

Service Manual

ClubTrack[®] 510, ClubTrack[®] 510 Plus[®]
ClubTrack[®] 612, ClubTrack[®] 612 Plus[®]



P/N 000448-83 | Rev New



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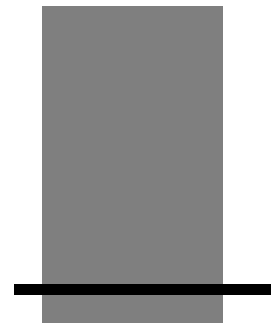
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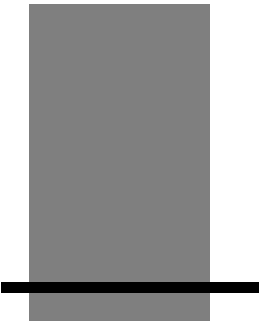
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Preface

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

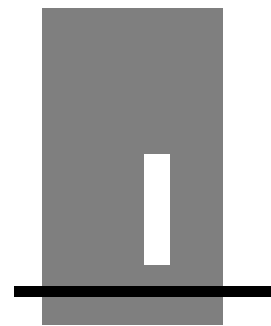
ClubTrack® 510	P/N 00448
ClubTrack® 510 Plus®	P/N 00458
ClubTrack® 612	P/N 00456
ClubTrack® 612 Plus®	P/N 00457

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.

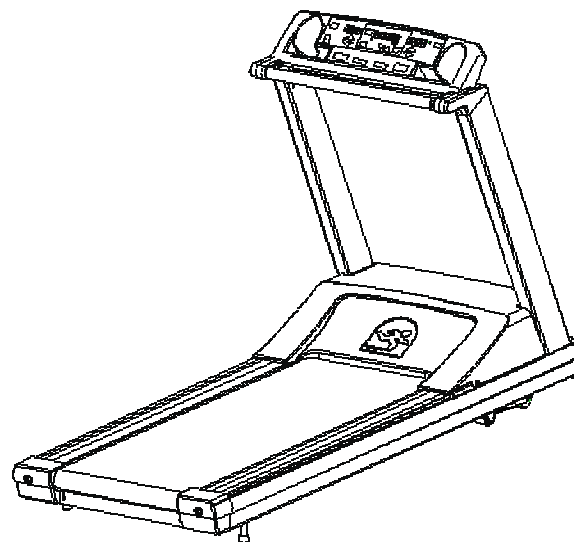
- Do not use this manual when servicing Series 90™, Q-Series™, ClubTrack 3.0™, or ClubTrack Hyperdrive™ treadmills.



Overview

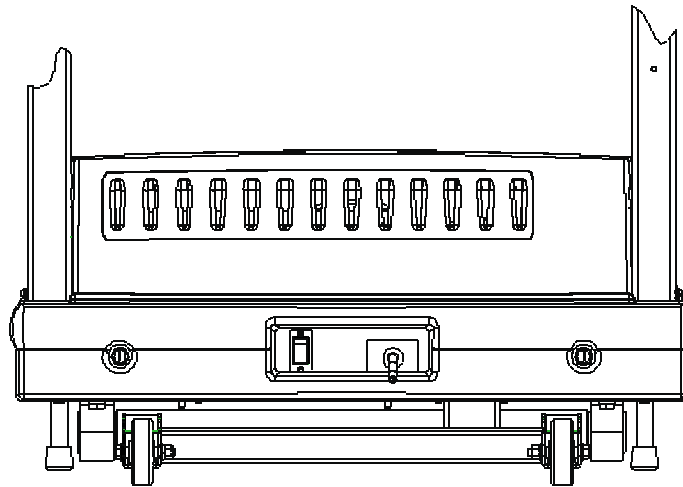
Quinton's ClubTrack series of treadmills are motorized treadmills with built-in controllers and are designed for fitness exercise. The series includes the ClubTrack 510 (P/N 00448), ClubTrack 510 Plus (P/N 00458), ClubTrack 612 (P/N 00456), and ClubTrack 612 Plus (P/N 00457). The ClubTrack Plus models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

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

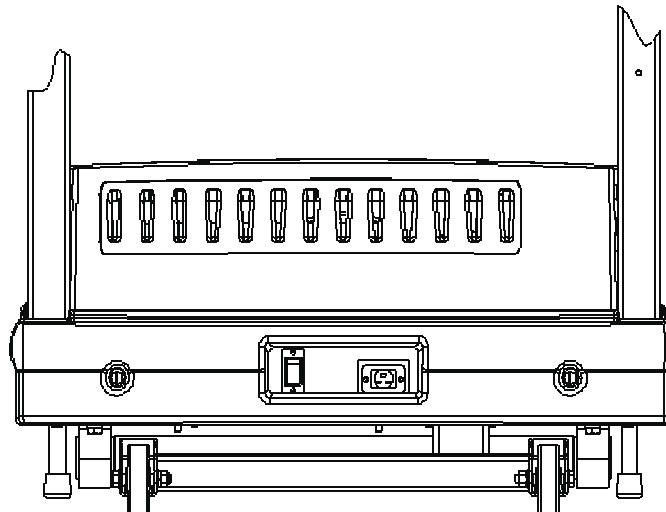


Treadmill

Configuration Plate



Domestic Configuration



International Configuration

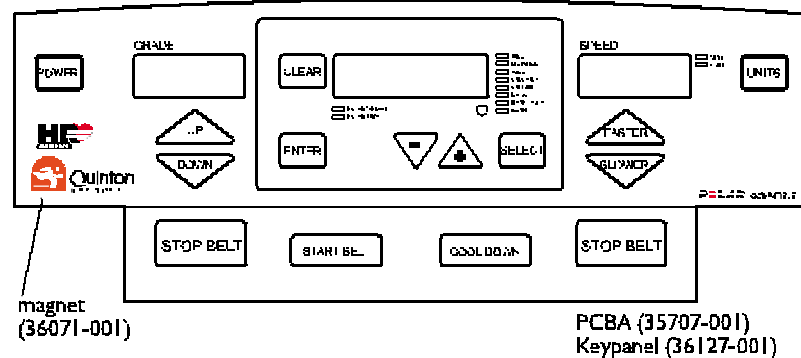
Power

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.

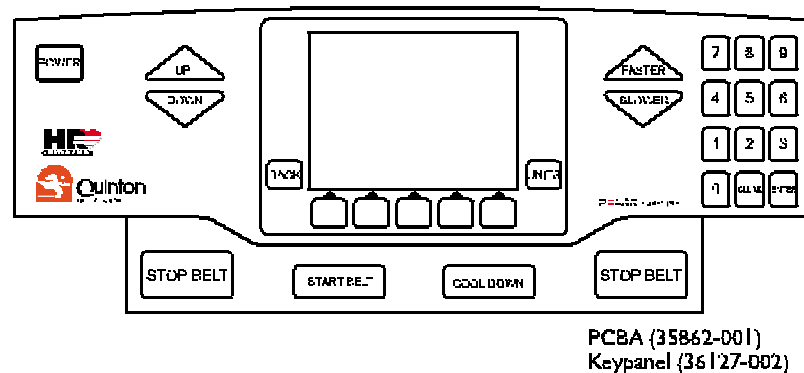
- Turn off the circuit breaker before connecting or disconnecting the treadmill from the wall outlet.

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

Theory of Operation

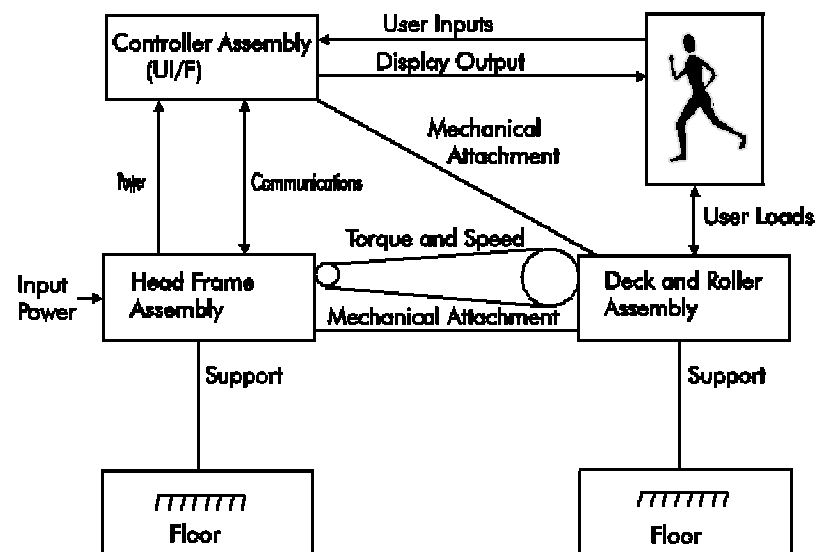
Overview

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

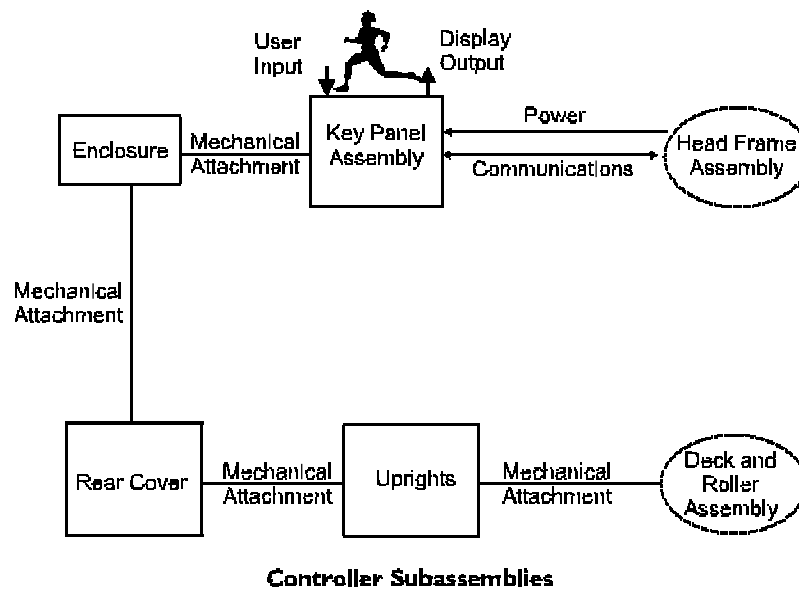
drives the walk belt by supplying torque and speed to the drive pulley through a drive belt. An AC actuator drives the front of the treadmill up and down to simulate hills. The headframe assembly receives speed and grade commands from the controller.

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.



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 displays 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, TV, 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.

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: - Unplug the treadmill. - Unplug the plugs at J2 and J3 of the Treadmill Voltage Configuration PCBA. - 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 - 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: - 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). - 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 NY 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)	P555	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. 2. Interference from electromagnetic signals (e.g., other belt transmitters, T.V., motors, computers, and such).	1. Move the treadmills at least 18 inch (46 cm) apart. 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 Quinon 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 <i>Specifications</i>). 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)

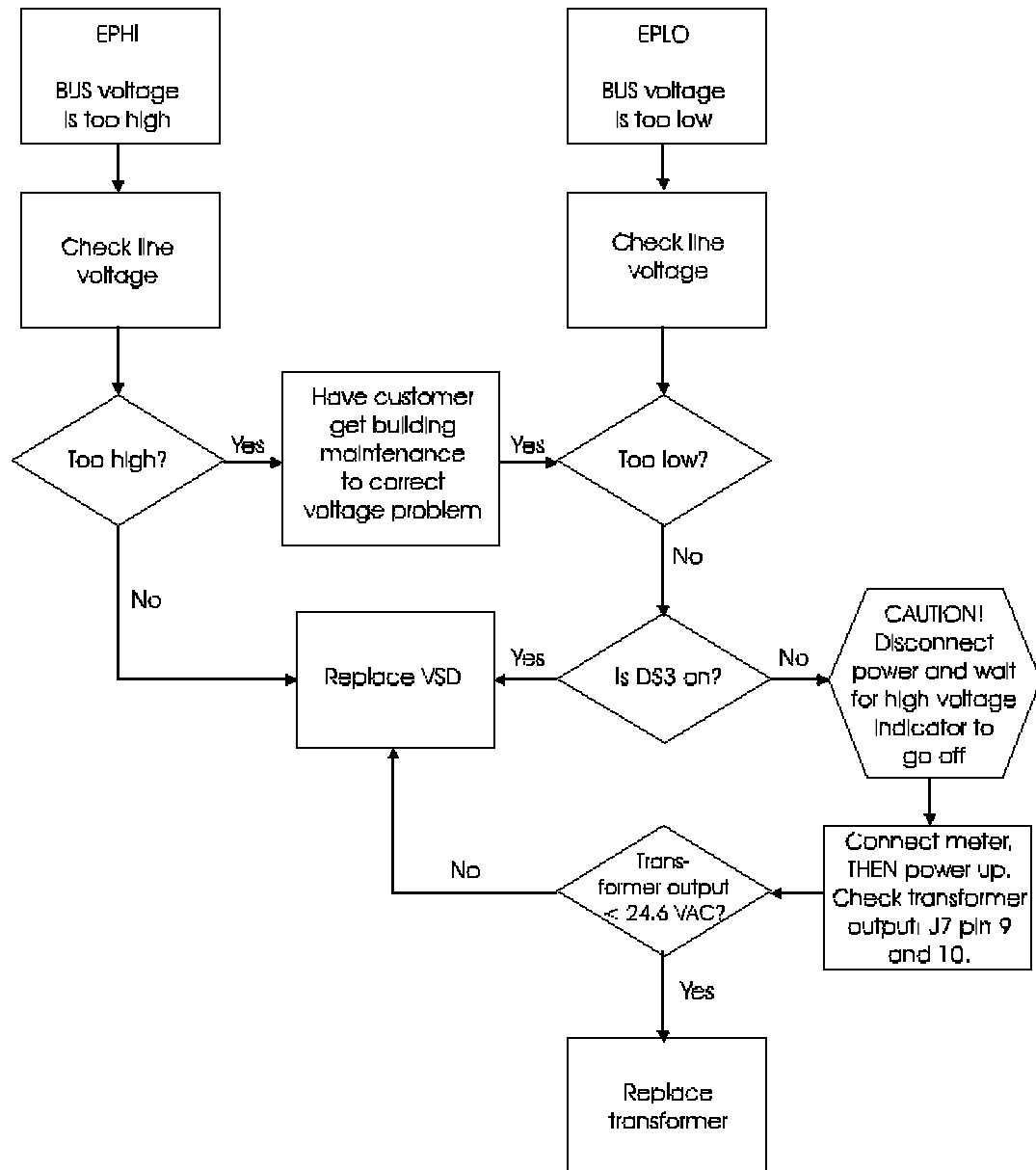
- * The rate of bearing noise can help determine which bearing is at fault. The number of knocks per minute varies with treadmill speed because the roller speeds change as the belt speed changes. Use a stethoscope with a tube-like end, or a piece of hose about two feet long, to isolate bearing noise. 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

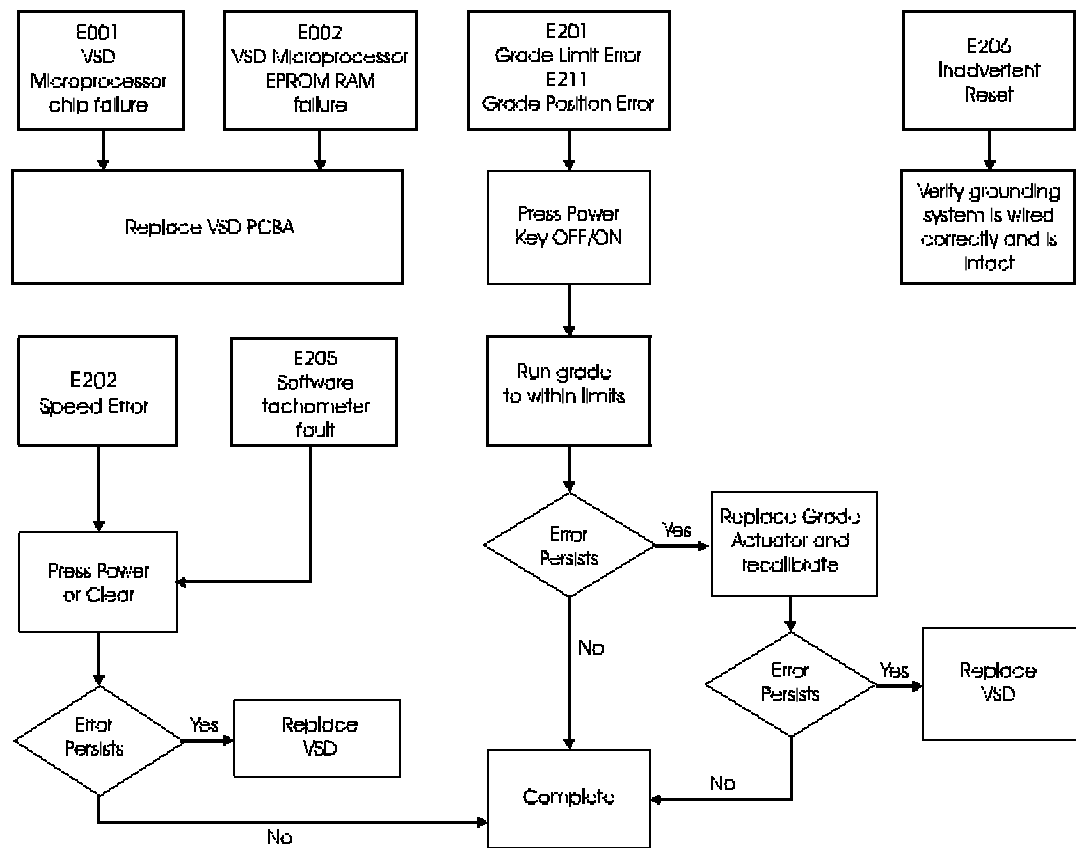
Use the following flow charts for step-by-step troubleshooting.

- 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

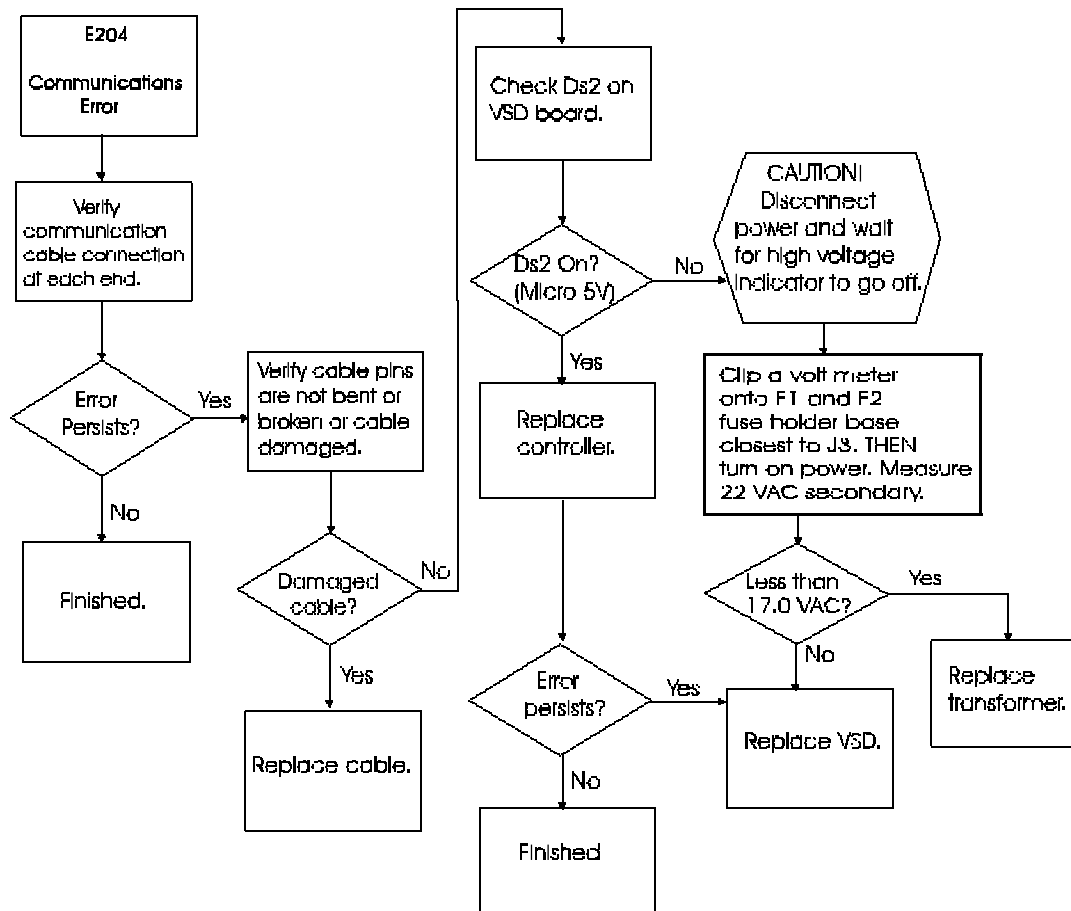


BUS Voltage



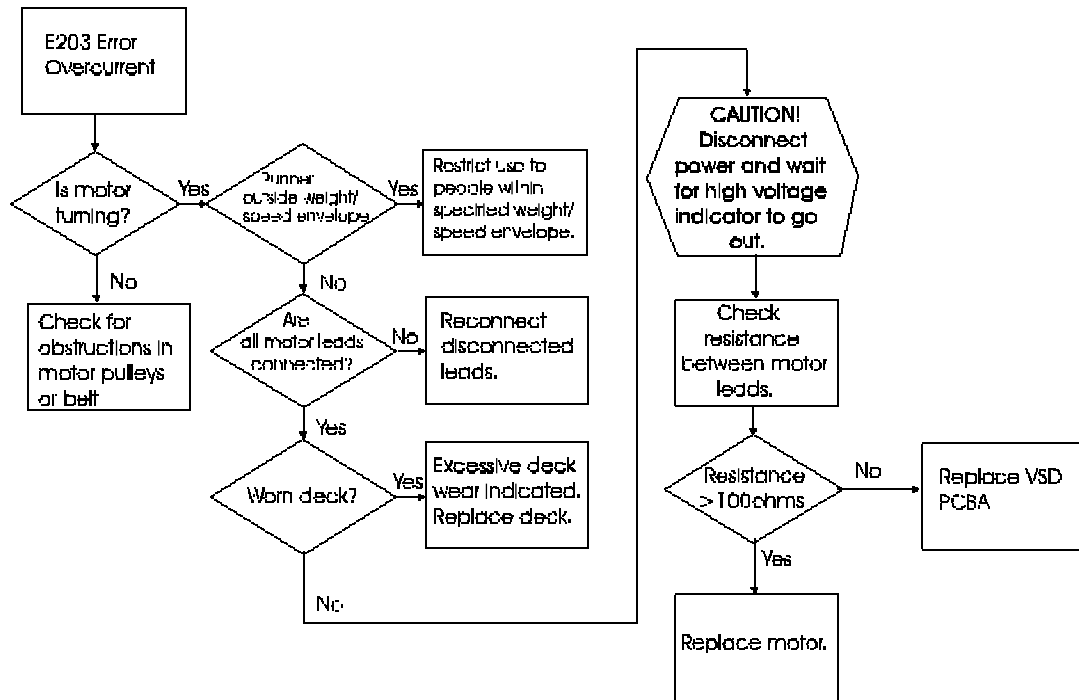
VSD Board

Error Code Flow Chart: E204



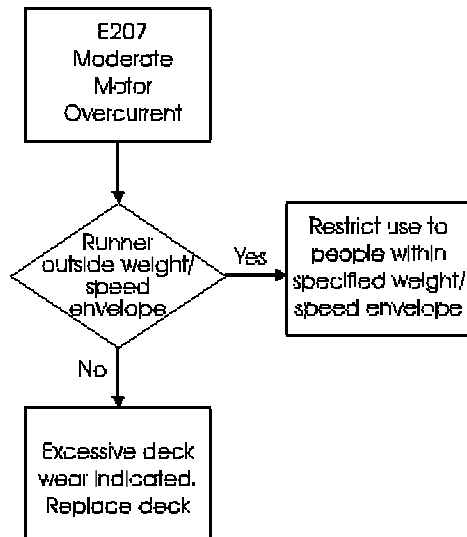
Communications Link

Error Code Flow Chart: E203

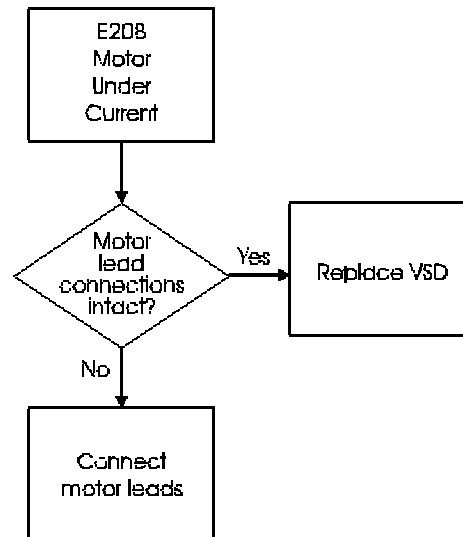


Motor Overcurrent

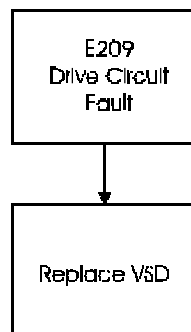
Error Code Flow Charts: E207, E208, E209, E210



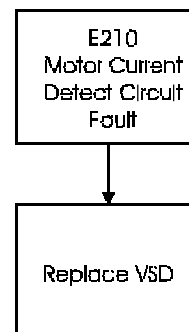
**Moderate Motor
Overcurrent**



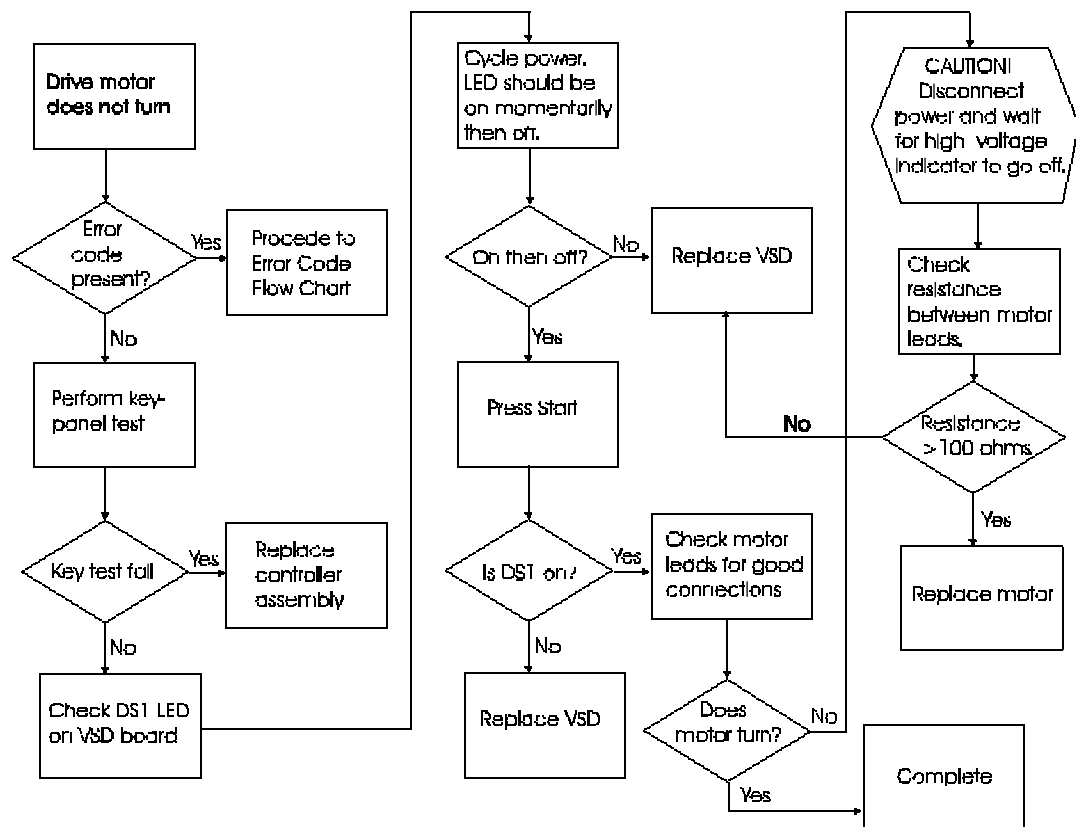
**Moderate Motor
Undercurrent**



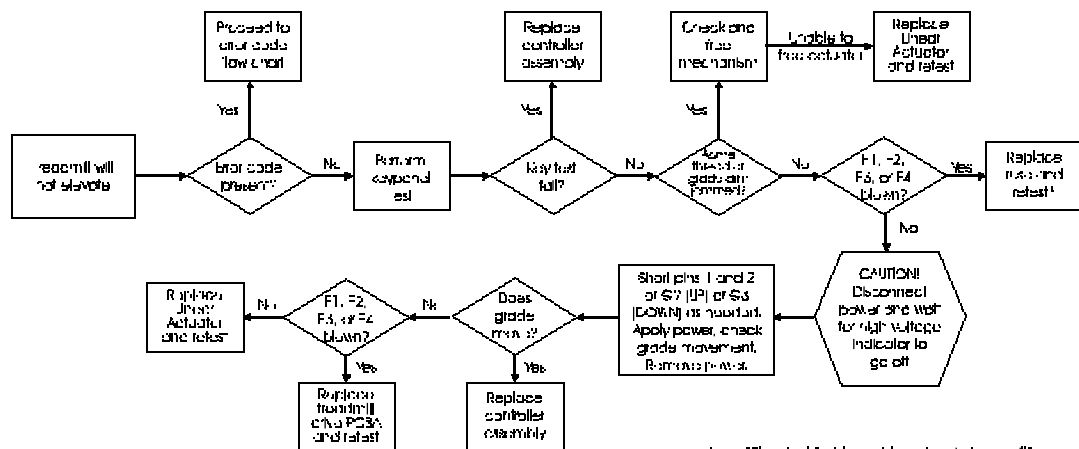
Drive Circuit Fault



**Drive Current Detect
Fault**



Drive Motor



* see "Electrical Problems" flow chart in freemill

Grade Problems

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
 - Heyto® 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.

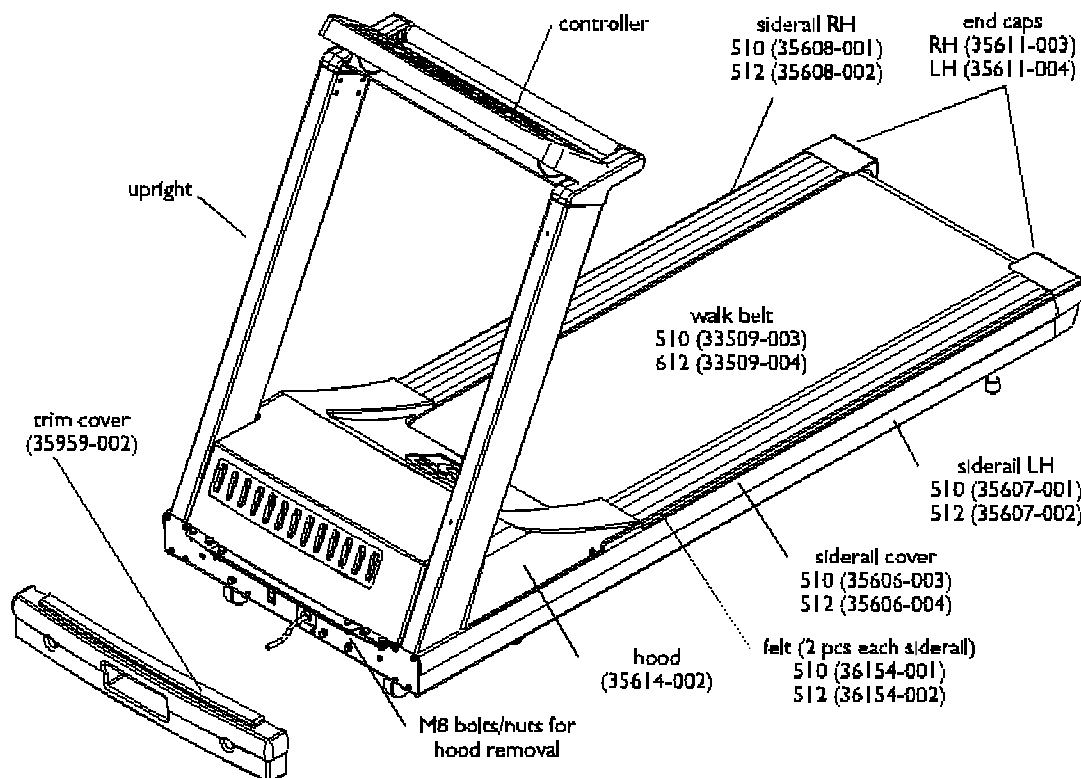
Field Functional Tests

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.

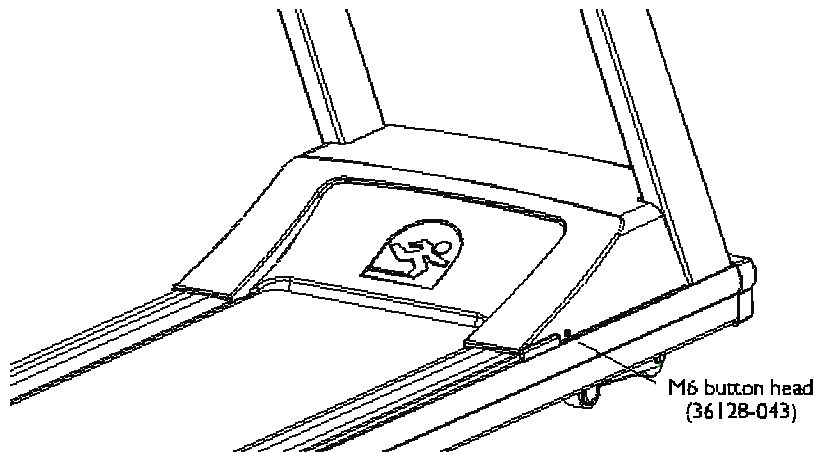
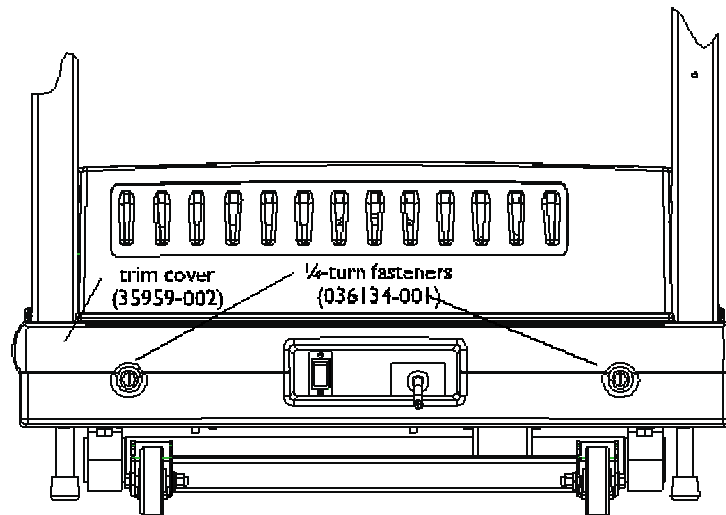
Warning



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.

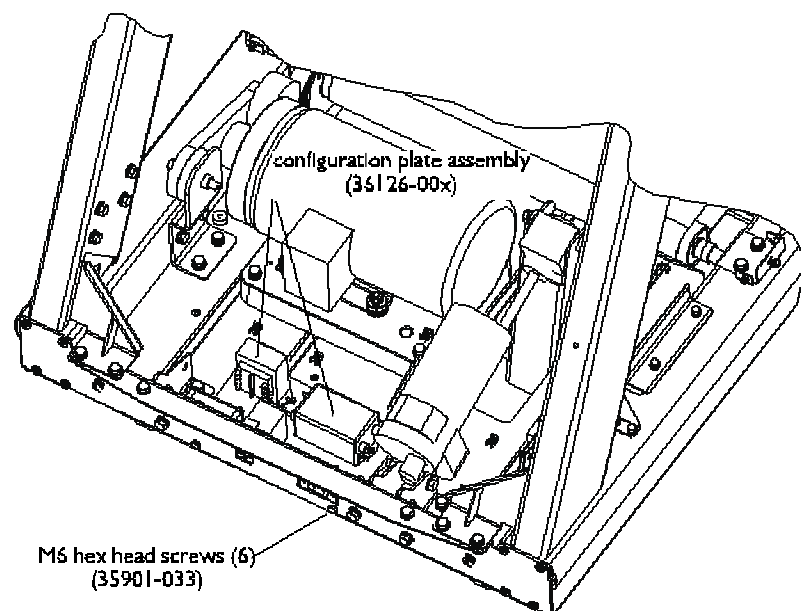
Field Functional Test

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

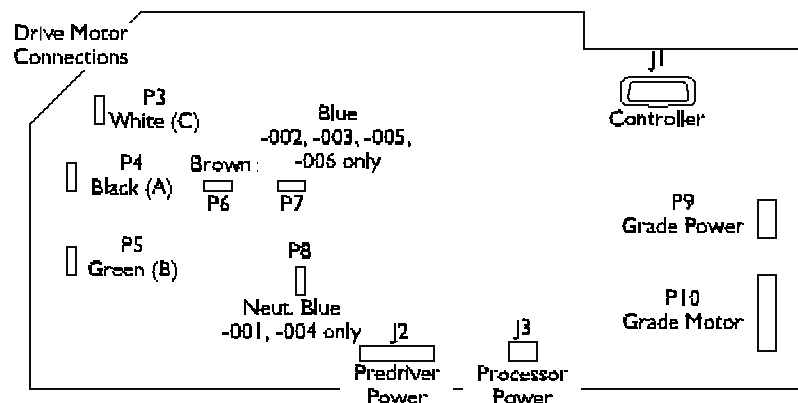
The VSD board is installed on a bracket located on the side of the treadmill.

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

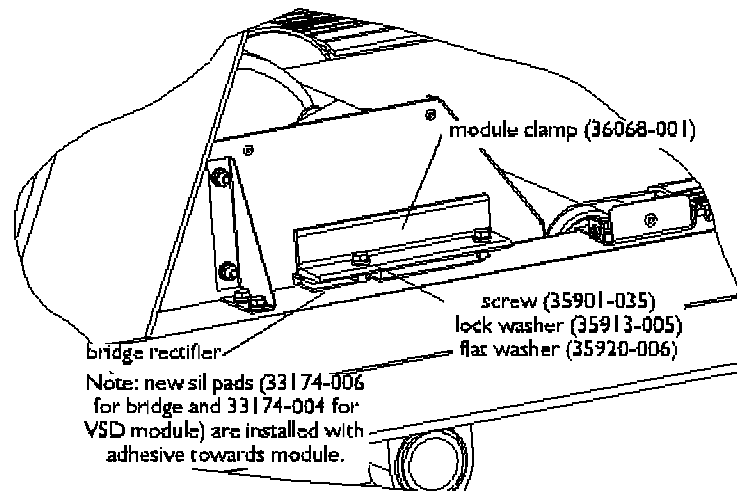


To prevent high voltage electrical shock: Before working on or around any electrical or mechanical component under the hood, wait at least two minutes from the time you unplug the power cord and be sure the red LEDs on the VSD board are off.



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

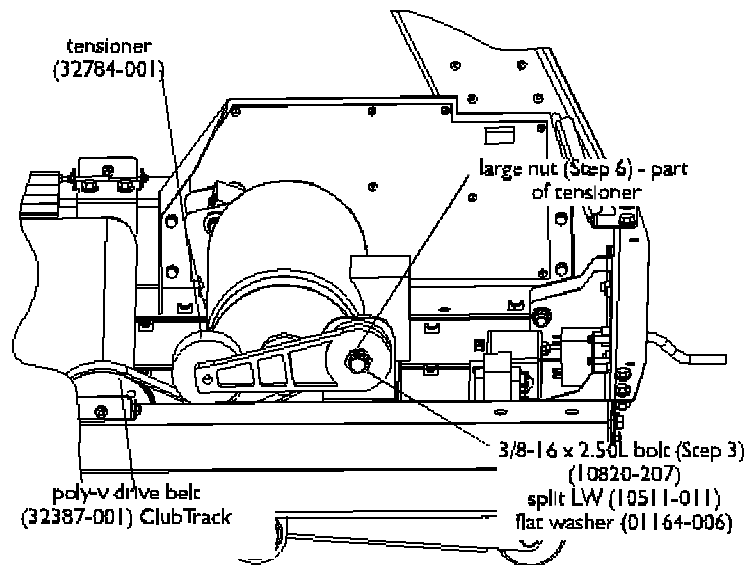
The tensioner may need to be replaced if the poly-V belt slips, if the idler pulley bearing makes noise, or if the tensioner roller is damaged.

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

Caution



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

1. Remove the hood as previously described.
2. Loosen the belt tensioner by turning the $\frac{1}{2}$ -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

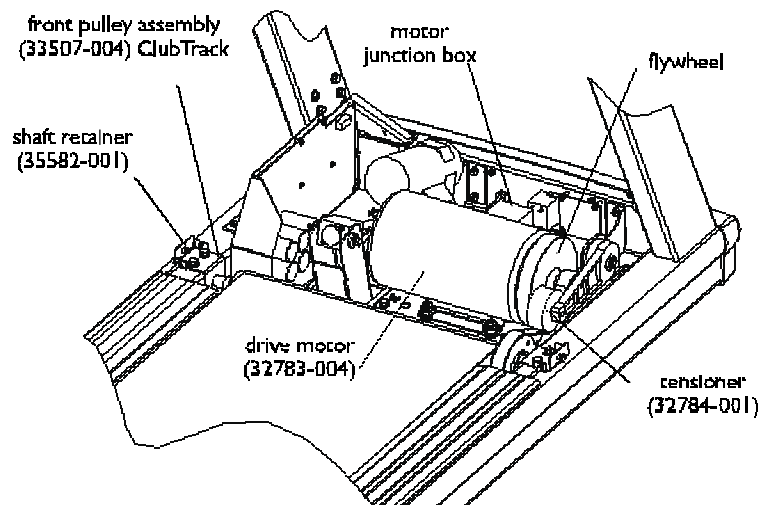
1. Install retainer. Be sure to center the shaft such that the retainer engages the grooves provided.
2. Assemble the treadmill following Steps 1-6 above in reverse order.
3. Tension the drive belt as described in Replacing the Tensioner.
4. Set the walk belt tension and tracking.

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.

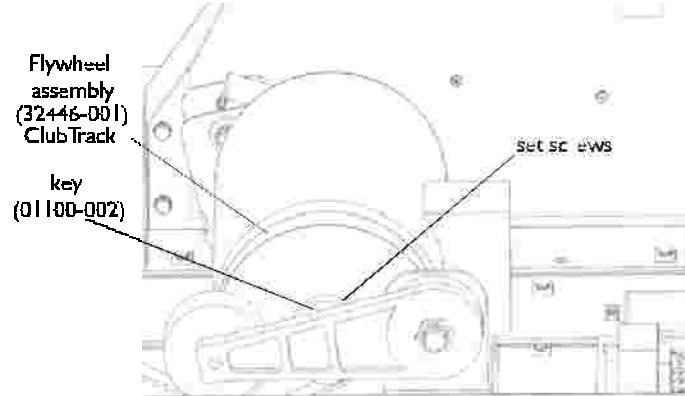
Replacing the Drive Motor

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

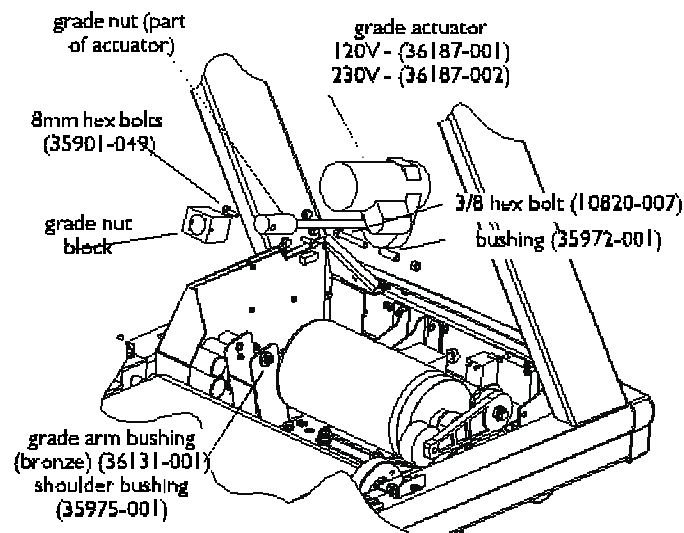
To verify that the treadmill is operating properly, perform Field Test No. 3. See Appendix D, Field Functional Tests for specific instructions.

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.



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

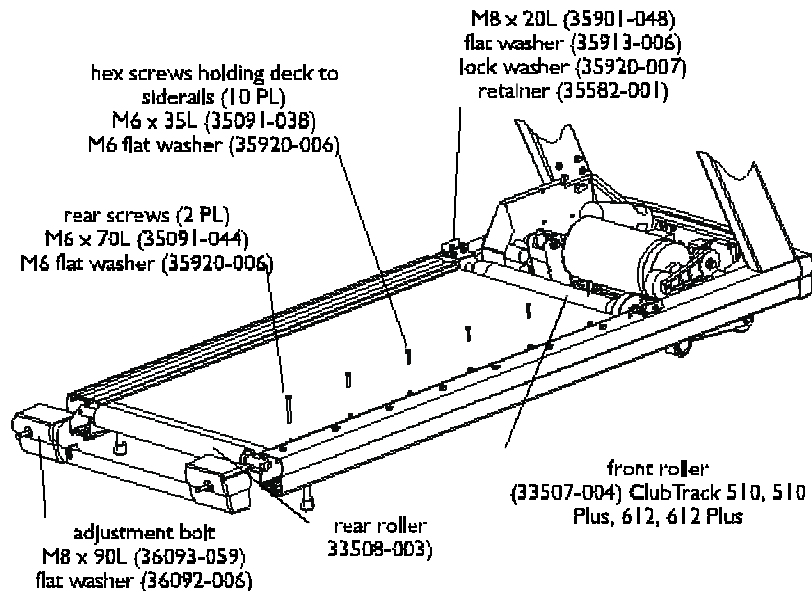
Verify that:

- 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

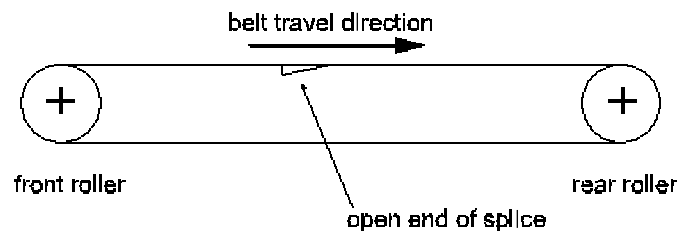
To verify proper operation, perform Field Test No. 5. See Appendix D, Field Functional Tests, for specific instructions.

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

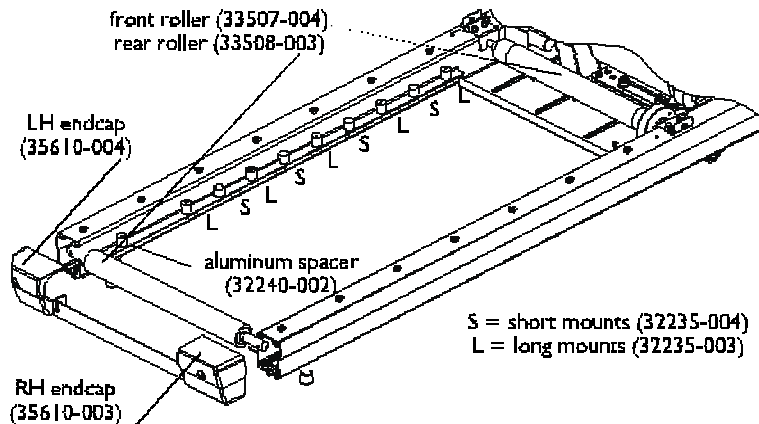
To verify that the treadmill is operating properly, perform Field Test No. 3. See Appendix D, Field Functional Tests, for specific instructions.

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 $\frac{1}{4}$ turn *clockwise*.
 - b. If the belt moves to the left, turn the screw $\frac{1}{4}$ 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

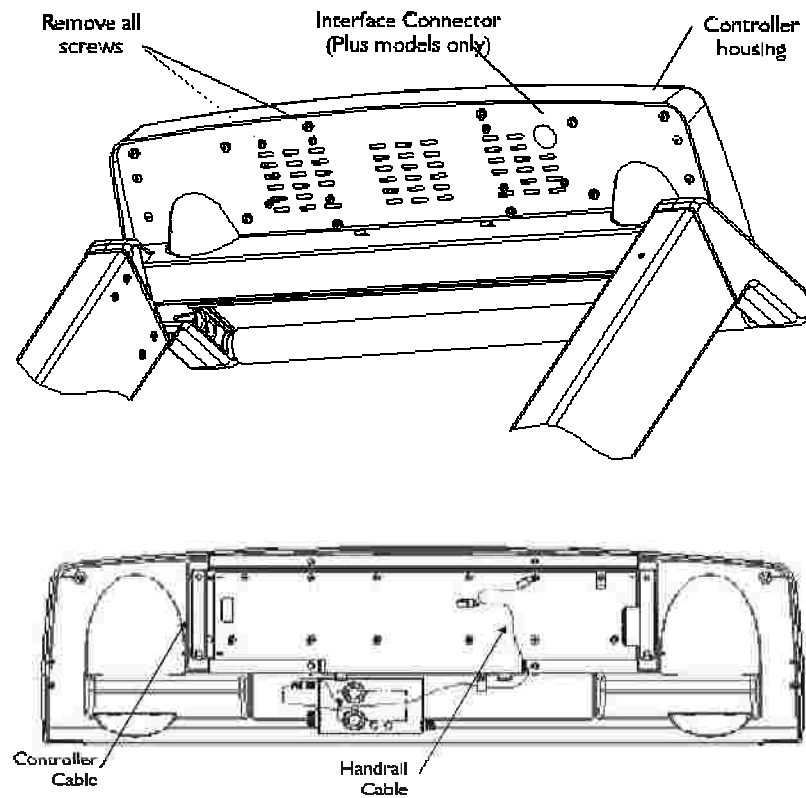
1. Turn the treadmill power off and disconnect the power cord from the power source.
2. Remove optional siderails if present.

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.

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

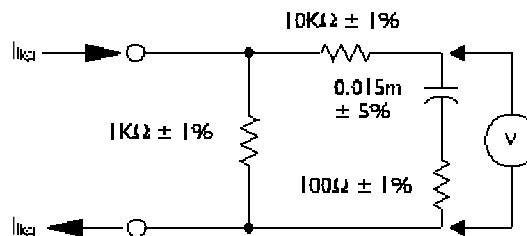
Store the belt in a warm, dry place away from direct sunlight. Do not store in plastic or other material that can trap moisture. Do not store in soap and water bath.

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 300 μ A. 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

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: $\pm$ 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 $\pm$ 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 $\pm 0.5\%$ actual grade during unchanging operation

MULTI-FUNCTION DISPLAY (4-digit display—displays exercise parameters, weight, and error messages)

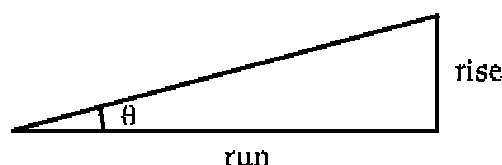
Elapsed time or countdown timer	Units: min:sec Range: 00:00 to 99:59 Increment: 00:01
Elapsed distance	Units: miles or kilometers Range: 0 99.9 miles or kilometers Increment: 0.001 from 0 to 9.999 mi or km, 0.01 from 10.00 to 99.99 mi or km
Pace	Units: minutes:seconds per mile or minutes:seconds per 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 $\pm 0.5\%$ 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; 0.1 from 10.00 to 99.99; 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



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

$$\text{Grade} = \tan \theta$$

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

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



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 - 99-132V, 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	01 227-006
Configuration Plate	
510 120V domestic	036126-001
510 230V domestic	036126-002
510 230V internacional	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	36127-001
German	36127-002
French	36127-004
Italian	36127-005
Spanish	36127-003
Japanese	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.



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 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.
- 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.

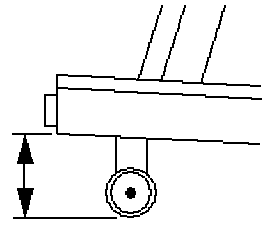
3. Check the rate displayed on the watch against the rate displayed on the controller. If the controller differs by five beats, replace the controller PCBA (ClubTrack 510/612, p/n 35707, and ClubTrack 510/612 Plus, p/n 35362).

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. 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 $\pm 3/8$ 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 Tensioner 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. I

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 CR-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.

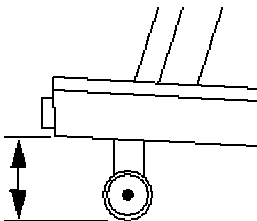
Field Test No. 4

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 $\pm 3/8$ 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 CR-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

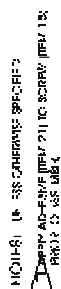
Turn the circuit breaker off, disconnect the power cord from the outlet, and place the treadmill back in service.



Assembly Drawings

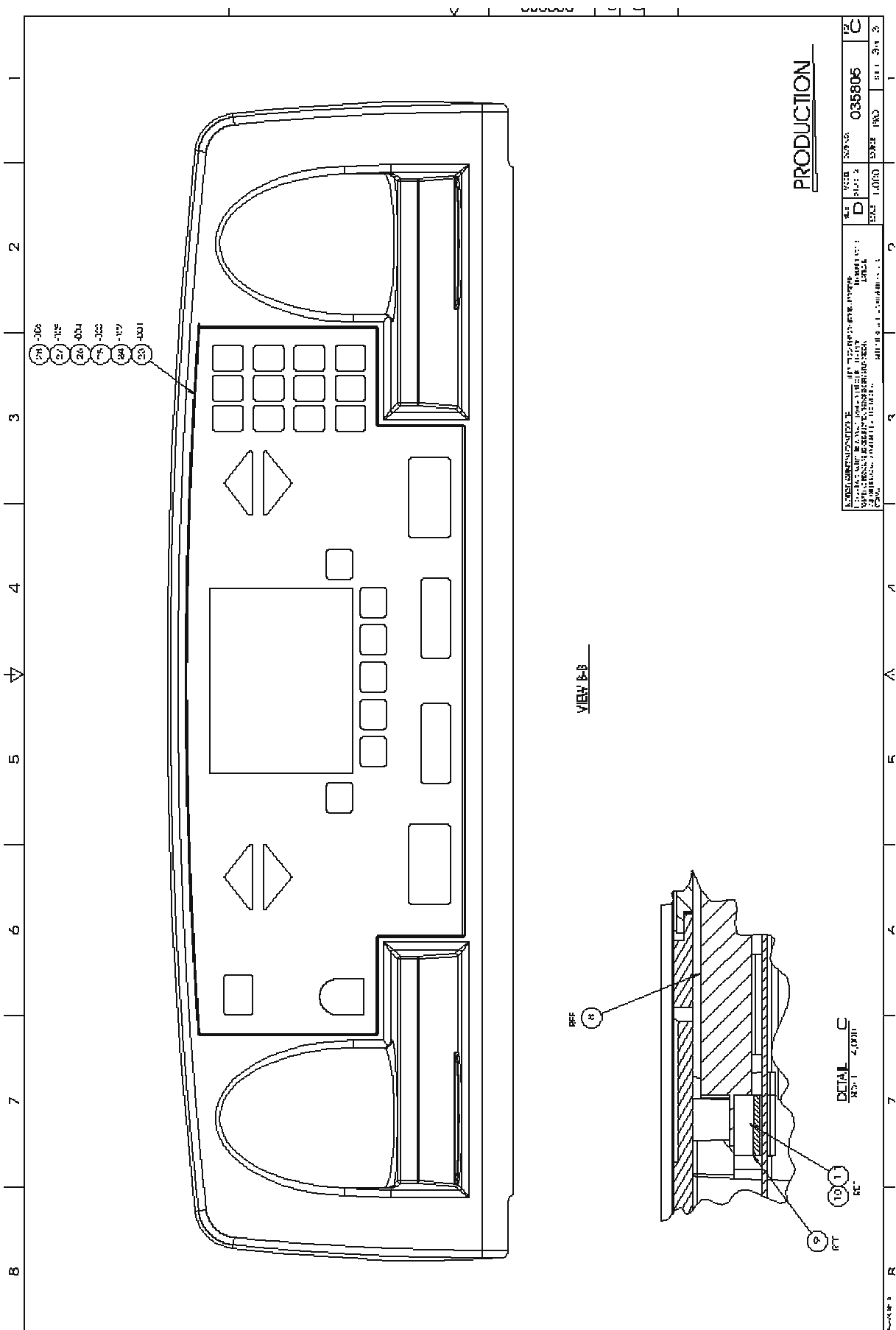
P/N	Assembly
35960	Configuration Plate Assembly
35805	Controller Assembly, ClubTrack 510/612 Plus
35806	Controller Assembly, ClubTrack 510/612
32783	Motor, Drive, AC Variable
35602	Final Mechanical Assembly/System Wiring

[illegible]



PRODUCTION

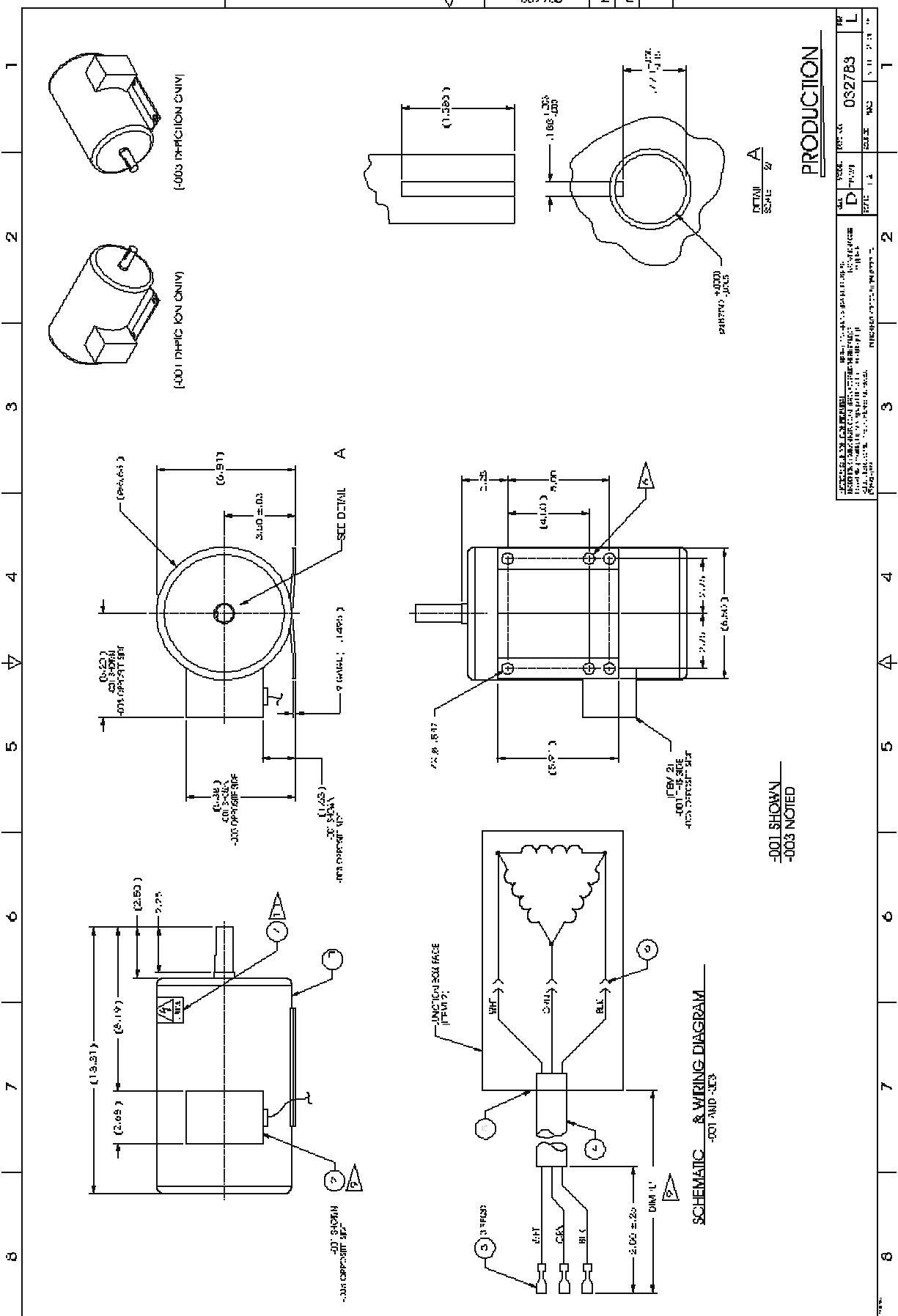
Part 1: 2014-2015		
2014-2015	2014-2015	2014-2015
2014-2015	2014-2015	2014-2015



REV	DATE	BY	CHK	APP	QTY	UNIT	PRICE	TOTAL	REMARKS
1	03/10/05	03/10/05	03/10/05	03/10/05	03/10/05	03/10/05	03/10/05	03/10/05	03/10/05

Fig. 10.30

[illegible]



[illegible]

NOTES: UNLESS OTHERWISE SPECIFIED,

ESPINOZA CNY
STATIONER - HENRIKOWSKI 23: 37164359

$\text{H}_2\text{O} = \text{H}_2 + \frac{1}{2}\text{O}_2$

3. **APPROPRIATE JUDICIAL REVIEW** 21 in OPEN ACCESS ITEM 113.

19 DE 99 AMU 001301 011676102
HUM-71 001 AMU 001307 001401 001402

2025 RELEASE UNDER E.O. 14176

MOVES ARE MADE TO THE FRANKLIN
TERRACE, CHURCH - 21101-076
MILWAUKEE - 400' 101-132

THESE ARE THE NAMES OF THE
LIVING AND THE DEAD WHO
WILL BE IN THE KINGDOM OF
GLORY

7777

[illegible]

THE UNIVERSITY OF CHICAGO PRESS

PRICE INCLUDING ACTING FEE \$ 07.50.

THE REBORN DESIGN CONCEPT FOR EXHIBITION

IN RE: PRUDENTIAL FUND LIFE INSURANCE GROUP, INC. & AFFILIATES
 IN RE: THE ESTATE OF JAMES M. HARRIS, JR.
 IN RE: THE ESTATE OF JAMES M. HARRIS, JR.

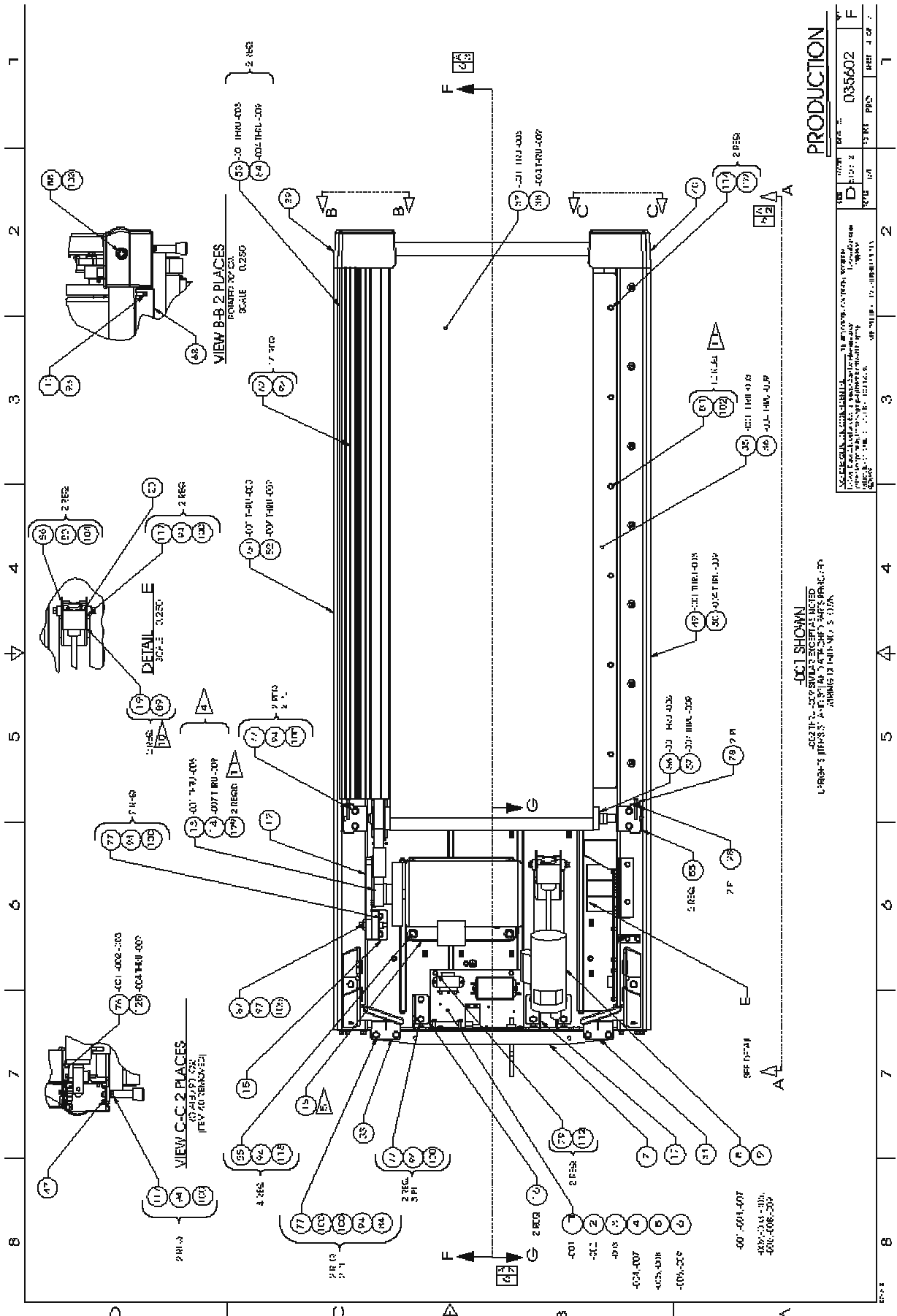
3:47 PM 3/18/2014

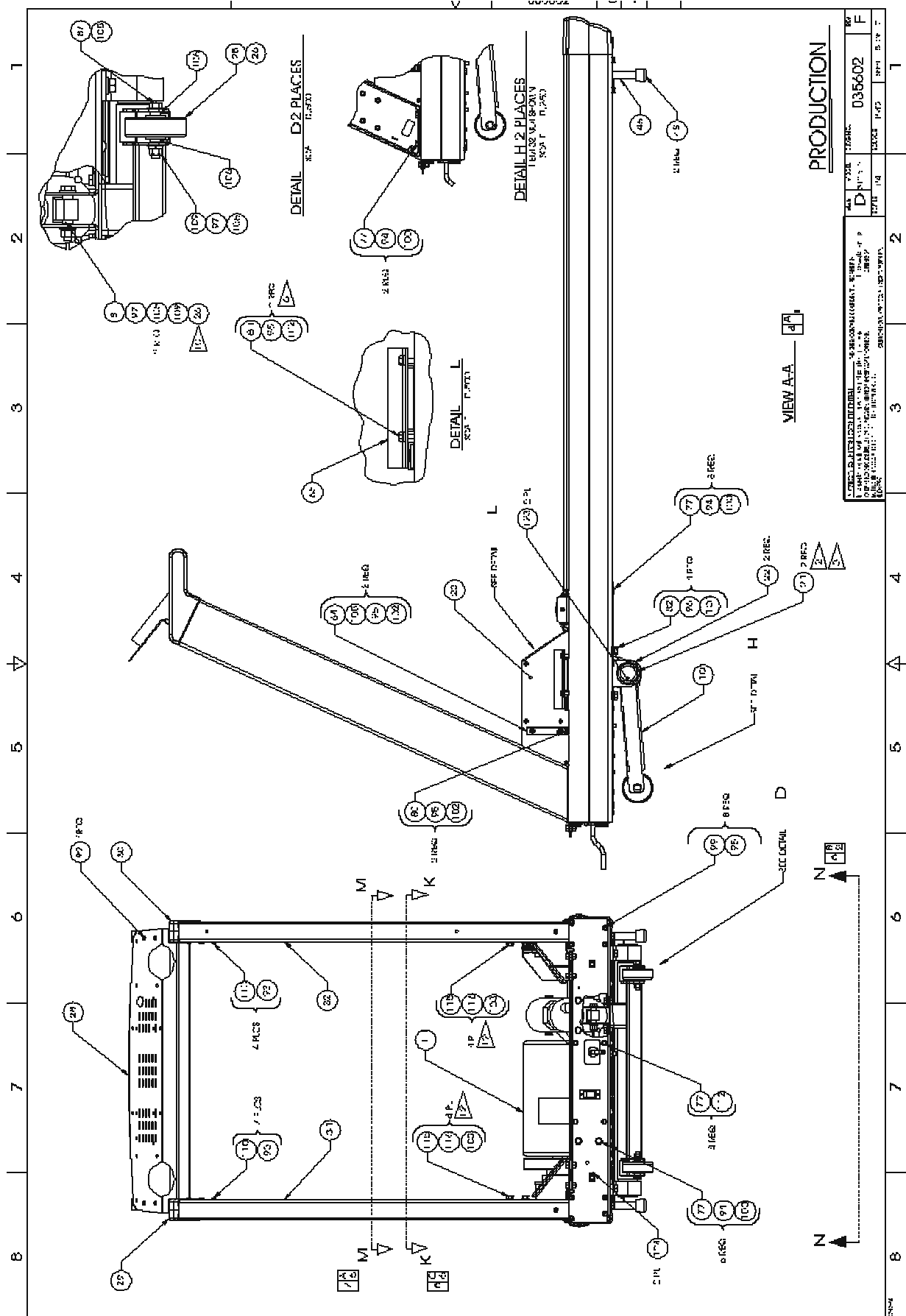
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PRODUCTION

[illegible][illegible]

476 478 479 480	200446 200495 200789	200445 200788 200785	200445 200788 200785	200445 200788 200785
486 488 489 490	200447 200786 200783	200446 200785 200782	200446 200785 200782	200446 200785 200782
496 498 499 500	200448 200784 200781	200447 200783 200780	200447 200783 200780	200447 200783 200780
506 508 509 510	200449 200782 200779	200448 200782 200779	200448 200782 200779	200448 200782 200779
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596 598 599 600	200458 200764 200761	200457 200764 200761	200457 200764 200761	200457 200764 200761
606 608 609 610	200459 200762 200759	200458 200762 200759	200458 200762 200759	200458 200762 200759
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696 698 699 700	200468 200744 200741	200467 200744 200741	200467 200744 200741	200467 200744 200741
706 708 709 710	200469 200742 200739	200468 200742 200739	200468 200742 200739	200468 200742 200739
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986 988 989 990	200497 200686 200683	200496 200686 200683	200496 200686 200683	200496 200686 200683
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1316 1318 1319 1320	200530 200620 200617	200529 200620 200617	200529 200620 200617	200529 200620 200617
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1346 1348 1349 1350	200533 200614 200611	200532 200614 200611	200532 200614 200611	200532 200614 200611
1356 1358 1359 1360	200534 200612 200609	200533 200612 200609	200533 200612 200609	200533 200612 200609
1366 1368 1369 1370	200535 200610 200607	200534 200610 200607	200534 200610 200607	200534 200610 200607
1376 1378 1379 1380	200536 200608 200605	200535 200608 200605		







Quick Reference

Keystroke Commands

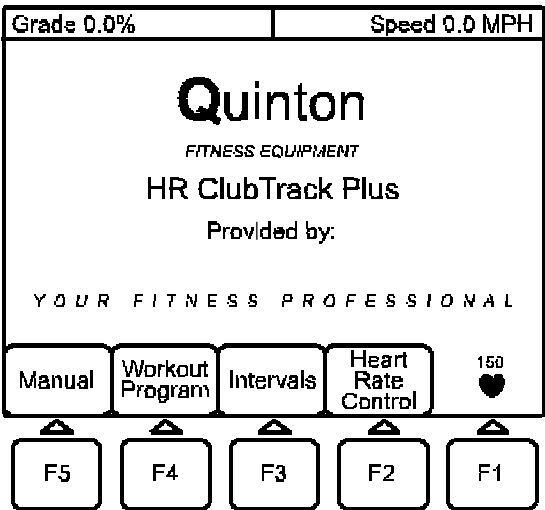
ClubTrack 510/612

Function	Key Combination
Change default units	 and 
Total time run	 and 
Total distance run	 and 
Custom Editor Mode	
Entering custom editor	 and  and 
Setting time limit alarm	 or  (0:96 is unlimited)
Setting time limit to 30 minutes	
Setting maximum speed	 or 
Exiting custom editor	 (to save settings)
Service Mode	
Entering/exiting service mode	 and  and 
7-segment display cycle test	 and  and 
NV program load test	 and 
VSD revision number	 and 

Man./prog. revision number	 and 
Configuration select	 and  or 
Configuration no change	
Configuration store	 or 
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

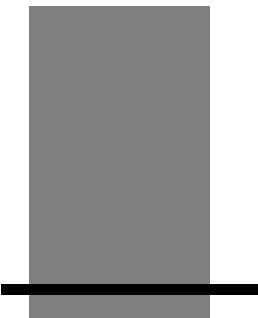
Error Codes

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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