TREADMILL

SERVICE MANUAL
VOL 2.

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INTRODUCTION

Welcome to the world of STAR TRAC. In your hands is the **NEW** STAR TRAC *PRO TREADMILL SERVICE MANUAL.* This manual includes the *PRO, PRO S, and the ELITE* model. Each section is easy to use, providing detailed instructions and quick maintenance instructions.

We highly recommend that you read the entire manual prior to performing any maintenance or repair procedure. The information on the following pages will enable you to begin easily, quickly and safely.

How to use the manual

THIS IS **NOT** AN OWNER'S MANUAL. This Service Manual is intended for use by qualified repair technicians as a guide to diagnose and correct service problems.

The Service Manual is divided into six chapters. Each section is provided with it's own Table of Contents to assist in locating specific topics and procedures. Titles and major headings are located at the top of every page.

The Service Manual contains the following sections:

Chapter 1: Introduction - Provides a general overview of the Pro Treadmill, outlines safety precautions to be observed when performing maintenance or repair.

Chapter 2: Preventive Maintenance Schedules - Outlines periodic preventive maintenance checks and services; provides detailed procedures for specific maintenance tasks.

Chapter 3: Diagnostics - Describes how to access and use built-in diagnostic and customizing features and capabilities.

Chapter 4: Troubleshooting - Provides information designed to help diagnose and correct equipment problems. Troubleshooting information is arranged in a Symptom - Probable Cause - Suggested Remedy format.

Chapter 5: Parts Replacement - Provides step-by-step illustrated procedures to remove and install authorized infield replacement parts.

Section 6: Parts Breakdown - Contains an illustrated listing of all parts and assemblies contained in the Pro Treadmill Series .

Safety Instructions

The following Safety Instructions apply whenever performing any maintenance or parts replacement procedures.

1. Read each procedure COMPLETELY before starting any work. Give particular attention to all NOTES, CAUTIONS and/or WARNINGS.

2. If the optional external wall powered power pack is used with the unit, MAKE SURE the power pack is unplugged from the wall before handling any electrical components.

3. When disconnecting cable connectors, ALWAYS pull on the connector head, NEVER the wires.

Product Support

STAR TRAC Product Support Department sets the industry standard in Customer Service and Technical Assistance world wide. Providing superior product support and customer service is at the very heart of STAR TRAC's business philosophy. This commitment to service has been a major contributor to STAR TRAC's success and growth in the worldwide fitness equipment industry.

Technical Assistance
- When purchasing a part or requesting technical assistance, please contact our Product Support Department: CALL TOLL-FREE: 1-800-535-4634 or 800-503-1221 US and CANADA or 714-669-1660, please have the following information available:
  1. STAR TRAC model.
  2. STAR TRAC serial number.
  3. Problem statement/symptom.

After Hours Voicemail Direct

- CALL TOLL-FREE: 1-800-486-4736
  1. STAR TRAC model.
  2. STAR TRAC serial number.
  3. Problem statement/symptom.
  4. Return phone number and contact name.

Fax Requests
- Domestic and international: FAX 714-669-0739
  1. STAR TRAC model.
  2. STAR TRAC serial number.
  3. Problem statement/symptom.
  4. Return phone fax number and contact name.
  5. Purchase order or reference number.
  6. Part description and quantity.
  7. Ship to/bill to.

CHAPTER 1: Preventative Maintenance

Performing regular scheduled preventive maintenance is essential in keeping your *PRO TREADMILL* in top operating condition. Without preventive maintenance, normal wear and tear may cause cumulative effects, such as misalignment and early replacement of parts.

This section provides a list of factory-recommended preventive maintenance requirements, along with detailed procedures for performing each task.

MAINTENANCE CHART

- **D = Daily**
- **W = Weekly**
- **M = Monthly**
- **W = WAX**

(depending on the amount of use, Monthly procedures may need to be performed more frequently).

INTERVAL			PROCEDURE
D	**W**	**M**	
►			Using a liquid non-abrasive cleaner: Formula 409™ or FANTASTIK™ Wipe down the following: display board, handrails, shroud, heart rate grips. **Note:** Do not spray directly onto the display board or grips. Inspect for wear and tear on exterior parts regularly, especially under the running belt. Inspect the running belt for alignment and tension. (See page **6. Adjustments for instructions**.) Inspect the line cord plug and cord for possible damage or loose connection.
	►		Elevate the treadmill and vacuum under the unit. **Note:** Unplug the unit when Vacuuming. Verify running belt alignment and tension. Inspect the area under the treadmill for Obstructions.
		►	Lift the motor shroud and vacuum around the motor and electronics. Clean and lubricate the elevation screws. **Note:** This must be done unplugged and turned off.
		►	Inspect the display and handrail screws for loosening. Inspect the display panel Keys for wear.
W			Periodic running belt re-waxing virtually eliminates belt down time, and maximizes the life of the running belt. (See page **7. for Re-waxing instructions**)

Running Belt Adjustments

The running belt and its headroller, drive belt, tailroller, and running deck are designed to be self-centering, slip-free, and smooth-operating without the need for frequent adjustments.

Running belt sideward movement, slipping, or grinding after extended use,
or thumping during initial use, may be corrected by the following procedures:
Change Sideward Movement to TRACKING: If the running belt is not centered on the tailroller and is either too far left or right, adjust tracking using the following steps:
1. Turn the treadmill on. Increase treadmill speed to 3.0 mph (5.0 kph).
2. Adjust tracking by adjusting the tailroller Allen screws (located at the back sides of the tailroller) with a 1/4" Allen wrench in 1/4-turn increments.

    If the running belt is tracking to the left, adjust the running belt to track to the right Tighten the left tailroller Allen screw by turning clockwise, or loosen the right tailroller bolt by turning counter-clockwise.

    If the running belt is tracking to the right, adjust the running belt to track to the left. Tighten the right tailroller Allen screw by turning clockwise or loosen the left tailroller bolt by turning counter-clockwise.
3. After the running belt appears to be tracking properly, increase the treadmill speed to 10.0 mph (16.0 kph) and verify that the belt stays centered.

Slipping-Running Belt: Remove the motor shroud and operate the treadmill slowly at 1 to 2 mph (2 to 3 kph). While observing the headroller, walk on the belt and try to slow it down by gently applying pressure with your feet while holding the handrails. If only the running belt, and not the headroller, slows down, tighten the running belt by turning both the right and left tailroller adjustment bolts clockwise 1/4-turn. Repeat this adjustment until the running belt no longer slips, ensuring that you turn both tailroller bolts an equal number of turns. Re-install the motor shroud. If the headroller and the running belt both slow down, tight-en the drive belt as described under "Slipping-Drive Belt", below.

Slipping-Driver Belt: Adjust the treadmill incline to 5% to provide clearance underneath. Set the ON/OFF switch to the OFF position and unplug the treadmill. Remove the motor shroud. With a 1/2" socket wrench, loosen the four motor bolts. Use the socket wrench to adjust the tension bolt in the middle of the motor bracket 1/4-turn clockwise, stretching the drive belt. Tighten the motor bolts and re-install the motor shroud. Plug the treadmill in, turn it on, and test for slipping as described under "Slipping-Running Belt", above. Repeat this step as necessary.

Thumping: Turn the treadmill off. Turn the right and left tailroller adjustment bolts counter-clockwise with the 1/4" Allen wrench until the running belt is loose. Note the number of times each bolt is turned. Remove excess accumulated running deck wax from the tailroller with a credit card, a putty knife, or other flexible plastic implement. Tighten the running belt by turning the adjustment bolts clockwise the same number of turns as they were loosened. Turn the treadmill on and check for sideward movement and/or slipping of the running belt. Tighten the tailroller adjustment bolts further, if necessary, in 1/4-turn increments.

Re-Waxing Belt

Periodic running belt re-waxing virtually eliminates belt down time, and maximizes the life of the belt. Whenever the present distance is 2000 miles (or 3000 km) more than the LAST DECK (last deck service), the start-up display will scroll REWAX BELT. This is a reminder to have your maintenance or service provider perform the 5-minute belt re-waxing procedure at your convenience. (Immediate service is not required). Wax is included in the treadmill.

TOOLS & MATERIALS
Bottle of Wax Powder (1)
Clean Towel (1)
Paint Stick or Ruler (1)
Diluted All-purpose Cleaner (409), or Bristle Brush

PROCEDURE:
Apply wax powder while belt & deck are still warm (5 minutes minimum use) for optimum benefit.
1. **CAUTION: TURN TREADMILL POWER OFF AND UNPLUG THE POWER CORD BEFORE REWAXING THE BELT.**

2. **CLEAN DECK & BELT:**
   A. Using the paint stick or ruler, slide a towel under the middle of the belt from one side of the frame to the other.
   B. Hold the edges of the towel; pull to the tailroller; pull to the headroller; then pull the belt down to wipe the remaining belt.
TIP: Fold the dirty towel and shake into trash.

3. **LIFT BELT:** Lift the left side (facing display) of the belt, about 12 inches down from the motor shroud. Hold the belt up to elevate the belt from the deck.

4. **SPREAD WAX:** Flip the nozzle on the cap of the wax bottle. Point the nozzle at the deck. Be sure that the bottle is tilted at a downward angle. Squeeze the wax bottle *twice* between the running belt and the deck. TIP: Gently shake the bottle between each squeeze.

5. Repeat steps 3 and 4, about 18 inches from the end of the deck.

6. Repeat steps 3 through 5, on the right side of the belt/deck.

7. **WALK:** Plug in the treadmill. Turn the treadmill ON/OFF switch to the ON position. Start the treadmill at 1 mph and walk on all sections of the belt and deck for 1 minute to ensure the wax has been evenly distributed and worked-in properly.

8. **CLEANUP:** Turn the treadmill power OFF . Remove any excess wax with diluted cleaner (409) and towel. TIP: Blow away extra wax first (like dust), then wipe.

9. **DISPLAY UPDATE:** Update the LAST DECK service mileage to remove the REWAX BELT message.
   A. Power ON the treadmill.
   B. Enter MAINTENANCE SETTINGS (see Chapter 8).
   C. Press the INCLINE DOWN key until the Information Window reads LAST DECK.
   D. Use the 0 ~ 9 keys to enter the present treadmill distance.
   E. Press the START key to enter and update the display.
   F. Press the STOP key to exit MAINTENANCE SETTIN

CHAPTER 2: Diagnostics

The **STAR TRAC** Pro Series Treadmill contains diagnostic and customized modes. In these modes you are able to check accumulated data about the past usage of the treadmill, test its motor and display controls and investigate display code messages.

- **Manager Mode (customize)**

- **Maintenance Mode (diagnostics)**

- **Motor Test Mode (diagnostics)**

- **Display Test Mode (diagnostics)**

- **Heart Rate Test Mode (diagnostics)**

Manager Mode

After having used your *Star Trac Pro treadmill* for several workouts, you may wish to specially customize your treadmill by changing some of its settings.

To engage Manager Mode:

1. Press and hold the " 0 ", " 1 " & " START " keys together. While holding the " 0 " & " START " keys down, release the " 1 " key only.

2. The display will beep and display **Manager Mode** momentarily, then UNITS will be displayed.

Once the treadmill is in Manager Mode, you may use the following keys:
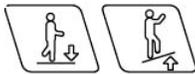
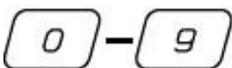INCLINE KEY: Displays the next or previous parameter.

SPEED KEYS: Allows the variable to be changed within the parameter.

ENTER KEY: Saves the value if changed in the EPROM (software).
Note: ENTER KEY must be pressed, for each value changed.

STOP KEY: Exists Manager Mode and restarts the treadmill with a "warm start."

0 – 9 KEYS: Enters new parameter values. If **UNITS** parameter is displayed, key **5** starts DISPLAY TEST and key **8** starts MOTOR TEST.

HEART KEY: When pressed will automatically display manufactures default value.
Note: ENTER KEY must be pressed, to save the default values if changed.

FOREST KEY: When pressed in MOTOR TEST mode will automatically engage running belt calibration process.
Note: Do not press stop key or stand on running belt while the unit is in the process of calibration.

Manager Mode

The following parameters may be changed using the previous keys:

| Parameters	Lowest Value	Highest Value	Option 1	Option 2	Default Value	Meaning
UNITS	---	---	English	Metric	English	English= units of lbs., miles, hours, minutes Metric= units of kg., km, hours, minutes.
MN SPD	0.1	2.5	English=0.5	Metric=1.0	0.5	Minimum speed in MPH or KM/HR
MX SPD	5.0	20.0	English=10.0	Metric=20.0	10.0	Maximum speed in MPH or KM/HR
EL OPT	---	---	ON	OFF	ON	Turns the elevation system ON or OFF.
TIME	5	99			99	Maximum time in minutes allowed for program, including warm-up/cool-down.
OP HRS	0	0	---	---	6,553.5	Total operating hours
DIST	0	0	---	---	65,635	Total treadmill miles (Units=English) or kilometers (Units=Metric)
WEIGHT	0	399	---	---	155	Defaults (to user), typical weight in lbs/kg depending on what setting (UNITS= English or Metric
SER NO	0	0	---	---	65,535	Treadmill serial number.
LANG	---	---	---	---	English	Language in English, Dutch, German, Portuguese, Spanish, Swedish, or Italian.
ENTRY	---	---	Units	Tenths	Units	This variable changes the starting speed in Units or Tenths

Maintenance Mode

Maintenance Mode includes all of the items of Manager Mode, plus additional data that is automatically saved to properly troubleshoot in case of a problem. To engage Maintenance Mode:

1. Press and hold the " 0 ", " 2 " & " START " keys together. While holding the " 0 " & " START " keys down, release the " 2 " key only.

2. The display will beep and display MAINTENANCE momentarily, then UNITS will be displayed.

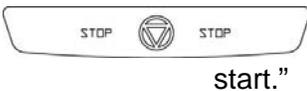Once the treadmill is in Maintenance Mode, you may use the following keys:
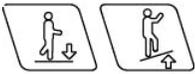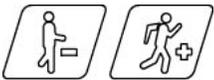
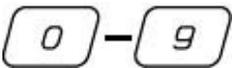INCLINE KEY: Displays the next or previous parameter.

SPEED KEYS: Allows the variable to be changed within the parameter.

ENTER KEY: Saves the value if changed in the EPROM (software).
Note: ENTER KEY must be pressed, for each value changed.

STOP KEY: Exists Manager Mode and restarts the treadmill with a "warm start."

0 – 9 KEYS: Enters new parameter values. If **UNITS** parameter is displayed, key **5** starts DISPLAY TEST and key **8** starts MOTOR TEST.

ALPINE KEY: When pressed will automatically display manufactures default

Note: START KEY must be pressed, to save the default values if changed.

FOREST KEY: When pressed in MOTOR TEST mode will automatically engage running belt calibration process.
Note: Do not press stop key or stand on running belt while unit is calibrating.

Maintenance Mode

The following parameters may be changed using the previous keys:

Parameters	Lowest Value	Highest Value	Option 1	Option 2	Default Value	Meaning
UNITS	---	---	English	Metric	English	English= units of lbs., miles, hours, minutes Metric= units of kg., km, hours, minutes.
MN SPD	0.1	2.5	English=0.5	Metric=1.0	0.5	Minimum speed in MPH or KM/HR
MX SPD	5.0	20.0	English=10.0	Metric=20.0	12.5	Maximum speed in MPH or KM/HR
ELEVATION	---	---	ON	OFF	ON	Turns the elevation system ON or OFF.
TIME	5	99			99	Maximum time in minutes allowed for program, including warm-up/cool-down.
OP HRS	0	0	---	---	0	Total operating hours
DISTANCE	0	0	---	---	0	Total treadmill miles (Units=English) or kilometers (Units=Metric)
WEIGHT	0	399	---	---	155	Defaults (to user), typical weight in lbs/kg depending on what setting (UNITS= English or Metric).
SER NO	0	0	---	---	0	Last five digits of Treadmill serial number.
LANGUAGE	---	---	---	---	English	Language in English, French, Dutch, German, Portuguese, Spanish, Swedish, Italian, or Katakana.
ENTRY	---	---	Units	Tenths	Units	This variable changes the starting speed in Units or Tenths

Maintenance Mode

Parameters	Lowest Value	Highest Value	Option 1	Option 2	Default Value	Meaning
HR CONTROL	---	---	ON	OFF	ON	OFF= Heart Control disable ON= Heart Control enabled
HEART RATE	---	---	POLAR CONTACT BOTH	POLAR CONTACT BOTH	Both	POLAR, CONTACT or BOTH (Polar & Contact)
METS	---	---	ON	OFF	OFF	OFF= METS disable ON= METS enable
WATTS	---	----	ON	OFF	OFF	OFF = WATTS disable ON = WATTS enable
PAUSE	30	60	30 45 60	30 45 60	45	Seconds of pause time during work out program.
SCALE	---	---	ON	OFF	On	Off = disable weight scales On = enable weight scales
INFRARED COM	---	---	ON	OFF	OFF	Off = disable infrared hardware ON = enable infrared hardware
CSAFE	---	---	ON	OFF	Off	Off = disable entertainment hardware On = enable entertainment hardware (Cardio Theater / Fitlinks)
FAN	---	---	On	Off	On	Off = disable display fans On = enable display fans
AUTO STOP	---	---	On	Off	On	Off = disable load detection On = enable load detection
Entertainment	---	---	On	Off	Off	Off = disable entertainment display key On = enable entertainment display key

Maintenance Mode

Parameters	Lowest Value	Highest Value	Option 1	Option 2	Default Value	Meaning
ACCEL TIME	25	60	---	---	25	Time, in seconds, to reach max speed.
DECEL TIME	20	60	---	---	20	Time, in seconds, to reach 0 mph (0km/hr)
LOCK OUT	---	---	ON	OFF	OFF	OFF = disabled ON = enabled
LOCKOUT ID	10000	65535			12345	Treadmill Lockout ID
RAIL STOP	---	---	ON	OFF	OFF	OFF = Disables Euro handrail stop. ON = Enables Euro handrail stop
10 REV	22.0	74.0	30.7 = For 110v units	35.6 = For 220v unit	30.7	Inches of belt traveled for 10 revolutions, 1.6" pulley:27.5 1.7" pulley: 29.1 1.8" pulley:30.7 (110v) 2.1" pulley:35.8(220v)
CNT/RV	1	31	31 = Magnetic RPM Sensor	31 = Magnetic RPM Sensor	125	Number of counts per RPM Revolution.
MN PWM	2	100	---	---	60	Minimum PWM automatically done.
1/2 PWM	150	300	---	---	260	1/2 Maximum PWM automatically done.
MX PWM	380	512	---	---	440	Maximum PWM automatically done.
DATE	---	---	---	---	0	Manufacturing date.
NO RAIL STOP	0	255	---	---	0	# of times the Stop Switch/ Stop key was down or disconnected on power-up since last reset.
KEY DN	0	255	---	---	0	# of times, one of the keys was down or depressed on power-up since last reset.
SPEED CHG	0	255	---	---	0	# of times a sudden change in speed was detected.
EL STL	0	255	---	---	0	# of times an elevation stall was detected.

Maintenance Mode

Parameters	Lowest Value	Highest Value	Option 1	Option 2	Default Value	Meaning
EL RANGE	0	255	---	---	0	# of times elevation range was detected. (EL Range will detect between the Pot read of 253 and 255).
EL LOST	0	255	---	---	0	# of times elevation range was detected. (EL Lost will detect when the display has lost the elevation motor Pot reading).
NO MOTOR	0	255	---	---	0	# of times No Motor was detected. (display when there's no motor current detected, but there is belt movement).
NO SENSOR	0	255	---	---	0	# of times No Sensor was detected. (No Sensor will display when there's no RPM feedback).
ELEV ZERO	175	242	---	---	240	Voltage to elevation motor to obtain 0%. Multiply by 0.0196608 to = actual voltage.
ELEV MAX	25	170	---	---	57 = 120V Black motor 25 = 120v Silver motor 80 = 230V	Voltage to elevation motor to obtain 15%. Multiply by 0.0196608 to = actual voltage
LAST DECK	0	65565	---	---	0	# of miles when the deck was last waxed. After a 2000 mile (or 3000 KM) difference, "REWAX BELT" will scroll in the display until "LAST DECK" miles are updated.
LAST BELT	0	65535	---	---	0	# of miles when the last running belt was replaced.
LAST MOTOR	0	65535	---	---	0	# of miles when the last motor was replaced.
MASTER PIN	---	---	13579	13579	13579	Master pin personal trainer configuration.

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Maintenance Mode

Parameters	Lowest Value	Highest Value	Option 1	Option 2	Default Value	Meaning
MODEL	0	255	---	---	1	Model number used by CSAFE to distinguish models and equipment.
MANUAL	0	65,535	---	---	0	# of times Manual Program was used since last reset.
FOREST	0	65535	---	---	0	# of times "Forest Program" was used since last reset.
TRIAL	0	65535	---	---	0	# of times "Trial Program" was used since last reset.
ALPINE	0	65535	---	---	0	# of times "Alpine Program" was used since last reset.
MYSTERY	0	65535	---	---	0	# of times "Mystery Program" was used since last reset.
5K LAKE	0	65535	---	---	0	# of times "5K Lake Program" was used since last reset.
10K BAY	0	65535	---	---	0	# of times "10K Bay Program" was used since last reset.
PALM PC CUSTOM	0	65535	---	---	0	# of times "Palm PC Custom Program" was used since last reset.
DHRC	0	65535	---	---	0	# of times "Dynamic Heart Rate Control Program" was used since last reset.
CUSTOM	0	65535	---	---	0	# of times "Custom Program" was used since last reset.
TRAINER	0	65535	---	---	0	# of times "Personal Trainer Program" was used since last reset.
QUICK-START	0	65535	---	---	0	# of times "Quick-Start Program" was used since last reset.

Motor Test Mode

Motor Test Mode allows you to test major components such the RPM Sensor, Motor response, MCB PWM readings and engages auto-calibration. To engage Motor Test Mode:

Caution : Do not stand on the running belt while performing these test.

WHEN SHOULD MOTOR TEST MODE BE ENGAGED?
Motor Test Mode should be engaged whenever a speed or elevation issue occurs.

1. Press and hold the " 0 ", " 2 " & " START " keys together. While holding the " 0 " & " START " keys down, release the " 2 " key only.

2. The display will beep and display MAINTENANCE momentarily, then UNITS will be displayed.

3. Then press key " 8" display will read:

240	3	.0
A. Elevation Motor Range.	**B.** PWM Duty Cycle.	**C.** RPM feedback

Once the treadmill is in TEST Mode, you may use the following keys:

INCLINE KEY: Adjust voltage to incline motor, inclines the treadmill in increments of 1%. When using the Incline Keys verify the elevation system is responding correctly by the following:
- As the treadmill elevates up and down verify the corresponding LEDs **D31 & D32** light up on the MCB. (See page **22-23** for MCB/LED layout
- Verify that the Elevation Motor Range (see above A column) is changing in increments of 1% as the treadmill elevates up and down.

Caution: Do not elevate treadmill above 15% = 57 (110v units), 80 (220v units) or below 0% = 240 (110 & 220v units) mechanical damage may occur.

SPEED KEYS: Adjust the PWM duty cycle and motor speed up and down, respectively, in increments of 0.1 mph (UNITS=English) or 0.1km/hr (UNITS = Metric). When using the Speed Keys verify the speed control system is responding correctly by the following:
- As the treadmill begins to increase speed, verify that the display registers RPM feedback (see above C column) in increments of 0.1 mph/km.

FOREST KEY: Starts automatic calibration of minimum, 1/2 maximum, & maximum speed.

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STOP KEY: Exists MOTOR TEST Mode and restarts the treadmill.

Display Test Mode

Display Test Mode allows you to test the light-emitting diodes (LEDs), it also allows software version to be displayed. To enter Display Test Mode:

__***Caution*** : Do not stand on the running belt while performing these test.__

WHEN SHOULD DISPLAY TEST BE ENGAGED?
Display Test should be done if any problems occur with either missing LED segments, a key fails to respond or when a KEY DN (key down) display code is given.

1. Press and hold the " 0 ", " 2 " & " START " keys together. While holding the " 0 " & " START " keys down, release the " 2 " key.

2. The display will beep and display **MAINTENANCE SETTINGS**.

3. Press and release the "5 key. Observe the display: **DISPLAY TEST**. Pressing the
 will automatically scroll through all the keys and LED segments.

4. Pressing the "1" key once will display the MCU1 software version. Pressing the **SPEED UP** key will verify MCU2 software, FIFO1 and FIFO2.

5. Press the to go back to **DISPLAY TEST.**

6. Pressing the "2" key once will display **KEYBOARD TEST.** Press any key on the display at this point and observe the information window. Verify on the display screen that each key pressed matches the button pressed.

Note: If display screen does not match the button pressed or does not respond to the key pressed, then we recommend replacing the keypad.

7. Press the to go back to **DISPLAY TEST.**

8. Pressing the twice will **EXIT DISPLAY TEST.**

Speed Calibration

In this mode minimum and maximum speed is automatically calibrated. Calibration lasts less than 3 minutes; belt will be in motion during this test.

*****Caution*** : Do not stand on the running belt while performing these test.**

WHEN SHOULD AUTO-CALIBRATION BE ENGAGED?
Auto-calibration should be done every time MN, MX SPD & UNITS parameters have been changed in either MANAGER or MAINTENANCE MODES. Auto-calibration must be engaged when speed controlling components have been upgraded or replaced such as; MCB, Display Board, Drive Motor & RPM Sensor.

1. Press and hold the " 0 ", " 2 " & " START " keys together (or the "0" , "2"). While holding the " 0 " & " START " keys down, release the " 2 " key. The display will beep and display **MAINTENANCE MODE**.

2. Press and release the "8" key. Display will read: **240 3 .0** if treadmill is at 0%.

3. Press [ALPINE] key, display will read: **CALI** treadmill will go into an automatic speed calibration for less than 3 minutes. Press "STOP" key to exit Motor Test.

NOTE: If Auto-calibration fails to give the correct response refer to Chapter 4.

4. Press [STOP ⊘ STOP] key to exit Motor Test.

Elevation Calibration

Re-calibrating the 0% or 15% elevation may become necessary if the Elevation Motor potentiometer goes out of range or looses range.

WHEN SHOULD ELEVATION CALIBRATION BE ENGAGED?
Elevation Calibration should be engaged in combination with the Motor Test Mode when dealing with elevation issues and display codes such as EL RANGE and EL LOST

NOTE: Do not elevate treadmill above 15% = 57 (110v units), 80 (220v units) or below 0% = 240 (110 & 220v units) mechanical damage may occur.

1. Press and hold the " 0 ", " 2 " & " START " keys together. While holding the " 0 " & " START " keys down, release the " 2 ". The display will beep and display **MAINTENANCE MODE**.

2. Press and release the "8" key. Display will read: **240 3 .0** if the treadmill is at 0%

Note: If the treadmill is not at 0%, then press the elevation keys until the unit is leveled at 0%.

3. Once the unit is leveled and the display is reading **240 3 .0** press the "0" key once, the letter **Z** will be displayed for 0% setting. Press the ALPINE key to save.

4. Pressing the **INCLINE UP** key until unit reaches desired maximum elevation (15%) "0" Press the " 0 " key a second time the letter **M** will be displayed for 15% setting. Press the ALPINE key to save the above elevation.

NOTE: 110V units maximum elevation is 57 and 80 for 220v units.

5. Press STOP STOP key to exit Motor Test.

NOTE: Verify that the Elevation Motor Range (see above A column) is changing in increments of 1% as the treadmill elevates up and down. Erratic increment changes would indicate the display cable may be faulty.

CHAPTER 3: Troubleshooting

Should the *STAR TRAC* PRO TREADMILL experience a problem or a display code appear, the following chapter will help determine the precise reason for the problem.

Included are troubleshooting and display code charts.

- Display Code Troubleshooting

- MCB LED Layout

- Main Drive Assembly Wiring

- Display Board Assembly Wiring

- Fan Board Assembly Wiring

Display Code Troubleshooting Chart

Display Code	Description of code	Possible Cause	Solution
No Rail Stop	# of times the Stop Switch/ Stop key was down or disconnected on power-up since last reset.	**1.** Disconnected Stop Switch on the handrail or in the upper display board.	**A.** Carefully pop-out the handrail stop switch from the handrail and check connec-Tion. **B.** Verify that the Stop Switch is not damaged or that it is sticking. **C.** Remove left handrail and check Stop Switch within the handrail. **D.** Carefully remove the display board and check connection. See page 28. **E.** Replace Stop Switch Assembly
		2. Stop Key on the Display Board faulty.	**A.** Engage Display Test and check STOP KEY. See page 18.
KEY DN	# of times, one of the keys was down or depressed on power-up since last reset.	**1.** One or more key(s) on the display panel are faulty or stuck.	**A.** Engage Display Test and check key pad re-response. See page 18.
SPEED CHG	# of times a sudden change in speed was detected.	**1.** Sudden speed change was detected from the RPM Sensor.	**A.** Engage Motor Test Mode, see page 17 and verify speed response. No response would indicate RPM Sensor re-placement.

			B. Verify that the RPM Sensor LED on the MCB is responding, see page 26. If LED does not respond replace MCB.
		2. Speed is irregular at high or low speeds.	**A.** Engage Manager Mode and verify that the MIN SPD, ½ SPD and MAX SPD are set correctly. See page 9. **B.** Engage Speed Calibration, see page 19. If speed calibration can not be obtained, replace the MCB. **C.** Turn unit off and verify that the motor brushes are secured within the motor.
EL STL	# of times an elevation stall was detected.	**1.** Elevation system has malfunctioned.	**A.** Engage Motor Test Mode, see page 17 and verify elevation response and corresponding LEDs on the MCB operate correctly, see page 26. No LED or Elevation Motor response would indicate MCB re-placement. **B.** If elevation motor appears to grind or overheat would indicate Elevation Motor replacement.

		2. Foreign obstruction not allowing the elevation system to elevate.	**A.** Verify that no foreign obstruction is blocking the elevation screws or elevation belt from elevating.
		3. Elevation screws binding.	**A.** Elevation screws that have not been cleaned or lubricated as outlined in the maintenance chart, see page 5 will cause the elevation system to bind.
		4. Elevation system loose causing bind.	**A.** Verify that the elevation idler is not loose or damaged.
EL RANGE	# of times elevation range was detected.	**1.** Elevation motor readings are outside the range.	**A.** Engage Elevation Calibration, see page 20 and verify that the elevation motor readings are within range.
EL LOST	# of times elevation lost was detected.	**1.** Elevation motor readings are outside the range or reading is lost	**A.** Combine Motor Test Mode, see page 17 with Elevation Calibration, see page 20 and verify that the elevation motor readings are within range. **B.** Verify that the Elevation Motor Range is changing in increments of 1% as the treadmill elevates up and down. Erratic

			increments would indicate the display cable or elevation motor is faulty.
NO SENSOR	# of times no sensor was detected.	**1.** Sudden speed change was detected from the RPM Sensor or no loss of speed feedback has been detected. **2.** Cable loose or interference. See note below for troubleshooting instructions.	**A.** Engage Motor Test Mode, see page 17 and verify speed response. No response would indicate RPM Sensor re-placement. **B.** Verify that the RPM Sensor LED on the MCB is responding, see page 26. If LED does not respond replace MCB. **D.** Engage Manager Mode and verify that the MIN SPD, ½ SPD and MAX SPD are set correctly. See page 9. **E.** Engage Speed Calibration, see page 19. If speed calibration can not be obtained, replace the MCB.

NOTE: verify that all cables are secured and tie wrapped away from the RPM sensor. The magnet on the display cable will bounce as the unit is in operation and may hit the connector for the RPM sensor causing it to loose contact for a second and the no sensor code will appear. See diagram:
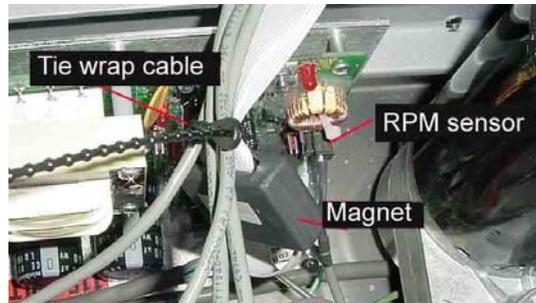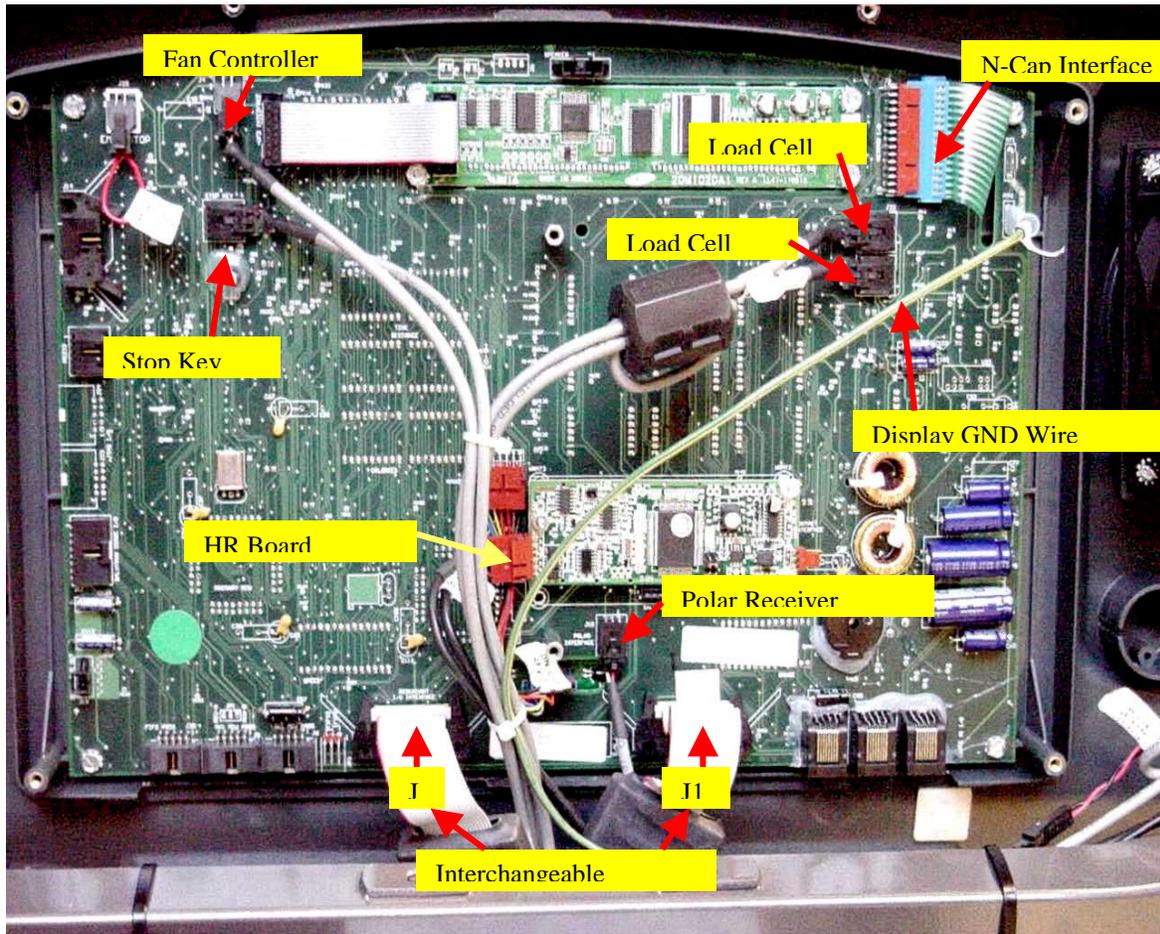
MCB (motor control board) Layout
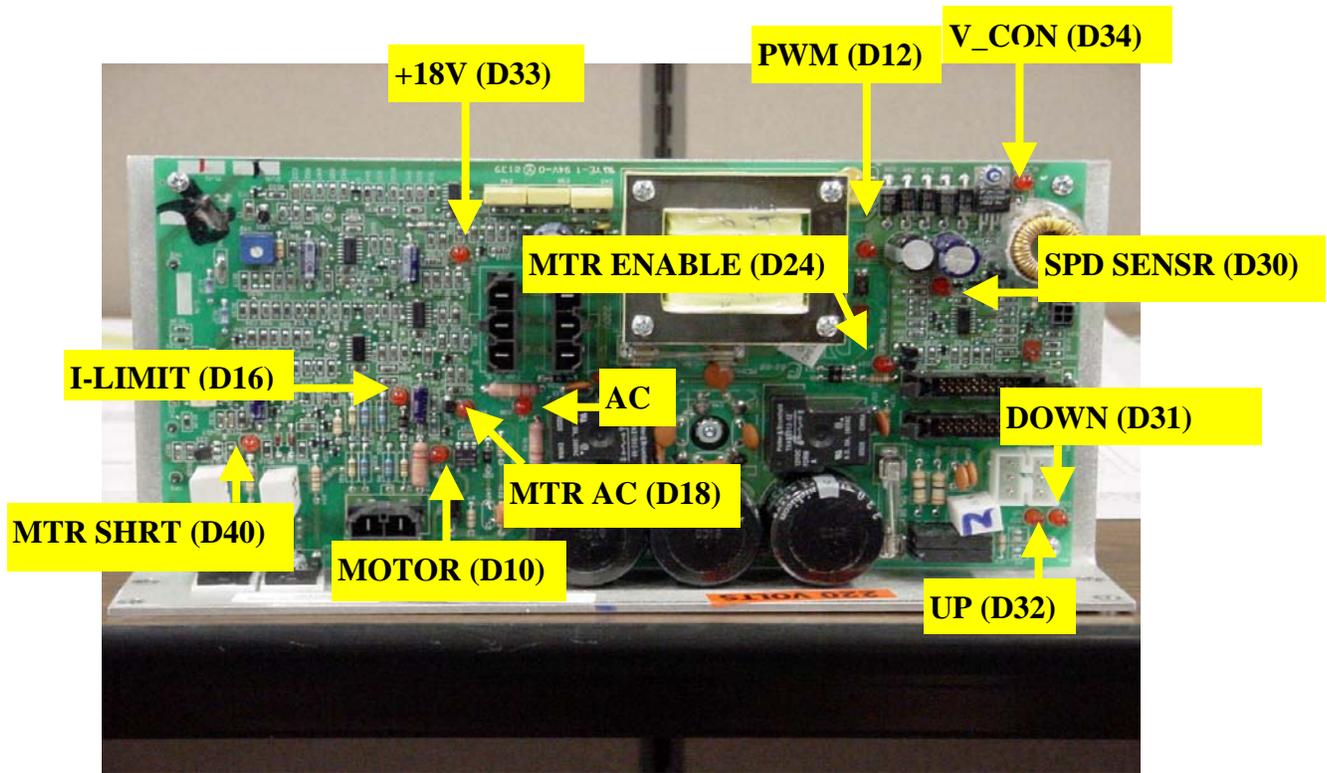
The above LED's are designed to help you determine at a quick glance if power is being applied to specific components such as; display, motor and RPM sensor. Combining this with Motor Test Mode will eliminate possible causes that may result to downtime.

The following page provides the definition for each LED.

MCB (motor control board) Layout

Designation	Description	Message When LED Is On
D10	MOTOR	AC power is 'on', Motor is hooked up and relay is energized. This LED will stay lit for a few minutes after AC voltage is removed or relay turned off.
D12	PWM	PWM command / signal is present.
D16	I-LIMIT	LED should blink once when AC voltage is first applied to Motor Controller board and should stay off at normal operation. When I-LIMIT (Over current) condition is hit, this LED will turn on. The MCB will shut down the drive to the motor when over current (Fault) condition is maintained for more than 5 seconds to protect the motor and MOSFET. This LED will stay on until the treadmill is reset or STOP button is hit.
D18	MTR AC	AC power is 'on', relay is energized and rectified AC line voltage is present.
D24	MTR ENABLE	Relay is 'on' (i.e. energized).
D30	SPD SENSR	Blinks when speed is detected. Blinking rate or 'on' rate depends on the speed detected.
D31	DOWN	Elevation Down command is present.
D32	UP	Elevation Up command is present.
D33	+18 V	Always 'on' when MCB supply voltage is present.
D34	V_CON	Always 'on' when Console supply voltage is present.
D38	AC	Stays 'on' when AC line voltage (110VAC/220VAC) is present.
D40	MTR SHRT	Turns 'on' when the motor is SHORTED.
TP1	Test Pin 1	Current sense feedback test-pin for troubleshooting.
TP2	Test Pin 2	Brush sense feedback test-pin for troubleshooting.
TP3	Test Pin 3	Power ground test-pin for troubleshooting.
P7	N/A	Activates the relays for troubleshooting.
P8	N/A	Bypasses the speed input for troubleshooting.

Display Board Assembly Wiring

Fan Controller

N-Cap Interface

Load Cell

Load Cell

Stop Key

Display GND Wire
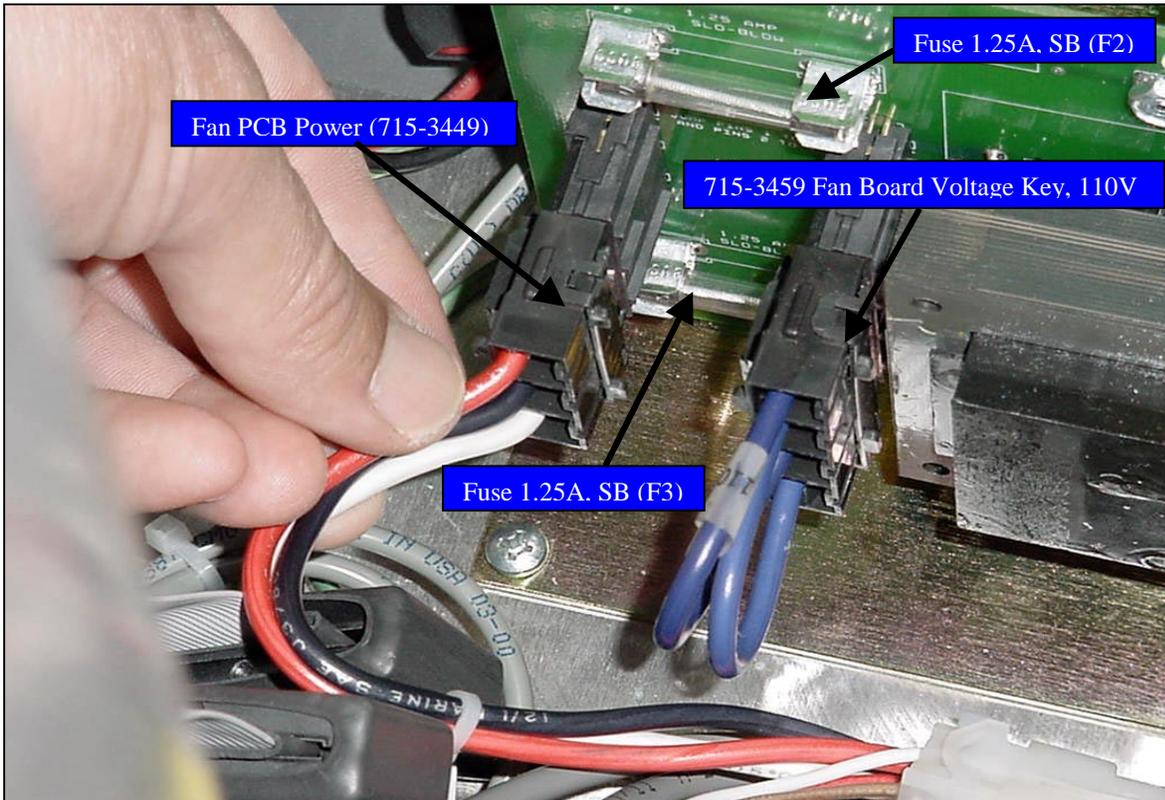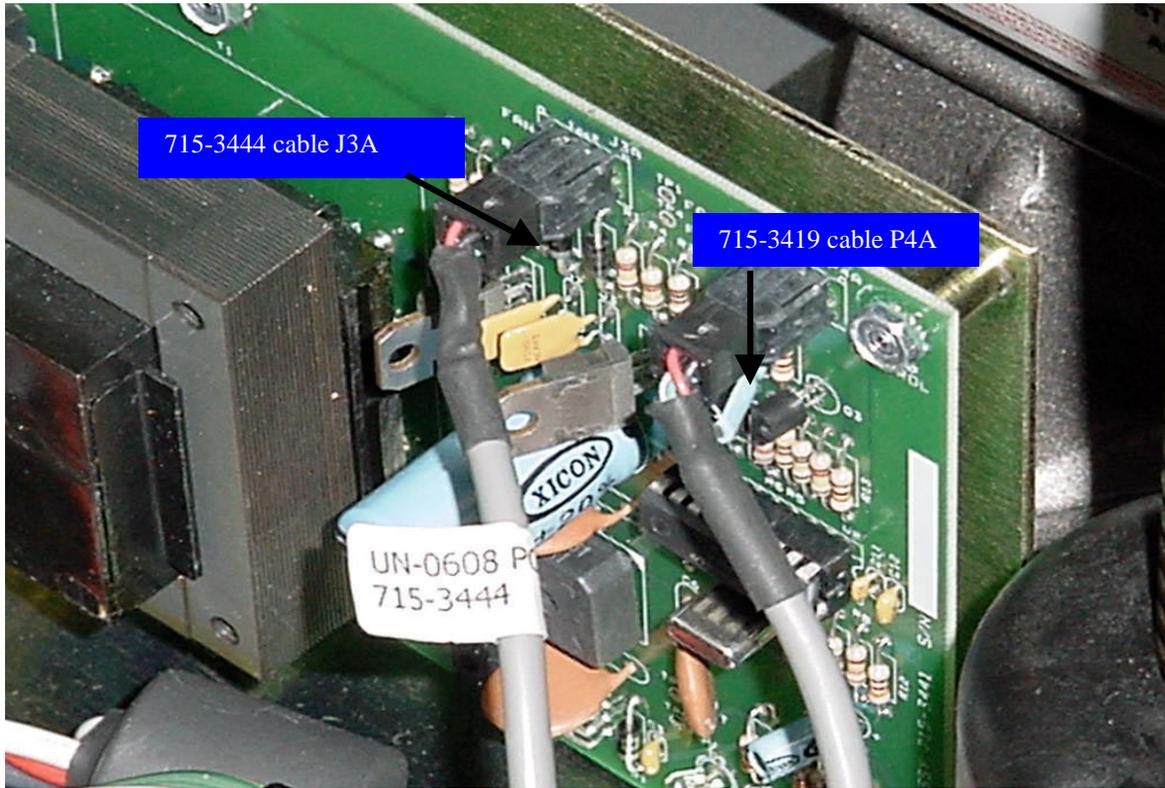
HR Board

Polar Receiver

J

J1

Interchangeable

Display Board Assembly Wiring (continued)
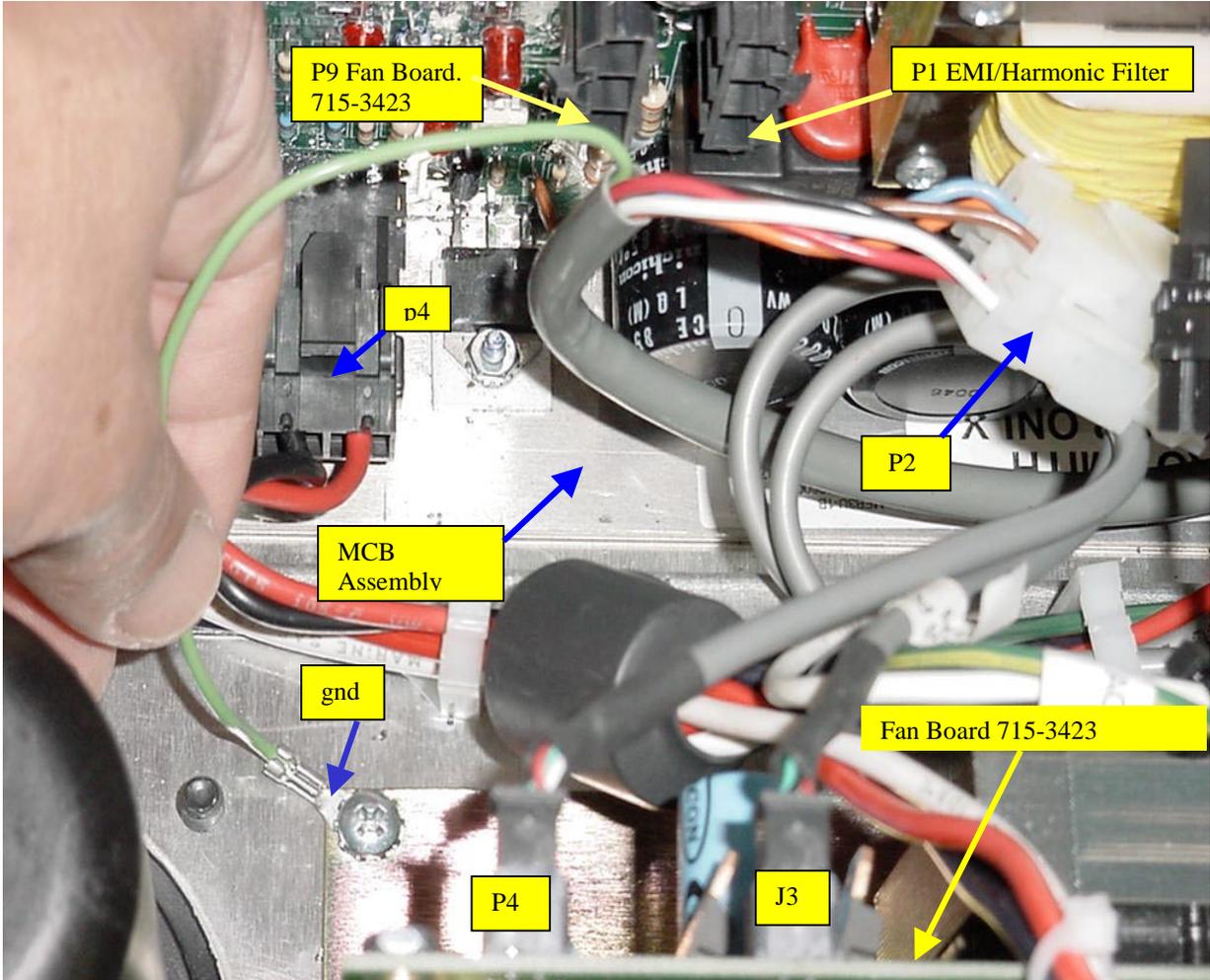

Complete wiring view of the back of a Pro Tread display
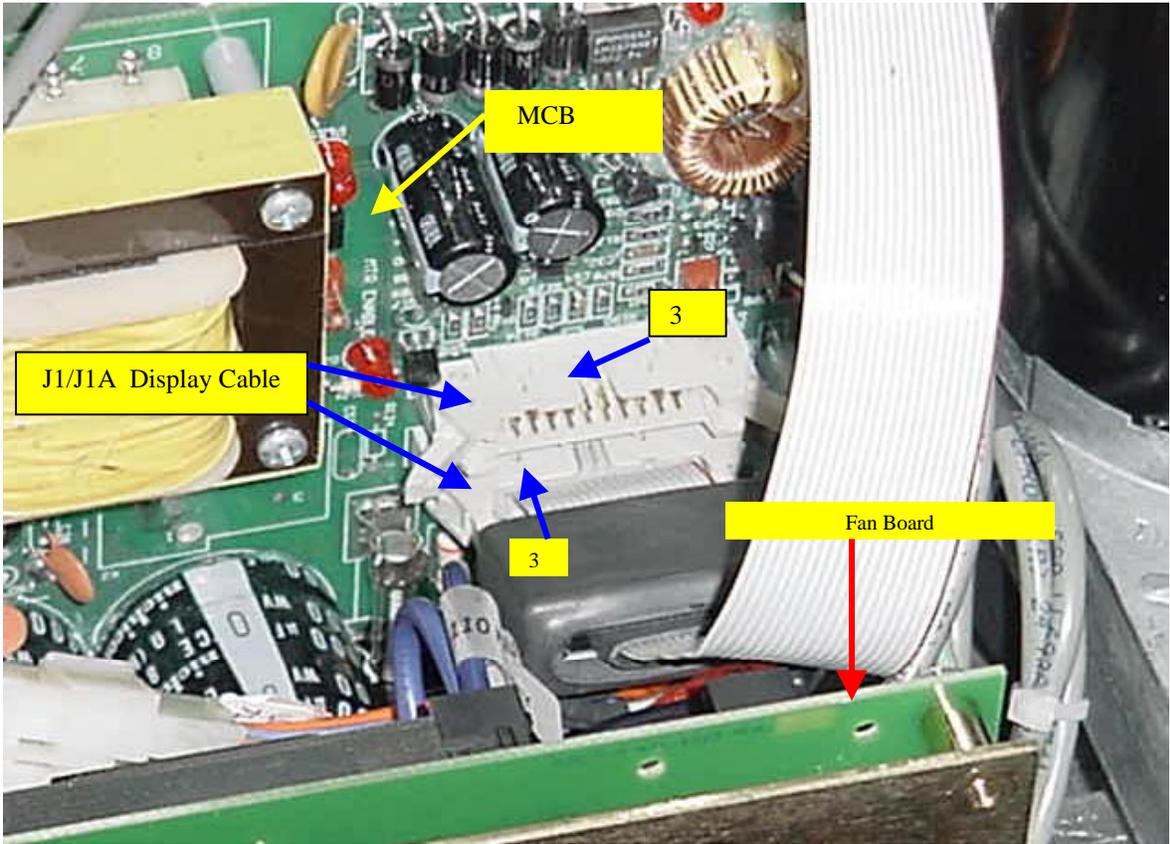
Fan Board Assembly Wiring
Lower Chassis

715-3444 cable J3A

715-3419 cable P4A

UN-0608 P(
715-3444

Fan PCB Power (715-3449)

Fuse 1.25A, SB (F2)

715-3459 Fan Board Voltage Key, 110V

Fuse 1.25A, SB (F3)

MCB (motor control board) Assembly Wiring

RPM Sensor

Ground

Main I/O Interface cable from upper display J1/J1A plugged in here. No matching ID required

Elevation Interface

MCB (motor control board) Assembly Wiring

P9 Fan Board.
715-3423

P1 EMI/Harmonic Filter

p4

P2

MCB
Assembly

gnd

Fan Board 715-3423

P4

J3
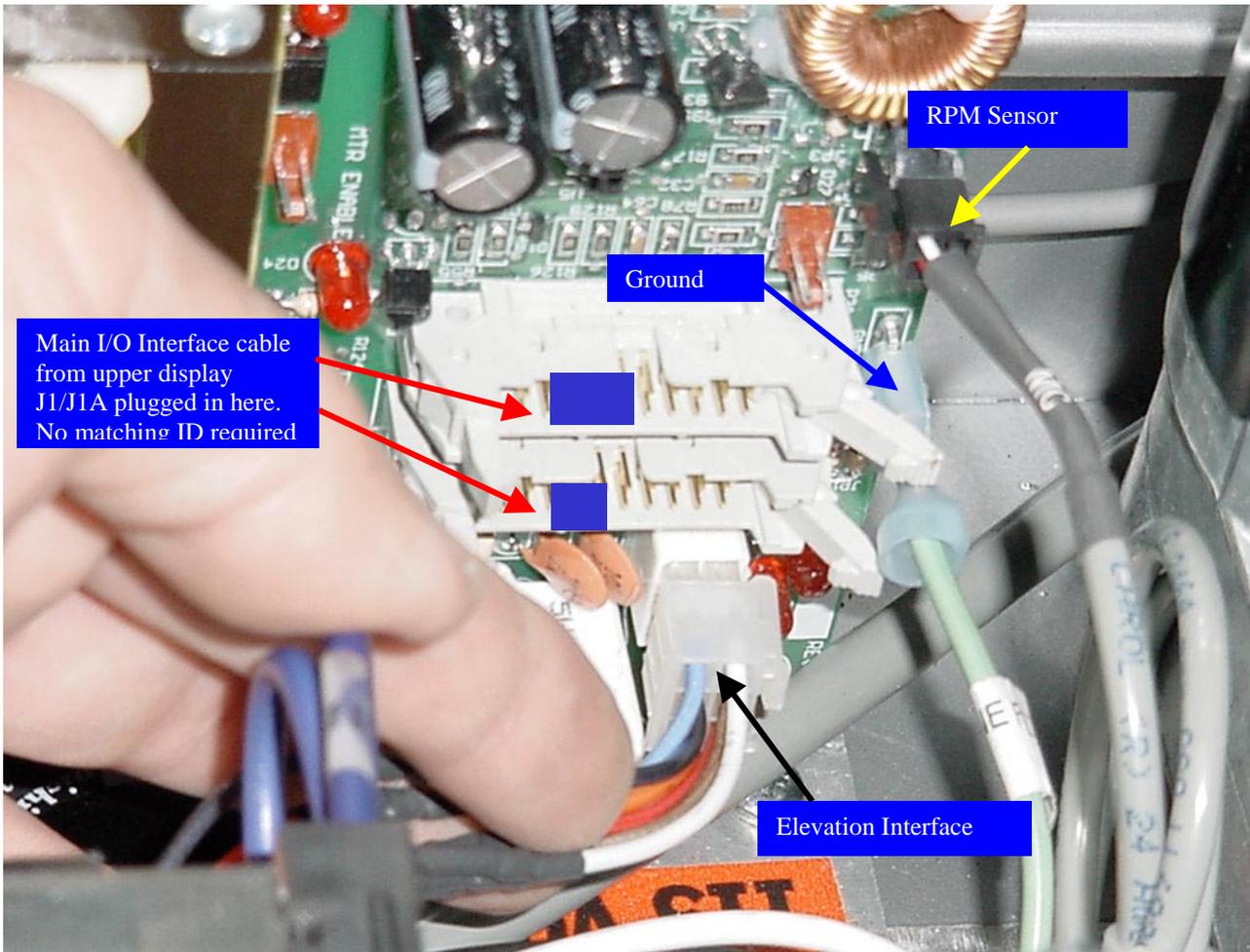
MCB (motor control board) Assembly Wiring

Main I/O Interface from Display to MCB

Drive Motor Wiring

Locking Wire Saddle

Drive Motor with ferrite

Motor Network Filter assembly 715-3466

Fan Board Assembly 715-3423

Grounds

Elevation

Drive Motor Wiring

RPM Sensor

Elevation Motor

Fan PCB

AC Line to MCB

Input from MCB (P4) 715-3426

Output to Motor

EMI Filter 440-0257
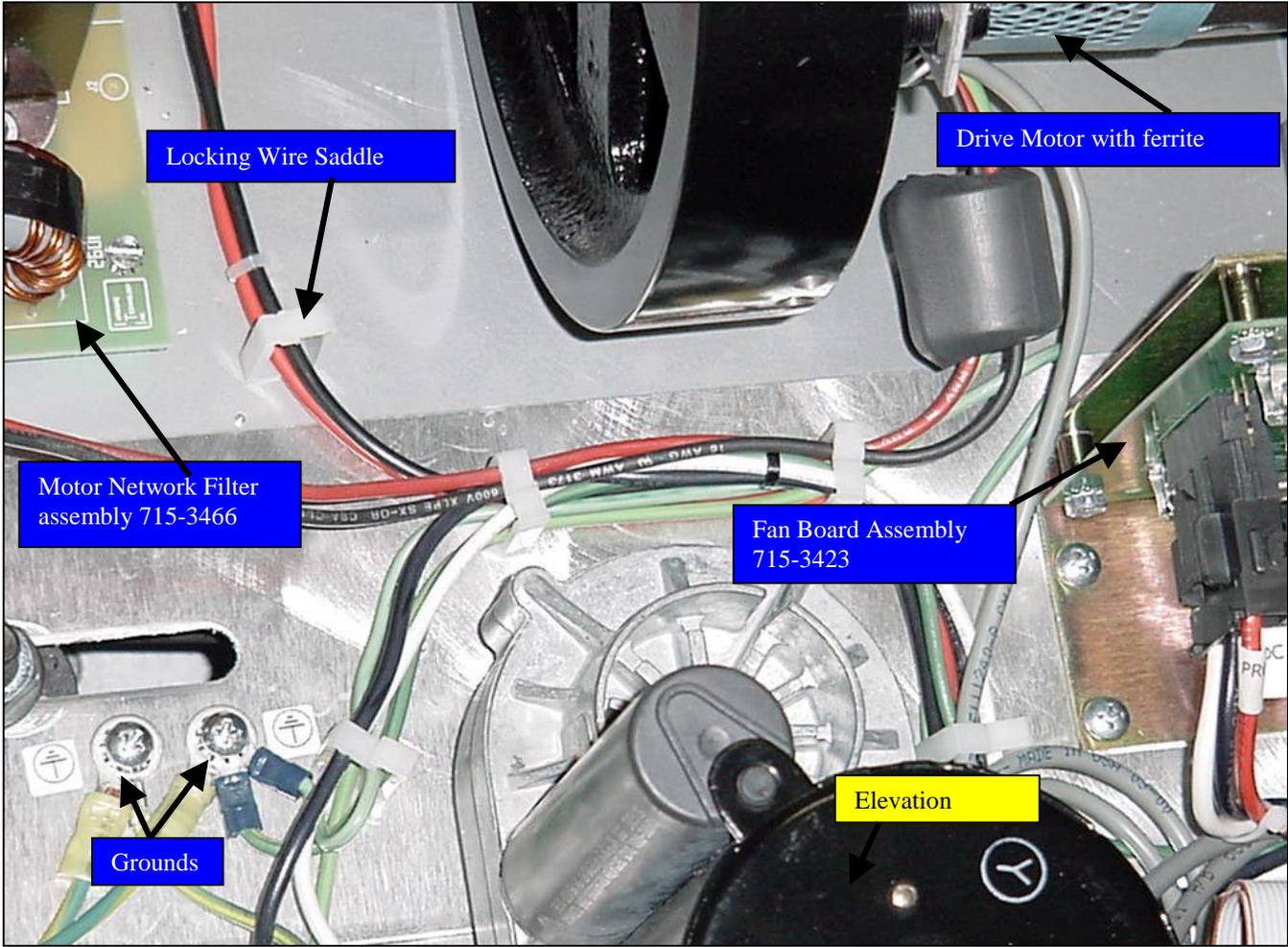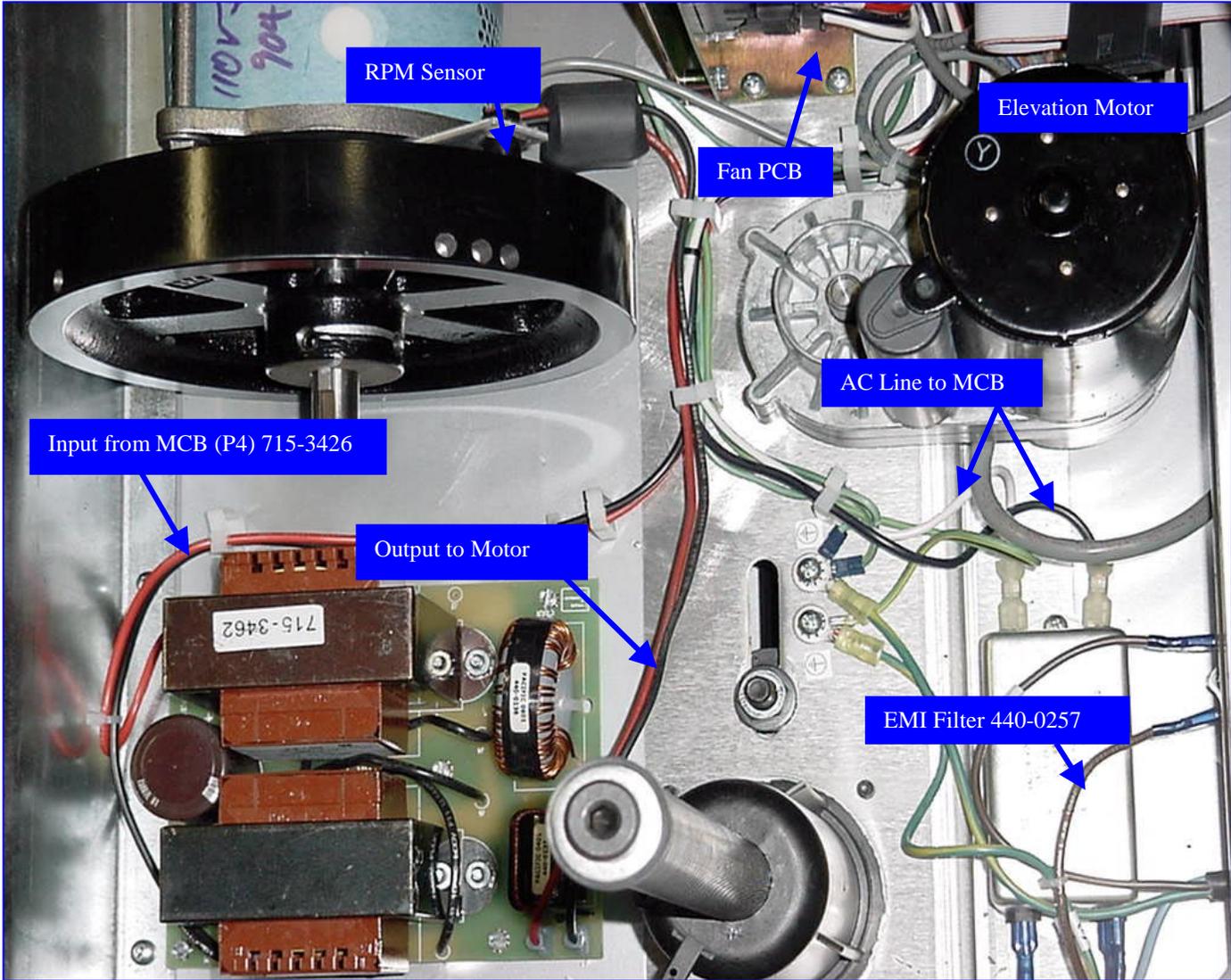
Electrical Wiring & Cable Routing

Complete Lower Chassis Wiring

MCB

Elevation Motor

AC Breaker Switch

Fan Board

EMI Filter

Motor

Motor Network Filter

Pro Tread Troubleshooting Guide

Symptom	Possible Cause	Remedy
Unit does not Power "ON"	• Not plugged in to AC outlet	• Plug in to an AC outlet.
	• Incorrect or no voltage at power source.	• Have a certified electrician verify wall outlet has proper voltage.
	• Pro Treadmill power breaker switch in "OFF" position.	• Depress the Pro Treadmill power breaker switch to the "ON" position.
	• Main I/O ribbon cables improperly connected.	• Check Main I/O ribbon cables for proper connection.
	• Bad fuses on Motor Control Board.	• Check fuses (F1 & F4) on Motor controller Board. Replace if necessary.
	• Bad Motor Control Board.	• Replace Motor controller Board if fuses are blown repeatedly.
	• Unit trips breaker when plugged into wall.	• It is highly recommend that each Pro Tread has the proper Ampere rate dedicated AC line. *Please review owner's manual.
Console Displays "Emergency Stop" Message	• The Emergency Stop Switch is in its active state.	• Turn the Emergency Stop Switch counter-clockwise to release.
	• No Emergency Bypass Connector installed behind Display Console.	• Install connector at J25 labeled # 715-3482 _EMG.STOP._
	• Incorrect wiring to Emergency Stop Switch.	• Replace Emergency Stop Switch Assembly (715-3473).
	• Main I/O ribbon cables improperly connected.	• Check Main I/O ribbon cables for proper connection.
	• Faulty Display Board.	• Verify all wiring and electronic connection before proceeding with next step • Replace Console Display Board.
No "Heart Rate in the Numeric window or Heart Chart" from handgrips. *Note: Max Heart rate is 225 beats per minute	• Contact Heart Rate system is disabled in software.	• Enable Contact Heart Rate system in software Manager/Maintenance mode menu. *Please review Owner's Manual.
	• Heart rate stainless steel grips are not installed properly.	• Check heart rate grip assembly.
	• Improper wiring of grips or grip cable harness.	• Check heart rate grip wiring connection and cable assembly.
	• No Animated Heart when heart rate is being displayed in Numeric window.	• Check all related electronic connections and recycle power. • Replace Pro Keypad.
	• No Active Heart Chart heart rate is being displayed in Numeric window or displaying number of beats per minute outside 90 to 170 range.	• Check all related electronic connections and recycle power. • Replace heart rate PCB (715-3405). • Replace Pro Keypad.
	• Above Remedies tried but still no success with any of the heart rate systems.	• Replace Main Display Console.

Pro Tread Troubleshooting Guide

Symptom	Possible Cause	Remedy
No "Heart Rate in the Numeric window or Heart Chart" when straps are worn. *Note: Max Heart rate is 225 beats per minute.	• Telemetry Heart Rate system is disabled in Software.	Enable Telemetry Heart Rate system in software Manager/Maintenance mode menu. *Please review Owner's Manual.
	• Improper "Salutron" Contact Heart Rate PCB connection seating.	• Check "Salutron" Contact Heart Rate PCB for proper connection seating.
	• Telemetry Heart Rate Strap (i.e. Polar strap) batteries are bad.	• Replace Telemetry Heart Rate Strap (i.e. Polar strap) batteries.
	• User is not wearing strap correctly.	• Verify strap worn properly.
	• Improper connection of the Telemetry Heart Rate Receiver to the main console.	• Check connection of the Heart Rate Receiver behind main console location J18 labeled "Polar Interface".
	• Bad Telemetry Heart Rate Receiver.	• Replace Telemetry Heart Rate Receiver.
	• No Animated Heart when heart rate is being displayed in Numeric window.	• Check all related electronic connections and recycle power. • Replace Pro Keypad.
	• No Active Heart Chart heart rate is being displayed in Numeric window or displaying number of beats per minute outside 90 to 170 range.	• Check all related electronic connections and recycle power. • Replace heart rate receiver (715-3407). • Replace Pro Keypad.
	• Above Remedies tried but still no success with any of the heart rate systems.	• Replace Main Display Console.
1 of 2 "Weight Scale system" can not calibrate error is displayed.	• Weight Scale system is not enabled in software.	• Enable Weight Scale system in software.
	• No weight cell or cells installed or connected.	• Notify Star Trac for options and availability. Connect if installed.
	• System was not calibrated at all or not calibrated properly.	• Recalibrate weight system using Nominal weight of 250lbs or similar known weights.
	• Cell not installed correctly	• Connect or re-install cell or cells.
	• Cell has been damaged due to an impact	• Replace Cell.
"No Stop" Error	• Stop Switch not installed or installed but not connected.	• Install switch or check display console connection or switch connection inside left handrail.
	• Stop Switch stuck in depressed position.	• Release Stop switch. If problem persists, replace Stop switch.
Belt continues to roll without runner for more than 1 minute	• Auto Stop was disabled.	• Enable Auto Stop (set to ON).
	• Display console replacement.	• Walk on belt at slow speed for 1 minute then step off leaving belt running. Auto Stop should now engage within 1 minute.
	• New software update.	• Walk on belt at slow speed for 1 minute then step off leaving belt running. Auto Stop should now engage within 1 minute.

Pro Tread Troubleshooting Guide

Symptom	Possible Cause	Remedy
2 of 2 "Weight Scale "Numeric values are beyond specifications " in respect to the actual weight after calibration success.	• Weight scale feature was disabled.	• Enable weight Scale system in software.
	• Calibration was not done properly.	• Check wiring and recalibrate using known weight distributed squarely on the weight plates.
	• Debris under cells	• Clean debris; refer to document 620-7244 for requirements.
	• Improper clearance on either side of weight cell.	• Add shim(s) to obtain clearance. • Replace one cell at a time until problem is solved
1 of 3 "Fan System will not power up" in the High or Low speeds.	• AC power is not plugged in or power switch is not on.	• Plug into AC outlet or turn power switch to ON.
	• Blown line fuses on the Fan board location F2 & F3.	• Verify power wall outlet has proper live voltage. Replace fuses. *Please refer to Certified Electrician.
2 of 3 "Only one fan operates."	• Improper connection on Fan board.	• Check for proper connection at J1C for line voltage. • Check the connection at J3A. • Look for green LED's on fan system board at FAN STATUS, FAN1 & FAN2.
	• If one or both LED's are RED in color. Fan may be short-circuited in the harness or is bad.	• Replace fan power harnesses or replace fan I/O harness or replace fan.
3 of 3 "Fan system will only power in one speed."	• Fan I/O cable is not connected properly at location labeled P4A.	• Check harness at connector P4A.
	• No communication between upper Membrane Keypad and Fan board.	• Verify proper wiring and electronic connections. Recycle power; proceed each step below at a time to establish communication. • Replace fan I/O harness. • Replace Fan. • Replace Pro Membrane Keypad. • Replace Fan Board. • Verify LED's labeled "Low Speed and High Speed" are toggle-in sync with the upper console keypad switching actions.
1 of 2 "Pro Keypad will not Illuminate to corresponding programs."	• Loose N-cap I/O cables.	• Check N-cap I/O cables.
	• Loose main I/O ribbon cables connection.	• Check main I/O ribbon cables connection at J3, J3A,P3, & P3A. • Proceed into Keypad test mode. *Please review owner's manual
2 of 2 "Pro Keypad will not function to corresponding programs Or No Beeps"	• Improper connection at location J3 connector labeled Keypad I/O.	• Engage connector at location J3 labeled Keypad I/O. • Proceed into Keypad test mode. *Please review owner's manual.
	• Loose Main I/O ribbon cables connection.	• Check Main I/O ribbon cables connections upper and lower. • Replace Pro Keypad. • Replace console PCB. • Proceed into Keypad test mode. *Please review owner's manual.

D33
+ 18V

D16
I LIMIT

D12
PWM

D34
V_CON

D30
SPD

D24
ENABLE

D31
DOWN

D40
MTR SHRT

D10
MOTOR

D38
AC

D32
UP

D18
MTR AC

MCB-PCBOARD-LEDS