Service Manual

Experience Series Treadmills

TRM 885.v2, TRM 835.v2 and TRM 811.v2

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Precor Customer Support

Contents

About This Document

Warning: This service manual is for use by Precor trained service providers only. If you are not a Precor Trained Servicer, you should not attempt to service any Precor products. Call your dealer for service.

This document contains information required to perform the majority of troubleshooting and replacement procedures required to repair and maintain this product.

This document contains general product information, software diagnostic procedures (when available), preventative maintenance procedures, inspection and adjustment procedures, troubleshooting procedures, replacement procedures and electrical block and wiring diagrams.

Part No: 20039-180 rev A05

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General Information

TRM 800v.2 Series Treadmill

This manual covers service information for the TRM 800 Series Treadmill.

Lubricants

- Do not apply any lubricants to the deck and belt. Do not use Wax Blast, silicon sprays, or other applied lubricants. The use of these lubricants will quickly degrade the low-friction surface of the deck.
- Do not use petroleum based lubricants on mechanical components such as the lift, as this may result in degradation of nylon gearing mechanisms. Use only synthetic lubricants such as "Super Lube with Teflon" or "Mobile One Synthetic" grease (RED).

NOTE Use of unapproved lubricants, cleaners, or solvents may void the treadmill warranty
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Electrical Requirements

When your equipment is delivered you will receive an equipment power cable that meets your local electrical code requirements. Precor treadmills must be connected to a 20 amp, individual branch circuit that can be shared only with one PVS (Personal Viewing System) screen. If you need additional help with the power connections contact your Precor authorized dealer.

IMPORTANT An individual branch circuit provides a hot conductor and neutral conductor to a receptacle. The conductors must not be looped, "daisy-chained", or connected to any other conductors or receptacles. The circuit must be grounded according to NEC guidelines or local region electric codes..

Note: NEC (National Electric Code) guidelines or local region electric codes must be followed.

US and Canada power requirements

The treadmill base is outfitted with a removable line cord plugged into a power entry socket. This is designed to accommodate either 120V or 240V NEMA compatible line cords, as well as line cords for other countries. The diagram below shows a NEMA 20A plug for both 120V and 240V configurations in the United States.

Power	Equipment voltage	Outlet/Plug type
US & Canada	120VAC, 50/60 Hz	NEMA 5-20R/5-20P
US & Canada	240VAC, 50/60 Hz	NEMA 6-20R/6-20P

NEMA 5-20R
120VAC 20A
Duplex Outlet

NEMA 5-20P
120VAC 20A
Plug

NEMA 6-20R
250VAC 20A
Outlet

NEMA 6-20P
250VAC 20A
Plug

PVS (Personal Viewing Systems) Equipped Units

For equipment fitted with a PVS screen, a separate power connection is required. Using a 20 amp branch circuit, up to 10 screens can be connected. No other devices except PVS may be connected to this circuit.

P80/P82 Console Equipped Units

For self-powered equipment fitted with a P80 console, a separate power connection is required. Using a 20 amp branch circuit, up to ten P80 consoles can be connected. No other devices except P80 consoles may be connected to this circuit.

RF (CATV) Requirements

Where P80 or PVS screens are used there is a minimum RF power requirement to properly supply CATV to the screens. We require +5dB to +10dB RF power with a minimum of +40dB C/N Channel to Noise ratio) at each screen for analog video and -5dB to 0dB for digital video signal. If a wall RF outlet is to be used to power several screens in a row of equipment there is a minimum RF power requirement at the outlet of +35dB (at +40dB C/N) for analog video (+25dB for Digital video). RF signal strength of +35dB can power 17 to 19 screens in a single row when properly tapped out.

Internet Ethernet Requirements

It is recommend a dedicated CAT6 Ethernet feed to each equipment location.

Communication Requirements:

- 512Kb/s up
- 5-10Mb/s down
- Switch Ports: 80, 123, 443

The P80 console uses a security token for communication to Precor servers. The security token is a hash string that is sent with every API call from the FE's to the Amazon Cloud.

It originates after the equipment is registered at the location. The P80 issues a 'Call' which returns the registration token and the fitness equipment URL. Every event after that uses the URL and the token to validate/authenticate communication with the Amazon servers and Preva Business Systems (PBS).

All communication with our servers is currently done via outgoing (originating from the console) HTTPS sessions. The P80 utilizes NTP to set its clock and for synchronization. At no time is Precor connecting to your network to "push" any data. The P80 initiates all data requests.

Power Input

Nominal 120V systems

Operating voltage range: 85 – 145 VAC

Frequency: 47 – 65 Hz

Nominal 230V systems

Rated operating voltage range: 180 – 264 VAC

Precor internal required operating voltage range: 180 – 275 VAC with reduced performance allowed.

Frequency: 47 – 65 Hz

120 Vac Systems

120 VAC distribution systems utilize a single pole circuit breaker (hot lead) and a neutral lead connected to a common neutral (ground) bar. The A.C. safety ground (green wire) is connected to a separate ground bar in the distribution system.

If it is determined that any of the above electrical conditions are in question, please consult with a qualified electrician to make appropriate circuit changes.

Safety Guidelines

Safety guidelines you should know and follow include:

- Read the owner's manual and follow all operating instructions.
- Operate the equipment on a solid, level surface.
- Visually check the equipment before beginning service or maintenance operations. If it is not completely assembled or is damaged in anyway, do not attempt to operate the equipment.
- When operating the treadmill:
  - Do not wear loose clothing.
  - Do not wear shoes with heels or leather soles.
  - Check the soles of your shoes and remove any embedded stones.
  - Tie long hair back.
- Do not rock the unit.
- Do not stand or climb on the handlebars, display enclosure or cover.
- Do not set anything on the handlebars, display enclosure, or cover. Never place liquids on any part of the treadmill while performing service.
- To prevent electrical shock, keep all electrical components away from water and other liquids.
- Do not use accessory attachments that are not recommended by the manufacturer-such attachments might cause injuries.
- Removing the hood exposes high voltage components and potentially dangerous machinery. Exercise extreme caution when you perform maintenance procedures with the hood removed.

Operation Verification

This section provides a method of checking the treadmill basic operation. Check the treadmill operation at the end of a maintenance procedure or any time it is necessary to ensure that the treadmill is operating properly. For a complete guide to all operating parameters, refer to the Operators Manual.

Procedure

Plug the power cord into the wall outlet and then switch the circuit breaker to the "**ON**" position.

Press and hold the reset key or the stop button for at least 6 seconds, if errors are present the error log will be displayed. Make note of all the errors in the error log and odometer reading for which the error occurred. The odometer in the error log can help you determine age and relevance of the error.

- Enter the **Hardware Validation** test by entering **Diagnostic** mode as follows:
  - Press either the **STOP**, **PAUSE** or **RESET** buttons and then enter **5,1,7,6,5,7,6,1**
- Select and run the **Display Test**, the **Keypad Test**, and the **Heart Rate Test.** Verify the following results.
  - LEDs light
  - Keys all function
  - Heart rate is acquired and displayed
- Enter the **Machine Tests** (submenu) and run the **Belt Speed test** and the **Incline test**, verify following results:
  - Running belt moves and is controlled from 0.5mph to 12.0mph in 0.1 increments.
  - Lift goes up and down and the A/D value is approximately 6800+/-500 at 0% incline)
- Press the reset key to exit diagnostics.
- Operate the treadmill in the **Manual** program. Adjust the speed of the running belt to 2–3mph. Operate the treadmill for at least 5 minutes while walking on the unit.
- Concentrate on the feel of the running belt, the sound of the drive motor and rollers. Be on the alert for unusual noises, smells or vibrations.
- Observe the LED's on the electronic console. Make sure that each LED lights as the information corresponding to that LED is displayed on the electronic console.
- Press the **INCLINE** ▯ key while viewing the electronic console. Confirm that the running deck inclines and the incline display increments to 15% as the INCLINE ▯ key is continually pressed.
- Press the **INCLINE** ▯ key while viewing the electronic console. Confirm that the running deck returns to a level position and the incline display decrements to 0% as the **INCLINE** ▯ key is pressed. (Depending on the software configuration of the console, the lowest level of incline might be -3%)
- While the unit is running and the running belt is in motion, press the **STOP** button and verify the running belt stops.
- While the unit is running and the running belt is in motion, pull the **ESTOP** cord and verify the running belt stops.

- Press and hold the reset key for at least 6 seconds and look at the error log again. This time look for any **NEW** errors displayed resulting from the verification test indicating that the unit

Operation Verification Checklist

☑ Check, record, and then clear any errors in the error log.

☑ Verify that all LEDs function properly during the **Hardware Validation Tests**.

☑ Verify that all keys on the keypad function properly during the **Hardware Validation** Tests.

☑ Verify that the heart rate functions normally and displays a valid heart rate.

☑ Verify the running belt drive system functions properly throughout the minimum to maximum range of control. All drive system components (deck, belts, rollers, IFT) are free of excessive noise, vibrations, or smells

☑ Verify the Incline A/D value is approximately 6000+/-500 at 0% incline; the incline operates within the complete range of the lift when the ↑ or ↓ keys are pressed and is free of excessive noise or vibrations.

☑ The **STOP** button stops the running belt from moving.

☑ Pulling the **ESTOP** cord stops the running belt from moving.

☑ Check for new errors that may have been recorded in the error log during operation verification of the treadmill.

Service Access Codes

Included topics:

- Service Access Codes
- Club Parameter - Settings (5651565)
- Information Display (65)

Service Access Codes

The service access codes are utilized on the following consoles:

- P10
- P30
- P80

The service codes access three functional modes, Hardware Validation, Club Parameters, and an Information Display.

- **Hardware Validation** is a set of functional diagnostic tests that are useful in troubleshooting problems as well as verifying proper operation.
- **Club Parameters** are sometimes referred to as Club Settings or Workout Parameters and are used to manage usage of the machine.
- **Information Display** is used to access information such as the odometer, software versions and error logs.

Accessing the Service Software

Accessing the service code functional modes is accomplished in the same way on the P10 and P30 consoles. The differences in the P80 will be discussed below.

To enter Service Software, press either the **STOP** or the **PAUSE** or **RESET** key followed by a numeric code for the area of service software you wish to access.

The standard access codes use sequential key presses, not simultaneously holding down multiple keys. The allowable delay between key presses is short. If too much time is taken between key presses or the wrong key is pressed, the access procedure will be aborted. If the access is aborted, it will be necessary to start over from the beginning.

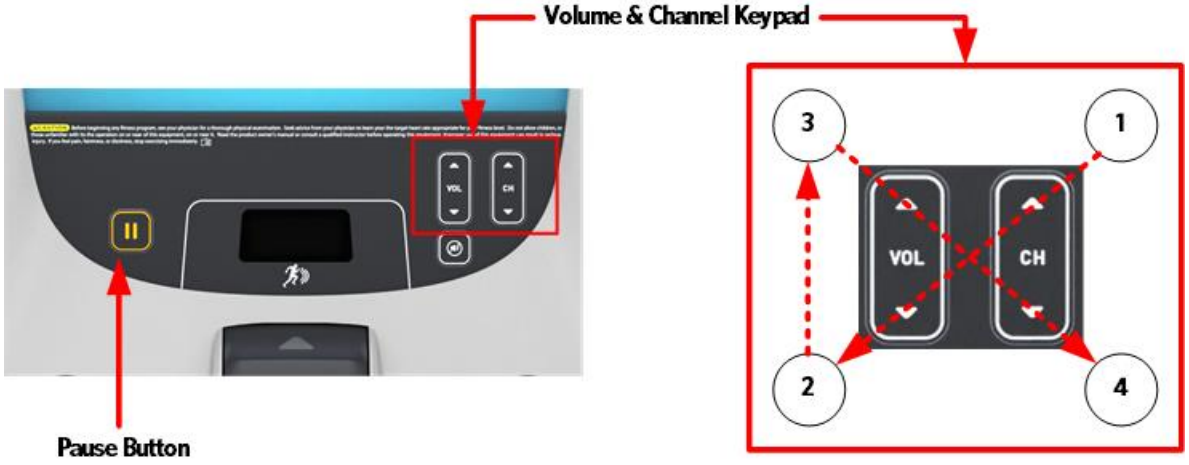
P80 Console

- Use the System Settings to test your equipment and set parameters that benefit your users and your facility.

The Welcome screen will be the first screen you see when you approach the P80 console. Press the Pause key and continue holding it down while you single press in sequential order an X configuration on the Volume and Channel key pad (①Channel Up, ②Volume Down,③ Volume Up,④ Channel Down). Release the Pause key when done pressing the arrows.

NOTE The keypad X configuration sequence should be not faster than 1 second between each key stroke. Any speed faster than 1 second may result in an unsuccessful access to the sign-in screen.

Figure 2: P80 Sign In Access



The sign-in screen will be displayed. Type in the technician access **,5,1,7,6,5,7,6,1,** and then touch OK. The Settings menu will be displayed.

Service Access Codes

Access Code	Heading Name	Function
5,1,7,6,5,7,6,1	Hardware Validation	Running Diagnostic Tests
5,6,5,1,5,6,5	Club Parameters	Changing Machine and /or Workout Parameters
6,5 (P10 & P30 Only)	Information Display	Acquiring Information

Hardware Validation Settings (51765761)

The Hardware Validation settings access code is **51765761**.

Figure 3: Hardware Validation

Enter Hardware Validation settings mode.		**Press STOP/PAUSE/RESET key, 5, 1, 7, 6, 5, 7, 6, 1**
DISPLAY TEST		Steps through a check of all LEDs on console
KEYBOARD TEST		Checks all key actions on console
PVS 10 KEY TEST		Checks all 10 keys
HEART RATE		Simulates heart rate activity

ACTIVE STATUS LIGHT		Shows current status of light- Hold QuickStart to reset
AS LIGHT BRIGHTNESS		Varies ASL LED brightness from Low, Med, High
MC LIGHT STATE		Shows current state of MC LED-Hold QuickStart to reset
MACHINE TEST		Allows manual operation of machine functions – all tests work independently of workout limits.
	BELT SPEED	Tests belt speed in 0.1 increments Displays Input Voltage, Current to the treadmill, and output voltage, current to the drive motor.
	AUTO STOP	Checks Auto Stop function by averaging footplants Displays if the user is detected or not detected. Footplant averaging delay renews with each speed change.
	INCLINE	Tests incline/decline Displays A/D number, Glitches, communication time between LPCA and UPCA.
	STOP KEY (P10/P30)	Checks Stop Key function Requires Stop Button press, then Lanyard E-Stop pull and button reset. Will exit the tests to the Welcome screen.

Club Parameter Settings (5651565)

The Club Parameter settings access code is **5651565**.

Figure 4: Hardware Validation

Enter Club Parameter settings mode (P10& P30)	**Press STOP/PAUSE/RESET key, 5, 6 , 5 , 1 , 5 , 6 , 5**
SAFETY CODE	Either enabled or disabled. When enabled, the setting requires a password (1234) to be entered in order to start the unit. Factory default is disabled.
SELECT LANGUAGE	Sets the default language for all workouts on this machine. Language for single use workouts can still be set by the user from the workout options.
SELECT UNITS	Sets units of measure (US standard or Metric). Factory default is US standard.
SET MAX WORKOUT TIME	Sets the maximum allowable workout time for each user. Factory default is 60 minutes.
SET MAX PAUSE TIME	Sets the maximum time that the workout can be paused during a workout. Factory default is 120 seconds.

SET COOL DOWN TIME	Sets the amount of time that a cool down period will occur at the end of every workout. Factory default is 5 minutes. Settable in 1 minute increments.
SET METRICS DEFAULT	Sets a metric that may be of specific importance to the specific facility or fitness trainer. The selected metric will scroll across the screen at regular intervals during the workout. Factory default is "NONE".
SET SPEED LIMIT	Sets the maximum speed the user can set the unit to. Factory default is 12 MPH.
SET INCLINE LIMIT	Sets the maximum value the user can set the unit to. Factory default is 15%.
HIDDEN PROGRAMS	Either enabled or disabled, the setting allows the unit to access specialized fitness tests designed for police, fire fighters and the military. Factory default is disabled.
REMOTE SPEED CONTROL	Not currently used or supported in software.
AUTOSTOP CONFIGURE	Sets the Auto Stop setting to On or Off. Factory default is “ON”
SET CUSTOM PROGRAM 1	Intended for a custom program to be programmed if the tread is used in a residential setting.
SET CUSTOM PROGRAM 2	Intended for a custom program to be programmed if the tread is used in a residential setting.

Information Display (65)

Information Display Access: press STOP/PAUSE/REST > 6,5

ITEM	DESCRIPTION
ODOMETER	Displays the total number of accumulated miles on the unit. This value is stored in the upper PCA in the console so if the PCA is replaced the accumulated miles would start again from "0".
HOUR METER	Displays the total number of hours that the unit took to accumulate unit miles. This value is stored in the upper PCA in the console so if that PCA is replaced the hours of use would start again from "0".
BELT RATING	Displays a belt rating from 10 (best) to 0 (worst). Resettable to 10 by holding QuickStart.
U-BOOT SW	Displays the current version of boot-up software for the upper PCA (console).
U-BASE SW	Displays the current version of software loaded in the upper PCA (console). This is the unit specific console software.
LOWER SW	Displays the current version of software loaded in the Machine Controller.

METRICS BOARD SW	Displays the current version of software loaded in the metrics board.
SER. NUMBER	The base serial number can be set here using the WinCSAFE computer software. The factory default is NONE.
USAGE LOG	Displays the type of workout programs the users are accessing most frequently.
ERROR LOG	Displays a running log of the last 30 errors encountered on the unit.
TREADMILL MAINTENANCE	Used to monitor and reset the 1000 mile belt cleaning maintenance reminder. Mileage counter starts at 1000 miles and decreases to 0 miles which triggers a blue pulsing ASL light indicating it's time for belt cleaning maintenance. The maintenance counter and ASL light is reset as follows: P10/P30 console 1. Select **Treadmill Maintenance.** 2. Press and hold **QUICKSTART** until 1000 Miles is displayed. The ASL light is also reset. 3. Exit the menu by pressing **BACK** or **PAUSE/RESET**. P80/P82 consoles: 1. Access the service diagnostics (5,1,7,6,5,7,6,1). 2. Select **Maintenance** page. 3. Select **Next Maintenance Due** page > **Reset.** On P82/P80 consoles, the belt cleaning reminder ASL function can be switched ON or OFF, select **Maintenance Reminder** > ON/OFF.

Theory of Operation

Included topics:

- Consoles
- Console To Base Communication
- Treadmill Base Operation

Consoles

Basic operation of a console

The purpose of this section is to describe the operation and maintenance of the treadmill base, however it would be difficult to explain the base operation without referring to the console controls. This section will explain basic functions that apply to all models of consoles. For specific details about a particular model of console (P10, P30, P80), refer to the applicable console manual.

The Controls

All consoles provide user input (keypad functions), user display (LED display / user feedback), automated control (heart rate program, interval program) and service software routines (tests, settings, and information).

The keypad functions can vary between different console models, however the basic functions that all consoles have are QuickStart, Incline (up or down) and Speed (up or down).

The Display

The display features can vary between different console models, however the information conveyed by those displays are very similar.

Service software routines are handled exactly the same for all console models. Entering into Hardware Validation tests, Club Parameter settings, or Information Display is also the same and is called Standardized Service Access Codes.

The service software and standard access codes are described in detail in ***Standardized Service Access Codes*** of this manual.

Optional TRM800.v2 Base Consoles

Figure 6: Commercial Treadmill Consoles

P10 ***P30*** ***P80***

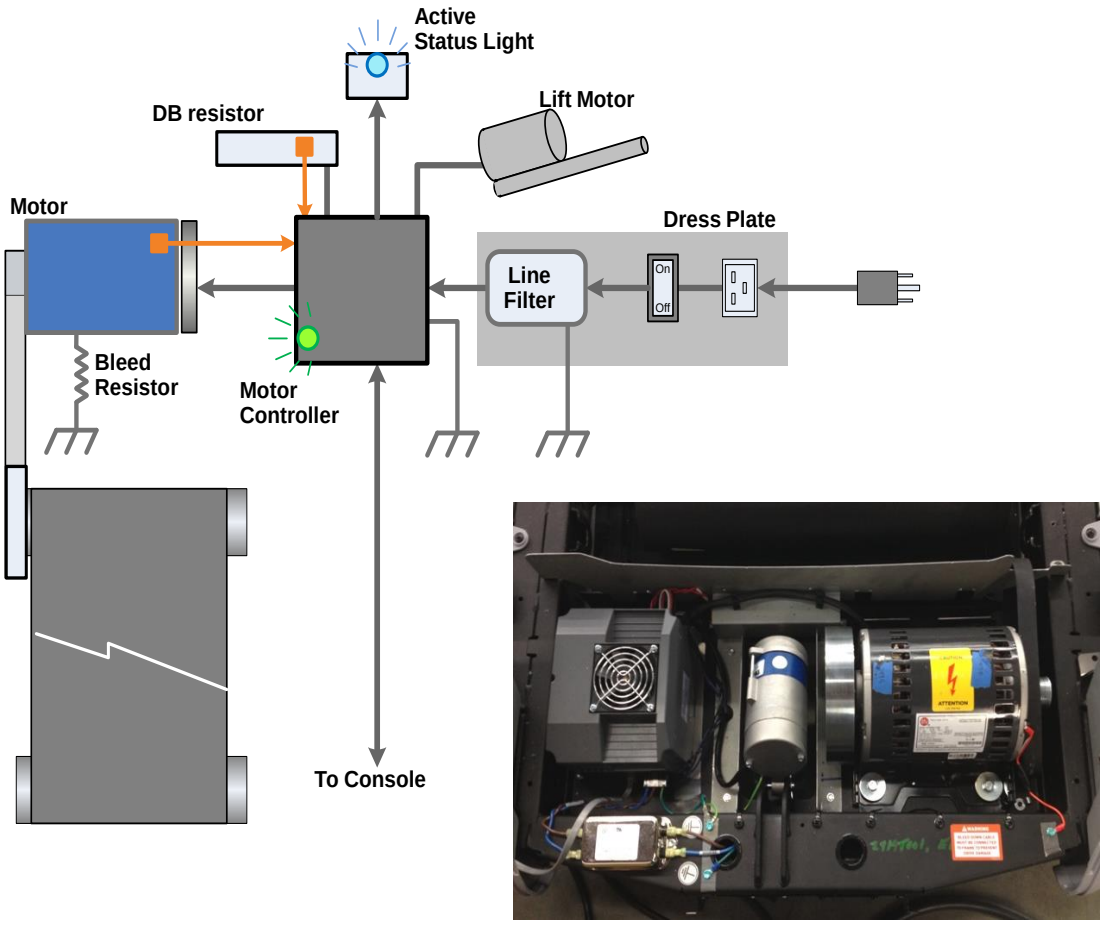
Console to Base Communication

The processor in the console provides user input, user display and automated control to the system. The processor in the lower electronics module performs the actual machine function.

The two processors communicate via a serial data stream. When the user requests a machine function to take place via the keypad, the console processor communicates the request to the processor in the lower electronics module.

Once the lower processor receives the request the lower control module performs the machine task associated with the request. The console processor continues to monitor keypad entry and provide display feedback. The lower processor also provides status back to the console processor (via the serial data stream) to report if everything occurred properly, or if an error code needs to be written to the error log.

Figure 7: Electrical System



Bleed Resistor

A 1MΩ 1500V bleed resistor between the secondary ground and earth ground is required for voltage stabilization.

Dynamic Brake (DB) Resistor

The dynamic brake resistor is turned on to dissipate power generated from the main motor. This can occur when the user runs at a high incline. The brake resistor must add the needed load to the system to prevent the treadmill from accelerating from the target speed. The dynamic brake resistor will go active when slowing to a stop if the system inertia causes the motor to generate power.

Dynamic Brake resistor overload detection (Thermal sensing)

The lower software has built in thermal sensing. This thermal sensing indicates when the brake resistor is too hot to use.

A power time algorithm will be used to estimate the temperature of the brake resistor. The intent is to shut down the treadmill based on this algorithm before the thermal switch opens.

When the maximum brake resistor operation time (temperature) has been reached:

Error 17 is sent to the display.

Dynamic Brake resistor detection circuit.

The DB resistor is tested on power up only. If it is not working an error 85 is thrown but the treadmill will operate normal except if the DB resistor is needed. When the DB resistor has failed, the buss voltage will increase until Over Voltage condition causing an error 15 event and the treadmill will stop.

A broken thermal switch to Motor Controller wire connection will cause the same symptoms.

Dynamic Brake thermal switch

As long as the thermal switch is open the console will show the “use another treadmill” message. The treadmill cannot be used when the DB resistor is overheated causing the thermal switch to open. When the DB resistor cools enough to allow the thermal switch to close the treadmill will return to normal operation. A broken wire will exhibit the same symptoms as an open thermal switch.

The DB resistor is only self-tested on power up. If it is not working correctly an error 85 is triggered but the treadmill will continue to operate normally except if the DB resistor is required. In this case the buss voltage can increase to an over voltage condition causing and an error 15 to trigger and the treadmill to stop.

The thermal switch contacts are easily spread and damaged by inserting meters probes while testing. This can cause intermittent connector electrical contact. If this occurs the DB resistor assembly will need to be replaced.

Diagnostics and Indicators

Motor Controller Light (MCL) Service Status Indicator

The MCL is a tri-colored LED showing service status, used to indicate an error condition within the MC. Currently only two colors are used – Green indicates no problems with the MC, Yellow indicates that an error has occurred, and diagnosis should be performed.

The console is in charge of setting the LED state; the MC will not change the LED state unless it is requested by the display.

The MC will remember the status even after a power cycle. It can only be reset via the console through the diagnostics menus.

The LED status is used to check the drive’s status when it is returned to the factory.

Status and error tracking data is stored in non-volatile memory. This provides information on recent operation and error in the drive. This is like ‘black box’ type of recorder for the drive.

Active Status Light (ASL) LED

The ASL is visible on the front of the treadmill and will indicate the status of the treadmill. There are currently four states for the ASL – Blue solid, Blue Flashing, Yellow Solid, and Yellow Flashing. These are described in detail in the Troubleshooting section.

The ASL is microprocessor controlled, and located on a PCB mounted to the front of the treadmill. The ASL will show blue at bootup. Communication between this board and the MC is via a four pin cable with RJ11 type connectors.

The console will determine, through the MC, what color will be displayed.

Drive System Monitoring

Parameters in the drive system must be monitored to ensure proper operation and to respond to overload conditions. This includes the input current, input voltage, motor current and temperature.

Input Current Overload Detection

The drive system will monitor the line input current. The drive should detect the overload before the circuit breaker.

Input current

Input current is reported in true RMS

Input current is averaged over 2500mSec rolling period.

Input current overload error 36

The error code is reported to the display when this overload is detected. The error is reported per the communications protocol.

Instantaneous Input Current Overload Detection

The drive system will monitor the input current for fast input current incursions. The drive will detect the overload before the circuit breaker. A hardware delay will define the error response time.

Input overload error 35

The error code is reported to the display when this overload is detected. The error is reported per the communications protocol.

Motor Over Temperature Detection

The motor temperature is monitored with a thermal switch in the motor winding and a time current shutdown algorithm. The thermal switch is an indicator the motor is getting hot and is used to start the current time counter algorithm. Thermal switch is normally closed.

An open thermal switch will report error 28.

The thermal switch must be closed before the motor will start.

Motor Current Overload Detection

A motor current and time algorithm will determine the time to shutdown of the motor. This algorithm will be adjusted to the drive's performance to maximize the time the motor can safely be operated with high current.

Motor current overload error 27

The error code is reported to the display when this overload is detected. The error is reported per the communications protocol

Lift Drive Motor Operation

Lift Motor

The lift motor changes the grade of the treadmill. The drive switches AC line voltage to control a dual-coil, single-phase AC induction motor. The lift motor incorporates a potentiometer to show the lift's grade position.

Lift accuracy

The accuracy of the lift is a function of the lift motor's gearing, linearity of the potentiometer, tolerance of the potentiometer, and tolerance of the voltage on the potentiometer combined with the tolerance of the voltage reference of the A to D converter. Circuit design tolerances are minimized by the design using the same voltage to the potentiometer and the A to D voltage reference.

Lift Motor Operation

The lift potentiometer must be in range, -3% to 15% grade before the lift motor will move.

The lift motor will not move if out of range, except when in the INCLINE diagnostic test.

After turning on the lift motor a change in potentiometer must be detected within 2 seconds.

All lift errors disable the lift motor from operating.

A power cycle will allow the lift motor to operate again.

When the main motor is running, if the lift motor is moved from the target position the lift motor will be moved back to the target position.

The lift motor is moved back to target if it has drifted further than 0.5% grade from the target position.

If the lift motor was moving down and immediately back driven out of range the lift should move back to the target position. This is an exception to the out of range operation.

When moving the lift motor down, when the lift motor is turned off, the up direction is run for a short burst in order to stop the motor. This is to prevent the condition above from happening.

Lift motor diagnostics

Open loop diagnostics commands will allow the lift motor to move regardless of potentiometer range or error state. The display will use those commands when in the diagnostics service mode.

Lift motor overload protection

The lift motor has a protection circuit. The protection circuit opens when the lift motor stalls. A 2A fuse is used and it is capable of being replaced by treadmill servicers.

AC Lift System – Motion Control

The motor used in the lift system is a "Permanent Split Capacitance" type, single phase AC motor. What this means is that the motor incorporates the use of a capacitor to provide the torque required to lift the weight of the user as well as the weight of the unit. Power to the lift motor is provided directly from the AC coming into the unit.

In order to turn the motor in 2 directions, the AC motor has 2 separate windings, one for up and one for down. AC1 has a continuous connection to the center / common connection of the motor.

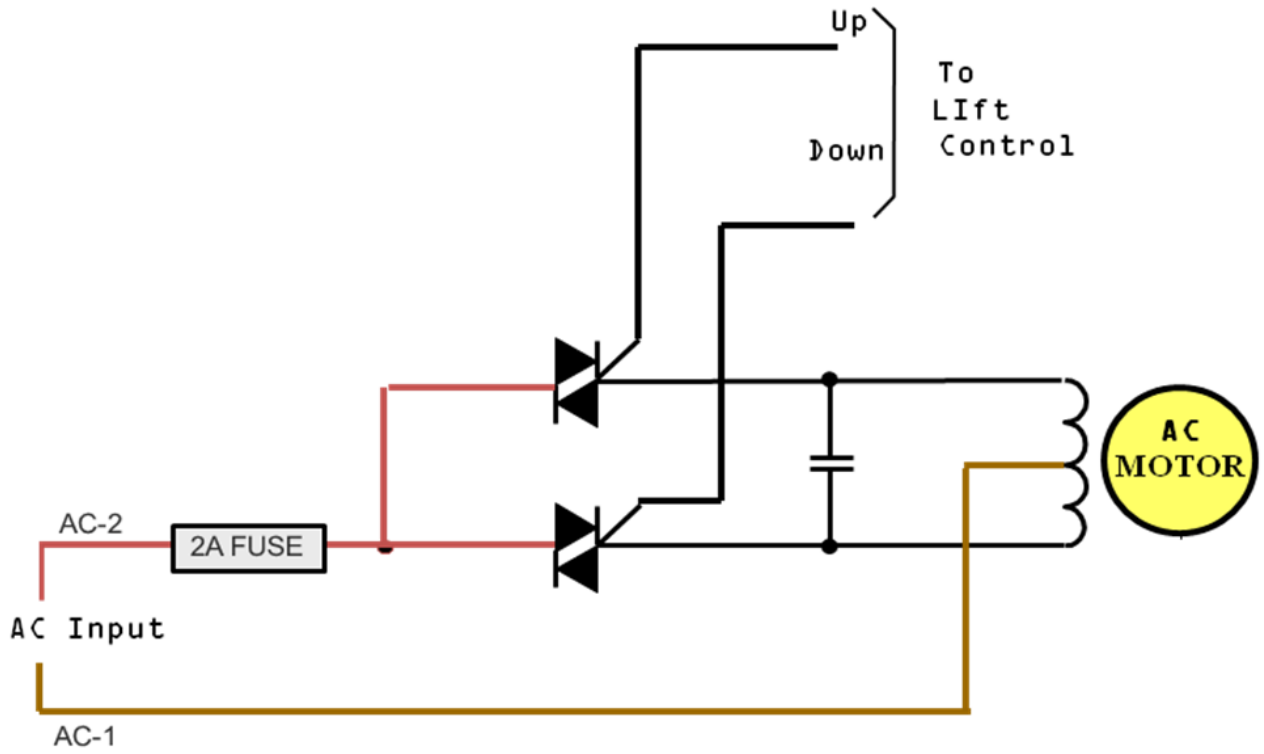
The system has a 2A fuse to protect the components from over-current failure.

When a control signal is applied to the "UP" input, AC1control line is active and turns on the up triac. This directs the AC2 connection to the up winding of the motor, causing the motor to spin in the up direction.

When a control signal is applied to the "DOWN" input, AC2 control line is active, turns on the down triac. This directs the AC2 connection to the down winding of the motor, causing the motor to spin in the down direction.

Since the lift motor runs directly on the AC line voltage coming into the unit, it is important to note that the lift motor is a different part number for a 120v unit than for a 240v unit.

Figure 8: AC Lift System - Motion Control



AC Lift System – Position Monitoring

The unit also requires an absolute measurement of lift position. This is achieved through the use of a potentiometer. The potentiometer is turned by gearing in the lift motor, which changes the wiper resistance.

With +3.3V DC applied across the potentiometer, the center wiper connection will be a variable voltage (between 0 and +3.3V DC), dependent on the position of the lift. This variable voltage is applied to the input of a 16-bit A/D converter which converts the analog voltage into a 16-bit binary numeric representation that the processor can understand.

As the voltage returned by the potentiometer changes between 0 and 3.3V DC, the corresponding A/D values change between 0 and 65507. In this way, the processor can keep track of where the lift is positioned.

It is important to note that since the potentiometer is mechanically connected to the gearing of the motor, it would be unlikely for a lift motor to go out of calibration without having some damage that needs to be repaired, see ***Troubleshooting the Incline System*** if this occurs.

Drive / Lift System Control

The Drive/ Lift System consists of an AC drive motor controller, an AC lift motor controller and a +8.5V DC power supply to power the console.

The electronic circuits in the console operate on +5V DC, however the lower control module sends +8.5V DC due to the optional external equipment such as Fitlinxx, that may be connected to the CSAFE (Communication Standard for All Fitness Equipment) port. Sending a higher voltage (+8.5V) and regulating the voltage down to +5V DC, ensures that we can supply enough power to both the console and the optional external equipment.

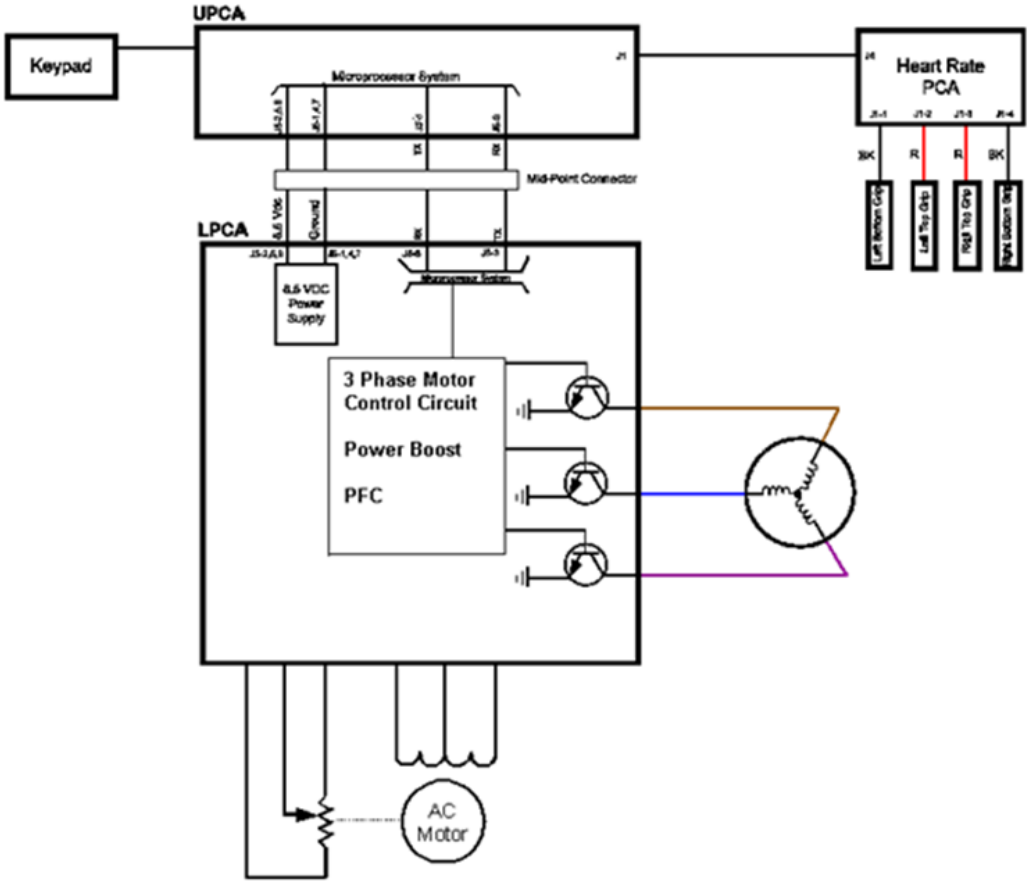
IMPORTANT It is important to note that the lower control module is a different part number for a 120V unit than for a 240V unit.

Drive Motor Operation

AC Drive Motor Controller

Treadmills use an AC drive system to control a three phase AC drive motor. In an AC motor, speed is controlled by frequency independent of voltage or current and torque is controlled by the voltage/current applied to the 3 windings. The windings (stator) and rotor core of the motor are designed to spin at a specific speed at the design frequency. This is by design of the motor itself. By changing the frequency of the drive current, we can change the speed. The lower control module generates the correct frequency to drive the motor at the desired speed. Since the speed of an AC motor is controlled by frequency, there is no need for a speed sensor.

Figure 9: AC Drive Motor Controller

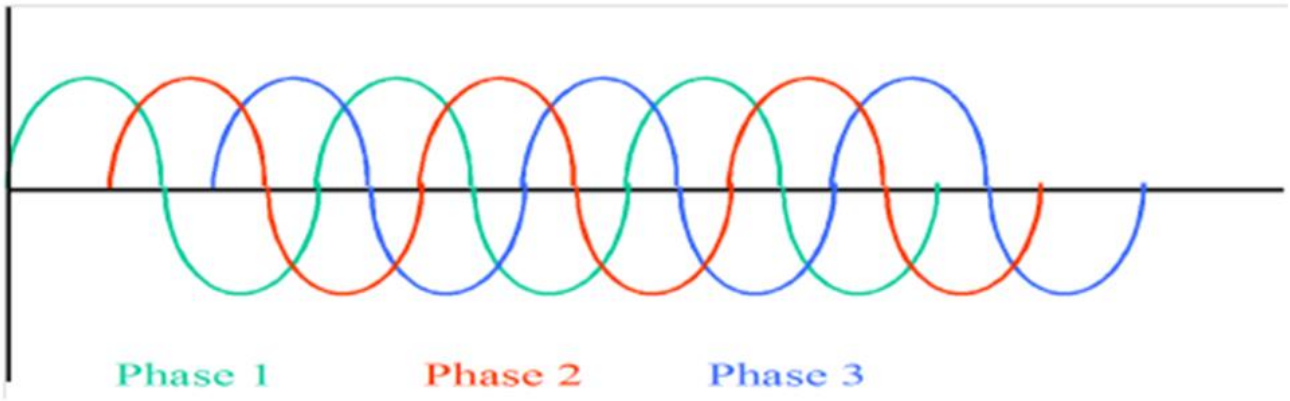


The frequency is then sent to the motor over 3 lines; with each of those lines being phase shifted 120 degrees from each other. This type of AC motor is referred to as a 3 phase AC motor and is used to allow enough torque to be applied over a continuous duty run time. The amplitude (voltage/current) of all three sine waves is the same at any given time and allows the torque to be applied smoothly throughout the rotation of the motor. Increasing the amplitude increases the torque and decreasing the amplitude decreases the torque.

The Motor Controller (MC) is responsible for sending the proper frequency to control speed and the proper amplitude (same on all 3 lines) to control torque. The motor must then be balanced both mechanically and electrically in order to translate the frequency and amplitude into fluid motion. Mechanical balance is achieved by balancing the weight of the flywheel, and electrical balance is achieved by all 3 windings being equal (same number of ohms).

Other features of this AC drive motor controller include "Dynamic Braking" and "Power Factor Correction". Dynamic Braking addresses an issue where an over-speed condition could occur. If a heavy user runs at a high incline, the weight of the user has the potential to push the running belt to go faster than the motor control was trying to maintain. The dynamic brake circuit senses the load variations and applies a braking force within the motor. The system utilizes an external power resistor to determine the point at which the braking force is applied, and to absorb the extra power being created by the motor. Power Factor Correction is a feature that attempts to reduce power consumption. The system monitors that this power factor is held within certain parameters. If it falls outside those parameters (i.e., the system is suing more current than expected), the system will flag an ERROR 27. Error codes are addressed in detail in the troubleshooting section of this manual.

Figure 10: AC Motor Phase Chart



Auto-Stop

The Auto Stop feature monitors the current used to drive the walk/run belt. The current bursts necessary to overcome foot plants and the resultant increase in friction indicates a user is present. The lack of current bursts indicates that a user is not present. If the running belt is moving and the Auto Stop does not detect motion from the belt drive, the Auto Stop feature will stop the motion of the running belt.

The auto-stop feature is controlled electronically via the Motor Controllers software. When a program is entered, Quick Start is pressed or the treadmill has been resumed after being paused, the treadmill starts at 1 mph. The user will then have 60 seconds to enter any remaining workout settings before motion detection begins. Once motion detection has commenced and if no or very little motion is detected, the Auto Stop feature interprets that the treadmill is no longer in use. The Auto Stop feature will continue to monitor the treadmill for motion for 30 seconds; if a user is still not detected a 10 second count down will be displayed on the console. After the 10 second count down has elapsed and a user has not been detected, the Auto Stop feature will stop the motion of the running belt and go into pause mode. If a user is detected within the 10 second count down cycles the shutdown feature will be aborted.

The Auto Stop feature can be enabled or disabled within the service software menus. See "Setting Club Parameters" in the corresponding P10, P30 or the P80 console service manual.

Note: If enabled, adjustment and tracking procedures should be performed while in the Hardware Validation – Belt Speed Test. This is because the Auto-Stop feature is not active during the Belt Speed Test.

Troubleshooting Procedures

This section provides the following Troubleshooting information:

- Introduction to Treadmill Troubleshooting
- Troubleshooting Methodology
- Troubleshooting Tripped Breakers
- Standardized Error Codes

Introduction to Treadmill Troubleshooting

This section contains troubleshooting procedures and presents a methodology for identifying and isolating system issues. Not all system issues will create an error code condition so the approach is to identify and verify the stated problem and then use the systems own self tests to help isolate the problem. In many cases, that will include the use of error codes, but not always.

The customer has reported a failed condition. The failure that is reported may differ from your observations as a trained technician. That is why it is important to validate the reported failure. The first step in this investigative troubleshooting methodology is to first identify the current overall operating condition of the treadmill, i.e., is it operational or not.

New features have been incorporated into the consoles and base of the TRM800.V2. Two status lights give an indication of the current and past condition of the machine. The Active Status Light (ASL) is located on the front of the base, and when all conditions are normal it will be a steady blue. The Machine Control Light (MCL) is located on the Machine controller, and will be a green when all conditions are normal.

The consoles now have the ability to display accurate voltage and current readings during operation, so the need for a separate meter is lessened. These readings can be viewed when accessing the Belt Speed test in the Machine Test menu. In addition to this, current and voltage readings are now added to each error logged. This information allows you to troubleshoot the equipment more accurately and quickly.

TRM 800.v2 ASL Status lights-

The TRM800-V.2 has three methods of communicating problems to the troubleshooter. The first is an Active Status Light (ASL) on the front of the treadmill, the second is through the use of an LED on the Motor Controller (MC) and, the third is through the use of Error Codes.

Active Status Light- ASL

The **Active Status Light** (**ASL**) is located on the lower center of the front cover and provides operation condition, maintenance, and troubleshooting information:

- **Off**. The unit is powered off or something is wrong with power to the Motor Controller or console.
- **Blue Solid** – Indicates the system has not detected an electronic error or if it has, the error is not fatal and the unit is electronically operational. A trouble call whereby the ASL is solid blue will most likely be either a mechanical issue or the MC has had a power cycle since the call originated.

- **Blue Pulsing** – The following conditions will cause the ASL to pulse blue:

  1. **Belt Rating 0 or 1**
     A belt rating of 0 or 1 will cause a blue pulsing ASL light indicating that there is a problem with the running belt/deck and is in need of servicing or replacement.
  2. **Belt Maintenance Reminder**
     A blue pulsing ASL light is also used as a 1000 mile running belt cleaning PM task reminder. The mileage counter resets to 1000 and counts down to 0 miles triggering the ASL light indicating that it's time for belt cleaning maintenance.

  How to reset a blue pulsing ASL light

  P10/P30 consoles:

  a Access the Information Display (**6,5**).

  b PM Belt Maintenance Reminder ASL reset: Select **Maintenance Test > Treadmill Maintenance** > press and hold **QUIKSTART** until **1000 Miles** is displayed.

  c Belt/Deck replacement ASL reset: select **Maintenance Test > Belt Rating >** press and hold **QUICKSTART** to reset.

  P80/P82 consoles:

  a Access the service diagnostic page (**5,1,7,6,5,7,6,1**).

  b Select the **Maintenance** page.

  c PM Belt Maintenance Reminder ASL reset: select **Next Maintenance Due** > **Reset**.

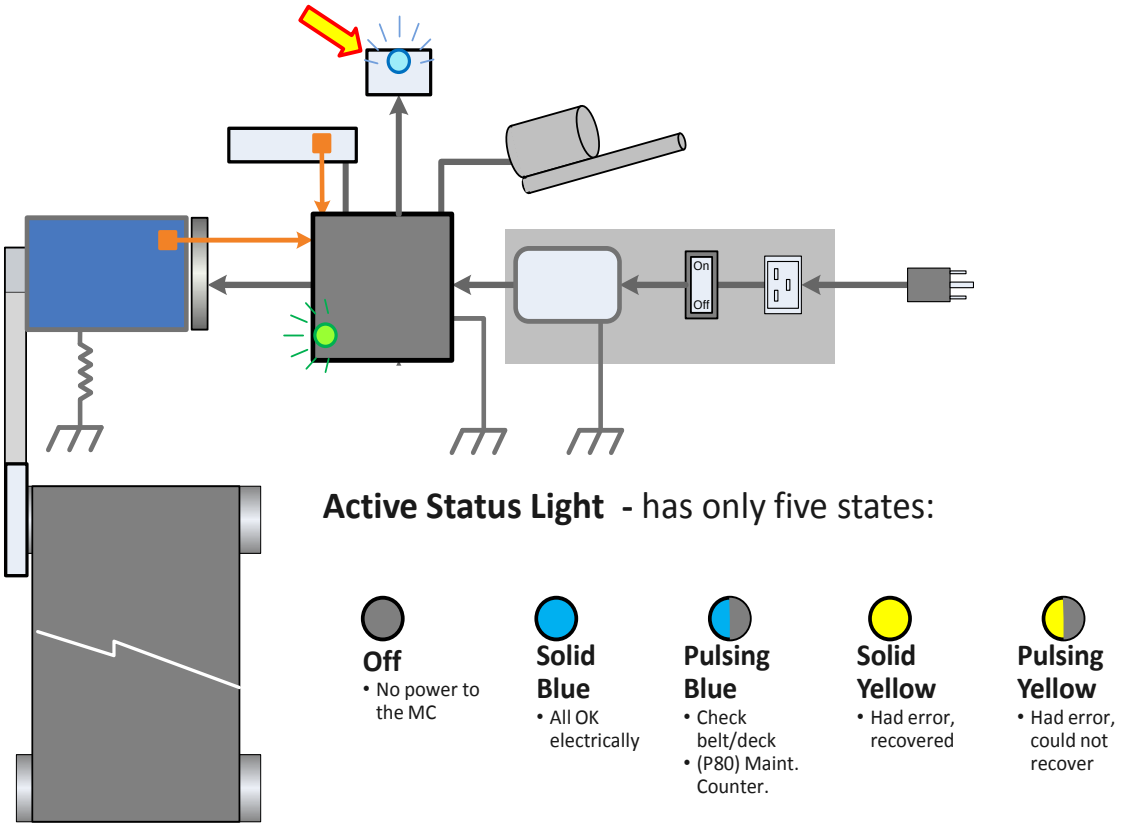
  d Belt/Deck replacement ASL reset: select **Belt Rating** > **REPLACE** to reset.

  Yellow Pulsing – There are two states for yellow pulsing:

  - An error has recently occurred or is occurring. This state is temporary, as the MC will attempt to resolve the issue and clear the codes so the tread can continue working if possible. This alleviates the tread being out of order until a technician is available to reset the MC.
  - If the MC cannot reset the error a fatal error has occurred and service is required. The **treadmill is not operational.** Service is required to correct the fault. After the fault is corrected, the ASL is reset to solid Blue by cycling power to the treadmill, or through the Active Status Light submenu in the Hardware Validation menu, or by clearing the error log.

- **Yellow Solid** – The treadmill has identified an irregular electronic/electrical occurrence however it was not a fatal error and the MC was able to reset – **treadmill is operational**. This occurrence has created an error code and is available in the error log so the servicer can determine if further service is needed. The ASL is reset to Blue solid by cycling power to the treadmill, or through the Active Status Light submenu in the Hardware Validation menu, or by clearing the error code log.

Figure 11: Active Status Light Conditions

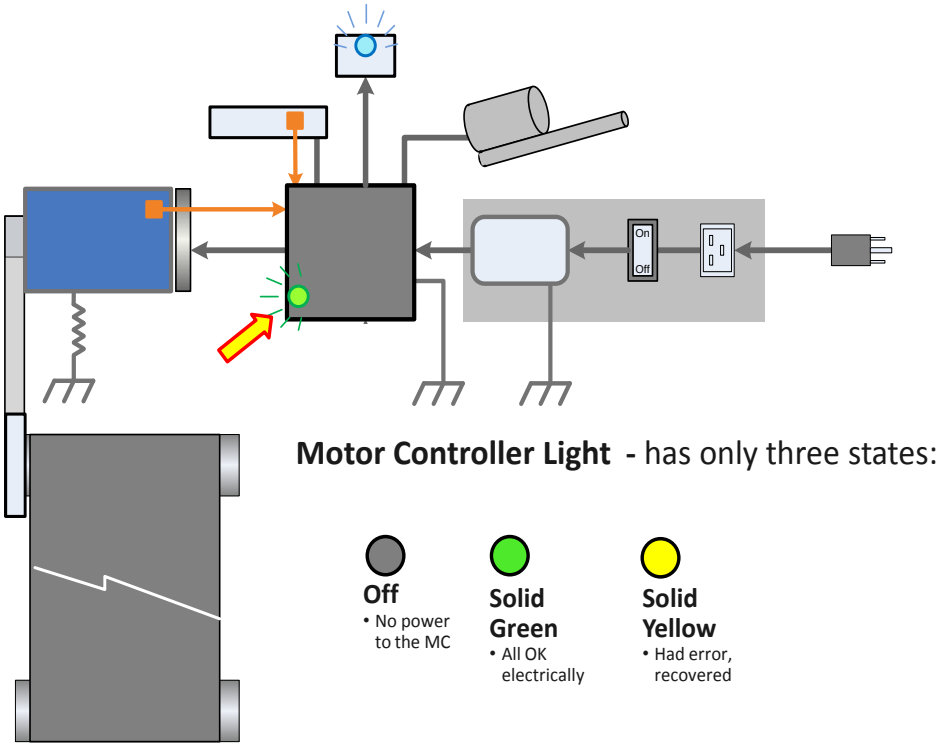


Motor Controller light-

The Motor Controller Light (MCL) will illuminate in one of two states:

- Green – MC is working correctly
- Yellow – A fault has occurred. The MC may be working correctly after fault reset, or the MC may have in internal fault that will need to be corrected. Troubleshooting is required. The MCL can only be reset to Green through the diagnostics menus.

Figure12:, Motor Controller Light Conditions



Drive Motor and Input Voltage/Current Measurements-

It is no longer necessary to connect a voltmeter or ammeter to the treadmill to see the wall input voltages and the currents and motor drive voltages and the currents.

By accessing the Belt Speed test from the diagnostics menus it is possible to see the following:

Voltage In (the voltage from the wall outlet)
Buss Voltage (the voltage to the motor from the MC)
Buss Current
Current In

On the P80 this information will be displayed as part of a list of information when the test is running. To display this information on the P10/P30 you must use the UP and DOWN arrows to select this. In both cases it will be necessary to start the test by pressing the Speed Up button/toggle to see the results of the measurements.

General Troubleshooting Methodology

- When you first approach the treadmill, first note the condition of the ASL. This will help to save you time by pointing out where your next step should be. By using the combination of the status lights and the error code list, you should be able to quickly determine your troubleshooting plan of action preventing you from following unnecessary steps, working more efficiently.
-
- Some faults with the treadmill will not have an error code logged, nor will the status LED's change. Most of these will be mechanical in nature – noises, loose parts etc. An exception to this is the belt/deck wear which is indicated by the ASL pulsing blue, but will not generate an error code.

- If the treadmill does not turn on, trips the breaker or the console will not illuminate:
  - Follow the appropriate procedure for Troubleshooting Tripped Breakers or Troubleshooting No Power to the Console.
- If the system powers up and can be at least partially operated:
  - Look for the ASL and MCL note their status.
  - Look in the error log for system information (drive system, lift system, etc) as appropriate
  - Clear the error log (which will also reset the ASL), and attempt to duplicate the error.
  - Run the unit in the Hardware Validation Tests and verify that the console and base are working normally.
  - Note any other observations you may notice about the treadmill – noises, stability, etc.
  - Isolate the fault to the system or component, repair or replace as required.
  - Retest the full functionality of the treadmill.

IMPORTANT If a failure is observed in user mode but works perfectly in the hardware validation tests:

- First check the Club settings. These might be set to limits that can give the appearance of a failure, such as the incline limit set to 0, or the Units set to Metric or US Standard.
- Some problems are caused by vibration or weight and are intermittent. Recreation of these conditions may be necessary.

Additionally, it is a good idea to be familiar with the recent service bulletins for the treadmill, the problem you are facing may already be known and addressed, saving you time troubleshooting.

Troubleshooting Tripped Breakers

It is extremely important to note whether the unit's breaker trips or the wall outlet breaker trips. It is also extremely important to note when the trip occurs:

- Immediately on power up
- After the belt starts but before the user walks on the belt
- After the user walks or runs on the belt.

If the unit trips the wall breaker:

1. Check the voltage coming from the wall. If it is approximately to 0V, the wall breaker has likely tripped.
2. Inspect the line cord. If damaged, replace the line cord. If the line cord is not damaged continue with the following steps.
3. Ensure that the AC line cord is attached correctly and secured to the treadmill with the clamp.
4. Verify if two or more treadmills on the same wall breaker. This will be especially evident if two or more treadmills shut down at the same time. To verify if multiple treadmills are sharing the same wall breaker, manually turn off the wall breaker. If more than one treadmill loses power, the treadmills are on the same breaker.
    - If YES, advise the customer to have their facility wiring upgraded per Precor specifications.
    - If NO, continue with the following steps.
5. Verify the wall outlets **do not** share neutral wiring and that each wall outlet is on an individual branch circuit. An individual branch circuit will have its own load line, neutral line and ground line. Have an electrician verify if neutrals are shared or not.
    - If YES, advise customer to have their facility wiring upgraded per Precor specifications.
    - If NO, Continue to step 6
6. Measure the AC input voltage with the treadmill unloaded (running belt moving, with no one walking on the running belt) and then again while loaded (someone walking/running on the belt). The difference between the two states should be no more than about 6 volts RMS, and ideally less.
    - If the voltage variance is more than 6 volts RMS, the distance of the branch circuit wire runs may be very long or may have used smaller diameter wire. Recommend to the club that they should consult with an electrician if this is suspected.

- If NO, Continue to step 7.

7. Overloading is the most frequent cause of treadmill shutting down. Overloading is most often caused by excess deck/belt friction, but can be made worse by line voltage conditions. This condition happens more often with heavier runners, but never walkers. In high user clubs (10 hours or more of use per day), the decks/belts will wear out much faster than at other locations, sometimes in months rather than years. Follow the steps for errors as per procedure, ***Troubleshooting the Drive Motor System***.

If the Treadmill breaker (power switch) is tripped:

1. Verify the wall outlets **do not** share neutral wiring and that each wall outlet is on an individual branch circuit. An individual branch circuit will have its own load line, neutral line and ground line. Have an electrician verify if neutrals are being shared or not.
   - If YES, advise customer to have their facility wiring upgraded per Precor specifications, and then continue with step 2.
   - If NO, continue with the following steps.
2. Verify that their Long Branch run is done with inadequate gauge wire.
   - If YES, advise customer to have their facility wiring upgraded per Precor specifications.
   - If NO, continue with the following steps.
3. Verify line voltage. Low line voltage for the U.S. is anything below 108VAC, measured while the treadmill circuit breaker is turned "ON", but the running belt is idle. For international, low line voltage is anything below 200VAC while the treadmill circuit breaker is turned "ON" and the running belt is idle. Measure the line voltage with the treadmill circuit breaker is turned "ON", but the running belt is idle. Make note of the voltage. Using the Belt Speed Test in the Diagnostics menu, note the voltage while running on the treadmill at 7.0 MPH or higher.
4. If any measurement is below 108VAC (US) or 200VAC (International), advise the customer to have their facility wiring inspected by an electrician.
5. If the measurements are at or above 108VAC (US) or 200VAC (International), continue with following steps.
6. Does the treadmill trip its breaker immediately on power up?
   - If YES, it is likely that there is a shorted component (line filter, Motor Controller) or faulty/shorted wiring.
   - If NO, continue with the following steps.
7. Does the treadmill power up, but trips the breaker after the motor is started?
   - If YES, it is likely that there is a bad roller or bad drive motor.
   - If NO, continue with the following steps.
8. Does the drive motor start up fine, but trips the breaker after a user walks/runs on the running belt?
   - If YES, Overloading is the most frequent cause of treadmill shutting down. Overloading is most often caused by excess deck/belt friction, but can be made worse by line voltage conditions. The overloading condition happens more often with heavier runners, but never walkers. In high user clubs (10 hours or more of use per day), the decks/belts will wear out much faster than at other locations, sometimes in months rather than years. It is often accompanied by error codes 27, 28, 35 or 36. For more information refer to "***Running Belt & Deck Troubleshooting***".

Troubleshooting No Power to the Console, P10 and P30

This troubleshooting is for Standard, P10 or P30 consoles only. The P80 uses its own power source separate from the Motor Controller.

1. Using an AC voltmeter, verify that the outlet voltage is appropriate. See procedure, ***Troubleshooting Tripped Breakers***
   - If NO, advise customer to have their facility wiring upgraded per Precor specifications and then continue with troubleshooting.
   - If YES, continue with the following steps.
2. Remove the treadmill hood and measure the AC voltage at the input side of the line filter with a voltmeter. Verify that line voltage is present when the breaker switch is turned on.
   - If NO, Replace the breaker switch.
   - If YES, continue with the following steps.
3. Measure the AC voltage at the output side of the line filter with a voltmeter. Verify that line voltage is present when the breaker switch is turned on.
   - If NO, Replace the line filter.
   - If YES, continue with the following steps.
4. Use a known good console and communication cable. Plug the test console and test communications cable into the suspect treadmill Control Module. Does the test console power up?
   - If NO, Replace the Control Module.
   - If YES, continue with the following steps.
5. If the test console did power up in step 4, re-connect the test communications cable from the test console to the original console. Does the original console power up?
   - If YES, Replace the Communications Cable.
   - If No, troubleshoot the console assembly.

CAUTION Swapping a Motor Controller from a good unit into a bad unit could damage the Motor Controller from the good unit. If the control module that is being swapped may have a defect and could damage components in the good unit. This could potentially produce two bad units instead of one.

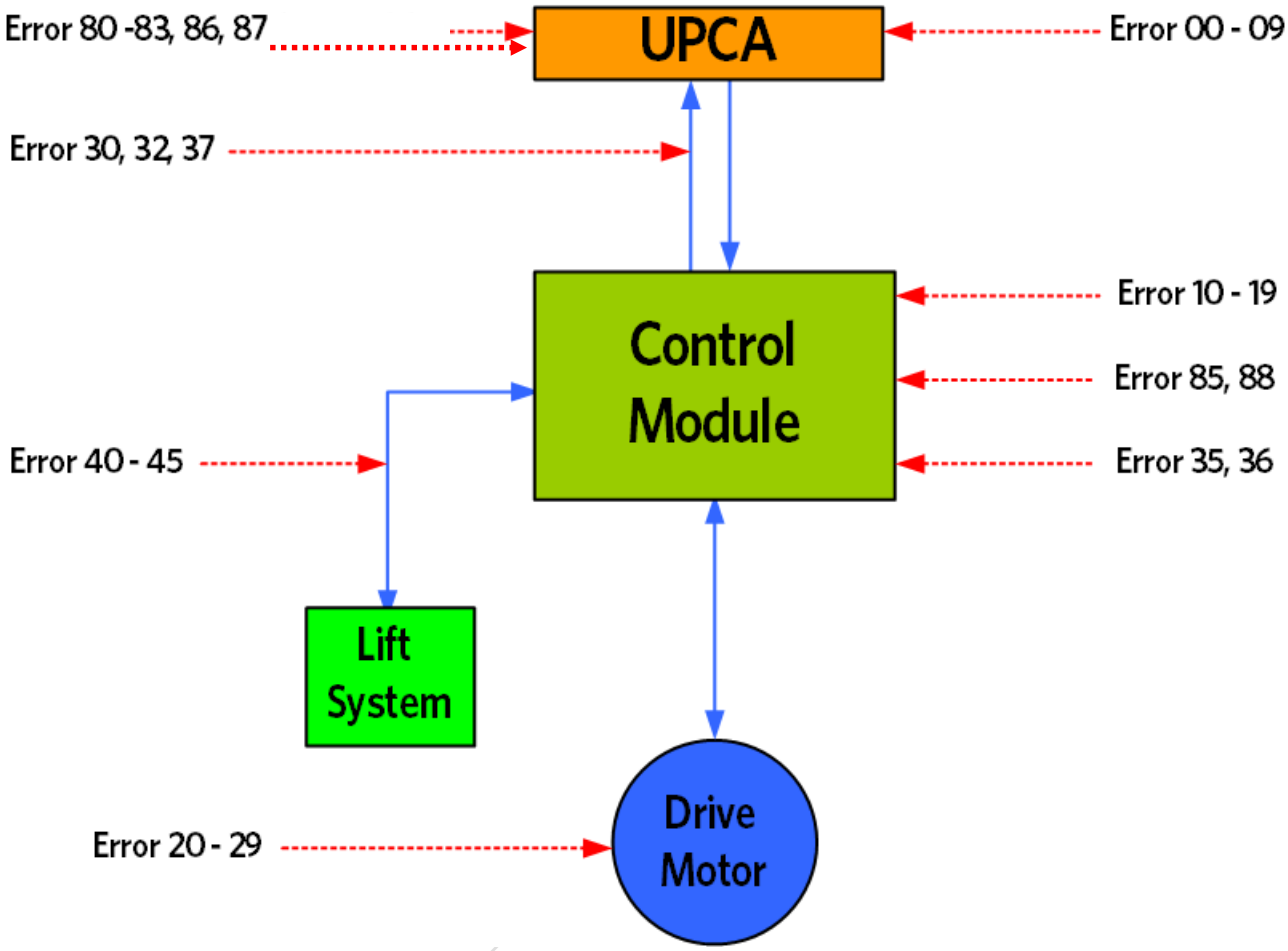
Error Codes

The system generates error codes and stores those codes in a block of memory known as the ERROR LOG. The error is entered into the ERROR LOG when it detects conditions that are defined in the error reporting software. On the P80 the errors are located, along with software events, in an EVENT LOG. The ERROR LOG (P10/P30) displays the 30 most recent errors, with error location one being the most recent. The EVENT LOG (P80) stores data from events over the last 30 days. The EVENT LOG is only accessible via the Diagnostics mode.

The error codes are useful in isolating certain system issues. In a fault state the error will be recorded if the values are different from the previous (odometer, hour meter, etc.). If two exact same faults happen within a short time frame, without any belt movement, only the first one will be recorded. Not all system issues will generate an error code, and only the errors that can be generated in the treadmill will be described in this manual.

To review the error log on a P10 or P30, press and hold the reset key or the Stop switch for at least 6 seconds. If there are errors logged, this action will take you into the error log. If there are no errors STUCK KEY will be displayed. The error log can also be accessed through the Information Display by pressing Stop, Pause, or Reset, then the numbers 6, 5.

Figure 13: Standard Error Codes Flow Chart



Error Codes

The subsequent pages list the details of each of the error codes that exist within the Precor software hierarchy for the TRM 800-V.2. Each page will include a description of the error code being displayed and the systems associated with the error code.

Potential causes for the error codes will be listed with the most likely cause first and the least likely because listed last. It must be understood that this manual can not anticipate every possible cause for a particular error code. However, it should list the causes encountered in the majority of cases.

The manual will then list the suggested remedies associated with each of the possible causes. The possible remedy listing will numerically coincide with the possible cause listing.

- When faults are detected, and error codes generated, certain rules will be followed in the software.error is recorded in the console if the new value is different than the old value (Odometer/Hour-meter/etc). For example, two faults caused inside a minute with no belt movement records one error.
- For all errors that result in the Motor Controller stopping or slowing the belt, when the workout is resumed the speed will resume at 1MPH.

- The console is solely responsible for commanding the color changes of the Motor Controller LED (MCL) and the Active Status LED (ASL).
- The console will attempt to reset all errors originating from the Motor Controller, with exceptions mentioned below in the error list.
- For an error state that prevents the treadmill from starting, at banner, the message bar will scroll “PLEASE USE ANOTHER TREADMILL.”

The error log will contain the following pieces of information for each error captured:

- Error code
- Hours
- Odometer
- Motor amps
- Line amps
- Line voltage
- Motor Controller buss voltage

Error Code Table

The following is a list of the error codes currently assigned to the TRM 800-V.2:

Table 1: TRM800.V2 Error Code

Error #	Description
none	Key Depressed at Power Up
10	Line Frequency out of Acceptable Range
11	Watchdog (Upper PCA) Low Voltage
12	Watchdog (Lower PCA) Low Voltage
14	Fan Fail (Lower PCA)
15	Over - buss voltage/ DC link voltage too high
16	A.C. Input Voltage Too Low
17	DB Resistor thermal I2t trip
18	DB Resistor thermal switch open
19	PFC Malfunction
20	Motor will not start/no motor movement detected
25	Lower Drive hardware error
27	Too Much Drive Motor Current
28	Temperature Too High/Drive Electronics
30, 32	Communications Error
35	Excessive AC Input Current/ Instantaneous
36	Excessive AC Input Current/ Circuit Breaker Trip Prevention
37	E-STOP Upper State vs. Lower State Mismatch
40	Lift Motion Not Detected
42	Lift Position Value Out of Range

Error #	Description
44	Un-commanded Lift Motion
45	Lift Moving in Wrong Direction
80,81,82,83	Phase A or B missing/Incline Control
85	No DB resistor detected/DBR failed Open
86	Old Console Detected on New TM12 Drive
87	New TRM800-14 Console Detected on Old TM5 Drive
88	Temperature Too High/Motor Temperature Switch

Table 2: TRM800.V2 Error Codes with Status Lights

Error #	Description	Probable Root Cause	Troubleshooting Steps	MC LED	Status LED Final
10	Line Frequency out of Acceptable Range	Line frequency is below 45Hz or above 65Hz	1. Was running off of a backup generator or backup power source 2. Check line frequency and line voltage	Green/ No Change	Yellow/Solid
11	Watchdog (Upper PCA) Low Voltage	Console internal HW failure	1. Cycle power, attempt to reproduce error -If error is reproduced, replaced console	Green/ No Change	Yellow/Solid
12	Watchdog (Lower PCA) Low Voltage	Drive HW issue	1. Cycle power 3 times - If error clears no further steps need to be taken -If error persists after power cycles, replace drive	Yellow	Yellow/Solid
14	Fan Fail (Lower PCA)	1. Fan bearings or winding worn out 2. Fan clogged with debris or disconnected	1. Check for debris, clean out fan and heatsink 2. Start treadmill belt to see if the fan is turning -If the fan is not turning, replace MC	Yellow	Yellow/Solid
15	Over - buss voltage/ DC link voltage too high	User pushing hard on hand grips while the MC is driving the belt	1. Verify all DB resistor connections are seated properly, check DB resistance - should be 100ohms. If greater than 150ohms, replace DB resistor 2. Check resistance between either terminal of the switch connector (smaller black) to either terminal of the resistor element connector (larger white/natural) - There should be greater than 1Meg of resistance. If less than 1Meg, replace DB resistor 3. If none of the above, replace drive	Green/ No Change	Yellow/Solid
16	A.C. Input Voltage Too Low	1. Prolonged brown out/ consecutive short blackouts / other poor power conditions 2. Shared neutral / too small wiring / belt + deck need replacement	1. Find out if blackouts/brownouts have occurred recently in that area 2. Check if treadmill was running off of a backup generator or backup power source 3. Monitor minimum rms line voltage with: -Treadmill at banner -Treadmill at 6MPH with runner -Treadmill at banner, run at 6MPH on a neighboring tread	Green/ No Change	Yellow/Solid
17	DB Resistor thermal threshold reached	Runner at incline with new deck and belt -Large runner at incline SW thermal limit reached	If deck and belt are new, this failure mode will likely go away after months of use. Allow DB resistor to cool down- reset MC status- monitor for repeat error.	Yellow	Yellow/Solid
18	DB Resistor thermal switch open	DB switch connector not plugged in DB reached its thermal upper limit	1. Check to see if the DB resistor thermal switch is properly seated into the connector (it can be wedged into the connector opening without being properly seated) 2. Check DB resistor temperature. If it is stuck on it may be hot. If stuck ON, replace both drive and DB resistor. 3. Unplug all connections from the DB resistor and check resistance of the DB thermal switch (smaller balck connector). If 10ohms or greater, replace the DB resistor.	Yellow	Yellow/Solid
19	PFC Malfunction	Drive HW issue	If persistent problem, replace drive	Yellow	Yellow/Solid
20	Motor will not start/ no motor movement detected	Disconnected drive motor	1. Verify motor connector is connected to drive 2. Check machine for stalling during operation 1MPH through 6MPH 3. Check error log for motor current during fault - If it is very low, check the connector and contacts, if it is over 7amps, it is likely a true stall condition 4. Check belt rating and current draw of treadmill - replace belt and deck if necessary	Yellow	Yellow/Solid
25	Lower Drive hardware error	Drive HW fault	Check error log - If log has multiple instances of this error, replace the drive. If there is only one ER25, power cycle the treadmill 3 times and see if it recovers.	Yellow	Yellow/Solid
27	Too Much Drive Motor Current	Belt and deck need replacement	1. Check belt rating - replace belt and deck if necessary 2. Check motor to determine if faulty	Green/ No Change	Yellow/Solid
28	Temperature Too High/Drive Electronics	Heat sink clogged with debris OR underhood airflow restricted	1. Clean out heat sink, pan corners, dust shield holes that can restrict airflow 2. If this does not correct the problem long term, replace the drive	Yellow	Yellow/Solid
30, 32	Communications Error Downstairs to Upstairs	Connector seating, corrosion, broken pins	1. Verify the connector is seated on both ends 2. Verify connector contacts have dielectric grease applied - if not, apply grease 3. Run treadmill and move comm cable around to try and reproduce error, if it reproduces, swap out cable	Green/ No Change	Yellow/Solid
35	Excessive AC Input Current	Drive HW	If persistent problem, replace drive	Green/ No Change	Yellow/Solid

Table 2 (continued): TRM800.V2 Error Codes with Status Lights

Error #	Description	Probable Root Cause	Troubleshooting Steps	MC LED	Status LED Final
36	Excessive AC Input Current/ Circuit Breaker Trip Prevention	Bad belt and deck	Check belt rating and current draw of treadmill - replace belt and deck if necessary	Green/ No Change	Yellow/Solid
37	E-STOP Upper State vs. Lower State Mismatch	Connector seating or corrosion	1. Verify connectors are seated properly and dielectric grease has been applied to both connectors 2. Run treadmill and move comm cable around to try and reproduce error, if it reproduces, swap out cable 3. If this error is persistent, install a new console 4. If the console does not correct the problem, swap out the drive	Green/ No Change	Yellow/Solid
40	Lift Motion Not Detected	Lift motor connectors, pins motor	1. Verify the lift motor connector is seated correctly and all connector pins are fully inserted 2. Verify that winding resistance from center to up pin and from center to down pin are the same 4. Monitor potentiometer voltage while moving the lift, if it does not change, replace the lift motor	Green/ No Change	Yellow/Solid
42	Lift Position Value Out of Range	Lift motor drifted too low, less than -3	1. If the incline has drifted down, perform appropriate lift motor calibration or install new lift motor 2. Verify that the lift connector is seated correctly and all pins are fully inserted into the connector housing	Green/ No Change	Yellow/Solid
44	Un-commanded Lift Motion	Lift motor drifted	1. Use incline test menu to recover the machine 2. If lift does not move in incline test menu, or only moves in one direction, replace drive	Green/ No Change	Blue/ No Change
45	Lift Moving in Wrong Direction	Miswired lift connector	1. Verify lift motor connector pinout is correct 2. If drive is always energizing the same coil, replace drive -If drive is not energizing coils at all, replace drive	Yellow	Yellow/Solid
85	No DB resistor detected/DBR failed Open	DB resistor not plugged in	1. Verify all DB resistor connectors are seated correctly and all pins to make sure they are inserted correctly 2. Check DB resistance - it should be 100ohms. If it is greater than 150ohms, replace DB resistor 3. Check resistance between either terminal of the switch connector (smaller black) to either terminal of the resistor element connector (larger white/natural) - There should be greater than 1Meg of resistance. If less than 1Meg, replace DB resistor	Yellow	Yellow/Solid
86	Old Console Detected on New TM12 Drive	Older P30 console SW, installed on treadmill	Check console SW in diagnostics menu	Green/ No Change	Blue/ No Change
87	New TRM800-14 Console Detected on Old TM5 Drive	New P30 console SW, installed on treadmill	Check drive PN in diagnostics menu	Green/ No Change	Yellow/Solid
88	Temperature Too High/ Motor Temperature Switch	Motor thermal switch not connected /connector not seated	1. Verify that the connector is properly seated in the drive jack 2. Check belt rating and current draw of treadmill - replace belt and deck if necessary 3. Check resistance across motor thermal switch (black) connector. If it is greater than 10ohms, replace motor.	Green/ No Change	Yellow/Solid
80,81, 82,83	Phase A or B missing/Incline Control	Machine controls connector, pins not seated or broken correctly	1. Start a workout, push machine controls connector left, right, and inwards while operating it up and down - if fault reproduces, replace console 2. Verify machine controls connectors are seated properly on each side 3. Verify machine controls connector pins are properly inserted	Green/ No Change	Yellow/Solid, sourced by console, cannot clear

Error Code Troubleshooting

This section contains the following Error Code and Troubleshooting information:

- Troubleshooting Input Power & Control Error Codes
- Troubleshooting the 3 Phase AC Drive Motor System
- Troubleshooting the Incline System
- Troubleshooting Communications Errors
- Running Belt & Deck Troubleshooting
- Troubleshooting the Auto Stop Feature

In addition to details about each of the error codes, possible causes and remedies. At the end of each error description will be a description of the expected status of the ASL and the MCL.

Troubleshooting Input Power & Control Error Codes

This section provides information about the following error codes: input power (error 10, 15 & 16) conditions, Console controls (stuck key & 80-83), or processor/memory (error 9 & 11) conditions. These are errors that although they are valid to the proper function of the machine, are not part of a specific treadmill base system (lift system, drive system, deck & belt system, etc…). Follow the steps for error code 10, 11, 12, 14, 15, 16, 80, 81, 82, or 83 on the following pages.

Error 10 – Line Frequency out of Acceptable Range

MCL – Green
ASL – Yellow Solid

Description

Line frequency is outside a range of 45Hz to 65Hz

Possible Causes

This error message almost always indicates a problem with a generator starting up

The input AC voltage is too low.

Possible Remedies

Check if the treadmill was running off of a backup generator or backup power source.
Check the line frequency.
Check the line voltage.
Check with the club to see if there have been any brown-outs lately.

Error 11 - Watchdog (Upepr PCA) Low Voltage

MCL – Green
ASL – Yellow Solid

Description

The error 11 watchdog monitors the upper PCA low voltage power. If the low voltage power drops below a preset level, the error 11 will be displayed.

Possible Cause

1. Console internal hardware failure

Possible Remedy

1. Cycle power, attempt to reproduce the error

If error is reproduced, replace the console

Error 12 - Watchdog (Lower PCA) Low Voltage

MCL – Yellow
ASL – Yellow Solid

Description

The error 12 watchdog monitors the lower PCA low voltage power. If the low voltage power drops below a preset level, the error 12 will be displayed.

Possible Cause

1. Control Module internal hardware error

Possible Remedy

1. Cycle power once – if error clears no further steps need to be taken.
2. If error persists after one power cycles replace the control module.

Error 14 – Fan Fail (Lower PCA)

MCL – Yellow
ASL – Yellow Solid

Description

The control module monitors the fan speed. If it drops below a preset level, the error 14 will be displayed.

Possible Causes

1. Fan bearings worn
2. Fan winding burned out
3. Fan clogged with debris
4. Fan connector disconnected or wires damaged

Possible Remedies

1. Open hood, check for debris, clean out fan and heat sink
2. Start Treadmill to see if the fan is turning

3. If the fan is not turning at all, power down the treadmill then open the case of the control module – verify the fan is plugged in.
4. Rotate the fan with hand, it should turn smoothly with no binding or scraping, all fan blades intact.
5. If the fan does not spin or turn smoothly, replace the control module.

Error 15 – DC Bus Over Voltage

MCL – Green
ASL – Yellow Solid

Description

The DC bus (motor) voltage is monitored. When the treadmill is used by a vigorous exerciser walking or running at steep incline or when pushing against the handlebars while the belt is moving, the AC motor becomes a generator forcing power back into the Motor Controller. This excess power would cause the bus voltage to increase enough to damage the control module were it not for the DB (dynamic brake) resistor, which automatically switches on to absorb the excess power. Error 15 is an indication that the Bus Voltage exceeded the bus voltage limits, either because the DB system wasn't functional or because the bus voltage power exceeded the DB system limit..

Possible Remedies

1. Check the error log to determine the error frequency and repeatability.
    a. If one time event, clear the error log and return to service.
    b. If repeated occurrences of the error are shown, clear the error log, raise the elevation to 15%, and walk at a fast but comfortable pace, pushing slightly against the handrail. If you are able to easily generate an Error 15, replace the DB resistor.
2. Check DB resistor connection
    a. Turn off unit.
    b. Verify all DB resistor connections are connected and are seated properly.
3. Check DB resistance
    a. Check the DB resistance. It should be 90 to 110 ohms. If greater than 150ohms, replace the DB resistor.
    b. Check the resistance between either terminals of the switch connector (smaller black) to either terminal of the resistor element connector (larger white/natural). The resistance should be greater than 1Meg of resistance. If less than 1Meg, replace the DB resistor.
4. If none of the above, replace the motor controller.
5. If NO, and the problem has only happened once or twice for this treadmill, dismiss it and clear the error logs.

Error 16 - A.C. Input Voltage Too Low

MCL – Green
ASL – Yellow Solid

Description

The condition that causes error 16 has to persist for 15 seconds before it is logged. The most common cause of this problem is external power fluctuations due to brownouts, blackouts or other poor power conditions. This can also be caused by wiring that is too small of a gauge to handle the current, or if the neutrals are shared between multiple outlets. Less likely but possible is a worn deck and belt causing high current.

Possible Causes

1. Prolonged brown out/consecutive short blackouts/.other poor power conditions
2. Shared neutral/too small wiring/belt deck need replacement
3. Flipping power switch ON/OFF over and over again
4. Motor controller hardware issue

Possible Remedies-

1 Find out if blackouts/brownouts have occurred recently in that area
2 Check if treadmill was running off of a backup generator or backup power source
3 Ask that an electrician verify wiring
4 Monitor minimum rms line voltage with:
5 Treadmill at banner
6 Treadmill at 6MPH with runner
7 Treadmill at banner, run at 6MPH on a neighboring tread

Error (none) - Key Depressed at Power Up- No Error Code Generated

MCL – Green
ASL – Blue

Description

The power up test sequence has detected a key in the operated condition. The power up test sequence is performed every time the unit is turned on (powered up) or reset. This test is performed because a permanently stuck key will inhibit the correct operation of the unit.

Possible Causes

1. A key on the display housing is permanently stuck in the operated condition.

2. One of the upper PCA's keypad interface chips has failed.
3. Liquid (perhaps perspiration) is present on the surface of the display overlay.

Possible Remedies

1. Remove the keypad connector cable from the upper PCA. Restart the power up sequence; if Stuck Key is no longer present, the keypad is the cause. The keypad is typically part of the display housing. Replace the display housing to correct the problem.
2. Remove the keypad connector cable from the upper PCA. Restart the power up sequence; if Stuck Key is still present, the upper PCA is the cause. Replace the upper PCA to correct this problem.
3. Wipe the surface of the display overlay clean of all liquid. Restart the power up sequence; if Stuck Key is no longer present, the liquid was the cause.

Error 80, 81, 82, & 83 – P30/P80 Machine Controls Not Working

MCL – Green
ASL – Yellow Solid

Description

The main symptoms for these errors are lack of control for incline and speed (TRM) or resistance and crossramp (EFX, AMT). These errors will occur upon "lack of" or broken hardware communication. The sensors communicate through an 8-pin connection. Pins 1-3 are incline controls; pins 6-8 are drive (speed or resistance) controls.

- Error 80 - Incline (or crossramp) will stop at current incline. Error 80 is displayed when there is a missing incline signal on pins 1 or 2.
- Error 81 - Incline (or crossramp) will stop at current incline. Error 81 is displayed when there is a missing incline signal on pin 3
- Error 82 - Speed will decrease at 0.1mph per key press until belt stops. Error 82 is displayed when there is a missing drive signal on pins 6 or 7
- Error 83 - Speed will remain at current speed. Error 83 is displayed when there is a missing drive signal on pin 8.

The most likely causes for these errors are a loose or disconnected connector to the upper PCA, damaged cables, or a faulty machine control.

Possible Causes

1. Machine control interconnect cable has come unplugged or backed off slightly from the upper PCA.
2. Bad machine control cable.
3. Bad machine control assembly.

Possible Remedies

1 Check the Error log for multiple occurrences of the error with the same odometer reading. Clear the error log, and cycle power to the machine.
2 Open the console and check the connectors. Ensure that they are securely connected to both the upper PCA and to the machine control.
3 Check the cable for visual damage; use an ohmmeter to verify continuity on each line. Replace both the cable and machine control if a fault is found.
4 Inspect the machine control for corrosion or damage, and replace both the machine control and cable if any damage is found.
5 Review the software version of the P30. If the user states the issue is related to the machine controls not working as designed, the P30 software may need to be updated in addition to the replacement of the machine control and cable assemblies. Current software versions are available on the Precor Connection website.

Troubleshooting the 3 Phase AC Drive Motor System

Occasionally, there may be issues with the proper operation of the drive system that do not generate error codes. This troubleshooting procedure is intended for those times.

If there is an error code for the drive system (Error 17-20, 25, 27-28, 35-36, 85, 88) in the error log, go to the appropriate error code troubleshooting page and follow the steps for that error.

If there are no errors in the log, yet the drive system appears to have issues (such as jittery motion) follow the steps below.

Note: When taking voltage readings of the AC drive motor, the readings may not seem accurate because of the frequencies being used, however, they are indicative of the presence of drive motor voltage and relative frequency changes.

Troubleshooting the Drive Motor

Procedure:

If the drive motor will not start at all, note any error that might result, and continue with step 1. If the drive motor starts when you force the running belt to move and once running the drive motor runs rough, a phase may be missing, and an error will not be generated. Continue with step 1.

Note: If the drive motor does not start on its own, the Motor Controller will only apply voltage for a couple of seconds before it shuts down. Therefore the voltage readings in the following step must be taken within the first couple of seconds after the treadmill is instructed to start the running belt. (A multi-meter with a hold feature is helpful in this case)

1. Connect an AC voltmeter between terminals 4 (red) & 5 (white) of the OUTPUT connector on the Motor Controller. **See Figure Below**. Set the treadmill's on/off switch to the ON position. Press the **QUICK START** key. If the Motor Controller is supplying output, you will momentarily read some value of AC voltage. Make a note of the value and set the treadmills on/off switch to the OFF position.
2. With the treadmill's on/off switch in the OFF position, repeat the procedure in step 1 between terminals 4 (red) & 6 (black) of the OUTPUT connector on the Motor Controller. Voltage should read the same value as in step 1. Set the treadmill's on/off switch to the OFF position.
3. With the treadmill's on/off switch in the OFF position, repeat the procedure in step 1 between terminals 5 (white) & 6 (black) of the OUTPUT connector on the Motor Controller. Voltage should read the same value as in step 1. Set the treadmill's on/off switch to the OFF position.

   If one or more of the voltage readings in steps 1 through 3 are not present, replace the Motor Controller. If the voltage readings in steps 1 through 3 are present, continue with step 4.

NOTE: All resistance measurements must be performed with power removed from the treadmill. Performing the resistance measurements with voltage applied may damage your multi-meter.

4. Set the treadmill's on/off switch to the OFF position. Disconnect the drive motor connector from the OUTPUT connector on the Motor Controller. With an ohmmeter, measure between terminals 4 (red) & 5 (white), 4 (red) & 6 (black) and 5 (white) & 6 (black) of the drive motor connector. Each reading should be approximately 2.5Ω. If any of the readings are significantly high or open, replace the drive motor.
5. If the resistance readings are correct, inspect the female terminals of the drive motor connector. Verify that they are not spread beyond the point of making good connection with the male pins on the OUTPUT connector on the Motor Controller. If proper connection is not being achieved, the connector **CAN BE** repaired (using the appropriate crimper and connector ends) as a preferable solution to replacing a costly drive motor.
6. If you have performed all of the procedures above and have been unable to correct the problem, call Precor customer support.

Figure 14: Motor Controller Connectors

Figure 15: Motor Controller Connector Pin 1 location

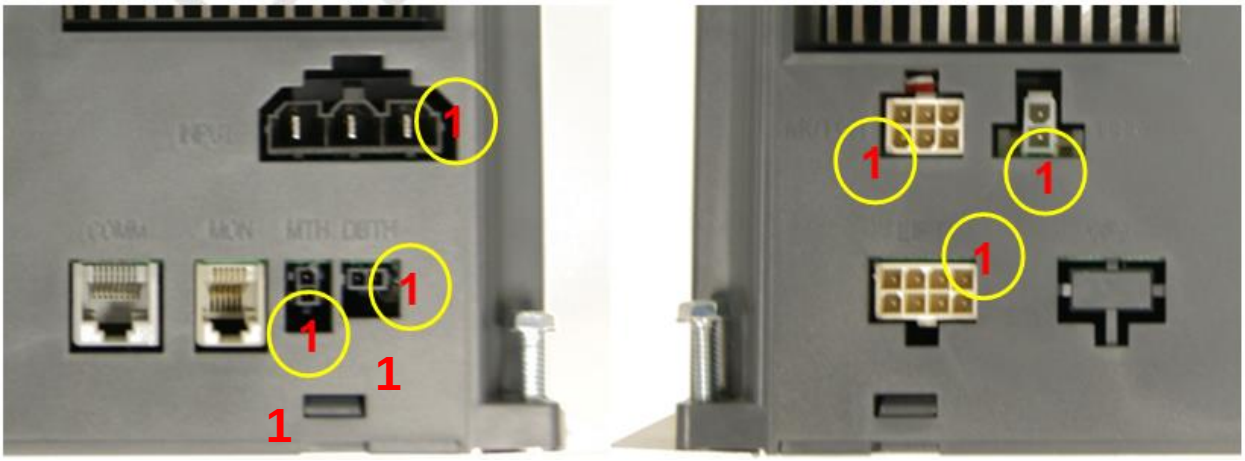


Table 3 Connector Numbering

Connector	Pin #	Pin Description	Connector	Pin #	Pin Description
INPUT	1	EARTH GROUND	COMM	1	DIGITAL GROUND
	2	AC LINE 1- LINE		2	+8VDC
	3	AC LINE 2- NEUTRAL		3	TCD DATA OUTPUT
				4	DIGITAL GROUND
MOTOR	1	MOTOR PHASE A		5	+8VDC
	2	MOTOR PHASE B		6	RXD DATA INPUT

	3	MOTOR PHASE C		7	DIGITAL GROUND
	4	MOTOR PHASE A		8	E-STOP
	5	MOTOR PHASE B			
	6	MOTOR PHASE C	DBR	1	RESISTOR OUTPUT
				2	RESISTOR OUTPUT
LIFT	1	COMMON OUTPUT			
	2	NOT USED	MON	1	+8VDC
	3	SENSE POT: VCC		2	/BOOT_EN
	4	SENSE POT: GND		3	TX
	5	DECLINE OUTPUT		4	8V GND
	6	INCLINE OUTPUT		5	D_RESET
	7	NOT USED		6	RX
	8	SENSE POT: SENSE			
			MTH	1	Thermal Switch
DBTH	1	Thermal Switch		2	Thermal Switch
	2	Thermal Switch			

Error 17 – DB Resistor Thermal Trip Software Detection

MCL – Yellow
ASL – Yellow Solid

Description

The Control Module monitors the Dynamic Brake (DB) resistor thermal condition by means of an algorithm. When the software determines that the DB is at a critical level, it will cause the Error 17 and will shut the treadmill down until the DB cools to an appropriate level. The Machine Control status light will go to yellow while the error is in effect. It will need to be manually reset through the diagnostic menus.

Possible Causes

1. This is a user sourced issue
    a. Runner at incline with a new deck and belt
    b. Large runner at incline

Possible Remedies

1. Discuss normal operating modes with the club management. If the deck and belt are new, this error will go probably go away after a few months of use.
1. Unplug all connections from the DB resistor and check switch for >10Ω. If greater than 10Ω replace the DB resistor.
2. Replace the MC.

Error 85 – No Dynamic Resistor Detected

MCL – Yellow
ASL – Yellow Solid

Description

The dynamic brake resistor (DBR) is designed to absorb the excessive current produced by the drive motor running faster than it is being driven. When the Machine Controller boots up, it checks for the resistor to be plugged in. If it does not detect the DBR an error 85 will be displayed. It will only be displayed briefly when power is applied to the MC. The most probable cause for this is the DBR not being plugged in, or it is open due to overheating or a broken cable.

Possible Causes

1. DB Switch connector not plugged in
2. Connector pins are not seated correctly, or the wire is damaged/broken
3. DB Resistor faulty

Possible Remedies

1 Visually determine if the DBR is connected to the MC. Ensure the cable connector is securely fastened and locked to the MC connector.
2 Use a multimeter to measure the DBR. It should read 100 ohms. If this is significantly higher than 100 ohms replace the resistor.

Error 19 – PFC Malfunction

MCL – Yellow
ASL – Yellow Solid

Description

The Control Module monitors the PFC (power factor correction) circuitry, and gives this error when the PFC malfunctions.

Possible Causes

1. The Control Module has had a hardware failure.

Possible Remedies

2. If the problem is persistent, replace the Control Module.
3.
4.

Error 20 – Motor will not start / No motor movement detected

MCL – Yellow
ASL – Yellow Solid

Description

When a program is started the drive motor does not move OR during a workout the motor stalls OR cannot maintain the requested speed.

Note:
This error requires that the power must be cycled on the MC to clear the error.

Possible Causes

1. The deck and belt may have very high friction causing an overload on the motor.
2. The drive motor could be bad.
3. The Motor Controller could be bad.

Possible Remedies

1. Check the belt rating and current draw of the treadmill. Replace deck and belt if necessary.

2. Test the drive motor per procedure, ***Troubleshooting the 3 Phase AC Drive Motor System,*** starting with step 4.
3. Test the Motor Controller per procedure, ***Troubleshooting the 3 Phase AC Drive Motor System,*** steps 1 thru 3.
4.
5.

Error 25 – Lower Drive Hardware Error

MCL – Yellow
ASL – Yellow Solid

Description.

The Control Module monitors the functionality of the module, and in the event of a module failure an Error 25 will be generated, and the treadmill will not work.

Possible Causes

1. Control Module Hardware fault.

Possible Remedies

1. Check the error log, if there are multiple instances of this error, replace the module.
2. If there is only one Error 25, cycle power to the module once. If it does not recover, replace the module.

Error 27 - Too Much Drive Motor Current

MCL – Green
ASL – Yellow Solid

Description

The Motor Controller monitors the amount of current being delivered to the drive motor. The software sets a maximum amount of allowable drive motor current. This error indicates that maximum drive motor current has been reached.

Possible Causes

1. The running belt and/or running bed are badly worn.
2. The motor is faulty

Possible Remedies

1. Check the belt rating – replace belt and deck as necessary. See BELT Rating XX to determine if the belt needs replacing.
2. Test the drive motor per procedure, ***Troubleshooting the 3 Phase AC Drive Motor System***, starting with step 4.

Error 28 - Temperature Too High / Drive Electronics

MCL – Yellow
ASL – Yellow Solid

Description

The Motor Controller monitors the temperature of the motor controller output switching device, using a fan to force cool the output devices via a large heat sink. This error indicates that the heat sink temperature has exceeded maximum.

Possible Causes

1. The lower PCA cooling fan or heat sink is clogged.
2. The lower PCA cooling fan is inoperative.
3. The lower PCA is defective.

Possible Remedies

1. Check the cooling fan mounted on the Motor Controller to ensure that the fan is not clogged with dust. Thoroughly clean the fan and ensure that it spins freely.
2. The lower PCA is clean and unobstructed but the fan does not spin. Ensure that the fan wiring is securely and correctly connected to the Motor Controller. If the fan is unobstructed and the fan wiring is good, replace the Motor Controller.
3. Substitute a known good Motor Controller to determine if the Motor Controller is defective.
4.
5.

Error 88 – Temperature Too High / Motor Temperature Switch

MCL – Green
ASL – Yellow Solid

Description

The drive motor contains a thermal switch which will open when the motor temperature reaches a specific set point.

Possible Causes

1. Motor thermal switch not connected/connector not seated completely
2. Bad belt and/or deck
3. Motor thermal switch failed open
4. Motor Controller hardware fault

Possible Remedies

Verify that the connector is properly seated in the Motor Controller MTH jack

1. Check the belt rating and current draw of the treadmill – replace the deck and belt as necessary
2. Check the resistance across the motor thermal switch connector. If it is greater than 10Ω, replace the motor
3. Verify the Motor Controller is working correctly by substituting a known good controller.
4.
5.

Error 35 - Excessive AC Input Current / Instantaneous

MCL – Green
ASL – Yellow Solid

Description

The Control Module monitors the AC input current, and if there is an instantaneous extremely high pulse in excess of 65A, the control module will shut down and log an Error 35.

Possible Causes

1. Although this error is designed to detect and protect against a high pulse of current, the most likely cause of this error being logged is a hardware failure in the Control Module.

Possible Remedies

1. Cycle power to the Control Module; if the error is persistent, replace the Control Module.
2.
3.

Error 36 - Excessive AC Input Current/ Circuit Breaker Trip Prevention

MCL – Green
ASL – Yellow Solid

Description

The Control Module monitors the AC input current. If the AC input current reaches a value slightly over 20 amps RMS (averaged over 2.5 sec.) and maintains this current for a period of time, the drive motor system will shut down and an error 36 will be logged.

Possible Causes

1. Bad belt and deck
2. Shared neutral/wiring undersized
3. Low AC line voltage
4. DB resistor stuck ON

Possible Remedies

1. Check the belt rating and current draw of the treadmill – replace belt and deck as necessary.
2. Monitor minimum RMS line voltage with:
    a. Treadmill at banner or welcome screen
    b. Treadmill at 6 Mph with runner
    c. Treadmill at banner, run at 6 Mph on neighbouring tread
    d. If fluctuations of more than 15% are observed between banner case to runner at 6 Mph case OR if fluctuations of 5V or more are seen when running on a neighbouring treadmill, request the club to have an electrician evaluate the distribution wiring
3. Check the DB resistor temperature. If it is stuck ON it may be hot. If stuck ON, replace both DB resistor and the Control Module.

Troubleshooting the Incline System

Incline System Description:

The Lift system consists of an AC line voltage driven lift motor (120VAC or 240VAC), and an internal 1kΩ 5W potentiometer for lift position monitoring. When you start to troubleshoot the lift system it is important to determine if the problem is due to an inability to move the lift, or an inability to monitor the lift position.

This will determine whether you need to troubleshoot the AC voltages going to the motor windings, or if you need to troubleshoot the DC voltages and/or ohm readings from the potentiometer. The error log will help determine which is causing the issue.

Press and hold the reset key for at least 6 seconds, if there are errors logged in the error log this action will take you into the error log.

If there is an error code for a lift system error (Error 40 through 45) logged in the error log, go to the appropriate error code troubleshooting page and follow the steps for that error.

Note: All resistance measurements must be performed with power removed from the treadmill. Performing resistance measurements with voltage applied may damage your ohmmeter.

Operation of lift motor for testing:

In manual operation the treadmill will require the running belt to be moving to operate the lift. For this reason it is recommended that the servicer use the Machine Tests within the "Hardware Validation" mode (accessible through Pause-5-1-7-6-5-7-6-1) to check lift operation. This will allow the lift to move without moving the running belt. Additionally the lift will be able to be operated independently of the A/D setting being out of range. This allows for the technician to recover from a lift motor that has erroneously moved beyond the normal operating range.

Error 40 - No Lift Motion Detected

MCL – Green
ASL – Yellow Solid

Description

Error indicates that the incline (lift) system has been instructed to start moving and no lift motion has been detected by the lift position monitoring system.

Possible Causes

1. Lift connector not seated
2. **Lift motor connector pins damaged**
3. Lift motor winding blown
4. Lift motor is physically jammed and unable to move
5. Lift capacitor is bad
6. Lift fuse is open
7. The Control Module is bad

Troubleshooting Procedures

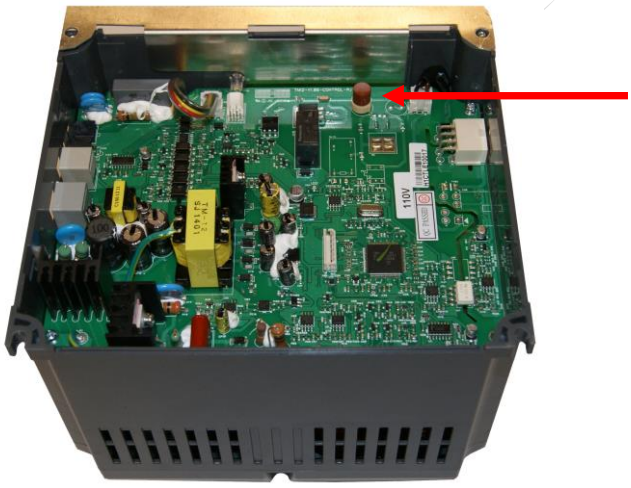
1. Set the treadmill's on/off switch in the off position. Visually inspect the lift motor's wiring and connector for any broken or improperly crimped connections. With an ohmmeter, measure between terminals 1 (white) & 5 (black) and 1 (white) & 6 (red) of the INCLINE connector. Both readings should be approximately 12 Ω (Ohms) for a 120VAC lift motor and approximately 24 Ω (Ohms) for a 240 VAC lift motor. If either reading is significantly high or open replace the lift motor.

2. Disconnect the lift motor from the lift platform. If the lift tube or lift nut is jammed against the motor housing, rotate the lift nut or lift tube away from the motor housing.

-
- If the lift was jammed, please refer to Calibrating the Lift motor, and reattach the lift motor to the lift platform.
  -

3. Set the On/Off switch to Off and unplug the tread from the wall. Remove the MC from the frame by loosening the four screws that secure it to the pan. Unplug all the connectors to access the bottom of the MC, and snap it off. The fuse is located as shown in figure 6. Using an ohmmeter, measure the fuse. If the reading is anything other than near 0Ω, replace the fuse, reinstall the MC and all connectors, and retest. If the fuse opens again, troubleshoot the motor for movement or shorted wiring.

Figure 16, Lift Fuse Location, MC Bottom Cover Removed



The lift capacitor is mounted inside the lift motor. If the lift capacitor is shorted, the lift fuse will blow. The capacitor may be checked by disconnecting the lift motor connector from the Motor Controller and using an ohmmeter to measure between pins 5 & 6 of the lift motor connector. If the lift capacitor is leaky, it may work for lighter people and not for others, while if it is open it will not work at all. If the capacitor is open or leaky it cannot be determined with an ohmmeter so the following test will determine if the capacitor is bad.

•

4. With the incline below 15% (to allow room for lift travel), connect an AC voltmeter between terminals 5 (black) & 6 (red) of the INCLINE connector. See Figures 4 and 5 for reference. Set the treadmill in the manual program and press the INCLINE ↑ key. The AC voltmeter should read between 1.5 to 2.0 times the AC line voltage. If this reading is significantly low, replace the lift motor. Note that the AC line voltage reading will only be present before an error condition is displayed.
    - If the capacitor is bad the lift motor must be replaced.
5. The lift switch could fail in an operated (shorted) condition. If this happens the lift will move (either up or down) as soon as the unit is powered up. The typical result is that the lift will be physically jammed as described above, and it will also probably cause the internal lift fuse to blow. If the lift moves un-commanded as soon as the power is turned on to the machine and eventually jams, the Motor Controller must be replaced. The lift switch may also fail in an open condition. If this happens the lift will not operate in one direction. Perform the following steps to determine if the switch is open.
6. With the incline below 15% (to allow room for lift travel up), connect an AC voltmeter between terminals 1 (white) & 6 (red) of the INCLINE connector. (See Figures 4 and 5 for connector location and pin numbering). Set the treadmill in the manual program and press the INCLINE ↑ key. The AC voltmeter should read AC line voltage (either 120VAC or 240VAC). Note that the AC line voltage reading will only be present before an error condition is displayed. A correct reading here verifies that the UP switch is working properly.
7. With the incline above 0% (to allow room for lift travel down), connect an AC voltmeter between terminals 1 (white) & 5 (black) of the INCLINE connector. Set the treadmill in the manual program and press the INCLINE ↑ key. The AC voltmeter should read AC line voltage (either 120VAC or 240VAC). Note that the AC line voltage reading will only be present before an error condition is displayed. A correct reading here verifies that the DOWN switch is working properly.
    - If either of these conditions fail, the Motor Controller must be replaced**.**
    - If a lift motor winding is bad, the lift will not operate in one or both directions depending on the exact fault in the motor. Replace the lift motor if the previous tests all pass.

Error 42 - Lift Position Value Out of Range

MCL – Green
ASL – Yellow Solid

Description

This error code monitors the physical lift position via a lift position potentiometer that mechanically tracks the lift's physical position and sends a DC voltage back to the control system. The voltage is converted to a 16 bit digital number. This number is then used to determine the lift's physical position. Software sets upper and lower numerical limits. If the lift position number is found to be outside of the set limits, error 42 will be displayed.

When troubleshooting an error 42 it is important to be aware of the actual physical position of the lift when the error occurs. If the lift is physically out of range or jammed you must first determine why the lift is physically out of range.

The A/D value for the home position (0%) is approximately 6800, and its A/D value at its lowest incline (-3%) is approximately 4300.

Possible Cause

- Lift motor drifted too low, less than -3%
- Lift motor connector not seated correctly
- Lift motor connectors backing out of the connector
- Lift motor potentiometer faulted
- Lift out of calibration

If the lift had been calibrated correctly at the time of installation and working for some period of time it would be highly unlikely for lift calibration to go out of calibration on its own. It would be more likely that something has broken causing the A/D value to be wrong.

1.

Possible Remedies

1. If the incline has drifted down, enter diagnostics and navigate to the Lift or Incline test. Attempt to drive the motor in the UP direction. If the lift does not move, remove the lift motor from the lift platform and verify the lift tube is not jammed against the motor assembly.
2. Intermittent connections can be difficult to locate. If the error 42 condition is intermittent a connection is almost certainly the problem. This is especially true if the error 42 occurs while the lift is within its normal physical range.

- Carefully inspect the lift potentiometer connector, repair the poor connection, if possible. If the intermittent connection cannot be found or repaired, replace the lift motor.
- An A/D number of 0 or 65535 indicates an open or shorted potentiometer connection. This problem could be anywhere between the lift motor and the upper PCA. It can typically be found and traced with an ohmmeter.
- Set the treadmill's on/off switch in the off position. Remove the lift motor's connector from the INCLINE connector on the Motor Controller. Visually inspect the lift motor's wiring and connector for any broken or improperly crimped connections. With an ohmmeter, read between terminals 3 (red) & 4 (black), 4 (black) & 8 (white) and 3 (red) & 8 (white) of the INCLINE connector. Terminals 3 (red) & 4 (black) should read approximately 1kΩ (Ohms).

The sum of the readings between terminals 4 (black) & 8 (white) and 3 (red) & 8 (white) should total approximately 1kΩ (Ohms). If either reading is significantly high or open, replace the lift motor.

NOTE: Readings While the Machine Is In the Home Position (Level)

- Potentiometer resistance black to red = approximately 1kΩ.
- Potentiometer resistance black to white = 20% of black to red (approximately 200Ω)
- Potentiometer voltage black to red = approximately 3.3 volts.
- Potentiometer voltage black to white = 20% of black to red (approximately 0.66 volts)
- A/D value = approximately 6800

- Refer to the lift calibration procedure. If the lift position number and physical lift position measurement does not correspond with the service manual, calibrate the lift motor.

Note: There must be a reason for the lift motor to be out of calibration, therefore simply re-calibrating the lift motor will often not fix the problem.

- If the lift calibration number (A/D value) is not 0 or 65535 and does not increment when the lift motor moves, replace the lift motor.
- If you have performed all of the procedures above and have been unable to correct the problem, search for solutions in the service bulletins or call Precor customer service.

Error 44 - Un-commanded Lift Motion

MCL – Green
ASL – Blue Solid

Description

The lift control system has detected that the lift is in motion without a lift command having been issued. This can happen in one of two ways: either the lift drive circuit has failed in a turned on condition or the lift position sensor (potentiometer) is sending an erroneous signal to the lift control circuit.

Possible Causes

1. **Poor or intermittent connection in the lift potentiometer.**
2. Bad Motor Controller.

Possible Remedies

1. Operate the lift in the diagnostics while monitoring the lift position number being displayed. If the reading is erratic and makes large changes in readings the lift position potentiometer is probably bad. Replace the lift motor.
2. If there is actual lift motion without a manual or program control lift command having been issued, replace the Motor Controller.

Error 45 - Lift Moving in Wrong Direction

MCL – Yellow

ASL – Yellow Solid

Description

The lift control system has detected that the lift is moving in the opposite direction of the issued lift command.

Possible Causes

3. Lift motor hysteresis
4. Miswired lift connector
5. Motor Controller hardware fault

Possible Remedies

1. Lift motor hysteresis would typically happen when the lift was already in motion (typically downward) when a lift command in the opposite direction (lift up) was issued.
2. This would most likely happen when the lift motor is new, or replaced. Verify the connector wiring. If this wiring is correct in the connector, replace the motor.
3. Check if the Motor Controller is properly controlling the lift motor – if the MC is always energizing the same coil, or not energizing any coils at all, replace the MC.

Troubleshooting Communications Errors

Errors 30 and 32 - Communications Error between Upper and Lower Boards

MCL – Yellow
ASL – Yellow Solid

Description

Errors 30 and 32 indicate the loss of communications or intermittent communications between the microprocessors in the upper PCA and the lower PCA. The trouble shooting procedures for all of the communication errors are essentially the same.

- Error 30 is defined as upper PCA not receiving from lower PCA.
- Error 32 is defined as lower PCA not receiving from upper PCA.

Possible Causes

1. The connector for the Data cable is not seated correctly
2. An upper PCA to lower PCA Data cable is bad
3. The interconnect cable at the upper PCA was mistakenly plugged into the CSAFE connector
4. Contact corrosion at connector/header

Possible Remedies

1. Inspect the cable for damage, both along the cable and on the connectors. Ensure locking tabs are intact and working.
2. Substitute a know good interconnect cable between the upper and lower PCAs to determine if the interconnect cable is defective.

3. Verify the data cable connectors have dielectric grease applied – if not apply grease.
4. Remove the interconnect cable from the CSAFE connector and insert it in the correct upper PCA connector.
5. Unplug all the components from the upper PCA and Motor Controller except, data cable, and the AC power going to the Motor Controller. If the unit shows an error other than a communication error, plug in components one at a time, cycling power after each new component is plugged in. If a communication error is displayed, the last component plugged in is the cause of the error.
6. Substitute a known good Motor Controller to determine if the Motor Controller is defective.
7. Substitute a known good upper PCA determine if the upper PCAs defective.

Error 37 - E-Stop Upper State vs. Lower State Mismatch

Description:

The error 37 is generated by the upper PCA in the console when the Motor Controller gets into an E-Stop state and the upper PCA in the console did not know about it. The system uses pin 8 of the data cable to communicate E-Stop states between the console and the Motor Controller.

Possible Causes:

1. Connectors not seated well on emergency stop switch.
2. Pinched/broken cable
3. Contact corrosion
4. Console hardware fault
5. Motor Controller hardware fault

Possible Remedies:

1. Verify the connectors to the emergency stop switch are seated correctly
2. Visually inspect the cables to verify they are sound
3. Run Treadmill and move communications cable to try and reproduce the error – if it reproduces, replace the cable. Be sure to apply dielectric grease to both connectors.
4. Verify Dielectric grease has been applied to both connectors of the data cable
5. If this error is persistent and none of the above solves the problem, replace the console.
6. If the console does not correct the problem, replace the Motor Controller

Error 86, 87 – Console / Motor Controller Mismatch – P10/P30 Only

Description

The software for the P10 andP30 is specific to the treadmill base upon which it is installed. If a console is installed and the software is not correct, the console will display either an error 86 or 87.

- Error 86 is defined as a console with TRM10 software being installed onto a TRM800 V.2.
- Error 87 is defined as a console with TRM800 V.2 software being installed onto a TRM10.

Remedy

Update the console with the correct software.

Worn Running Belt & Deck Troubleshooting

This procedure is to be used to determine the condition of the running belt and running deck combination. The AC input current is a direct indication of the load being placed on the treadmill. Treadmill loading consists of several factors, the user's weight, treadmill speed and condition of the running belt and running deck.

With each foot plant friction is created, and the MC overcomes this by adding additional current to the motor. As the deck and belt wear, this friction increases, causing the MC to have to supply more current to compensate. The console software uses an algorithm to determine the belt/deck friction measurement, and displays this in the information display as Belt Rating. This is a ranking representing the average input currents from the last 100 workouts, weighted by treadmill speed. The ranges go from 10 (best) to 0 (worst). While this information is useful to see the wear of the belt/deck in order to anticipate the need for changing them, it does not tell you how many miles may be left on your belt.

The Active Status Light (ASL) will start pulsing blue when the belt rating is 0 or 1, and will reset to solid blue when the rating is 2 or higher. A belt rating of 2 indicates a severely worn belt and deck. You can attempt to resolve the issue by doing belt/deck cleaning maintenance and then resetting the belt Maintenance Reminder function, see *Introduction to Treadmill Troubleshooting - How to reset a blue pulsing ASL light*. If the issue is a worn belt, the blue flashing ASL will return after approximately 1-2 months.

Belt Rating Details

- The belt wear will be measured from 0 – 10 with 10 representing a new belt and 0 representing a fully worn out belt.
- The state of belt wear can be viewed in the Information Display menu
- Belt rating is an algorithm derived from the average of the last 100 workouts between 5.5 and 12.5 mph, looking at current draw and other parameters. To reach a level below "2" says that there is severe deck and belt wear.
- In the P30, this menu is also used to clear out the belt history and reset the belt rating to 10 after a tech has serviced the unit and replaced the belt.
- When the belt rating goes below 2, the ASL (Active Status Light) will go to the blue flashing state as described in the LED status flowchart.
- The ASL will automatically change back to blue solid once the belt rating has moved above 2.

Procedure

1. On the console enter the information display (RESET, 6, 5) and navigate to the Belt Rating selection. Press OK, and note the Rating. A lower rating may indicate that the belt and deck need cleaning. If the rating is 0 or 1, the belt will need to be replaced, and the deck should be flipped or replaced if previously flipped. See procedure ***Running Belt and/or Deck Replacement***.

2. Press and hold QuickStart while in the belt rating menu to reset the rating to 10. When the rating is reset, the algorithm takes this into account, and loads new average data into the equations. In this way if the deck and belt are truly worn out the blue pulsing light will return after 1-2 months.

Troubleshooting the Auto Stop Feature

Auto stop is a feature incorporated into current Precor Commercial Treadmills. This is a safety feature that shuts off a treadmill that has been abandoned while the belt is running. Exclusive of the first sixty seconds after a workout has begun or resumed, any 30 second window with no user detected will prompt a 10 second countdown and then a full stop. The detection is done through software, and has been tested to detect person 50 lbs (22.7kg) or greater walking with a normal cadence.

The feature is selectable ON or OFF in the facility settings menus. It is default from the factory set to ON, and it is recommended that this be left this way.

Procedure:

1. Access the service access software (hardware validation tests), and select the Auto Stop test. When the feature is enabled the P10 or P30 consoles will display USER DETECTED if motion is detected from the running deck or NO USER DETECTED if no motion is detected from the running deck. It may take 5 or 6 steps for the USER DETECTED to be displayed. This cycle will start over if the speed is changed. On the P80 console when START is pressed, after a few steps the status line will say USER DETECTED and the STEP COUNT will show the steps. If steps are not detected NO USER DETECTED will be displayed in the status field.
2. If the Auto Stop Feature did not pass the test replace the MC.

Troubleshooting Heart Rate Issues

Hand Held Heart Rate Does Not Work

1. Place your hands on the HHHR (Hand Held Heart Rate) contacts, making full contact with both top and bottom contacts for at least 15 seconds.

- If the unit displays a heart rate, no problem exists.
- If the unit does not display a heart rate value within this time, continue to step 2.

2. Set the on/off switch to the off position, wait 10 seconds, then set the on/off switch to the on position and repeat step 1.

- If the HHHR functions correctly, then the processor on the HR board was in a "latched-up" condition, and cycling the power cleared the condition.
- If the HHHR does not function correctly, continue with step 3.

3. Verify that the HHHR board has the correct operating voltage. Connect a voltmeter to Vdc and Ground on the Power/Signal connector. The voltage should read between 4.5 and 5.5VDC.

4. Verify the wiring of the HHHR contacts (top left, bottom left, top right, bottom right) go to the proper pin on the Grip/Contact connector, that none of the lines are shorted,

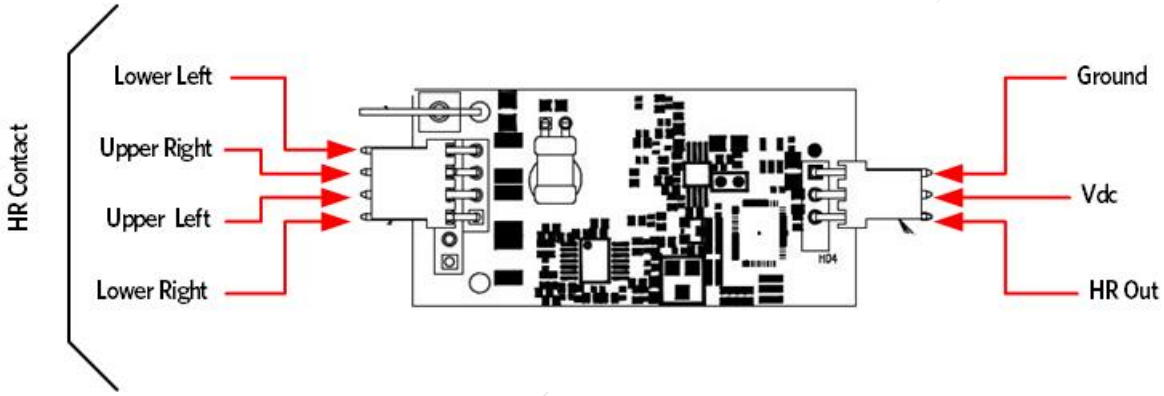
- If NO, Correct the wiring error.
- If Yes, Continue.

5. Verify that the grip connections are free of corrosion.

- If NO, Replace the corroded HHHR grips.
- If Yes, Continue.

6. Verify that the unit does not display a heart rate with only one hand on a grip. This would indicate static damage, and require replacement of the heart rate board.
7. If the above procedures do not correct the problem, replace the heart rate board.

Figure 17: Hand Held - Chest Strap Heart Rate PCA



Wireless Heart Rate Does Not Work

1. Verify wireless heart rate with a known good chest strap transmitter or test transmitter. If the heart rate reading is erratic, incorrect, or absent, continue with step 2.

NOTE: It may be necessary to lean in closer to the console at first to allow receiver to begin to acquire a heart rate signal.

2. Verify that the HHHR board has the correct operating voltage. Connect a voltmeter to VCC and Ground on the Power/Signal connector. The voltage should read between 4.5 and 5.5VDC.
3. Identify other sources of wireless interference signals in close proximity to the unit (such as Wi-Fi networks, cordless phones, etc.).

NOTE: This is not to say that something like a Wi-Fi network cannot be present at all, but if it is transmitting in close proximity to the treadmill the heart rate system MAY pick it up. These interference sources can be very difficult to track down and locate, and may require that you ask the customer if such devices are present. Some common sources of interference signals are listed below.

Possible sources of interference signals include, BUT NOT LIMITED TO:

- Wi-Fi Network Routers
- Cordless Telephones
- Cell Phones
- Electronic Dog Fences
- Garage Door Remotes
- Noisy AC feeds
- Florescent light ballasts

4. Using an ohmmeter, verify that upper and lower PCAs have a good electrical path to chassis ground.
5. If the above procedures do not correct the problem, replace the heart rate board.

Replacement Procedures

This section contains the following replacement procedures:

- Removing the Hood
- Removing the Deck Trim Strips
- Removing the Front Side Trim
- Replacing the Line Cord, Circuit Breaker or ASL
- Replacing the Line Filter
- Replacing Drive Motor
- Replacing the Lift motor
- Replacing the Incline Platform
- Replacing the Motor Control Module
- Replacing the End Cap or Belt Guard
- Drive Belt and Roller Replacement
- Take Up Roller Replacement
- Running Belt and/or Deck Replacement

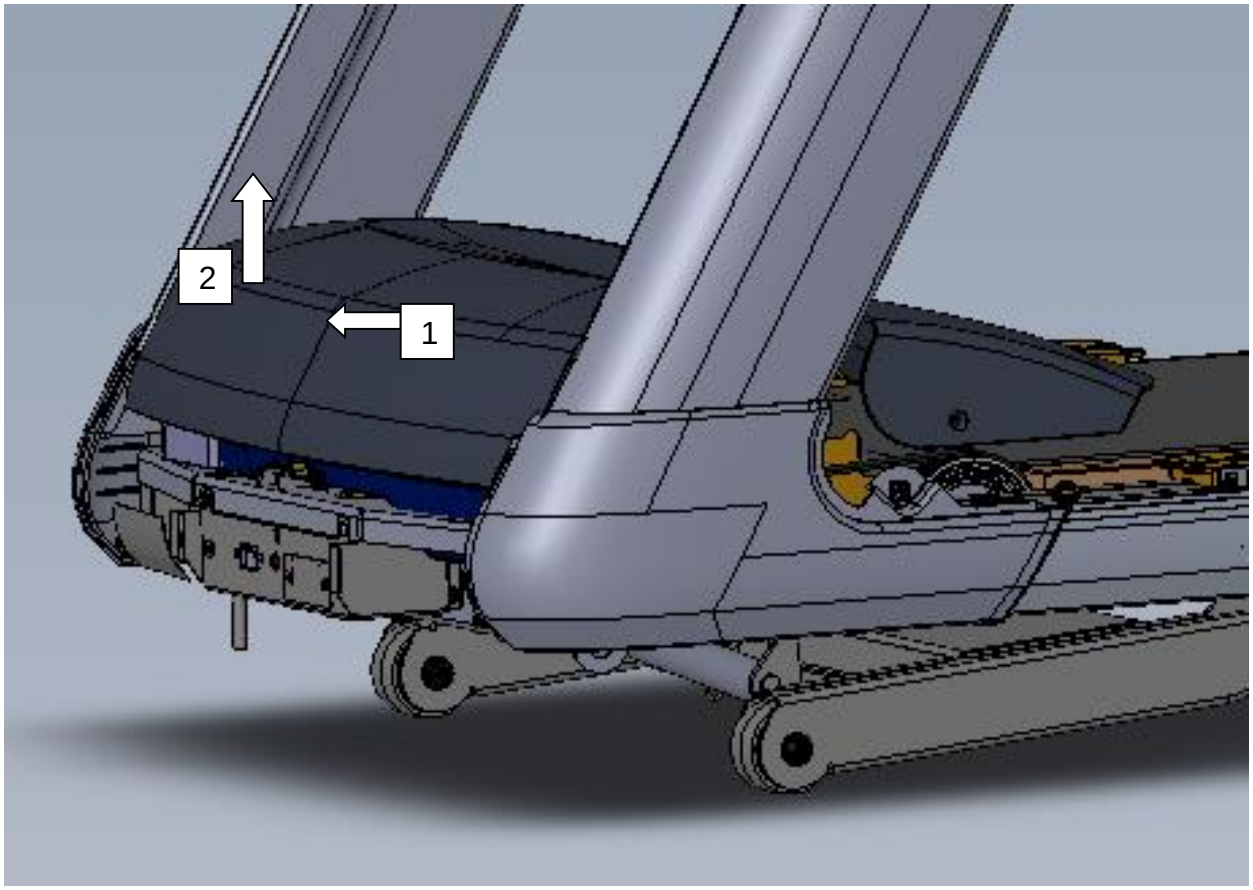
Removing the treadmill hood.

Most replacement procedures will require that the hood over the front drive system is removed. There are six #3 Phillips screws that secure the hood to the frame. The front of the hood is curved to provide a sleek appearance to the treadmill. It will be necessary to flex the cover to make this curved material clear the frame. Similarly, it is necessary to flex the cover outward to replace the cover onto the tread when the service is accomplished.

Procedure:

1. Remove the screws securing the hood to the frame.
2. Grasping the front bottom of the hood, pull out and lift up to clear the curved edge of the frame. See figure 8-1.
3. Reverse the process to install the cover and secure it with the screws removed in step 1.

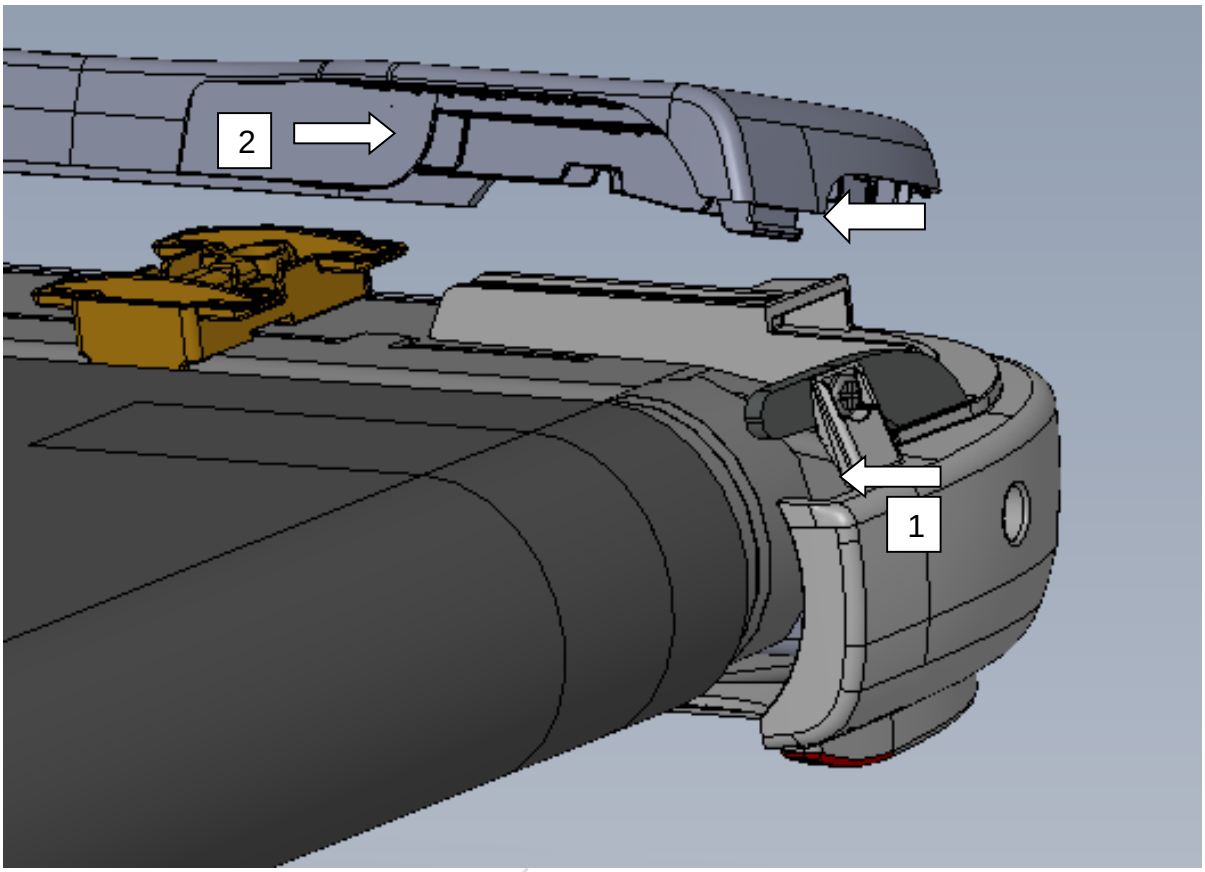
Figure 18, Front cover removal, 1 – Grasp and pull, 2- Lift up and away



Removing and replacing the Deck Trim Landing Strips.

1. Set the treadmill circuit breaker in the off position and unplug the treadmill's line cord from the AC outlet.
2. Remove the hood.
3. Remove the screw, washer and spacer from the front of the Deck Trim Landing Strip.
4. At the rear of the tread, grasp the inside of the trim, and sharply pull up to unsnap the trim from the rear cover.
5. Grasp the landing and pull back sharply, about ¾ inches, to detach the trim from its mounts.
6. Install the new landing in the reverse order. It may help to lock the tab in the back by flexing the landing, allowing room for the lock to slip past the edge of the rear cover.
7. Install the screw, washer and spacer; torque the screw to 30 in-lbs. The spacer is important to prevent the screw compromising the plastic in the landing.
8. Replace the hood.
9. Check treadmill operation per, ***Checking Treadmill Operation***.

Figure 19: Deck Trim Landing Strip removal 1. Press in while lifting, 2. Pull to the back.



Removing and replacing the front Corner Cover

1. Set the treadmill circuit breaker in the off position and unplug the treadmill's line cord from the AC outlet.
2. Remove the hood.
3. Remove the #3 Phillips screw securing the corner cover to the frame.
4. Pull back on the front of the cover, freeing the tab that wraps around the upright.
5. Lift the back slightly, allowing the side tabs to come out of the frame, freeing the cover.
6. Install the cover by first aligning the side tabs of the cover with the holes in the frame, and then push the cover into place so the front tab is inside the upright.
7. Secure it to the frame with the screw removed in step #3.
8. Replace the hood.
9. Check treadmill operation per, ***Checking Treadmill Operation***.

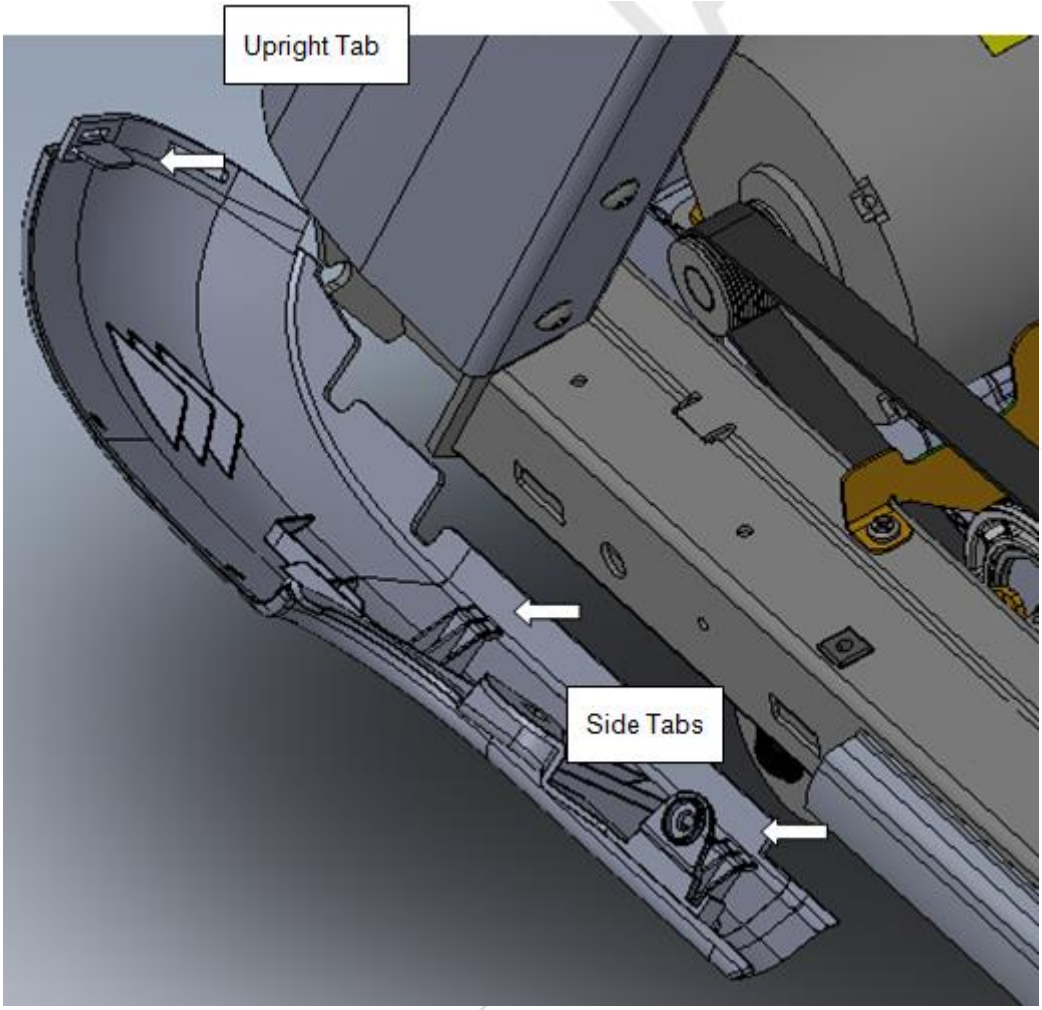
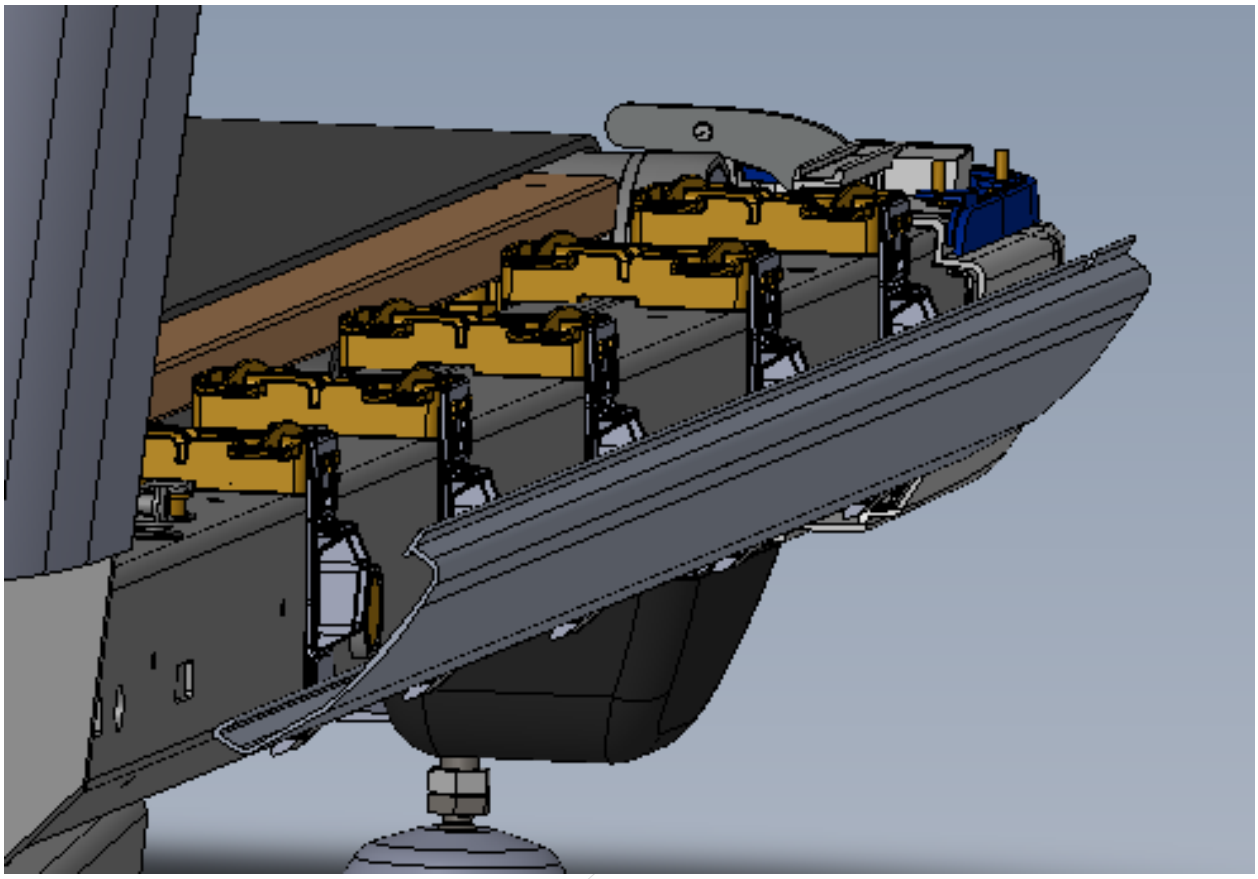


Figure 20: Removing the front corner cover.

Removing and Replacing the Side Trim

1. Set the treadmill circuit breaker in the off position and unplug the treadmill's line cord from the AC outlet.
2. Remove the hood.
3. Remove the front Corner Cover and the Deck Trim Landing.
4. Using your hands, pull back the top edge of the side trim to lift if off the plastic anchors.
5. Slide the side trim downward to separate it from the treadmill.
6. Install the side trim by lifting the bottom of the trim into the hooks on the anchors, then snapping the top over the anchors hooks at the top.
7. Reinstall covers.
8. Check treadmill operation per, ***Checking Treadmill Operation***.

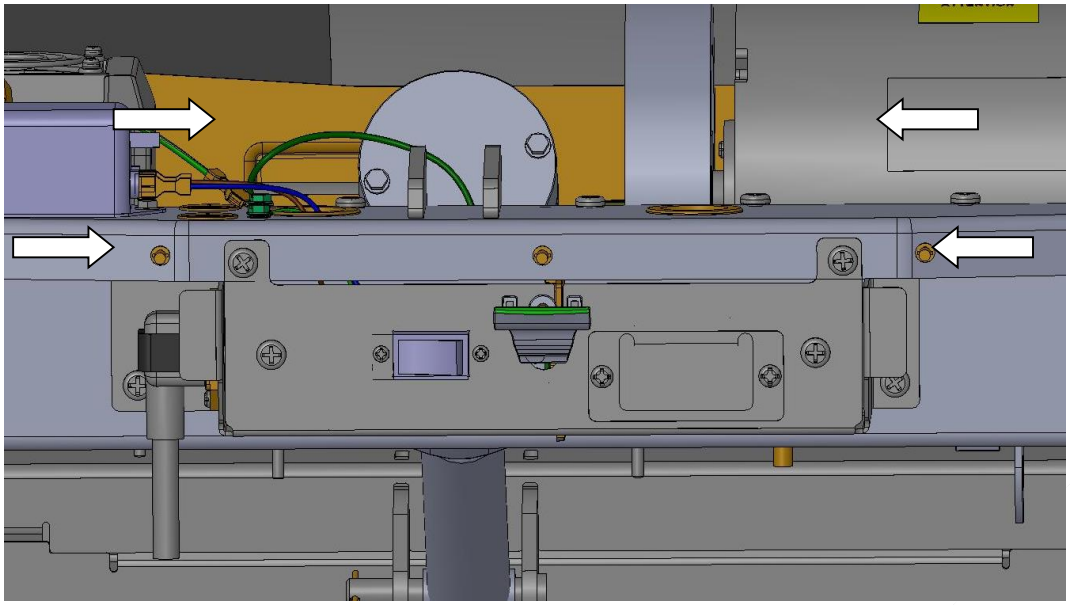
Figure 21: Side Trim removal.



Removing and replacing the Line Cord, Circuit Breaker or ASL PCB.

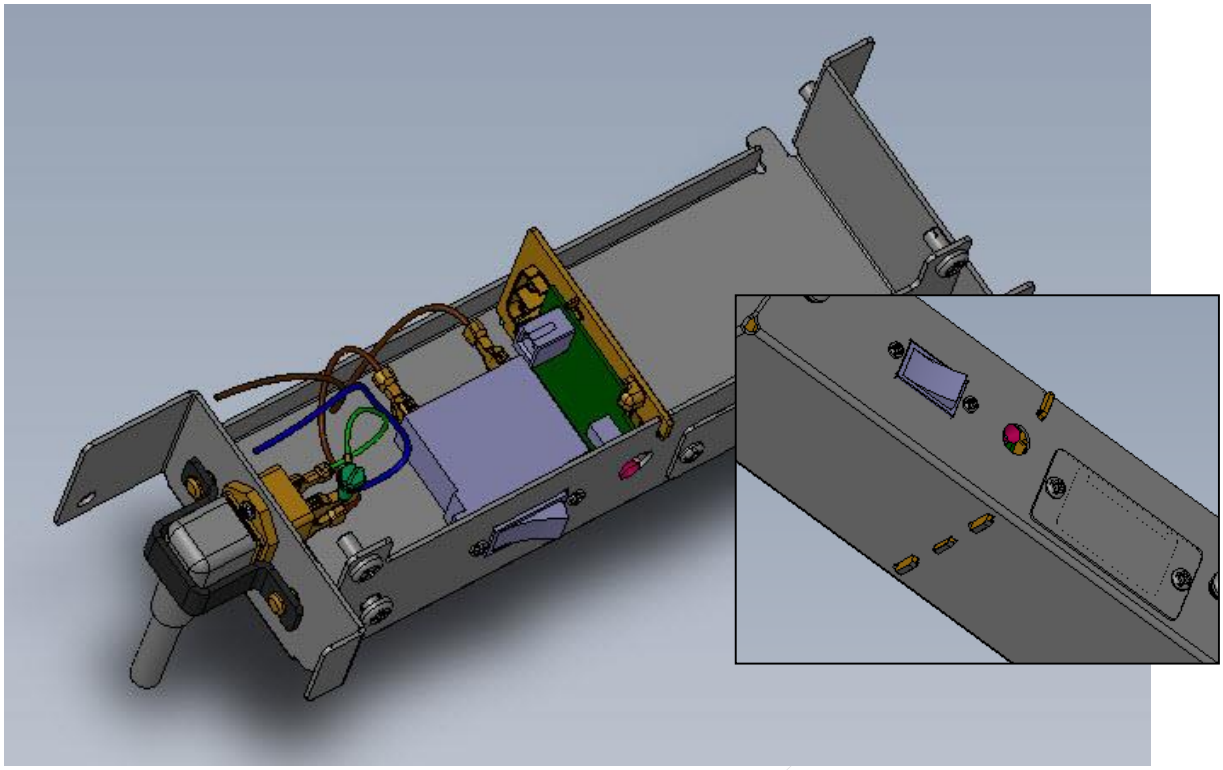
1. Set the treadmill circuit breaker in the off position and unplug the treadmill's line cord from the AC outlet.
2. Remove the hood.
3. Remove the four #3 Phillips screws that fasten the AC input assembly to the frame (see Figure 5).

Figure 22: AC Input Assy. screw locations



4. Lift the AC input panel from the frame and rotate it to expose the mounting hardware of all attached items.
5. Remove the blue wire and ground wire from the power receptacle.
6. Remove the brown wire from the input side of the line filter.
7. To remove the ASL board, unsnap the plastic holder from the panel by pressing the tabs on the bottom of the panel, then lifting the holder. Unsnap the PCB from the holder to disconnect the RJ11 connector. See Figure 6, Next page.
8. Remove and replace the power cord, power receptacle, and circuit breaker, reusing the hardware.
9. Replace the ASL PCB holder into the panel, ensuring it snaps firmly into place.
10. Set the input panel in its mounting position and fasten it with the hardware removed in steps 3 to7.
11. Replace the hood.
12. Check treadmill operation per, ***Checking Treadmill Operation***.

Figure 23: ASL PCB Holder detail



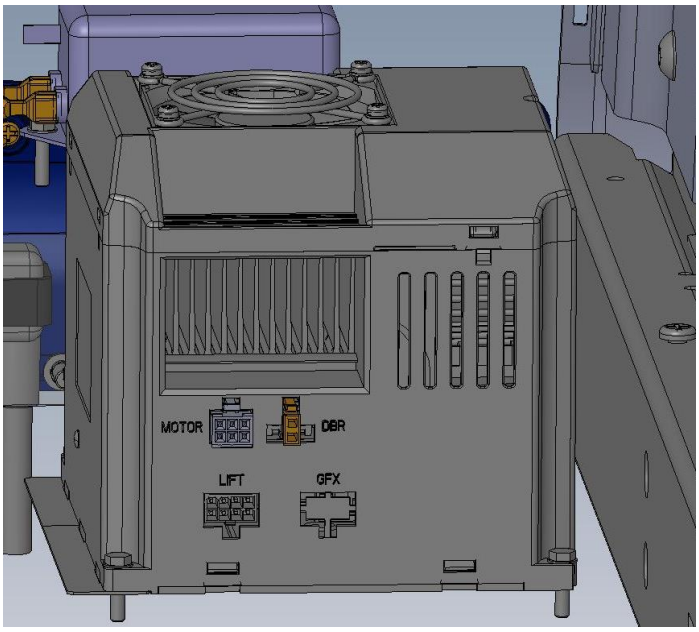
Replacing the Motor Control (MC) Module

1. Set the treadmill on/off switch in the off position and remove the AC line cord from the AC outlet.
2. Remove the hood.
3. Facing the front of the treadmill, loosen the two screws on the left side of the MC. Do not remove them as the MC has slots on the left side of the housing.
4. Loosen the two screws on the right side until they are free of the frame. Do not remove them completely as they will stay attached to the plate mounted to the MC.
5. Lift the MC from its location and then disconnect all cables connected to it.

Note: The COMM cable has dielectric grease applied to ensure proper connections are maintained. Do Not wipe off the grease.

6. Reconnect all cables and connectors removed in step 5.
7. Set the replacement motor control module in its mounting position
8. Tighten securely all 4 screws.
9. Replace the hood.
10. Check treadmill operation per, ***Checking Treadmill Operation***.

Figure 24: Motor Control Module



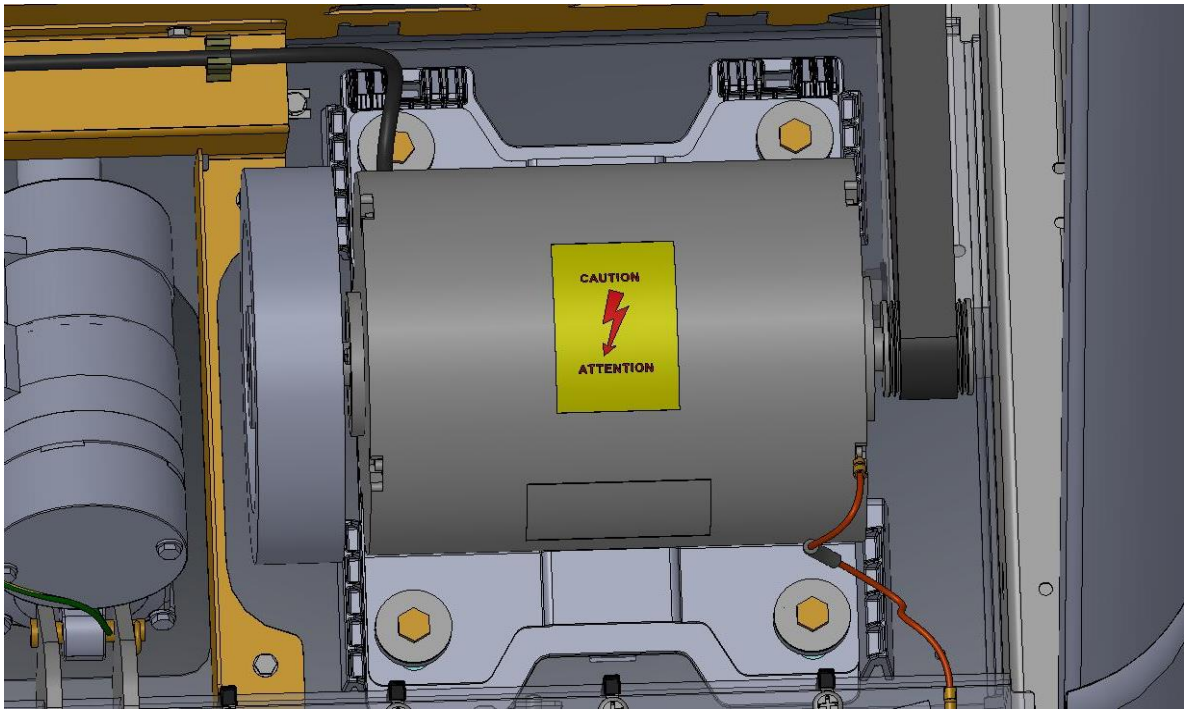
Replacing the Drive Motor

1. Set the treadmills on/off switch in the off position and unplug the treadmill's line cord from the AC outlet.
2. Remove the hood.

Note: Due to the location of the connectors t may be easier to perform this service if you lift up the MC. Refer to Replacing the Motor Controller (MC) Module.

3. Disconnect the drive motor connector from the MOTOR connector on the MC.
4. Walk the drive belt off the pulley on the drive motor.
5. Remove the four bolts and plastic isolation spacers that fasten the drive motor to the frame.
6. Set the replacement drive motor in its mounting position and fasten the drive motor with four mounting bolts and spacers removed in step 5.
7. Connect the bleed resistor (Red Wire) between the motor and the frame.
8. Walk the drive belt on the drive roller pulley and on the drive motor pulley.
9. Adjust the drive belt tension and complete the motor installation, got ot *Adjusting Drive Belt Tension*.
10. Install the MC (if necessary) and all covers.
11. Check treadmill operation, go to ***Checking Treadmill Operation***.

Figure 25: Drive motor mounting.



Replacing the Lift motor

This procedure calibrates the replacement lift motor prior to installation.

1. Set the treadmill circuit breaker to OFF.
2. Remove the hood.
3. Calibrate the replacement Lift Motor
   a Disconnect the lift motor connector from the motor controller (MC) "LIFT" input port,

   Tip: It may be easier to disconnect/connect the MC connectors by removing the MC from its mounting bracket and lifting to access the connections.

   b Lay the replacement lift motor on the floor in front of the treadmill with space to allow lift actuator jack screw movement up and down. Connect the lift motor connector to the MC "LIFT" input port.

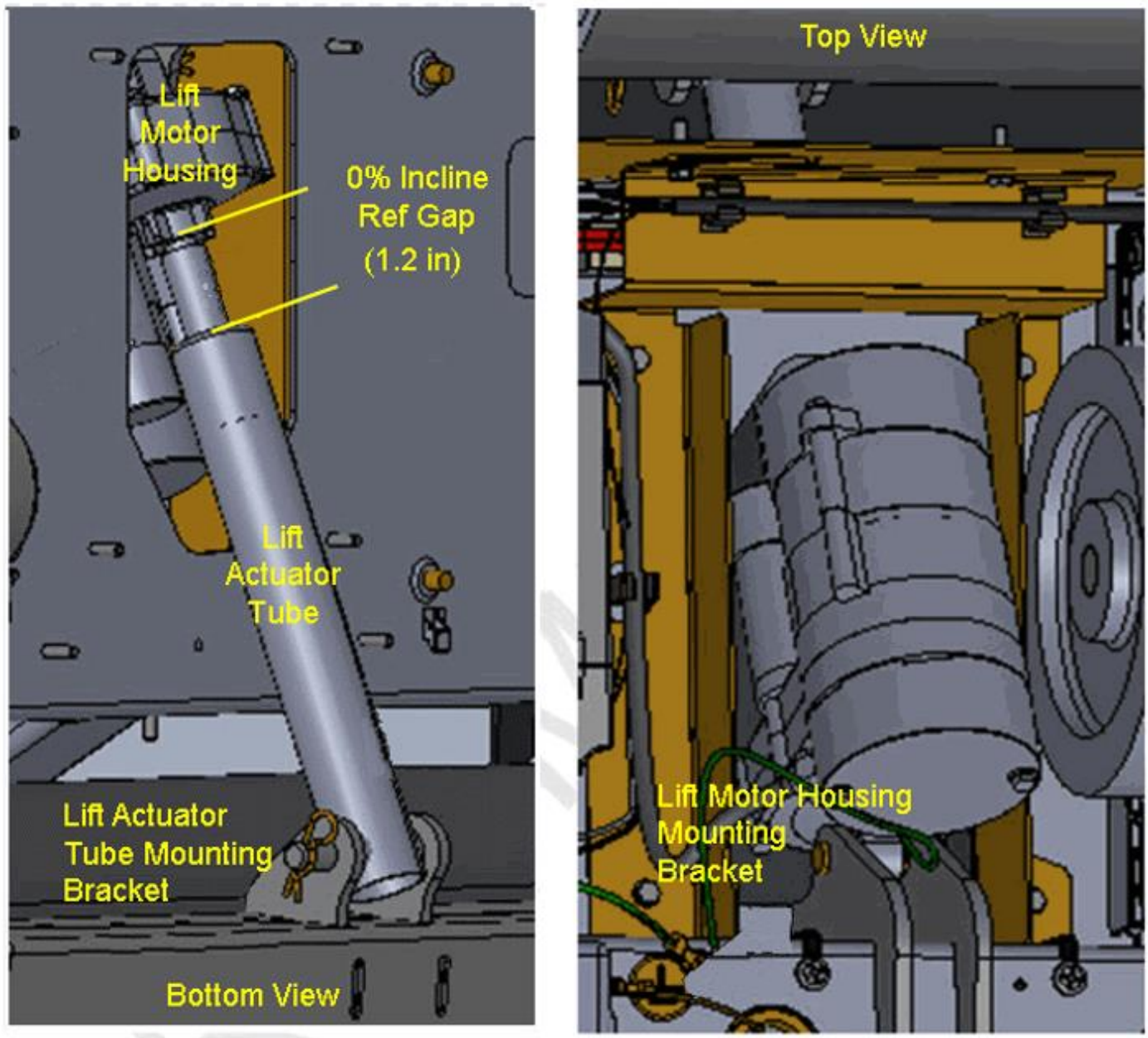
   c Set the treadmill circuit breaker to ON. The treadmill will begin to auto-calibrate the replacement lift motor to the home position (0% incline position).

   Warning: Be aware that the lift motor actuator will begin to auto-calibrate causing movement to the lift motor actuator when power is applied to the treadmill.

   d Set the treadmill circuit breaker to OFF and disconnect the power cord. Disconnect the replacement lift motor connector from the MC "LIFT" input port.

   e Set the lift actuator 0% incline reference gap to 1.2 inches as measured between the top of the lift actuator tube nut to the bottom of the lift motor actuator housing. Firmly hold the jack screw from turning while adjusting (turning) the lift actuator tube nut.

Figure 26: Replacing the Lft Motor



Access the lift motor mounting brackets. You can either 1) carefully lay the treadmill on its side or 2) remove the treadmill base weight from the lift platform by raising and securely resting the frame base onto blocks placed under the front corners of the frame.

4. Remove the defective lift motor:
   a Remove the green/yellow lift motor ground wire from the frame.
   b Remove the lift actuator tube from the lift platform, remove the hitch pin and clevis pin.
   c Remove the lift motor actuator housing from the frame mounting bracket. Grasp the lift motor and remove the lift motor housing mount hitch pin and clevis pin. Remove the lift motor from the treadmill.

5. Install the pre-calibrated replacement lift motor.

Note: Be careful to not allow the actuator tube nut to turn during the installation process. This will cause the actuator reference gap to change.

a Set the lift motor housing mount into the base frame mounting bracket. Install the clevis pin and secure with the hitch pin.

b Set the actuator tube into the lift platform mounting bracket. It may be necessary to slightly rotate the actuator tube to align the clevis pin mounting holes. Choose an adjustment direction that will minimize the change to the actuator tube reference gap distance. Firmly hold the jack screw from turning while adjusting (turning) the lift actuator tube nut.

c Connect the frame ground wire to the treadmill frame. Securely tighten the mounting screw to ensure very good electrical connectivity.

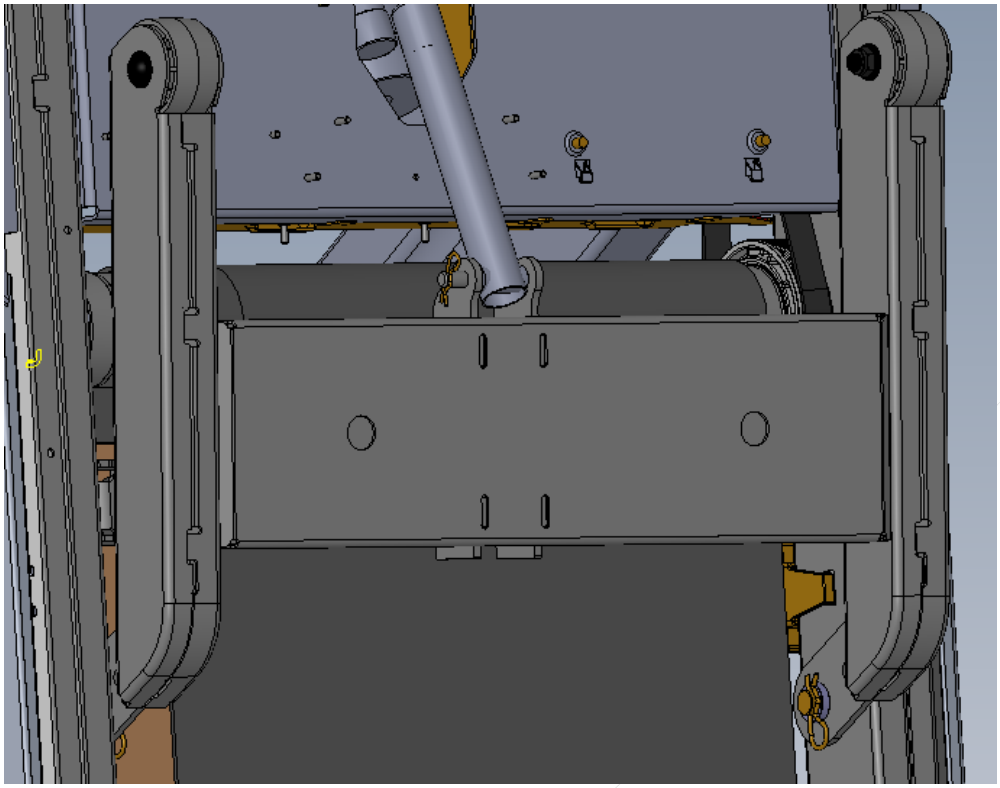
d Route the lift motor cable through the frame cable clip. Connect the lift motor cable connector to the MC "LIFT" input port.

5. Install the MC if it was removed.
6. Return the treadmill to upright position or remove support blocks.
7. Install the hood.
8. Connect the power cord and set the treadmill circuit breaker to ON.
9. Verify the treadmill incline function and return to service, see ***Checking Treadmill Operation***.

Replacing the Incline Platform

1. Set the treadmill circuit breaker in the OFF position. Remove the AC line cord from the AC outlet.
2. Remove the hood, front corner trim, deck trim landings and the side trims.
3. Carefully, lay the treadmill on its side, or block it up to take the weight off of the lift platform.

Figure 27: Incline Platform Mounting



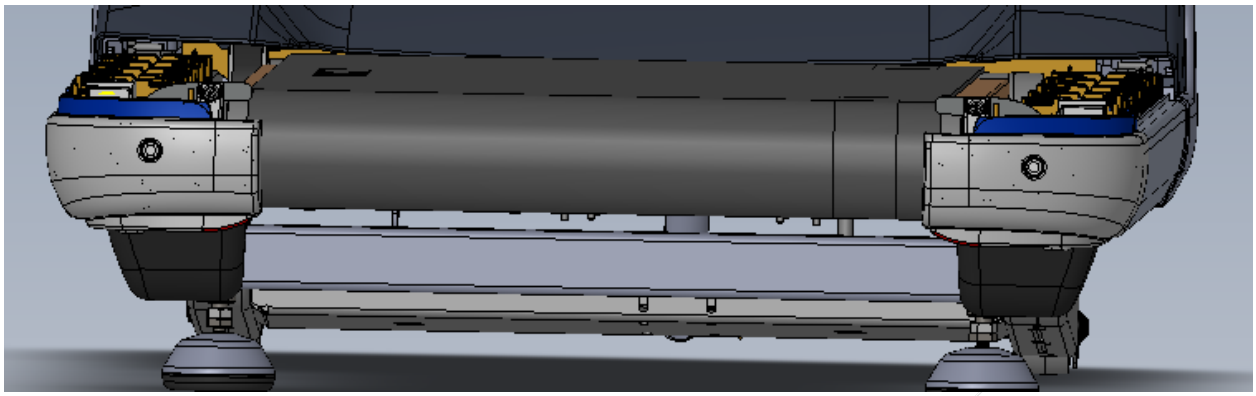
4. Remove the hitch pin and clevis pin that fastens the lift motor tube to the incline platform. While the incline tube is not fastened to the incline platform, care must be taken to not allow the incline tube to rotate. If the incline tube rotates, the lift motor must be calibrated per Procedure, Calibrating the Lift motor.
5. Remove the two large hitch pins (one each side) from the incline platform to frame mounting. See Figure Below. Remove the incline platform mounting pins and remove the incline platform from the treadmill.
6. Remove the wheels from the old incline platform and remount them on the replacement incline platform.
7. Set the replacement incline platform into position and slide the incline mounting pins into place. Fasten the incline mounting pins with the hitch pins removed in step 4.
8. If the incline tube or the lift motor's drive screw has been moved, calibrate the lift motor per Procedure, Calibrating the Lift motor, at this time.
9. Fasten the incline tube to the incline platform with the clevis pin and hitch pin removed in step 3.
10. Set the treadmill in its upright position, replace all covers and thoroughly check it per ***Checking Treadmill Operation*** (see "***Operation Verification***".

Replacing the Take-Up Roller

1. Set the treadmill circuit breaker in the off position and unplug the treadmill's line cord from the AC outlet.
2. Remove the hood and both Deck Trim Platforms.

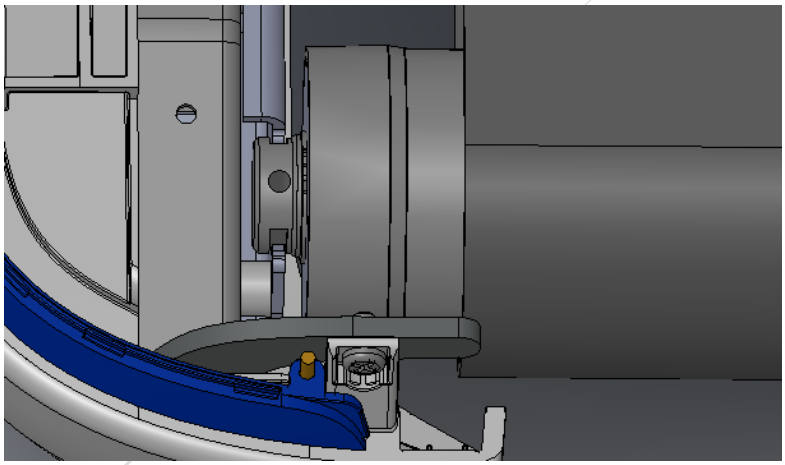
3. Loosen the two bolts on the rear roller adjustment cassettes. It is recommended that the bolts be loosened fairly evenly to prevent binding.

Figure 28: Take Up Roller Adjustment Bolts



4. Lift the roller out of the cassettes.
5. Install the new roller, ensuring the slotted end of the shaft is on the left side and seated into the tabs of the cassette.
6. Tension the belt per procedure Replacing the Running Belt.
7. Check treadmill operation per, ***Checking Treadmill Operation***.

Figure 29: Take Up Roller slotted shaft installation

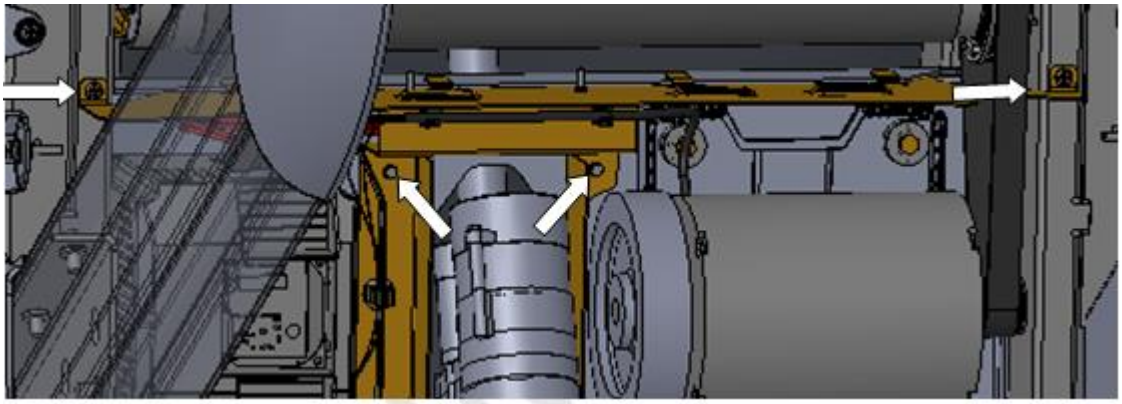


Drive Belt and Roller Replacement

1. Remove the hood,

2. Loosen the take up roller tension bolts. These bolts are being loosened to remove the tension on the running belt.
3. Walk the drive belt off the motor pulley.
4. Remove the four screws (two #3 Philips and two 7/16 hex head), shown in Figure 30, and lift up the dust shield, which is held to the frame by four clips.

Figure 30: Dust Shield Screw Locations.



5. Lift the drive roller and remove the roller and the drive belt from the machine.
6. If you are replacing the drive belt, place the new drive belt on the inside of the drive roller pulley, and set the roller back into place.
7. Feed the belt onto the motor pulley, and then walk the drive belt onto the drive roller pulley by rotating the drive motor flywheel. Be sure the belt is fully seated in the grooves of both pulleys and correctly aligned.
8. Reseat the dust shield, and install the four screws removed in step #4.
9. Adjust the drive belt tension per the Procedure, ***Adjusting Drive Belt Tension***.
10. Tension the Running Belt as per procedure ***Tensioning the Running Belt*** and Running Belt Tracking Adjustment as per procedure ***Running Belt Tracking Adjustment***.
11. Install all covers, and then check treadmill operation per ***Checking Treadmill Operation***.

Running Belt and/or Deck Replacement

1. Remove the hood and both Deck Side Platforms.
2. Remove the Take Up Roller, then the Drive Roller.
3. Using a 3/16 hex wrench remove the four screws securing the deck at the rear to the pivoting deck mounts. Keep for reinstallation.
4. Using a hex wrench remove the two screws securing the front of the deck to the Tinnerman Clips on the forward most GFX cushion. Keep for reinstallation.
5. Carefully lift the deck and belt out of the treadmill frame.

Note: The deck has two usable surfaces. If only one surface has been used the deck can be flipped to utilize the second side. If both surfaces have been used a new deck must be installed.

6. Slip the running belt off the deck and discard. If the second side of the deck has already been used replace it with a new deck.
7. The new running belt will have an arrow with the word RUN pointing in one direction printed on the underside. The arrow indicates the correct direction of travel for the belt. Premature belt failure will occur if the belt is installed incorrectly. Slip the new running belt onto the deck and carefully place them back onto the treadmill. The printed belt information should be on the right hand side of the belt.
8. Secure the deck using the previously removed screws through the rear of the deck to the pivoting deck mounts. Torque the bolts to 50-55 in-lbs.
9. Install the two previously removed screws into the front of the deck to the Tinnerman clips on the GFX cushion. Torque the screws to 20 in-lbs.
10. Install the Drive and Take up Rollers, install the drive belt onto both pulleys.
11. Center the belt in the frame between the rollers front to back.

Note: Proper tensioning of the belt requires the use of two tensioning gauges, Precor part number PPP000000020007101. These must be used to ensure proper tensioning of the belt, and proper force on the roller bearings.

12. Install the two belt tensioning gauges on both sides of the belt, across from each other. Set the dials to an accurate reference point for starting the measurement. When properly tensioned the belt will be 0.55% of stretch, or 5.5 tick marks away from the starting reference point.
13. Begin tightening the bolts on the rear, moving left and right a few turns at a time to ensure that the belt is being stretched evenly. Continue turning both sides until the gauges read 5.5 ticks away from the beginning reference. For example, if 3.0 is your starting point, tighten until you reach 3.55.
14. Verify the running belt tension and tracking, go to “Tension and Tracking the Running Belt” adjustment procedure.

New Belt Breakin Procedure

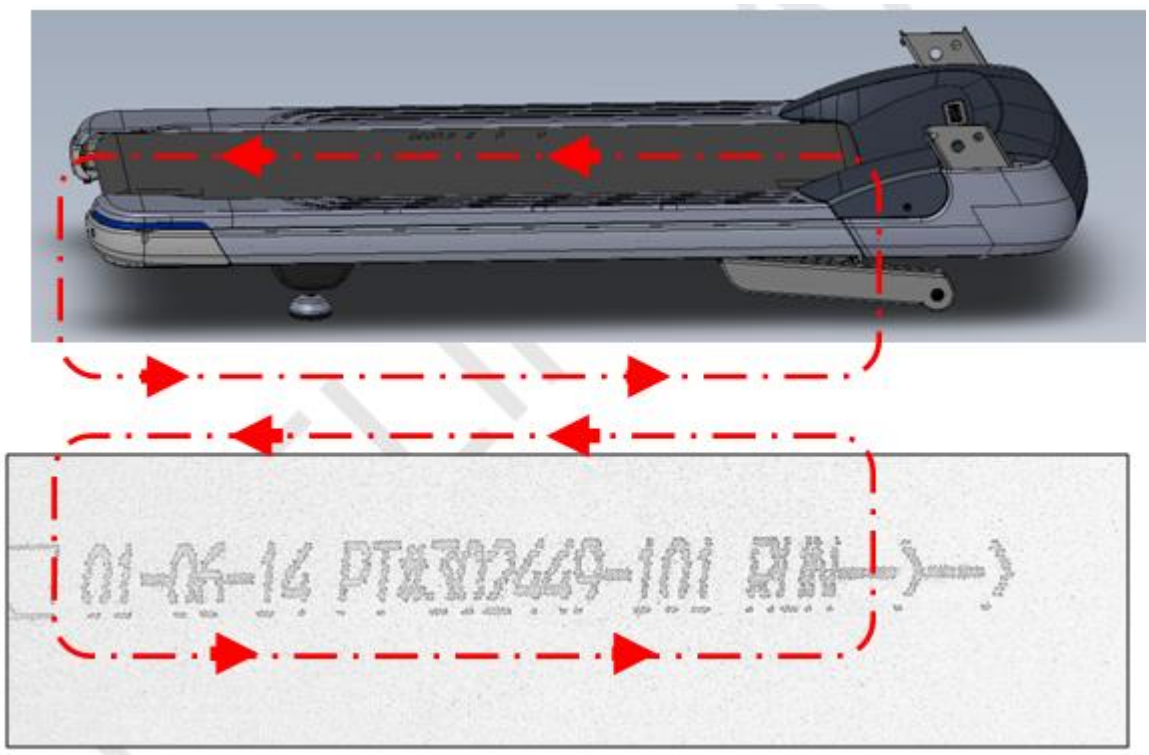
Note: After the belt is correctly adjusted for tension and tracking, walk on the belt to initialize the break-in wax on the deck surface.

16. Set the treadmill to 3 mph and walk on the center of the belt, moving from the front to the back, four times total. Repeat this on the left, then on the right.
17. Stop the belt, then while standing to the side of the tread start a manual program and run the speed up to max. Let this run at max speed for 3.5 minutes. This is to clean up any break in wax that may have become loose during the walking phase.

Note: It may be necessary to press resume or speed up several times as the Auto Stop feature will detect that no one is walking on the belt. Restarting the speed will not negatively impact the process.

18. Install all covers, check treadmill operation per, ***Checking Treadmill Operation***.

Figure 31: Running Belt Direction



Adjustment Procedures

This section provides you with the step-by-step procedures required to make adjustments. Perform the appropriate adjustment procedures when a trouble symptom points to a particular problem and after removing and replacing major components. Refer to ***Replacement Procedures*** for instructions on how to disassemble and reassemble the running belt, deck, drive motor, rollers and all associated parts.

Adjustment procedures::

- Adjusting Drive Belt Tension
- Tensioning the Running BeltError! Bookmark not defined.
- Running Belt Tracking Adjustment
- Calibrating the Lift Motor

Drive Belt Tension Adjustment

1. Set the treadmill circuit breaker in the off position and unplug the line cord from the wall outlet.
2. Remove the hood.

Note: This procedure assumes that the drive belt has been installed and seated onto the motor drive belt pulley and roller drive pulley.

3. Place the drive belt tension gauge on the drive belt as shown in Figure 32.

Figure 32: Drive Belt Tension Gauge

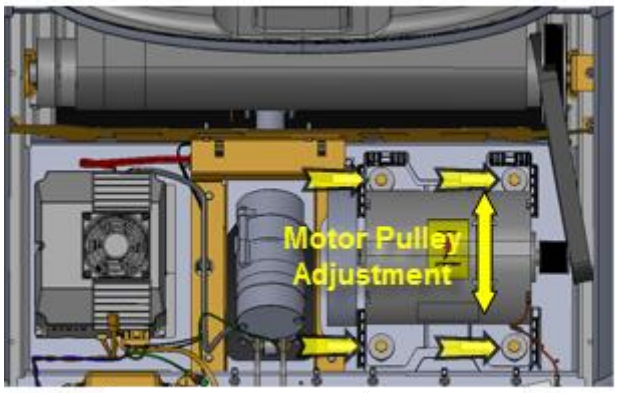
4. There is a different belt tension specification for a new belt replacement installation and a reinstall of an existing used belt. Verify that the drive belt tension is within the new or used belt tension range specification. When the belt tension is not within the range specification, continue to the next step and re-tension to OEM specification.

Drive Belt Condition	Tension	Range
new	**105 lbs +/- 10** (48 kgs +/- 4.5)	**95-115 lbs** (43-52 kgs)
used	**85 lbs +/- 5** (39 kgs +/- 2)	**80-90 lbs** (36-41 kgs)

Belt Tension Specification

5. Walk the drive belt off the drive motor pulley and slightly loosen the four drive motor mount bolts. Move the drive motor (forward or backward) and adjust the belt tension.
6. Walk the drive belt onto the drive roller pulley by rotating the drive motor flywheel. Be sure the belt is fully seated in the grooves of both pulleys and correctly aligned.

Figure 33: ***Drive Belt Adjustment Bolts, Drive Belt Position for Walking on***



Example Drive Motor Mount Bolt Locations

7. Run the tread at 3 mph for 1 minute to allow the belt and pulley groves to align
8. Stop the treadmill, set the treadmill circuit breaker in the off position and unplug the line cord from the wall outlet
9. Re-attach the drive belt gauge and verify the belt tension is within specification. If not within specification, repeat the steps above until the tension is within specification.
10. Torque the four drive motor mounting bolts to 204 inch pounds (17 foot pounds).
11. Re-install the hood.
12. Plug the line cord into the wall outlet and set the treadmill circuit breaker in the on position.
13. Check treadmill operation.

Running Belt Tension and Tracking Adjustment

NOTE: Proper tensioning of the belt requires the use of two tensioning gauges, Precor part number PPP000000020007101. These must be used to ensure proper tensioning of the belt, and proper force on the roller bearings.

Tensioning the Running Belt

1. Remove the front cover and left/right side step covers.
2. Remove the motor drive belt off the motor drive roller pulley.

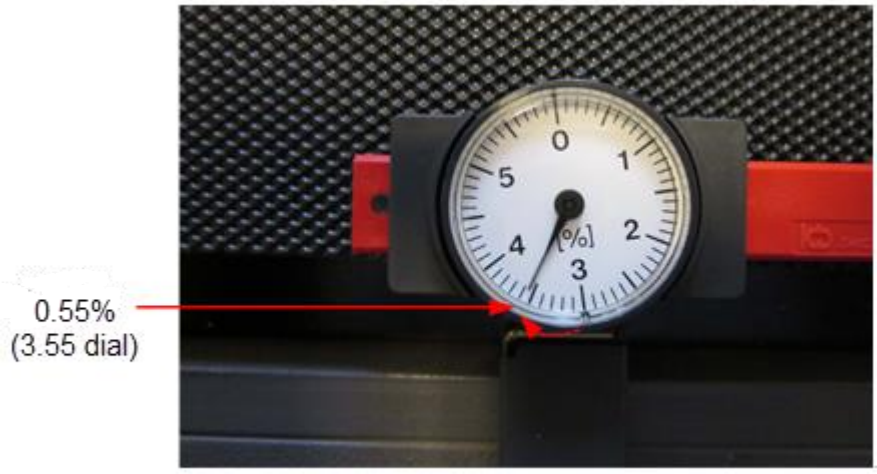
NOTE: The drive motor belt must be removed to properly adjust the running belt tension.

3. Make sure that the take up roller keeper is installed.
4. Center the running belt and make sure that it is squarely positioned from the front drive roller to rear take up roller.
5. Move the running belt so that the seam is positioned underneath the treadmill.
6. Attach a running belt tension gauge on each side of the running belt opposite each other, avoiding interference from the side step cover brackets.

7. Slide the gauge head to set the dial needle to a coarse setting of 3. You can then rotate the gauge dial face to fine tune the needle to precisely 3.

NOTE: Setting the gauge to a 3 reference value centers the gauge head travel allowing +/- movement without impeding travel

8. Alternately tighten the right/left take up roller mounting bolts so that the roller is evenly tightened to the final 0.55% (dial 3.55) specification:
    a. Incrementally and alternately tighten the left and right bolts until each gauge dial reaches a value of 3.
    b. Tighten the right bolt to dial setting 3.2, then the left bolt to 3.2
    c. Tighten the right bolt to dial setting 3.4, then the left bolt to 3.4,
    d. Tighten the right to dial setting 3.55 (0.55%), tighten the left to bolt to 3.55 (0.55%).



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Running Belt Tracking Adjustment

CAUTION: 1) The tracking adjustments should only be done in 1/4 turn increments..

2) ONLY use the right side take up roller mounting bolt to adjust tracking.

3) ONLY use hand tools to adjust tracking, power tools may overtighten.

9. Replace the motor drive belt.
10. Start the treadmill and set the speed to 3 mph (5 kph).
11. Observe the running belt tracking while verifying that the belt remains centered::
    a. If the belt starts to drift toward the right, slowly turn the right side take up roller mounting bolt clockwise in ¼ turn increments until the drifting stops.
    b. If the belt starts to drift toward the left, slowly turn the right side take up roller bolt counterclockwise in ¼ turn increments until the drifting stops.

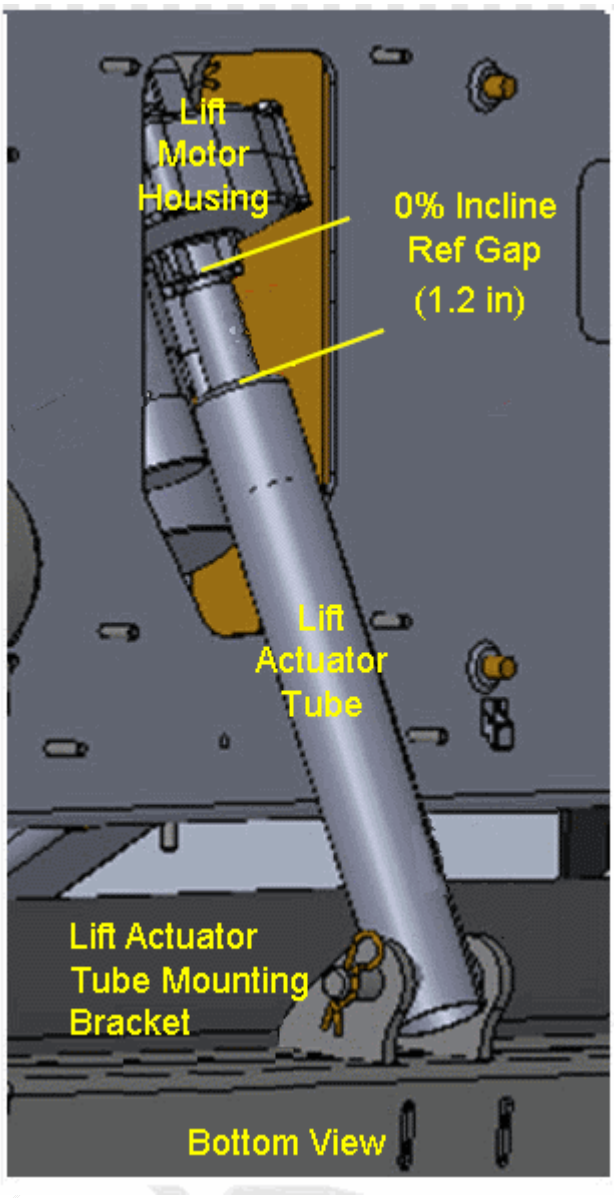
12. Increase the speed to 9 mph (14 kph) and then 12 mph (19 KPH), making any small adjustments as needed.
13. Verify that the treadmill is level, adjust as necessary.
14. Verify the running belt/deck surfaces are clean
15. Replace all covers.
16. Verify the treadmill operation and return to service.

Calibrating the Lift Motor

1. Switch the treadmill circuit breaker from OFF to ON. The treadmill will auto-calibrate the running deck incline to the 0% incline level (This is the lift motor calibration reference position).

   Warning: Be aware that switching power ON will cause the lift motor actuator to begin the auto-calibrate process moving the running deck incline to the 0% incline level.

2. Set the treadmill circuit breaker to OFF and disconnect the power cord.
3. Access the lift motor actuator tube. You can either access from the bottom by carefully laying the treadmill on its side or access from the front by raising the treadmill and resting the frame base onto blocks securely placed under the front corners of the frame (this procedure removes weight from the lift platform and lift motor actuator tube).
4. Disconnect the lift actuator tube from the lift platform mounting bracket, remove the hitch pin and clevis pin.
5. Set the lift actuator 0% incline reference gap to 1.2 inches. Firmly hold the jack screw and rotate the lift actuator tube nut to adjust the reference gap.
   The reference gap is measured between the top of the lift actuator tube nut to the bottom of the lift motor actuator housing.
6. Install the actuator tube into the lift platform mounting bracket. It may be necessary to slightly rotate the actuator tube to align the clevis pin mounting holes. Choose an adjustment direction that will minimize the change to the actuator tube reference gap distance. Firmly hold the jack screw from turning while adjusting (turning) the lift actuator tube nut.
10. Return the treadmill to the upright position or remove support blocks.
11. Install the hood.
12. Connect the power cord and set the treadmill circuit breaker to ON.
13. Verify the treadmill incline function and return to service, see ***Checking Treadmill Operation***.



Preventive Maintenance

About

Preventative maintenance is proven to extend the life of the equipment, improve the user experience, and keep maintenance problems and service calls to a minimum. Precor recommends the following preventative maintenance schedule.

IMPORTANT: It is the responsibility of the owner to maintain equipment in accordance with the Precor recommended preventative maintenance schedule. Always purchase replacement parts and hardware from Precor. If you use parts not approved by Precor, you could void the Precor Limited Warranty. Use of parts not approved by Precor may cause injury.

Additional Services

Precor offers a subscription Preventative Maintenance Program, see Preventative Maintenance Program.

Maintenance Schedule

Preventative maintenance tasks are grouped into Daily, Weekly, Monthly, Quarterly, and Semiannual scheduled maintenance tasks. Do all tasks for each scheduled time period.

IMPORTANT: If you determine that the equipment needs service, disconnect all power connections (television, Ethernet, and power) and move the equipment away from the exercise area. Place an OUT OF SERVICE sign on the equipment and make it clear to all patrons and other users that they must not use it.

Daily

Perform the following maintenance tasks daily:

Daily Task	Instruction
Clean the equipment exposed frame and plastic components.	Clean the equipment exposed frame and plastic components with a soft cloth that you have moistened with water on an approved cleaning solution. Keep excess moisture away from electronic components to avoid electrical shock and/or damage to the unit. Dry unit completely.

Daily Task	Instruction
Clean the LED/LCD/LCD consoles.	Clean the LED electronic console with damp lint free cloth using water or approved cleaner. Dry completely. On LCD, Touch-screen, or PVS consoles, clean the display with a damp lint free cloth using ONLY a diluted solution of one part 91% Isopropyl Alcohol to one part water.
Clean the running belt top surface.	Clean the top surface of the running belt with a soft dry or damp cloth using an approved cleaner.
Clean the running belt and deck.	Clean the running belt and deck.
Check for the following possible issues: • Slipping belts • Loose fasteners • Unusual noises • Worn or frayed power cords • Worn, damaged, missing safety lanyards or clips	Verify that none of the following issues are occurring: • Slipping belts • Loose fasteners • Unusual noises • Worn or frayed power cords • Worn, damaged, missing safety lanyards or clips
Visually inspect the running belt condition and alignment/tracking.	Make sure that the running belt is not frayed/worn and that the belt alignment and tracking is centered on the deck and rollers.

Weekly

Perform the following maintenance tasks every week:

Weekly Task	Instruction
Verify unit sits level and solid on floor[1].	Use bubble level placed on running belt to verify level. All feet should be touching the floor and the unit should not rock or wobble when in use.
Perform the following items at maximum Incline, power switch OFF, and cord disconnected: Raise Incline to maximum level, then Switch the input power (circuit breaker) to OFF and unplug the power cord.	
Verify that the power cord is not damaged or laying underneath the treadmill[1].	Verify that the power cord is not damaged, pinched, coiled, or positioned under the treadmill.

Weekly Task	Instruction
Vacuum and clean area underneath equipment[1].	Vacuum and/or use damp mop to clean floor area underneath equipment. Make sure the floor is completely dry.
Clean surfaces on foot contact locations[1].	Use a soft nylon scrub brush to clean the grooves and textured surfaces on foot contact locations.
Connect power cord and switch the input power ON, set incline to 0%.	
Verify the treadmill operation and functionality.	Perform the “Operation Verification” procedure to verify unit features and functions (parameter controls, HHR, Stop key. etc.).

Note: 1). Perform test with incline set to maximum level and power OFF and power cord disconnected.

Monthly

Perform the following maintenance tasks every month.

Monthly Task	Instruction
Verify the Safety clip is attached to the lanyard and functional.	Pull on the lanyard attached to the Safety clip which trips the Restart (Stop/Restart) switch. The "PUSH TO RESET SWITCH" message is shown and an arrow pointing to the Restart switch. Treadmill slows and stops.
Inspect the power cord for damage and that the cord clamp is securely installed[1].	Inspect the power cord, make sure it is not damaged or underneath the treadmill. Verify the cord clamp is securely installed.
Visually inspect the running belt and deck condition.	Make sure the deck and belt are not worn and are in good condition, replace as necessary.
Verify the running belt alignment and tracking.	Verify the running belt alignment and tracking, see "Running Belt Tension and Tracking Adjustment" procedure.
Clean the treadmill’s frame using a cloth dampened with an approved cleaning solution[1].	Use only approved plastic cleaners.

Monthly Task	Instruction
Clean outer surface of running belt[1].	Use water and a soft nylon scrub brush to clean the outer surface of the running belt. Do not use chemical cleaners.
Clean drive motor and pulleys[1].	Remove hood and use wire brush to clean belt and pulley grooves.
Vacuum debris from around motor, pulleys, and floor underneath the treadmill[1].	Remove hood. Use a vacuum cleaner (recommended with static protection feature) to clean debris and lint from front area under the front cover. Be careful not to bring the nozzle to close to any electronic circuit boards.
Inspect visible welds, frame, and wire connections[1].	Do a visual check of welds and frame. Check for loose wire connections.
Check for loose fasteners[1].	Check all fasteners and clips for proper tightness and torque.
Clean and lubricate the Lift Motor jack screw.	Raise the Incline to maximum, Switch the input power OFF, and disconnect the power cord. Clean the jack screw and apply approved grease.
Perform functional test to verify all features are performing properly[2].	Verify the unit available functions and programs. Do the “Operation Verification procedure”.

Note: 1). Perform task with power removed and incline set to maximum level.

2) Diagnostic tests will vary depending on console model.

Quarterly

Perform the following maintenance tasks every 3 months:

Quarterly Task	Instruction
Verify the drive motor belt tension.	Verify the drive motor belt tension and adjust as necessary, see "Drive Motor Belt Tension Adjustment" procedure.
Vacuum the front compartment and motor controller fan.	Remove hood and vacuum the compartment and motor controller fan. It is recommended that you use a static resistant vacuum cleaner. Be careful to not put nozzle near PCA electronics.
Check the console metric and indicator display and numeric keypad functionality.	Run the Display\Keypad diagnostic tests and check the console metric/indicator LED/LCD displays and numeric keypad functionality. On P80 series touch-screen consoles, run the Touchscreen/Backlight/RGB/Numeric Backlight/Numeric Display diagnostic tests, refer to Hardware Validation - Diagnostic Tests (51765761).
Record the current Odometer and Hours.	Access the Information Display or Equipment Usage data and record the Odometer and Hours metrics, see, Information Display (65).

Note: 1). Perform task with power removed and incline set to maximum level.

2) Diagnostic Test will vary depending on console model.

Running Belt and Deck Cleaning Procedure

Review the entire procedure before beginning.

1. First, check for proper operation of the safety **Stop** key.
    a. Stand to one side of the treadmill – Do not stand or allow others to stand on the treadmill running belt during this procedure. Ensure that the stop key tether is hanging straight down and is not wrapped around the handle bars.
    b. Select **Quick Start** and wait for the running belt to begin moving
    c. Once the running belt is moving, push the **SAFETY STOP** key.
    d. Ensure the running belt stops moving, then reset the **SAFETY STOP** key.
    e. Turn the power switch to **OFF**. The **ON/OFF** switch is located at the front of the treadmill.

WARNING: If the running belt does not stop, turn off the power using the ON/OFF switch at the front of the treadmill and unplug the power cord. The treadmill must remain out of service until the stop switch is repaired.

2. Get a clean, dry cotton towel that is at least 36 inches (1 meter) in length and fold it in half lengthwise.
    a. Lift the running belt and push the towel through to the other side so that both ends of the towel extend an equal distance over the deck trim on both sides.
    b. Push the towel forward to the front of the machine so it is located beneath the **SAFETY STOP** key.
    c. Turn the power switch to **ON**.
3. Mount the machine by standing on the side rails and attach the stop key tether. Do not stand on the running belt at any time. Stand firmly on both ends of the towel keeping your feet off of the treadmill running belt. Brace yourself using the handlebars or side hand rails. Push the **Quick Start** button once in position.

CAUTION: You have approximately 3 seconds before the treadmill running belt begins to move after pressing Quick Start. Ensure you are in the proper position.

WARNING: Press the safety stop key if the towel becomes loose to prevent it from being pulled into the treadmill's rollers.

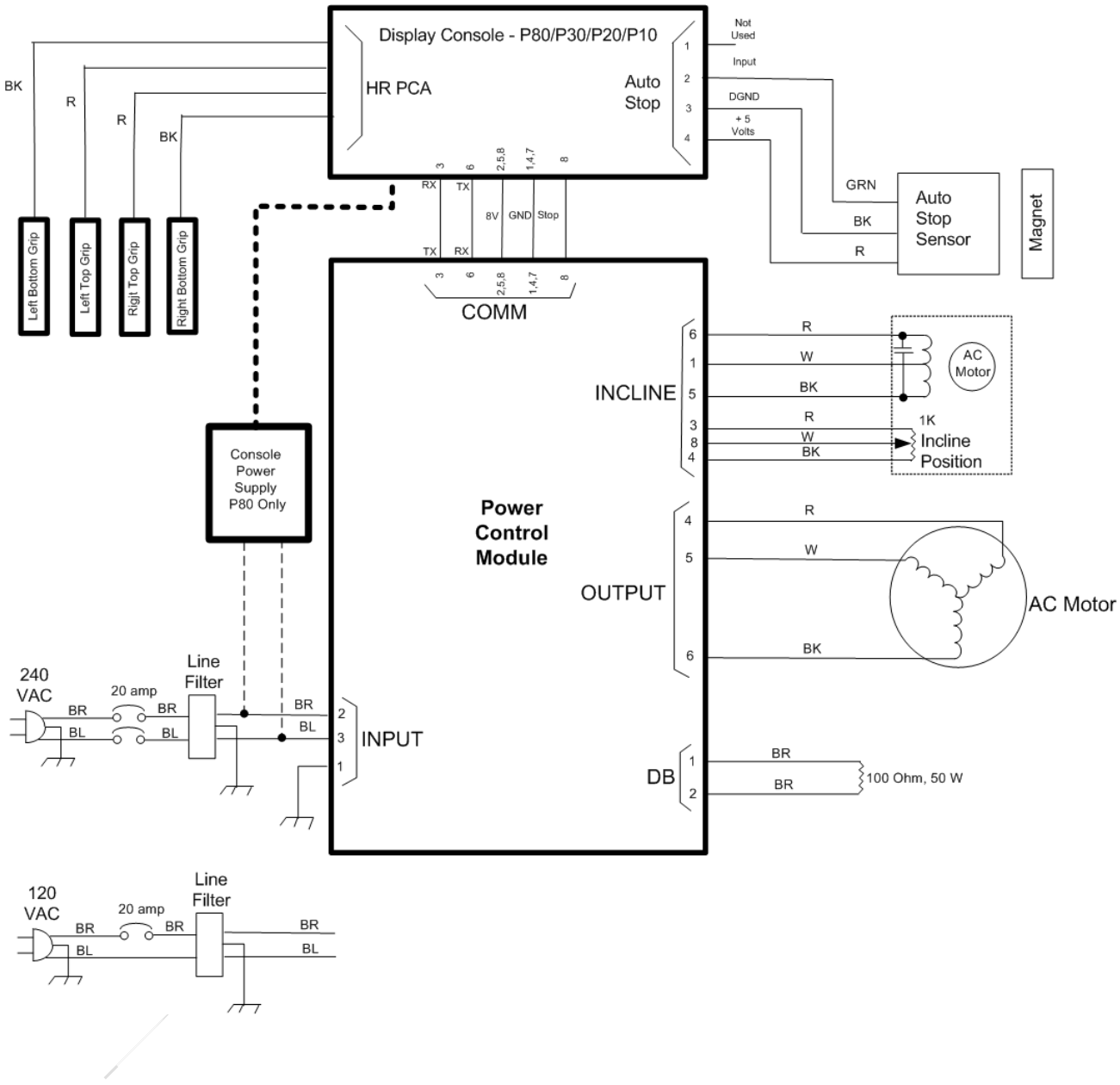
4. The treadmill will begin to run at 1 mph. Allow the treadmill to run for one minute while keeping the towel firmly in place.

WARNING: Do not adjust the treadmill's speed or run it higher than 1 mph.

5. After one minute, stop the treadmill by pressing the **STOP** button.
6. When the belt has fully stopped moving, remove the **STOP** key tether, exit the treadmill, and turn the power switch to **OFF**.
7. Grasp both sides of the towel and run it up and down the length of the belt several times to clean the top of the deck.
8. Remove the towel from beneath the belt.
9. Turn the power switch to **ON**.
10. Verify operation and return to service.

System Block Diagram

System Block Diagram - 120 Volt Models



Exploded View & Parts List

Contents

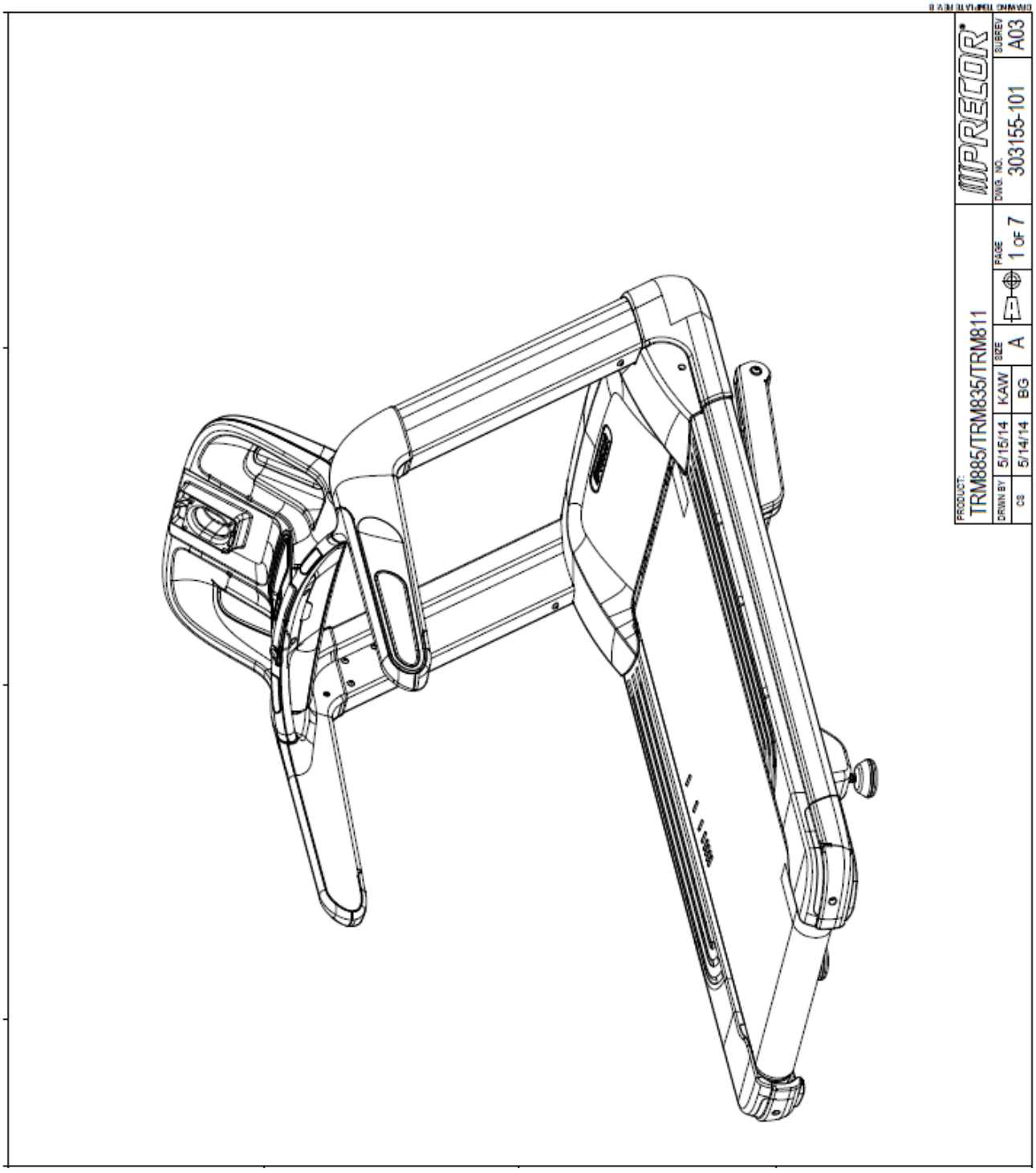
- Exploded View diagram.
- Parts Identification List – matches Exploded View part bubble numbers to associated part number.

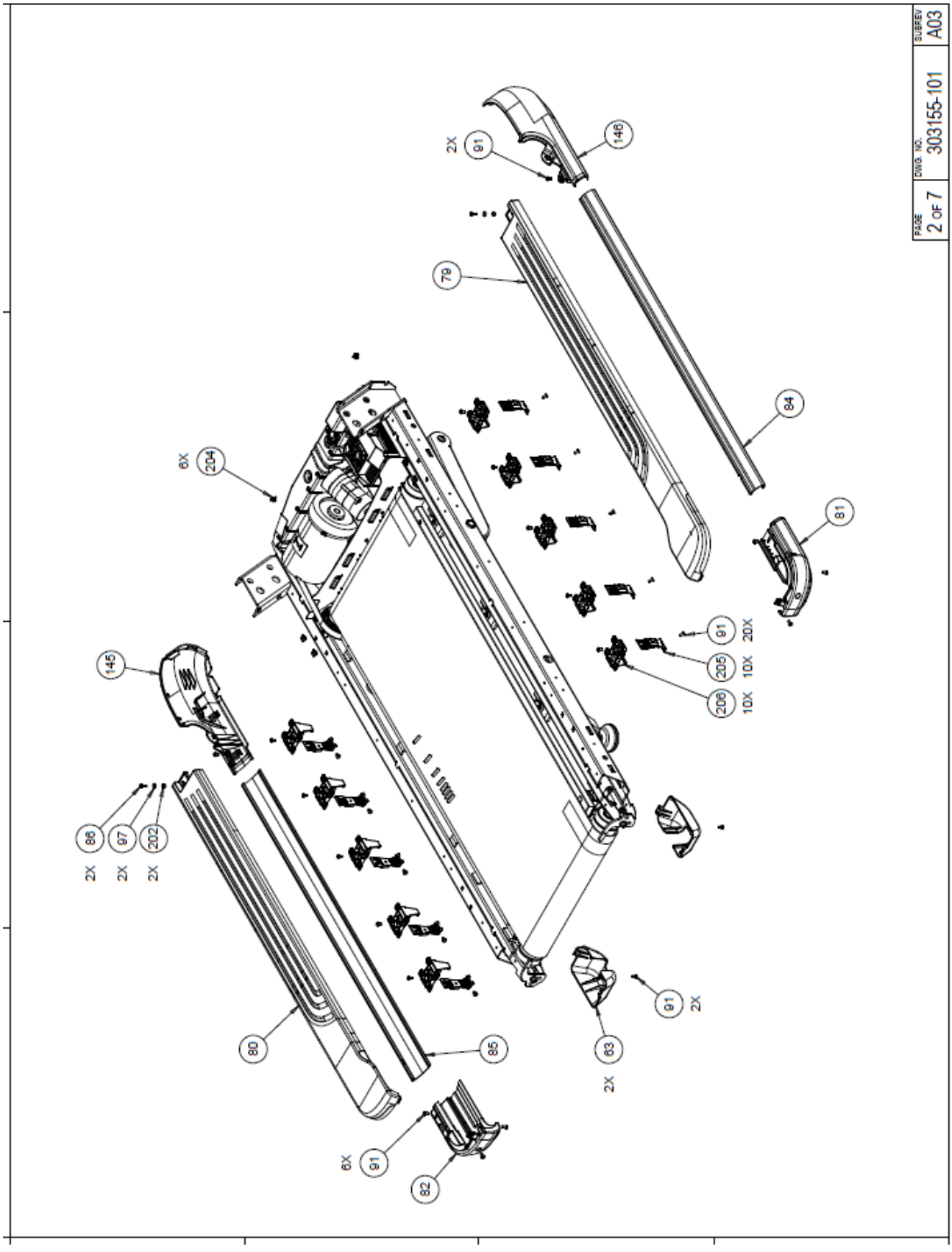
NOTE: The Exploded View and Parts List Identification table are provided as quick reference material and may change without notice. For the latest equipment parts information go to either the new Precor Connect website (http://www.precorconnect.com) or the legacy Precor Connection website (http://connect.precor.com).

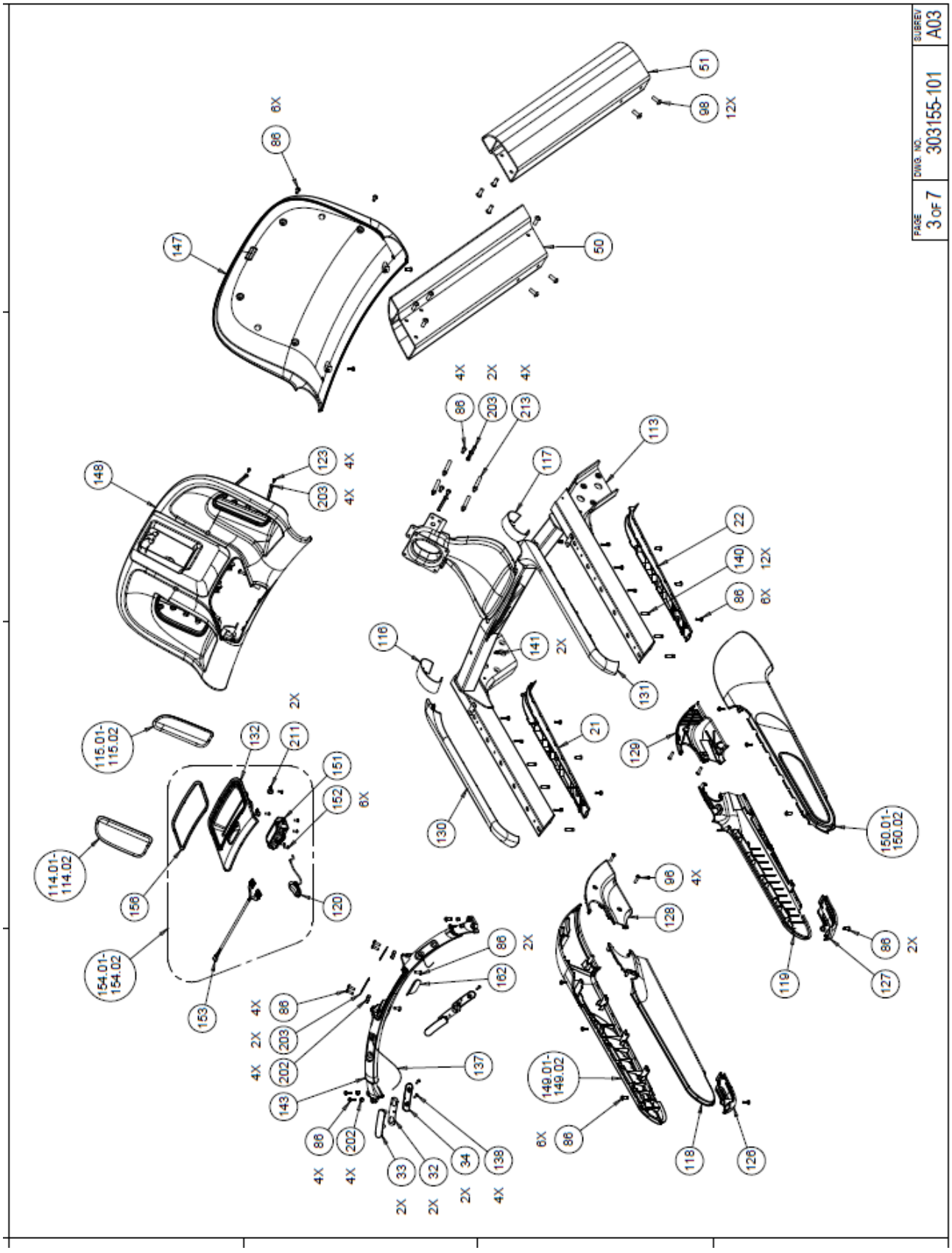
FInding Part Numbers

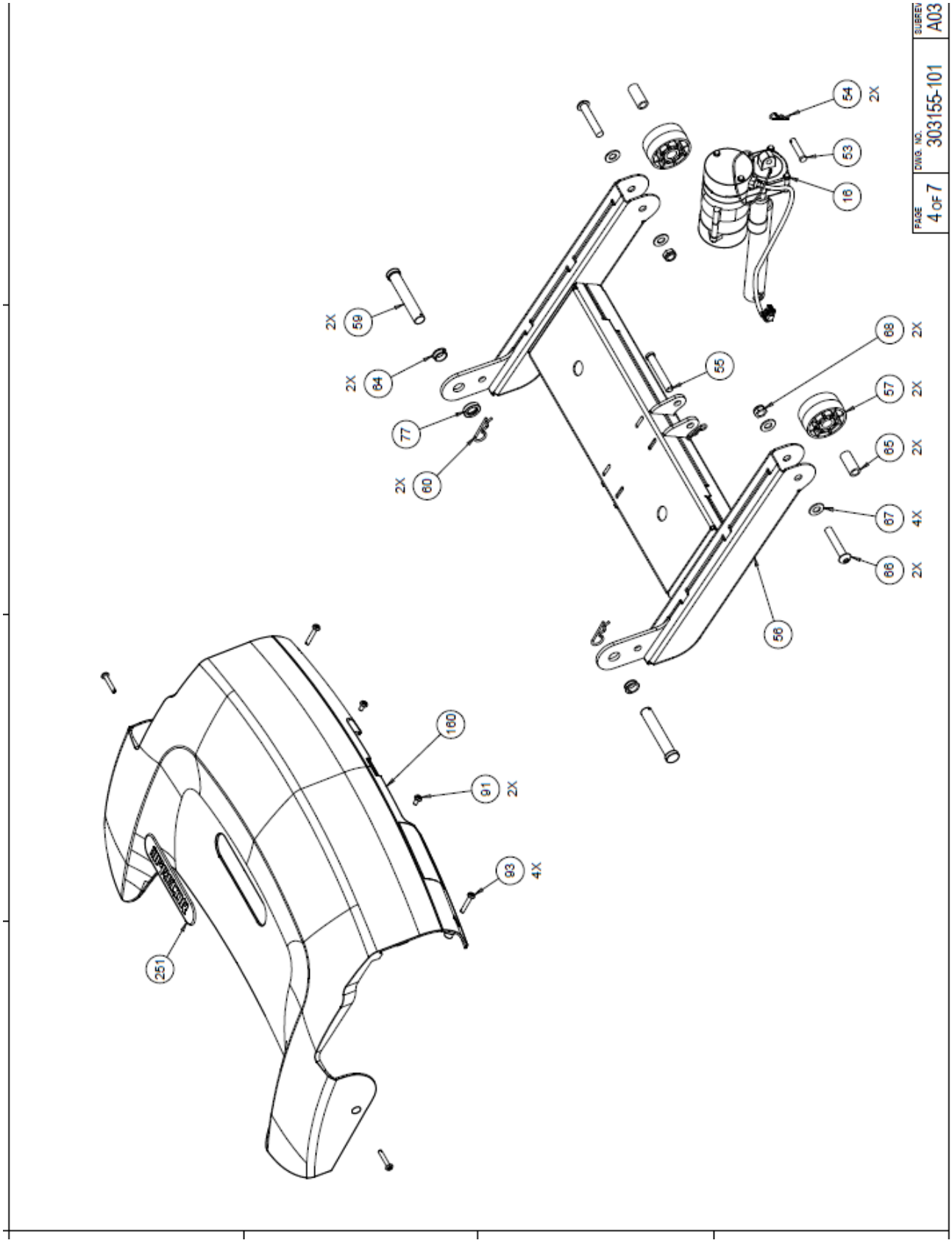
First use the Exploded View diagrams to locate and identify the part and associated parts list bubble number. Then go to the Parts List table to find the part number by bubble number.

Exploded View





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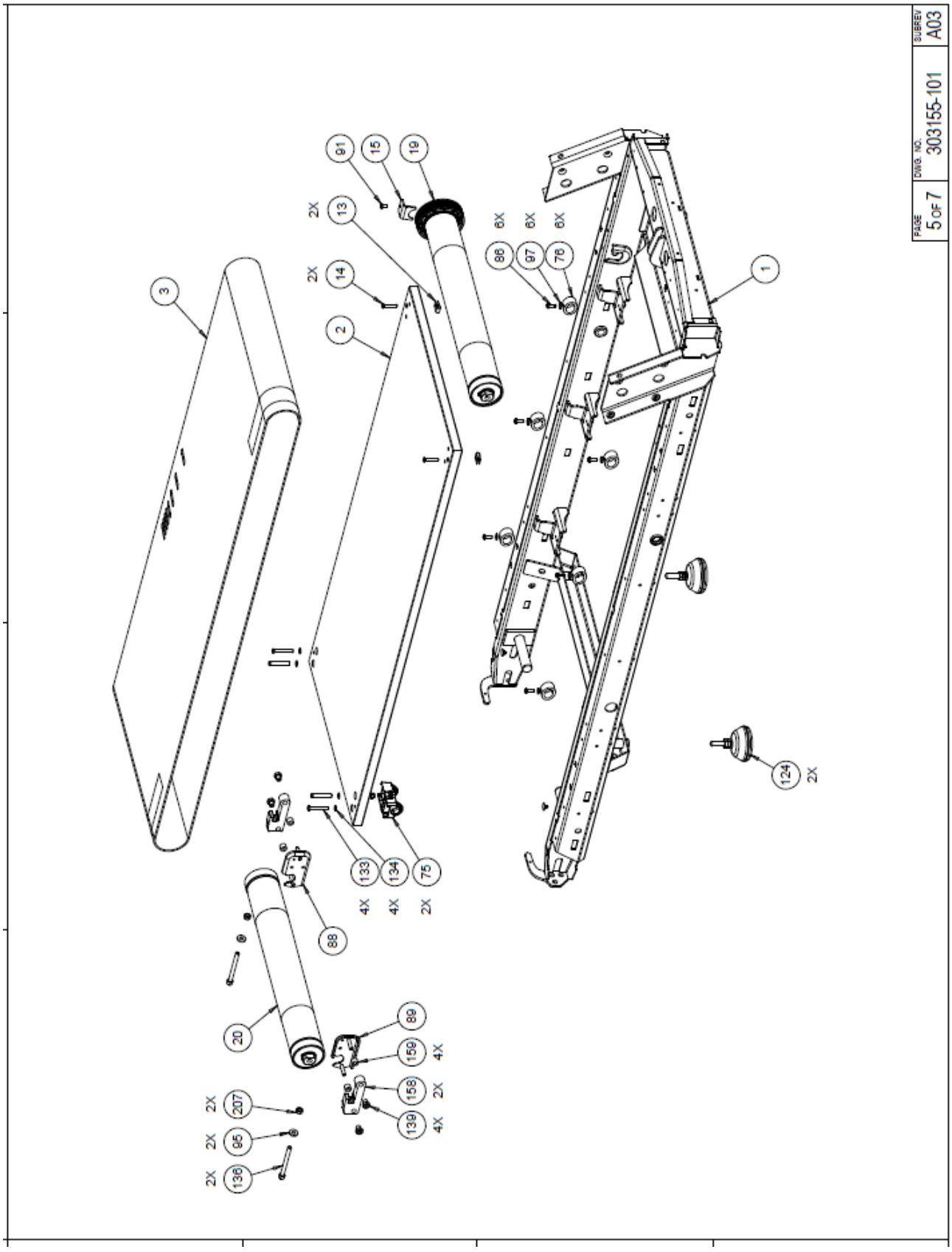

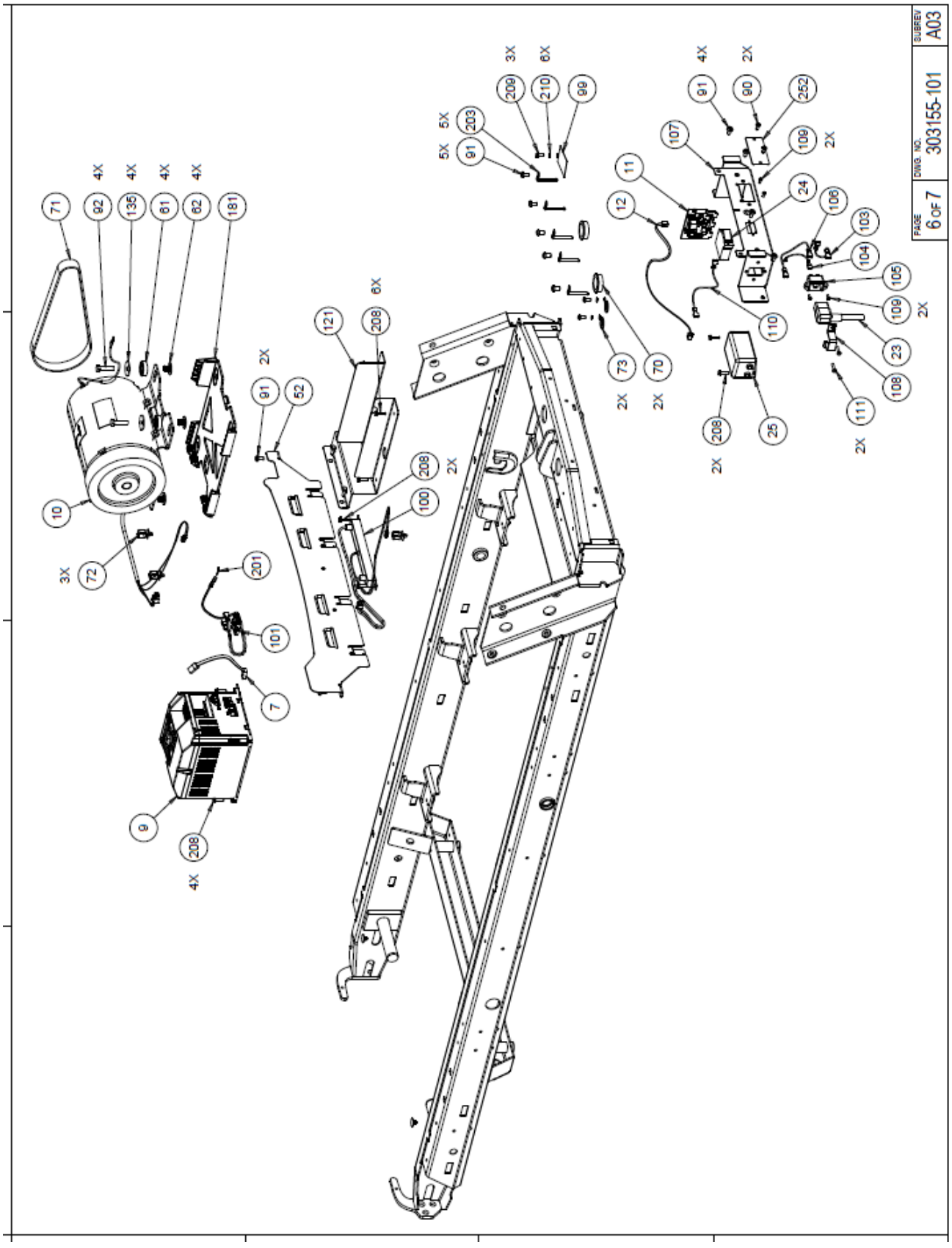
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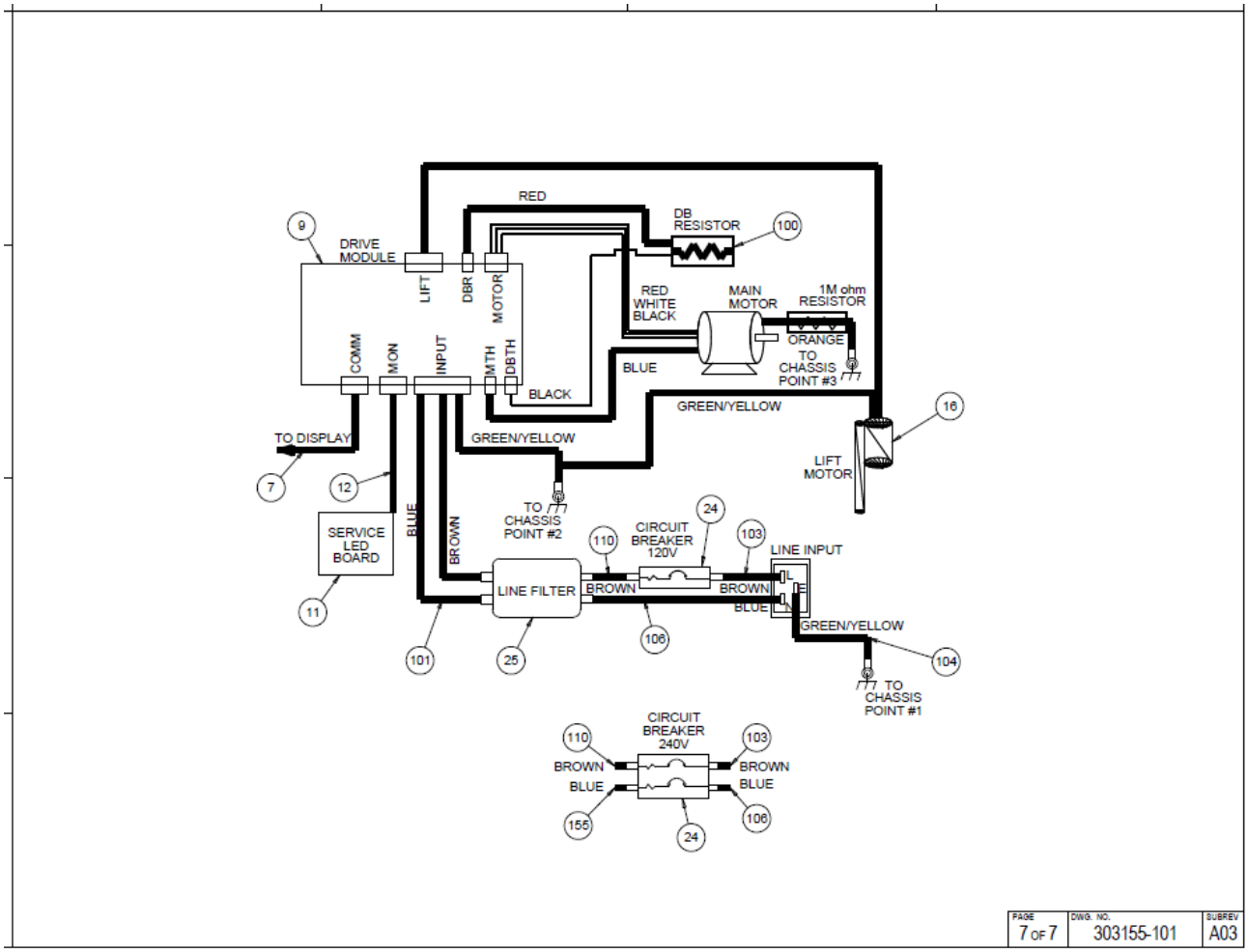
RED
DB RESISTOR
100
9
DRIVE MODULE
LIFT
DBR
MOTOR
RED WHITE BLACK
MAIN MOTOR
1M ohm RESISTOR
ORANGE
TO CHASSIS POINT #3
COMM
MON
INPUT
MTH
DBTH
BLUE
BLACK
GREEN/YELLOW
16
LIFT MOTOR
TO DISPLAY
7
12
GREEN/YELLOW
TO CHASSIS POINT #2
SERVICE LED BOARD
BLUE
BROWN
11
LINE FILTER
101
25
110
CIRCUIT BREAKER 120V
24
103
LINE INPUT
BROWN
BROWN
BLUE
106
GREEN/YELLOW
104
TO CHASSIS POINT #1
CIRCUIT BREAKER 240V
110
103
BROWN
BLUE
BROWN
BLUE
155
24
106
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SUBREV A03

Parts List

TRM 800-14, BASE, 120V (serial code AGNB)	
Description	**Bubble Number**
DECK W/SHIPPER, TRM800-14	2
RUNNING BELT	3
ASSY,CBL,MOD,8P8C,1-1,SILVER,108"	7
ADVANCED MOTOR DRIVE,COMMERCIAL 120	9
KIT, BOXED, MOTOR DRIVE,COMMERCIAL	10
ASSY, SERVICE LED BOARD	11
ASSY,CBL,MOD,6P4C,1-1,SILVER,18"	12
CLIP,U TYPE, TINNERMAN, 1/4-20	13
SCREW,FLAT HD SOCKET CAP,1/4-20 X 1	14
ROLLER KEEPER	15
MOTOR, LIFT ACTUATOR, 120V	16
ASSEMBLY, ROLLER, DRIVE	19
ASSEMBLY, ROLLER, TAKE UP	20
BOTTOM COVER, SIDE BAR, LEFT	21.01
BOTTOM COVER, SIDE BAR, LEFT	21.02
BOTTOM COVER, SIDE BAR, RIGHT	22.01
BOTTOM COVER, SIDE BAR, RIGHT	22.02
PWR CORD,125VAC,20A,NEMA 5-20RA45/I	23
CKT BRKR,250V,MAGNETIC,ROCKER,1 PO	24
FILTER, POWER LINE, #10 PANEL MOUNT	25
GASKET, HHHR CONTACT	32
ASSEMBLY, UPPER HHHR CONTACT WITH C	33
CONTACT, HHHR LOWER, STAINLESS	34
DUST GUARD	52
PIN,CLEVIS, 3/8 X 1.75, ZINC	53
PIN, HITCH, .093 DIA, ZINC, #203	54
PIN, LIFT PIVOT, 3.34, MUSHROOM HEA	55
WELDMENT, LIFT PLATFORM, PAINTED	56
WHEEL, LIFT	57
PIN, LIFT PIVOT	59
PIN, HITCH, .125 DIA, ZINC, #216	60
WASHER, TOP HAT, MOTOR	61
WASHER, BOTTOM, MOTOR	62
PLASTIC, FOOT COVER	63

TRM 800-14, BASE, 120V (serial code AGNB)	
Description	**Bubble Number**
BUSHING,SNAP-IN,THOMSON NYLINER,728	64
BUSHING, SPANNER	65
SCREW,BHCS,1/2-13 X 2-3/4,BLK SHRPR	66
WASHER, FLAT,1/2,.086 BLK CVS	67
LOCKNUT,HALF,1/2-13,BLK ZN	68
BUSHING, SNAP	70
BELT, DRIVE, 280J10 POLY V, TEM	71
CABLE CLAMP,INSERT	72
LABEL, SAFETY, GROUND SYMBOL	73
ASSY, PIVOT, REAR DECK	75
CUSHION, GFX	76
SPACER, LIFT PLATFORM	77
ASSEMBLY, TRIM LANDING AND BLUE INS	79
ASSEMBLY, TRIM LANDING AND BLUE INS	80
PLASTIC, END CAP, RIGHT	81
PLASTIC, END CAP, LEFT	82
EXTRUSION, SIDE TRIM, RH	84
EXTRUSION, SIDE TRIM, LH	85
SCREW, SELF TAPPING, 1/4-20 X 0.75,	86
PLATE, REAR ROLLER ADJUSTMENT (INNE	88
PLATE, REAR ROLLER ADJUSTMENT (INNE	89
SCREW,SELF-TAP,TRI,PAN HD PHIL,10-2	90
SCREW,S/T,#1/4-20X1/2,PANHD,PHIL,TR	91
SCREW,HEX,GR 5,5/16-18X1.25,ZN	92
SCREW, SELF TAPPING, 1/4-20 X 1.50,	93
WASHER, FLAT, 3/8 X .875 X .150	95
SCREW,BTHD,1/4-20X1,BLK ZN,(MECH PL	96
WASHER,FLT,1/4X.625X.063,ZN	97
SCREW, BTHD, 3/8-16X1, ZN,(MECH PLT	98
LABEL, WARNING, BLEED DOWN CABLE AT	99
ASSY, CABLE, MINI FIT TO RESISTOR/T	100
CABLE, FILTER TO DRIVE MODULE,10"	101
LABEL, CHASIS NEUTRAL	102
ASSY,CBL,1C,12AWG,250X032 QD RECP(X	103
CBL,1C,14AWG,,#10 RING,250X032 QD R	104
IEC 16/20A POWER CORD INLET	105
ASSY,CBL,1C,12AWG,250X032 QD RECP(X	106

TRM 800-14, BASE, 120V (serial code AGNB)	
Description	**Bubble Number**
BRACKET, POWER ENTRY	107
BRACKET, POWER ENTRY CABLE CLAMP	108
SCREW,MCH,6-32X3/8,PANHD,PHIL,	109
ASSY,CBL,1C,12AWG,250X032 QD RECP(X	110
SCREW,MCH,8-32X3/4,PANHD,PHIL,	111
WELDMENT, DASH STRUCTURE, POWDER CO	113
BUCKET, DASH, BASIC TRIM OPTION, LH	114.01
BUCKET, DASH, OVERMOLDED, PREMIUM T	114.02
BUCKET, DASH, BASIC TRIM OPTION, RH	115.01
BUCKET, DASH, OVERMOLDED, PREMIUM T	115.02
COVER, ELLIPTICAL DASH TO HANDRAIL	116
COVER, ELLIPTICAL DASH TO HANDRAIL	117
INSIDE COVER, SIDEBAR, LEFT	118
INSIDE COVER, SIDEBAR, RIGHT	119
CLIP ASSEMBLY	120
SHIELD COVER, BRAKE RESISTOR	121
SCREW,TCS,#8X1/2,PHIL,BLK SHARPERIZ	123
SCREW,SELF-TAP,TRI,PAN HD PHIL,#8 X	123
FOOT, REAR LEVELING, TALL	124
LED BLUE ACCENT, HANDRAIL, LEFT	126
LED BLUE ACCENT, HANDRAIL, RIGHT	127
TOP HANDCOVER, ASSEMBLY, LEFT	130
TOP HANDCOVER, ASSEMBLY, RIGHT	131
TRAY, DASH, PLASTIC	132
TRAY, DASH, OVERMOLDED	132
SCREW, LOW PROFILE SHCS, ALLOY STEE	133
WASHER,FLT, STEEL, SHARPERIZED BLK	134
WASHER,FENDER,EXTRA THICK,5/16,1.25	135
BOLT, BELT TENSION	136
ASSY, CABLE, CHR PCA TO GRIP, JACKE	137
SCREW, BTHD, 8-32X.75,SS	138
NUT, BARREL	139
SCREW,SKHD,1/4-20X1,BLK SHARPERIZED	140
SCREW,SKHD,1/4-20X3/8,BLK SHRPRZD	141
HHHR BAR, MOLDED	143
ASSY, CORNER COVER, LEFT	145
ASSY, CORNER COVER, RIGHT	146

TRM 800-14, BASE, 120V (serial code AGNB)	
Description	**Bubble Number**
COVER, DASH BACK	147
COVER, DASH FRONT	148
OUTER COVER, SIDE BAR, BASIC, LEFT	149.01
OUTER COVER, SIDE BAR, PREMIUM, LEF	149.02
OUTER COVER, SIDE BAR, BASIC, RIGHT	150.01
OUTER COVER, SIDE BAR, PREMIUM, RIG	150.02
ASSY, EMERGENCY STOP SWITCH	151
SCREW,MCH,8-32X1/2,PANHD,PHIL,	152
ASSY,CABLE W/JACKET,E-STOP PLUS SOF	153
ASSEMBLY, TRAY AND STOP SWITCH, BAS	154.01
ASSEMBLY, TRAY AND STOP SWITCH, PRE	154.02
TRIM RING, DASH	156
EXTRUSION, REAR ROLLER ADJUSTMENT (	158
SPACER, REAR ROLLER ADJUSTMENT	159
ASSEMBLY, HOOD	160
ISOLATOR, PLASTIC MOTOR	181
CONN,QK DISC,TAB,250X032,45DEG,0.19	201
HARDWARE, COMPRESSION LIMITER 6MM X	202
WIRE CLAMP, .25 INCH FASTENER, META	203
SQUARE PLASTI-GROMMET, 1/4 IN FSTNR	204
ANCHOR, SIDE TRIM	205
TRIM LANDING, ANCHOR, MOUNTING BLOC	206
NUT,PLAIN,HEX,3/8-24,STL,CLR ZN	207
SCREW,SELF-TAP,TRI,WASHER HD HEX,10	208
SCREW,SELF-TAP,TYPF,WASHER HD HEX/S	209
WASHER, LOCK, EXT TOOTH, #10	210
CLIP, TRAY MOUNTING	211
CUSTOM SCREW, .25-20 X .375 X 3.5 S	213
FUSE,2.00A,250VAC,SLOW,RADIAL	250
LABEL, HOOD ALUMINUM, NEW LOGO	251
PLATE, CONNECTOR COVER, BLANK	252