9,10 OR 11-P3)
("W4, BROWN TO ITEM 8,9,10 OR 11-P2)
("W2, BROWN" FROM ITEM 3)
("W1, BLUE" FROM ITEM 3)
("BLUE" FROM ITEM 12 OR 13)
("BROWN" FROM ITEM 12 OR 13)
"P2" PART OF ITEM 7
TO PCBA ITEM 8,9,10 OR 11-J2
NOTICE: QUINTON CONFIDENTIAL
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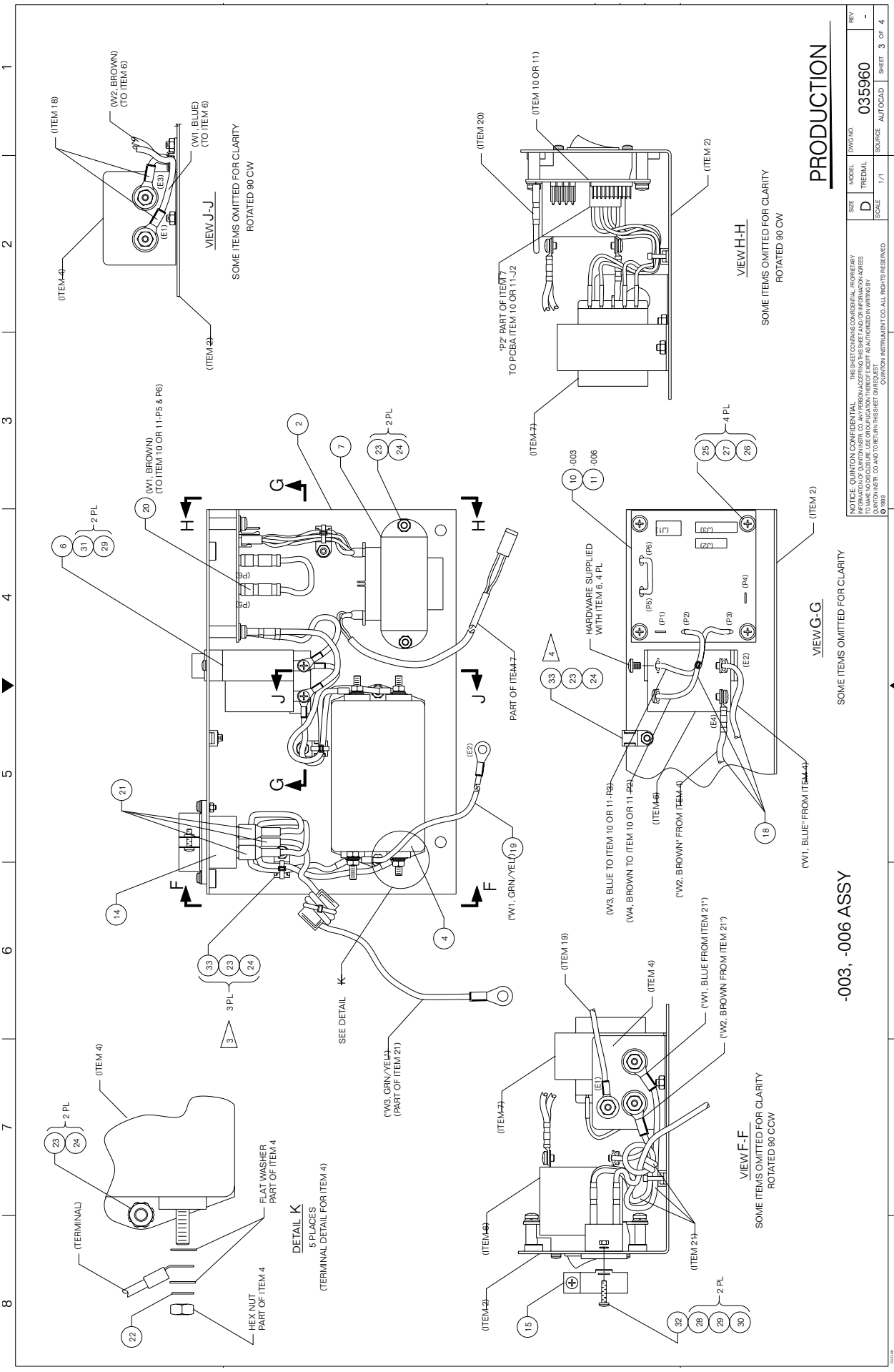
SIZE D
MODEL TREDMIL
DWG NO. 035960
REV -
SCALE NONE
SOURCE AUTOCAD
SHEET 2 OF 4


PRODUCTION
-003, -006 ASSY
VIEW J-J
SOME ITEMS OMITTED FOR CLARITY
ROTATED 90 CW
VIEW H-H
SOME ITEMS OMITTED FOR CLARITY
ROTATED 90 CW
VIEW G-G
SOME ITEMS OMITTED FOR CLARITY
VIEW F-F
SOME ITEMS OMITTED FOR CLARITY
ROTATED 90 CCW
DETAIL K
5 PLACES
(TERMINAL DETAIL FOR ITEM 4)
SEE DETAIL K
(W1, BLUE)
(TO ITEM 6)
(W2, BROWN)
(TO ITEM 6)
(W1, BROWN)
(TO ITEM 10 OR 11-P5 & P6)
"P2" PART OF ITEM 7
TO PCBA ITEM 10 OR 11-J2
HARDWARE SUPPLIED
WITH ITEM 6, 4 PL
(W3, BLUE TO ITEM 10 OR 11-P3)
(W4, BROWN TO ITEM 10 OR 11-P2)
("W2, BROWN" FROM ITEM 4)
("W1, BLUE" FROM ITEM 4)
("W1, BLUE" FROM ITEM 21)
("W2, BROWN FROM ITEM 21")
("W1, GRN/YEL" 19)
("W3, GRN/YEL")
(PART OF ITEM 21)
PART OF ITEM 7
FLAT WASHER
PART OF ITEM 4
HEX NUT
PART OF ITEM 4
(TERMINAL)
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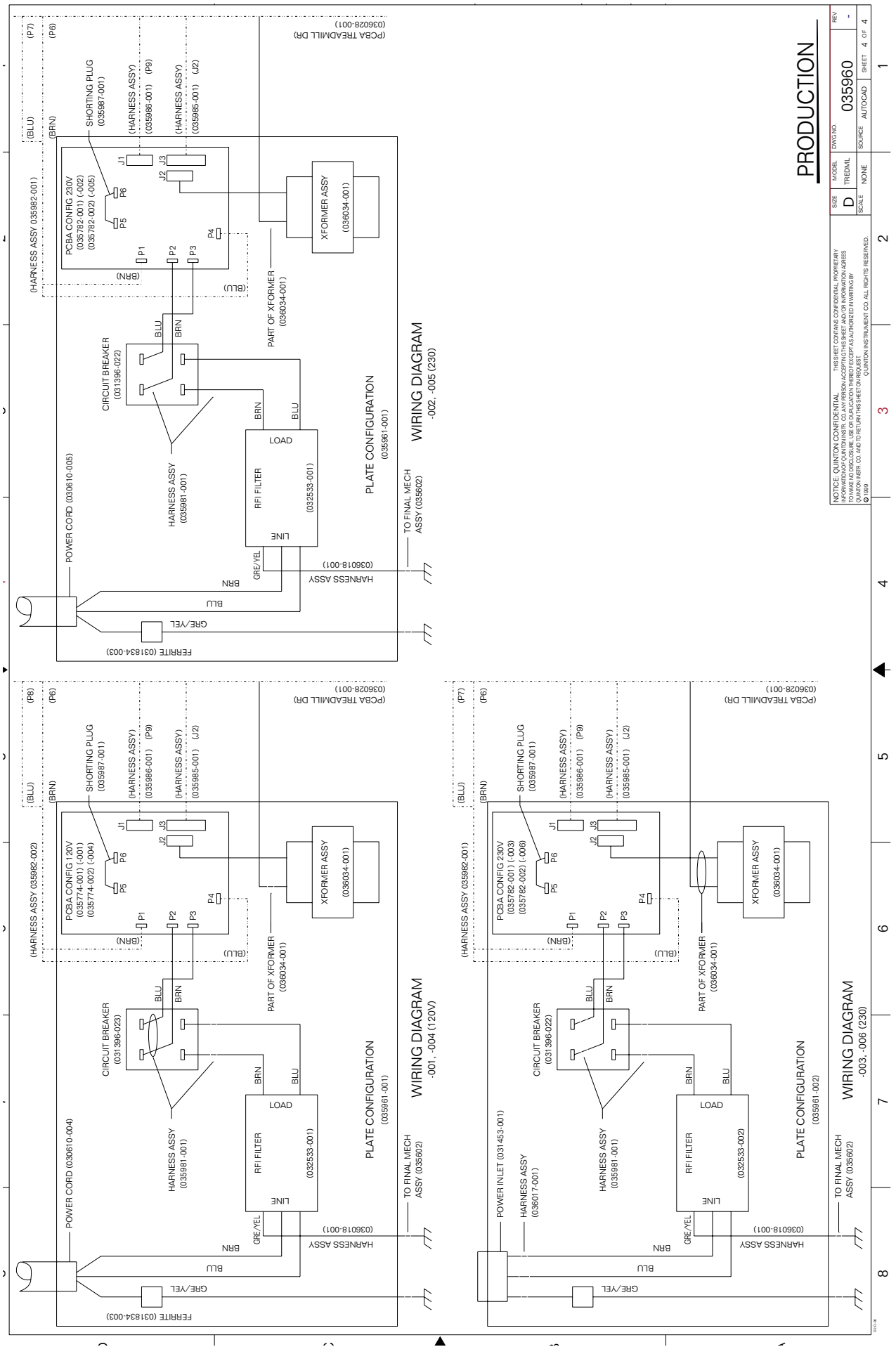
SIZE D
MODEL TREDMIL
DWG NO. 035960
REV -
SCALE 1/1
SOURCE AUTOCAD
SHEET 3 OF 4


WIRING DIAGRAM
-002, -005 (230)
PLATE CONFIGURATION
(035961-001)
WIRING DIAGRAM
-001, -004 (120V)
PLATE CONFIGURATION
(035961-001)
WIRING DIAGRAM
-003, -006 (230)
PLATE CONFIGURATION
(035961-002)
PRODUCTION
035960
TREDMIL
AUTOCAD
NONE
D
SHEET 4 OF 4
REV -
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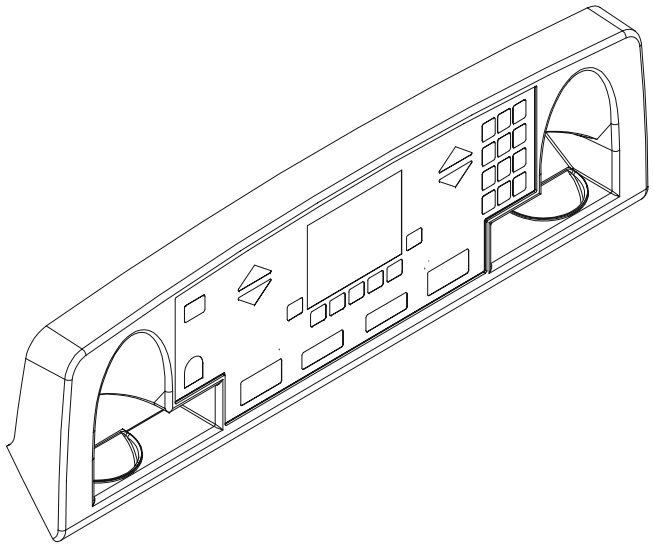
NOTES: UNLESS OTHERWISE SPECIFIED

1. APPLY ADHESIVE (ITEM 21) TO SCREW (ITEM 15) PRIOR TO ASSEMBLY.



REVISIONS				
LTR	ZONE	DESCRIPTION	APPROVED	DATE
C		DCN: 49065 CPN: 49067 ITEM 1 WAS 035807-001 ITEM 2 WAS 034719-001 ITEM 3 WAS 035809-001 ITEM 4 WAS 035809-002 ITEM 5 WAS 035809-003 ITEM 6 WAS 035809-004 ITEM 7 WAS 035809-005 ITEM 19 WAS 036138-030 ITEM 20 WAS 030578-003 ITEM 22 WAS 035809-006 ADDED ITEMS 23 THRU 28 ACTION CODE: H1 MOD: DOR		

-006	-005	-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
⌐	-	-	-	-	-	28	036292-012	KEYPANEL ASSEMBLY	JAPANESE	
-	⌐	-	-	-	-	27	036292-011	KEYPANEL ASSEMBLY	ITALIAN	
-	-	⌐	-	-	-	26	036292-010	KEYPANEL ASSEMBLY	FRENCH	
-	-	-	⌐	-	-	25	036292-009	KEYPANEL ASSEMBLY	SPANISH	
-	-	-	-	⌐	-	24	036292-008	KEYPANEL ASSEMBLY	GERMAN	
-	-	-	-	-	⌐	23	036292-007	KEYPANEL ASSEMBLY	ENGLISH	
						22	DELETED			
AR	AR	AR	AR	AR	AR	21	016891-001	ADHESIVE	LOCTITE 222	
						20	DELETED			
						19	DELETED			
⌐	⌐	⌐	⌐	⌐	⌐	18	032560-005	FINGER GASKETING, EMI		
7	7	7	7	7	7	17	032816-568	STANDOFF, MALE/FEMALE	METRIC	
8	8	8	8	8	8	16	035918-003	WASHER, EXTERN. STAR ZINC	M4	
2	2	2	2	2	2	15	017439-063	SCREW, PAN HD. PHILLIPS	M4 X 10	
⌐	⌐	⌐	⌐	⌐	⌐	14	035862-001	PCBA, INSTITUTIONAL HRC		
⌐	⌐	⌐	⌐	⌐	⌐	13	035922-001	SHIELD, PROG. CONT. PCBA		
2	2	2	2	2	2	12	017439-034	SCREW, PAN HD. PHILLIPS	M2 X 6	
2	2	2	2	2	2	11	017439-032	SCREW, PAN HD. PHILLIPS	M2 X 4	
2	2	2	2	2	2	10	035918-002	WASHER, EXTERN. STAR ZINC	M2	
2	2	2	2	2	2	9	032560-001	FINGER GASKETING, EMI		
⌐	⌐	⌐	⌐	⌐	⌐	8	034618-002	DISPLAY, LIQUID CRYSTAL		
						7	DELETED			
						6	DELETED			
						5	DELETED			
						4	DELETED			
						3	DELETED			
						2	DELETED			
						⌐	DELETED			
\	-	-	-	-	-	-	-006	CONTROL HOUSING ASSY	PROGRAMMABLE, JAPANESE	
-	\	-	-	-	-	-	-005	CONTROL HOUSING ASSY	PROGRAMMABLE, ITALIAN	
-	-	\	-	-	-	-	-004	CONTROL HOUSING ASSY	PROGRAMMABLE, FRENCH	
-	-	-	\	-	-	-	-003	CONTROL HOUSING ASSY	PROGRAMMABLE, SPANISH	
-	-	-	-	\	-	-	-002	CONTROL HOUSING ASSY	PROGRAMMABLE, GERMAN	
-	-	-	-	-	\	-	-001	CONTROL HOUSING ASSY	PROGRAMMABLE, ENGLISH	

PARTS LIST

PRODUCTION

QTY PER ASSEMBLY

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS AND TOLERANCES
PER ANSI Y14.5-1982

TOL .XX ± 0.01
.XXX ± 0.001
ANGLE ± 0.5°

CLASS CODE: HOUA | VALUE CODE: TREDML | DIST CODE: -

DRAWN: C.MATHIS 2/5/99
ENGR: R.BINGHAM 2/5/99
MFG ENGR: D.CRAIN 2/5/99
QUAL ENGR: D.VANDEVENTER 2/5/99
COMPL ENGR: --- --
REG AFFAIRS: --- --
OTHER:

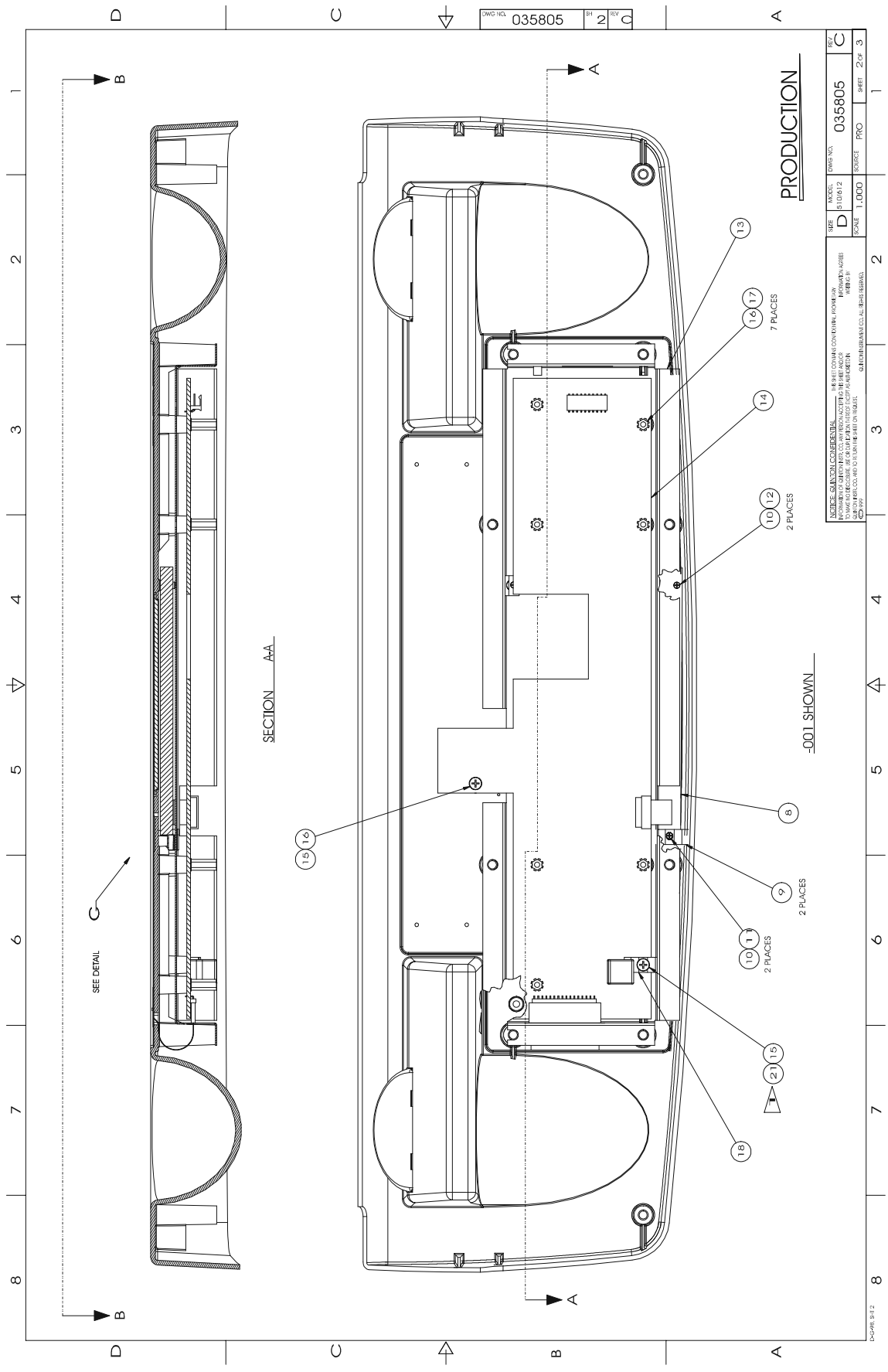
QUINTON your heart company
3303 MONTE VILLA PARKWAY
BOTHELL, WASHINGTON 98021-8906
425/402-2000

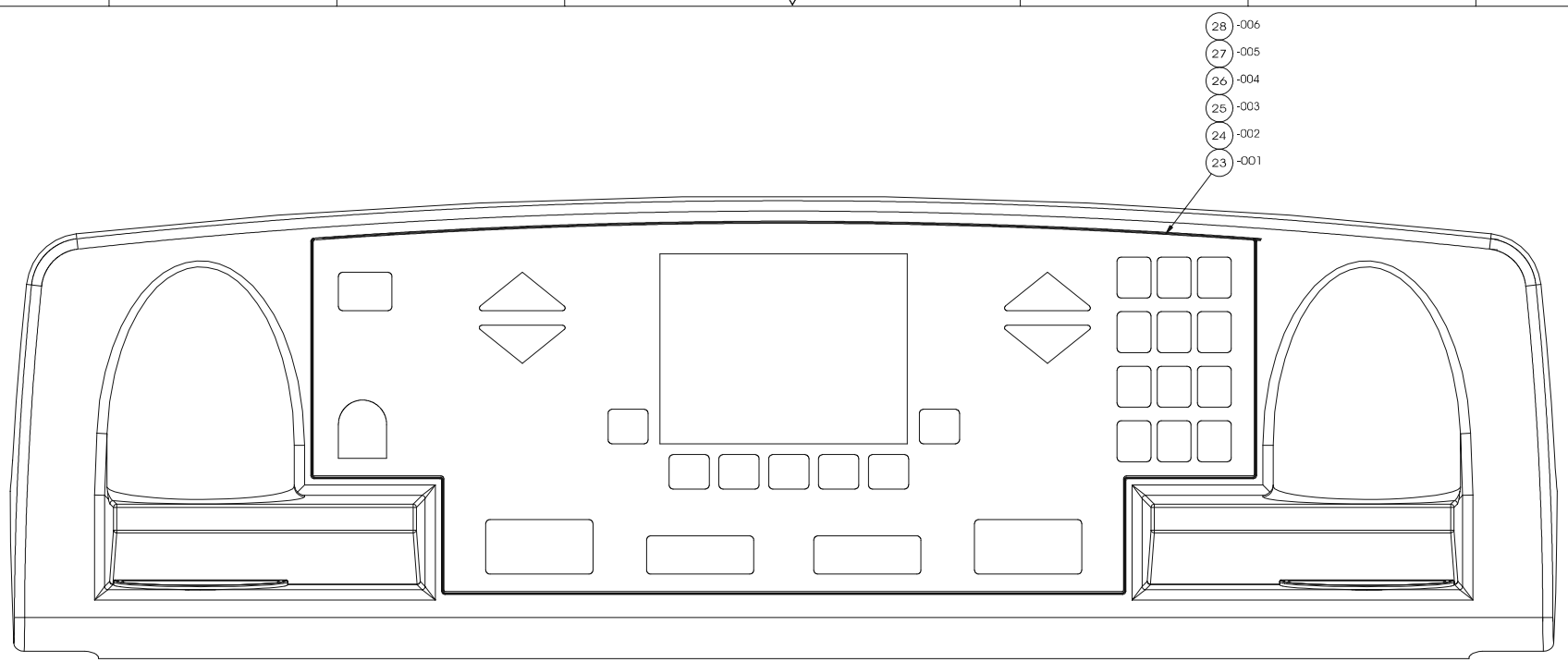
TITLE
CONTROL HOUSING ASSY, PROGRAMMABLE

SIZE D | MODEL 510/612 | DWG NO. 035805 | REV C
SCALE 1.000 | SOURCE PRO | SHEET 1 OF 3

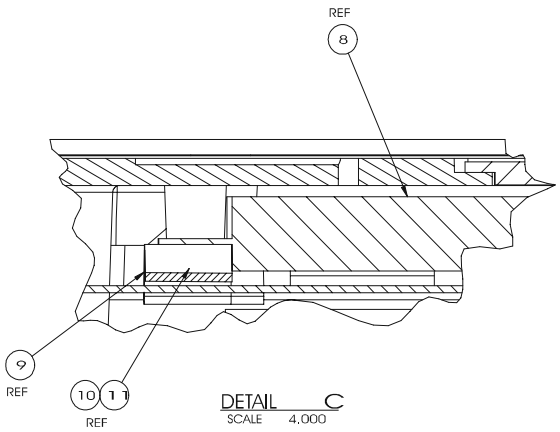
ALL	000457/458	000457/458
PART NO.	NEXT ASSY NO.	END ITEM NO.
APPLICATION		

D-G-98, SHT 1


DWG NO. 035805
SH 2
REV C
PRODUCTION
SECTION A-A
SEE DETAIL
-001 SHOWN
7 PLACES
2 PLACES
2 PLACES
2 PLACES
SIZE D
MODEL 510/612
SCALE 1.000
DWG NO. 035805
SOURCE PRO
SHEET 2 OF 3
REV C



VIEW B-B



DETAIL C
SCALE 4.000

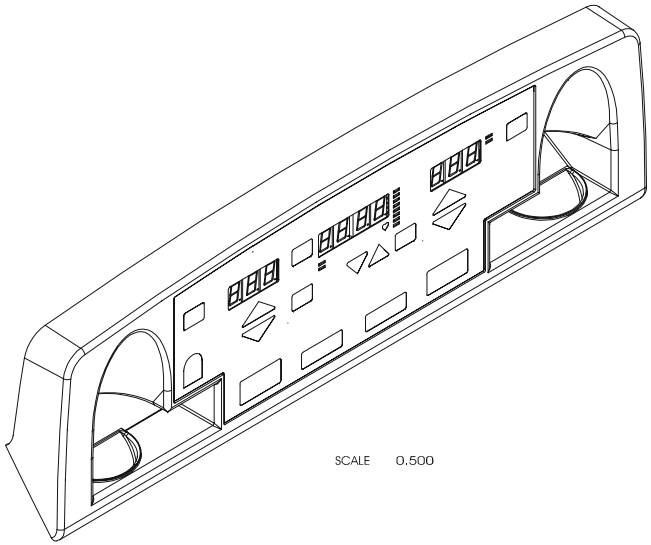
PRODUCTION

SIZE	MODEL	DWG NO.	REV.
D	510/612	035805	C
SCALE 1.000		SOURCE PRO	SHEET 3 OF 3

REVISIONS				
LTR	ZONE	DESCRIPTION	APPROVED	DATE
C		DCN: 49066 CPN: 49067 ITEM 1 WAS 035807-002 ITEM 3 WAS 035810-001 ITEM 4 WAS 035810-002 ITEM 5 WAS 035810-003 ITEM 6 WAS 035810-004 ITEM 7 WAS 035810-005 ITEM 8 WAS 035810-006 ITEM 15 WAS 036138-030 ITEM 16 WAS 030578-003 ADDED ITEMS 19 THRU 24 ACTION CODE: F1 MOD: DOR		

NOTES:

1. POSITION ITEMS 13 APPROXIMATELY AS SHOWN.
2. APPLY ADHESIVE (ITEM 17) TO SCREW (ITEM 11) PRIOR TO ASSEMBLY.
3. LOCATE BUMPER (ITEM 18) IN APPROXIMATE



SCALE 0.500

-006	-005	-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
┐	-	-	-	-	-	24	036292-006	KEYPANEL ASSEMBLY	JAPANESE	
-	┐	-	-	-	-	23	036292-005	KEYPANEL ASSEMBLY	ITALIAN	
-	-	┐	-	-	-	22	036292-004	KEYPANEL ASSEMBLY	FRENCH	
-	-	-	┐	-	-	21	036292-003	KEYPANEL ASSEMBLY	SPANISH	
-	-	-	-	┐	-	20	036292-002	KEYPANEL ASSEMBLY	GERMAN	
-	-	-	-	-	┐	19	036292-001	KEYPANEL ASSEMBLY	ENGLISH	
┐	┐	┐	┐	┐	┐	18	036130-003	BUMPER, ROUND, ADH BACKED		
AR	AR	AR	AR	AR	AR	17	016891-001	ADHESIVE	LOCTITE 222	
						16	DELETED			
						15	DELETED			
┐	┐	┐	┐	┐	┐	14	032560-005	FINGER GASKETING, EMI		
2	2	2	2	2	2	13	032560-004	FINGER GASKETING, EMI		
7	7	7	7	7	7	12	032816-568	STANDOFF, MALE/FEMALE	METRIC	
5	5	5	5	5	5	11	017439-063	SCREW, PAN HD. PHILLIPS	M4 x 10	
11	11	11	11	11	11	10	035918-003	WASHER, EXTERN. STAR ZINC	M4	
┐	┐	┐	┐	┐	┐	9	035923-001	SHIELD, MANUAL CONT. PCBA		
						8	DELETED			
						7	DELETED			
						6	DELETED			
						5	DELETED			
						4	DELETED			
						3	DELETED			
┐	┐	┐	┐	┐	┐	2	035707-001	PCB ASSEMBLY ODYMON		
						┐	DELETED			
	-	-	-	-	-	-	-006	CONTROL HOUSING ASSY	MANUAL, JANPANESE	
-		-	-	-	-	-	-005	CONTROL HOUSING ASSY	MANUAL, ITALIAN	
-	-		-	-	-	-	-004	CONTROL HOUSING ASSY	MANUAL, FRENCH	
-	-	-		-	-	-	-003	CONTROL HOUSING ASSY	MANUAL, SPANISH	
-	-	-	-		-	-	-002	CONTROL HOUSING ASSY	MANUAL, GERMAN	
-	-	-	-	-		-	-001	CONTROL HOUSING ASSY	MANUAL, ENGLISH	

PARTS LIST

-006	-005	-004	-003	-002	-001
		000448	000448		
		000456	000456		
PART NO.		NEXT ASSY NO.	END ITEM NO.		
APPLICATION					

QTY PER ASSEMBLY

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DIMENSIONS AND TOLERANCES PER ANSI Y14.5-1982

TOL .XX ± ---
.XXX ± ---
ANGLE ± ---

CLASS CODE:	VALUE CODE:	DIST CODE:
HOUA	TREDML	-

DRAWN:	P.COYAS	2/5/99
ENGR:	R.BINGHAM	2/5/99
MFG ENGR:	D.CRAIN	2/5/99
QUAL ENGR:	D.VANDEVENTER	2/5/99
COMPL ENGR:	----	--
REG AFFAIRS:	----	--
OTHER:		

PRODUCTION

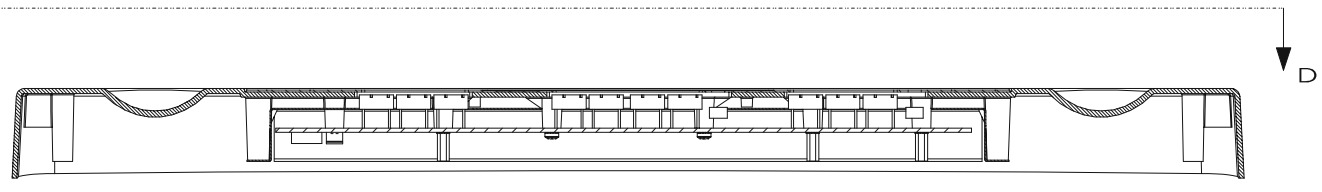
QUINTON your heart company
3303 MONTE VILLA PARKWAY
BOTHELL, WASHINGTON 98021-8906
425/402-2000

TITLE
CONTROL HOUSING ASSY, MANUAL

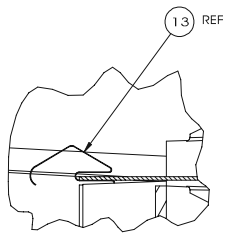
SIZE	MODEL	DWG NO.	REV
D	510/612	035806	C

SCALE	SOURCE	SHEET
0.750	PRO	1 OF 3

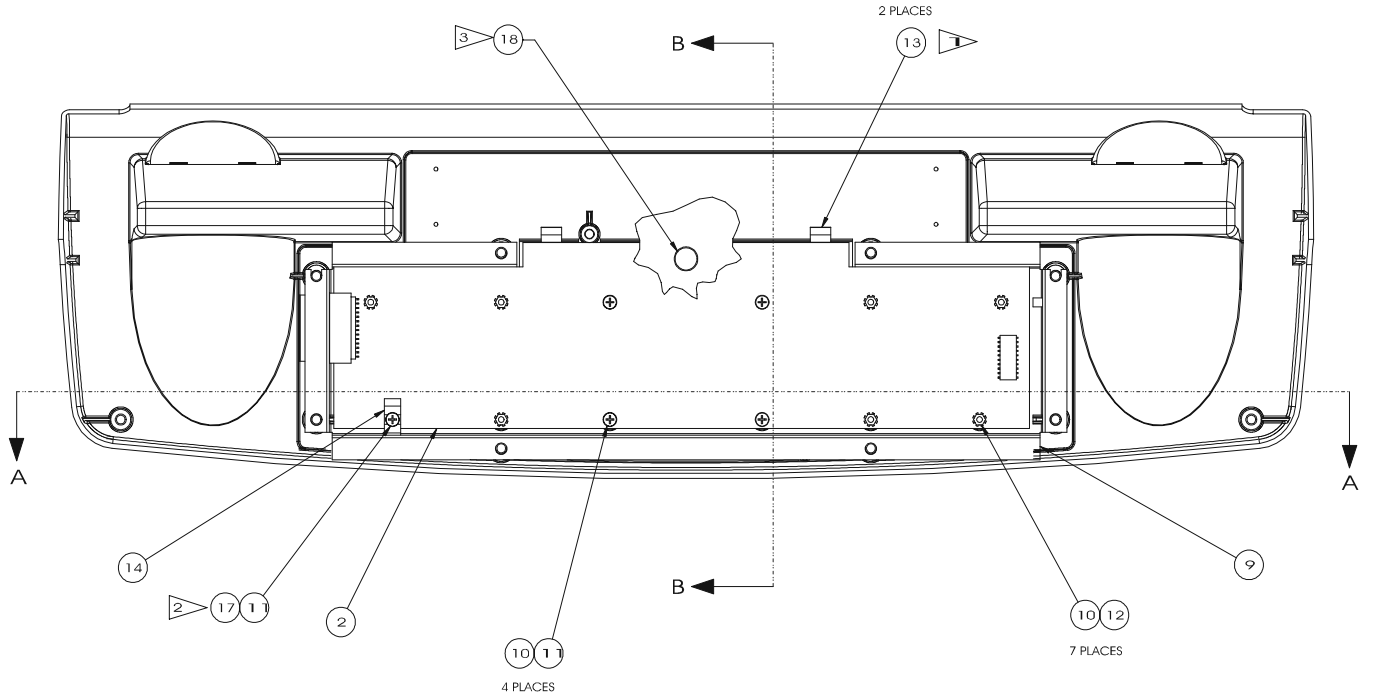
D-C-98, SHT 1

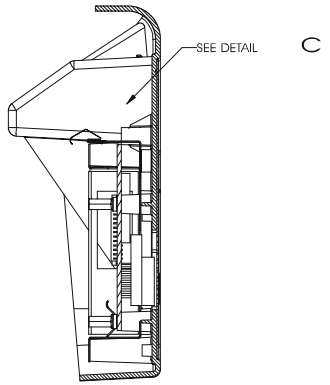


SECTION A-A



DETAIL C
SCALE 2.000



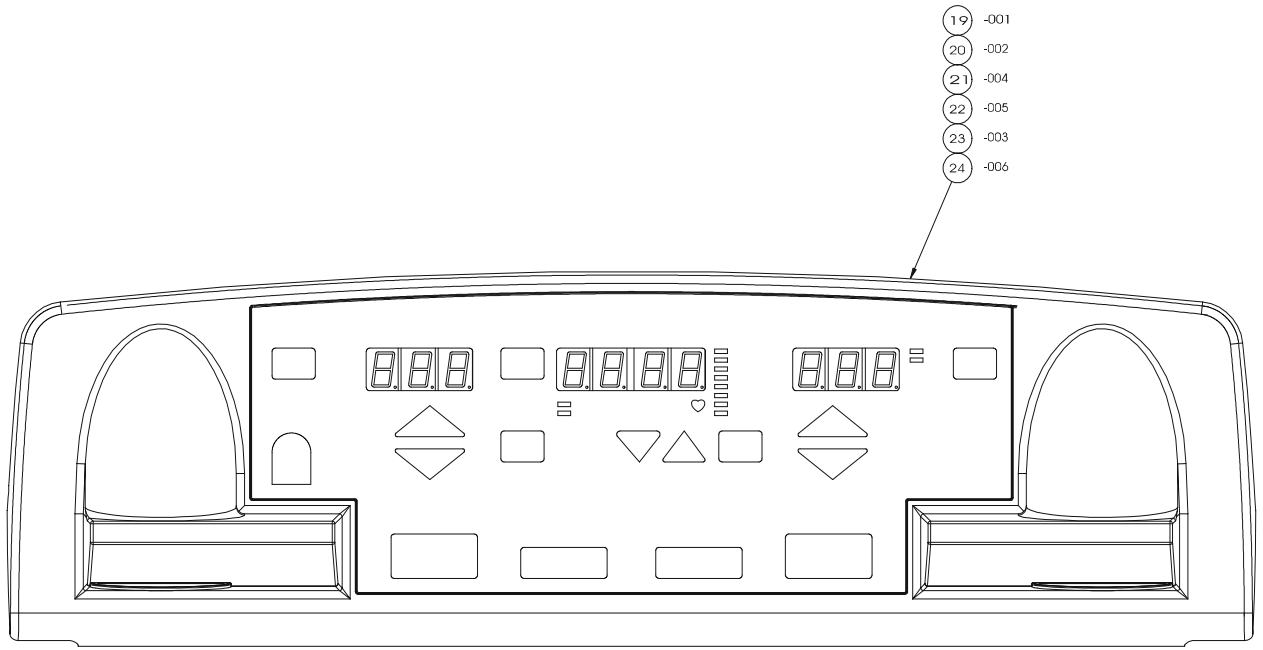


SECTION B-B

-001 SHOWN

PRODUCTION

SIZE	MODEL	DWG NO.	REV
D	510/612	035806	C
SCALE 0.750	SOURCE PRO	SHEET 2 OF 3	



VIEW D-D

PRODUCTION

SIZE	MODEL	DWG NO.	REV.
D	510/612	035806	C
SCALE 0.750	SOURCE PRO	SHEET 3 OF 3	

D-6-98, SHT 2

NOTES:

1. MATERIAL TO BE SUPPLIED BY VENDOR.
2. ALL PARTS PER DRAWING RECOMMENDATION.
3. PERMANENTLY MARK MOTOR WITH QUINTON PART NUMBER, DASH NUMBER, REVISION LETTER TO WHICH MANUFACTURED AND VENDOR IDENTIFICATION.
4. THIS COMPONENT MUST BE CERTIFIED BY A RECOGNIZED TESTING AGENCY TO COMPLY WITH APPROPRIATE CSA AND UL STANDARDS.
5. DELETED
6. TWO EXTRA NEMA STANDARD MOUNTING HOLES OPTIONAL.
7. USE SEALED BALL BEARINGS IN MOTOR CONSTRUCTION, THERE ARE TO BE NO EXTERNAL GREASE FITTINGS ON MOTOR CASE.
8. WITH ORDER OF PHASING, BLK(0), GRN (120), WHT (240) MOTOR ROTATION SHALL BE COUNTERCLOCKWISE WHEN VIEWED FROM OUTPUT SHAFT END.
9. POWER CORD (ITEM 4) TO EXTEND OUT BOTTOM SIDE OF JUNCTION BOX (ITEM 2). LENGTH DIMENSION TO BE MEASURED FROM SURFACE OF JUNCTION BOX TO END OF CONNECTOR (ITEM 3), PER TABLE I.
10. DELETED
11. ADD LABEL (ITEM 7) IN APPROXIMATE LOCATION SHOWN.
12. "X" IS A NON-SIGNIFICANT INTEGER AND MAY NOT BE PRESENT

ONLY THE ITEMS DESCRIBED ON THIS DRAWING WHEN PROCURED FROM THE VENDOR(S) LISTED HEREON IS APPROVED BY THE QUINTON DESIGN ENGINEERING DEPARTMENT IN THE APPLICATIONS SPECIFIED BY THIS DOCUMENT NUMBER. SUBSTITUTE ITEMS SHALL NOT BE USED.

BALDOR ELEC CO. FORT SMITH, AR (2)
DELETED (1)
APPROVED SOURCE(S) OF SUPPLY

REVISIONS				
LTR	ZONE	DESCRIPTION	APPROVED	DATE
L		DCN: 49002 CPN: 49003	K.E. MARTY	08/03/99
	1D7	REVISED NOTE 3: WAS: 'PERMANENTLY MARK WITH... IDENTIFICATION.' IS: 'PERMANENTLY MARK MOTOR WITH...IDENTIFICATION.'		
	2C8	MOVED FLAG NOTE 9 IN SIDE VIEW VIEW FOR CLARIFICATION		
	1D8	DELETED NOTE 5:		
		REVISED NOTE 7: WAS:'...GREASE FITTING ON...' IS:'...GREASE FITTINGS ON...'		
	1C8	DELETED FLAGNOTE 10:		
	1A6	REVISED MOTOR SPECIFICATIONS; DELETED MFG CODE 1 FOR WINDING: WAS:'T6341504'		
		REVISED FORMATS TO CURRENT QIC DRAFTING STANDARDS.		
		ACTION CODE: F1 MODIFIED: DATE OF RELEASE		

PRODUCTION

DASH NO.	DESCRIPTION	MFG CODE	MFG PART NO.
-003	MOTOR ASSY, DRIVE, AC VARIABLE	2	35Q559Y211G1
-001		2	35M825Y211G1
		┐	DELETED

SOURCE CONTROL DRAWING

MOTOR SPECIFICATIONS:

HP: 2

NEMA FRAME: 145T

RPM: 1740

PHASE: 3

FREQUENCY: 60 HZ

PWM SWITCHING FREQUENCY: 12.5 KHZ

VOLTAGE: 200 V

MOTOR TYPE: AC

MAX FULL LOAD AMPS: 6.2 A

SERVICE FACTOR: 1.00 MINIMUM

PROTECTOR: NONE

AMBIENT: 50°C CONTINUOUS

DUTY CYCLE: 100% AT 2 HP

INSULATION CLASS: H"X" (12)

ATTACH WIRE INSULATION CLASS: F

WINDING: MFG CODE 1 - DELETED
MFG CODE 2 - 35Y211

DOUBLE DIP BAKED

EXTRA PHASE PAPER

-004	MARKET	MARKET
-003	035602	000448
-002	MARKET	MARKET
-001	032359	000390 000383 000382 000380 000378 000377
PART NO.	NEXT ASSY NO.	END ITEM NO.
APPLICATION		

TABLE I	
DASH NO.	DIM "L"
-001	29.00 ±.75
-002	
-003	29.75 ±.75
-004	

-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
					PARTS LIST			
┐	-	┐	-	8	(11)	CONTAINER, SHIPPING		
┐	-	┐	-	7	016222-003	LABEL, CAUTION		
-	3	-	3	6		TERM, SOLDERLESS, CLE SPLC	18-10 AWG	
-	┐	-	┐	5		STRAIN RELIEF		
-	AR	-	AR	4	(9)	POWER CORD	16 AWG SJT INSULATION	
-	3	-	3	3		QD TERMINAL, .25	FULLY INSUL, DBL CRIMP	
-	┐	-	┐	2		JUNCTION BOX		
4 -	┐	-	┐	┐		DRIVE MOTOR	PER SPEC	
\	-	-	-	-	-004	MOTOR ASSY, DRIVE, AC VARIABLE	SPARES	
┐	\	-	-	-	-003	MOTOR ASSY, DRIVE, AC VARIABLE		
-	-	\	-	-	-002	MOTOR ASSY, DRIVE, AC VARIABLE	SPARES	
-	-	┐	\	-	-001	MOTOR ASSY, DRIVE, AC VARIABLE		

QTY PER ASSEMBLY | DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DIMENSIONS AND TOLERANCES PER ANSI Y14.5-1982

TOL .XX ± .01 .XXX ± .005 ANGLE ± —

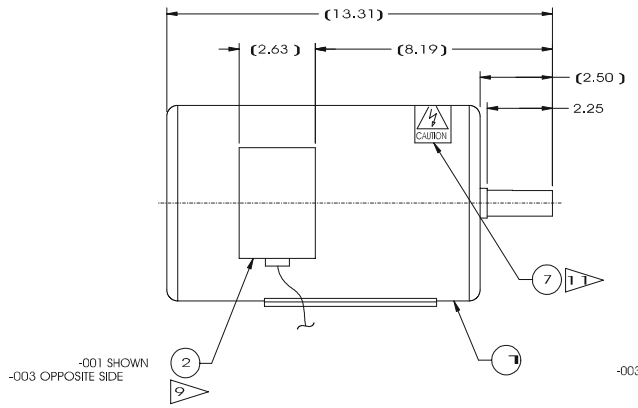
DRAWN:	DERNOVSEK	11/5/94
ENGR:	S. DECKERS	12/1/94
MFG:	B. TRATHEN	12/2/94
QUAL:	K. BAILEY	12/22/94
COMPL:	B. NAFEA	6/15/95
MKTG:		
TECH SVCE:		

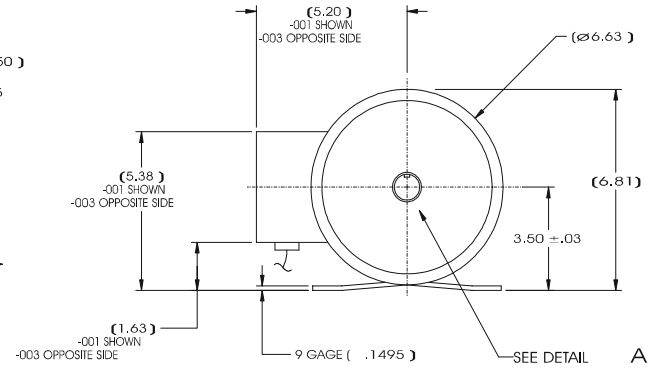
CLASS CODE: MOTR | VALUE CODE: ////// | DIST CODE: 2

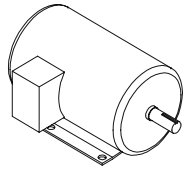
QUINTON your heart company
3303 MONTE VILLA PARKWAY
BOTHELL, WASHINGTON 98021-8906
425/402-2000

TITLE
MOTOR ASSEMBLY, DRIVE, AC VARIABLE

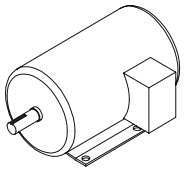
SIZE	MODEL	DWG NO.	REV
D	TREADMILL	032783	L
SCALE 1/2	SOURCE PRO	SHEET ┐ OF 2	



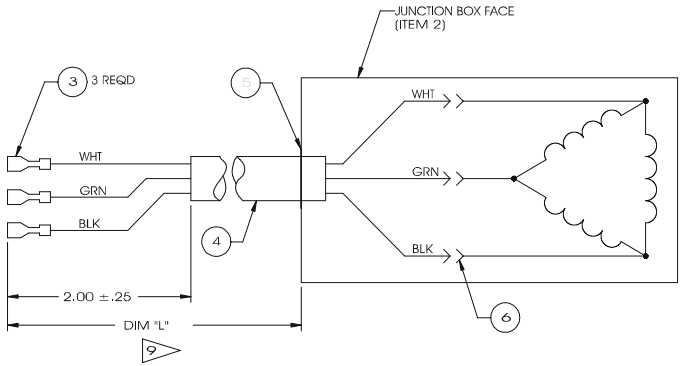




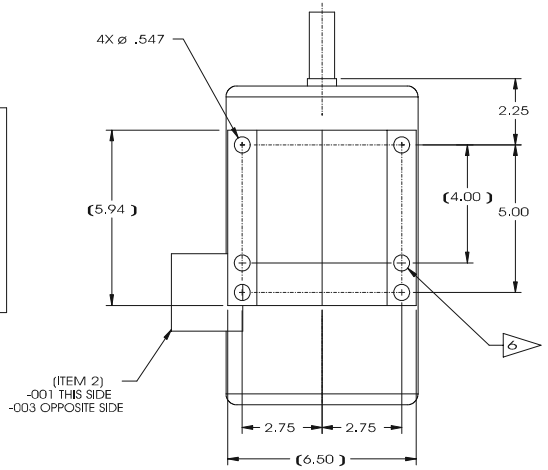
(-001 DEPICTION ONLY)

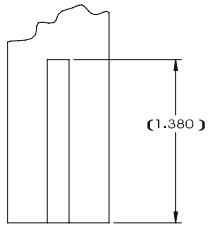


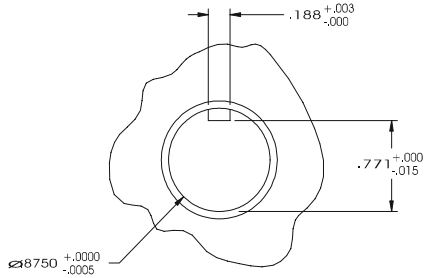
(-003 DEPICTION ONLY)



SCHEMATIC & WIRING DIAGRAM
-001 AND -003







DETAIL A
SCALE 2/1

-001 SHOWN
-003 NOTED

PRODUCTION

NOTICE: QUINTON CONFIDENTIAL — THIS SHEET CONTAINS CONFIDENTIAL, PROPRIETARY INFORMATION OF QUINTON INSTR. CO. ANY PERSON ACCEPTING THIS SHEET AND/OR INFORMATION AGREES TO MAKE NO DISCLOSURE, USE OR DUPLICATION THEREOF EXCEPT AS AUTHORIZED IN WRITING BY QUINTON INSTR. CO. AND TO RETURN THIS SHEET ON REQUEST. ©1994 - 1999 QUINTON INSTRUMENT CO. ALL RIGHTS RESERVED.	SIZE D	MODEL TREADMILL	DWG NO. 032783	REV L
	SCALE 1/2	SOURCE PRO	SHEET 2 OF 2

REVISIONS				
LTR	ZONE	DESCRIPTION	APPROVED	DATE
F		CPN: 49070 DCN: 49068 DELETED ITEM 111, P/N WAS: 036130-003 Z5C3 DETAIL "L" DELETED ITEM 111 ACTION CODE: E2, MOD: DATE OF RELEASE		

NOTES: UNLESS OTHERWISE SPECIFIED.

1. ASSEMBLE PER QUINTON WORKMANSHIP STANDARDS AND PROCEDURES.
2. PRESS BUSHING (ITEM 21) INTO SUPPORT (ITEM 22) FLUSH ±.030.
3. LUBRICATE BUSHING (ITEM 21) WITH GREASE (ITEM 113) PRIOR TO ATTACHING GRADE WELDMENT.
4. ALIGN FLYWHEEL ASSEMBLY (ITEM 13 OR 14) WITH POLY-V-PULLEY (PART OF ITEM 56 OR 57) WITHIN ±.020.
5. ORIENT MOTOR MOUNT (ITEM 18) WITH PROPER NOMENCLATURE FACING TO THE FRONT OF THE TREADMILL. CLUBTRACK: -001 THRU -006, MEDTRACK: -007 THRU -009.
6. ALTERNATE TENSIONING OF BOTH SCREWS (ITEM 81) UNTIL SPLIT LOCK WASHER (ITEM 95) IS FLAT.
7. DELETED.
8. CABLE TIES USED ON ALL CABLE MOUNTS (ITEM 75) AND AS NEEDED ON WIRE BUNDLES.
9. CONNECT WIRE HARNESSES PER WIRING SCHEMATIC ON SHEET 7.
10. LUBRICATE BUSHINGS (ITEMS 26) WITH GREASE (ITEM 113) PRIOR TO INSTALLING ACTUATOR (ITEM 8 OR 9).
11. APPLY LOCTITE 242 (ITEM 122) TO THREADS PRIOR TO INSTALLING.
12. THESE ITEMS TO BE REMOVED AND PACKAGED SEPARATELY IN BAG PROVIDED FOR USE IN SHIPPING KIT AT FINAL ASSEMBLY:
    (ITEM 103) FLAT WASHER, QTY: 8
    (ITEM 115) SCREW, HEX CAP, QTY: 8
    (ITEM 116) LOCK WASHER, QTY: 8
13. TRUNION KIT IS LISTED FOR COST ONLY. IT IS PART OF ACTUATOR (ITEM 8 OR 9).
14. STRAIN RELIEF CABLE ASSY (ITEM 27) WITH CABLE TIE (ITEM 74). LEAVE 11.5 ±.5 INCHES OF CABLE FREE FROM POINT OF STRAIN RELIEF.

PRODUCTION

-009	-008	-007	-006	-005	-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
■	■	■	■	■	■	■	■	■	12	032784-001	ROTARY TENSIONER		
■	■	■	■	■	■	■	■	■	11	032783-003	DRIVE MOTOR ASSYEMBLY		
■	■	■	■	■	■	■	■	■	10	035730-001	GRADE WELDMENT		
■	■	-	■	■	-	■	■	-	9	035853-002	LINEAR ACTUATOR	220V	
-	-	■	-	-	■	-	-	■	8	035853-001	LINEAR ACTUATOR	115V	
■	■	■	■	■	■	■	■	■	7	035620-001	HEADFRAME, SHEET METAL		
■	-	-	■	-	-	-	-	-	6	035960-006	PLATE ASSY., CONFIGURATION	612 INTL., 230V	
-	■	-	-	■	-	-	-	-	5	035960-005	PLATE ASSY., CONFIGURATION	612 DOMESTIC, 220V	
-	-	■	-	-	■	-	-	-	4	035960-004	PLATE ASSY., CONFIGURATION	612 DOMESTIC, 115V	
-	-	-	-	-	-	■	-	-	3	035960-003	PLATE ASSY., CONFIGURATION	510 INTL., 230V	
-	-	-	-	-	-	-	■	-	2	035960-002	PLATE ASSY., CONFIGURATION	510 DOMESTIC, 220V	
-	-	-	-	-	-	-	-	■	1	035960-001	PLATE ASSY., CONFIGURATION	510 DOMESTIC, 115V	
	-	-	-	-	-	-	-	-	-	-009	MECHANICAL ASSEMBLY, CLUB/MEDTRACK	MEDTRACK CR 230V INTL.	
-		-	-	-	-	-	-	-	-	-008	MECHANICAL ASSEMBLY, CLUB/MEDTRACK	MEDTRACK CR 220V DOMESTIC	
-	-		-	-	-	-	-	-	-	-007	MECHANICAL ASSEMBLY, CLUB/MEDTRACK	MEDTRACK CR 115V DOMESTIC	
-	-	-		-	-	-	-	-	-	-006	MECHANICAL ASSEMBLY, CLUB/MEDTRACK	612 230V INTERNATIONAL	
-	-	-	-		-	-	-	-	-	-005	MECHANICAL ASSEMBLY, CLUB/MEDTRACK	612 220V DOMESTIC	
-	-	-	-	-		-	-	-	-	-004	MECHANICAL ASSEMBLY, CLUB/MEDTRACK	612 115V DOMESTIC	
-	-	-	-	-	-		-	-	-	-003	MECHANICAL ASSEMBLY, CLUB/MEDTRACK	510 230V INTERNATIONAL	
-	-	-	-	-	-	-		-	-	-002	MECHANICAL ASSEMBLY, CLUB/MEDTRACK	510 220V DOMESTIC	
-	-	-	-	-	-	-	-		-	-001	MECHANICAL ASSEMBLY, CLUB/MEDTRACK	510 115V DOMESTIC	

PARTS LIST

-009 -008 -007	000465 000459	000465 000459
-006 -005 -004	000457 000456	000457 000456
-003 -002 -001	000448 000458	000448 000458
PART NO.	NEXT ASSY NO.	END ITEM NO.
APPLICATION		

QTY PER ASSEMBLY — DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES. DIMENSIONS AND TOLERANCES PER ANSI Y14.5-1982

TOL .XX ±.– .XXX ±.– ANGLE ±.–

CLASS CODE:	VALUE CODE:	DIST CODE:
ASSY	TREDML	-

DRAWN:	S.ERICKSON	2/9/99
ENGR:	S.ERICKSON	2/9/99
MFG:	D.CRAIN	2/9/99
QUAL:	D.VANDEVENTER	2/9/99
COMPL:	---	---
MKTG:	---	---
TECH SVCE:	C.MATHIS	2/9/99

QUINTON your heart company
3303 MONTE VILLA PARKWAY
BOTHELL, WASHINGTON 98021-8906
425-402-2000

TITLE
MECHANICAL ASSEMBLY, CLUBTRACK, MEDTRACK CR

SIZE	MODEL	DWG NO.	REV
D	510/612	035602	F

SCALE 1/4 — SOURCE PRO — SHEET 1 OF 7

-009	-008	-007	-006	-005	-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
									72	DELETED			
┐	┐	┐	┐	┐	┐	┐	┐	┐	71	036035-001	WIRECLIP, LATCHING		
2	2	2	2	2	2	2	2	2	70	031610-003	SUPPRESSOR, FERRITE		
┐	┐	┐	┐	┐	┐	┐	┐	┐	69	035985-001	HARNESS ASSY, CONFIGURATION		
-	-	┐	-	-	┐	-	-	┐	68	035982-002	HARNESS ASSY, A.C.	115V	
┐	┐	-	┐	┐	-	┐	┐	-	67	035982-001	HARNESS ASSY, A.C.	230V	
┐	┐	┐	┐	┐	┐	┐	┐	┐	66	035986-001	HARNESS ASSY, GRADE POWER		
┐	┐	┐	┐	┐	┐	┐	┐	┐	65	036068-001	CLAMP, DRIVE MODULE		
┐	┐	┐	┐	┐	┐	┐	┐	┐	64	036057-001	BRACKET, PCBA SUPPORT		
┐	┐	┐	┐	┐	┐	┐	┐	┐	63	036062-001	GUARD, FOOT		
14	14	14	14	14	14	14	14	14	62	035965-001	RETAINER, COVER		
┐	┐	┐	┐	┐	┐	┐	┐	┐	61	035943-001	RETAINER, HANDRAIL		
┐	┐	┐	┐	┐	┐	┐	┐	┐	60	019921-001	GRIP, HANDRAIL		
┐	┐	┐	┐	┐	┐	┐	┐	┐	59	019644-002	HANDRAIL		
┐	┐	┐	┐	┐	┐	┐	┐	┐	58	019138-003	PULLEY, DRIVEN		
┐	┐	┐	-	-	-	-	-	-	57	035586-002	DRIVE ROLLER ASSEMBLY	MEDTRACK CR	
-	-	-	┐	┐	┐	┐	┐	┐	56	035586-001	DRIVE ROLLER ASSEMBLY	CLUBTRACK 510/612	
2	2	2	2	2	2	2	2	2	55	035582-001	RETAINER, FRONT SHAFT		
2	2	2	2	2	2	-	-	-	54	035606-002	SIDERAIL COVER	CLUB/MEDTRACK 612	
-	-	-	-	-	-	2	2	2	53	035606-001	SIDERAIL COVER	CLUB/MEDTRACK 510	
┐	┐	┐	┐	┐	┐	-	-	-	52	035608-002	SIDERAIL, MACHINED, R.H.	CLUB/MEDTRACK 612	
-	-	-	-	-	-	┐	┐	┐	51	035608-001	SIDERAIL, MACHINED, R.H.	CLUB/MEDTRACK 510	
┐	┐	┐	┐	┐	┐	-	-	-	50	035607-002	SIDERAIL, MACHINED, L.H.	CLUB/MEDTRACK 612	
-	-	-	-	-	-	┐	┐	┐	49	035607-001	SIDERAIL, MACHINED, L.H.	CLUB/MEDTRACK 510	
2	2	2	2	2	2	2	2	2	48	014639-001	FOOT, RUBBER		
2	2	2	2	2	2	2	2	2	47	035940-001	NUTPLATE, FOOT		
┐	┐	┐	┐	┐	┐	┐	┐	┐	46	036259-001	WELDMENT, SUPPORT		
2	2	2	2	2	2	2	2	2	45	032240-002	SPACER, RIGID		
10	10	10	10	10	10	10	10	10	44	032235-003	COMPRESSION MOUNT, LONG		
8	8	8	8	8	8	8	8	8	43	032235-004	COMPRESSION MOUNT,SHORT		
┐	┐	┐	-	-	-	-	-	-	42	032387-002	DRIVE BELT, POLY-V	MEDTRACK CR	
-	-	-	┐	┐	┐	┐	┐	┐	41	032387-001	DRIVE BELT, POLY-V	CLUBTRACK 510/612	
┐	┐	┐	┐	┐	┐	┐	┐	┐	40	035610-002	ENDCAP, LEFT HAND		
┐	┐	┐	┐	┐	┐	┐	┐	┐	39	035610-001	ENDCAP, RIGHT HAND		
┐	┐	┐	┐	┐	┐	-	-	-	38	019019-004	BELT, WALKING	CLUB/MEDTRACK 612	
-	-	-	-	-	-	┐	┐	┐	37	019019-003	BELT, WALKING	CLUBTRACK 510	
┐	┐	┐	┐	┐	┐	-	-	-	36	035613-002	SLIDER BED	CLUB/MEDTRACK 612	
-	-	-	-	-	-	┐	┐	┐	35	035613-001	SLIDER BED	CLUBTRACK 510	
┐	┐	┐	┐	┐	┐	┐	┐	┐	34	035603-002	UPRIGHT BRACKET, LEFT		
┐	┐	┐	┐	┐	┐	┐	┐	┐	33	035603-001	UPRIGHT BRACKET, RIGHT		
┐	┐	┐	┐	┐	┐	┐	┐	┐	32	035623-001	UPRIGHT, LEFT		
┐	┐	┐	┐	┐	┐	┐	┐	┐	31	035622-001	UPRIGHT, RIGHT		
┐	┐	┐	┐	┐	┐	┐	┐	┐	30	035803-002	UPRIGHT FITTING,MACH.,L.H.		
┐	┐	┐	┐	┐	┐	┐	┐	┐	29	035803-001	UPRIGHT FITTING,MACH.,R.H.		
┐	┐	┐	┐	┐	┐	┐	┐	┐	28	035808-001	PANEL, REAR		
┐	┐	┐	┐	┐	┐	┐	┐	┐	27	036033-001	CABLE ASSY., COMM.		
3	3	3	3	3	3	3	3	3	26	035972-001	BUSHING, GRADE WHEEL		
2	2	2	2	2	2	2	2	2	25	035971-001	WHEEL, GRADE		
									24	DELETED			
┐	┐	┐	┐	┐	┐	┐	┐	┐	23	036118-001	CARD CAGE ASSY, PCBA DRIVE		
2	2	2	2	2	2	2	2	2	22	035616-001	SUPPORT, GRADE, MACHINED		
2	2	2	2	2	2	2	2	2	21	035615-001	BUSHING, GRADE SUPPORT		
┐	┐	┐	┐	┐	┐	┐	┐	┐	20	035976-001	BLOCK, GRADE NUT		
2	2	2	2	2	2	2	2	2	19	035975-001	BUSHING, SHOULDER		
┐	┐	┐	┐	┐	┐	┐	┐	┐	18	036087-001	MOTOR MOUNT		
┐	┐	┐	┐	┐	┐	┐	┐	┐	17	035619-002	BRACKET, ACTUATOR		
2	2	2	2	2	2	2	2	2	16	035619-001	BRACKET, ACTUATOR		
┐	┐	┐	┐	┐	┐	┐	┐	┐	15	035621-001	BRACKET, TENSIONER		
┐	┐	┐	-	-	-	-	-	-	14	032446-003	FLYWHEEL ASSEMBLY	MEDTRACK CR	
-	-	-	┐	┐	┐	┐	┐	┐	13	032446-001	FLYWHEEL ASSEMBLY	CLUBTRACK 510/612	

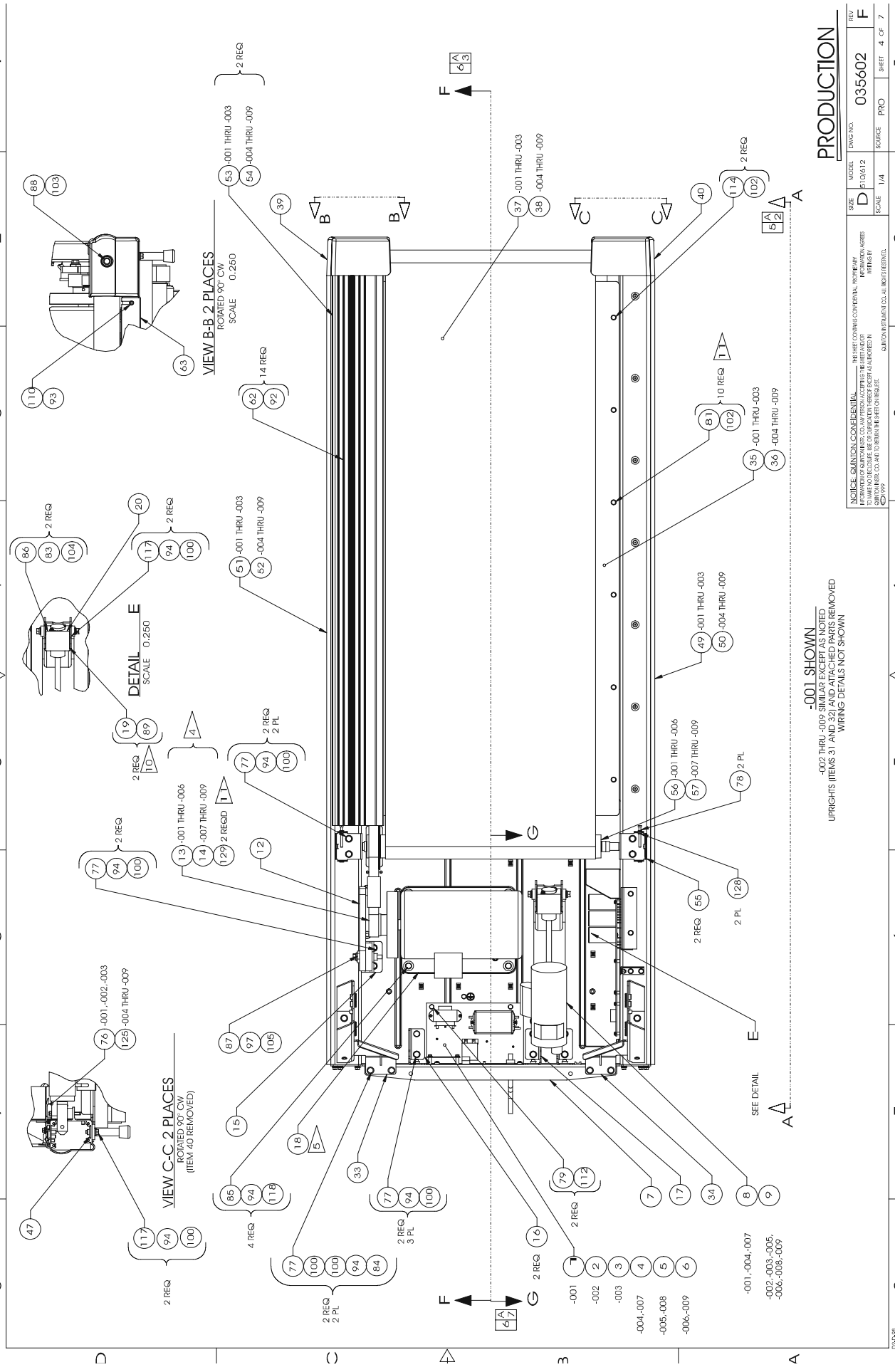
PRODUCTION

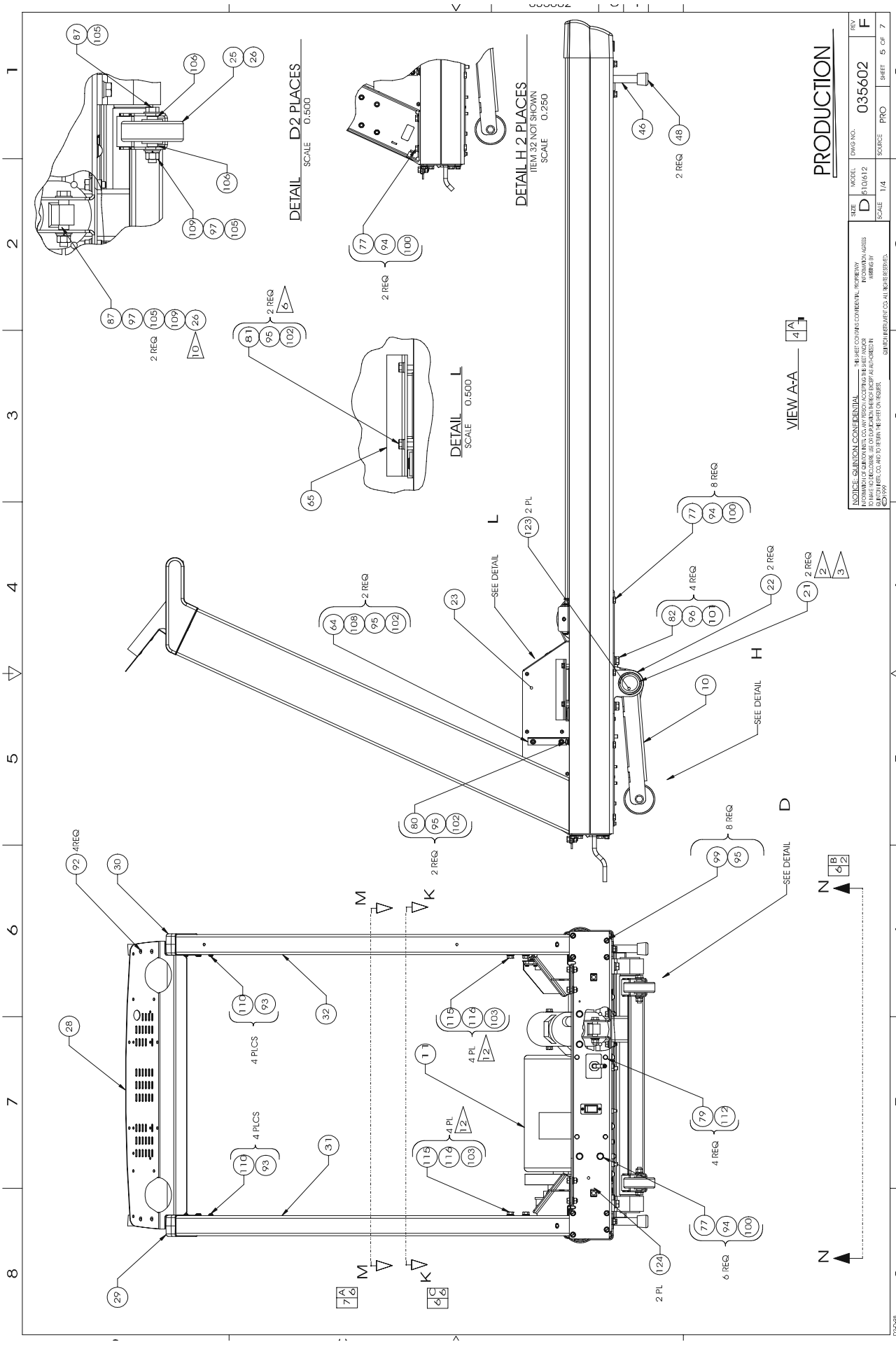
SIZE	MODEL	DWG NO.	REV
D	510/612	035602	F
SCALE 1/4	SOURCE PRO	SHEET 2 OF 7	

-009	-008	-007	-006	-005	-004	-003	-002	-001	ITEM NUMBER	PART NUMBER	DESCRIPTION	MATERIAL SPECIFICATION	REFERENCE DESIGNATION
1	1	1	1	1	1	1	1	1	131	036198-001	KIT, TRUNION		NOT SHOWN
2	2	2	2	2	2	2	2	2	130	006769-004	RIVET	.188 PLAIN	
2	2	2	2	2	2	2	2	2	129	010833-145	SET SCREW	1/4-20UNC X .250L	
2	2	2	2	2	2	2	2	2	128	035908-004	NUT, HEX, ZINC PLTD-METRIC	M5	
2	2	2	2	2	2	2	2	2	127	036166-045	SET SCREW, CONE POINT-METRIC	M6 X 12	
2	2	2	2	2	2	2	2	2	126	035901-049	SCREW, HEX CAP, F/THD-METRIC	M8 X 25	
AR	AR	AR	AR	AR	AR	-	-	-	125	036157-002	FELT, ADHESIVE-BACKED	(58.00 X .50 X .045)	
2	2	2	2	2	2	2	2	2	124	036178-001	RECEPTACLE, SNAP FIT	1/4 TURN	
2	2	2	2	2	2	2	2	2	123	036156-001	PLUG, HOLE, RIB-LOCK		
AR	AR	AR	AR	AR	AR	AR	AR	AR	122	015233-001	ADHESIVE, THREAD LOCKING	LOCTITE 242	
1	1	1	-	-	-	-	-	-	121	036144-002	COVER, DRIVE PULLEY		
-	-	-	1	1	1	1	1	1	120	036144-001	COVER, DRIVE PULLEY		
2	2	2	2	2	2	2	2	2	119	010011-070	LABEL, ADH-BACK AL FOIL	GROUND STICKER	
8	8	8	8	8	8	8	8	8	118	036122-006	WASHER, FLAT FENDER METRIC	M8	
6	6	6	6	6	6	6	6	6	117	035901-049	SCREW, HEX CAP, METRIC	M8 X 25	
8	8	8	8	8	8	8	8	8	116	036094-007	WASHER, LOCK, BLK-METRIC	M8	12
8	8	8	8	8	8	8	8	8	115	036093-048	SCREW, HEX CAP, BLACK-METRIC	M8 X 20	12
2	2	2	2	2	2	2	2	2	114	035901-044	M6 X 70 HEX HEAD		
AR	AR	AR	AR	AR	AR	AR	AR	AR	113	005002-001	GREASE	AEROSHELL #5	
7	7	7	7	7	7	7	7	7	112	035918-005	EXTERNAL STAR WASHER	M6	
									111	DELETED			
10	10	10	10	10	10	10	10	10	110	036128-043	M6 X 16 BUTTON HD	BLACK OXIDE	
3	3	3	3	3	3	3	3	3	109	016839-031	HEX NUT	.375	
2	2	2	2	2	2	2	2	2	108	035908-005	HEX NUT	M6	
8	8	8	8	8	8	8	8	8	107	033318-001	WASHER,NEOPRENE	MOTOR MOUNT	
4	4	4	4	4	4	4	4	4	106	032180-134	SPACER, NYLON	OD 1.120 ID .540 X .125	
7	7	7	7	7	7	7	7	7	105	001164-006	FLAT WASHER	.375	
2	2	2	2	2	2	2	2	2	104	035919-002	FLAT WASHER	M4	
10	10	10	10	10	10	10	10	10	103	036092-006	FLAT WASHER	M8, BLACK OXIDE	12
22	22	22	22	22	22	22	22	22	102	035920-006	FLAT WASHER	M6	
4	4	4	4	4	4	4	4	4	101	035920-008	FLAT WASHER	M10	
42	42	42	42	42	42	42	42	42	100	035920-007	FLAT WASHER	M8	
8	8	8	8	8	8	8	8	8	99	036136-031	SCREW, THD CUT, HEX WASHER HEAD	1/4-20UNC X .750L	
4	4	4	4	4	4	4	4	4	98	019012-003	WASHER,SHOULDER,ISOLATION		
4	4	4	4	4	4	4	4	4	97	010511-011	SPLIT LOCK WASHER	.375	
4	4	4	4	4	4	4	4	4	96	035913-008	SPLIT LOCK WASHER	M10	
18	18	18	18	18	18	18	18	18	95	035913-006	SPLIT LOCK WASHER	M6	
46	46	46	46	46	46	46	46	46	94	035913-007	SPLIT LOCK WASHER	M8	
10	10	10	10	10	10	10	10	10	93	036094-006	SPLIT LOCK WASHER	M6, BLACK OXIDE	
18	18	18	18	18	18	18	18	18	92	006769-103	RIVET	.188 (BLACK)	
12	12	12	12	12	12	12	12	12	91	034485-005	RIVET,BLIND	.125	
4	4	4	4	4	4	4	4	4	90	036135-013	M6 X 20 HEX HEAD	THD FORMING BLK OXIDE	
2	2	2	2	2	2	2	2	2	89	036131-001	BEARING,BRONZE		
2	2	2	2	2	2	2	2	2	88	036093-059	M8 X 90 HEX HEAD	BLACK OXIDE	
4	4	4	4	4	4	4	4	4	87	010820-207	.375 X 2.50 HEX HEAD		
2	2	2	2	2	2	2	2	2	86	017439-062	M4 X 8 PAN HD PHILLIPS		
8	8	8	8	8	8	8	8	8	85	035901-056	M8 X 60 HEX HEAD		
12	12	12	12	12	12	12	12	12	84	035908-006	HEX NUT	M8	
2	2	2	2	2	2	2	2	2	83	035918-003	EXTERNAL STAR WASHER	M4	
4	4	4	4	4	4	4	4	4	82	035901-063	M10 X 20 HEX HEAD		
12	12	12	12	12	12	12	12	12	81	035901-038	M6 X 35 HEX HEAD		
7	7	7	7	7	7	7	7	7	80	035901-034	M6 X 16 HEX HEAD		
6	6	6	6	6	6	6	6	6	79	035901-033	M6 X 12 HEX HEAD		
2	2	2	2	2	2	2	2	2	78	035901-030	M5 X 50 HEX HEAD		
38	38	38	38	38	38	38	38	38	77	035901-048	M8 X 20 HEX HEAD		
-	-	-	-	-	-	AR	AR	AR	76	036157-001	FELT, ADHESIVE-BACKED	(.53.00 X .50 X .045)	
14	14	14	14	14	14	14	14	14	75	011560-002	ANCHOR TIE		
AR	AR	AR	AR	AR	AR	AR	AR	AR	74	001899-001	CABLE TIE		
2	2	2	2	2	2	2	2	2	73	036166-044	SET SCREW, CONE POINT	M6	

PRODUCTION

SIZE	MODEL	DWG NO.	REV
D	510/612	035602	F
SCALE 1/4		SOURCE PRO	SHEET 3 OF 7


PRODUCTION
035602
-001 SHOWN
-002 THRU -009 SIMILAR EXCEPT AS NOTED
UPRIGHTS (ITEMS 31 AND 32) AND ATTACHED PARTS REMOVED
WIRING DETAILS NOT SHOWN
VIEW B-B 2 PLACES
ROTATED 90° CW
SCALE 0.250
DETAIL E
SCALE 0.250
VIEW C-C 2 PLACES
ROTATED 90° CW
(ITEM 40 REMOVED)
SEE DETAIL


PRODUCTION
035602
DETAIL D2 PLACES
SCALE 0.500
DETAIL H 2 PLACES
ITEM 32 NOT SHOWN
SCALE 0.250
DETAIL L
SCALE 0.500
VIEW A-A
SEE DETAIL
4 PLCS
4 PL
2 REQ
4 REQ
6 REQ
8 REQ
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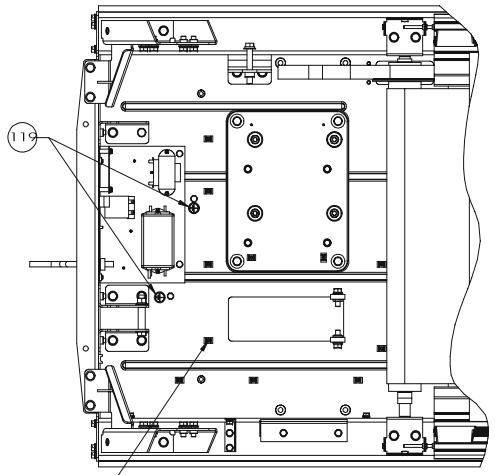
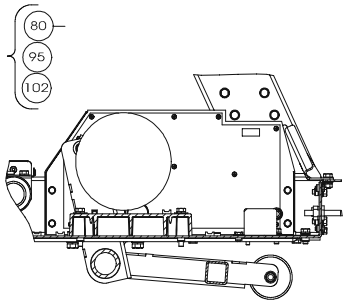
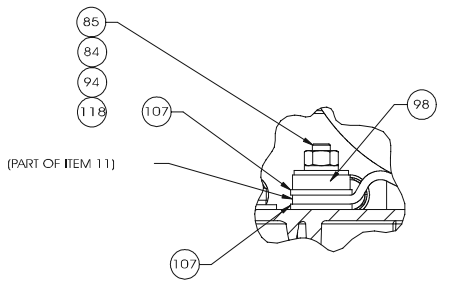
SIZE D
MODEL 510/612
SCALE 1/4
DWG NO. 035602
SOURCE PRO
REV F
SHEET 5 OF 7



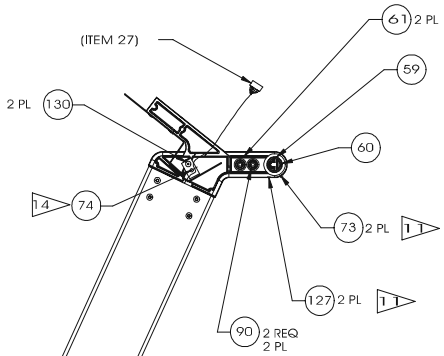
VIEW K-K ROTATED 90 ° CW (5 C 8)
ANCHOR TIE (ITEM 75) LOCATIONS
SOME COMPONENTS OMMITTED

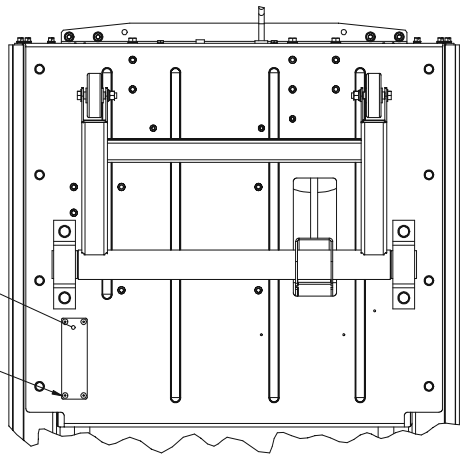


SECTION G-G ROTATED 180° (4 B 8)
SOME COMPONENTS REMOVED
SCALE 0.250

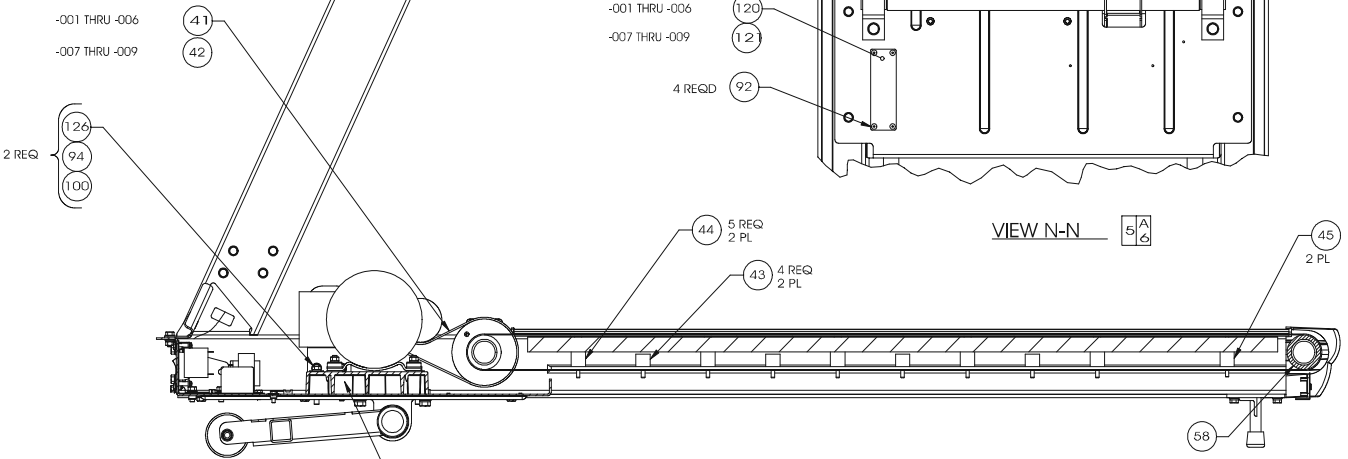


DETAIL J 4 PLACES
SCALE 1.000





VIEW N-N (5 A 6)



SECTION F-F (4 B)

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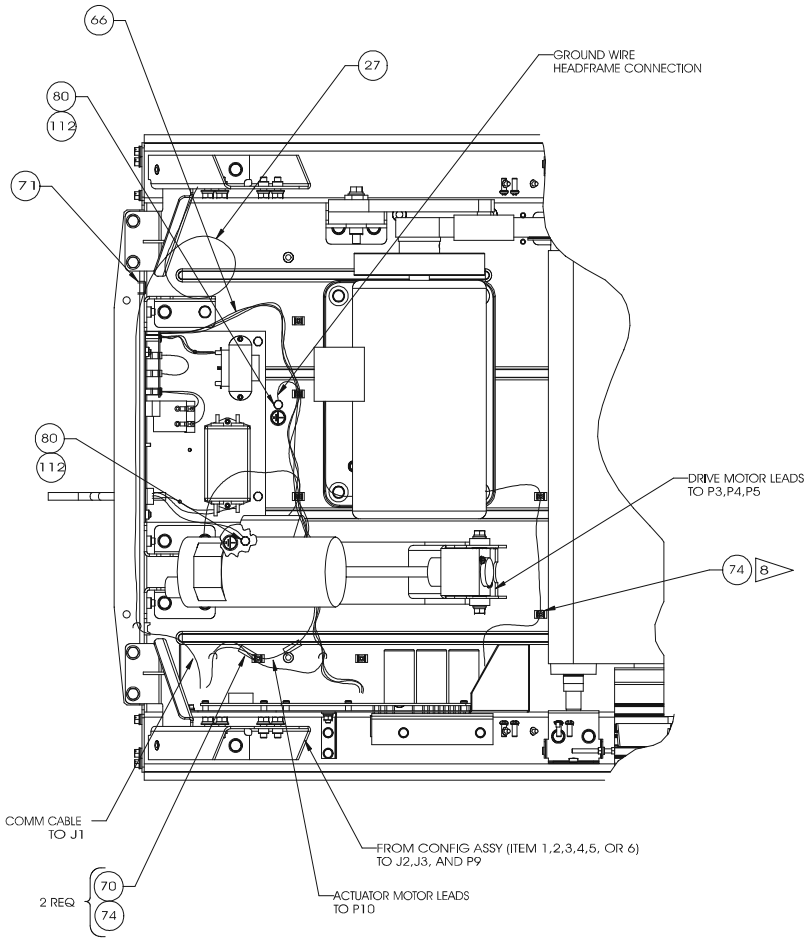
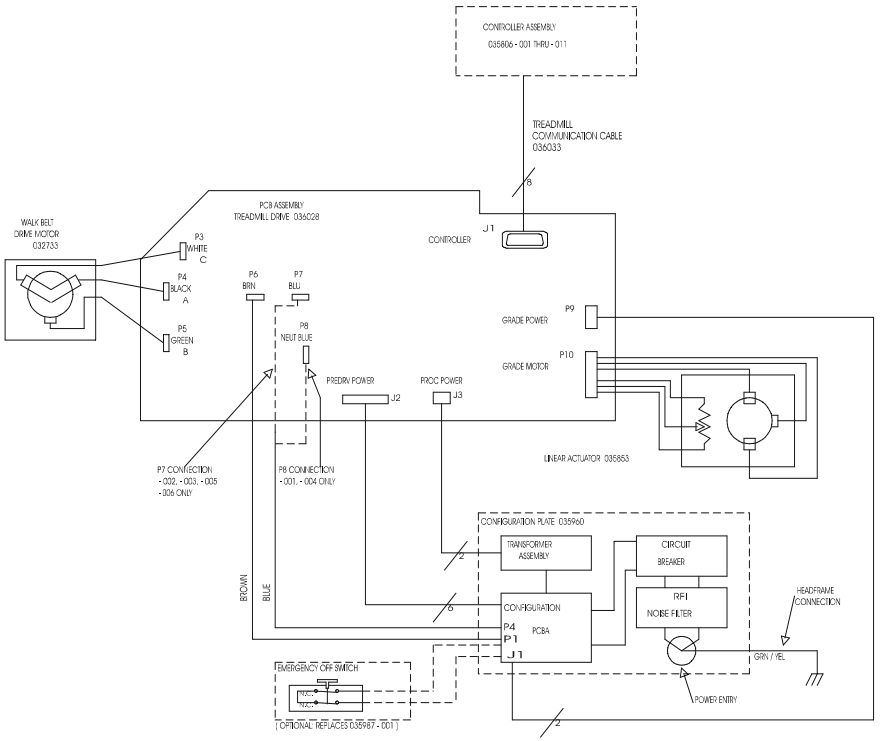
SIZE	MODEL	DWG NO.	REV
D	510/612	035602	F
SCALE 1/4		SOURCE PRO	SHEET 6 OF 7

D2-0-98



VIEW M-M (ROTATED 90° CW) 5 C 6

WIRE ROUTING DETAIL
SOME COMPONENTS OMMITTED FOR CLARITY



SYSTEM WIRING DIAGRAM

PRODUCTION

SIZE	MODEL	DWG NO.	REV
D	510/612	035602	F
SCALE 1/4	SOURCE PRO	SHEET 7 OF 7	

D2-D-98

F

Quick Reference

Keystroke Commands

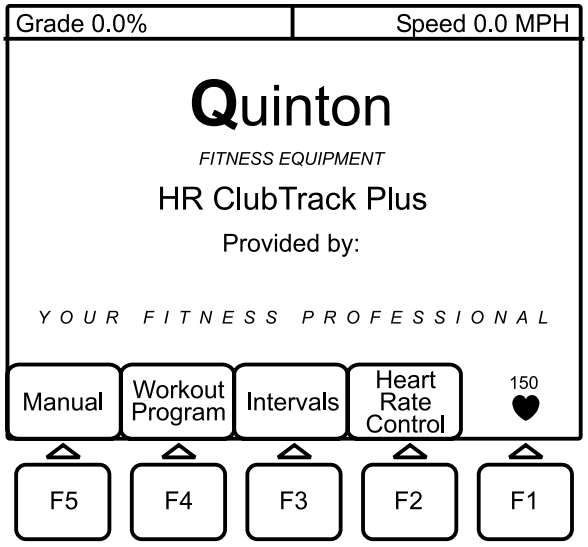
ClubTrack 510/612

Function	Key Combination
Change default units	POWER and UNITS
Total time run	STOP BELT and FASTER
Total distance run	STOP BELT and SLOWER
Custom Editor Mode	
Entering custom editor	STOP BELT and SELECT and COOL DOWN
Setting time limit alarm	+ or - (0:96 is unlimited)
Setting time limit to 30 minutes	CLEAR
Setting maximum speed	SLOWER or FASTER
Exiting custom editor	SELECT (to save settings)
Service Mode	
Entering/exiting service mode	STOP BELT and SLOWER and FASTER
7-segment display cycle test	STOP BELT and UP and DOWN
NV program load test	STOP BELT and COOL DOWN
VSD revision number	STOP BELT and DOWN

Man./prog. revision number	STOP BELT and UP
Configuration select	STOP BELT and + or -
Configuration no change	CLEAR
Configuration store	SELECT or ENTER
ABS voltage display	+ and -

Key Input	Displayed Code	Key Input	Displayed Code
No key	P000	Select/Enter	P007
Clear	P001	Start Belt	P009
Up	P002	Units	P010
Down	P003	Cool Down	P013
Stop Belt	P004	Faster	P014
+	P005	Slower	P015
—	P006	Shorted Keys	P555

ClubTrack 510/612 Plus



Function	Key Combination
Custom editor mode	POWER and F4
Service mode access	STOP BELT and SLOWER and FASTER
Magnetic key override	POWER and F1

Error Codes

Self Test

Error	Description (all are fatal)
E001	VSD controller chip failure
E002	VSD controller EPROM failure
E003	VSD controller stuck interrupt
E004	VSD controller A/D failure
E101	Man/prog. controller RAM failure
E102	Man.prog. controller EPROM corrupted
E103	Man./prog. controller stuck interrupt
E104	Man./prog. controller Communication Packet failure
E105	Man./prog. controller NVRAM corrupted
E107	Prog. controller External UART failure
CP--	Man./prog. configuration needs updating

Operating

Error	Indicates	Fatal/Non Fatal
E201	Grade greater than allowable limit	Non-fatal
E202	Speed greater than allowable limit	Fatal
E203	Motor drawing excessive current for at least 1 second	Fatal
E204	VSD is not communicating with Man./prog. controller	Fatal
E205	VSD tachometer not working	Fatal
E206	VSD has received an unexpected reset	Fatal
E207	Motor is drawing moderately excessive current for 2 minutes	Non-fatal
E208	Motor current sense circuit not detecting appropriate current	Fatal
E209	Motor drive circuitry has failed	Fatal
E210	Motor current sense circuit has failed	Fatal
E211	Grade sensing circuit is either detecting motion when none is expected or not detecting motion when change should occur	Non-fatal
E212	User input configuration code is not valid for the hardware	Fatal
E213	(Plus only) Circuit breaker was tripped or power was lost while belt was moving	Information Only
EPLO	Input voltage has dropped too low	Fatal
EPHI	Input voltage has gone too high	Fatal

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