

Service Manual 80 Series 2011

L793536>

L821517>

L907804>

[Repair and Maintenance]

CSA

[10/02/2011]

TABLE OF CONTENTS

SERVICE REIMBURSEMENT POLICY:

This is offered to all Landice dealers as well as all authorized Landice service providers. Landice covers our treadmills with a 1-year labor reimbursement policy.

OUR POLICY:

Landice will reimburse the selling dealer according to our labor rate schedule. If you are a service provider for Landice and do not sell our product, you have the option of billing us direct or you can bill the dealer that you're providing service for. Call for service reimbursement rates. Generally, if our capped rate does not cover your labor charge you would bill the selling dealer. Diagnostic and return trips are not covered. Note that treadbelt tracking, treadbelt / drive belt tensioning, blown fuses, and set-up procedures (see next paragraph) are not covered by this warranty.

Set-Up Includes:

Assembly, adjusting treadbelt and drive belt (if needed), walking the treadbelt and deck wax in, and performing any additional adjustments that may have been upset during shipping. The dealer must call for a Service Authorization (SA) number **prior** to performing any service to verify the treadmill is under labor warranty. It is advisable to call Landice from the treadmill location to successfully diagnose the problem. This will insure that the correct part will be shipped out the first time. Labor claim forms must be submitted within three months from the date service was performed. Labor claim forms must be completely filled out and have the Landice Service Authorization number at the top. Generally service claims are paid out upon the return of defective parts and/or crediting of the warranty invoice. If parts are outstanding for a period of more than 90 days previously submitted service claims will be returned unpaid.

FLOOR MODELS AND DEALER STOCK

If the dealer sells a treadmill to a customer within one year of its purchase from Landice, the warranty period will be extended to start from the date of sale to the customer. If a home treadmill is over 1 year old when sold to a customer, the treadmill will carry a 5 year parts warranty and there will be **NO labor** warranty. If a commercial unit is over 1 year old when sold to a customer, the treadmill will carry the remainder of the parts warranty from the date of shipment with **NO labor** warranty.

PARTS POLICY

Landice Treadmills reserves the right to request the return of any part regardless of age. A prepaid Return Tag will be provided at Landice's discretion. All warranty parts requested to be returned will be billed to the dealer at dealer cost. Landice will credit this invoice upon receipt of defective parts. It is the dealer's responsibility to return the defective parts to Landice with a copy of the invoice or packing slip. If the defective parts are not returned within 30 days, payment of invoice is expected in full.

PART ORDERING:

When ordering parts please have the following information available. **Warranty orders cannot be processed without this information:**

- 1) Customer's name, address and phone number
- 2) Treadmill serial number
- 3) Detailed description of failure
- 4) Purchased parts are covered by a 90 day replacement part warranty from the date the order shipped.

SERVICE CLAIM FORM SA#

DEALER INFORMATION:		
Service Dealer / Dealer Name:		
Address		
City	State	Zip
Phone() -		
Contact		

CUSTOMER INFORMATION		
Name		
Address		
City	State	Zip
Phone() -	Contact	

TREADMILL INFORMATION	
Model Type:	Date of Service
Frame Serial #	Date of Purchase
DCP Serial # (if applicable)	
Out of box problem Yes No	

CUSTOMER COMPLAINT	

SERVICES PERFORMED/PARTS REPLACED		
TRAVEL / LABOR: Travel Time:	Labor Time:	TOTAL TIME: _____

VALIDATION SIGNATURES		
Service Rep. Signature	Customer Signature	Date

CLAIMS CAN BE MAILED, EMAILED, FAXED OR SENT IN WITH THE RETURNED DEFECTIVE PART. DO NOT SUBMIT SERVICE CLAIMS WITHOUT SERVICE AUTHORIZATION NUMBERS.

PRORATION INFORMATION

The pro-rate scale applies to wear items **only on commercial treadmills** sold prior to 2/14/2014 and within our 5 year warranty period. After that date the policy changed to full coverage of all parts for the first two years and then the following parts would be purchased.

Pro-rated items include:

- Drive belt
- Motor brushes
- Deck
- Walking belt.

Wear items will get covered under full warranty for the first 6 months of ownership if they fail due to wear.

Discounts will be off of Dealer cost and the Dealer is expected to pass the same discount off of retail price on to the end user.

Wear items are pro-rated as follows:

Up to 6 months	No Charge
6-12 months	80% Discount
Year 2	60% Discount
Year 3	50% Discount
Year 4	40% Discount
Year 5	30% Discount

RECOMMENDED TOOLS FOR SERVICING LANDICE TREADMILL

Deep socket set 3/8 drive with ratchet and extension: Must have 3/8, 7/16, 1 /2, 5/16, 9/16 sockets.

Combination wrench set: Must have 3/8, 7/16, 1 /2, 5/16, 9/16

#1, 2, and 3 Philips head screwdriver (or electric screwdriver)

#1, 2, and 3 flat head screwdriver (or electric screwdriver)

Socket head cap screw wrench set/ multi Allen Wrench

Rubber mallet

Diagonal cutter/ dykes

Wire stripper

Wire crimper

Digital voltmeter

Note: Analog voltmeters are not recommended.

Utility knife

Pulse simulator tester

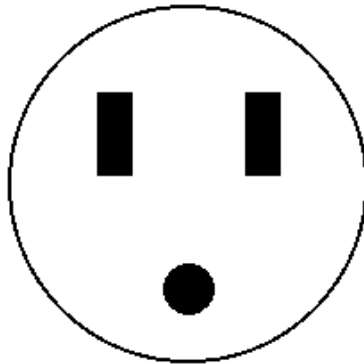
AC/DC Amp Meter

ELECTRICAL REQUIREMENTS

Landice Treadmills and Ellipticals are rated for 110 or 220 VAC and should be wired to a dedicated circuit.

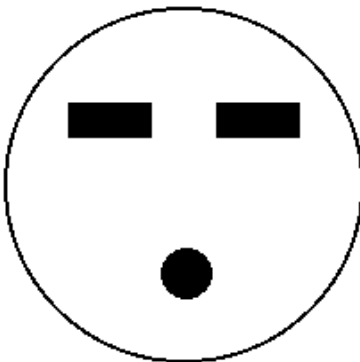
Residential, LTD and Club 110v Electrical Requirements
110 (120) VAC, 60 Hz, 15 AMP

Plug – NEMA Style 5-15P
Receptacle – NEMA Style 5-15R



Club 220v Electrical Requirements
220 VAC, 60 Hz, 15 AMP

Plug – NEMA Style 6-15P
Receptacle – NEMA Style 6-15R



NOTE: Arc Fault Circuit Interrupters (AFCI) or Ground Fault Interrupters (GFI) should **NOT** be used. If a unit is running on a 3-phase voltage, please contact Technical Service at 1-800-LANDICE (526-3423) for additional information.

ADDITIONAL ELECTRICAL INFORMATION

Arc Fault Circuit Breakers (AFCI)

An Arc Fault Circuit Interrupter is a circuit breaker designed to prevent fires by detecting a “false arc” and tripping the power before the arc starts a fire. An AFCI should, **but may not always**, distinguish a working arc that may occur in household or industrial appliances. Since our DC drive motor uses motor brushes, the arcing from the motor brushes create a “false arc” and will trip the breaker and power to the machine. For optimal performance, we recommend placing the machine on a normal 15 amp circuit breaker.

Ground Fault Interrupters (GFI)

Ground Fault Interrupters are designed to protect someone from electrical shock by tripping the outlet when there is a difference in current between the hot and neutral wires. In our treadmills, there may be a difference in current flowing through the ground wire due to current leakage from the drive motor or capacitors. Our drive motors will trip these outlets as it needs an in-rush of current to get it started when the machine is turned on. This in-rush of current goes back through the wiring which will be detected by the GFI and cause the outlet to trip.

We recommend installing a standard NEMA Style 5-15 (for 110v machines) or NEMA Style 6-15 (for 220v machines) wall outlet to prevent any outlet / breaker from tripping.

For 220v & 110v units using 3-phase voltage:

- Each treadmill must have its own circuit breaker and be run on the same phase; same power leg.
- If 220v power is required, all treadmills must run on the same two phases (power legs) and on their own circuit breakers.

TRACKING AND TENSIONING

Proper tensioning of the Treadbelt and Drive Belt are necessary to insure smooth operation and long life for your treadmill. As these components may stretch as part of their normal break in period it is one of the few things we ask our customers to do in maintenance of their treadmills. The following illustrates how to tension the Treadbelt and Drive Belt.

Check Drive Belt tension



Drive Belts are pretension before the treadmill leaves the factory. Adjustments are ONLY necessary when Drive Belt is slipping during use. If the belt needs to be adjusted use a 7/16" socket and turn the bolt underneath the motor pan attached to the hook screw.

To test for tightness:

1. Remove motor cover.
2. With mill running at 2mph walk on treadbelt.
3. If Drive Belt is moving front roller with no slippage then drive belt is correctly tensioned.
Tighten belt only until it stops slipping to insure maximum drive motor and roller life.

As a starting point check the tension on the Drive Belt by placing the Drive Belt between your thumb and forefinger and twisting. The proper twist is 45°.

CAUTION: NEVER OVER TENSION THE DRIVE BELT. TIGHTEN ONLY TILL SLIPPING STOPS. OVER TIGHTENING MAY CAUSE SERIOUS DAMAGE TO THE DRIVE MOTOR AND WILL VOID THE MOTOR'S WARRANTY.

TREADBELT TENSIONING

Treadbelts are tensioned at the factory and normally need no adjustment. To determine if the treadbelt needs to be adjusted perform the following test:

1. Remove motor cover.
2. Set treadmill speed to 2mph.
3. Walk on treadbelt and see if drive roller is turning but belt is not moving. If belt is not moving then tension treadbelt ONLY until belt ceases to slip.

The same adjustment bolts used for tracking tension the Treadbelt. To tighten Treadbelt, turn both adjustment bolts (clockwise) exactly the same amount. Failure to turn them equally will affect belt tracking. You are moving the Take-Up Roller closer or further away from the deck to tension the Treadbelt.

DO NOT OVER TIGHTEN TREADBELT! If you can't reach the palm of your hand under the center of the Treadbelt, if the edges of the belt are curled up, or if you hear the belt “groaning” the treadbelt is too tight.

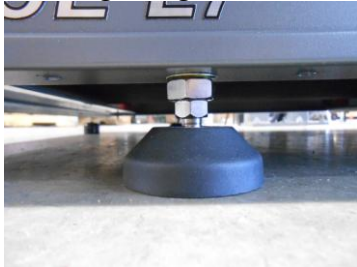
TREADBELT TRACKING

MAKE SURE TREADMILL IS LEVEL!

Make sure the treadmill is completely level. Place a carpenter's level across rear frame rails running parallel with rear roller. **VERY IMPORTANT:** Must have a minimum of 150 pounds on the treadmill's side steps for the reading to be accurate. If not level, try to move treadmill to more level flooring. If that is not an option use leveling shims. You can either put something under the rear feet or install shims between the rear foot and the frame.

Simply loosen the two Philips head screws and slide shim in place. Tighten screw and re-check that the treadmill is level. **On Models made after 1/1/2014 we started using Leveling Feet. Instructions for adjusting leveling feet below.**

STEP1: Confirm feet are touching the ground.



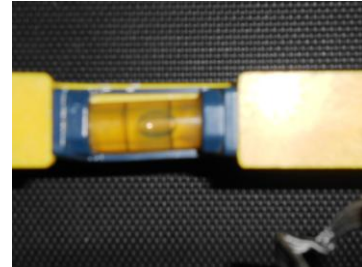
Loosen the 19mm & 14mm nuts using a 19mm & 14mm open end wrench (or adjustable wrench) until foot touches the floor.

STEP 2: Lay carpenter's level at rear of machine.

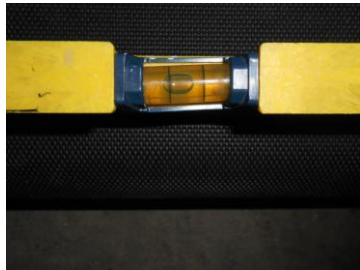
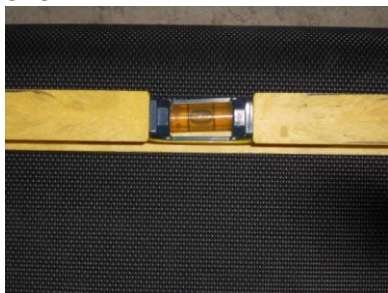
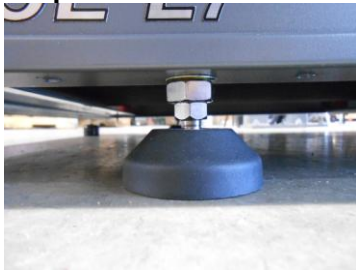


Lay carpenter's level at rear of machine and stand in the middle of the running surface. Check if the bubble is not centered in between the lines.

STEP 3A: Level out machine.



If the bubble goes past the line to the right (while standing on machine) then adjust the left foot located at the rear of the machine. Loosen the 19mm nut by turning it clockwise and rest it against the 14mm nut. Turn the 14mm nut clockwise to raise the foot. Stop adjusting the foot when the bubble is centered in between the lines.

STEP 3B: Level out machine.  If the bubble goes past the line to the left (while standing on machine) then adjust the right foot located at the rear of the machine. Loosen the 19mm nut by turning it clockwise and rest it against the 14mm nut. Turn the 14mm nut clockwise to raise the foot. Stop adjusting the foot until the bubble is centered in between the lines.	STEP 4: Confirm bubble is in between lines on carpenter's level.  Check the bubble to make sure it's in between the two lines.	STEP 5: Lock leveling feet into place.  Thread the 19mm nut until it touches the bottom of the frame. Turn the 19mm nut counterclockwise and 14mm nut clockwise using your 19mm & 14mm open end wrench to lock the leveling foot into place.
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Tracking the treadmill

The Treadbelt is TRACKED by means of two adjustment bolts (9/16" wrench) located at rear of treadmill. By tightening the side the belt is closest to and loosening the opposite side by the same amount, you change the alignment of the rear roller without changing overall tension. Adjustments should be made with treadmill running, and should be made in 1/4-turn increments. Allow at least 30 seconds for treadmill to stabilize between each adjustment. Perform the adjustments at slower speeds (2-3 mph) until you are comfortable making adjustments. Faster speeds will cause the adjustments to take effect quicker (5-6 mph).

Example: Treadbelt tracks to the right:

- Turn treadmill on, and bring speed up to 2.0 mph.
- Using a 9/16" wrench, tighten the right-hand adjustment bolt 1/4" turn.
- Loosen the left-hand adjustment bolt 1/4" turn.
- Let Treadbelt stabilize (rotate for 30 seconds) and readjust if necessary.

*If normal tracking procedures are not working satisfactorily, proceed with the following steps:

Drive Roller Alignment

The Drive Roller is preset at the factory. However, if the Treadbelt is centered at the Rear Roller but is off center in the front, an adjustment will need to be made. This problem often appears as the belt is running diagonally (closer to one side at the top but farther away at the bottom). The Drive Roller is secured to the frame with two hex head bolts. (3/8 wrench) The holes in the frame are elongated; this allows for forward and aft adjustment of the drive roller.

Example:

Treadbelt is tracking to the right hand side. Adjust right hand side of drive roller by moving it towards the front (motor side) of treadmill. The Treadbelt will move towards the center.

COMMERCIAL TREADMILL / RECOMMENDED MAINTENANCE**INTRODUCTION**

Landice Inc. recommends the following maintenance to be performed at the specified intervals. All maintenance should be performed with **treadmill off and unplugged** unless otherwise indicated.

Supplies needed and Maintenance Schedule

<u>Weekly Maintenance</u>	<u>Monthly Maintenance</u>	<u>Bi-Yearly Maintenance</u>
• Clean soft cloth Mild, non-phosphate cleaner • Vacuum • Nylon Bristle Brush – medium stiffness	• All items for weekly maintenance • Clean cloth or towel • Flat Head Screw Driver • 9/16" Wrench • "Slip Coat" lubricant	• All items for weekly / Monthly maintenance • Needle Nose Pliers • Commutator Stone

ACTIVITY/PROCESS**Weekly**

Using a mild, non-phosphate cleaner to wipe down treadmill make sure soft cloth is **damp, not wet!**

- Wipe down, display, handrails, traction strips, deck area to include visible area of rear roller.
- Remove any dirt on treadbelt with Nylon Brush then wipe down &/or vacuum.
- Vacuum all areas around treadmill.

Monthly

In addition to Weekly activities.

- Check condition of line cord. If any cuts, gouges or broken prongs on plug end, replace.
- Remove motor cover & vacuum motor pan. Take care not to touch circuit boards.
- Turn treadmill on & elevate to 15%. Turn off & vacuum under and around treadmill. Return to 0% elevation, turn off & unplug.
- Examine the Treadbelt & Deck for wear as follows:
 - Mark the adjustment bolts then loosen the rear roller two (2) full turns each side.
 - Rotate the belt 1 full revolution (180°) to examine the underside of the entire treadbelt.
 - If not worn & replacement is not needed, slide a clean towel under the treadbelt. Wipe the deck and the underside of the treadbelt with a soft cotton cloth to remove dirt and debris.
- Lubrication

Recommended quantities of Landice Slip Coat lubricant:

If under 100< hours a month 1 ounce every two months. 100> hours a month 1 ounce a month. If Slip Coat starts oozing out of sides of treadbelt lengthen service times or use ½ the amount of Slip Coat. If Slip Coat oozes out of seam of belt, replace belt. Be sure to wipe off excess Slip Coat with rubbing alcohol.

NOTE: If any lubricant gets on the top of the treadbelt – wipe off immediately using rubbing alcohol.

- Apply 1 oz. of Slip Coat to the middle 10" of the deck for the entire length of the deck.
- Retighten rear roller two (2) full turns each side.
- Turn treadmill on and set speed for 2 MPH.
- Check for proper tracking and tension of the treadbelt.
- Walk on the treadmill for 5 minutes to ensure complete lubrication.

Bi-yearly (every 6 months)

In addition to Weekly and Monthly activities.

- Check that all nuts and bolts are secure and tight. Do not over tighten.
 - Pay special attention to the handrails and where the uprights connect to the frame.

Check the Commutator and motor brushes for wear using the "Drive Motor Brush & Commutator Maintenance" for the appropriate model (Baldor or McMillan) drive motor.

McMillan Drive Motor Brush Replacement & Commutator Inspection Instructions.

Drive Motor brush inspection and maintenance is important especially for LTD or Commercial Machines. If motor brushes get worn down too low, it is possible it will harm the drive motor as well. Here are simple instructions on how to remove/inspect/replace motor brushes as well as inspect the Commutator on our McMillan Drive Motors.

STEP 1



Remove the cap with a flat head screwdriver.



This exposes the brush holder and brush

STEP 2



Take a needle nose pliers and use them to remove the motor brush wires from the connector

STEP 3



Press down on the metal spring, slide the motor brush holder and take the clip out.

STEP 4



A good motor brush will be shiny. Free from scorch marks, chips, and not dull where the Commutator would make contact.

STEP 5



The Commutator is copper color and shiny. Cleaning the Commutator with a cleaning stone or piece of emery cloth may remove the dull appearance & black scorch marks.

STEP 6



Connect the motor brush to the terminal using the needle pliers.

STEP 7



Insert the motor brush back inside the brush holder.

STEP 8



After the motor brush is seated back in and secured down, just pop the cover back on and repeat these instructions for the other side.

COMMUTATOR INSPECTION

A normal Commutator surface will be shiny and smooth. The Commutator will collect brush carbon as they wear inside the motor. To clean the Commutator; slide the Commutator cleaning stone or emery cloth thru the brush holder or thru the access cap at the top of the motor by the drive motor wires. Then rotate the flywheel by hand for a couple of revolutions to clean off the carbon. After that then remove your cleaning stone or emery cloth and see if the Commutator has a shiny, copper look to it. If you cannot clean the Commutator surface so that it's a shiny, copper color then replace the drive motor because the Commutator has burnt up.

Signs of a failed Commutator ; deep vertical scratches, pit marks, dull, or completely lost its copper look. This will be reflected on the tips of the motor brush too (see motor brush inspection Step #4 for more details) If you find any of these signs exhibited on the Commutator then the drive motor needs to be replaced.

Commercial Treadmill Maintenance Checklist

- ☐ Check treadbelt tension and tracking
- ☐ Wipe underneath treadbelt
- ☐ Check drive belt tension
- ☐ Check motor brushes
- ☐ Use cleaning stone to clean Commutator
- ☐ Vacuum under motor hood
- ☐ Vacuum around and under treadmill
- ☐ Lubricate deck with slipcoat if needed
- ☐ Wipe down display with soft cotton & mild soap and water.

80 Series LVS Instructions

*** (includes iPod Video Cable Option) ***

Use a ½” socket to secure the bracket from the underside of the pod. The hardware is attached to the bracket.



1. Mount the TV to the bracket. The 4 screws are pre attached to the TV.
2. Complete connections at the top of the TV: Power, Cable Line and *iPod Cable*



3. Feed the power cord from the base of the bracket through POD access hole.

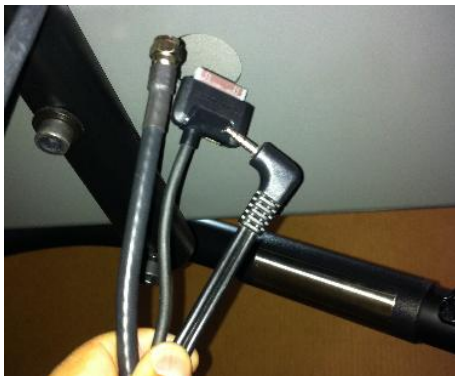


4. Take the power wires and run them down the upright leg (use the extra “J” clips to secure it) and into the motor pan. Use white harness clip (circled in pic) and route the wires behind lift motor away from the shaft.
5. Connect the insulated power fastons to the auxiliary power lugs on the motor controller.

Each motor controller varies slightly (see next page for connection chart).

IF YOUR BOARD IS MISSING AUX POWER LUGS – CONTACT LANDICE TO ACQUIRE ADDITIONAL HARNESS.

6. Ground the third wire (green with a ring terminal) to any available grounding screw near the connection.
7. Feed the cable line and *iPod Cable* (iPod Cable was no longer included with the product as of 1/14) from the base of the bracket into the pod through the 1.25” access hole.



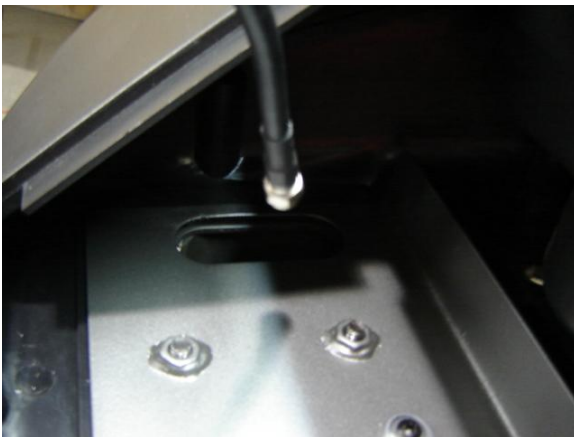
8. ***If you have an iPod Cable***, connect the headphone plug to the available jack on the inside of the pod.



9. ***If you have an iPod Cable***, feed the docking connector through the pod and reinsert the black plastic access cap.



10. Feed the coaxial cable line down the left upright to the access at the base.

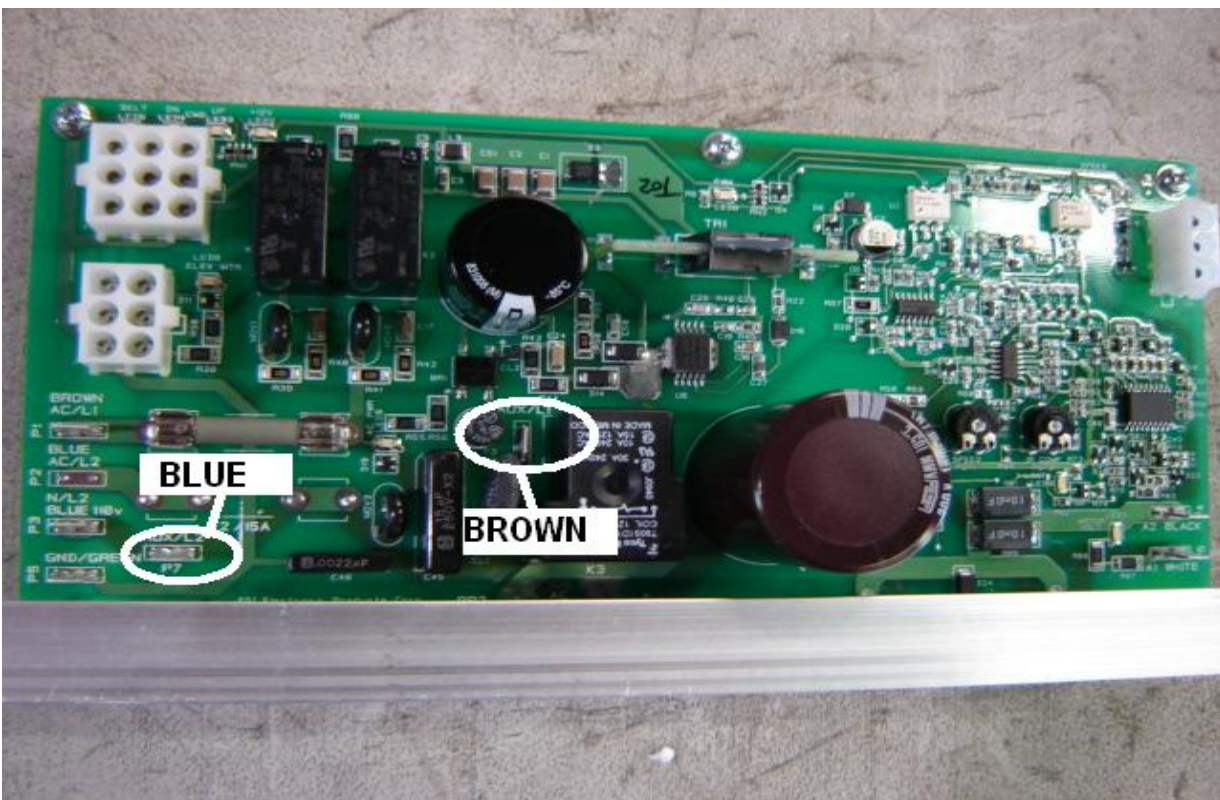
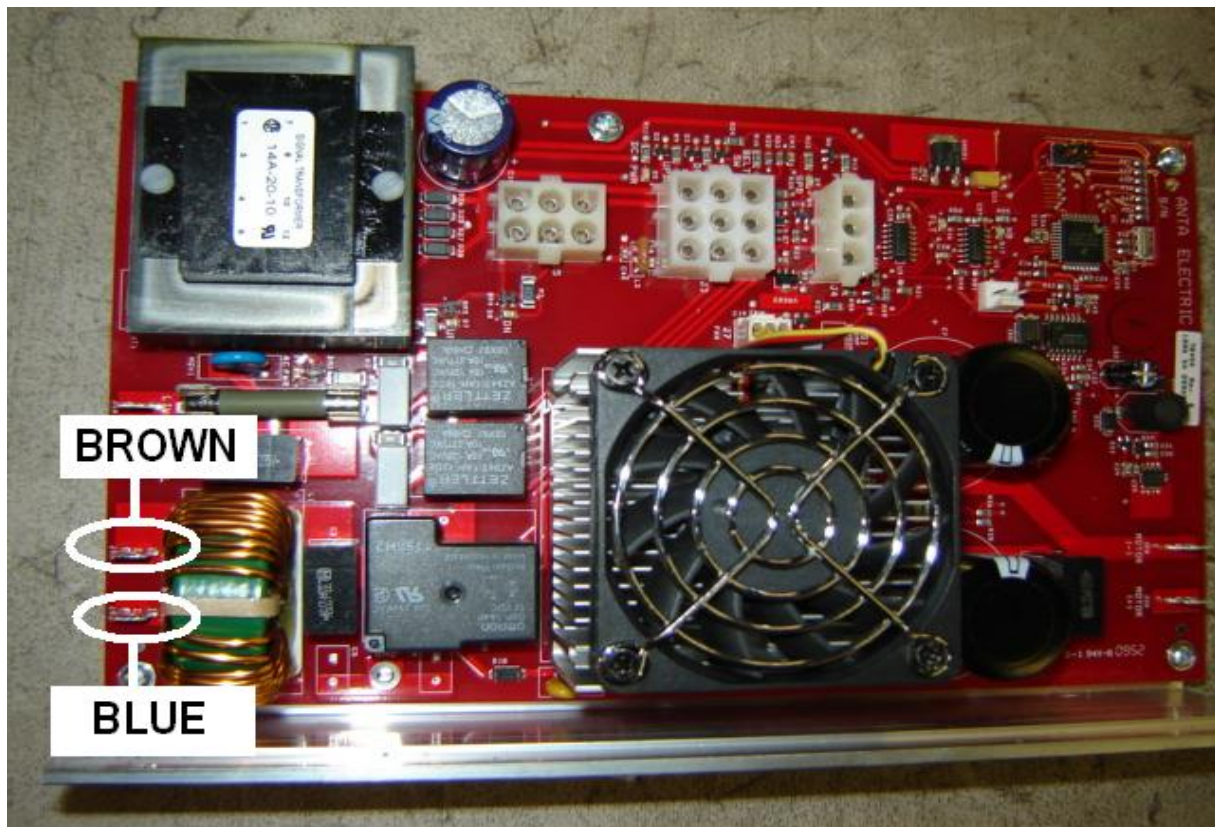


11. Connect the cable line to the available coaxial plug in the inside of the upright.

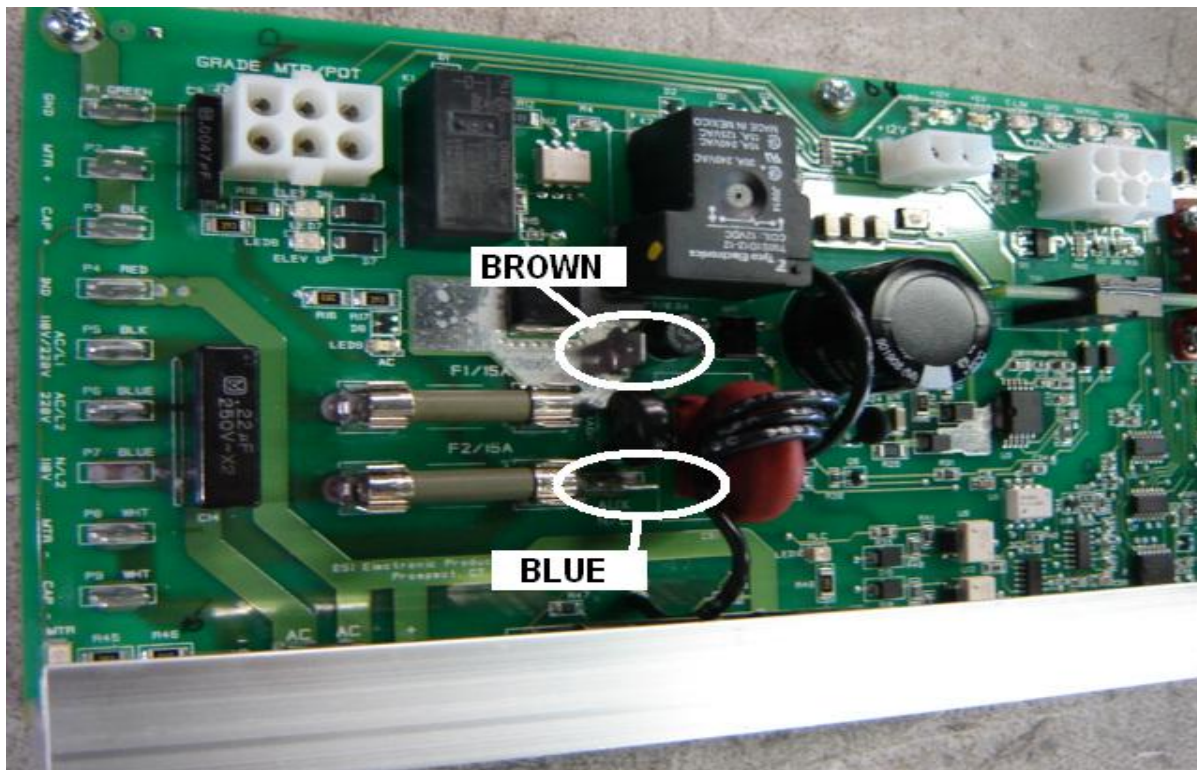


12. Turn on the unit and verify everything is working as expected before snapping the upright covers back on.

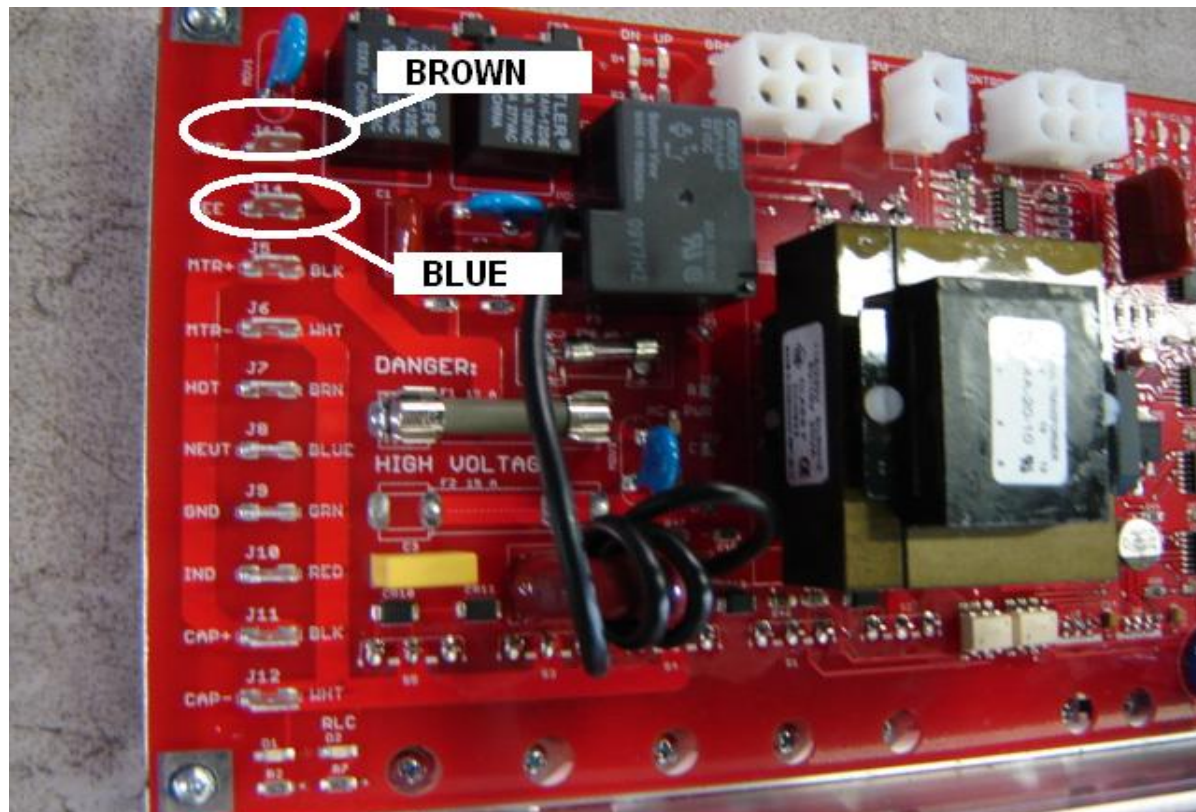
Connection Charts: Find Your Board



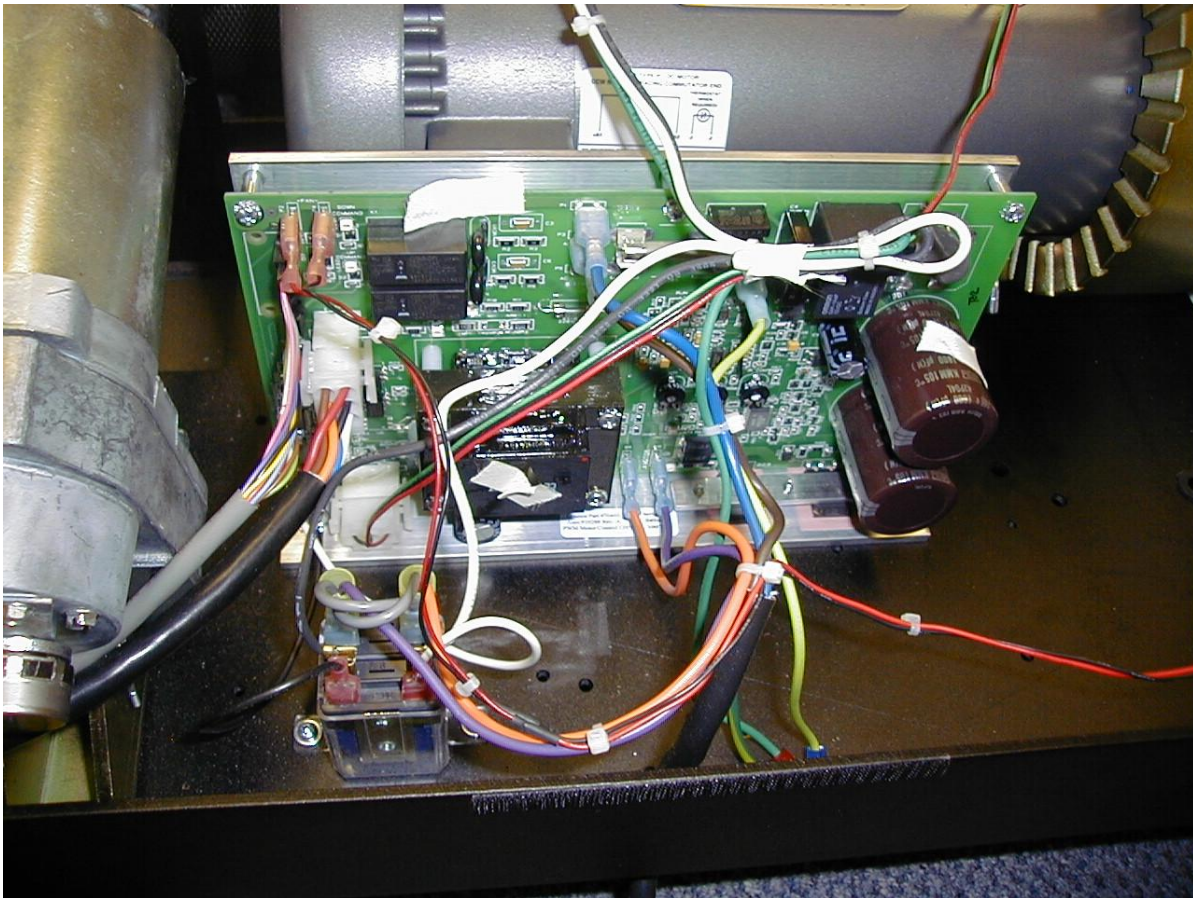
Commercial Boards



Above is 220v ESI MCB



Above is 110v Anta MCB



Above is a RTM MCB and Reverse Relay

80 SERIES CONTROL PANEL & FEATURES



Pro Trainer Display is used on all models L770, L780, L870, L880, L970 and L980

Production Date: October 2, 2011 – Serial Number: L7-93536, L8-21517 & L9-07804

Electronic: Upper Display Board. Uses Face plate no Membrane

Home setting: 0.5-12 mph and max elevation is 15%

Commercial setting: 0.5-11 mph and max elevation is 15%



Pro Sport Display is used on all models L770, L780, L870, L880, L970 and L980

Production Date: October 2, 2011 – Serial Number: L7-93536, L8-21533, & L9-07800

Electronic: Upper Display Board. Uses Membrane

Home setting: 0.5-12 mph and max elevation is 15%

Commercial setting: 0.5-11 mph and max elevation is 15%



Cardio Display is used on all models L770, L780, L870, L880, L970 and L980

Production Date: October 2, 2011 – Serial Number: L7-93550, L8-21519, & L9-07814

Electronic: ESI-PWM, SCR I & SCR 2 (110v and 220v),

Home setting: 0.5-12 mph and max elevation is 15%

Commercial setting: 0.5-11 mph and max elevation is 15%



Executive Display is used on all models L770, L780, L870, L880, L970 and L980

Production Date: October 2, 2011 – Serial Number: L7-93576, L8-21524, & L9-07806

Electronic: ESI-PWM, SCR I & SCR 2 (110v and 220v),

Home setting: 0.5-12 mph and max elevation is 15%

Commercial setting: 0.5-11 mph and max elevation is 15%



Executive ET3 Display is used on models L780, L880, and L980
Production Date: February 25, 2014 – Serial Number: L7-102463, L8-24195, L9-09021 & DCP-55116
Electronic: Home and LTD PWM, Club SCR I & SCR 2 (110v and 220v),
Home setting: 0.5-12 mph and max elevation is 15%
Commercial setting: 0.5-11 mph and max elevation is 15%



RTM Display is used on L7-RTM, L8-RTM, L7-RTM-REV, L8- RTM-REV,
Production Time Frame: October 2, 2011
 Starting Serial numbers: L7-93606, L8-21546
Electronics: ESI PWM-R, 110V, 220v See Wiring Diagram
Settings Used In: Rehabilitation, Physical Therapy, and Hospitals
Key Features: Closed Loop Treadmill (w/ speed sensor), Safety Lanyard, Push Button Speed and Elevation Control, Isolation Leakage Package to keep current leakage under 100 micro-amps.

RTM: Moves in forward direction only, Speed range is from 0.0 to 12.0 mph in 0.1 mph increments, No reverse button on display panel, Optional Remote Start/Stop switch.

RTM-REV: Moves in forward **and** reverse direction, Standard remote start/stop switch with holder; Speed range in forward direction is 0.0 to 12.0 mph in 0.1 increments. Speed range in reverse direction is 0.0 to 3.0 to 0.1 mph increment (slow scroll). Tracking is accomplished by use of reverse guide rollers. Production treadmills to have metal guide rollers then could change to plastic guide rollers. While belt is moving in reverse, treadbelt will move slightly until the reverse guide rollers activate. This treadmill is slightly louder due to our treadbelt guide system. Reverse button on display panel has red reverse LED. The **REVERSE** button allows user to switch treadbelt direction from forward to reverse and vice versa. The Rehabilitation treadmill will run in reverse when Reverse button is pressed and red reverse light is illuminated.

Accessing Features on the 80 series Treadmill

To access functions, turn treadmill off and press and hold first button listed then press next button listed. Release ALL buttons at same time to access feature.

Executive Trainer 3

1) HOME/START

Speed Sensor feedback
Pot- Shows Pot Calibration
Pulse-Pulse system test(Contact or Chest Strap)
Hours and Miles
Software Version of the Display Board
Button Check- Checks membrane buttons

Touch Screen Check- Shows if different parts of the Touch Screen are functioning

2) Grade Up/Home/Start

Reprogram” the software with a UBS device

3) Settings/Diagnostics

Diagnostic test on the different components/functions of the unit

Executive Trainer 2

1) MENU/START

Diagnostic mode & Open Loop

2) MAIN MENU go to SETUP
Go to UNITS

Configures Metric or English

3) Elevation (down)/PAUSE/START

Reboots

4) MAIN MENU go to SETUP
Go to RESET STAT

Resets hours and miles

Cardio Treadmill 4

1) ENTER/START

Diagnostic mode & Open Loop

2) Display/START

Self-Diagnostics

3) MANUAL/PROGRAM/START

Configures Metric or English

4) Elevation (down)/PAUSE/START

Reboots

5) 1/5/START

Resets hours and miles

Pro Sport Treadmill 4

1) ENTER/START

Diagnostic mode & Open Loop

2) Display/START

Self-Diagnostics

3) MANUAL/PROGRAM/START

Configures Metric or English

4) Elevation (down)/PAUSE/START

Reboots

5) 1/5/START

Resets hours and miles

Pro Treadmill 2 & Rehabilitation Treadmill (RTM)

1) DISPLAY/START

Diagnostic mode

2) Speed (faster)/START

Open Loop Speed

3) SPEED (slower)/ELEVATION (down)

Configures Metric or English

/START

4) PAUSE/START

5) Elevation (down)/PAUSE/START

Display Software version

Reboots

TESTING COMPONENTS

MOTOR COMPONENTS

DRIVE MOTOR:

Generation Test – all Landice drive motors (110 & 220) are Direct Current (DC). A DC drive motor can produce (generate) a DC voltage when it's manually rotated. The DC output is linear to the speed the motor is rotated. To perform the "Generation Test" follow these steps:

1. Un-plug treadmill from wall outlet.
2. Disconnect drive motor from motor control board.
3. Connect DMM (Digital Multi-Meter) to the drive motor wires.

Note: Your DMM should be set on Volts DC (VDC)

Motor plus (+) = Red test lead from DMM

Motor minus (-) = Black test lead DMM

4. Position your DMM so you can read it while standing on the treadbelt.
5. Start to push / run on the treadbelt.

Note: You are spinning the drive motor manually. The faster you spin the motor, the higher the output of DC voltage will register on your DMM.

110 VAC treadmills use a 90 VDC drive motor. For every mile per hour you spin the drive motor you will generate approximately 10 VDC output. So, at 1 mph you will measure 10VDC +/- and at 9mph you will measure 90VDC +/-.

220 VAC treadmills use a 180 VDC drive motor (double the input voltage, double the size of the drive motor). For every mile per hour (mph) you spin the drive motor you will generate approximately 20 VDC output. So, at 1.0mph you will measure 20 VDC +/- and at 9.0mph you will measure 180 VDC +/-.

If you measure very low DC voltage or zero DC voltage, first check the drive motor brushes for condition. Motor brushes are the leading cause for drive motor failure. If the motor brushes are worn below 3/8" in length, replace them. (90VDC Motor Brush part#70222, 180 VDC Motor Brush part#70223)

Alternate Test 1: Attach 9 or 12 volt battery to motor leads. There should be motor movement.

Alternate Test 2: Unplug Treadmill. Disconnect Drive Motor wires. Disconnect Drive Belt.

Hold black and white wires together. Spin flywheel. There should be resistance when wires are connected.

ELEVATION MOTOR:

Using your voltmeter measure the input voltage (AC) to the elevation motor. Secure the black (negative) meter probe to a good chassis ground. Place the red meter probe on the RED wire in the elevation harness. Press the elevation DOWN key and you should get 120 /220VAC. Place

the red meter probe on the BLACK wire in the elevation harness. Press the elevation UP key and you should get 120/220VAC. If the elevation motor is getting the proper AC voltage in but does not turn, replace it.

ELEVATION POTENTIOMETER:

Remove the elevation pot from elevation motor but do not disconnect the brown, orange and blue wires. Using a digital voltmeter set to ohms (Ω), place meter probes on the pot prongs with the (orange) and (brown) wires. You are measuring resistance so you do not need to observe polarity.

- Turn pot shaft completely clockwise (0-1000 Ω).
- Turn pot shaft completely counterclockwise (1000-0 Ω).

Now place meter probes on prongs (orange) and (blue) wires.

- Turn shaft of the potentiometer completely clockwise (1000-0 Ω).
- Turn pot shaft completely counterclockwise (0-1000 Ω)

If the elevation potentiometer does not indicate the proper resistance readings, it must be replaced. Note: Potentiometer should fit snugly into motor. Check for tight fit. Also check that nut on Potentiometer is tight.

MOTOR CONTROL COMPONENTS

PWM MOTOR CONTROL:

The PWM board runs on AC voltage. The AC voltage is delivered to the PWM board across two input terminals marked L1 and L2. Confirm AC voltage into the PWM by measuring across these terminals with your voltmeter. You should measure 120/220VAC input. The DC voltage comes out of the PWM board (going to the drive motor) across two output terminals marked A+ and A-. Power up treadmill in Open Loop Speed OLS mode and bring to maximum speed. Confirm DC voltage out by measuring across these two terminals with your voltmeter. You should measure 90/180VDC output. If the PWM board is getting the proper AC voltage in but does not supply any DC voltage out, it must be replaced. This holds true as long as proper speed reference voltage is being supplied from relay board to PWM across the V+, P1, & P2 terminals.

SCR MOTOR CONTROL:

The SCR board runs on AC voltage. The AC voltage is delivered to the SCR board across two input terminals marked HOT and NEUT. Power up treadmill in Open Loop Speed (OLS) mode (see Page 56) and bring displayed speed to the max. Confirm AC voltage into the SCR board by measuring across these terminals with your voltmeter. You should measure 120/220VAC across these terminals. The DC voltage comes out of the SCR board (going to the drive motor) across two output terminals marked MTR+ and MTR-.

You will have to put the treadmill in Open Loop Speed Mode (see “Entering Diagnostic Modes”) to check the voltage is mill is not running. Confirm DC voltage out by measuring across these two terminals with your voltmeter. You should measure 90/180VDC output. If the SCR board is getting the proper AC voltage in but does not supply any DC voltage out, it must be replaced.

SPEED SENSOR:

The speed sensor can be checked for proper operation by entering the Open Loop Speed (OLS) Mode. There is a yellow SPD LED mounted to the Motor Control Board. The light will flash

ON and OFF when you rotate the drive motor flywheel slowly by hand. This indicates the proper operation of the speed sensor. If you do not get this flashing to occur, then check for proper speed sensor alignment (only on Baldor motors). If this does not help, replace the speed sensor.

DISPLAY COMPONENTS

UPPER DISPLAY BOARD:

The upper display board is powered by DC voltage. The power is supplied by the Motor Control Board through the Upper Wire Harness and then connected to the upper display board. By measuring the Black and Green wires on the Upper Wire Harness you can confirm voltage from the MCB. Confirm the upper display is getting 12+DC volts delivered to it. If the display board has the proper DC voltage supplied and does not light, check Membrane Bypass (see below) and Faceplate (directly below) and flow chart for “Display Does not Light”.

FACEPLATE:

The faceplate has no mechanical or electrical components that can fail. However, if you press a key and it fails to respond check for proper display board spacing. The faceplate is designed as a passive panel. When the user presses a key (pushes through the faceplate) they activate a switch mounted on the upper display board. If the display board to face plate distance is too great, the display board switch will not be fully activated and result in a dead response. Small washers are placed between the display board and mounting studs to adjust this distance. This is performed at the factory but can be upset if disassembled in the field. See below “Testing Membranes and Faceplates”.

MEMBRANE PANEL:

The membrane panel has small micro switches laminated inside that transmit the user’s commands into treadmill functions. Enter “Diagnostic Mode” to confirm proper operation of the membrane panel. In this test mode (Button Feedback, see below) you will be able to check each key on the membrane panel. By pressing a key, you will hear an audible beep and also see a numeric code appear in the speed window. There is a numeric code assigned to each key on the panel (except the OFF key). For a complete list of these codes, see the chart on page 40. If you do not hear a “BEEP” or see the proper code appear the key is bad and the membrane panel must be replaced. See below for “Testing Membranes and Faceplates”

Membrane Button Feedback

TESTING MEMBRANES AND FACEPLATES

CODE #	Executive	Cardio	Pro Sport	Pro	Rehab
1	LEFT 1 (TOP)	QUICK SPEED	QUICK SPEED	START	START
2	LEFT 2	0	0	PAUSE	PAUSE
3	LEFT 3	1	1	DISPLAY	DISPLAY
4	LEFT 4 (BOTTOM)	START	START		REVERSE (ONLY ON RTM-REV)
5	RIGHT 1 (TOP)	4	4	SPEED UP	SPEED UP
6	RIGHT 2	7	7	SPEED DOWN	SPEED DOWN
7	RIGHT 3	PAUSE	PAUSE	ELEVATION UP	ELEVATION UP
8	RIGHT 4 (BOTTOM)	DISPLAY -	DISPLAY -	ELEVATION DOWN	ELEVATION DOWN
9	BACK	QUICK GRADE	QUICK GRADE		
10	MENU	ENTER	ENTER		
11	NEXT	2	2		
12	START	PROGRAM	PROGRAM		
13	PAUSE	5	5		
14	SPEED UP	8	8		
15	SPEED DOWN				
16	ELEVATION UP	ENTER	ENTER		
17	ELEVATION DOWN	ELEVATION DOWN	ELEVATION DOWN		
18	QUICK SPEED				
19	QUICK GRADE	3	3		
20	0	SPEED DOWN	SPEED DOWN		
21	1	6	6		
22	2	9	9		
23	3				
24	4				
25	5	ELEVATION UP	ELEVATION UP		
26	6				
27	7				
28	8				
29	9	HRC BUTTON			
30	NEXT	MANUAL	MANUAL		
31		SPEED UP	SPEED UP		
32		DISPLAY +	DISPLAY +		

L-80 BUTTON FEEDBACK

Membrane Panel Bypass Test

When a treadmill with a membrane experiences a loss in power to the upper display, such as when a customer presses the START button and nothing happens, a possible cause of this is a bad membrane panel. A membrane panel bypass test can verify this.

NOTE: +12-17Vdc must be confirmed across the black and green wires at the upper connector on the wire harness to perform this procedure.

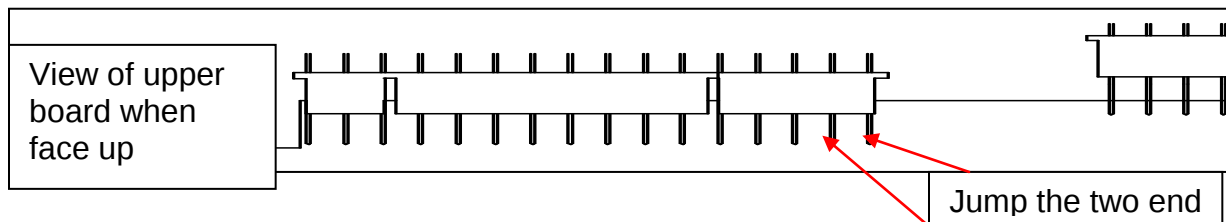
Tools Required:

- Phillips Head Screwdriver
- Digital Multimeter
- Jumper wire (only if your multimeter doesn't have a continuity setting)
- Towel or bubble wrap.

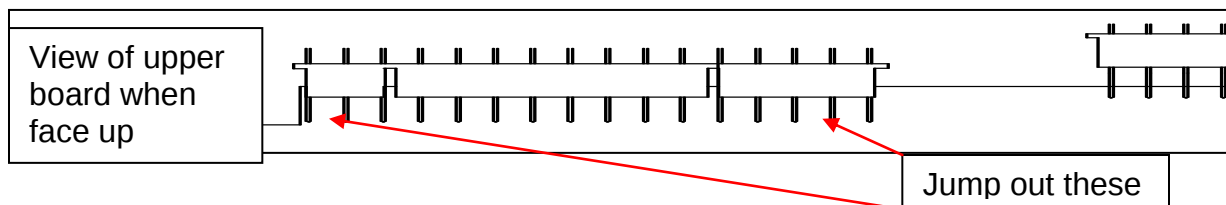
Instructions:

1. Pull the console forward of the Velcro seal and then disconnect the membrane ribbon cable.
2. Remove all the display board screws holding the upper board to the membrane.
3. Pop the upper display board off the membrane panel but leave the wire harness connected to the upper board.
4. Lay your towel or bubble wrap inside the control panel frame and lay the upper board face up.
5. Set your voltmeter to continuity and touch your two test leads together to make sure they beep. Then proceed to follow the steps below to jump out the START & GND pins which upper board application you're working on.

FOR EXECUTIVE UPPER BOARDS:



FOR PST4/CT4 UPPER BOARDS:



Treadmills with Faceplates (PRO TRAINER, SPORT TRAINER, RTM)

Remove the Faceplate from the Upper Display Board. Once you lay the upper board on a towel the START button is already on it. Just press it manually and if it doesn't turn on the upper board is bad. If it does then it's a mounting issue.

Heart Rate Diagnosis

ACCUTRACK CHR Crossbar Diagnosis:

1. There should be a constant 4.8-5.0Vdc across the red & black wires on ACCUTRACK CHR Crossbar harness. If there is 0Vdc then the UPDB is bad.
2. If the ACCUTRACK CHR Crossbar is working properly this is what you should see with your voltmeter (not touching the grips):

TABLE A

WIRES	Vdc	OHMS
RED & BLACK	5Vdc	No reading
RED & WHITE	1.96Vdc	No reading
BLACK & WHITE	2.97Vdc	0L

If the ACCUTRACK CHR Crossbar **is** working properly with a Pulse Simulator or when touching the grips, this is what you should see on your meter:

TABLE B

WIRES	Vdc	OHMS
RED & BLACK	5Vdc	No reading
RED & WHITE	4.9Vdc	No reading
BLACK & WHITE	Voltage fluctuation in millivolts.	Fluctuates from 160-300 ohms at low heart rate settings (approx 60 – 80 bpm) *NOTE: Ohm reading increases as you increase the heart rate on pulse simulator*

If the ACCUTRACK CHR Crossbar **is not** working properly with a Pulse Simulator or when touching the grips, this is what you should see on your meter:

TABLE C

WIRES	Vdc	OHMS
RED & BLACK	5Vdc	No reading
RED & WHITE	Steady 1.96Vdc	No reading
BLACK & WHITE	Steady 2.97Vdc	0L

If you the get readings from TABLE B and the console won't output a heart rate reading then the upper board has failed.

Heart Rate Receiver / Chest Strap Diagnosis:

1. There should be a constant 4.5Vdc – 5Vdc across the red & black wires on the heart rate receiver harness. If you measure 0Vdc across those two points then the upper board is bad.
2. If the heart rate receiver is working properly, this is what you should see on your voltmeter (not touching the grips)

TABLE A

WIRES	Vdc	OHMS
RED & BLACK	5Vdc	0 ohms
RED & YELLOW	4.3Vdc	0 ohms
BLACK & YELLOW	0Vdc	0 ohms

If the heart rate receiver **is** working properly with your pulse simulator or chest strap, this is what you should see on your voltmeter:

TABLE B

WIRES	Vdc	OHMS
RED & BLACK	5Vdc	0 ohms
RED & YELLOW	3.8 – 4.4Vdc	0 ohms
BLACK & YELLOW	Voltage will fluctuate from .3Vdc – 1.0Vdc (Fluctuation gets faster as you increase your heart rate)	0 ohms

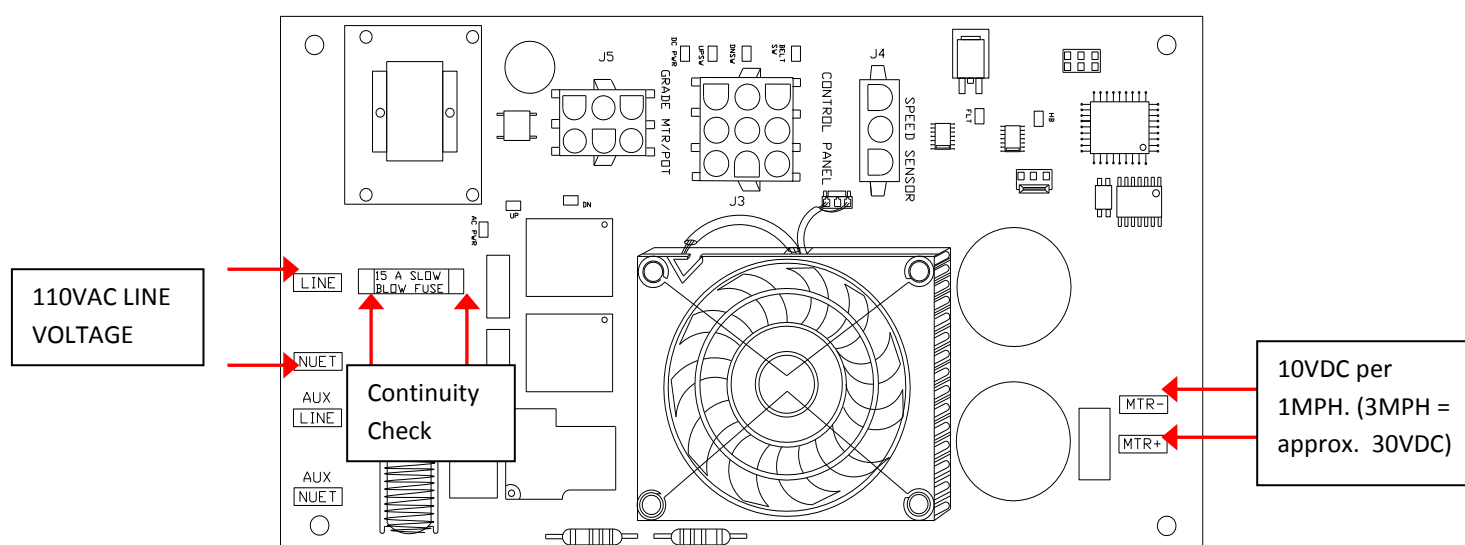
If you get the readings from TABLE B and the upper display board still doesn't show a heart rate output then the upper board is bad and needs to be replaced.

If the heart rate receiver **is not** working properly with your pulse simulator or chest strap, this is what you should see on your voltmeter:

TABLE C

WIRES	Vdc	OHMS
RED & BLACK	5Vdc	0 ohms
RED & YELLOW	4.2Vdc	0 ohms
BLACK & YELLOW	.45Vdc (reading will be steady)	0L

LED CONFIGURATION: ANTA PWM LOWER BOARD



AC VOLTAGE TO THE TREADMILL

15 Amp Slow Blow Fuse – must always have flow of continuity

AC PWR LED (green) – The AC (Alternating Current) LED illuminates when AC line voltage is delivered to the treadmill. It then passes through the in-line fuse and lights the AC LED.

DC PWR LED (green) – As the proper AC voltage is delivered to the treadmill it passes through the in-line fuse and through the full wave bridge rectifier. This changes AC to DC voltage and the transformer steps down DC to +12V VDC

TREADMILL POWERED ON

DC PWR LED (green) – The +12 V DC is always is on. This sends voltage to the upper board.

BELTSW (green) – The BELTSW LED illuminates upon start up and there's voltage being sent to the drive motor. Both BELTSW and PWM LED will illuminate for belt movement.

PWM (yellow) – This LED will light when the upper board is sending a speed signal to the PWM. Both the PWM LED and BELTSW LED must be lit for belt movement.

Page 35 of 85

SPEED (yellow) – The SPD LED flashes on and off when the speed sensor is working properly. The sensor is reading from the tachometer wheel which is located in the rear of the drive motor.

PWM LED and BELTSW LED must be lit for belt movement.

SPEED (yellow) – The SPD LED flashes on and off when the speed sensor is working properly. The sensor is reading from the tachometer wheel which is located in the rear of the drive motor.

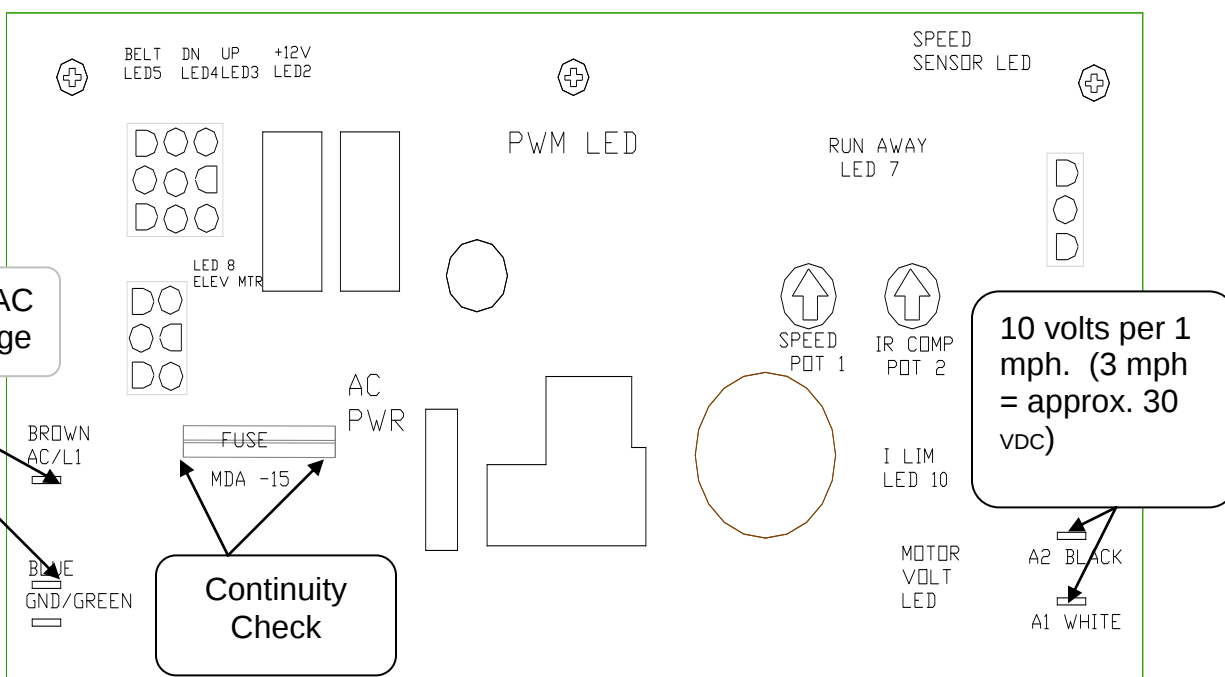
DNSW & UPSW (green) – The DN and UP LED's indicates the elevation DN and UP relays are functioning properly. The LED's on the relay has energized and is sending high voltage to the elevation motor.

HB LED (green) – The HB LED illuminates when there's voltage present to the lower board. This LED

MALFUNCTION LED's

FLT LED (red) The FLT LED should **NEVER** come on. If the FLT LED illuminates then this is an indication of an interruption of dc voltage from the lower board to the drive motor. If this led illuminates then the treadmill would shuts down with a loss of signal error code.

LED CONFIGURATIONS: GREEN ESI PWM MCB



AC VOLTAGE TO THE TREADMILL

15 Amp Slow Blow Fuse – Fuse must always have flow of continuity or be replaced.

AC LED (green) – The AC (Alternating Current) LED illuminates when AC line voltage is delivered to the treadmill. It then passes through the in-line fuse and lights the AC LED.

+12V (green) – As the proper AC voltage is delivered to the treadmill it passes through the in-line fuse and through the full wave bridge rectifier. This changes AC to DC voltage and the transformer steps down DC to +12V VDC

TREADMILL POWERED ON

+12V (green) – The +12 V DC is always on. This sends voltage to the upper board.

MOTOR Volt (yellow) – The MTR LED illuminates when direct current (dc) voltage is sent to the motor. The LED gets brighter when the dc output increase.

PWM (yellow) – This LED will light when the upper board is sending a speed signal to the PWM. Both the PWM LED and BELTSW LED must be lit for belt movement.

SPEED (yellow) – The SPD LED flashes on and off when the speed sensor is working properly. When running it may look like a constant light but if you move the flywheel slowly when the treadmill is not running (but still plugged in) the light will blink. The sensor is reading the movement of the drive motor and sending the signal to MCB and then back up to the UPDB.

The sensor is reading from the tachometer wheel which is located in the rear of the drive motor.

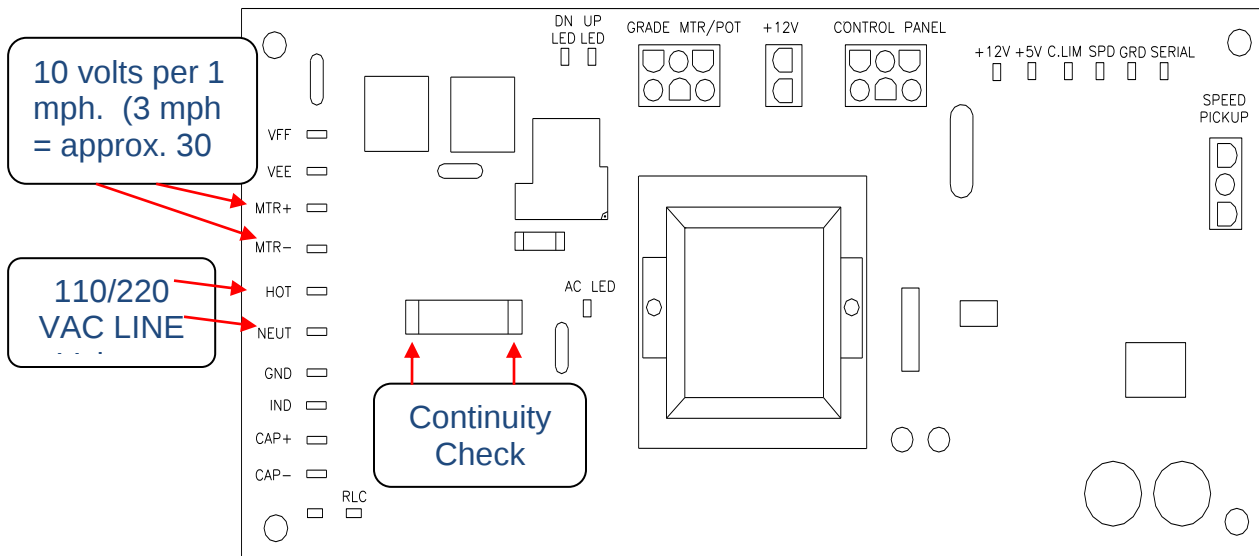
DN & UP (yellow) – The DN and UP LED's indicates the elevation DN and UP relays are functioning properly. If the LED's are on it means the relay has energized and is sending high voltage to the elevation motor.

MALFUNCTION LED's

C.LIM (red) – The C.LIM (Current Limit) LED should **NEVER** be on. This diagnostic LED is use to determine the condition of the treadbelt and deck. The SCR board has a built-in amp meter. When the treadbelt and deck system wears, the amperage will increase. When this amperage reaches its max limit, the lower board will shut down its power (treadbelt will slowdown/low torque) to the drive motor and C.LIM LED will illuminate.

RUN AWAY (red) - This is an indication the speed of the treadmill is running faster than the commanded speed. MCB should be replaced.

LED CONFIGURATION: RED ANTA BOARD



AC VOLTAGE TO THE TREADMILL

15 Amp Slow Blow Fuse – The fuse must always have flow of continuity

AC LED (green) – The AC (Alternating Current) LED illuminates when AC line voltage is delivered to the treadmill. It then passes through the in-line fuse and lights the AC LED

+12V (green) – As the proper AC voltage is delivered to the treadmill it passes through the in-line fuse and through the full wave bridge rectifier. This changes AC to DC voltage and the transformer steps down DC to +12V VDC

TREADMILL POWERED ON

+5V (green) – The +5v LED turns on when the upper board is powered on. This activates the **Belt Relay Switch** and there should be belt movement of 0.5 mph.

MTR (yellow) – The MTR LED illuminates when direct current (dc) voltage is sent to the motor. The LED gets brighter when the dc output increases.

RLC (yellow) – The RLC (R=Reactance/ L= Inductance/ C= Capacitance) LED illuminates when the filtering system is properly working. The filtering system includes the capacitor and filter choke.

SPD (yellow) – The SPD LED flashes on and off when the speed sensor is working properly. When running it may look like a constant light but if you move the flywheel slowly when the treadmill is not running (but still plugged in) the light will blink. The sensor is reading the movement of the drive motor and sending the signal to MCB and then back up to the UPDB. The sensor is reading from the tachometer wheel which is located in the rear of the drive motor.

DN & UP (yellow) – The DN and UP LED's indicates the elevation DN and UP relays are functioning properly. The LED's on the relay has energized and is sending high voltage to the elevation motor.

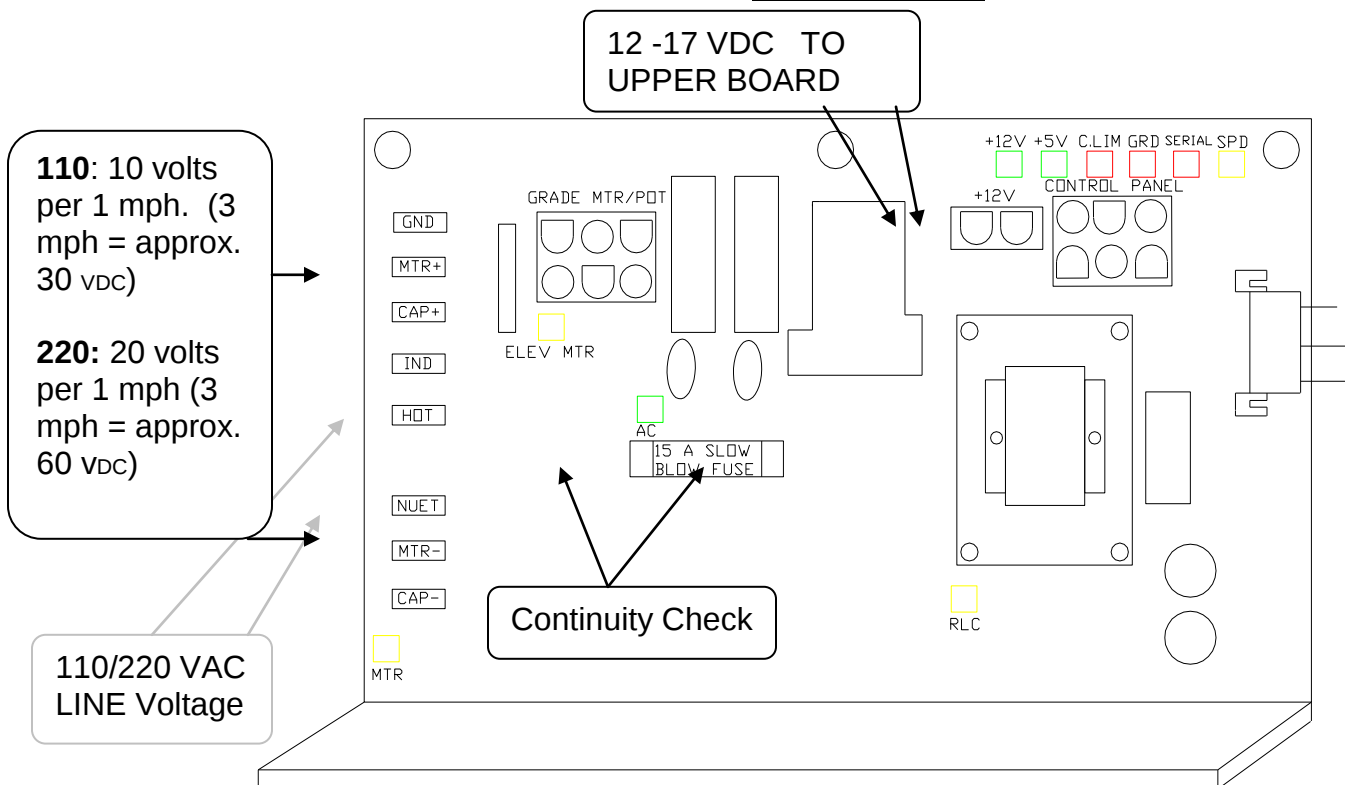
MALFUNCTION LED's

C.LIM (red) – The C.LIM (Current Limit) should **NEVER** be on. This diagnostic LED is use to determine the condition of the treadbelt and deck. The SCR board has a built-in amp meter. When the treadbelt and deck system wears, the amperage will increase. When this amperage reaches its max limit, the lower board will shut down its power (treadbelt will slowdown/low torque) to the drive motor and C.LIM LED will illuminate.

GRD (red) – The GRD (**GRADE**) LED should **NEVER** come on. It illuminates only when there's an elevation malfunction.

SERIAL (red) – The SERIAL LED should **NEVER** come on. This is an indication of an interruption of the flow of data between the upper and lower board. It's usually due to a loose connection on the main harness.

LED CONFIGURATIONS: ESI SCR II LOWER BOARD



AC VOLTAGE TO THE TREADMILL

15 Amp Slow Blow Fuse – Fuse must always have flow of continuity or be replaced.

AC LED (green) – The AC (Alternating Current) LED illuminates when AC line voltage is delivered to the treadmill. It then passes through the in-line fuse and lights the AC LED.

+12V (green) – As the proper AC voltage is delivered to the treadmill it passes through the in-line fuse and through the full wave bridge rectifier. This changes AC to DC voltage and the transformer steps down DC to +12V VDC.

TREADMILL POWERED ON

+5V (green) – The +5v LED turns on when the upper board is power on. This activates the Belt Relay Switch and there should be belt movement at 0.5 mph.

MTR (yellow) – The MTR LED illuminates when direct current (dc) voltage is sent to the motor. The LED gets brighter when the dc output increase.

SPD (yellow) – The SPD LED flashes on and off when the speed sensor is working properly. When running it may look like a constant light but if you move the flywheel slowly when the treadmill is not running (but still plugged in) the light will blink. The sensor is reading the movement of the drive motor and sending the signal to MCB and then back up to the UPDB. The sensor is reading from the tachometer wheel which is located in the rear of the drive motor.

RLC (yellow) – The RLC (R = Reactance / L = Inductance / C = Capacitance) LED illuminates when the filtering system is properly working. The filtering system includes the capacitor and filter choke.

DN & UP (yellow) – The DN and UP LED's indicates the elevation DN and UP relays are functioning properly. When the LED are on the relay has energized and is sending high voltage to the elevation motor.

MALFUNCTION LED's

C.LIM (red) – The C.LIM (Current Limit) should **NEVER** be on. This diagnostic LED is use to determine the condition of the treadbelt and deck. The SCR board has a built-in amp meter. When the treadbelt and deck system wears, the amperage will increase. When this amperage reaches its max limit, the lower board will shut down its power (treadbelt will slowdown/low torque) to the drive motor and C.LIM LED will illuminate.

GRD (red) -The GRD (GRADE) LED should **NEVER** come on. It illuminates only when there's an elevation malfunction.

SERIAL (red) – The SERIAL LED should **NEVER** come on. This is an indication of an interruption of the flow of data between the upper and lower board. It's usually due to a loose connection to the main harness.

Error Codes Definition

“SAFETY SHUTDOWN Loss of Speed Signal” or “L5” **WITH** belt movement

This is usually an indication of a speed control malfunction. The upper board is not recognizing a signal pickup from the speed sensor. This could be due to the speed sensor being misaligned, improper connection, or bad speed sensor. Refer to the flowchart to diagnose.

“SAFETY SHUTDOWN Loss of Speed Signal” or “L5” **WITH NO** belt movement

The speed sensor is not recognizing any motor movement. This displays the error message to the upper board. Refer to the flowchart to diagnose.

“Potentiometer Out of Range” or “PO”

There’s a failure in the elevation system. The potentiometer, elevation motor, lower board, upper harness and finally the upper board can cause this error. Refer to the flowchart to diagnose.

“Overspeeding” or “O5”

The speed sensor recognizes the actual speed of the treadmill is faster than the command speed. **Note:** During high elevation and low speed the role of the user’s weight and gravity is likely to cause an Overspeed error. Refer to the flowchart to diagnose.

“Comm Error”, “CE Error”, or “Communication error”

This will occur when there’s a break in communication between the upper board and the lower board. If the upper board does not identify signal to the lower board it’s very likely the main upper harness has a poor connection. Re-seat the main harness at the upper and lower board. **Note:** A signal break may also cause an O5, PO, or L5 error.

Self-diagnostic Error Detections

SAFETY KEY:

The upper console is not identifying the safety key. This could be the result of the failure in the reed switch, bad connection or short in the safety cable, the magnetic flux guide is not in position, and/or the safety key is missing.

DISPLAY MEMORY:

Checking for RAM and ROM memory within the programs of the upper board. This will notify you if there's a problem with the software within the upper board.

BELT OVERSPEEDING:

This indicates the requested speed versus the actual speed of the treadmill is not within the set parameters. Speed fluctuation or overspeed can be caused by improper position of the speed sensor, a bad speed sensor, a bad motor control board, or using the treadmill at low speed with high elevation.

SPEED SENSOR:

The speed sensor reads the RPM from the tachometer wheel inside the drive motor and relays this information to the upper board. The SPEED LED will flicker on and off when moved slowly as detects movement of the tachometer wheel. This is most easily demonstrated when the treadmill is plugged in but not turned on and the flywheel is spun slowly by hand. *Note it will appear to be a constant light when treadmill is running.

MOTOR VOLTAGE:

This test DC voltage from the motor control board to the drive motor. If voltage is sent to the drive motor and it does not move or if no voltage is being sent then this error will come up. Check if there is voltage being sent to Drive Motor in diagnostic mode. No voltage replace MCB. If there is voltage test Drive Motor.

INCLINE SENSOR:

This will confirm feedback from the potentiometer. A working potentiometer will give 1000 ohms, or 1K Ω , reading.

ELEVATION MOTOR:

This will test elevation motor movement.

GRADE POTENTIOMETER:

This test works in relation with the INCLINE SENSOR test. Test will check if the potentiometer reading is calibrated and check if the feedback is within set parameters.

NOTE: USE THIS FOR DIAGNOSING GREEN & RED PWM BOARDS

Upper display lights up but treadbelt doesn't move: L5 Error

1. Disconnect drive motor wires from PWM board.
2. Enter Open Loop Mode;
ET2's: MENU & START
PST4/CT4: ENTER & START
PT2/RTM: SPEED + & START
3. Press the SPEED – button to set the speed window to 0.0mph.

Confirm proper line voltage input to PWM board. Measure across **P1** and **P3** (**GREEN BD**) or LINE & NEUTRAL (**RED BD**) terminals for proper line voltage.

NO

Is the green BELTSW LED illuminated on the PWM board?

NO

1. Check RED wire on 9-pin harness for loose connection or pushed pin.
2. Replace upper board.

YES

YES

Set speed window to 12mph and verify at least 90VDC from the A2 & A1 terminals (**GREEN BD**) or MOTOR + & MOTOR – on (**RED BD**). Did you measure at least 90VDC?

NO

Replace PWM board

YES

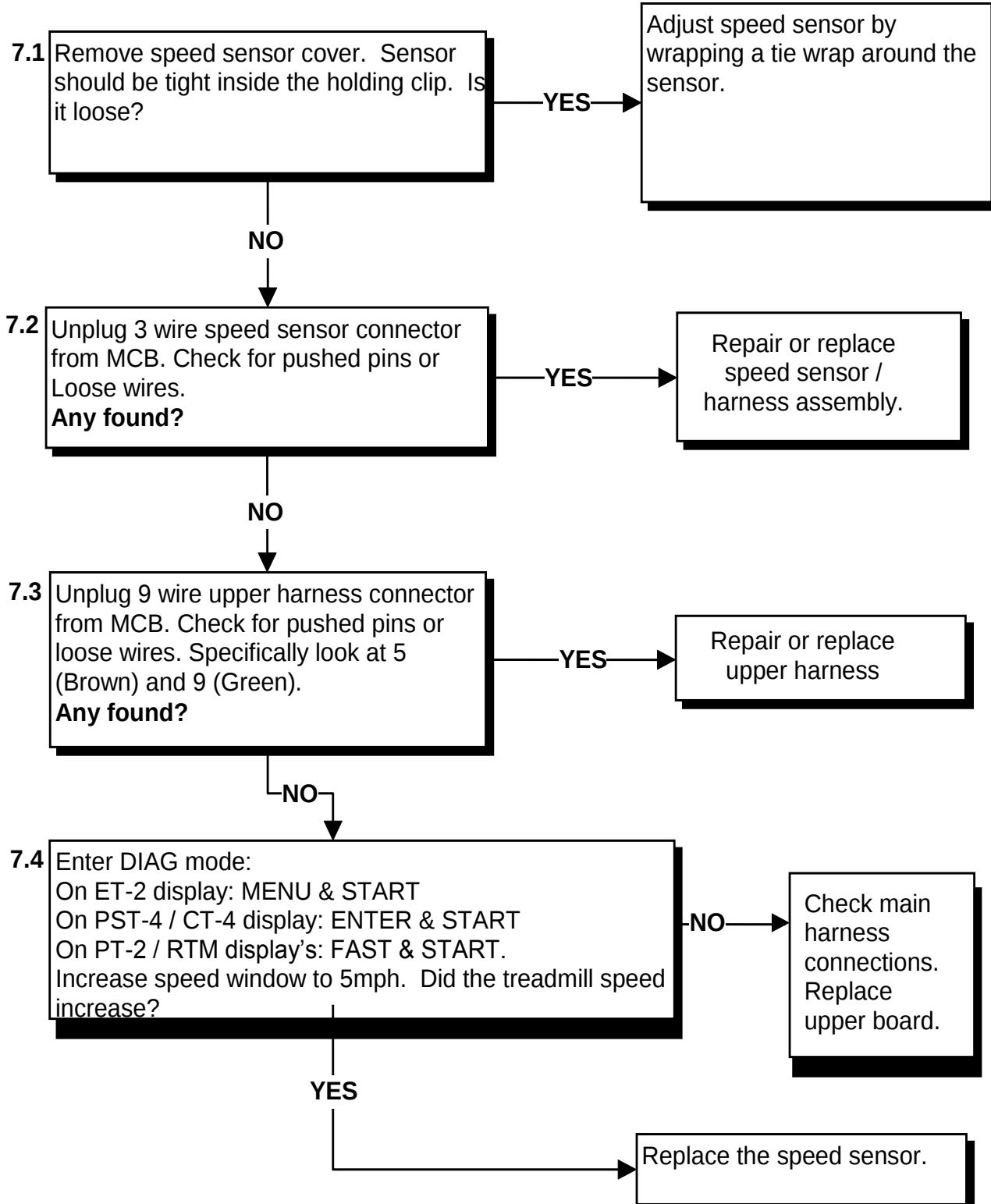
Test drive motor by;

1. Hook up the black and white drive motor wires to the terminals of your drill battery. Polarity does not need to be observed. Did the motor move?
2. Insert your RED test lead into the connector for the BLACK drive motor wire. Insert your BLACK test lead into the connector for the WHITE drive motor wire. Position your voltmeter so you can read it while standing on machine and run on the treadbelt manually. Did you generate 20 – 40 VDC from the motor?

NO

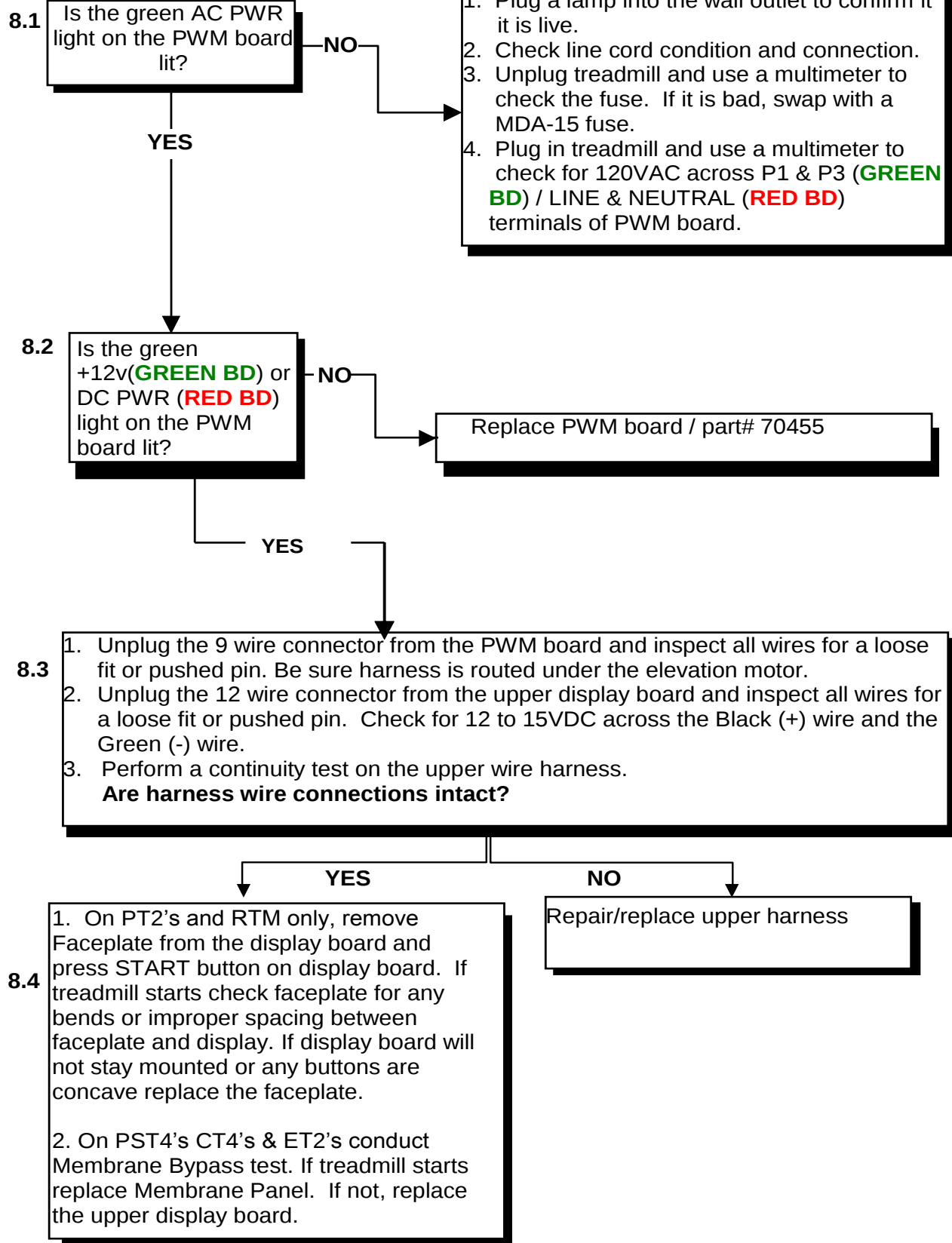
Replace Drive Motor.

NOTE: USE THIS FOR DIAGNOSING GREEN & RED PWM BOARD
Upper display lights up; treadbelt moves; speed will not increase; L5 error.

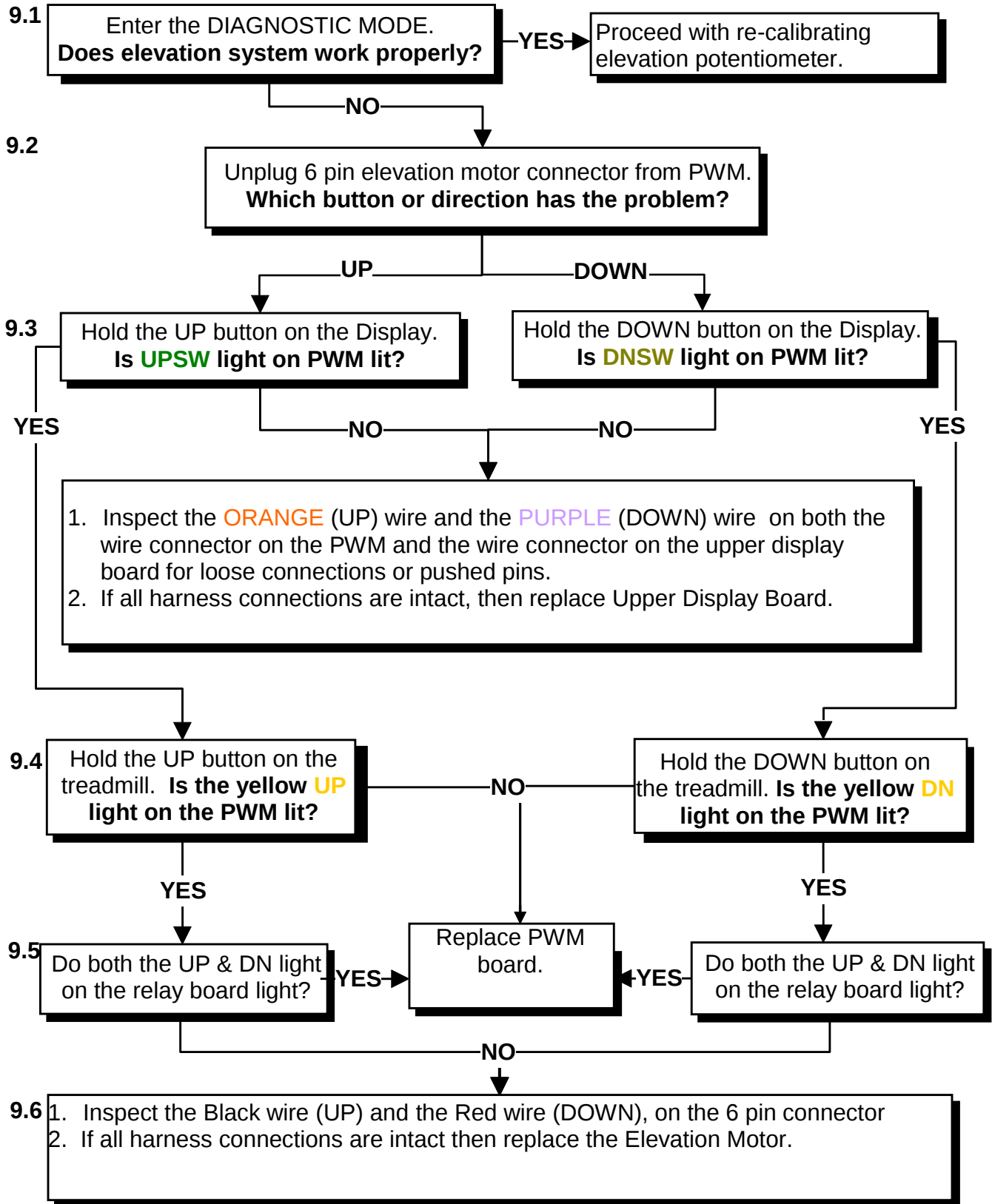


NOTE: USE THIS FOR DIAGNOSING GREEN & RED PWM BOARD

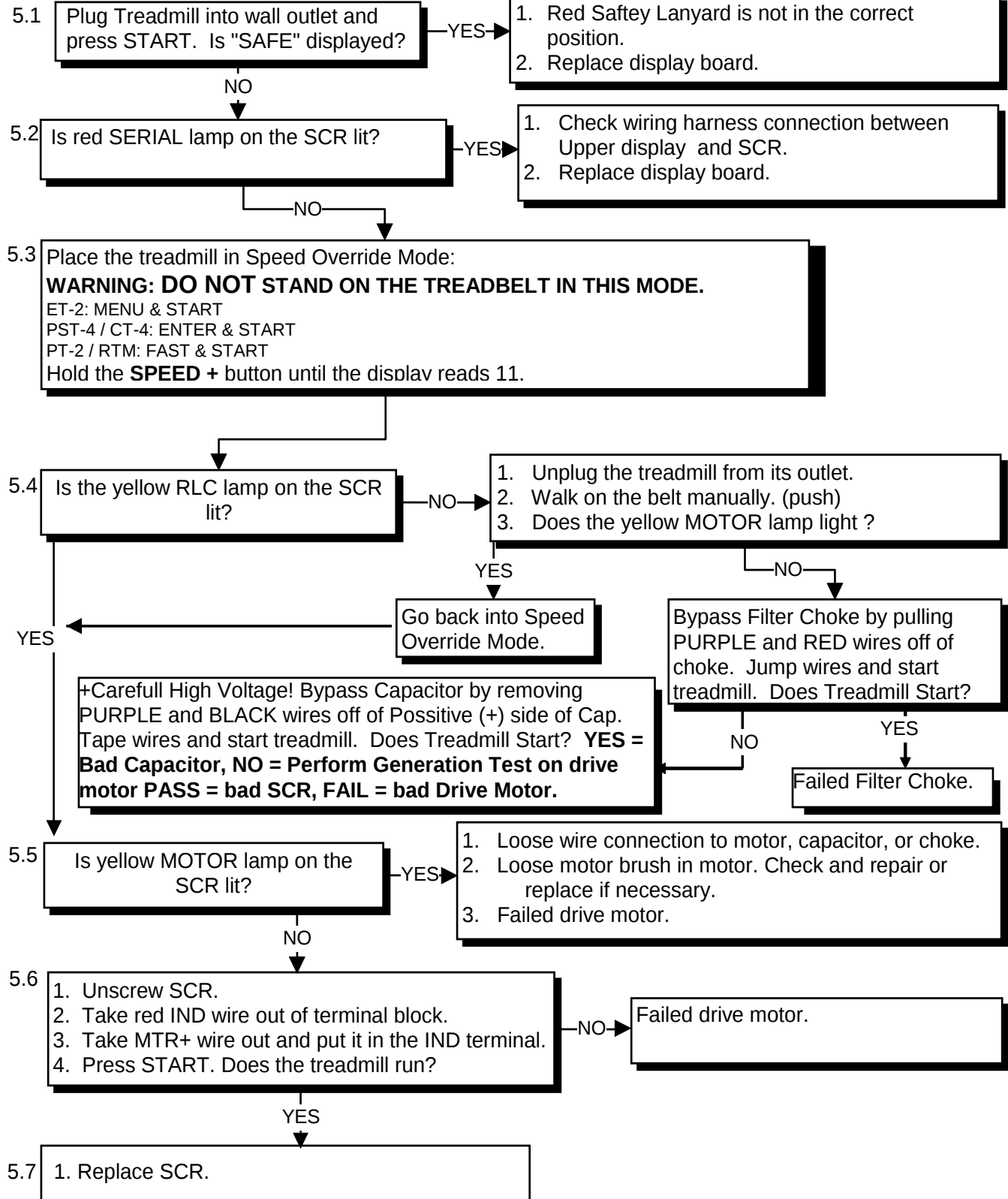
Upper display fails to light when START is pressed.



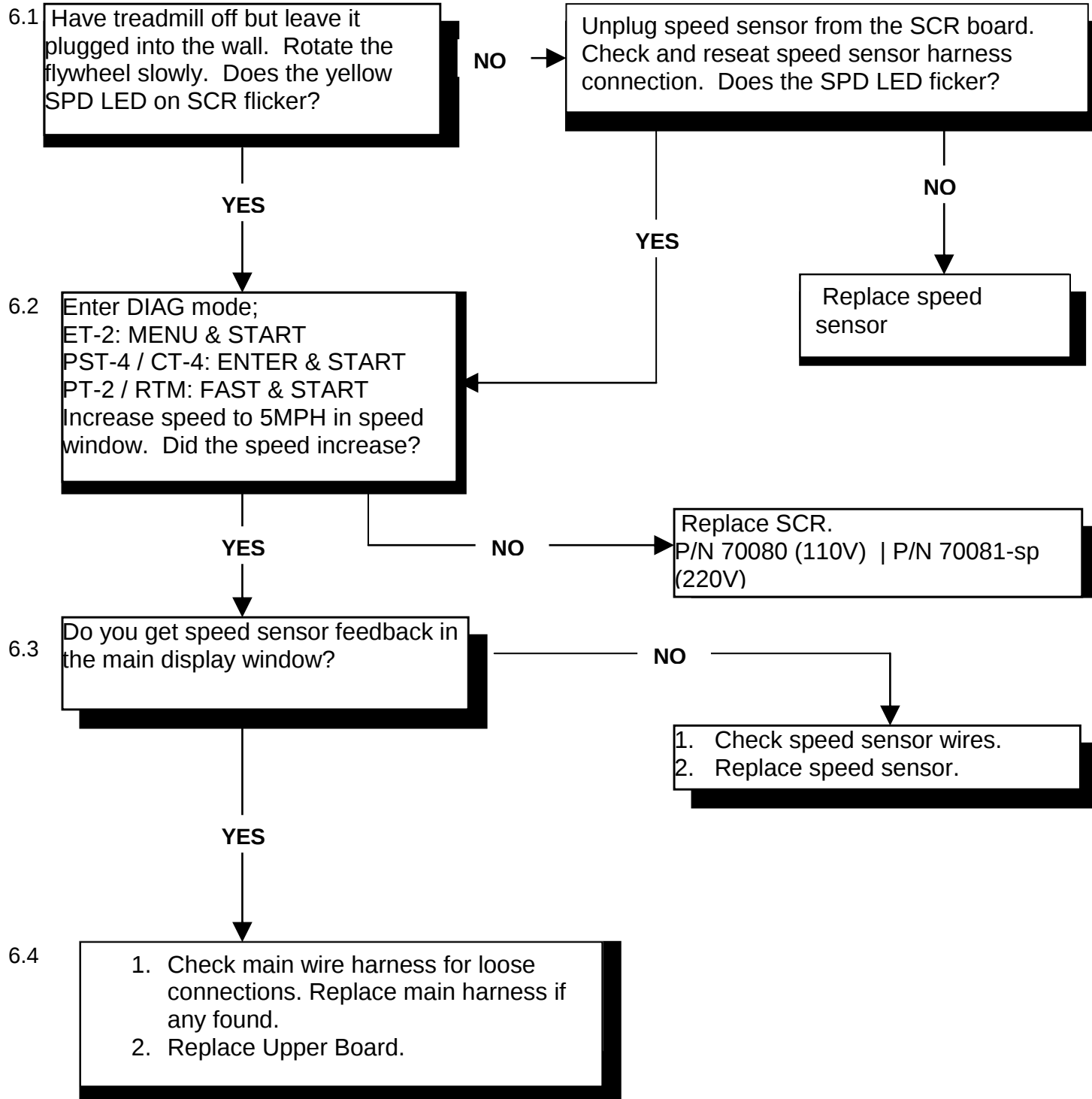
NOTE: USE THIS FOR DIAGNOSING THE GREEN & RED PWM BOARD
Elevation system not functioning or PO (Pot Out) error code displayed



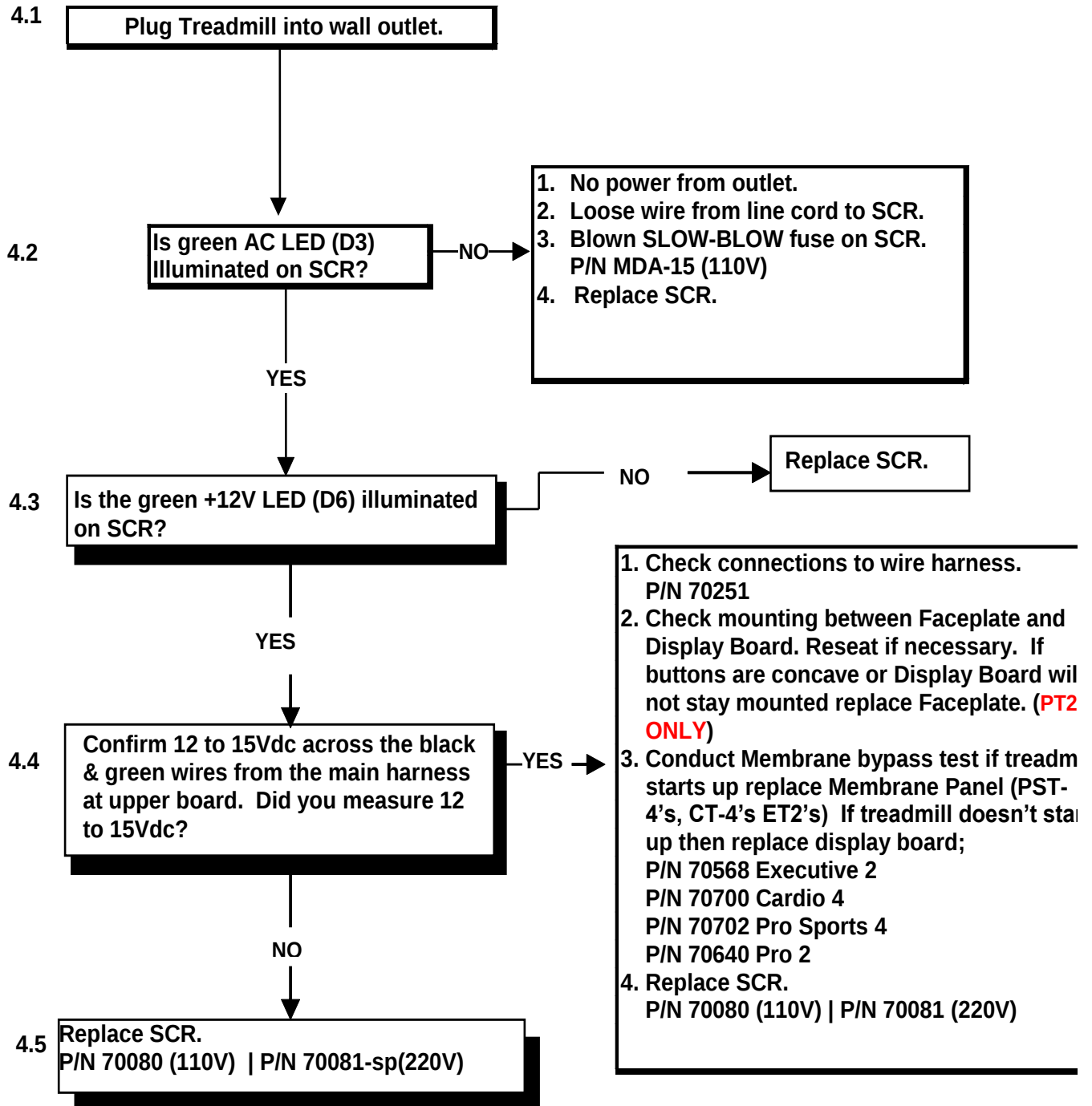
Display lights up; treadbelt does not move; L5 error on **RED ANTA SCR**



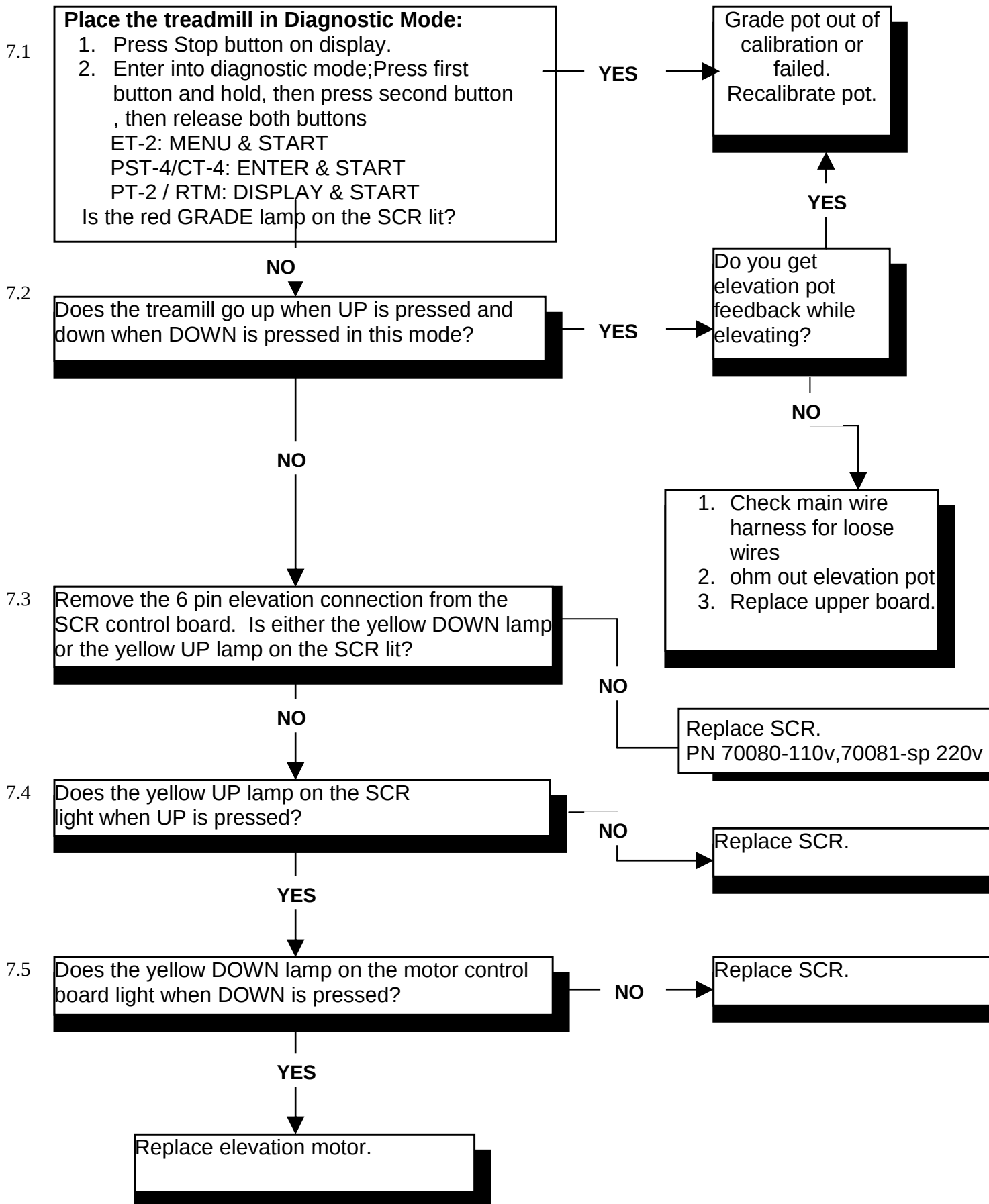
**Display lights up; treadmill moves; speed does not increase; L5 error on
RED ANTA SCR BOARDS.**



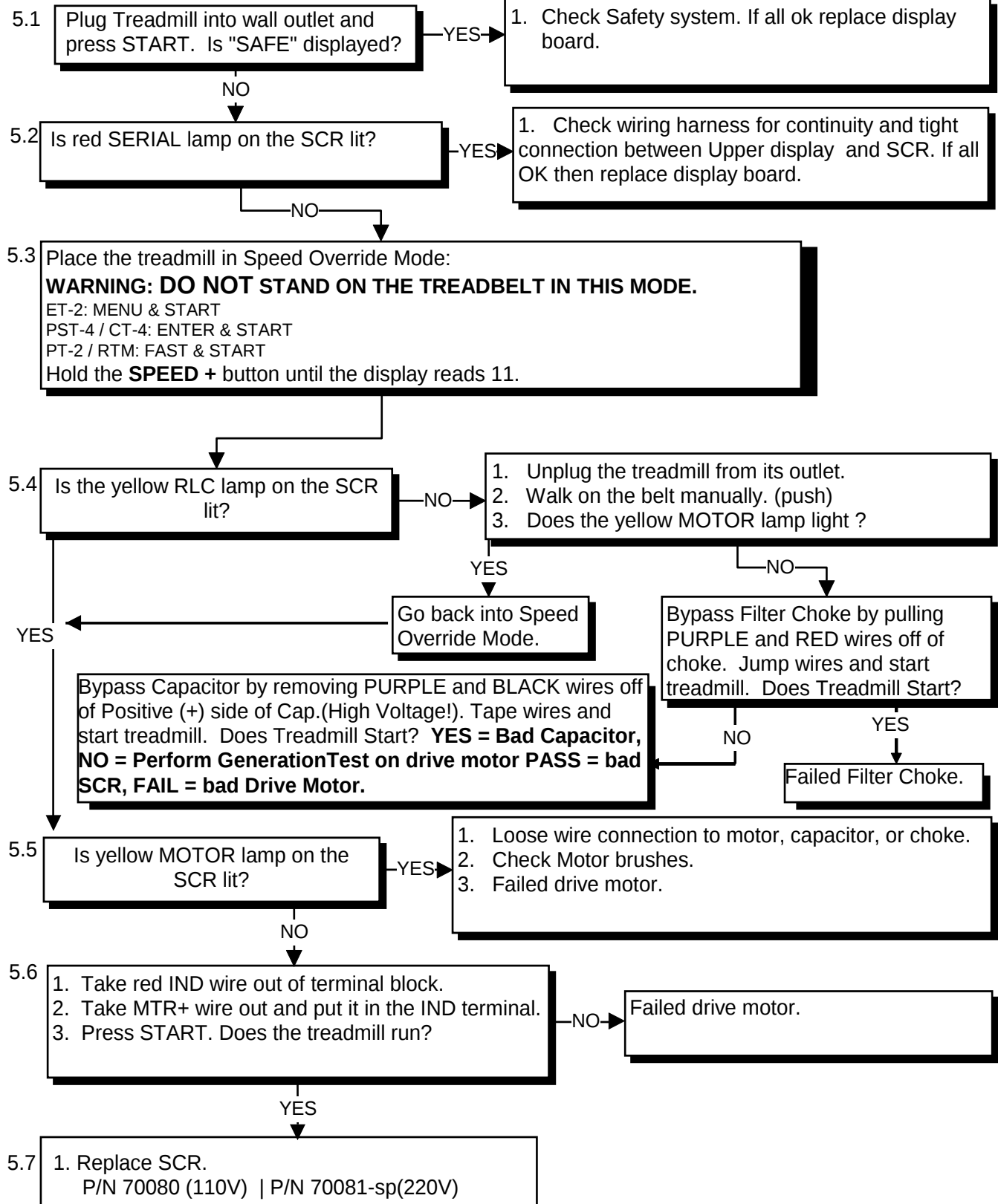
Upper display fails to light when START is pressed on **RED ANTA SCR**



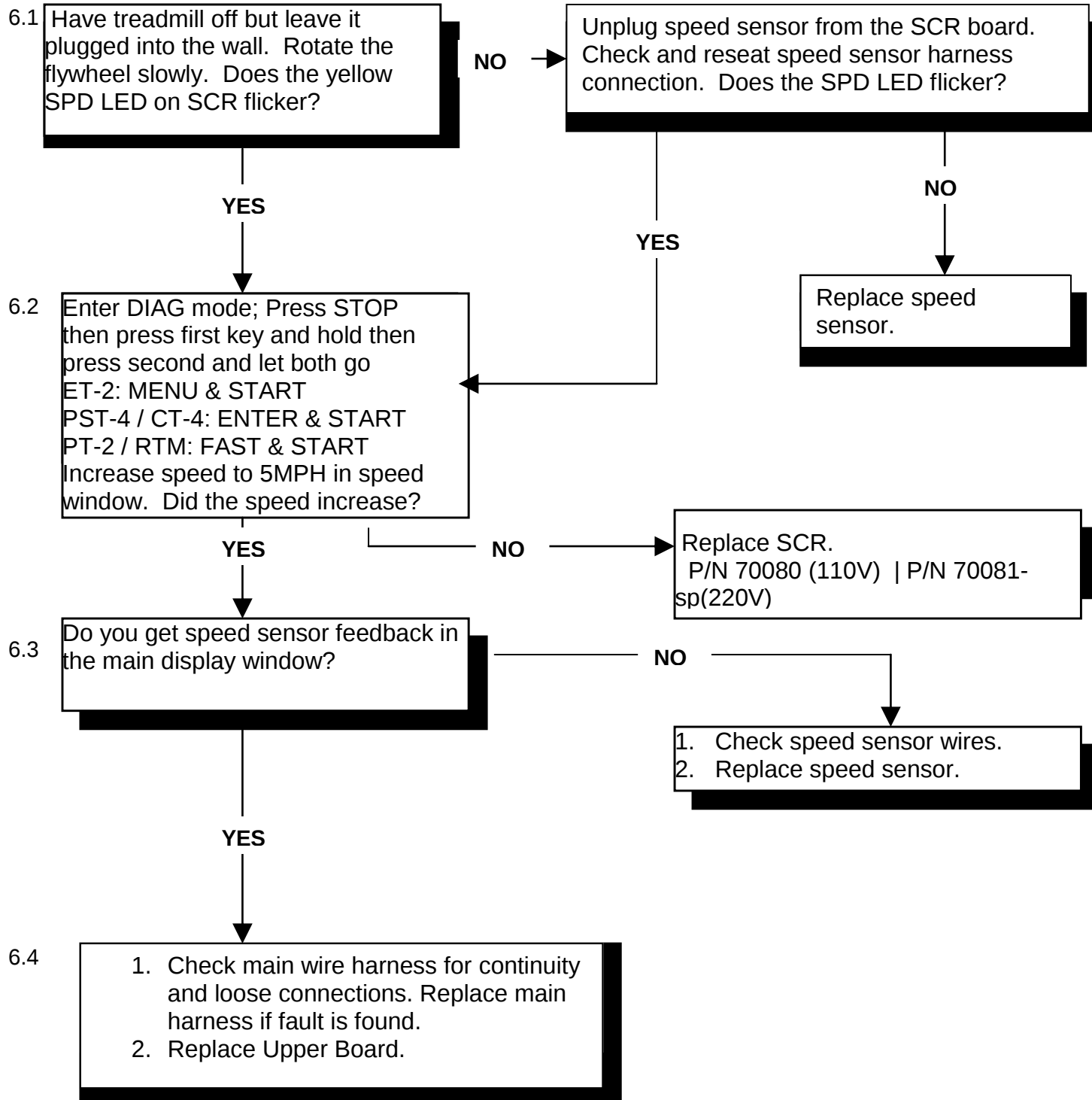
Elevation system failure; "PO" error **RED ANTA SCR**



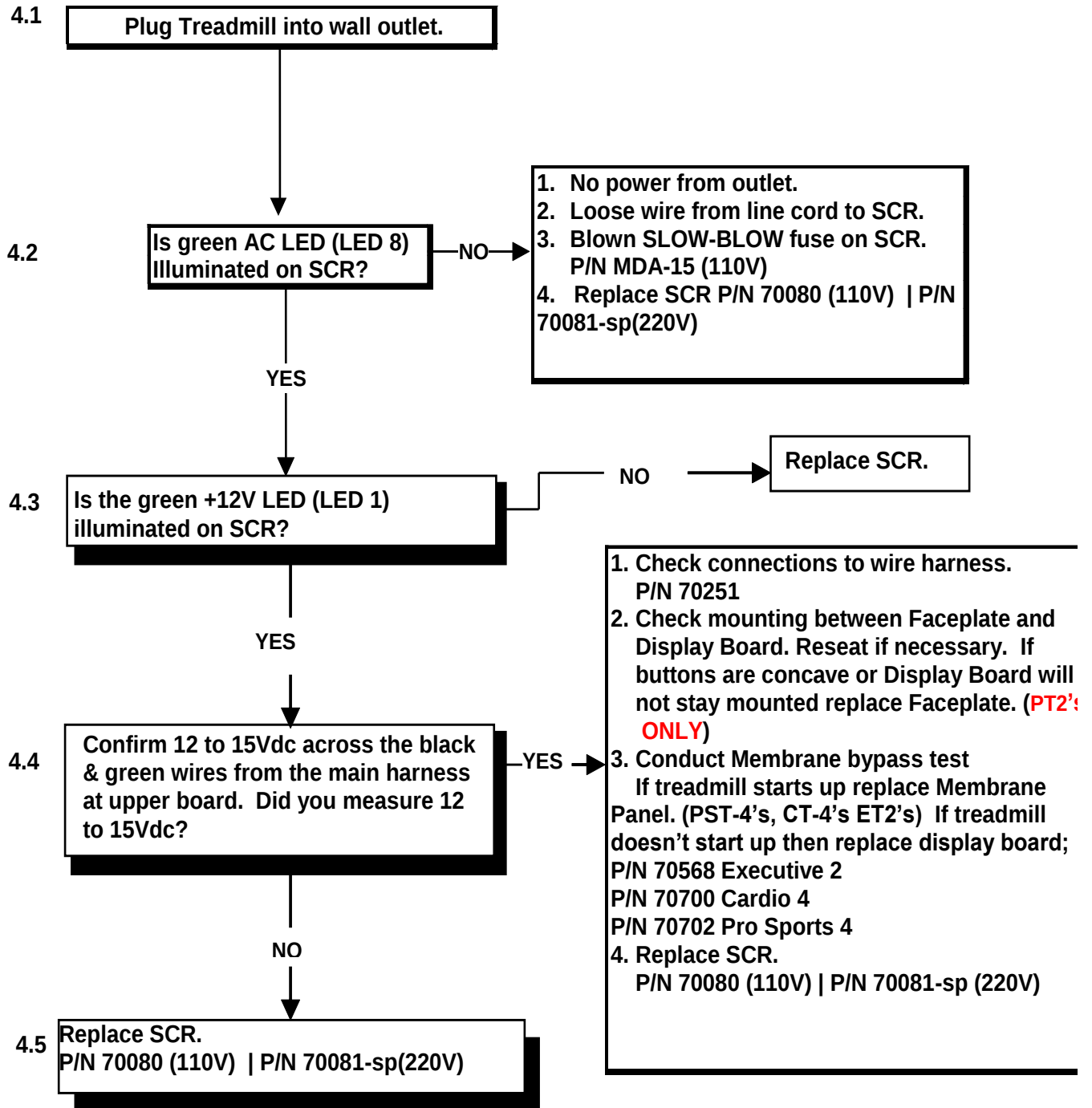
Display lights up; treadbelt does not move; L5 error on **GREEN ESI SCR**



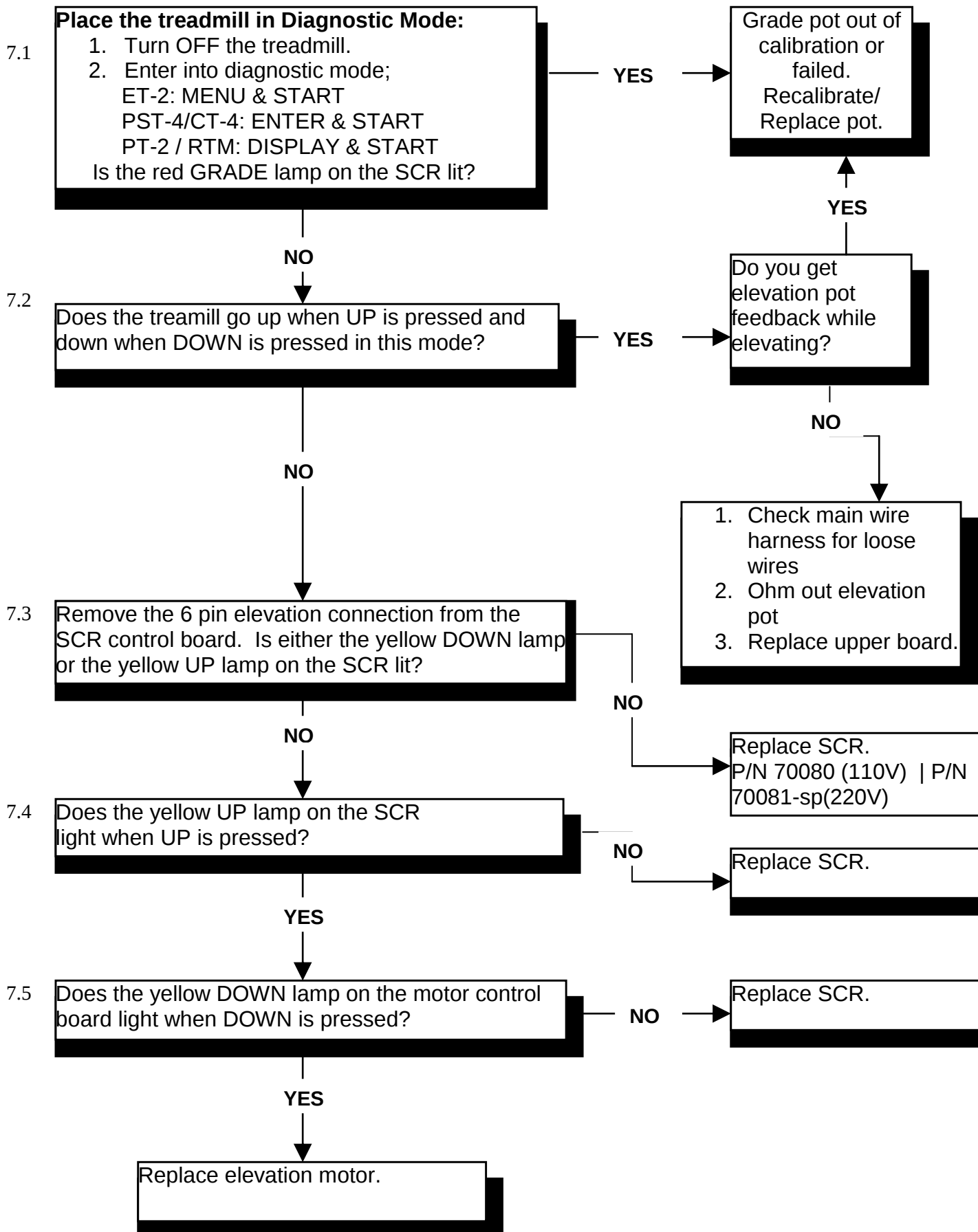
**Display lights up; treadmill moves; speed does not increase; L5 error on
GREEN ESI SCR**



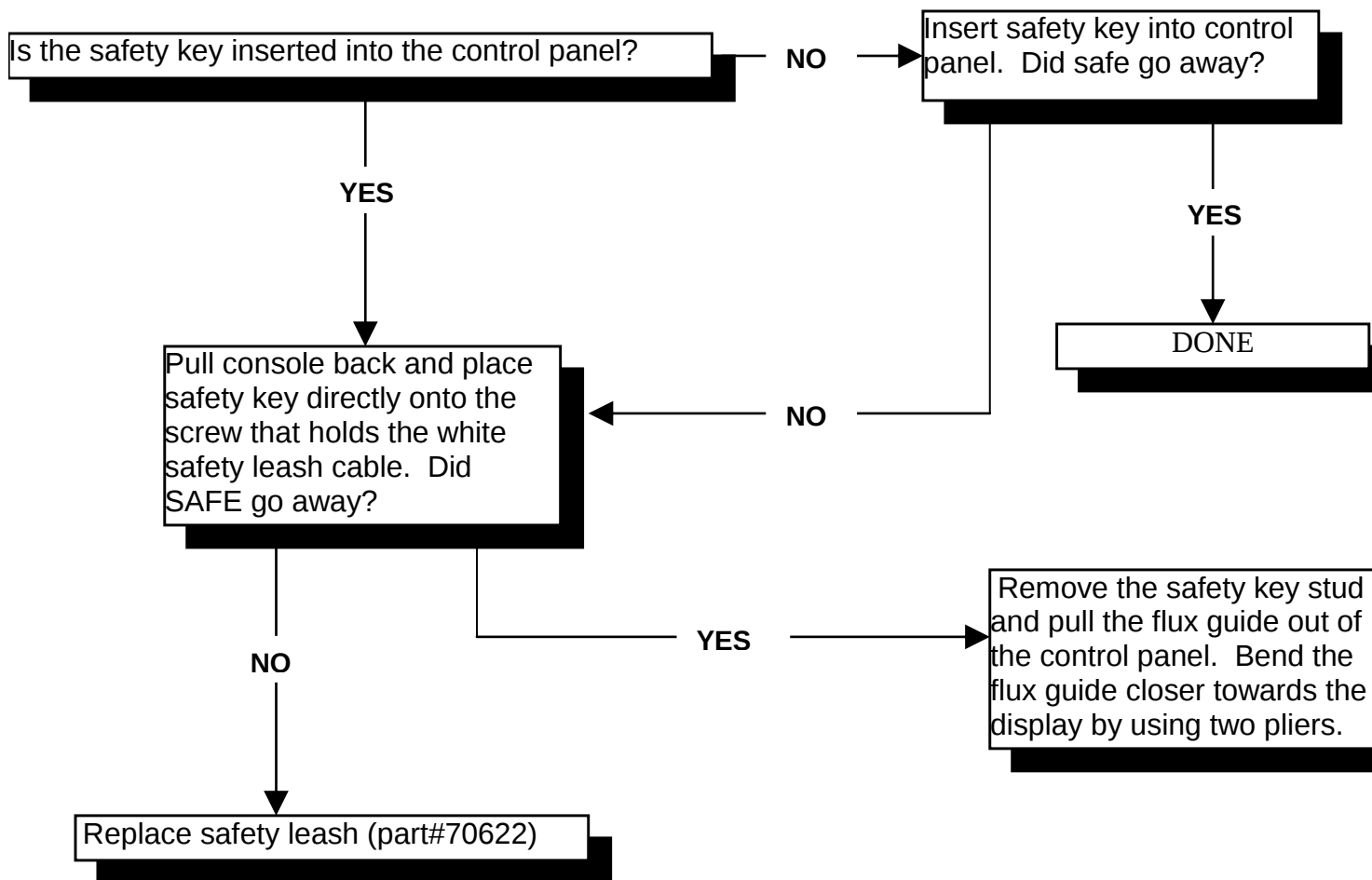
Upper display fails to light when START is pressed **GREEN ESI SCR**



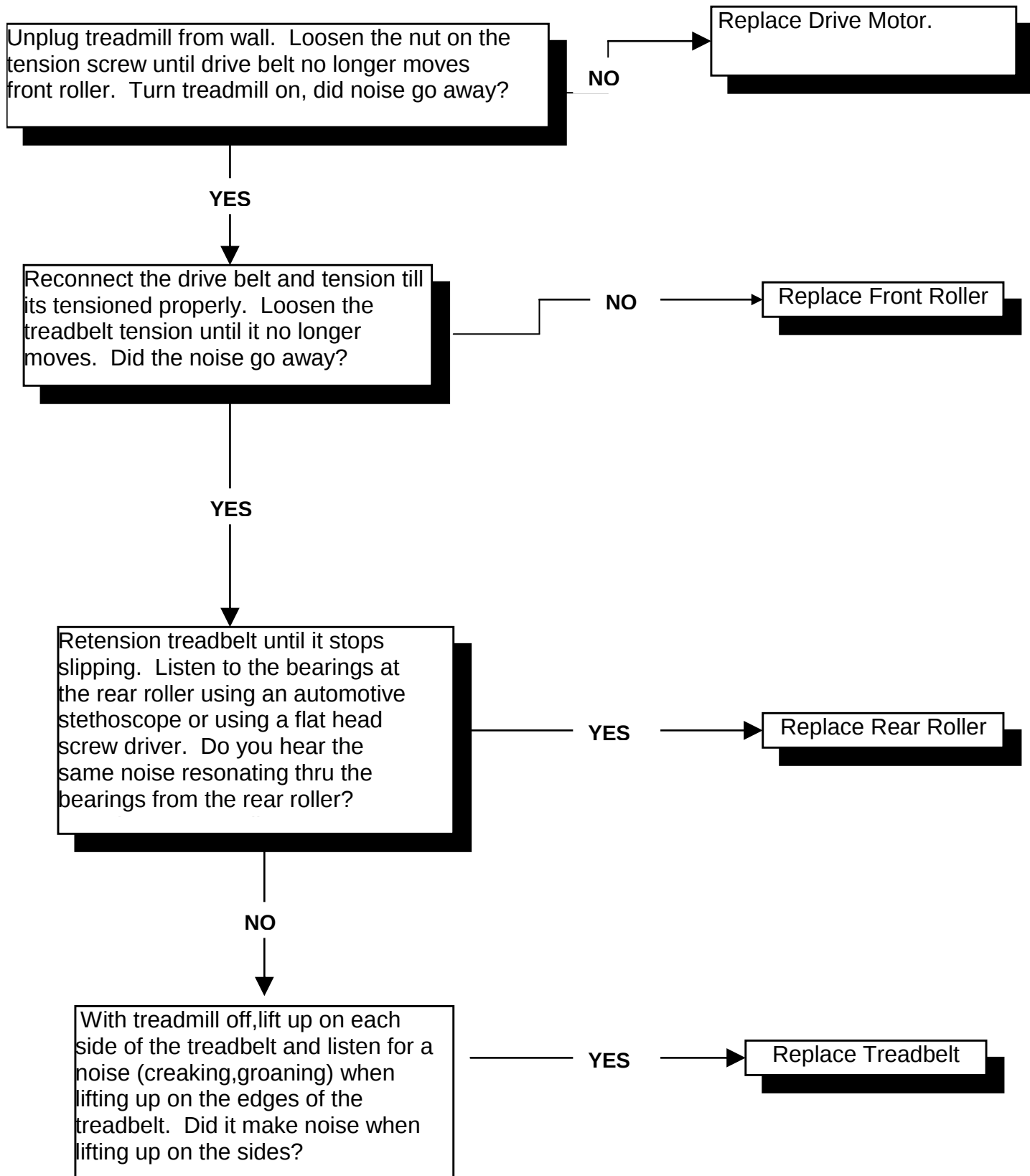
Elevation system failure; "PO" error for **ESI SCR BOARDS**.



Press START, Machine reads SAFE.



Press START, Noise coming from machine without a load



NOISE COMING FROM THE MACHINE WHEN LOADED



Place (4) 2X4's where you have 2 stacked on top of each other and placed at the front and rear of the machine as illustrated in this picture. Walk on the machine, does the noise occur? **NO = proceed to Step #2.**

YES

	Make sure that the bolts for the rear feet are tight.
	1. Make sure that bearing block bolts are tight. 2. Apply lithium grease to bearing block area.
	3. Make sure that bolt is not rubbing on legs. If so apply washer on both sides until its spaced out enough.
	Make sure that the screws at the front of the motor pan are torque down. Run screws out and back in.
	Make sure motor pan bolts are tight. There are 3 on each side at the edge of the pan Run bolts out and back in. **ALSO MAKE SURE ELEV. MTR SHAFT IS NOT BENT. RUN ELEVATION TO SEE IF SHAFT WOBBLES**



L-Series Elevation Motor Replacement

1. UNPLUG TREADMILL FROM WALL OUTLET! HIGH VOLTAGE!

2. Removal of Elevation Motor:

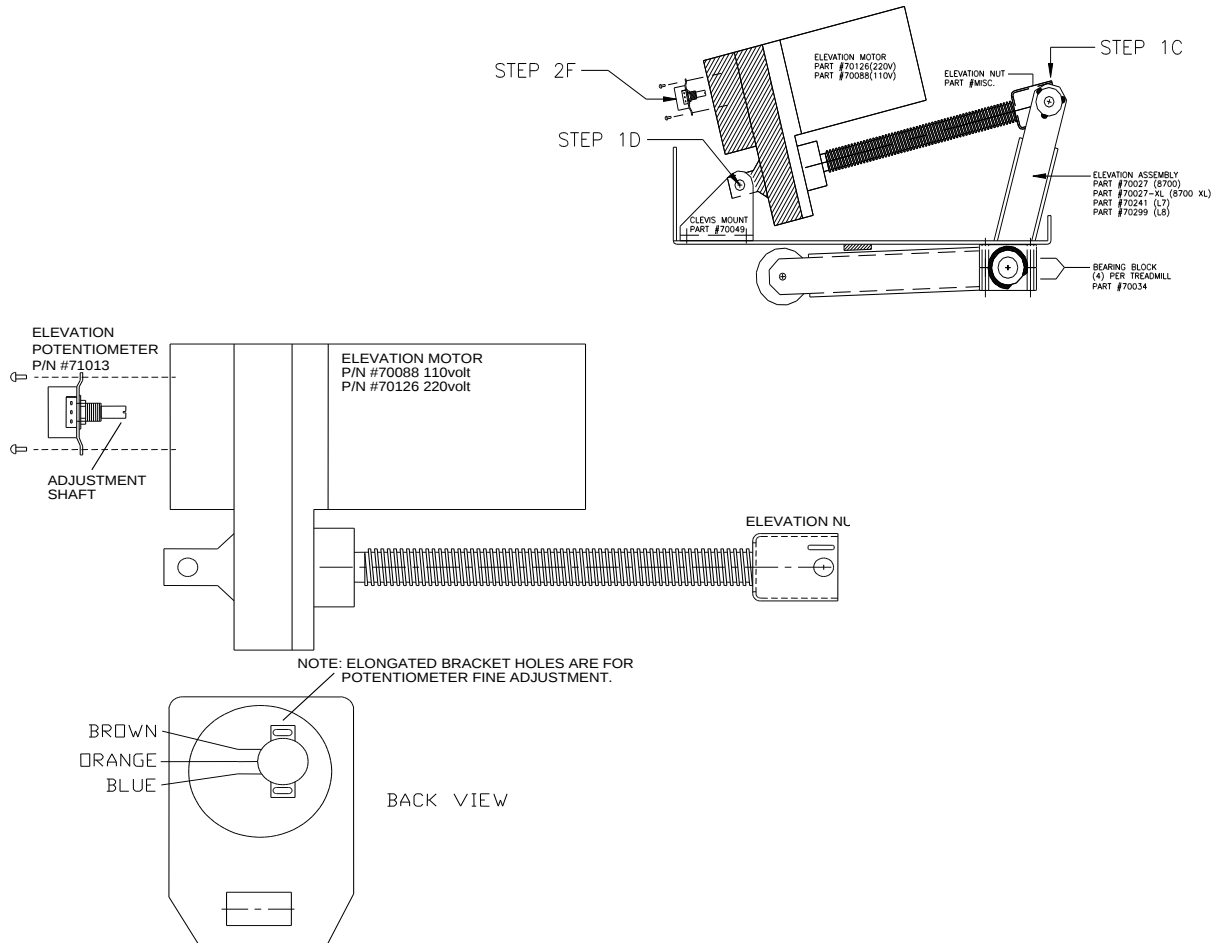
- A.** Remove all weight from the elevation assembly by placing something solid under the motor pan to remove ALL weight from the elevation wheels.
- B.** Disconnect the elevation motor harness from the lower board.
- C.** Disconnect the elevation motor nut from the elevation assembly. To do this, loosen the two set screws and slide the two elevation pins out.
- D.** Remove the elevation motor mounting pin from the clevis mount.
- E.** Remove the elevation motor.

3. Installation of Elevation Motor:

Plug machine back into wall outlet and Enter Diagnostic Mode. (See Next Page on how to enter DIAG Mode)

- A.** Align the elevation motor with the clevis mount & install the elevation motor mounting pin.
- B.** Insert hitch pin.
- C.** Reconnect the elevation harness to the lower board.
- D.** **THIS MUST BE DONE BEFORE PROCEEDING WITH STEPS F. G. & H.** Set the **lowest limit switch by holding the UP elevation button for 5 seconds** Then press and hold the DN elevation button until you hear the motor stop turning. Hit the DN elevation button one more time to make sure you only hear a click.
- E.** For L7/L8/L9 machines: Thread the elevation nut to where it's flush with the threads on the worm shaft.
- F.** Mount the elevation nut to the leg assembly by lining up the holes on the elevation nut to the holes on the leg assembly. You may have to move the leg assembly so that the holes on the elevation nut line up. Then slide the two elevation pins

through the elevation assembly and into the elevation nut. Then secure the pins with the 2 set screws.



SERVICE TIP: USE 2 PEOPLE TO CALIBRATE THE ELEVATION POT. ONE PERSON TURNS THE POST ON THE POT WHILE THE OTHER LOOKS AT THE DISPLAY AND TELLS THE POT READING.

To Enter Diagnostic Mode 70 & 80 series machines:

Turn off the treadmill.

ET's – Press MENU & START simultaneously.

PST's 2 & CT's 2 – Press NEXT & START simultaneously

PST's 4 & CT's 4 – Press ENTER & START simultaneously

ST, PT, & RTM's – Press DISPLAY & START simultaneously

To calibrate the potentiometer:

1. Visually confirm treadmill is level. (0% grade)
2. Adjust the pot settings as follows:
 FOR PWM BD'S – Set elevation pot reading to 0.0
 FOR SCR BD'S – Set elevation pot reading to 0.2
3. If the setting is incorrect, follow the steps below.
 STEP 1: Turn the post of the potentiometer all the way **CLOCKWISE**.
 STEP 2: **Slowly** turn the potentiometer **COUNTER-CLOCKWISE** until the setting is correct.
4. Carefully install potentiometer into the motor housing.

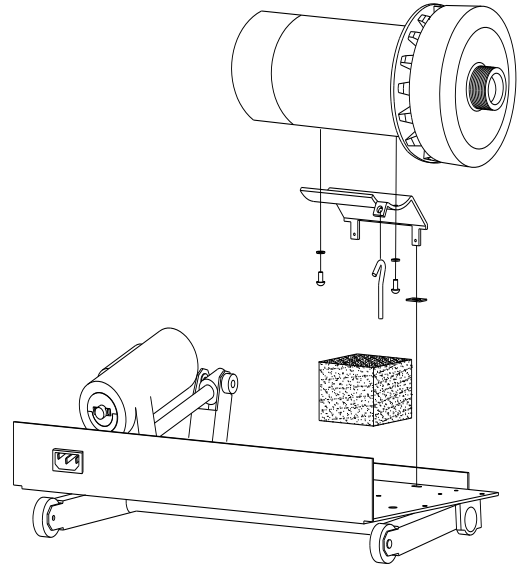
***NOTE:** The setting may vary when inserting the potentiometer into the motor. As long as the change is minimal, fine adjustment can be achieved by rotating the potentiometer while inside the elevation motor.

5. Press OFF to turn treadmill off. Then restart the machine in manual mode to test elevation by elevating the machine all the way up and down.

MCMILLAN DRIVE MOTOR REMOVAL & INSTALL

REMOVAL:

1. Raise Treadmill to highest elevation.
2. **UNPLUG TREADMILL**
3. Using a 7/16" wrench loosen nut on motor tensioning J-Hook located underneath motor pan.
4. Remove two hitch pins securing motor to motor pan.
5. Remove drive belt.
6. Disconnect three wires coming from drive motor. (White, Black and Green Wires)
7. Unplug the speed sensor from lower board.
8. Remove drive motor.



REVERSE STEPS FOR INSTALL.

INSTALLING MOTOR SPACERS:

The rubber and metal spacers mounted between the motor mount and the motor pan are arranged in a specific manner. The reason for this is to reduce vibration. If you're standing on the treadmill, the following arrangement applies: On the right side you will have (0) spacers on top of pan and (1) rubber, (1) metal followed by (1) retaining clip on bottom. On the left side you will have (1) metal spacer on top of the pan and (1) rubber on the bottom followed by (1) retaining clip.

DRIVE BELT:

The drive belt tensioning screw is located on the drive motor bracket.

By turning the nut clockwise you will pull down the motor bracket and tighten the drive belt. **DO NOT OVER TIGHTEN!** If you over tighten this belt you risk damaging the drive motor shaft. To determine if the drive belt is tensioned properly we would recommend tightening the tensioning hook until the hook stops jiggling. Then make 1 & 1/2 turns to tighten the tension nut to properly tension the drive belt.

FRONT ROLLER REPLACEMENT INSTRUCTIONS:

TOOL'S REQUIRED:

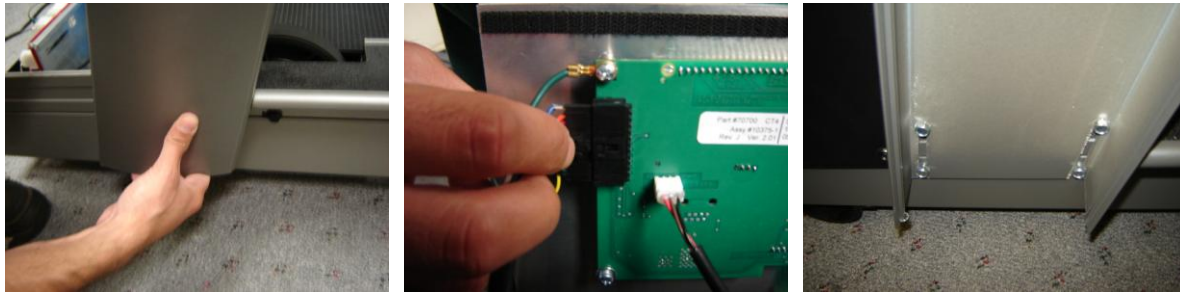
- Power drill with #2 Phillips Head Bit. (this is the only way to take out frame rail screws)
- 3/8th, 7/16th, 1/2, 9/16th standard sockets
- 3/8th ratchet w/ 2" extension
- Rubber Mallet

TIME REQUIRED: 1 technician = 1/2 an hour.

DISASSEMBLY PROCEDURE:

- 1) Turn treadmill ON and elevate it to highest elevation.
- 2) Turn treadmill OFF. **UNPLUG TREADMILL FROM WALL OUTLET.**
- 3) Remove motor cover.

STEP 4: REMOVING THE UPRIGHT



- 1) Remove the upright frame covers by pulling outwards from the bottom of the cover.
- 2) Disconnect the main harness and ground wire from the display board.
- 3) Loosen all 8 (4 on each side) upright bolts using a 7/16th socket, ratchet and 2" extension. You do not need to completely remove these bolts from the frame.
- 4) Lift upright assembly UP and OFF.

STEP 5: LOOSENING TENSION OF TREADBELT



- 1) Loosen treadbelt tension using a 9/16th socket and ratchet at the adjustment bolts located at the rear of the machine.

REAR ROLLER REPLACEMENT INSTRUCTIONS

TOOL'S REQUIRED:

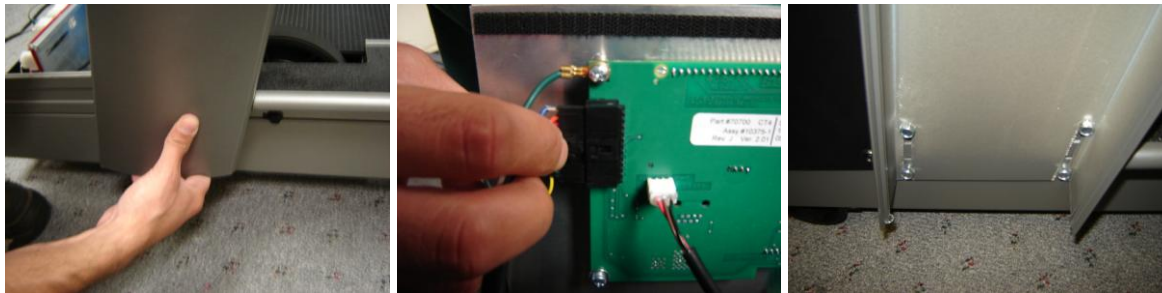
- Power drill with #2 Phillips Head Bit. (this is the only way to take out frame rail screws).
- 3/8th & 9/16th standard sockets.
- 3/8th ratchet with extension

TIME REQUIRED: 1 technician = ½ an hour.

DISASSEMBLY PROCEDURE:

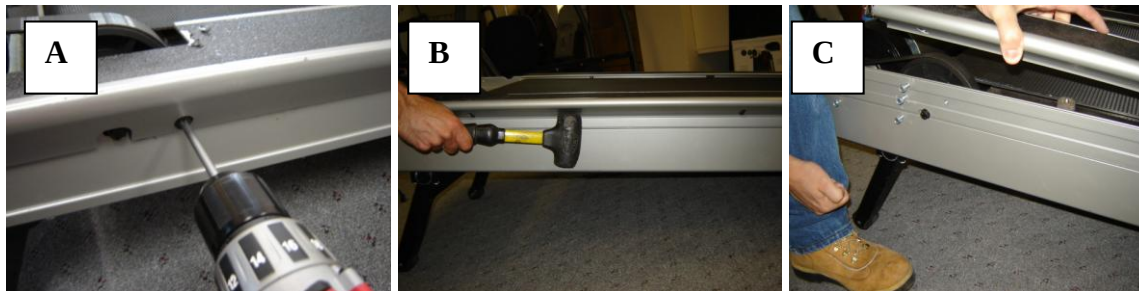
1. **UNPLUG TREADMILL FROM WALL.**
2. Remove the bed end cap screws at each side.

STEP 3: REMOVING THE UPRIGHT



- 1) Remove the upright frame covers by pulling outwards from the bottom of the cover.
- 2) Disconnect the main harness and ground wire from the display board.
- 3) Loosen all 8 (4 on each side) upright bolts using a 7/16th socket, ratchet and 2" extension. You do not need to completely remove these bolts from the frame.
- 4) Lift upright assembly UP and OFF.

STEP 4: REMOVING THE LEFT & RIGHT FRAME RAIL COVERS



- 1) Remove all 4 Phillips head screws on each side using your power screw gun and #2 Phillips head bit shown in **Figure A**.
- 2) Take your rubber mallet and lightly tap the bottom of the frame rail in an upwards direction shown in **Figure B**. Then lift up on the side frame cover to remove it from the machine (see **Figure C**).

STEP 5: REMOVING THE REAR ROLLER



- 1) Remove the rear-take up bolts using your 9/16th socket and ratchet.
- 2) Grab the roller with your hand, angle it and slide it out from inside the treadmill.

Follow steps 1 thru 5 in reverse to put everything back together.

TENSIONING

Need for tension is indicated by uneven belt speed and may be sensed by sudden stopping of the treadmill when your foot comes down on the belt.

TREADBELT Tensioning: To tension the treadmill, use the same hex head bolts as were used for tracking below.

- 1) Turn screws on both sides of the roller *clockwise* the same amount.
 - o Failure to turn them equally will affect the treadmill tracking.

DO NOT OVERTIGHTEN THE TREADBELT.

If you cannot slide the palm of your hand between the Treadbelt and the deck to the center of the treadmill, **the Treadbelt Is Too Tight** and tension must be relieved.

TREADBELT Tracking: The Treadbelt is tracked by means of two hex head adjustment bolts located at rear of treadmill. By tightening the side the belt is tracking closest to and loosening the opposite side by the same amount, you change the alignment of the rear roller without changing overall tension.

- o Adjustments should be made with treadmill running, and should be made in 1/4-turn increments. Allow at least 30 seconds for treadmill to stabilize between each adjustment. Perform the adjustments at slower speeds (2-3 mph) until you are comfortable making adjustments. Faster speeds will cause the adjustments to take effect quicker (5-6 mph).

Example: Treadbelt is tracking to the right:

- a) Turn treadmill on, and bring speed up to 4.0 mph.
- b) Using a 9/16" wrench, tighten the right-hand adjustment bolt 1/4" turn.
- c) Loosen the left-hand adjustment bolt 1/4" turn.
- d) Let Treadbelt stabilize (rotate for 30 seconds) and readjust if necessary.

L-80 SERIES T-BELT/DECK/IMPACT ABSORBER REMOVAL & REPLACEMENT INSTRUCTIONS.

TOOLS REQUIRED:

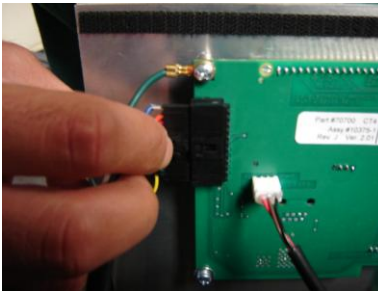
- Power drill with #2 Phillips Head Bit. (this is the only way to take out frame rail screws)
- 3/8th, 7/16th, 1/2, 9/16th standard sockets
- 3/8th ratchet w/ 2" extension
- Rubber Mallet
- Vice grips or pliers
- Lubriplate Grease

TIME REQUIRED: 1 technician = 1 hour

DISASSEMBLY PROCEDURE:

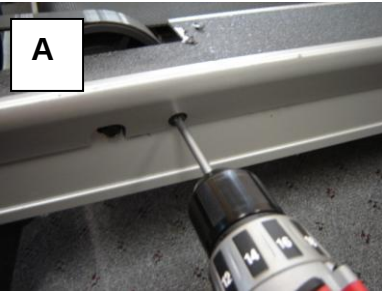
1. Remove the bed end caps screws at each side.
2. Turn treadmill on and elevate the machine to highest elevation.
3. **UNPLUG TREADMILL.**
4. Remove motor cover.

STEP 5: REMOVING THE UPRIGHT



- 1) Remove the upright frame covers by pulling outwards from the bottom of the cover.
- 2) Disconnect the main harness and ground wire from the display board.
- 3) Loosen all 8 (4 on each side) upright bolts using a 7/16th socket, ratchet and 2" extension. You do not need to completely remove these bolts from the frame.
- 4) Lift upright assembly UP and OFF.

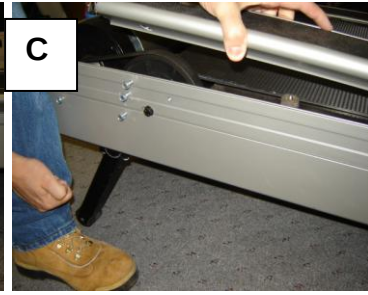
STEP 6: REMOVING LEFT & RIGHT FRAME RAIL COVERS



A



B

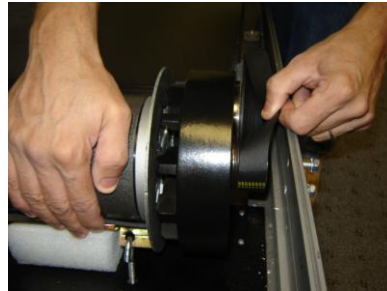


C

- 1) Remove all 4 Phillips head screws on each side using your power screw gun and #2 Phillips head bit shown in **Figure A**.
- 2) Take your rubber mallet and lightly tap the bottom of the frame rail in an upwards direction shown in **Figure B**. Then lift up on the side frame cover to remove it from the machine (see **Figure C**).

STEP 7: REMOVE THE DRIVE BELT

Drive belt
tension nut



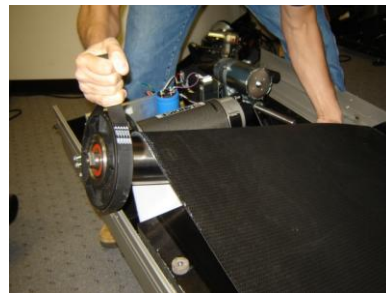
- 1) Remove the motor tensioning nut using your 7/16th deep well socket.
- 2) Pull the motor towards the rear of the machine with one hand. Use your other hand and twist the drive belt and rotate it forward so it comes off the flywheel.

STEP 8: REMOVE THE REAR ROLLER



- 3) Remove the rear take up bolts using your 9/16th socket and ratchet.
- 4) Grab the roller with your hand, angle it and slide it out from inside the treadbelt.

STEP 9: REMOVE THE FRONT ROLLER



- 1) Remove the front roller bolts using your 3/8th socket w/ ratchet. Front roller bolts are located on the right and left side of front roller.
- 2) Angle the roller and slide the front roller out from inside the treadbelt

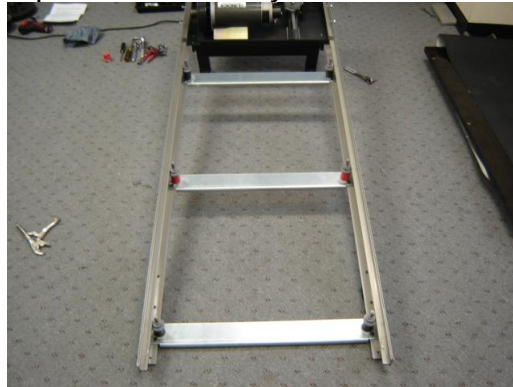
SERVICE TIP: Have the drive belt wrapped around the drive roller pulley and use that as a handle to remove the front roller.

STEP 10: LIFT THE DECK OUT OF TREADMILL FRAME ASSEMBLY



- 1) Place the handle of your rubber mallet between the deck and frame. This will keep the deck free from the deck posts on one side when working by yourself. Then you can walk to the opposite side and lift the deck off.
- 2) Walk over to other side and lift the deck out of the frame assembly. Then slide the treadbelt over the deck to take it off.

Here is a picture of the fully disassembled treadmill.

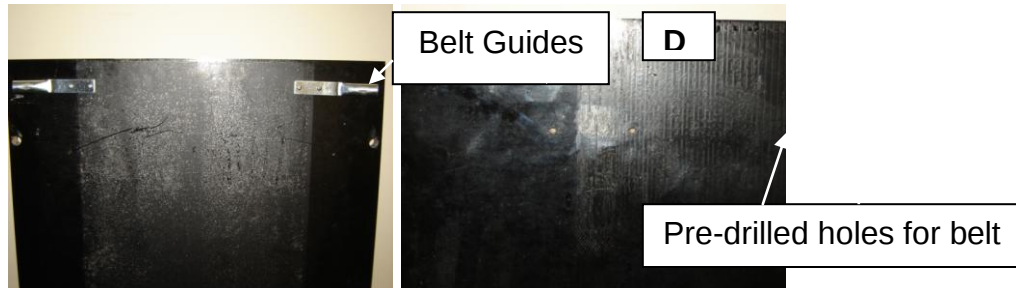


STEP 11: REMOVE THE IMPACT ABSORBERS



- 1) Take your vice grips or locking pliers, lock them around the tip of the deck post. Then turn the pliers counterclockwise to remove the deck post.
- 2) Slide the deck post out of the impact absorber and load washer.
- 3) **For L8 & L9 Machines;** just slide the load washer and impact absorber off the deck post. Then take your locking pliers, lock them around the tip of the deck post and turn your pliers counterclockwise to remove the deck post. **NOTE: The deck post will not slide out of the nylon spacer. Both parts will come off at once when the deck post is completely loose. You will need to remove this assembly to lubricate the bottom of the nylon spacer (see Step 13 for details).**

STEP 12: DECK REVERSAL **NOTE: LANDICE DECKS ARE REVERSIBLE AND ONLY NEED TO BE REVERSED WHEN A NEW T-BELT IS INSTALLED.**



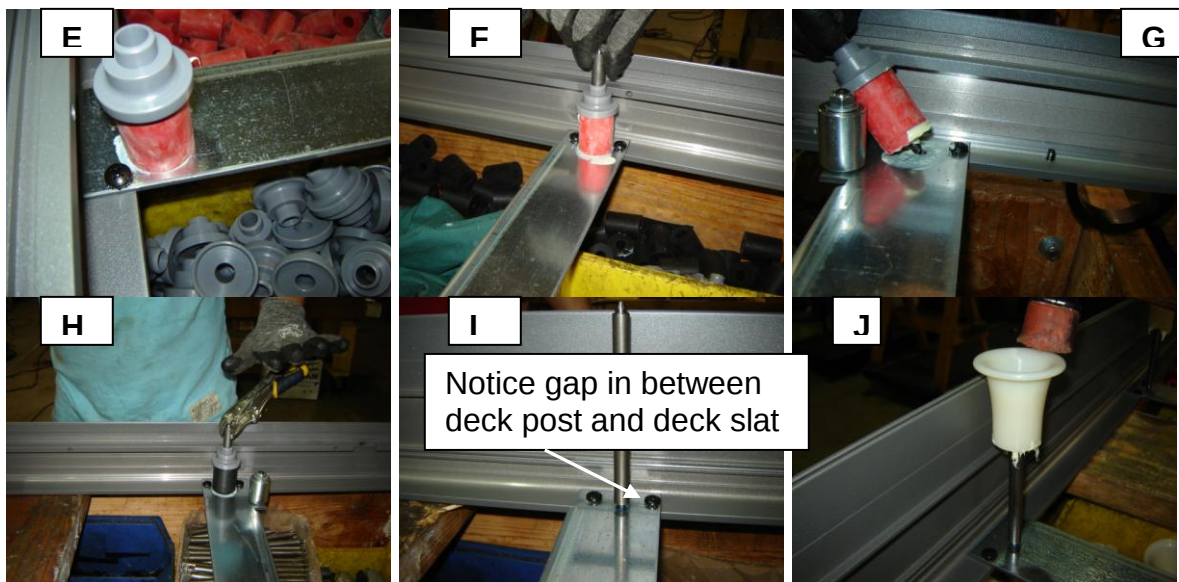
- 1) You will need to remove the belt guides from the “old” side and install them on the “new side”. Remove the 2 screws on each belt guide to transfer them to the other side.
- 2) The holes for the belt guide are predrilled into the bottom part of the deck (see picture D) to accommodate the belt guides. Use these holes to mount the belt guides onto the fresh deck surface. Make sure belt guides are in front when reinstalling the deck. If the deck has already been reversed then install a new deck with a new treadbelt. **DO NOT FLIP THE DECK IF YOU ONLY NEED TO REPLACE THE IMPACT ABSORBERS**

STEP 13: LUBRICATING VFX COMPONENTS



- 1) Use lubriplate (white lithium) grease and a small brush to apply the grease on the deck post. Make sure the grease is applied around the whole deck post.
- 2) Next place lubriplate (white lithium) grease on the top of each absorber. Then place the end of the absorber without the grease and meet it to the other absorber with grease and rub them together. Repeat this step for the other side.
- 3) **For L8/L9 Machines**; place some lubriplate (white lithium) grease on the bottom of each nylon spacer.

STEP 14: REINSTALLING VFX COMPONENTS



- 1) Place all absorbers and load washers at each end of the deck slat (see picture E)
- 2) Take your deck post and slide it thru the load washer and impact absorber (see picture F)
- 3) Tilt the deck post, load washer and impact absorber as shown in picture G. Align the end of the deck post to the threads on the deck slat. Hand thread the deck post to get it started.
- 4) Use a pair of vice grips or locking pliers, grip them around the tip of the deck post and have the handle part of your pliers angled upwards (see picture H). Turn your pliers clockwise to snug the deck post down. Once the deck post is snug, give one ¼ turn clockwise to fully tighten the deck post to the slat.
- 5) **For L8/L9 Machines**; get threads on deck post started into the deck slat (see picture I) but do not tighten them down all the way. Slide nylon spacer on and use rubber mallet to tap it all the way down the post (see picture J). Then use your locking pliers to tighten the deck post all the way down.

6) INSTALL ALL NEW IMPACT ABSORBERS

7) Follow steps 1 thru 10 in reverse to put everything back together.

- 8) ***Treadbelt and Deck break in procedures:*** There is a powder coat of wax on the new deck surface. This melts into the treadbelt and mixes with the slipcoat to complete the lubrication procedure when a new treadbelt is installed. To break in the wax, turn the machine on and set speed window to 1mph and elevate machine to 5% grade. Start at the right rear of machine and walk in a zig-zag pattern moving up and down the running surface for 10 minutes to break in the deck wax. The customer can do this after everything is assembled. **DO NOT RUN THE MACHINE AT HIGH SPEEDS UNTIL DECK WAX IS BROKEN IN. THIS MAY RESULT IN CIRCUIT BREAKERS TRIPPING, HESITATION IN SPEED AND WAX BUILD UP ON BOTH ROLLERS**

TENSIONING

Need for tension is indicated by uneven belt speed and may be sensed by sudden stopping of the treadmill when your foot comes down on the belt.

TREADBELT Tensioning: To tension the treadmill, use the same hex head bolts as were used for tracking below.

- 2) Turn screws on both sides of the roller *clockwise* the same amount.
 - Failure to turn them equally will affect the treadmill tracking.

DO NOT OVERTIGHTEN THE TREADBELT.

If you cannot slide the palm of your hand between the Treadbelt and the deck to the center of the treadmill, **the Treadbelt Is Too Tight** and tension must be relieved.

DRIVE BELT Tensioning: The drive belt tensioning nut is located on the drive motor bracket.

- 1) Turn the nut clockwise which will pull down the motor bracket, thus tightening the drive belt.

DO NOT OVER TIGHTEN!

If you over tighten this belt you risk damaging the drive motor shaft.

- 3) To determine if the drive belt is tensioned properly Landice recommends:
 - Tighten the tensioning hook until the hook stops jiggling.
 - Tighten the tension nut 1 & ½ turns.

TREADBELT Tracking: The Treadbelt is tracked by means of two hex head adjustment bolts located at rear of treadmill. By tightening the side the belt is tracking closest to and loosening the opposite side by the same amount, you change the alignment of the rear roller without changing overall tension.

- Adjustments should be made with treadmill running, and should be made in 1/4-turn increments. Allow at least 30 seconds for treadmill to stabilize between each adjustment. Perform the adjustments at slower speeds (2-3 mph) until you are comfortable making adjustments. Faster speeds will cause the adjustments to take effect quicker (5-6 mph).

Example: Treadbelt is tracking to the right:

- e) Turn treadmill on, and bring speed up to 4.0 mph.
- f) Using a 9/16" wrench, tighten the right-hand adjustment bolt 1/4" turn.
- g) Loosen the left-hand adjustment bolt 1/4" turn.
- h) Let Treadbelt stabilize (rotate for 30 seconds) and readjust if necessary.

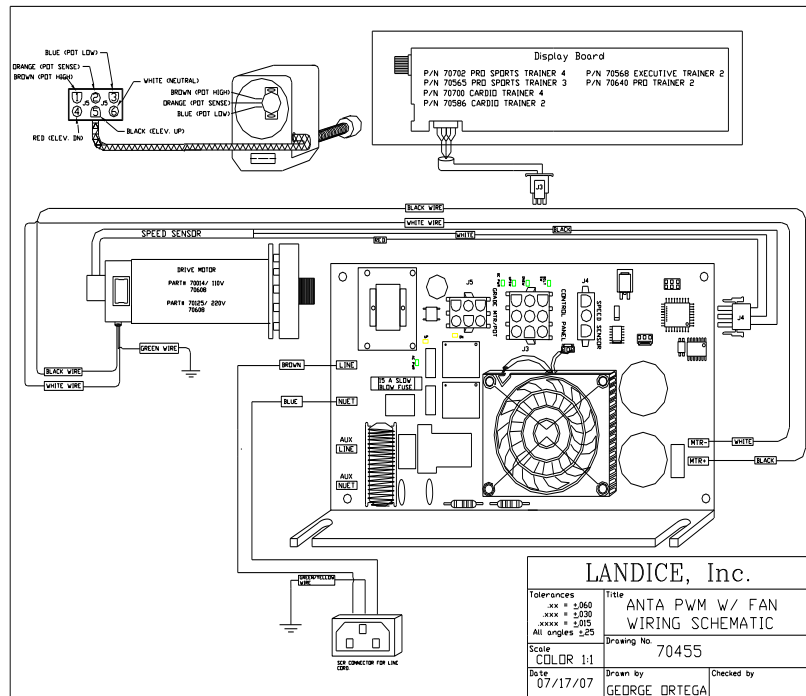
Treadbelt and Deck break in procedures: The new deck surface has a powder coat of wax. This melts into the treadmill and mixes with the slip coat to complete the lubrication process when a new treadmill is installed.

- 1) To break in the wax:
 - Turn the machine on
 - Set speed window to 1 mph
 - Set elevation to 5% grade
- 2) Start at the right rear of machine and walk in a zig-zag pattern moving up and down the running surface for 10 minutes to break in the deck wax. The goal is

to cover every part of the running service. The customer can do this after everything is assembled.

DO NOT RUN THE MACHINE AT HIGH SPEEDS until deck wax is broken in. Running unit at high speeds may result in circuit breakers tripping, hesitation in speed and wax build up on both rollers.

ANTA PWM W/ FAN LOWER BOARD UPGRADE WIRING INSTRUCTIONS

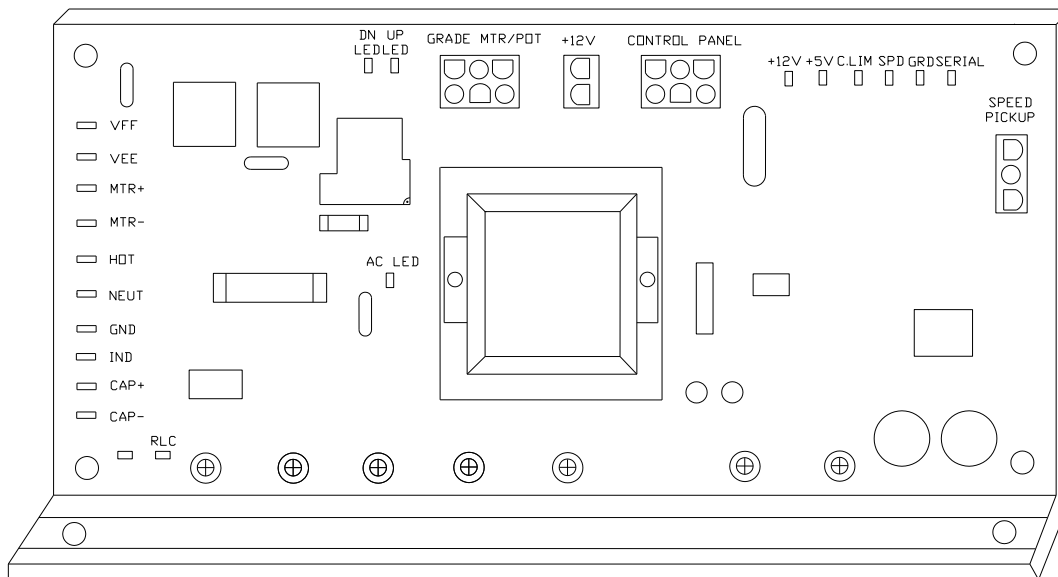


USE THESE INSTRUCTIONS WHEN RETROFITTING THE NEW ANTA PWM W/FAN TO AN ORIGINAL ANTA PWM LOWER BOARD WITH RELAY.

- 1) Remove the original lower board from the treadmill
- 2) Install the new lower board and wire the new lower board on the treadmill. Connect the **Brown** wire from the linecord and connect it to the Line terminal. Connect the **Blue** wire from the linecord to the Neutral connector on the lower board.
- 3) Connect the black wire from the drive motor to the Motor (+) Terminal. Connect the White wire from drive motor to the Motor (-) Terminal on the lower board. Continue to connect all of the Molex connect into the lower board as well.
- 4) Align the lower board on the motor pan locating one of the original mounting holes and mark the h Remove the lower board from the treadmill and Drill and tap out the secondary mounting hole and t reinstall the lower board back on the treadmill.

DO NOT DRILL AND TAP THE HOLE WITH THE NEW LOWER BOARD STILL INSTALLE ON THE TREADMILL.

RED SCR Boards



Removal Instructions:

- 1) Unplug the line cord from the wall outlet.
 - 2) Disconnect the elevation harness, speed sensor connections, and main harness & 12 volt connection from the lower board.
 - 3) Remove the LVS brown and blue wires from the terminals VFF and VEE. (This step only applies if the treadmill has an LVS system.)
 - 4) Remove the drive motor black wire from the MTR + terminal and white from the MTR - terminal.
 - 5) Remove the line cord brown wire from the HOT terminal and blue from the NEUT terminal.
 - 6) Remove the green ground wire from GND terminal
 - 7) Remove the red choke wire from the IND terminal.
 - 8) Remove capacitor black wire from CAP + and capacitor white from CAP –
 - 9) Remove the 2 Phillips head screws at the bottom heat sink on lower board.
- Remove the board completely out.

Installation Instructions:

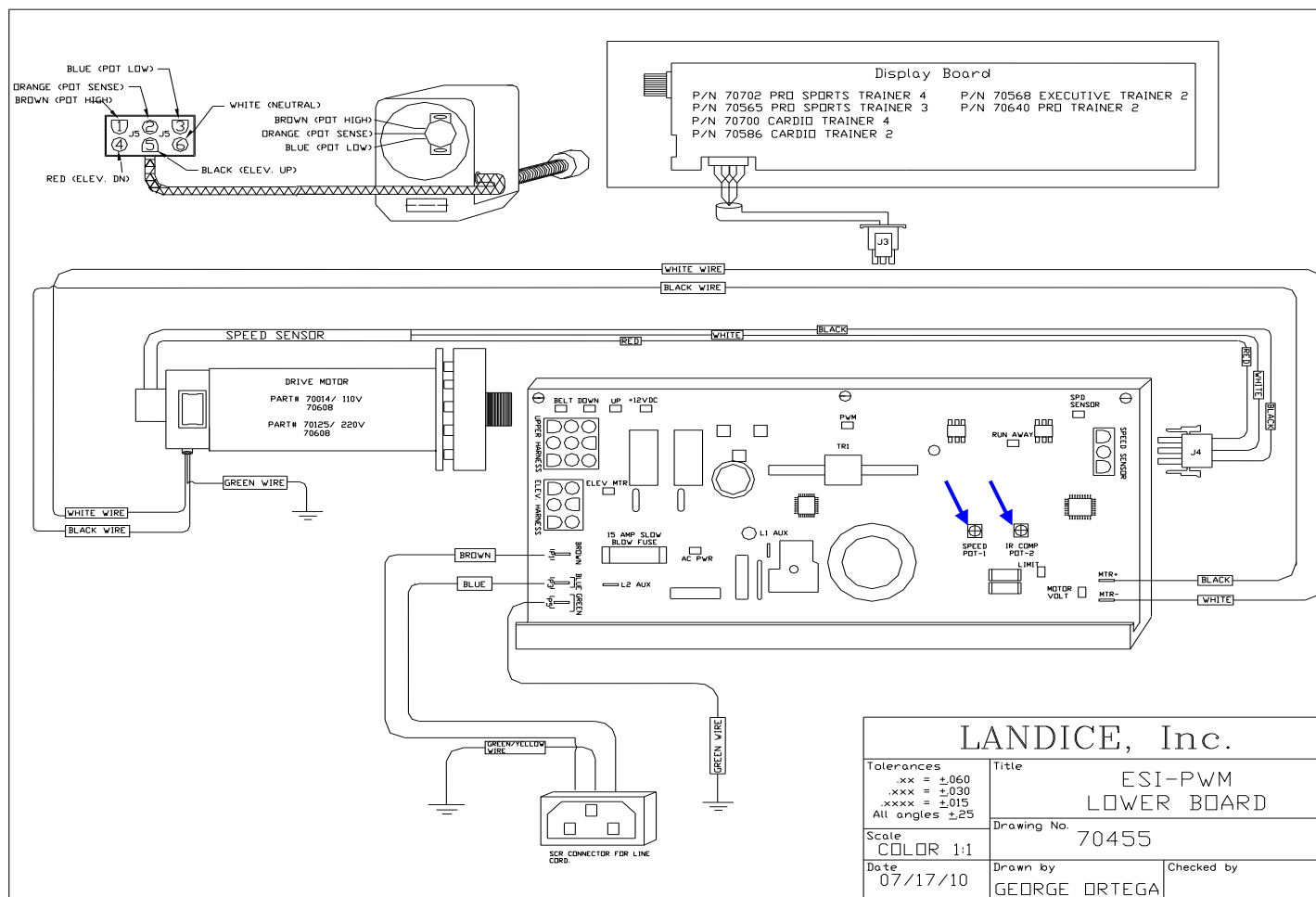
- 1) Lay lower board on heat sink inside motor pan. Reconnect wires to lower board:

CAP (-)	White wire from capacitor
CAP (+)	Black wire from capacitor
IND	Red wire from filter choke
GND	Ground wire fro leg on filter choke
NEUT	Blue wire from line cord receptacle
HOT	Brown wire from line cord receptacle
MTR (-)	White wire from drive motor
MTR (+)	Black wire from drive motor
*VEE	Blue wire from TV line cord
*VFF	Blue wire from TV line cord

*use only if TV option is equipped on machine

- 2) Flip lower board up so its standing straight up. Line up holes from lower board to motor pan. Insert the 2 phillips head screw & blot lower board to motor pan

ESI PWM LOWER BOARD UPGRADE WIRING INSTRUCTIONS



USE THESE INSTRUCTIONS WHEN RETROFITTING THE NEW ESI PWM TO AN ORIGINAL PWM LOWER BOARD WITH RELAY.

- 1) Remove the original lower board from the treadmill.
- 2) Align the lower board inside the motor pan locating one of the original mounting holes and mark the second hole. **Remove the lower board from the treadmill.** Then drill and tap out the secondary mounting hole and reinstall the lower board back on the treadmill.
- 3) Connect the Brown wire from the linecord to the P-1 Line terminal on the lower board. Connect the Blue wire from the linecord to the P-3 Neutral terminal on the lower board. Connect the Green grounding wire to P-5 terminal on the lower board and ground it to the motor pan.
- 4) Connect the Black wire from the drive motor to the P-4 Black terminal. Connect the White wire from the drive motor to the P-6 White terminal.
- 5) Once the lower board is mounted and wired you will need to calibrate the speed by adjusting the **IR & Speed** pots which is located on the lower board.

(ARROWS INDICATE WHERE THE ADJUSTMENT POTS ARE LOCATED.)

REFER TO THE WIRING SCHEMATIC ABOVE

SPEED CALIBRATION PROCEDURE

- 1) Enter into Open Loop Speed mode (O.L.S.) by pressing Stop button then pressing and holding the first button listed and simultaneously pressing the second button listed. For example for the Executive Trainer press stop, press and hold Menu then press and hold Start button , count to two and let both buttons go.

Executive Trainer	MENU & START
Cardio Trainer	DISPLAY & START
Cardio Trainer 2	NEXT & START
Cardio Trainer 4	ENTER & START
Pro Sport Trainer 3	NEXT & START
Pro Sport Trainer 4	ENTER & START
Sport Trainer 2	FAST & START
Pro Trainer 2	FAST & START

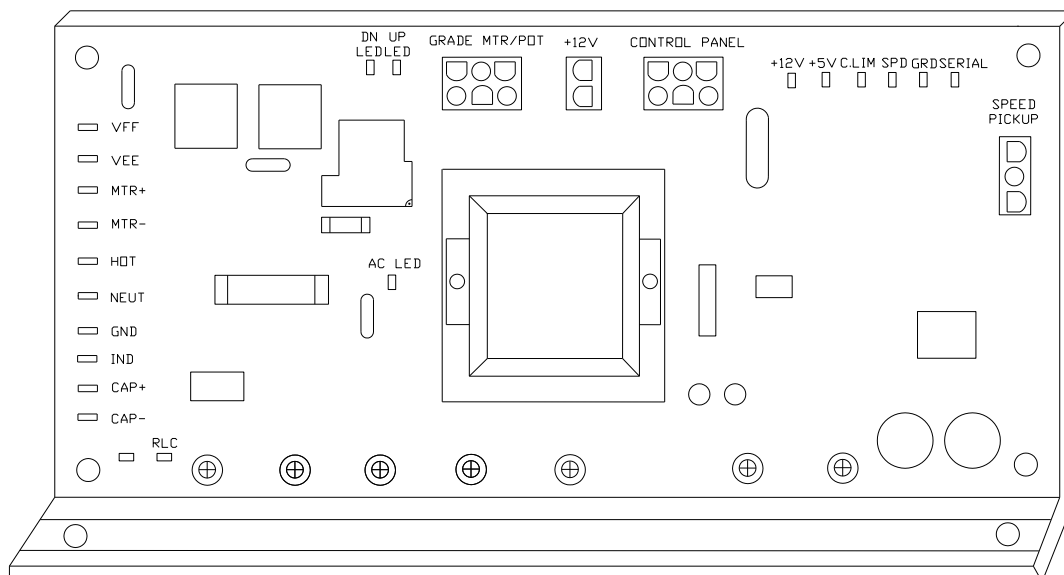
ALL 50 SERIES ST, PT, PST, & CT MODEL USE FAST & START TO ENTER O.L.S. MODE.

CLOCKWISE=INCREASE SPEED/ COUNTERCLOCKWISE=DECREASE SPEED

- 2) Bring the set speed to 12mph. Let actual speed stabilize in the center display
- 3) Adjust the **Speed Pot** on the ESI PWM motor control board accordingly. (11.7 to 12.3 mph is acceptable)
- 4) Decrease set speed to .5mph. Let actual speed stabilize. Adjust the **Speed Pot** accordingly if needed. (.40 to .60mph is acceptable)
- 5) Before turning treadmill off, check the MAX speed one more time for accuracy.
- 6) Shut off & restart the treadmill again and bring the speed to 1.0 mph in the programmed speed.

- 7) Stand on the treadbelt to see if there's any hesitation or speed surge present.
- 8) If there's any then adjust the **IR Pot** counterclockwise on the board until the surging & hesitation subsides.

RED SCR Boards



Removal Instructions:

- 1) Unplug the line cord from the wall outlet.
- 2) Disconnect the elevation harness, speed sensor connections, and main harness & 12 volt connection from the lower board.
- 3) Remove the LVS brown and blue wires from the terminals VFF and VEE. (This step only applies if the treadmill has an LVS system.)
- 4) Remove the drive motor black wire from the MTR + terminal and white from the MTR - terminal.
- 5) Remove the line cord brown wire from the HOT terminal and blue from the NEUT terminal.
- 6) Remove the green ground wire from GND terminal
- 7) Remove the red choke wire from the IND terminal.
- 8) Remove capacitor black wire from CAP + and capacitor white from CAP –
- 9) Remove the 2 Phillips head screws at the bottom heat sink on lower board.
Remove the board completely out.

Installation Instructions:

- 1) Lay lower board on heat sink inside motor pan. Reconnect wires to lower board:

CAP (-)	White wire from capacitor
CAP (+)	Black wire from capacitor
IND	Red wire from filter choke
GND	Ground wire from leg on filter choke
NEUT	Blue wire from line cord receptacle
HOT	Brown wire from line cord receptacle
MTR (-)	White wire from drive motor
MTR (+)	Black wire from drive motor
*VEE	Blue wire from TV line cord
*VFF	Blue wire from TV line cord

*use only if TV option is equipped on machine

- 2) Flip lower board up so its standing straight up. Line up holes from lower board to motor pan. Insert the 2 Phillips head screw & blot lower board to motor pan

LED Lights on RED SCR

These two lights should be on if treadmill is plugged in but not turned on.

AC (green) – The AC (Alternating Current) LED illuminates when AC line voltage is delivered to the treadmill. It then passes through the in-line fuse and lights the AC LED.

+12V (green) – As the proper AC voltage is delivered to the treadmill it passes through the in-line fuse and through the full wave bridge rectifier. This changes AC to DC voltage and the transformer steps down DC to +12V VDC

These lights should be on if treadmill is turned on.

+5V (green) – The +5v LED turns on when the upper board is powered on. This activates the Belt Relay Switch on and there's belt movement at 0.5 mph.

MTR (yellow) – The MTR LED illuminates when direct current (dc) voltage is sent to the motor. The LED gets brighter when the dc output increase.

RLC (yellow) – The RLC (R=Reactance/ L= Inductance/ C= Capacitance) LED illuminates when the filtering system is properly working. The filtering system includes the capacitor and filter choke.

SPD (yellow) – The SPD LED flashes on and off when the speed sensor is working properly. The sensor is reading from the tachometer wheel which is located in the rear of the drive motor.

DN & UP (yellow) – The DN and UP LED's indicates the elevation DN and UP relays are functioning properly. The LED's on the relay has energized and is sending high voltage to the elevation motor.

MALFUNCTION LED's

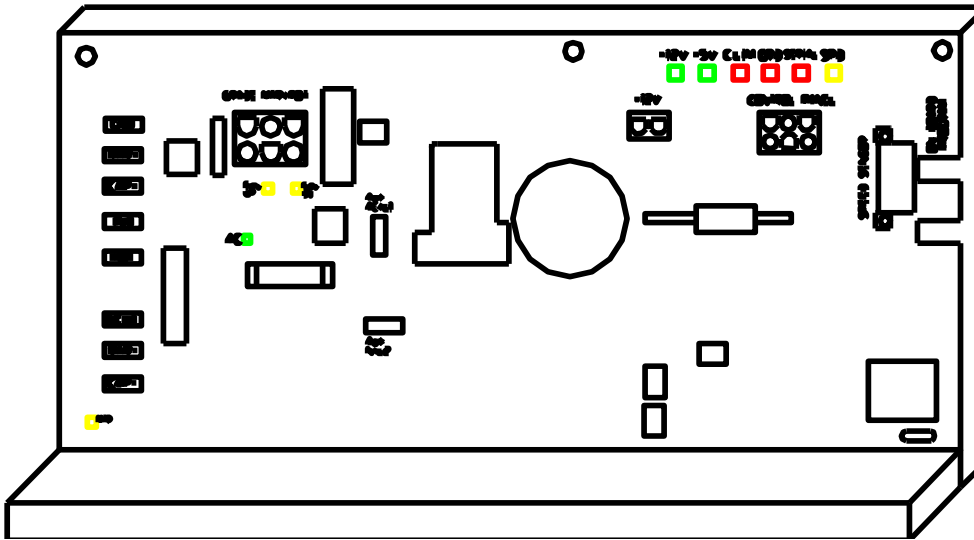
These lights should NEVER be on

C.LIM (red) – The C.LIM (Current Limit) should **NEVER** be on. This diagnostic LED is use to determine the condition of the treadbelt and deck. The SCR board has a built-in amp meter. When the treadbelt and deck system wears, the amperage will increase. When this amperage reaches its max limit, the lower board will shut down its power (treadbelt will slowdown/low torque) to the drive motor and C.LIM LED will illuminate.

GRD (red) – The GRD (**GRADE**) LED should NEVER come on. It illuminates only when there's an elevation malfunction.

SERIAL (red) – The SERIAL LED should NEVER come on. This is an indication of an interruption of the flow of data between the upper and lower board. It's usually due to a loose connection to the main harness.

GREEN SCR Boards



Removal Instructions:

- 1) Unplug the line cord from the wall outlet
- 2) Disconnect the elevation harness, speed sensor connections, main harness and 12 volt connection from the lower board
- 3) Remove the LVS brown wire from AUX AC L1 terminal and blue wire from the AUX N L2 terminal (This step only applies if the treadmill has an LVS system.)
- 4) Remove the green ground wire from GND terminal
- 5) Remove the drive motor black wire from MTR plus (+) terminal
- 6) Remove capacitor black wire from CAP plus (+)
- 7) Remove the red choke wire from the IND terminal.
- 8) Remove the line cord brown wire from the AC/L1 terminal and blue from the N/L2 terminal.
- 9) Remove the drive motor white wire from the MTR minus (-) terminal
- 10) Remove capacitor white wire from CAP minus (-)
- 11) Remove the 2 Phillip head screws holding lower board to pan.

Installation Instructions:

- 1) Lay lower board flat inside the motor pan. Reconnect wires to the lower board:

CAP (-)	White wire from capacitor
MTR (-)	White wire from drive motor
NEUT	Blue wire from line cord receptacle
HOT	Brown wire from line cord receptacle
IND	Red wire from filter choke
CAP (+)	Black wire from capacitor
MTR (+)	Black wire from drive motor
*AUX AC L1	Blue wire from TV line cord
*AUX N L2	Blue wire from TV line cord
*Only if LVS option is present	

- 2) Turn lower board so its standing straight up. Line up hole from lower board to motor pan. Insert 2 Phillip Head screws & bolt lower board to motor pan.

Tip: Wrap the CAP-, MTR-, and Neutral wire around back of heat sink. This will keep the wires away from the filter choke which helps you align the holes from the lower board to the motor pan

LED Lights on Green SCR

These two lights should be on if treadmill is plugged in but not turned on.

AC (green) – The AC (Alternating Current) LED illuminates when AC line voltage is delivered to the treadmill. It then passes through the in-line fuse and lights the AC LED.

+12V (green) – As the proper AC voltage is delivered to the treadmill it passes through the in-line fuse and through the full wave bridge rectifier. This changes AC to DC voltage and the transformer steps down DC to +12V VDC

These lights should be on when treadmill is turned on

+5V (green) – The +5v LED turns on when the upper board is power on. This activates the Belt Relay Switch on and there's belt movement at 0.5 mph.

MTR (yellow) – The MTR LED illuminates when direct current (dc) voltage is sent to the motor. The LED gets brighter when the dc output increase.

SPD (yellow) – The SPD LED flashes on and off when the speed sensor reads the gaps in the “teeth” of the flywheel on the drive motor. When the flywheel is moved slowly the speed sensor will flash on and off (it will appear to be on constantly at higher speeds. *Note-On McMillan Motors it is located inside the motor housing but can be checked the same way.

RLC (yellow) – The RLC (R = Reactance / L = Inductance / C = Capacitance) LED illuminates when the filtering system is properly working. The filtering system includes the capacitor and filter choke.

DN & UP (yellow) – The DN and UP LED's indicates the elevation DN and UP relays are functioning properly. When the LED are on the relay has energized and is sending high voltage to the elevation motor.

MALFUNCTION LED's -These Lights should never be on

C.LIM (red) – The C.LIM (Current Limit) should **NEVER** be on. This diagnostic LED is use to determine the condition of the treadbelt and deck. The SCR board has a built-in amp meter. When the treadbelt and deck system wears, the amperage will increase. When this amperage reaches its max limit, the lower board will shut down its power (treadbelt will slowdown/low torque) to the drive motor and C.LIM LED will illuminate.

GRD (red) -The GRD (GRADE) LED should **NEVER** come on. It illuminates only when there's an elevation malfunction.

SERIAL (red) – The SERIAL LED should **NEVER** come on. This is an indication of an interruption of the flow of data between the upper and lower board. It's usually due to a loose connection to the main

