LANDICE
Crafting the World's Finest Treadmills

111 Canfield Avenue • Randolph, New Jersey 07869 • 1-800-LANDICE • FAX 973-927-0630

L-Series
Home and Commercial Treadmill
Diagnostic and Service Manual
2003

Version C/D.2

For Technical Service Call 1-(800)-LANDICE

Service Manual Version C/D.2

Page 2-3 Table of Contents

SECTION 1- Introduction
Page 4 How to Use this Manual
Page 5-14 Replica Landice Warranty Cards and Warranty Policy
Page 15 Service Authorization Form
Page 16 Time Allotted for Repairs
Page 17-18 Tools Needed for Repairs

SECTION 2- Installation
Page 19-21 Safety Warnings
Page 22 Electrical Requirements for L-Series Treadmills
Page 23-25 Treadmill Assembly and Installation Instructions
Page 26 Treadmill's General Dimensions

SECTION 3- - Parts Identification
Exploded View of L7 & L8/L9
Page 27 L8/L9 Bed
Page 28 L7 Bed
Page 29 L-Series Upright
Page 30 L-Series Motor Pan and Elevation Assembly
Page 31-34 Parts Listing
Page 35 Commercial Motor Pan Picture
Page 36-37 Commercial Motor Pan Wire Schematics
Page 38-39 LED lights on SCR
Page 40 SCR Upper Wire Harness Wiring Diagram
Page 41 Home Motor Pan Picture
Page 42 Home Motor Pan Wire Schematic
Page 43 PWM Voltage Readings and Paths
Page 44 LED Lights on PWM
Page 45 Relay Board Voltage Readings and Paths
Page 46 LED Lights on Relay Board
Page 47 Home Motor Pan Wire Schematic (PWM/Relay Assembly)
Page 48 Picture of PWM with Relay Assembly
Page 49 PWM Upper Wire Harness Wiring Diagram
Page 50 Executive Trainer LCD Wire Schematic
Page 51-54 L-Series Display Control Panels & Features
Page 55 Cardio Trainer / Executive Trainer Addendum
Page 56 Accessing Diagnostic Features on L-Series Treadmills

SECTION 4 –Servicing Landice Treadmills

Page 57-59 Definitions of Components
Page 60-62 Testing Components
Page 63-64 Membrane Panel Bypass Test
Page 65-68 Common Symptoms
Page 69-87 Removal and Replacement of Components
Page 88-91 Noises
Page 92 Voltage Tests
Page 93-94 Diagnostics and Error Codes
Page 95-98 Executive Trainer Error Codes
Page 99-103 L7, L8, & L9 Commercial Diagnostic Flow Charts
Page 104-108 L7 & L8 Home Diagnostic Flow Charts
Page 109-116 L7 & L8 Road Runner Diagnostic Addendum

Page 117-118 Tracking and Tensioning Treadbelt and Drive Belt
Page 119-121 Maintenance for Home and Commercial Treadmills
Page 122-128 L-Series Dealer Parts List
Page 129-130 Sport Trainer/Pro Trainer Upper Display Board Combinations

Page 131 Appendix A
Page 132 L-Series CRT Display Control Panel & Features
Page 133 L-Series CRT Wiring Diagram
Page 134-135 Isolation Leakage
Page 136-137 L-Series English/Metric Conversion
Page 138-142 L-Series ESI PWM Diagnostic Addendum
Page 143-150 Index

How to Use this Manual

This manual is designed to help service technicians in the installation, maintenance, or repair of Landice L7 and L8 model treadmills. It covers terminology, installation, tools needed, diagnostics, removal and replacement of parts, estimated time of repairs, warranty forms, Service Authorization forms, wiring schematics, and recommended maintenance. We are including an Index to further aid you in quickly finding what you need.

If you find a problem not covered in this manual please call 1-800-LANDICE to talk to a Landice Service Technician.

[Life•time] [War•ran•ty]

noun: *The period of time during which an individual is alive.*

noun: *A legally binding guarantee attesting to the quality and durability of a product.*

All Landice home treadmills feature a bumper-to-bumper Lifetime Warranty on all parts, including wear items.

For over 35 years, Landice has made treadmills – only treadmills. We have placed over 40,000 units in the harshest commercial environments. Because we use the same time-tested commercial grade components in *all* our treadmills, only Landice can offer a lifetime residential treadmill warranty.

American-made 3 horsepower continuous-duty drive motor provides 0.5 mph to 12 mph speed range.

- *Runs cooler, lasts longer.*

Softer-than-grass VFX shock absorption system eliminates harmful side to side motion.

- *Easy on your joints.*

1000-pound thrust elevation motor is 33% stronger than the nearest competitor's.

- *Smooth operation, extended life.*

1-inch thick, reversible deck is rated for 3000 hours per side.

- *Takes a pounding for over 30 years.*

4-ply treadbelt is twice as strong as conventional 2-ply belts.

- *You can count on its durability.*

Rust-free aluminum frame with up to a 500-pound user weight capacity.

- *Built to last a lifetime.*

*Kenwood Stereo System carries manufacturer's one-year factory warranty.

MADE IN THE USA

LANDICE

Crafting the World's Finest Treadmills

www.landice.com • 800-LANDICE

LANDICE
Crafting the World's Finest Treadmills
111 Canfield Avenue • Randolph, New Jersey 07869 • 800-LANDICE • FAX 973-927-0630

Assignable Lifetime Home Treadmill Warranty

Landice, Inc. warrants all HOME **treadmills sold into residential settings after June 1, 2002, as follows:**

TREADMILL FRAME	**LIFETIME**
TREADMILL PARTS	**LIFETIME**
WEAR ITEMS	**LIFETIME**
SERVICE LABOR	**1 YEAR**

To ensure the quality of our service and meet the requirements of this commitment, this warranty is contingent on the following conditions. **Failure to meet these conditions without Landice's expressed written consent shall void the factory warranty.**

CONDITIONS

- All home treadmills must be dealer-installed within a 60-mile driving radius of the selling dealer's nearest retail store. In cases of uncertainty, Internet-based driving directions will be used to determine mileage.
- Prepaid postage "Warranty Registration Card" must be mailed by purchaser within 30 days of purchase.
- Warranty applies to original owner only except in cases where a spouse, child, or domestic partner, is named as a "Beneficiary" on the "Warranty Registration Card" within 30 days of initial installation.
- Floor models and demonstration units over one-year old shall carry a 5-year parts only warranty.

TREADMILL PARTS
This warranty does not cover cosmetic damage, damage due to acts of God, accident, misuse, abuse, improper maintenance, or negligence to the product. This warranty **does** cover normal wear and tear. Worn or defective parts must be returned to Landice within 30 days of repair for analysis. This warranty is valid only in the United States and Canada.

SERVICE LABOR
For a period of 1 year, Landice will reimburse the selling dealer according to the terms, rates and conditions in effect at the time of service. A service authorization number must be obtained prior to performing service in order to qualify for service reimbursement. This service warranty does not cover customer instruction, installation, setup, or adjustments. Note that treadbelt tensioning and tracking is the responsibility of the user and is not covered by this warranty. Instructions for treadbelt tensioning and tracking are located in the owner's manual. This warranty is valid only in the United States and Canada.

Registration card must be mailed within 30 days of purchase in order to register your warranty.

Landice will send you a complimentary Landice T-Shirt upon receipt of your registration card.

Home Treadmill Warranty Registration Card

Model #_____ Serial #_____ Date Purchased _____

CUSTOMER INFORMATION

Name_____
Occupation_____
Address_____
City & State_____ZIP_____
Phone_____Fax _____
Do you understand the owner's manual & safety precautions outlined?_____
Does this product perform to your satisfaction? _____
Product comments _____

FITNESS LEGACY

In the event of my death, I hereby transfer my rights as stated in the terms and conditions of Landice's "Assignable Lifetime Home Treadmill Warranty" to:

_____
Beneficiary: Spouse, Children (list names), or Domestic partner

LANDICE
Crafting the World's Finest Treadmills

111 Canfield Avenue • Randolph, New Jersey 07869 • 800-LANDICE • FAX 973-927-0630

5 YEAR / 5,000 Hour
Limited Institutional Warranty

Effective August 1, 2002, Landice is pleased to offer an unprecedented 5-year / 5,000 hour warranty on our LTD series treadmills. To receive this warranty the treadmill must be registered with the factory and placed in the application for which it has been intended. LTD series treadmills are intended for light commercial environments where usage is less than five hours per day. "Heavy use" and "pay-for-membership" facilities such as health clubs, gyms, and YMCAs are not eligible for this warranty program.

TREADMILL PARTS
All defective parts must be delivered prepaid to Landice where they will be replaced for a period of five years or 5,000 hours, whichever comes first. This warranty does not cover cosmetic damage, damage due to acts of God, accident, misuse, abuse, or negligence to the product. Treadmills must be lubricated and maintained on a monthly basis (see owner's manual) in order to be eligible for this warranty program. Wear items, specifically belts and decks, are pro-rated over the five-year period. This warranty is valid only in the United States and Canada.

SERVICE LABOR
The authorized selling dealer shall provide warranty labor for a period of 1-year.
For a period of 1 year, the selling dealer will be reimbursed by Landice according to the terms, rates, and conditions in effect at the time of service. A service authorization number must be obtained by an authorized dealer prior to performing service in order to qualify for service reimbursement. This service warranty does not cover customer instruction, installation, setup, or adjustments. Note that treadbelt tensioning and tracking is the responsibility of the user and is not covered by this warranty. Instructions for treadbelt tensioning and tracking are located in the owner's manual. This warranty is valid only in the United States and Canada

Warranty registration card must be filled out and mailed to Landice in order to qualify for this

Landice will send you a complimentary Landice T-Shirt upon receipt of the Warranty Registration Card

5 Year / 5,000 Hour LTD Warranty Registration Card

Model #_____ Serial #_____ Date Purchased _____

CUSTOMER INFORMATION
Facility_____
Contact_____
Address_____
City & State_____ZIP_____
Phone_____ Fax _____
Do you understand the owner's manual & safety precautions outlined? _____
How did you hear about Landice? _____
What factors most influenced your decision to purchase a Landice treadmill?
_____

DEALER INFORMATION
Dealer Name_____
City & State_____
Price_____ Were you satisfied with your dealer?_____

LANDICE
Crafting the World's Finest Treadmills
111 Canfield Avenue • Randolph, New Jersey 07869 • 800-LANDICE • FAX 973-927-0630

5-Year Club Treadmill Warranty

Effective January 1, 2003, Landice warrants all CLUB series treadmills as follows:

TREADMILL PARTS: 5-YEARS
All defective parts must be delivered prepaid to Landice where they will be replaced for a period of 5-years. This warranty does not cover cosmetic damage, damage due to acts of God, accident, misuse, abuse, or negligence to the product. This warranty is valid only in the United States and Canada.

SERVICE LABOR: 1-YEAR
For a period of 1-year, the selling dealer will be reimbursed by Landice according to the terms, rates, and conditions in effect at the time of service. A service authorization number must be obtained by an authorized dealer prior to performing service in order to qualify for service reimbursement. This service warranty does not cover customer instruction, installation, setup, or adjustments. Note that treadbelt tensioning and tracking is the responsibility of the user and is not covered by this warranty. Instructions for treadbelt tensioning and tracking are located in the owner's manual. This warranty is valid only in the United States and Canada.

CONDITIONS
Underside of treadbelt must be cleaned and lubricated per owner's manual on a monthly basis. A one-year supply of Landice SlipCoat is included with the treadmill. Bearing damage due to over-tightened drive belts or treadbelts are not covered by this warranty. Wear items, specifically belts, decks, and motor-brushes are pro-rated over the five- year period.

Registration card must be mailed within 30 days of purchase in order to register your warranty.

Landice will send you a complimentary Landice T-Shirt upon receipt of your registration card.

5-Year Club Treadmill Warranty Registration Card

Model #_____ Serial #_____ Date Purchased _____

CUSTOMER INFORMATION

Facility_____
Contact_____
Address_____
City & State_____ZIP_____
Phone_____Fax _____
Do you understand the owner's manual & safety precautions outlined?_____
How did you learn about Landice? _____
What factors most influenced your decision to purchase a Landice treadmill?
_____

DEALER INFORMATION

Dealer Name_____
City & State_____ Price Paid_____
Dealer Comments_____

LANDICE WARRANTY AND POLICIES

The Service Warranty covers installation of parts shown to be defective in material or workmanship. The selling dealer is responsible for labor for treadmills needing repairs. A Service Authorization (SA) number must accompany any service reimbursement request. Service Authorization numbers are given when the selling dealer or the service technician calls Landice **prior** to beginning work on the treadmill. This allows Landice to verify that the treadmill is within the labor warranty and also aids us in helping the technician troubleshoot the treadmill. Landice welcomes technicians to call us from the field and gives these calls the highest priority.

This Service Warranty does **not** cover customer instruction, installation, setup, maintenance, or adjustments to treadbelt or drivebelt. Line Cords (power cords) are also not covered by this warranty as these can only be damaged by misuse or abuse.

WEAR ITEM WARRANTY

Light institutional treadmills (LTD's) are covered under parts warranty for 5 years or 5000 hours. (see standard warranty policy) LTD treadmills are designed for commercial applications in which use is 5 hours a day or less. CLUB Treadmills are covered under parts warranty for 5 years with unlimited hours. CLUB treadmills are designed for heavy-duty commercial applications and any pay-for-membership facilities.

This warranty does not cover cosmetic damage, damage due to acts of God, accident, misuse, abuse, or negligence of the product. Wear items, specifically treadbelts, and decks, are covered in full during the first six months of the warranty, treadbelts and decks are pro-rated after the first six months of the warranty if they need replacement due to wear. The part will be covered in full only if it exhibits evidence of a manufacturing or material defect during the warranty period. Please keep in mind, "negligence of the product" includes damage inflicted by using the treadmill with an improperly tracked treadbelt. **This causes irreversible damage to the treadbelt edges and is not considered a warranty issue.**

PRO-RATE SCALE FOR WEAR ITEMS

The following pro-rate scale applies to all wear items on Landice L-Series Commercial Treadmills.

WEAR PERIOD	CHARGE	L7 TREADBELT	L7 DECK	L8/L9 TREADBELT	L8/L9 DECK
		DEALER PRICE *$204.00*	*DEALER PRICE* *$140.00*	*DEALER PRICE* *$259.00*	*DEALER PRICE* *$162.00*
		RETAIL PRICE *$340.00*	*RETAIL PRICE* *$234.00*	*RETAIL PRICE* *$432.00*	*RETAIL PRICE* *$271.00*

L-Series LTD Treadmills sold **PRIOR** to August 1, 2002 and **ALL** CLUB Treadmills carry a 3-year parts Warranty. Wear Items are pro-rated as follows:

0-6 MONTHS	NO CHARGE	NO CHARGE	NO CHARGE	NO CHARGE	NO CHARGE
6-12 MONTHS DEALER	75% OFF	$51.00	$35.00	$64.75	$40.50
6-12 MONTHS RETAIL	75% OFF	$85.00	$58.50	$108.00	$67.75
YEAR 2 DEALER	50% OFF	$102.00	$70.00	$129.50	$81.00
YEAR 2 RETAIL	50% OFF	$170.00	$117.00	$216.00	$135.50
YEAR 3 DEALER	33% OFF	$136.68	$93.80	$173.53	$108.54
YEAR 3 RETAIL	33% OFF	$227.80	$156.78	$289.44	$181.57

L-Series LTD Treadmills sold after August 1, 2002 carry a 5-year parts warranty. Wear Items are pro-rated as follows:

0-6 MONTHS	NO CHARGE	NO CHARGE	NO CHARGE	NO CHARGE	NO CHARGE
6-12 MONTHS DEALER	80% OFF	$40.80	$28.00	$51.80	$32.40
6-12 MONTHS RETAIL	80% OFF	$68.00	$46.80	$86.40	$54.20
YEAR 2 DEALER	60% OFF	$81.60	$56.00	$103.60	$64.80
YEAR 2 RETAIL	60% OFF	$136.00	$93.60	$172.80	$108.40
YEAR 3 DEALER	50% OFF	$102.00	$70.00	$129.50	$81.00
YEAR 3 RETAIL	50% OFF	$170.00	$117.00	$216.00	$135.50
YEAR 4 DEALER	40% OFF	$122.40	$84.00	$155.40	$97.20
YEAR 4 RETAIL	40% OFF	$204.00	$140.40	$259.20	$162.60
YEAR 5 DEALER	30% OFF	$142.80	$98.00	$181.30	$113.40
YEAR 5 RETAIL	30% OFF	$238.00	$163.80	$302.40	$189.70

PRO-RATE SCALE FOR WEAR ITEMS

The following pro-rate scale applies to all wear items on Landice L-Series Commercial Treadmills.

L-Series LTD Treadmills sold after **August 1, 2002** carry a 5-year parts warranty. Wear Items are pro-rated as follows:

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

L-Series LTD Treadmills sold **prior** to August 1, 2002 and **all** CLUB Treadmills carry a 3-year parts warranty. Wear Items are pro-rated as follows:

Up to 6 months –	No Charge
6-12 months –	75% off
Year 2 –	50% off
Year 3 –	33% off

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. That means we will pay to fix our treadmill as long as it's within one year from the date the treadmill was purchased.

OUR POLICY:

Landice will reimburse the selling dealer according to our flat rate labor 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. Generally, if our capped rate does not cover your labor charge you would bill the selling dealer. The current rate is $30.00 per hour and is capped at a maximum of one hour labor and one hour travel per treadmill failure. Diagnostic and return trips are not covered. Note that treadbelt tracking, treadbelt / drive belt tensioning, blown fuses, and set-up procedures 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 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

Our policy requires that all defective parts be returned to Landice. All warranty parts 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.

WARRANTY PART ORDERING:

When ordering parts under warranty please have the following information available. Warranty orders can not be processed without this information:

1) Customer's name, address and phone number
2) Treadmill serial number
3) Detailed description of failure

PURCHASE PART ORDERING:

Serial numbers are recommended to help ensure the correct part is shipped. Purchased parts are covered by a 90 day replacement part warranty from the date the order shipped.

WARRANTY TIMETABLE

DATE	FRAME	PARTS	LABOR
Home Treadmills			
Prior to 1994	5 Years	1 Year	1 Year
January 1, 1994	5 Years	2 Years	1 Year
July 15, 1996	Lifetime	3 Years	1 Year
July 15, 1998	Lifetime	5 Years	1 Year
September 1, 2001	Lifetime	Lifetime	1 Year
June 1, 2002	Legacy	Program	Introduced
LTD Treadmills (less than 5 hours use per day)			
Before September 1, 1996	1 Year	1 Year	1 Year
After September 1, 1996	3 Years	3 Years	1 Year
August 1, 2002	5 Years	5 Years	1 Year
CLUB Treadmills (pay for membership facilities)			
Before November 15, 1996	1 Year	1 Year	1 Year
After November 15, 1996	3 Years	3 Years	1 Year
January 1, 2003	5 years	5 Years	1 Year
International Treadmills ***			
Before November 1, 2001	13 Months	13 Months	0
After November 1, 2001	3 Years	3 Years	0

******* For information on International Warranties please contact LANDICE at 1-800-LANDICE

LANDICE
Crafting the World's Finest Treadmills

111 Canfield Avenue • Randolph, New Jersey 07869 • 1-800-LANDICE • FAX 973-927-0630

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 PREFORMED/PARTS REPLACED		
TRAVEL / LABOR: Travel Time:	Labor Time:	**TOTAL TIME:**

VALIDATION SIGNATURES		
Service Rep. Signature	**Customer Signature**	Date

PLEASE SUBMIT SERVICE CLAIMS VIA **U.S. MAIL OR BY FAX**.
DO NOT INCLUDE SERVICE CLAIMS WITH RETURNED WARRANTY PARTS.
DO NOT SUBMIT SERVICE CLAIMS WITHOUT SERVICE AUTHORIZATION NUMBER

TIME ALLOTTED FOR REPAIRS

L-Series Treadmills

WORK PERFORMED	TIME ALLOTTED
Diagnosis at the time of repair	30 min
Remove and Replace Drive Motor	30 min
Remove and Replace Drive Belt	20 min
Remove and Replace Elevation Motor (Includes Pot Calibration)	40 min
Remove and Replace Upper Board	15 min
Remove and Replace Membrane	15 min
Remove and Replace PWM	15 min
Remove and Replace SCR	15 min
Remove and Replace Treadbelt	40 min
Remove and Replace Deck	40 min
Replace Belt and Deck	40 min
Remove and Replace Front Roller	20 min
Remove and Replace Rear Roller	30 min

RECOMMENDED TOOLS FOR SERVICING LANDICE TREADMILLS

1. Deep socket set 3/8 drive with ratchet and extension: Must have 3/8, 7/16, 1 /2, 5/16, 9/16 socket.
2. Combination wrench set: Must have 3/8, 7/16, 1 /2, 5/16, 9/16
3. #1, 2, and 3 Philips head screwdriver (or electric screwdriver)
4. #1, 2, and 3 flat head screwdriver (or electric screwdriver)
5. Socket head cap screw wrench set/ multi Allen Wrench
6. Rubber mallet
7. Diagonal cutter/ dykes
8. Wire stripper
9. Wire crimper
10. Digital voltmeter (We recommend Radioshack Pocket Digital Voltmeter). Analog voltmeters are not recommended.
11. Utility knife
12. Pulsemeter tester
13. AC Amp Meter

DIGITAL MULTIMETER

VDC - Direct Current flows in one direction. You must observe circuit polarity when measuring DC voltage. Landice utilizes DC technology in our drive motors and circuit boards.

KΩ (Kilo-Ohms) - The electrical resistance of a component or conductor measured in ohms. You can check the condition of a potentiometer (a variable resistor) by measuring the ohms.

CONT - Electrical Continuity the continuous flow of electricity, uninterrupted and unbroken. Use CONT to check: Fuses and wire harnesses

Multimeter use:
A multimeter is a device used to measure a variety of electrical functions. The multimeter best suited for diagnosing a treadmill will be able to measure:
AC voltage, DC voltage, Ohms and electrical continuity.

VAC - Alternating Current reverses polarity periodically from plus (+) to minus (-). AC voltage is found in both residential and commercial dwellings. Landice treadmills come in both 110VAC and 220VAC versions.

IMPORTANT OPERATING SAFETY INSTRUCTIONS

WARNING: Failure to observe the following operating instructions can result in serious injury!

1 If you are suffering from any illness, condition, or disability which affects your ability to run, walk or exercise, do not use this product without consulting your doctor first.

2 If you are suffering from any illness, condition, or disability which affects your ability to run, walk or exercise, do not use this product without supervision present. Failure to do so can result in serious injury should you fall while the treadbelt is moving.

3 Failure to leave ample clearance around the treadmill could result in the user becoming trapped between the treadmill and a wall, resulting in burns or other serious injury from the moving treadbelt.

Allow a minimum clearance of 18 inches on each side of the treadmill.
Allow a minimum clearance of 4 feet at the rear of the treadmill.

4 Never stand on the treadbelt when starting the treadmill. A sudden start could cause you to lose your balance. Always stand with one foot on each side rail until the belt starts moving.

5 Always wear the emergency stop safety strap securely around your wrist while exercising. Failure to do so can result in severe injuries should you accidentally fall while exercising.

6 Test the emergency stop safety key on a regular basis by pulling on the cord and ensuring that the treadbelt comes to a complete stop.

7 Always remove the safety key from the treadmill when you are through exercising, especially if children are present. This will prevent them from accidentally starting the treadmill.

8 Be sure to familiarize yourself with the owner manual. Look it over carefully. Be sure you understand the control panel operation before using the treadmill.

DANGER

To reduce the risk of electric shock, always unplug the treadmill from the electrical outlet immediately after using. Always unplug the treadmill before cleaning or removing the motor cover.

WARNING

To reduce the risk of burns, fire, electric shock, or injury to persons:

1 Treadmill should never be left unattended when plugged in. Unplug from outlet when not in use.
2 Close supervision is necessary when this unit is used by or near children or disabled persons.
3 Use this treadmill only for its intended use as described in this manual.
4 Do not operate this treadmill if it has a damaged cord or plug, if it is not working properly or if it has been damaged. Call your selling dealer immediately for examination and repair.
5 Keep the power cord away from heated surfaces. Be sure the line cord has plenty of slack and does not get pinched underneath the treadmill when it elevates and lowers. If an extension cord must be used do not use one longer than 6 feet with 12 gauge wire.
6 Never operate the treadmill with the air openings blocked. Keep the air openings free of lint, hair, and the like.
7 Never drop or insert any object into any opening. Be sure no objects are near or underneath the moving treadbelt when using the treadmill.
8 Do not use outdoors.
9 Do not operate where aerosol spray products are being used or where oxygen is being administered.
10 Connect this appliance to a properly grounded outlet only. Do not use a GFI outlet.
11 To disconnect, press the OFF button, remove the SAFETY LANYARD, and unplug the unit from the wall outlet.

GROUNDING INSTRUCTIONS

This product must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electric current to reduce risk of electric shock. This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. We do not recommend using a GFI outlet.

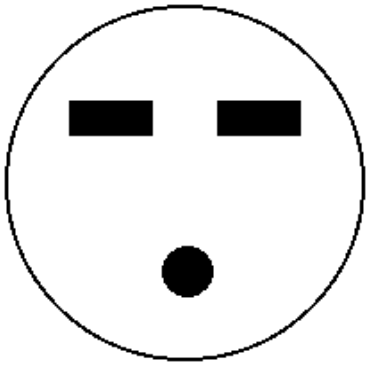
120 Volt Treadmills (15 Amp dedicated line)
Treadmills marked 120 VAC are intended for use in a nominal 120-volt circuit with a grounding plug. Make sure the product is connected to an outlet having the same configuration as the plug. No adapter should be used with this product.

220 Volt Treadmills (15 Amp dedicated line)
Treadmills marked 200-250 VAC are intended for use on a circuit having a nominal rating more than 120V and are factory-equipped with a specific cord and plug to permit connection to a proper electric circuit. Make sure the product is connected to an outlet having the same configuration as the plug. No adapter should be used with this product. If the product must be reconnected for use on a different type of electric circuit, the reconnection should be made by qualified service personnel.

DANGER! Improper connection of the equipment-grounding connector can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with the product. If it will not fit in the outlet, have a proper outlet installed by a qualified electrician.

ELECTRICAL REQUIREMENTS FOR L-SERIES TREADMILLS

220 VAC CLUB TREADMILL

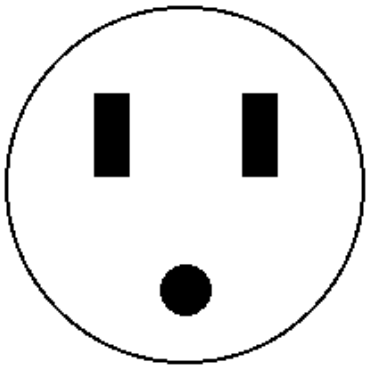


220V CLUB ELECTRICAL REQUIREMENTS:
220VAC , 60 Hz , 15 AMP - DEDICATED CIRCUIT & GROUND

PLUG - NEMA 6-15P (PLUG)
RECEPTACLE - NEMA 6-15R (RECEPTACLE)

ABOVE IS DIAGRAM OF PLUG CONFIGURATION.

110 VAC HOME, LTD, & CLUB TREADMILL



HOME, LTD, & 110V CLUB ELECTRICAL REQUIREMENTS:
110 VAC , 60 Hz , 15 AMP - DEDICATED CIRCUIT & GROUND

PLUG - NEMA 5-15P (PLUG)
RECEPTACLE - NEMA 5-15R (RECEPTACLE)

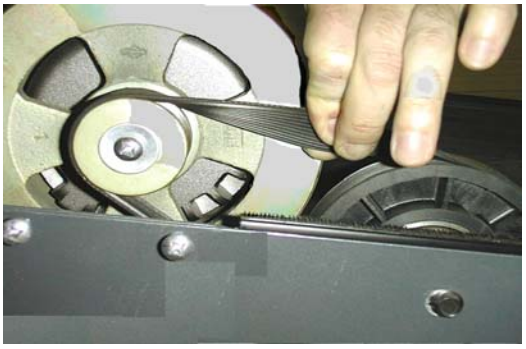
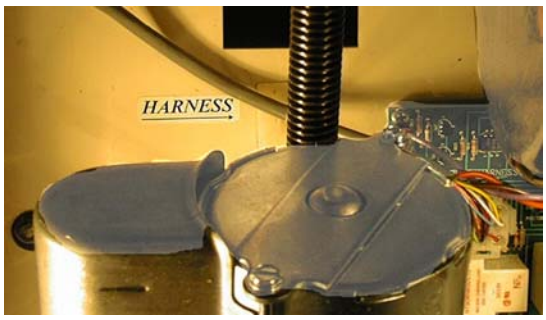
ABOVE IS DIAGRAM OF PLUG CONFIGURATION

FOR 220V & 110V MACHINES 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 then all treadmills must run on the same two phases (power legs) and on their own circuit breakers.

ASSEMBLY INSTRUCTIONS

STEP 1  	Lay the treadmill on the ground. Using a razor blade knife cut the box just above the brass staples along all sides of the box. **DO NOT** cut through the center of the box, as you could hit the treadmill. Remove the box and discard.
STEP 2 	The treadmill components are held together with plastic strapping. Carefully cut and remove the strapping and remove the treadmill from the pallet. Carefully remove the upright side cover from the upright assembly.
STEP 3 Mount the upright  	Slide the upright down onto the 8 side frame bolts. Be sure the washers are located on the outside of the upright and against the head of the bolt. Tighten bolts with a 3/8" extended socket. • For L8 models insert and tighten the top frame bolts. (These bolts can be found in the hardware kit)
STEP 4 Snap side cover into place 	Carefully align the side frame cover. Working from top to bottom, snap the upright side cover into place.

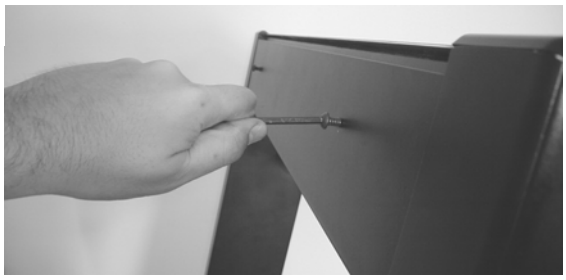
ASSEMBLY INSTRUCTIONS

STEP 5 Install side cover screw 	Align the side frame cover beneath the end cap and install the Phillips head screw. Tighten the Phillips head screw until side cover aligns with endcap.
STEP 6 Check drive belt tension 	Check the tension on the drive belt by placing the drive belt between your thumb and forefinger and twisting. The proper twist is 45°. 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.
STEP 7 Route the wire harness 	**HOME:** Route the wire harness **UNDERNEATH** the elevation motor and secure with tie-wrap provided. Plug connector into circuit board until it snaps into place. **COMMERCIAL:** Route the wire harness **AROUND** the elevation motor and secure with tie-wrap provided. Plug connector into circuit board until it snaps into place.
STEP 8 Install motor cover 	Attach motor cover with Phillips head screws provided. Plug treadmill into a dedicated 15A outlet.

READING RACK INSTALLATION GUIDE

1. **Begin by completely assembling the treadmill per the instructions in owners manual.**
2. **Place upright on bed per main assembly instructions.**
3. **Check that the membrane is seated correctly, it may have shifted in shipping.**
4. **Do not install plastic end caps on treadmill yet.**

Step 5

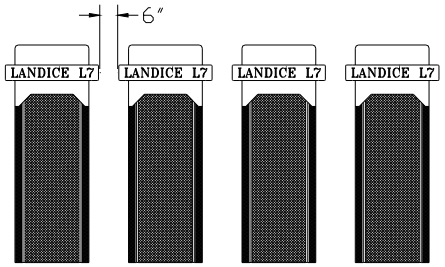
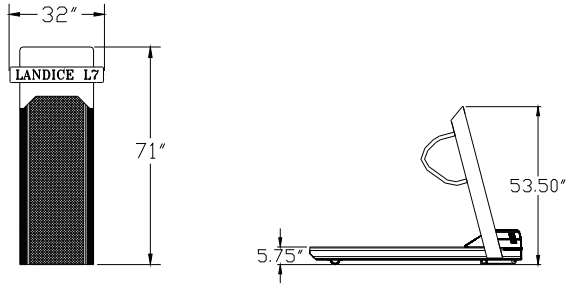
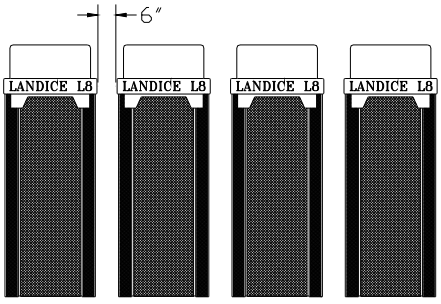
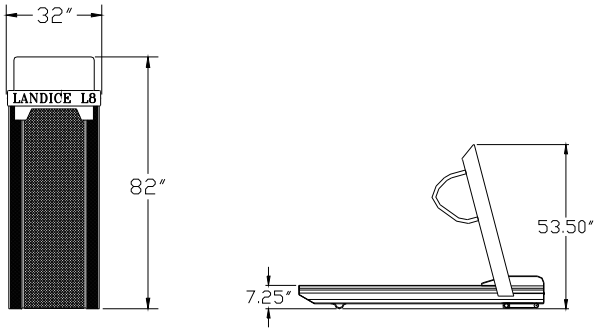
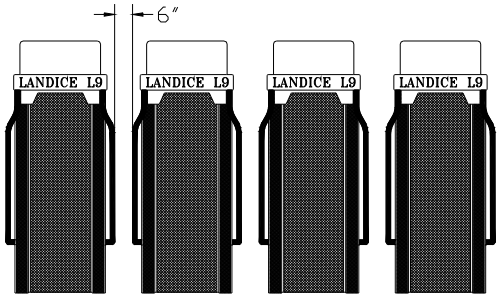
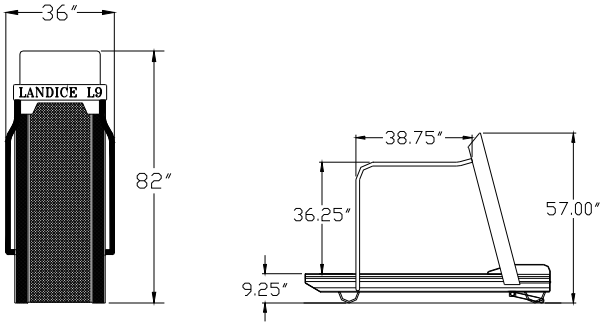


Step 6

Step 7

5. Remove the two screws on the back of the control panel using 5/32 allen wrench.
6. Place the reading rack in position on the back of the control panel. Be sure that the front edge of the reading rack overlaps the display panel.
7. If working alone, hold reading rack in correct position and insert screw on one side and tighten fully. Insert and tighten second screw. Verify proper alignment per step 3. If working with a second person, one should hold the rack and maintain proper alignment per step 3, while the other person attaches reading rack with screws provided.
8. Place plastic end caps on treadmill.
9. Test.

L-SERIES TREADMILLS GENERAL DIMENSIONS

COMMERCIAL TREADMILL SPACING	GENERAL DIMENSIONS
L7 	
L8 	
L9 	

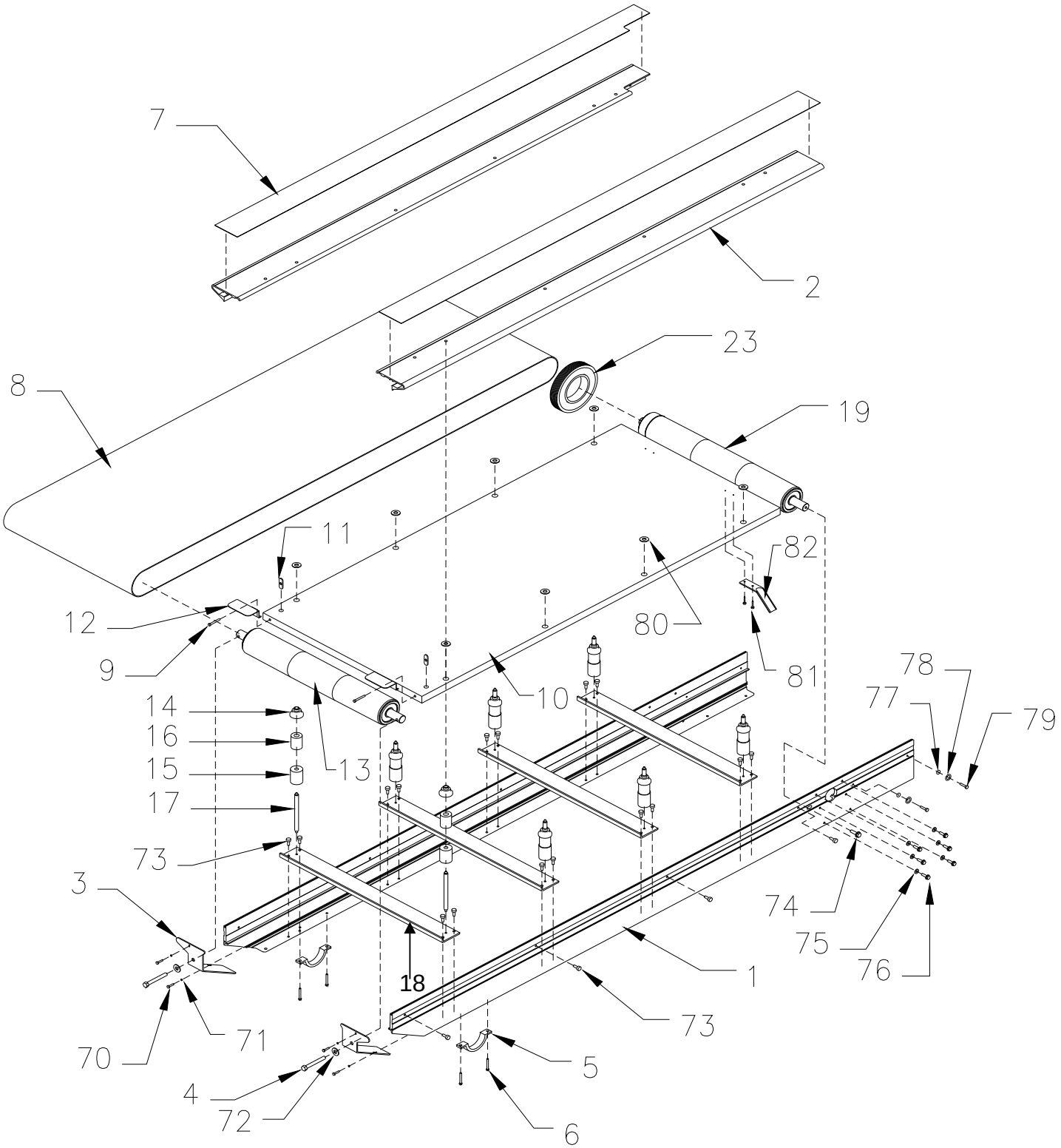
L8 = approx. 380 pounds
L9 = approx. 380 pounds

Recommended clearance around unit for safe and functional operation in a home

ALLOW A MINIMUM CLEARANCE OF 18 INCHES ON EACH SIDE OF THE TREADMILL.
ALLOW A MINIMUM CLEARANCE OF 4 FEET AT THE REAR OF THE TREADMILL.

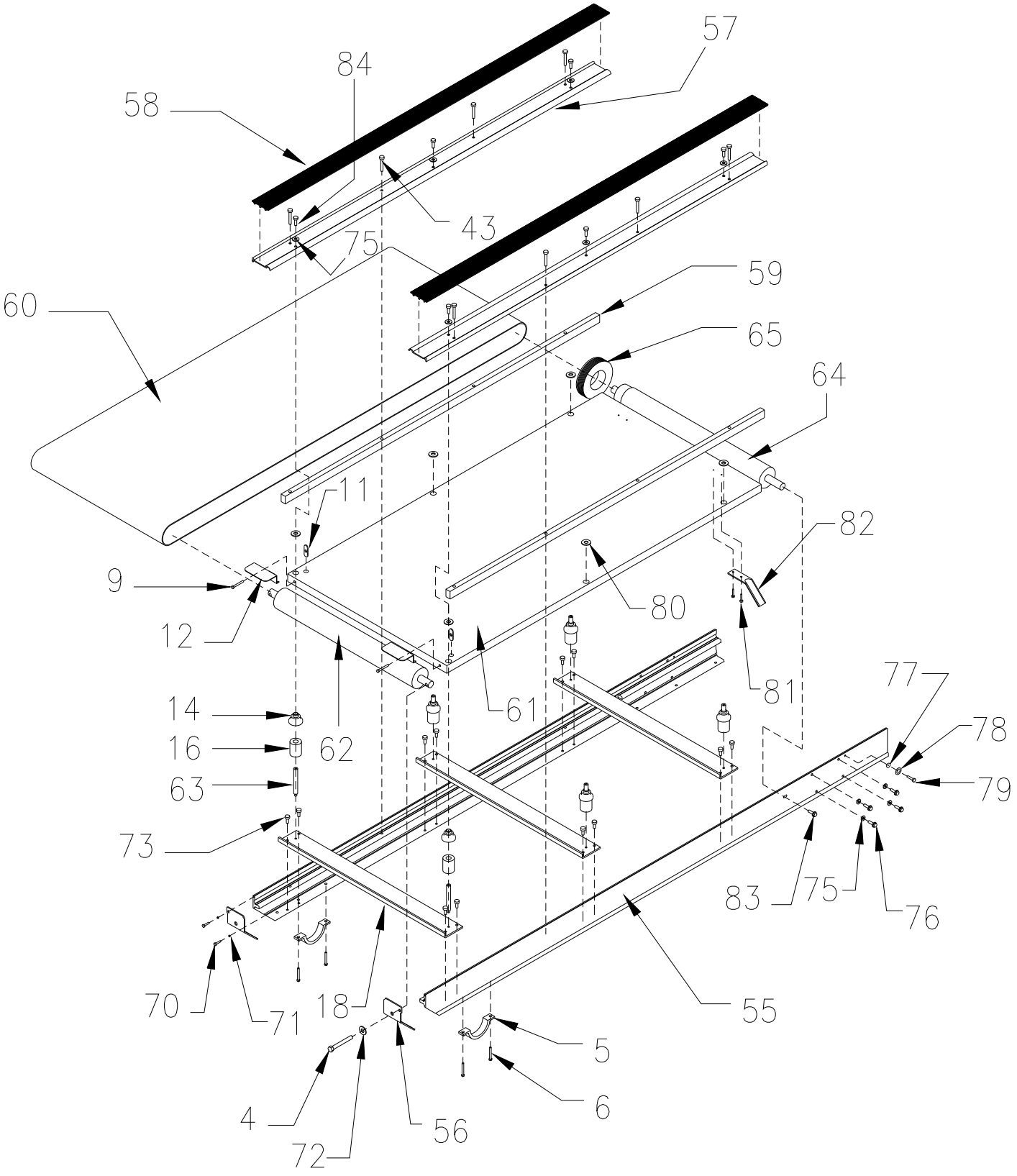
Section 3- Parts Identification

L8/L9 BED EXPLODED VIEW



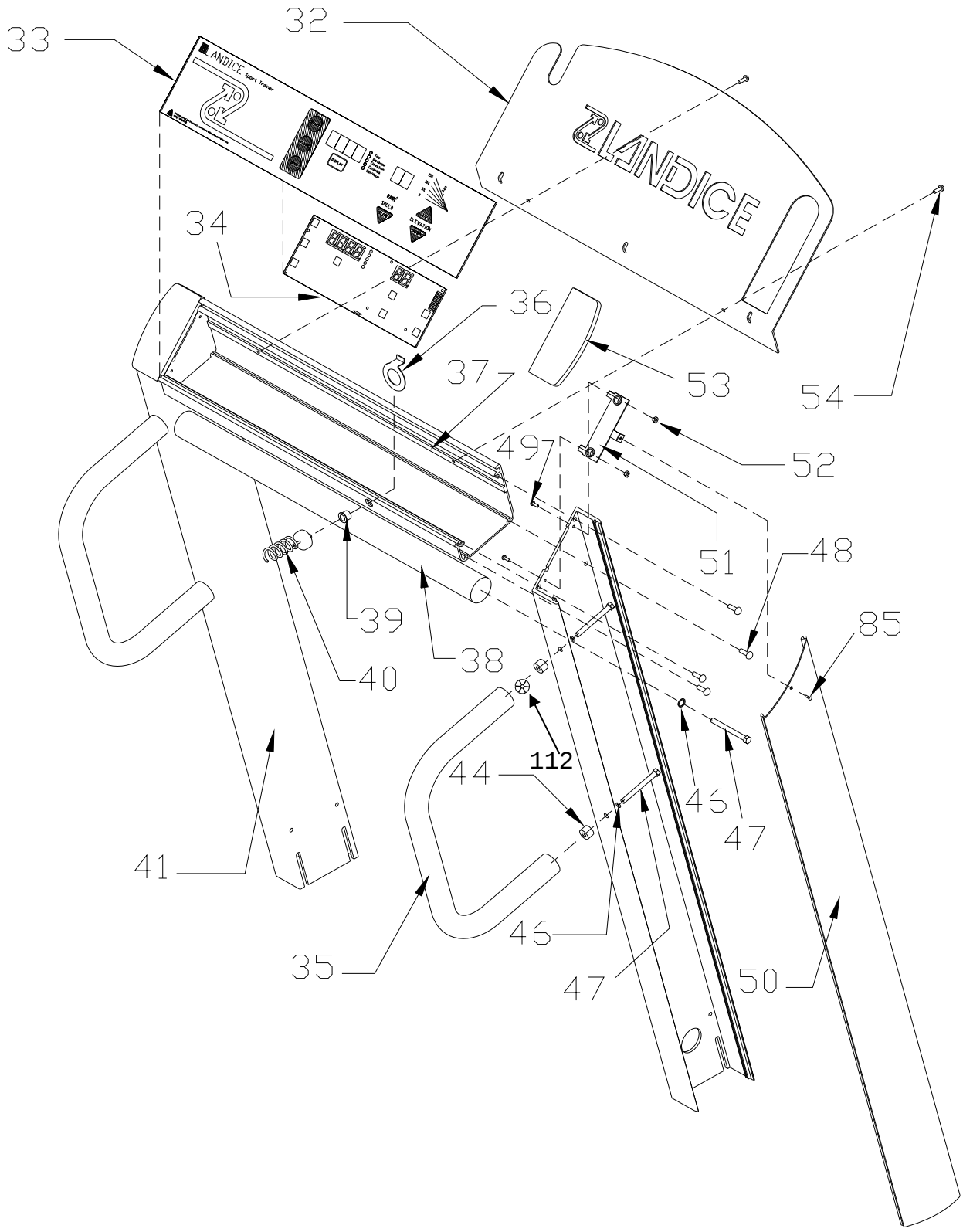
R.E.

L7 BED EXPLODED VIEW



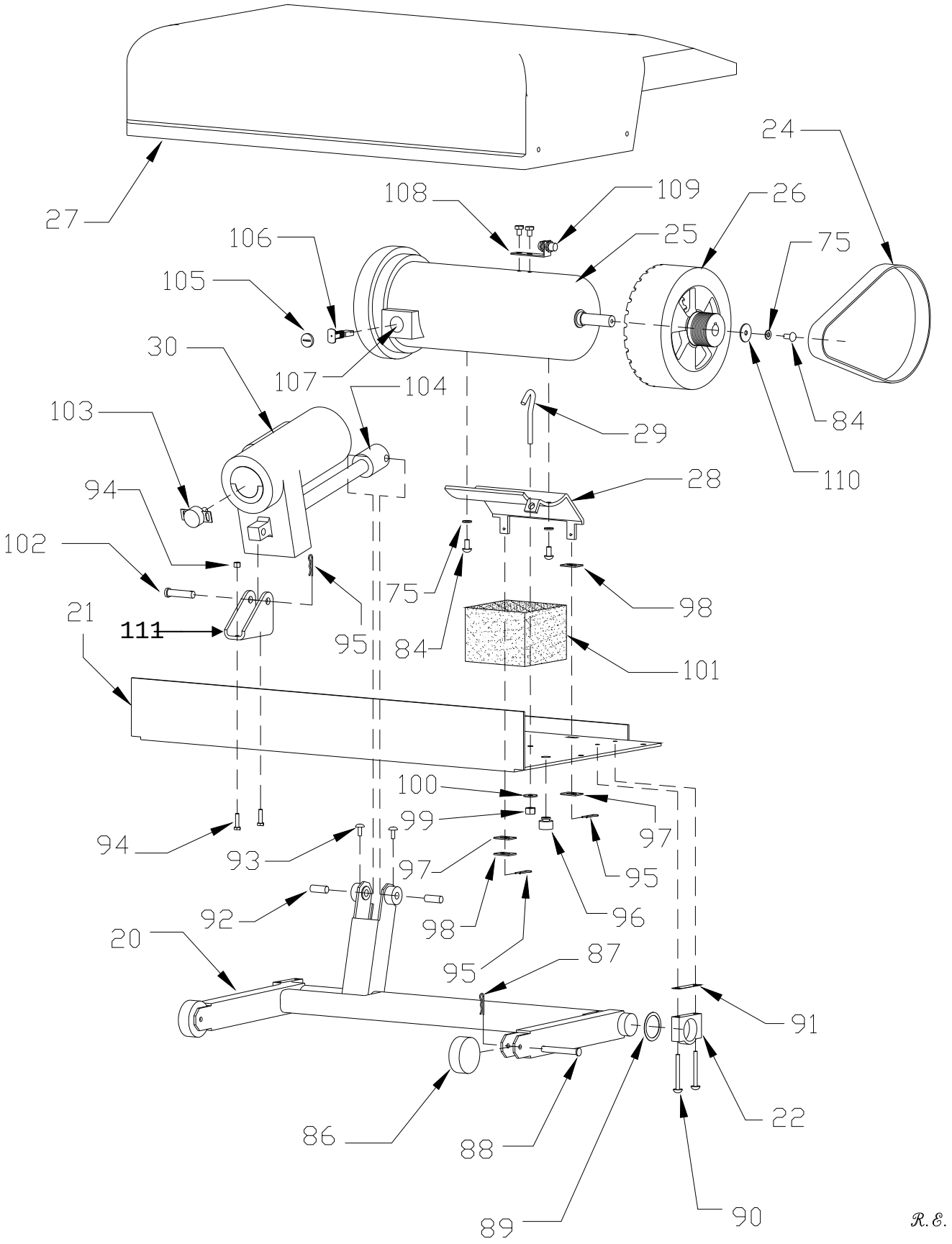
R.E.

L-SERIES UPRIGHT EXPLODED VIEW



R.E.

L SERIES MOTOR PAN EXPLODED VIEW



PARTS LIST FOR EXPLODED VIEW L7 & L8 TREADMILLS

Note: Always get Version number for electronic components to insure compatibility.

#	MODEL	DESCRIPTION	PART NUMBER
1	L8/L9	SIDE FRAME (R)	70284
		SIDE FRAME (L)	70285
2	L8/L9	SIDE FRAME COVER(R)	70286
		SIDE FRAME COVER(L)	70287
3	L8	BED ENDCAP (R)	70294
		BED ENDCAP (L)	70295
4	L7/L8/L9	TAKE-UP ROLLER BOLT	3023
5	L7/L8	FOOT	70008
6	L7/L8/L9	FOOTBOLT	¼-20_3/4_TTZ
7	L8/L9	TREADSTRIP	70293
8	L8/L9	TREADBELT	70292
9	L7/L8/L9	SAFETYBRACKETNUT	½-2_MSZ
10	L8/L9	VFX DECK	70296
11	L7/L8/L9	¼ NUT	¼-20 _WELD_NUT
12	L7/L8/L9	SAFETYBRACKET	70204
13	L8/L9	TAKE UPROLLER	70289
14	L7/L8/L9	VFX DECK LOAD WASHER	70217
15	L8/L9	VFX DECK SPACER (PVC)	70298
16	L7/L8/L9	VFX DECK IMPACT ABSORBER	70221
17	L8/L9	VFX DECK POST	70297
18	L7/L8/L9	VFX DECK SLAT	70240
19	L8/L9	DRIVE ROLLER	70288
20	L7	ELEVATION LEG ASSEMBLY	70241
		ELEVATION LEG ASSEMBLY, WIDE	70367
	L8/L9	ELEVATION LEG ASSEMBLY	70299
		ELEVATION LEG ASSEMBLY, WIDE	70374
21	L7/L8/L9	MOTOR PAN	70242
22	L7/L8/L9	BEARING BLOCK, WIDE (SINGLE PIECE)	70373
		BEARING BLOCK (TWO PIECES)	70034
23	L8/L9	DRIVE ROLLER SHEAVE	70290
24	L7	DRIVEBELT	220J10
	L8/L9	DRIVEBELT	70222
25	L7/L8/L9	DRIVE MOTOR (110V)	70014
	L7/L8/L9	DRIVE MOTOR (220V)	70125
26	L7/L8/L9	FLYWHEEL	70010
27	L7	MOTOR COVER, WIDE	70379
		MOTOR COVER	70257
	L8/L9	MOTORCOVER	70300
28	L7/L8/L9	MOTOR BRACKET	70043
29	L7/L8/L9	TENSION SCREW	70071

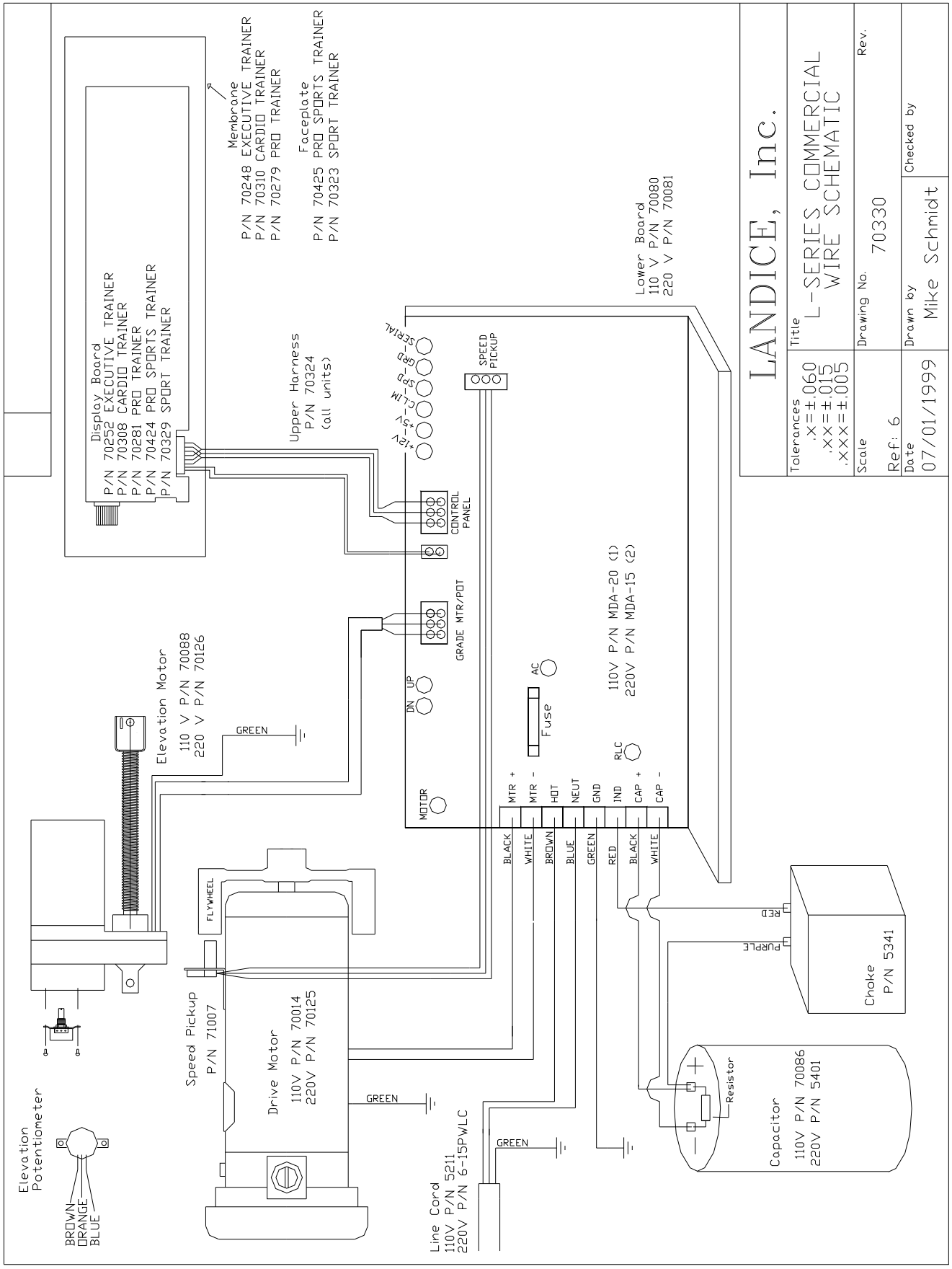
30	L7/L8/L9	ELEVATION MOTOR (110V)	70088
		ELEVATION MOTOR (220V)	70126
31	L7/L8/L9	ELEVATION CLEVIS	70049
32	L7/L8/L9	READING RACK ASSEMBLY	70346
33	L7/L8/L9	MEMBRANE PANEL(ET)	70248
		MEMBRANE PANEL(CT)	70310
		MEMBRANE PANEL(PT)	70279
		MEMBRANE PANEL(ST)	70282
34	L7/L8/L9	DISPLAY BOARD(ET)	70252
		DISPLAY BOARD(CT)	70308
		DISPLAY BOARD(PT)	70281
		DISPLAY BOARD(ST)	70329
		DISPLAY BOARD(CRT)	70336
35	L7/L8	SIDE U-RAIL ASSEMBLY	71063
36	L7/L8/L9	MAGNETIC FLUX GUIDE	70340
37	L7/L8/L9	CONTROL PANEL FRAME	70227
38	L7/L8/L9	CROSSBAR	70304
39	L7/L8/L9	TREE-LOK FASTENER	71048
40	L7/L8/L9	SAFETY LANYARD	71011
41	L7/L8/L9	LEFT UPRIGHT	70229
		RIGHT UPRIGHT	70228
42	L7/L8/L9	UPRIGHT COVER SCREW	6-32_1/2_PFM
43	L7	DECK SCREW	¼-20_1.75_TT
44	L7/L8	U-RAIL SPACER	70347
46	L7/L8	LOCKWASHER	5/16_LW
47	L7/L8	RAIL BOLTS (3”)	5/16-18x3_HHMS
48	L7/L8/L9	UPRIGHT MOUNTING BOLTS	¼-20x3/4_TT
49	L7/L8/L9	END CAP SCREW	8-32_1/2_MSZ
50	L7/L8/L9	UPRIGHT COVER (L)	70231
		UPRIGHT COVER (R)	70230
51	L7/L8/L9	CONTROL PANEL END CAP BRACKET ASSBLY (L)	70316
		CONTROL PANEL END CAP BRACKET ASSBLY (R)	70315
52	L7/L8/L9	END CAP NUT	8-32_NUT
53	L7/L8/L9	CONTROL PANEL END CAP(L)	70247
		CONTROL PANEL END CAP(R)	70246
54	L7/L8/L9	READING RACK SCREW	¼-20_5/8_WHT
55	L7	SIDE FRAME (R)	70232
		SIDE FRAME (L)	70233
56	L7	END CAP (R)	70238
		END CAP (L)	70239
57	L7	SIDE FRAME COVER	70258

58	L7	TRACTION STRIP	70005
		TRACTION STRIP, WIDE (R)	70371
		TRACTION STRIP, WIDE (L)	70372
59	L7	DECK SPACER	70219
60	L7	TREADBELT	70235
61	L7	VFX DECK	70234
62	L7	TAKE UP ROLLER	70237
63	L7	VFX DECK POST	70216
64	L7	DRIVE ROLLER	70236
65	L7	DRIVE ROLLER SHEAVE	CV-18-2
70	L7/L8/L9	BED END CAP SCREW	8-32x3/4_PPHTTW
71	L7/L8/L9	#8 ZINC LOCK WASHER	8_LW
72	L7/L8/L9	TAKE UP ROLLER BOLT WASHER	3/8_FW_BL_OX
73	L7/L8/L9	DECK SLAT SCREWS AND L8 FRAME SCREWS	¼-20_3/4_TTZ
74	L8/L9	DRIVE ROLLER SCREW	5/16-18_1_HFZ
75	L7/L8/L9	STAR WASHER	¼_LW_EXT
76	L7/L8/L9	UPRIGHT HEX HEAD BOLT	¼-20x3/4-TT
77	L7/L8/L9	RUBBER MOTOR COVER GROMMET	1259
78	L7/L8/L9	MOTOR COVER FINISHING WASHER	10_finishing_w
79	L7/L8/L9	MOTOR COVER SCREW	8-32_3/4_TTB
80	L7/L8/L9	FELT WASHER	70220
81	L7/L8/L9	BELT GUIDE SCREW	8x1_A_PPSTS_ZN
82	L7	BELT GUIDE	70208
83	L7	DRIVE ROLLER SCREW	¼-20x3/4_HWFL
84	L7	VFX POST SCREW	¼-20_9/16_MSZN
85	L8/L9	BELT GUIDE	70351
86	L7/L8/L9	WHEEL (ELEVATION LEGS)	4851
		WHEEL, WIDE (ELEVATION LEGS)	70358
87	L7/L8/L9	HITCH PIN FOR AXLE	221
		HITCH PIN FOR AXLE, WIDE	213
88	L7/L8/L9	WHEEL AXLE	70065
		WHEEL AXLE, WIDE	70359
89	L7/L8/L9	WASHER, WIDE	70402
90	L7/L8/L9	BEARING BLOCK BOLT	¼-20_2_MSZ
91	L7/L8/L9	BEARING BLOCK SPACER, WIDE	70403
92	L7/L8/L9	ELEVATION PINS	70032
93	L7/L8/L9	ELEVATION PIN SCREWS	¼-20_9/16
94	L7/L8/L9	CLEVIS BOLT HARDWARE	70345
95	L7/L8/L9	HITCH PIN (MOTOR BRACKET AND CLEVIS)	233
96	L7/L8/L9	ELEVATION LEG RUBBER BUMPER	2215
97	L7/L8/L9	MOTOR MOUNT SPACER, RUBBER	70090
98	L7/L8/L9	MOTOR MOUNT SPACER, METAL	70089
99	L7/L8/L9	TENSION SCREW NUT	¼-20_NUT
100	L7/L8/L9	TENSION SCREW FLAT WASHER	¼_SHOULDER_W
101	L7/L8/L9	FOAM BLOCK	70103
102	L7/L8/L9	CLEVIS PIN	70063

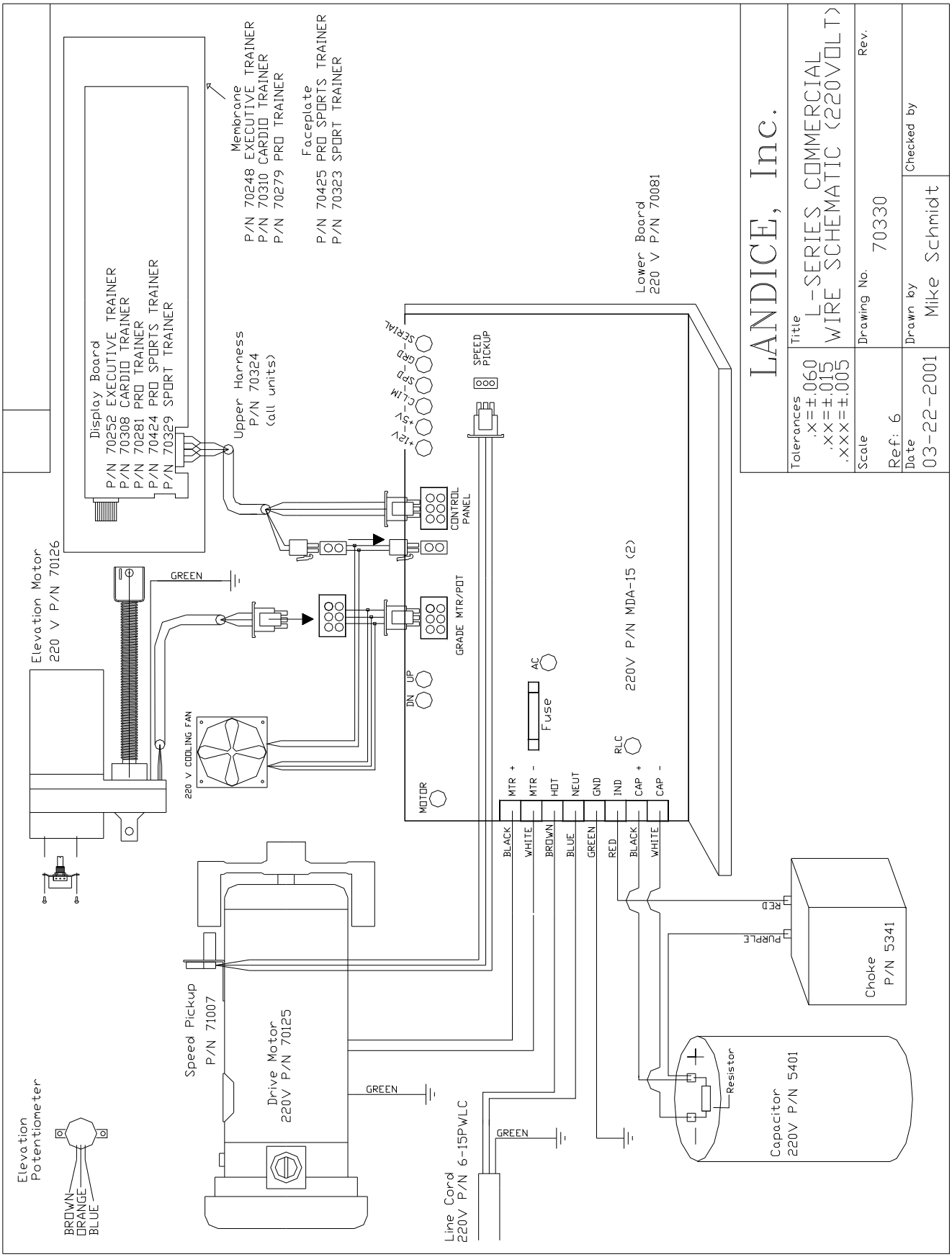
103	L7/L8/L9	ELEVATION POTENTIOMETER	71013
104	L7/L8/L9	ELEVATION NUT	MISC
105	L7/L8/L9	MOTOR BRUSH CAP	MISC
106	L7/L8/L9	MOTOR BRUSH, 110V	70222
		MOTOR BRUSH, 220V	70223
107	L7/L8/L9	MOTOR BRUSH HOLDER	MISC
108	L7/L8/L9	SPEED SENSOR BRACKET	70067
109	L7/L8/L9	SPEED SENSOR	71007
110	L7/L8/L9	FLYWHEEL FLAT WASHER	1/4x1_FLAT_WASHER
111	L7/L8/L9	ELEVATION CLEVIS	70049
112	L7/L8	RAM CONNECTOR 1-1/4” DIA. (SIDE RAIL)	71038

COMMERCIAL MOTOR PAN (SCR MOTOR CONTROL BOARD)

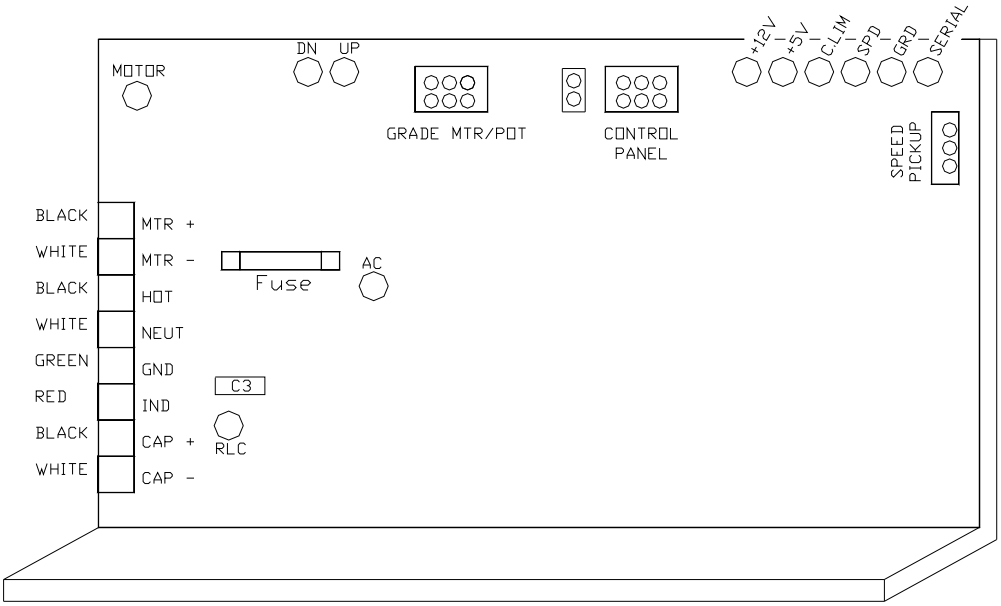
L-SERIES 110V COMMERCIAL LOWER WIRE SCHEMATIC



L-SERIES 220V COMMERCIAL LOWER WIRE SCHEMATIC



LED CONFIGURATIONS: SCR LOWER BOARD



The SCR lower board is designed with diagnostic LED lights. The LED's are color coded according to their specific function. Green indicates a properly operating treadmill; the green lights should always be ON when power is supplied to the treadmill. Yellow indicates a treadmill function. Red indicates a treadmill malfunction. Here is a list of each LED and what it signifies:

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

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. If there is a short in either component then the RLC light will not come on.

DN & UP (yellow) – The DN and UP LED lights tell us if the elevation DN and UP relays are functioning properly. When the LED lights, it tells us that the relay has energized and is sending high voltage (110vac or 220vac) to the elevation motor.

AC PWR (green) – The AC PWR (Alternating Current Power) illuminates when AC line voltage is delivered to the treadmill. It then passes through the in-line fuse (110)/s(220) and lights the AC PWR LED.

+12V (green) – When the proper AC voltage is delivered to the treadmill, passes through the in-line fuse/s, through the full wave bridge rectifier (changes AC to DC), through the transformer (steps down DC to +12vdc) then the +12V LED lights.

C. LIM (red) – The C.LIM or Current Limit LED should **NEVER** come on. This diagnostic light is used to determine the condition of the treadbelt and deck. The SCR board has a built-in amp meter. When the treadbelt belt 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 slow down / low torque) to the drive motor and the C.LIM LED will illuminate.

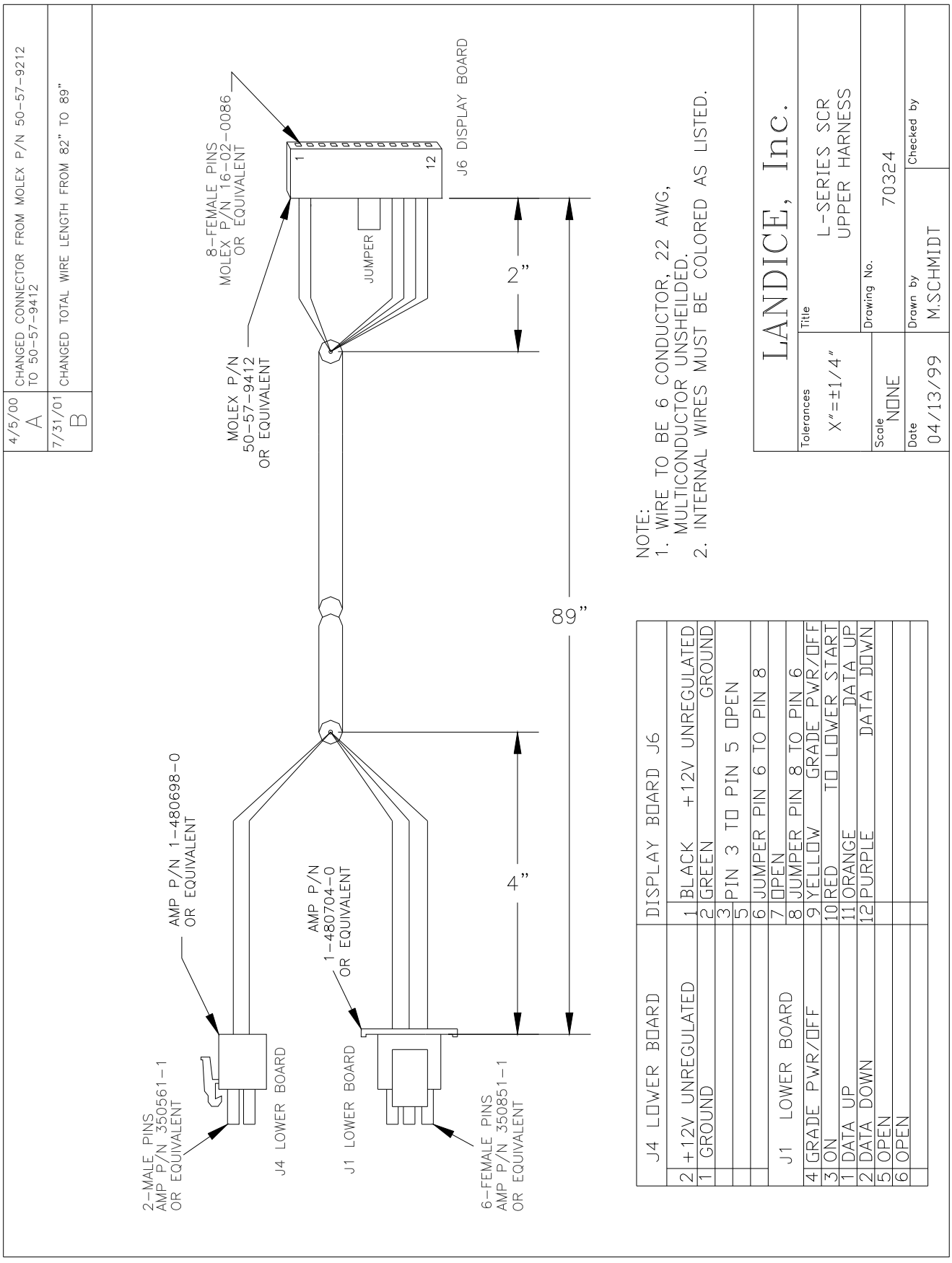
SPD (yellow) – The SPD LED flashes on and off (relative to speed) when the speed sensor is operating properly.

GRD (red) – The GRD (GRADE) LED should **NEVER** come on. It illuminates only when the elevation potentiometer becomes out of calibration.

SERIAL (red) – The SERIAL LED should **NEVER** come on. It illuminates only when there is an interruption of the flow of data between the upper and lower boards. This could be a loose or pushed pin on the main wire harness.

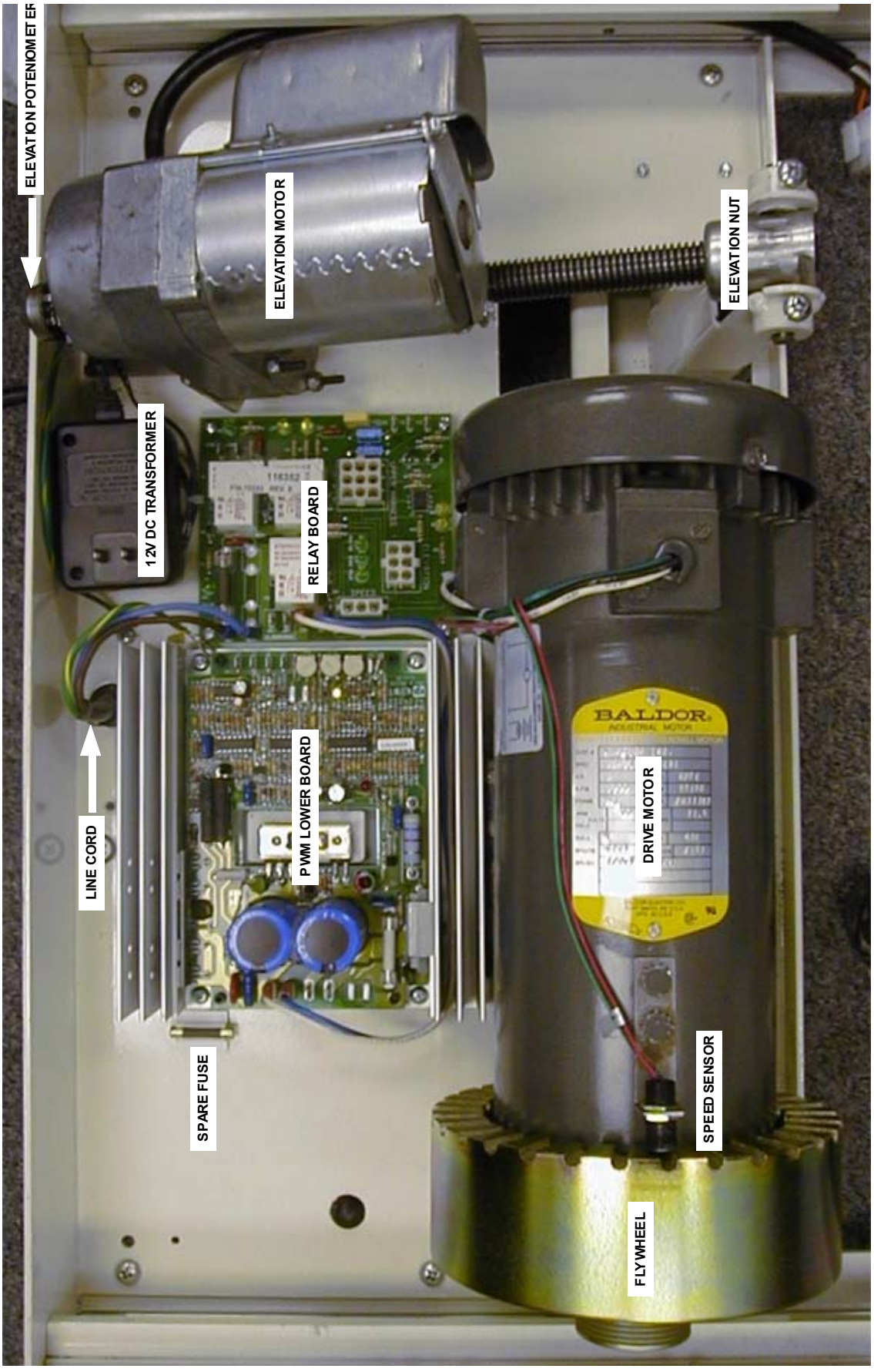
+5V (green) – The +5V light comes on when there is power going to the Upper Display. If the light is not on check wire harness for connections. If it is not the wire harness then the MCB is defective.

L-SERIES SCR UPPER WIRE HARNESS WIRING DIAGRAM

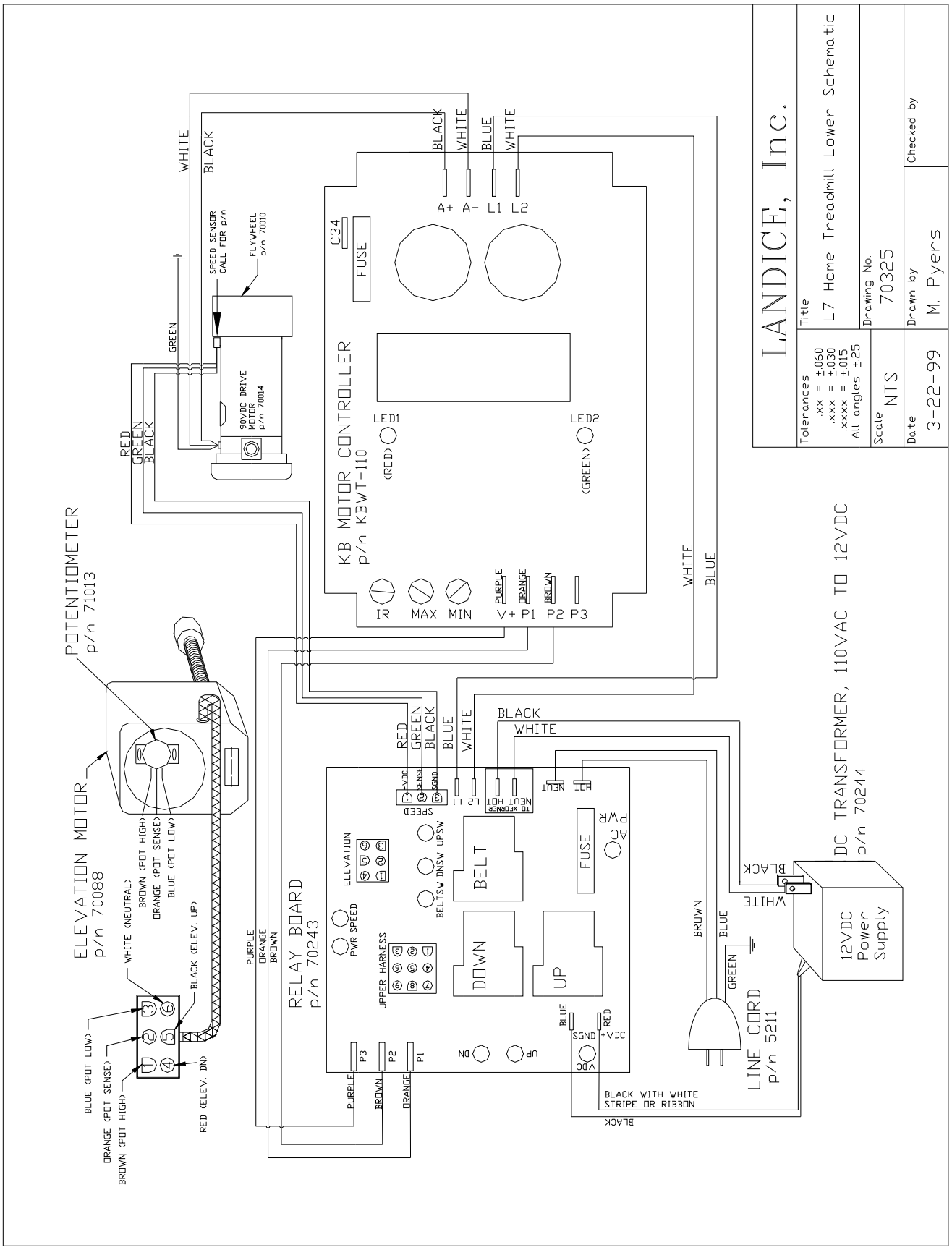


J4 LOWER BOARD		DISPLAY BOARD J6
2	+12V UNREGULATED	1 BLACK +12V UNREGULATED
1	GROUND	2 GREEN GROUND
		3 PIN 3 TO PIN 5 OPEN
		5
		6 JUMPER PIN 6 TO PIN 8
J1 LOWER BOARD		7 OPEN
		8 JUMPER PIN 8 TO PIN 6
4	GRADE PWR/OFF	9 YELLOW GRADE PWR/OFF
3	ON	10 RED TO LOWER START
1	DATA UP	11 ORANGE DATA UP
2	DATA DOWN	12 PURPLE DATA DOWN
5	OPEN	
6	OPEN	

L-SERIES PWM MOTOR PAN (PWM MOTOR CONTROL BOARD)



L-SERIES HOME MOTOR PAN WIRING SCHEMATIC



PWM VOLTAGE READINGS AND PATHS

DC VOLTAGE OUTPUT
A+/A- = DC Voltage out.

AC VOLTAGE INPUT
L1/L2 = Line Voltage (110/220)

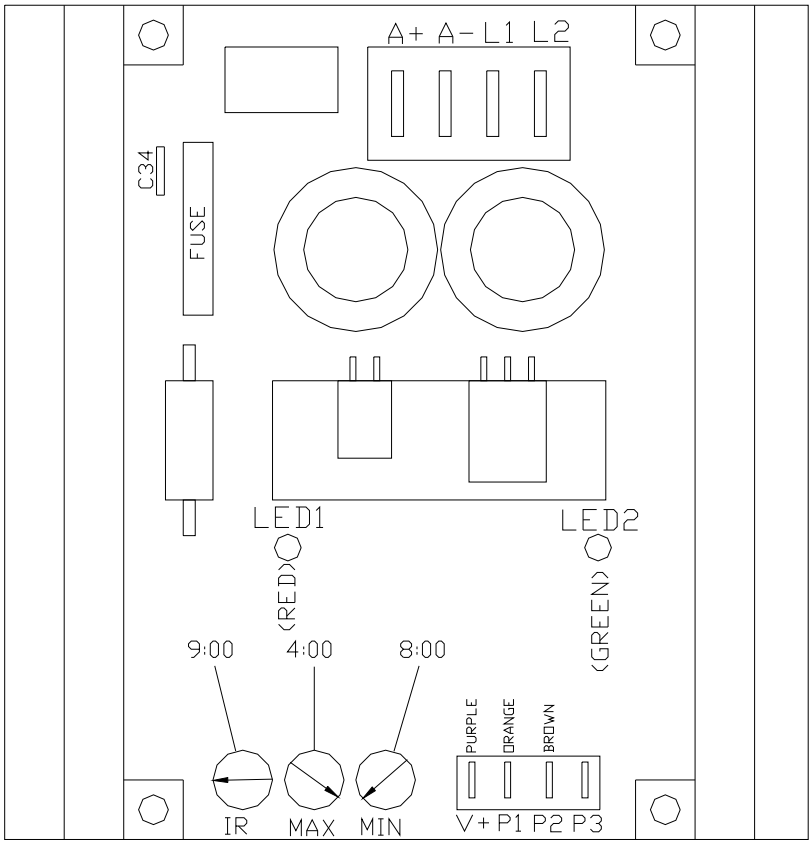
Speed Calibration Poteniometers
Used to calibrate speed.
-MAX: Used to calibrate top speed
-MIN: Used to calibrate low speeds
-IR: Used to regulate drive motor
and treadbelt surging.

V+ to P1:
Continuous 6.5 to 7.0 VDC

P2 to P1:
Variable from 0 to 7 VDC

The PWM motor control board is what we use to run our drive motors. Since our drive motors are DC, we need to convert the AC voltage from the wall outlet, to DC voltage to drive the motor. The PWM is the "doorway" which AC changes to DC when it passes through. We vary the DC voltage output to vary the drive motor speed. The L1 and L2 terminals is where the AC voltage from wall outlet comes in. The A+ and A– terminals is where DC voltage goes out to the drive motor. The V+, P1 and P2 terminals is where we control the output of the PWM board.

LED CONFIGURATIONS: PWM LOWER BOARD



The PWM lower board is designed with two diagnostic LED lights. The LED's are color coded according to their specific function.

LED 1 (red) – This indicates a high current draw similar to the C.LIM LED on our SCR lower control board. LED 1 will only light if there is high current being used due to a possible worn out treadbelt and deck system or it can also light if the IR pot is out of adjustment. The IR pot controls how the PWM board reacts to varying loads (users' weights). If the IR pot is out of adjustment you will notice the treadbelt will surge and the red LED 1 will flash in unison with the belt surge.

LED 2 (green) – This indicates proper line voltage is being supplied to the PWM board. This line voltage is delivered to the PWM via the belt relay located on the relay board. When the belt relay energizes 110VAC or 220VAC is sent to the input terminals (L1 & L2) on the PWM board and LED 1 illuminates.

RELAY BOARD VOLTAGE READINGS AND PATHS

LOW DC VOLTAGE OUTPUT TO MOTOR CONTROL BOARD. CONTROLS SPEED OF TREADMILL.
P3 TO P1 = CONTINUOUS 6.5-7.0VDC
P1 TO P2 = VARIABLE FROM 0-7VDC

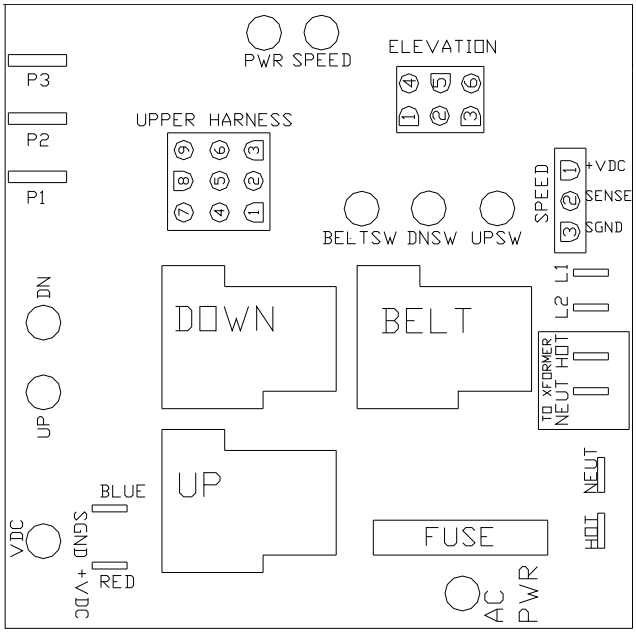
AC VOLTAGE OUTPUT TO MOTOR CONTROL BOARD
L2 / L1 = Line voltage 110VAC

AC VOLTAGE OUTPUT TO DC TRANSFORMER
NEUT / HOT = Line voltage 110VAC

AC VOLTAGE INPUT
HOT / NEUT = Line voltage 110VAC
Notice: Only the HOT leg is fused on 110 volt treadmills.

12 VDC INPUT FROM DC TRANSFORMER
+VDC = +12vdc
SGND = Ground

LED CONFIGURATIONS: RELAY BOARD



The RELAY board is designed with diagnostic LED lights. The LED's are color coded according to their specific function. Green indicates a properly operating treadmill; the green lights should always be ON when power is supplied to the treadmill. Yellow indicates a treadmill function. Red indicates a treadmill malfunction. Here is a list of each LED and what it signifies:

AC PWR (green) - The AC PWR (Alternating Current Power) illuminates when AC line voltage is delivered to the treadmill. It then passes through the in-line fuse (110)/s(220) and lights the AC PWR LED.

VDC (green) – The VDC LED will light when it receives DC voltage from the DC power supply.

DN & UP (yellow) – The DN and UP LED lights tell us if the elevation DN and UP relays are functioning properly. When the LED lights, it tells us that the relay has energized and is sending high voltage (110vac or 220vac) to the elevation motor.

UPSW (green) – This LED will illuminate when the low voltage dc is delivered from the upper display board to the elevation UP relay. This low voltage dc is what energizes the coil of the relay.

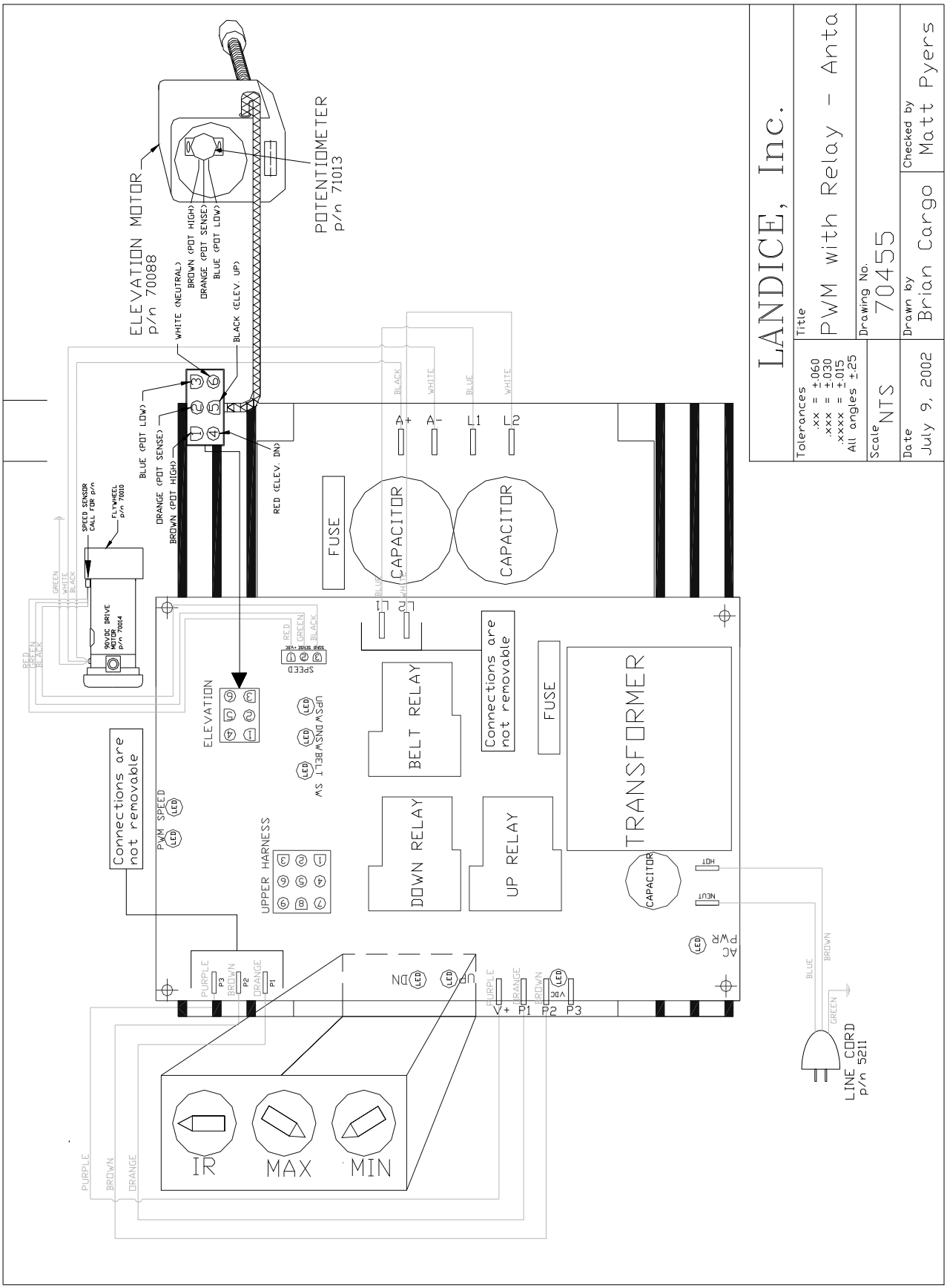
DNSW (green) - This LED will illuminate when the low voltage dc is delivered from the upper display board to the elevation DOWN relay. This low voltage dc is what energizes the coil of the relay.

BELTSW (green) - This LED will illuminate when the low voltage dc is delivered from the upper display board to the belt (motor start) relay. This low voltage dc is what energizes the coil of the relay.

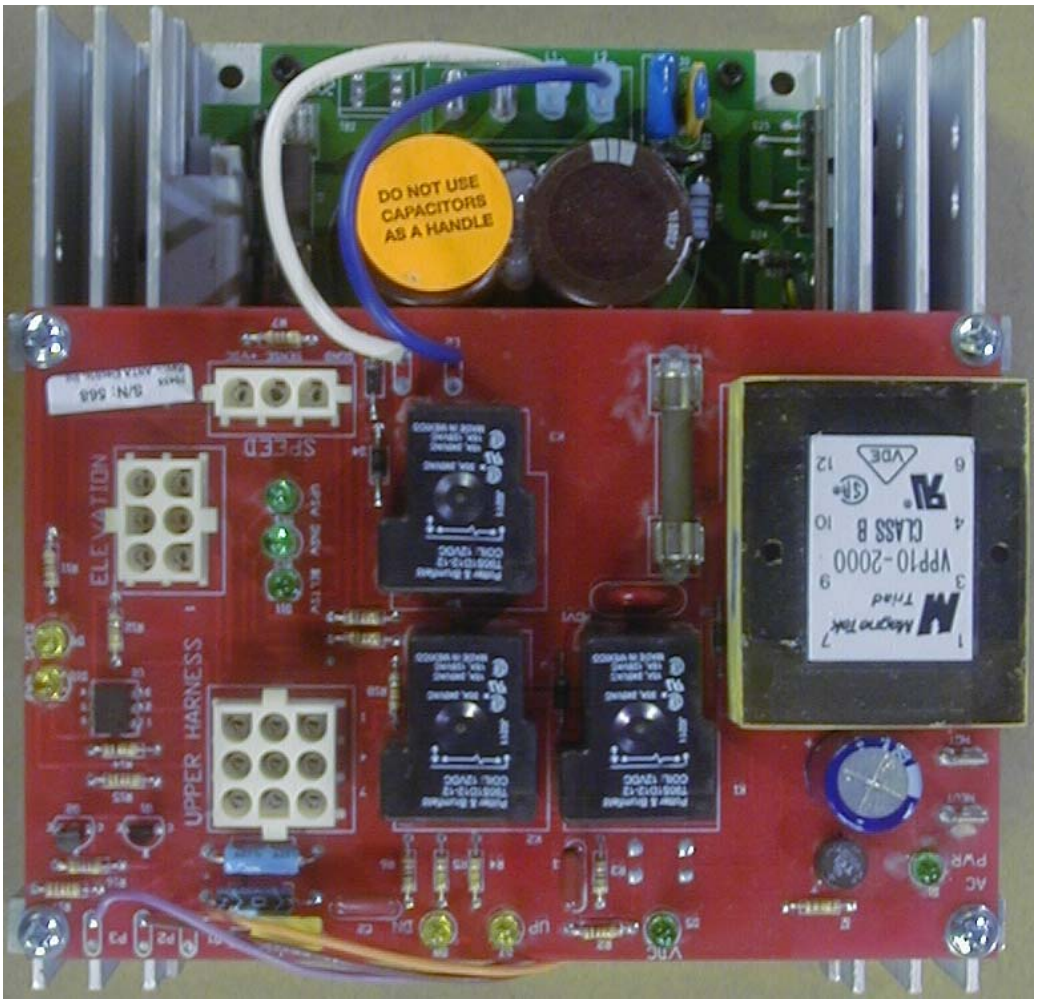
SPD (yellow) – The SPD LED flashes on and off (relative to speed) when the speed sensor is operating properly.

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.

L-SERIES HOME MOTOR PAN WIRING SCHEMATIC
(PWM MOTOR CONTROL BOARD W/ RELAY ASSEMBLY)

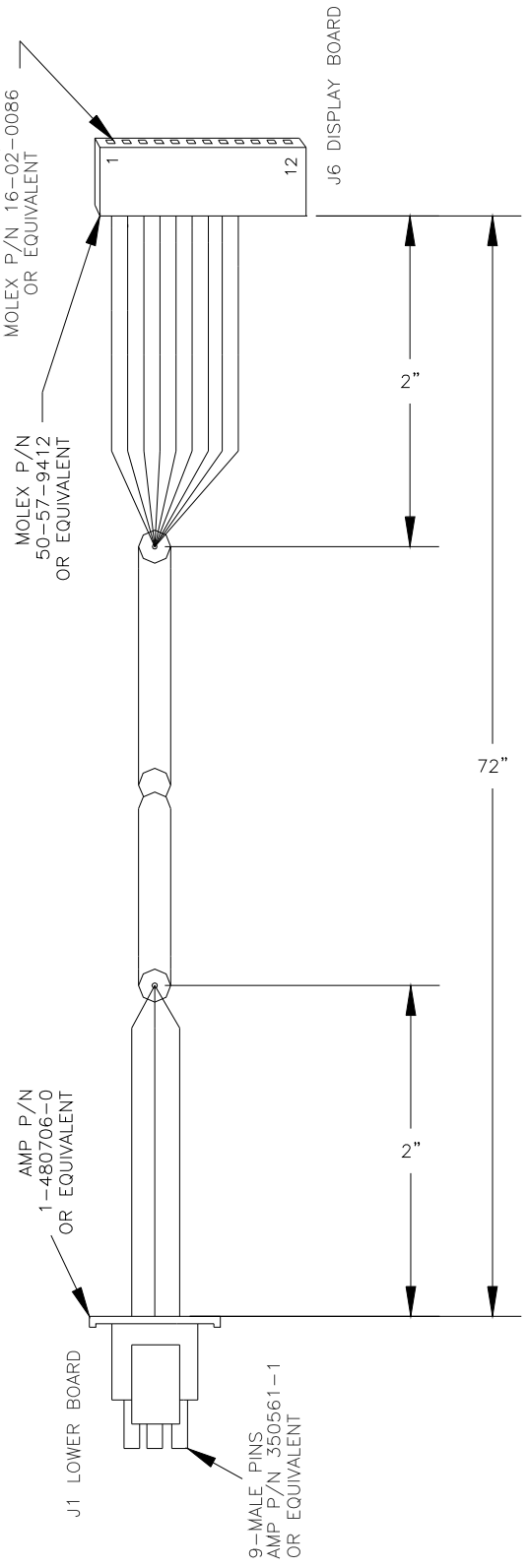


PWM MOTOR CONTROL BOARD W/ RELAY ASSEMBLY



L-SERIES PWM UPPER WIRE HARNESS WIRING DIAGRAM

12/20/99 A	RMV'D WIRE COLOR CALL OUTS NEXT TO 12-PIN FEMALE MOLEX CONNECTOR
4/5/00 B	CHANGED CONNECTOR FROM MOLEX P/N 50-57-9212 TO 50-57-9412



NOTE:
1. WIRE TO BE 9 CONDUCTOR, 22 AWG, MULTICONDUCTOR UNSHEILDED.
2. INTERNAL WIRES MUST BE COLORED AS LISTED.

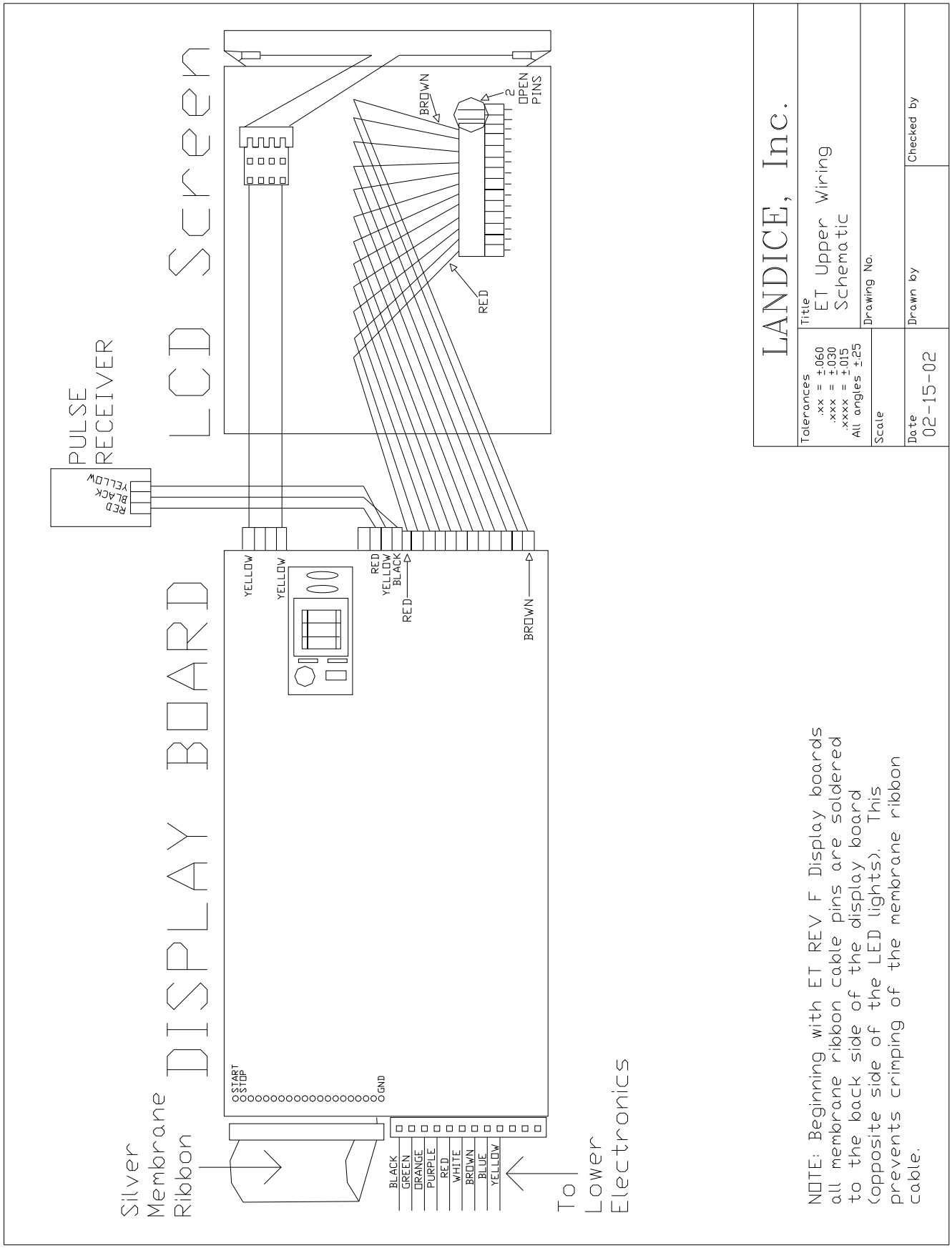
9 PIN CONNECTOR	12 PIN CONNECTOR	
1 RED	1 BLACK	(+12 VDC)
2 BLUE	2 GREEN	GND - GROUND
3 YELLOW	3 ORANGE	GRADE UP
4 PURPLE	4 PURPLE	GRADE DOWN
5 BROWN	5 RED	BELT ON
6 WHITE	6 WHITE	BELT PWM
7 ORANGE	7 BROWN	SPEED
8 BLACK	8 LIGHT BLUE	GRADE
9 GREEN	9 YELLOW	GRADE POWER / OFF
	10 OPEN	
	11 OPEN	
	12 OPEN	

LANDICE, Inc.

Tolerances	Title		
X"=±1/4"	L-SERIES PWM UPPER HARNESS		
Scale	Drawing No.		
	70251		
Date	Drawn by	Checked by	
07/23/99	MIKE SCHMIDT		

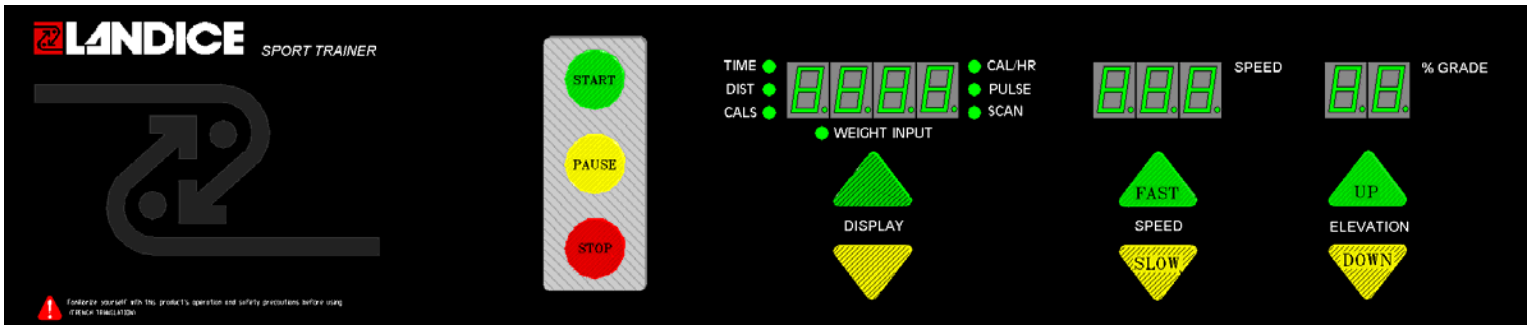
I:\USERS\CAD\R13\70251.DWG

EXECUTIVE TRAINER LCD WIRING SCHEMATIC



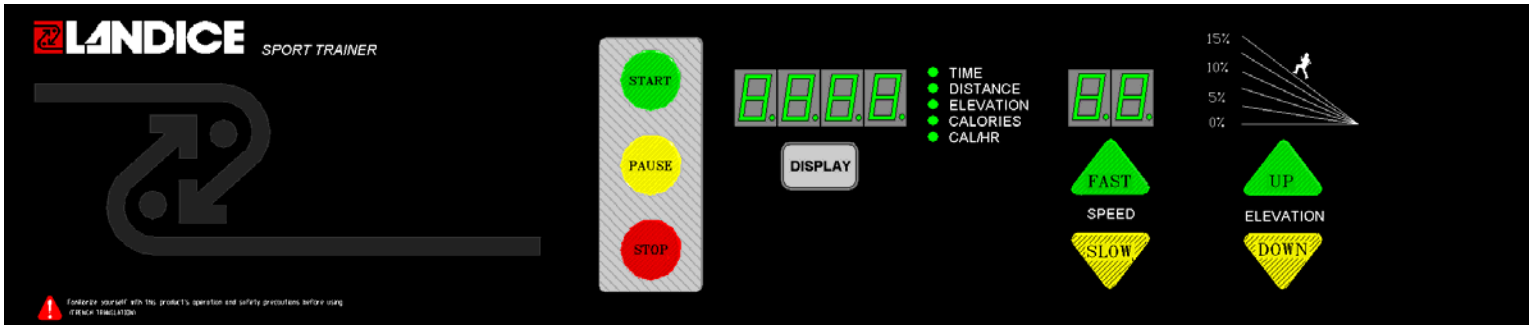
L-SERIES DISPLAY CONTROL PANELS & FEATURES PART 1

L-Series Sport Trainer Membrane



Models That Use This Membrane:
L7-ST, L8-ST, L7-LTD-ST, L8-LTD-ST, L7-CLUB-ST, L8-CLUB-ST.
(All L7's before L7-03229 and all L8's before L8-01478)
Production Time Frame: 1999
Electronics: : PWM motor pan on all Home Units, 110V SCR commercial motor pan for LTD's and 110V CLUB's, 220V SCR commercial motor pan for 220V CLUB units. See Wiring Diagrams.
***NOTE:** this Unit Used a **Pro Trainer** Display Board, Part#: 70281*
Settings Used In: Home and Commercial (LTD's and CLUB's)
Key Features: Closed Loop Treadmill (w/ speed sensor), Safety Lanyard, 0.5-12MPH Push Button Speed and Elevation Control (11MPH on LTD's and CLUB's)

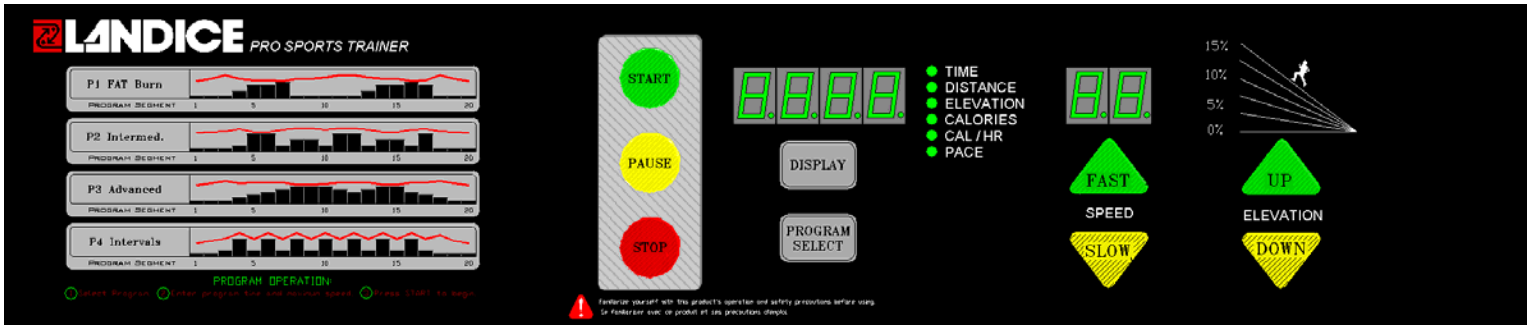
L-Series Sport Trainer Faceplate



Models That Use This Faceplate:
L7-ST, L8-ST, L7-LTD-ST, L8-LTD-ST, L7-CLUB-ST, L8-CLUB-ST.
Production Time Frame: 1999-Present
Electronics: : PWM motor pan on all Home Units, 110V SCR commercial motor pan for LTD's and 110V CLUB's, 220V SCR commercial motor pan for 220V CLUB units. See Wiring Diagrams.
Settings Used In: Home and Commercial (LTD's and CLUB's)
Key Features: Closed Loop Treadmill (w/ speed sensor), Safety Lanyard, 0.5-12MPH Push Button Speed and Elevation Control (11MPH on LTD's and CLUB's)

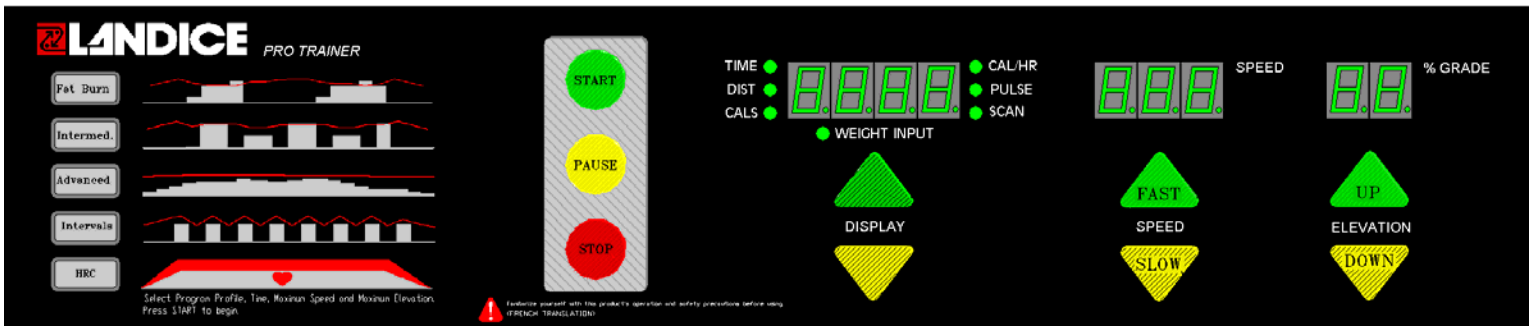
L-SERIES DISPLAY CONTROL PANELS & FEATURES PART 2

L-Series Pro Sports Trainer Faceplate



Models That Use This Faceplate:
L7-PST, L8-PST, L7-LTD-PST, L8-LTD-PST, L7-CLUB-PST, L8-CLUB-PST, L9-CLUB-PST(110V) & L9-CLUB-PST(220V)
Production Time Frame: 2001-Present
Electronics: : PWM motor pan on all Home Units, 110V SCR commercial motor pan for LTD's and 110V CLUB's, 220V SCR commercial motor pan for 220V CLUB units. See Wiring Diagrams.
Settings Used In: Home and Commercial (LTD's and CLUB's)
Key Features: Closed Loop Treadmill (w/ speed sensor), Safety Lanyard, 0.5-12MPH Push Button Speed and Elevation Control (11MPH on LTD's and CLUB's), 4 Built in Programs, 2 User Defined Programs.

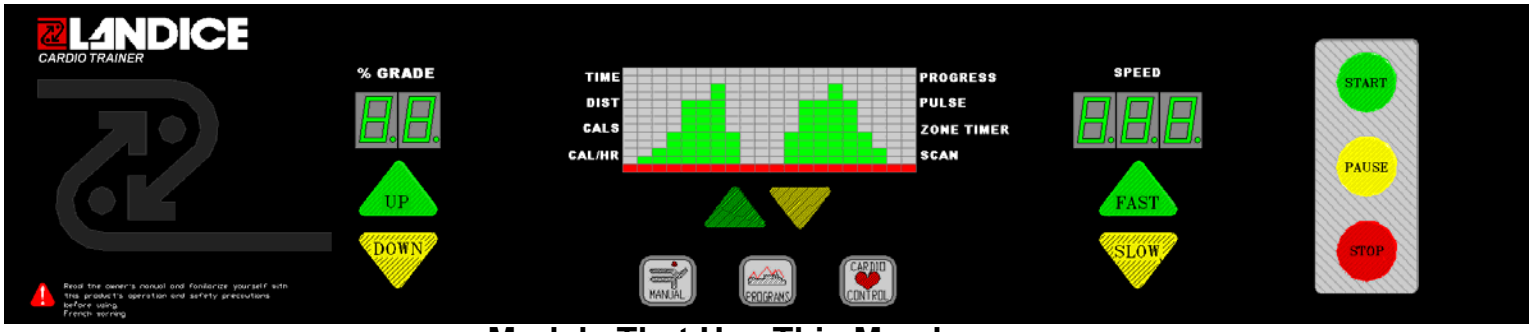
L-Series Pro Trainer Membrane



Models That Use This Membrane:
L7-PT, L8-PT, L7-LTD-PT, L8-LTD-PT, L7-CLUB-PT, L8-CLUB-PT.
Production Time Frame: 1999-Present
Electronics: : PWM motor pan on all Home Units, 110V SCR commercial motor pan for LTD's and 110V CLUB's, 220V SCR commercial motor pan for 220V CLUB units. See Wiring Diagrams.
Settings Used In: Home and Commercial (LTD's and CLUB's)
Key Features: Closed Loop Treadmill (w/ speed sensor), Safety Lanyard, 0.5-12MPH Push Button Speed and Elevation Control (11MPH on LTD's and CLUB's), 5 Built in Programs, 5 User Defined Programs, Optional Wireless Heart-Rate Control.

L-SERIES DISPLAY CONTROL PANELS & FEATURES PART 3

L-Series Cardio Trainer Membrane



Models That Use This Membrane:
L7-CT, L8-CT, L7-LTD-CT, L8-LTD-CT, L7-CLUB-CT, L8-CLUB-CT, L9-CLUB-CT(110V) & L9-CLUB-CT(220V).
Production Time Frame: 1999-Present
Electronics: PWM motor pan on all Home Units, 110V SCR commercial motor pan for LTD's and 110V CLUB's, 220V SCR commercial motor pan for 220V CLUB units. See Wiring Diagrams.
Settings Used In: Home and Commercial (LTD's and CLUB's)
Key Features: Closed Loop Treadmill (w/ speed sensor), Safety Lanyard, 0.5-12MPH Push Button Speed and Elevation Control (11MPH on LTD's and CLUB's), 5 Built in Programs, 5 User Defined Programs, Standard Wireless Heart-Rate Control.

L-Series Executive Trainer Membrane

Models That Use This Membrane:
L7-ET, L8-ET, L7-LTD-ET, L8-LTD-ET, L7-CLUB-ET, L8-CLUB-ET, L9-CLUB-ET(110V) & L9-CLUB-ET(220V)
Production Time Frame: 1999-Present
Electronics: PWM motor pan on all Home Units, 110V SCR commercial motor pan for LTD's and 110V CLUB's, 220V SCR commercial motor pan for 220V CLUB units. See Wiring Diagrams.
Settings Used In: Home and Commercial (LTD's and CLUB's)
Key Features: Closed Loop Treadmill (w/ speed sensor), Safety Lanyard, 0.5-12MPH Push Button Speed and Elevation Control (11MPH on LTD's and CLUB's), 5 Built in Programs, 5 User Defined Programs, Standard Wireless Heart-Rate Control, LCD Graphic Display.

L-SERIES DISPLAY CONTROL PANELS & FEATURES PART 4

L-Series Road Runner Membrane

Models That Use This Membrane:
L7-RR, L8-RR
Production Time Frame: Estimated to begin in December, 2001
Electronics: PWM motor pan on all Home Units, See Wiring Diagrams.
Settings Used in: Home
Key Features: Closed Loop Treadmill (w/ speed sensor), Safety Lanyard, 0.5-12MPH Shifter Knob Speed and Elevation Control, 3 Built in Programs, 1 User Defined Program, Standard Wireless Heart-Rate Control, Dot-matrix LED Graphic Display. 6-Disc CD changer, w/ high tech Kenwood Full Range Sound Speakers, Specially Designed Ignition Style Start-Up, Pause, and Stop Feature w/ Removable Key.

CARDIO TRAINER / EXECUTIVE TRAINER ADDENDUM

ACCUTRACK Contact Heart Rate Monitoring System™

The AccuTrack Contact Heart Rate Monitoring System™ can be used in place of the wireless chest strap to perform any of the following functions:

- Monitor your Time in Zone
- Control HRC programs
- Help you maintain your target heart rate

1. Use the Display buttons to switch to the PULSE display.
2. Grab on to the pulse grips.
3. As soon as you put your hands on the grips a heart will appear on the display. This indicates that the system has been activated.
4. The heart will "beat" briefly and then display your heart rate. Your heart rate will be continuously monitored while your hands remain on the grips.

- NOTE: If you are wearing the wireless chest strap, the AccuTrack system is automatically disabled.

- NOTE: You do not have to be viewing the PULSE display for the AccuTrack system to function.

The HRC programs will continue to make speed and elevation adjustments to keep you at your target heart rate while your hands remain on the grips. If you remove your hands the HRC programs will not make any speed or elevation changes until you place your hands on the grips again.

The AccuTrack system is designed to be used at walking speeds. A natural running motion involves using your arms to maintain balance. Since contact heart rate systems require your arms to remain stationary, we recommend using the system only at speeds of less than approximately 4 mph (6.4 km/h) or the fastest speed at which you are comfortable walking.

ACCESSING DIAGNOSTIC FEATURES ON L-SERIES TREADMILLS

NOTE: The following information is for diagnostic and troubleshooting purposes and is meant to be used by authorized Landice service technicians ONLY and should not be made available to the general public.

EXECUTIVE TRAINER

1 - PREV/3RD GREY CIRCLE BUTTON ON THE LEFT SIDE OF THE LCD SCREEN/START Reboots ET's manufactured before December 2001
DOWN/PAUSE/START Reboots ET's manufactured from December 2001 on.
2 - UP/DOWN/START Toggles 12% and 15% elevation selection
3 - MENU/START Accesses Diagnostic Mode and Open Loop Speed Mode.
NOTE: There is now a display for total miles and total hours for **commercial** ET's **only**.

CARDIO TRAINER

1 - PAUSE/START Displays software version.
2 - DOWN/PAUSE/START Reboots.
3 - MANUAL/START Accesses Diagnostic Mode on CT's built prior to October 2001.
DISPLAY UP/START Accesses Diagnostic Mode on CT's built after October 2001.
4 - UP/DOWN/START Toggles 12% and 15% elevation selection.
5 - FAST/START Open Loop Speed Mode.

PRO TRAINER

1 - PAUSE/START Displays software version.
2 - DOWN/PAUSE/START Reboots.
3 - DISPLAY UP/START Accesses Diagnostic Mode.
4 - FAST/START Open Loop Speed Mode.

PRO SPORTS TRAINER

1 - PAUSE/START Displays software version.
2 - DOWN/PAUSE/START Reboots.
3 - UP/DOWN/START Toggles 12% and 15% elevation selection
4 - DISPLAY/START Accesses Diagnostic Mode.
5 - FAST/START Open Loop Speed Mode.

SPORT TRAINER

1 - PAUSE/START Displays software version.
2 - DOWN/PAUSE/START Reboots.
4 - DISPLAY/START Accesses Diagnostic Mode.
5 - FAST/START Open Loop Speed Mode.

ROAD RUNNER

1 - UP/PAUSE Displays software version.
2 - DOWN/PAUSE Reboots.
3 - SLOW/PAUSE Accesses Diagnostic Mode.
4 - FAST/PAUSE Accesses Speed and Grade diagnostics.

DEFINITIONS

12 VDC POWER SUPPLY (Transformer)
This transformer converts AC power to DC power. It provides low voltage current for the Upper Display Board. This component is found on treadmills with PWM Motor Control Boards. It is incorporated into the SCR Motor Control Boards.

CAPACITOR
Stores energy to smooth out voltage to Drive Motor. Used with SCR Motor Control Boards.

CHOKE (Inductor)
Acts like a filter to smooth out voltage to Drive Motor. Used with SCR Motor Control Boards.

DCP (DISPLAY CONTROL PACKAGE)
Package containing all components relative to the Upper Display Console. This includes the membrane/faceplate, upper display board, & wire harness. DCP's also include owner's manuals warranty card's, and cardio pulse transmitter strap (if applicable). DCP's are for **HOME TREADMILLS ONLY,** that are shipped without upper electronics.

DECK
Wooden board 1" thick with a phenolic coating. Treadbelt rides over it. Reversible.

DRIVE BELT
This connects Drive Motor to Sheave (Pulley) on Drive Roller.

DRIVE MOTOR
Provides power to Drive Belt to turn Pulley on Drive Roller to move Treadbelt. This gets its power from the PWM or SCR. Landice Drive motors are either 110v for 220v.

DRIVE ROLLER W/ SHEAVE
This is the Roller at the front of the Treadmill. The Sheave (pulley) is pressed onto the roller and allows transfer of movement from Drive Belt to Treadbelt.

ELEVATION LEG ASSEMBLY
Connects to Elevation Motor to allow movement of front of treadmill up or down.

ELEVATION MOTOR
This motor works through the elevation leg assembly to raise or lower the front of the treadmill. It gets its power from the Relay Board on Home models and from the SCR on LTD and Club models.

ELEVATION POTENTIOMETER
Attaches to Elevation Motor and gives feedback to Upper Display as to what incline the treadmill is at. Needs to be calibrated whenever elevation motor is replaced. A Potentiometer should be checked whenever there is a problem with elevation or when Error Code PO comes up.

FACE PLATE
This overlay is found on our Sports Trainer, Pro Sports Trainer, and CRT models and is screwed onto the Upper Display Board.

FRAMES (SIDE)
One on either side, these connect with the Deck Slats and Motor Pan to form the frame of the machine.

FRAME COVERS (SIDE)
These sit on top of the Frame Rails and keep Deck in place. They also form the base for the Traction Strip.

IR POTENTIOMETER
The IR Pot is located on the PWM Motor Control Board and is used to adjust the time it takes the PWM to react to a load or amperage spike. It normally requires adjustment if the motor feels like its surging.

MEMBRANE PANEL
This takes information from the display membrane keys and transmits it to Upper Display Board via the ribbon cable. It is found on the PT, CT, and ET models.

PWM (Pulse Width Modulation) Motor Control Boards- Used mostly in home models but occasionally in commercial units. This circuit board is designed to run the drive motor. It takes the AC voltage from the wall outlet and changes it to DC voltage to run the drive motor. The AC voltage comes in on the L1 line and L2 line terminals on the PWM where it's rectified (change from AC to DC) and comes out as DC on terminals A+ and A- (Armature + and Armature -). Since the PWM motor control switches at such a high frequency, the DC voltage produced is "clean" and relatively free of electrical noise or static. In other words, it needs no external Capacitor or Choke (Inductor) to run the drive motor. It receives its commands from the Upper Display Board via the Relay Board. Generally these need the voltage coming out of the outlet to be + or – 8 % of the PWM rating. For example a 115v PWM should have outlet voltage of at least 106v with a maximum of 124v.

RELAY BOARDS
This circuit board controls the elevation relays, belt relays, DC transformer (for Upper Display Power), and diagnostic lights. It is only found on mills with PWM Motor Control Boards.

SAFETY LANYARD
This is a safety feature that completes a switch in the Display Board . If it is not connected the treadmill will not run.

SCR (Silicon Controlled Rectifier) Motor Control Boards-Used in LTD (110v) and Club Models (220v)
This circuit board is designed to run the drive motor, elevation relays, the belt relay, DC transformer for power to Upper Display Board, and on board diagnostic lights. The SCR requires a Capacitor and Choke to provide "clean" power to the Drive Motor. It receives its commands from the Upper Display Board and eliminates the need for a Relay Board. These require outlet voltage of + or – 10% of the SCR rating.

SLIPCOAT LUBRICANT
Recommended Treadbelt lubricant for Landice Commercial Treadmills

SPEED SENSOR
Landice uses a magnetic speed sensor to receive accurate speed readings. Readings are taken directly from the flywheel on the motor and sent to the Relay Board or SCR. Distance between the sensor and the flywheel is critical but the sensor is unaffected by dirt or dust build-up (unlike optical sensors).

TAKE UP ROLLER
This is the Roller at the rear of the treadmill. It completes the loop for Treadbelt movement and allows tracking and tension adjustment of Treadbelt.

TREADBELT
This is the surface the user walks on. It rides over the deck and rollers.

UPPER DISPLAY BOARD
This controls information from the Membrane panel and Face Plate. It then transmits it to the relay board on Home models and the SCR on Club or LTD models.

UPRIGHTS
One on either side, they house the wire harness, the upper display, the cross member and the handrails.

UPPER WIRE HARNESS
Transmits data from lower electronics to upper electronics.

VFX SYSTEM
Shock-absorbing Deck. Consists of wood Deck, VFX Deck Post, Deck Spacer, Deck Load Washer, Deck Felt Washer, and Deck Impact Absorber.

TESTING COMPONENTS

1. MOTOR COMPONENTS

DRIVE MOTOR:

Generation Test – all Landice drive motors (110 & 220) are direct current or 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 manual 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 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 (0-1000Ω).*

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

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

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

- *Turn the shaft in completely counterclockwise (0-1000Ω)*

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

2. 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-. 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. SEE PAGE 92)**

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 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-. 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.

RELAY BOARD

The relay board runs on AC voltage. The AC voltage is delivered to the relay board across two input terminals marked HOT and NEUT. The AC voltage then passes through one fuse or two (220 models) and lights the AC PWR led light. If this LED light is not on, first check the fuse/s. If the fuse/s are good measure across the input terminals HOT and NEUT to confirm proper AC voltage in (110/220VAC). If the relay board is receiving the proper AC voltage in but does not function properly, it must be replaced.

SPEED SENSOR

The speed sensor can be checked for proper operation by entering the Open Loop Speed Mode. (See page 56) There is a yellow SPD LED mounted to either the relay board (HOME PWM models) or the SCR board (LTD and CLUB models). 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. If this does not help, replace the speed sensor.

3. DISPLAY COMPONENTS

12 VDC POWER SUPPLY

Measure across the input terminals for AC line voltage (120/220VAC). Measure across the output wires for DC voltage (12.0VDC to 17.0VDC is acceptable). If you confirm proper input voltage (AC) and have no output voltage (DC) the DC power supply must be replaced.

UPPER DISPLAY BOARD

The upper display board is powered by DC voltage. On HOME treadmills this DC voltage is supplied by the DC power supply. On LTD/CLUB treadmills the SCR board supplies this DC voltage. Confirm the upper display is getting DC voltage delivered to it. If the display board has the proper DC voltage supplied and does not light, it must be replaced.

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.

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 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 opposite page. If you do not hear a "BEEP" or see the proper code appear the key is bad and the membrane panel must be replaced.

MEMBRANE PANEL BUTTON CODES					
CODE #	***Executive Trainer***	***Cardio Trainer***	***Pro Trainer***	***Pro Sports Trainer***	***Sport Trainer***
1	LEFT 1 (TOP)	MANUAL	START	START	START
2	LEFT 2	PROGRAMS	N/A	PAUSE	PAUSE
3	LEFT 3	CARDIO	PAUSE	DISPLAY	DISPLAY
4	LEFT 4 (BOTTOM)	UP	DISPLAY UP	PROGRAM SELECT	FAST
5	RIGHT 1 (TOP)	DOWN	DISPLAY DOWN	FAST	SLOW
6	RIGHT 2	DISPLAY UP	FAST	SLOW	UP
7	RIGHT 3	DISPLAY DOWN	SLOW	UP	DOWN
8	RIGHT 4 (BOTTOM)	FAST	UP	DOWN	
9	PREV	SLOW	DOWN		
10	MENU	START	FAT BURN		
11	NEXT	PAUSE	INTERMED		
12	START		ADVANCED		
13	PAUSE		INTERVALS		
14	FAST		HRC		
15	SLOW				
16	UP				
17	DOWN				

Conducting a membrane bypass test can also test the functionality of a membrane panel.

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. A membrane panel bypass test is conducted by literally taking the membrane and bypassing its functions. The membrane panel has small micro switches laminated inside that transmit the user's commands into treadmill functions. These functions can be simulated by means of a membrane bypass:

1. Disconnect the silver foil ribbon cable from the membrane panel.

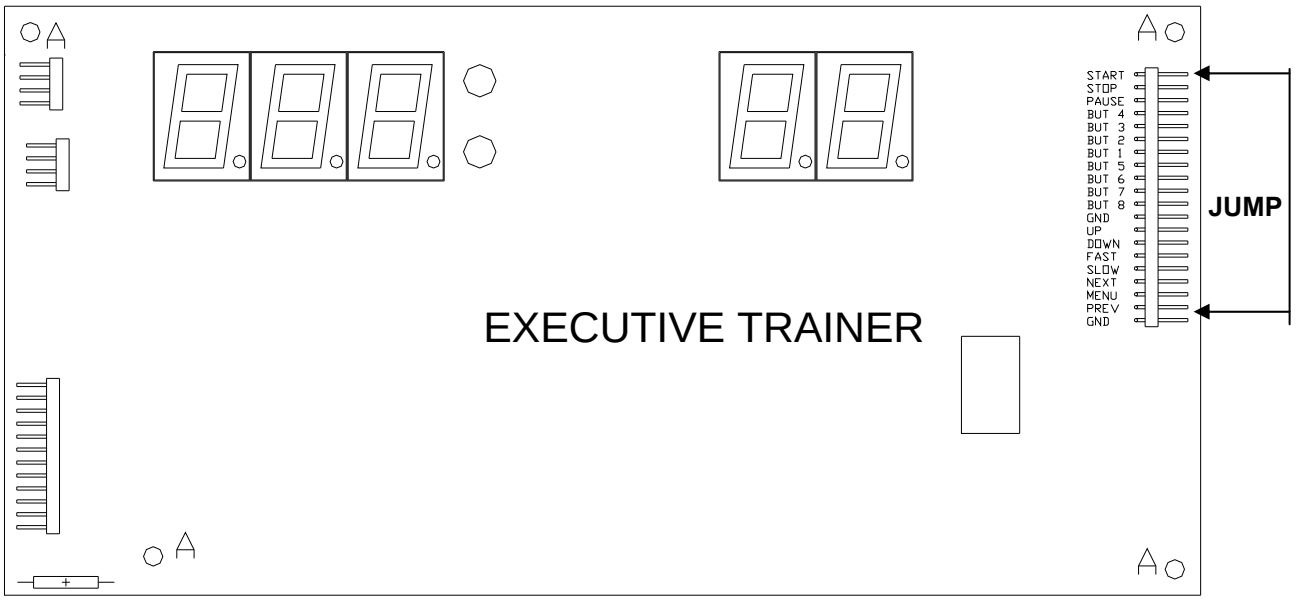
2. Remove the membrane panel completely from the upper display board.

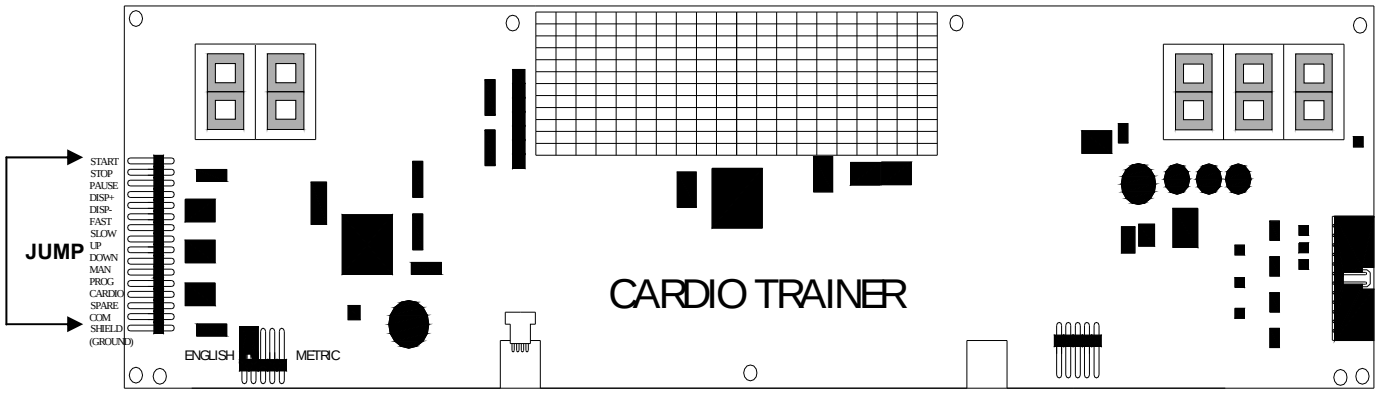
3. Use a **DRY** towel or a terry-cloth to wrap over the open area of the control panel frame. Place the upper display board with wire harness still attached on top of the towel to prevent it from touching any metal.

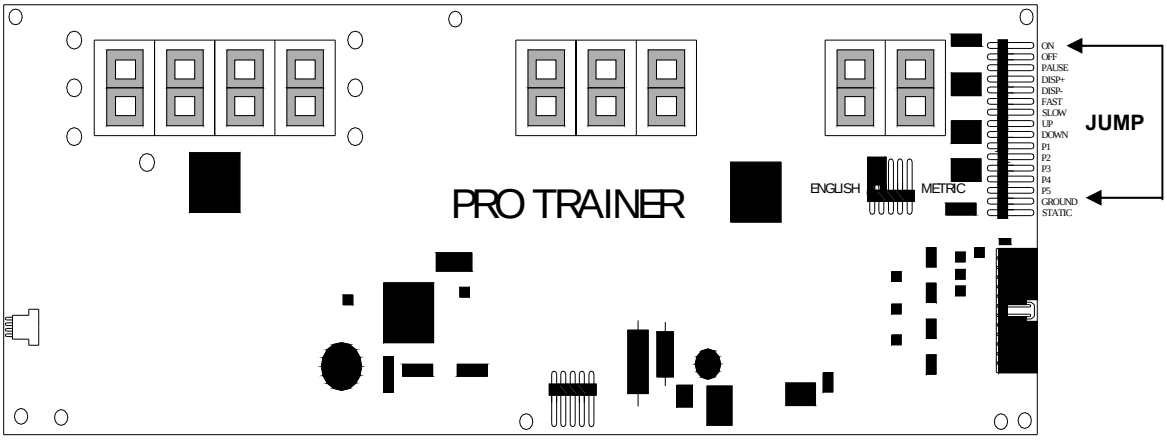
4. Look at the pins where the silver membrane ribbon cable connected to the display board. You should note that printed on the green circuit board behind each pin is it's specific function.

5. Using a jumper (i.e. a jumper wire with two copper ends, a paper clip, or a voltmeter set to continuity) bypass the start button by touching one end of the jumper to the pin labeled **GND** or **GROUND**, and the other end of the jumper to the pin labeled **START** or **ON**. (Note on page 2 where to locate these pins on various Landice display boards) If the membrane is bad the treadmill will turn on and read **"SAFE."**

6. If it is necessary, replace the damaged membrane panel.


START
STOP
PAUSE
BUT 4
BUT 3
BUT 2
BUT 1
BUT 5
BUT 6
BUT 7
BUT 8
GND
UP
DOWN
FAST
SLOW
NEXT
MENU
PREV
GND
JUMP
EXECUTIVE TRAINER


JUMP
START
STOP
PAUSE
DISP+
DISP-
FAST
SLOW
UP
DOWN
MAN
PROG
CARDIO
SPARE
COM
SHIELD
(GROUND)
ENGLISH
METRIC
CARDIO TRAINER


ON
OFF
PAUSE
DISP+
DISP-
FAST
SLOW
UP
DOWN
P1
P2
P3
P4
P5
GROUND
STATIC
JUMP
ENGLISH
METRIC
PRO TRAINER

COMMON SYMPTOMS

Symptom: Treadbelt feels like it's slipping or grabbing when walked on.

Possible Cause: Loose drive belt or treadbelt. Adjust as per manual. Remember to adjust only till slipping stops. **DO NOT OVERTIGHTEN**

Possible Cause: Worn treadbelt and/or deck. If treadbelt or deck is worn it will cause excessive friction and the user will feel like belt is slipping or grabbing.

1. Reach hand under front of treadbelt and see if deck feels rough, grooved, or if you see bare wood. These are signs the belt needs to replaced and the deck needs to be reversed or replaced if it has already been reversed.

2. Compare the outer edge of the treadbelt to the middle of the treadbelt. The outer edge wears less since the user walks near the center of the belt. You will be able to see the cross weave of fabric on a good treadbelt. This cross weave design traps air inside tiny pockets. The treadbelt glides on this trapped air. When a belt wears, the cross weave becomes flat and smooth. This is not good because there are no more pockets to catch the air. If the center of the treadbelt is smooth (glazed) and exhibits black streaks it's time to replace.

3. **If amp draw is high (8 amps or more on home) it is advisable to check belt and deck for wear. Tip: If Red Current Lamp is lit then Amp Draw is high.**

TREADBELTS AND DECK SURFACE SHOULD ALWAYS BE REPLACED TOGETHER IF EITHER IS WORN OUT.

Symptom: Treadmill slows down when user steps onto treadbelt.

Possible Cause: Worn out treadbelt or deck. See above.

Possible Cause: Worn or defective motor brushes and/or scorched commutator on drive motor. Dress out commutator and replace brushes.

Possible Cause: Demagnetized stator magnets on drive motor.
Make sure that treadmill is unplugged! Disconnect drive motor from lower circuit board. Hold the two motor wires, Black A+ and White A-, together and rotate the motor flywheel by hand. Get a good feel for the rotational friction of the drive motor. Then disconnect the two motor wires and rotate the drive motor by hand. If the drive motor begins to spin much easier, then your motor is not the problem. If you notice no difference, then replace the drive motor. **NOTE:** A good drive motor will spin freely with little friction when disconnected from the lower circuit board. If the two motor wires are connected together, the drive motor will become much harder to rotate. Also see: **Component Testing –Drive Motor**

Symptom: Treadbelt is moving diagonally.
If a belt is moving diagonally on the treadmill it can be corrected with the following steps:

1. Loosen the take up roller (both sides)
2. Take off the motor cover.
3. Loosen the drive roller adjustment bolt on the right side (opposite the sheave pulley).
4. Using a large screw driver or pry bar move the drive roller forward if the belt is angled right to left or backward if its angled left to right.
5. Tighten drive roller until star washer bites into aluminum frame, start treadmill, and adjust tracking. If belt is straight then put on motor cover. If belt is still not straight, go to #6.
6. If there is improvement and there is still room to move drive roller adjustment bolt, continue to adjust until fixed.
7. If there is no more adjustment on right side adjustment bolt, go to left side adjustment bolt (make sure to loosen the drive belt via the drive belt tension adjustment bolt and re-tension when done).

Landice has adjustment on the front roller to correct for this type of problem. The front roller will not be damaged by the adjustment providing these steps are followed. If this doesn't correct problem please call 1-800-LANDICE.

Symptom: Treadmill speed is erratic and/or surges.

Possible Cause: Defective drive motor
See Component Testing -drive motor:

Possible Cause: Loose drive belt or treadbelt.
Check for proper drive belt and treadbelt tension. If one of these belts are not tight enough, they will slip and create a treadbelt skip or surge. This will usually be more apparent with heavier users. (See belt-tensioning procedures)

Possible Cause: High drive motor current due to excessive treadbelt friction.
Check for treadbelt and tread deck for wear. Check that Red Lamp marked Current is not on.

Possible Cause: Worn or defective motor brushes and /or commutator.
Check Motor brushes move freely in holder. Brushes should be at least ¼ inch long, approximately the same length, and free of cracks, splits, and fraying.

Possible Cause: Line voltage surging.
Use voltmeter, monitor line voltage supply. Make sure customer has the treadmill plugged into a circuit that meets our electrical requirements. (Home & LTD Treadmills = 120V / 20 amp dedicated circuit), (Club Treadmills = 220V / 15 amp dedicated circuit)
NO extension cord should exceed 6 feet in length and must be 12Awg, same as linecord.
NO surge suppressors or GFI outlets.

Possible Cause: (PWM boards ONLY Home Mills) IR potentiometer out of adjustment.
Adjust the IR "pot" on the lower motor control board until the surge subsides.

IR POTENTIOMETER ADJUSTMENTS, PWM ONLY:

IR = I (amperage) R (resistance)

The IR potentiometer that is located next to the MAX speed potentiometer on the PWM motor control board is used to adjust the time it takes the PWM to react to a load or amperage spike. When the user steps onto the treadbelt a load is introduced to the system which creates an amperage spike. The PWM board senses this amperage spike and reacts by feeding more power to the drive motor. This “more power” compensates the amperage spike (load) and the treadmill does not slow down. If the IR was adjusted to react slowly the user would notice a lag in belt movement when stepping onto the treadbelt. If the IR was adjusted to react too quickly the user would notice a quick surge when stepping onto the treadbelt. Either way, the treadmill will surge considerably when this occurs. There have also been isolated cases where the treadmill will surge without a user walking on it. When this occurs, the red light on the PWM (LED1) will flash in sequence with the belt surge.

To adjust the IR potentiometer:

No load / belt surging / LED1 flashing = use a small screwdriver to rotate IR pot. Make this adjustment while the treadmill is running (surging). Rotate the pot in small increments until the treadmill surge subsides and runs smoothly.
NOTE: the IR pot can be rotated Clockwise or Counter Clockwise to achieve smooth operation.

With load / belt surging / LED1 may be flashing = use a small screwdriver to rotate IR pot. Make this adjustment while the user is walking on the treadmill. Rotate the pot in small increments until the treadmill surge subsides and runs smoothly. Keep speed setting under 2.0mph for safety.
NOTE: the IR pot can be rotated CW or CCW to achieve smooth operation.

Possible Cause: Damaged motor control board.
Disconnect the drive motor from the motor control board. Enter OLS (Open Loop Speed) mode and bring displayed speed to max. Measure with a voltmeter across the lower motor control board output terminals A+ and A-. Monitor the DC voltage on your meter. If the DC voltage is surging, the motor control board is defective. Replace the motor control board.

Symptom: Display reads “SAFE”

Possible Cause: Safety Lanyard is missing.
Solution: Replace Safety Lanyard.

Possible Cause: Defective Display Board.
Solution: Replace Display Board.

Symptom: Speed shown is not actual speed.

Possible Cause: Speed needs to be calibrated. The following page illustrates how to calibrate.

SPEED CALIBRATION: L-SERIES PWM TREADMILLS

1. Enter the O.L.S. Mode (Open Loop Speed) by pressing “MENU” and “START” simultaneously for Executive Trainers and “FAST” and “START” for all other models.
2. Adjust the max speed first. Bring the set speed to 12mph. Let actual speed stabilize.
3. Adjust the MAX potentiometer on the PWM motor control board accordingly. (See Picture on page 43)
   CW = increase speed / CCW = decrease speed.
   The actual speed will be displayed in the center display window.
4. Decrease set speed to 2.0mph. Let actual speed stabilize. Adjust the MIN pot accordingly. (1.9 to 2.1mph is acceptable)
5. Before turning treadmill off, check the MAX speed one more time for accuracy. If speed calibration does not fix problem suspect relay board failure.

REMOVAL AND REPLACEMENT OF COMPONENTS

1. Before beginning any removal or replacement of components unplug power cord from wall.
2. Make a note of serial number, model (L7, L8, Home, LTD, or Club) and type (Sport, Pro, Cardio, CRT, or Executive). Landice tracks all information from this serial number and it must be given when requesting parts or technical assistance.
3. Always remove one component at a time to test for problems and to simplify replacement.

POWER CORD (LINE CORD)

1. Unplug from wall. Remove motor cover screws and motor cover. Follow cord to where it enters frame. Remove screw holding Green wire to frame and remove Green wire. Remove Blue wire and Brown wire from motor control board. Remove old cord. Remove strain relief (have a spare in case it's damaged in removal). Push new cord through motor pan. Replace Strain Relief. Replace green ground wire to frame and Blue (Neutral) and Brown (Hot) wire to motor control board.

PWM or **MOTOR CONTROL BOARD (MCB)** – Cut plastic wire ties as needed but remember to replace them when done!

1. Remove Blue wire from L1. This wire connects MCB to Relay Board.
2. Remove White wire from L2. This wire connects MCB to Relay Board.
3. Remove White wire from A-. This wire connects MCB to Drive Motor.
4. Remove Black wire from A+. This wire connects MCB to Drive Motor.
5. Remove Orange wire from P1. This wire connects MCB to Relay Board.
6. Remove Brown wire from P2. This wire connects MCB to Relay Board.
7. Remove Purple wire from V+- This wire connects MCB to Relay Board.
8. Remove four screws attaching board to frame and remove MCB.
9. Reverse to install new MCB.

SCR – LTD and Club ONLY

1. Remove Clip with Blue, Orange, Brown, Red, Black , and White wires. These wires connect SCR to Elevation Motor.
2. Remove Clip with Red, Green, and Black wires. These wires connect SCR to Speed Sensor on Drive Motor.
3. Remove Black and White wires from connections marked MTR. These connect SCR to Drive Motor.
4. Remove Red wire. This connects SCR to Choke.
5. Remove Green wire. This connects SCR to Ground on Frame.
6. Remove Black wire. This connects SCR to Capacitor.
7. Remove White wire. This connects SCR to Capacitor.
8. Remove Clip with Green and Black wires. This SCR to Upper Display.
9. Remove Clip with Red, Blue, White, and Orange wires. This connects SCR to Control Panel.
10. Reverse to install.

CHOKE- LTD and Club ONLY
1. Remove Red wire. This connects Choke to SCR.
2. Remove Purple wire. This connects Choke to SCR.
3. Reverse to install.

CAPACITOR- LTD and Club ONLY
1. Remove White wire. This connects Capacitor to SCR.
2. Remove Black wire. This connects Capacitor to SCR.
3. Remove Purple wire. This connects Capacitor to Choke.
4. Remove Resistor. This connects both Poles of the Capacitor.
5. Reverse to install.

12 VDC TRANSFORMER REPLACEMENT

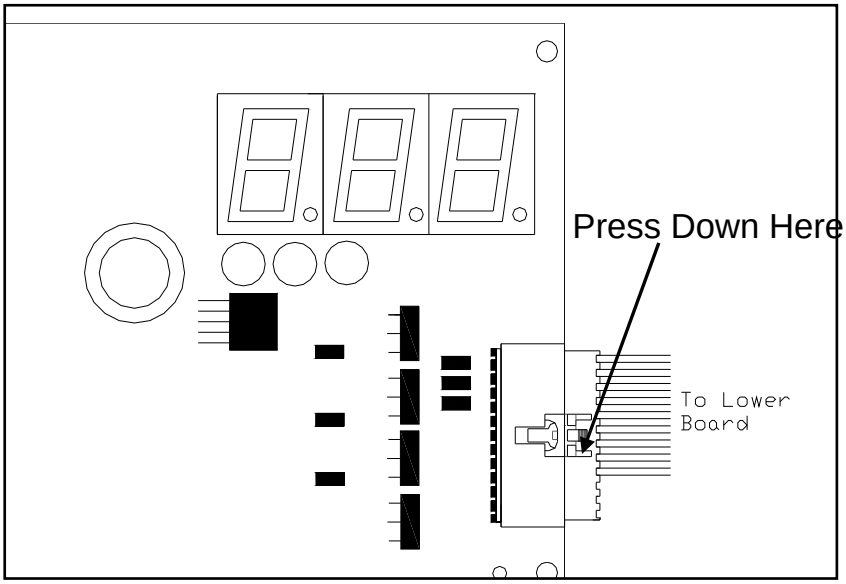
Observe the proper polarity when installing a new DC power transformer. Catastrophic damage can occur to the upper display board electronics if the DC polarity is reversed.

1. If your DC transformer has color coded fast-on (push on) connectors:
   Blue - negative (-)
   Red - positive (+)
2. If your DC transformer has fast-on (push on) connectors:
   Black Wire (smooth) - negative (-)
   Black Wire (ribbed) - positive (+)
3. If your DC transformer has pin-type connectors:
   Black Wire - negative (-)
   Black Wire w/ White strip - positive (+)
4. If you are retrofitting a new style DC transformer (Fast-On) connectors to a treadmill equipped with (Pin - Type) connectors follow these instructions.
   a. Snip the DC output wires six inches from the harness plug with a pair of diagonal cutters.
   b. Snip the FAST-ON connectors from the new DC transformer.
   c. Use solder-less butt-type connectors to splice the wires together.
   d. Use the information listed above to make sure the proper polarity is observed.

RELAY BOARD
1. Remove Orange wire from P1. This wire connects Relay Board to MCB.
2. Remove Brown wire from P2. This wire connects Relay Board to MCB.
3. Remove Purple wire from V+. This wire connects Relay to MCB.
4. Remove two (2), Black wires from DC Transformer. These wires connect Relay Board to DC Transformer. Note: Wires coming from Transformer are hard wired.
5. Remove Clip for Red, Green, and Black wires. These wires connect Relay Board to Speed Sensor mounted on Drive Motor.
6. Remove Clip for Blue, Orange, Brown, Red, Black, and White wires. These wires connect to Elevation Motor.
7. Remove Clip with Red, Brown, Blue, Yellow, White, Black, and Green wires labeled Upper Harness. This connects the Relay Board to the Upper Display.
8. Remove Four screws and remove board.
9. Reverse to install.

UPPER DISPLAY BOARD

1. Remove screws from upright on either side of display.
2. Remove Caps from Display.
3. Display is attached to upright with Velcro. Pull from top of display to remove.
4. Remove Membrane from Display.
5. Disconnect main wire harness clip. (See Diagram below) **IMPORTANT:**Remove the display board from the membrane BEFORE removing the wire harness from the defective display board. Please review the following to prevent breaking the connector: **The wire harness locks into place on the display board. Press firmly down on the clip to unlock and slowly move the harness side to side until it is disconnected from the display board.**



6. Reverse to install.

MEMBRANE PANEL

1. Remove screws from upright on either side of Display panel.
2. Remove Caps from Display panel.
3. Display is attached to upright with Velcro. Pull from top of Display panel to remove.
4. Disconnect main wire harness clip.
5. Lay display on a clean towel on a workbench and carefully remove Display Board from Membrane panel.
6. Reverse to install.

FACEPLATE (Replaces Membrane Panel on Sport Trainer and Pro Sports Trainer Models)

1. Remove screws from upright on either side of Faceplate.
2. Remove Caps from Faceplate.
3. Faceplate is attached to upright with Velcro. Pull from Top to remove.
4. Disconnect main wire harness clip.
5. Lay Faceplate on clean towel on workbench and carefully remove display board.
6. Reverse to install.

DRIVE MOTOR

1. Elevate treadmill to 15%. Unplug power cord.
2. Remove motor cover screws (4)
3. Disconnect white, green, and black wires from MCB.
4. If applicable remove green ground wire from frame.
5. Remove drive belt tension adjustment bolt by removing nut. Nut is located on bottom of motor pan. Note: See section on **Tracking and Tensioning**
6. Remove drive belt from motor.
7. Locate Drive Motor hitch pins on bottom of motor pan. Remove hitch pins using needle nose pliers. Note: When reinstalling hitch pins make sure to crimp ends to insure positive locking.
8. Remove 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 your 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.
9. Remove Drive motor. Be sure not to lose metal spacer from under right side.
10. When re installing make sure to properly position foam block under motor.
11. Reverse to install

DRIVE MOTOR BRUSHES

1. Unplug Treadmill.
2. Remove Motor Brush caps (2) with large flat head screwdriver.
3. Remove Motor Brushes and inspect. They should be replaced if 1/4 inch or less. Inspect motor Commutator for wear (Black-scoring present on copper segments) Try to dress out (clean up) Commutator with a Commutator stone or emery cloth.
4. When you reinstall motor brushes make sure the brush does not bind up in its holder. The motor brush must move freely the full length with zero resistance. If resistance is present you must carefully dress out the brush until the correct tolerance is achieved.

Motor brushes should be checked every 6 months on institutional treadmills and after 5 years on home units.

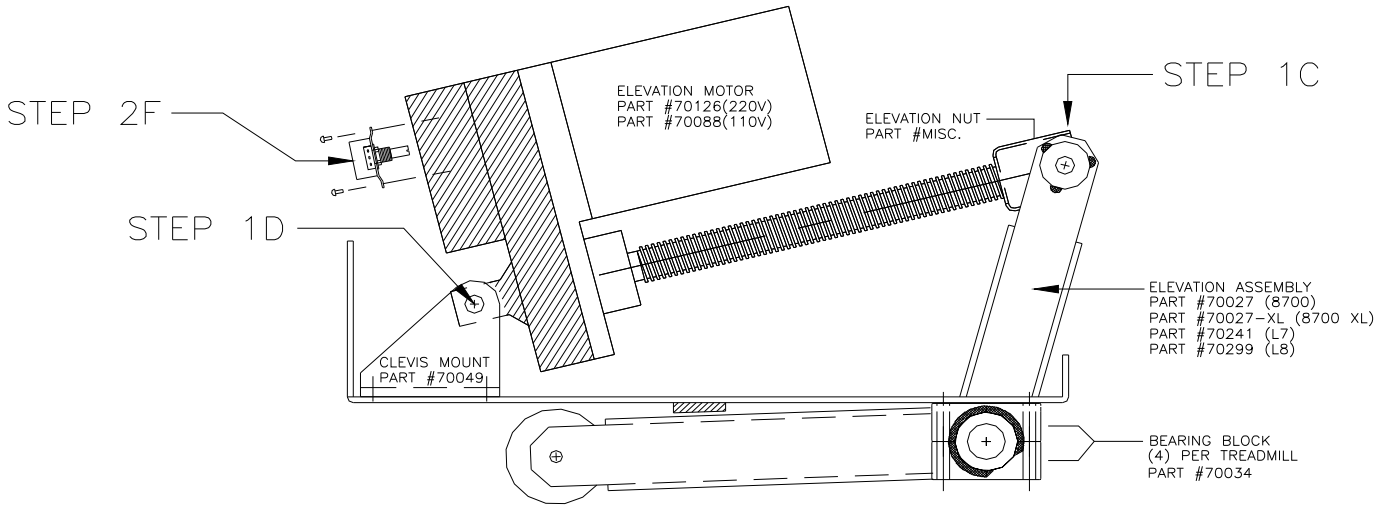
ELEVATION MOTOR

1. **Remove Elevation Motor.**
   A. Remove all weight from the elevation assembly by placing a suitably strong object under the under motor pan (many technicians use their toolbox) so that the wheels are in the air.
   B. Disconnect Elevation Motor wires. (Step 2F)
   C. Disconnect the Elevation Motor nut from the elevation assembly. To do this, loosen the two (2) ¼-20 screws and slide the two (2) ¼" dia. pins out. (Step 1C)
   D. Remove the 3/8" dia. Elevation Motor mounting pin from the Clevis mount. (Step 1D)
   E. Remove Elevation Motor.

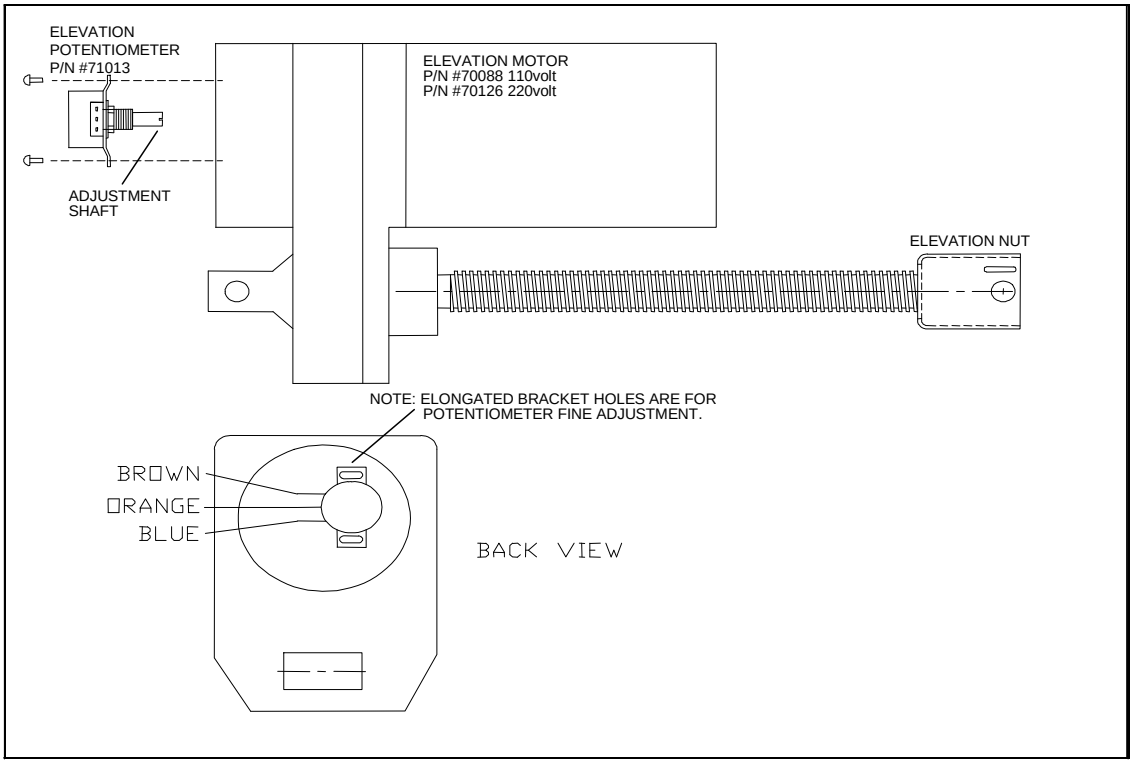
2. Install new Elevation Motor.

A. Remove your toolbox and set the treadmill on the ground.
B. Align the Elevation Motor with the Clevis mount and install the 3/8" diameter mounting pin. Insert the hitch pin.
C. Reconnect the Elevation Motor wires.
D. Enter diagnostic mode. (See page 56.) Press the UP key briefly and then hold the DOWN key until the motor stops. **NOTE: This process sets the elevation lower limit switch and <u>MUST</u> be done to obtain maximum elevation range.**
E. Hold the ¾" dia. elevation screw to prevent it from turning and turn the elevation nut to line it up with the holes on the elevation assembly (or just short of them). * NOTE-Leave approximately 2 threads open at end of elevation nut to insure proper alignment. Slide the two (2) ¼" dia. pins through the elevation assembly and into the elevation nut, then secure the pins with the two (2) ¼-20 screws.

Proceed with the instructions on the next page for calibrating the potentiometer.



ELEVATION POTENTIOMETER CALIBRATION



Enter Diagnostic Mode:

Press **OFF** to turn treadmill off.

L-Series ET's – Hold MENU & START

All other L-Series Treadmills - Hold DISPLAY (or up arrow Δ) & START

(Some older CT's, hold MANUAL & START)

Calibrate the elevation potentiometer:

1. Visually confirm treadmill is level. (0% grade). Press down arrow for elevation till machine is level.

2. The potentiometer should read 0 (zero) for all models after 11/7/00. Prior to 11/7/00, the potentiometer should be set to –0.4 to –0.6. NOTE: Elevation window shows actual elevation. Display shows potentiometer setting.

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. (**NOTE:** If the setting seems stuck at 25.5 check that pot wires are seated in the correct order and that upper wire harness connection is seated tightly.)

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 achieved after the potentiometer is secured into the motor housing.**

5. Press **OFF** to turn treadmill off.

ELEVATION LEG ASSEMBLY

1. Remove motor cover screws (4 screws) and remove motor cover.
2. Remove set screws (2) holding elevation motor to elevation leg assembly.
3. Remove elevation pins from elevation gear nut.
4. Carefully turn treadmill onto its side to gain access to elevation leg mounting brackets.
5. Remove screws from mounting brackets (2 on each side) and remove leg assembly. Note: On re-assembly be sure to lubricate brackets with Lubriplate.
6. Reverse to install.

TREADBELT AND DECK REMOVAL/DECK REVERSAL

L7

1. Remove Traction Strip from frame rail by lifting from end. Strip just snaps into place on grooves of frame rail.
2. Unscrew Take up Roller end caps.
3. Loosen Take up Roller adjustment bolts till belt is loose. Do both sides equally. Note: See section on **Tracking and Tensioning**
4. Remove frame rail cap from left & right sides (7 screws). Note: Felt washers under machined screws (3). You may need to use rubber mallet to loosen rail.
5. Remove Drive Belt from Drive Roller by loosening tension screw on Drive Motor Bracket.
6. Remove Drive Roller by loosening mounting bolts on left and right side.
7. Lift Deck off of VFX mounting posts.
8. Reverse to install. Note: Be sure to lubricate the VFX post with Lubriplate when re-installing Deck.

L8

1. Unscrew Take Up Roller End Caps (2 Philips Head Screws)
2. Loosen take up roller adjustment bolts (9/16) till treadbelt is loose. Do both sides equally. Note: See section on **Tracking and Tensioning**
3. Remove frame rail cap from left side (4 Philips Screws) and rear (2 Philips Screws). You may need to use a rubber mallet to loosen rail.
4. Lift Deck off of VFX mounting posts.
5. Reverse to install. Note: Be sure to lubricate the VFX post with Lubriplate when re-installing Deck.

Take Up Roller/ Rear Roller

L7

1. Remove Traction Strip from left side Frame Rail Cap. Traction Strip just snaps into place on grooves in Frame Rail Cap.
2. Remove Frame Rail Cap (7 screws). Note: Felt washers under (3) machined screws.
3. Remove End Caps (2 Screws)
4. Remove Roller bolts (2 Bolts). Note: See section on **Tracking and Tensioning**
5. Remove Metal Finger Guard (2 Screws)
6. Remove Roller.
7. Reverse to install

L8

1. Remove Frame Rail Cap from left side (4 Philips Head Screws) and rear (2 Philips Screws)
2. Remove End Caps (2 Philips Head Screws)
3. Remove 9/16 Roller Bolts (2 Bolts). Note: See section on **Tracking and Tensioning**
4. Remove Roller.
5. Reverse to install

Drive Roller/Front Roller

L7

1. Elevate treadmill to Maximum elevation.
2. Remove Motor Cover (4 Philips head screws)
3. Remove Traction Strip from left side Frame Rail Cap (7 Philips head screws). Note: Felt washers, (3) under machine screws.
4. Loosen Take-up Roller bolts with 9/16 wrench so Treadbelt is loose. Note: See section on **Tracking and Tensioning**
5. Loosen tension on Drive Belt adjustment screw. This nut (7/16 wrench) is located underneath motor pan. Note: See section on **Tracking and Tensioning**
6. Tilt motor toward rear of treadmill so Drive Belt is loose enough to come off Drive Roller Pulley.
7. Remove Philips Head Screws (2) that hold Drive Roller in place.
8. Remove Drive Roller.
9. Reverse to install.

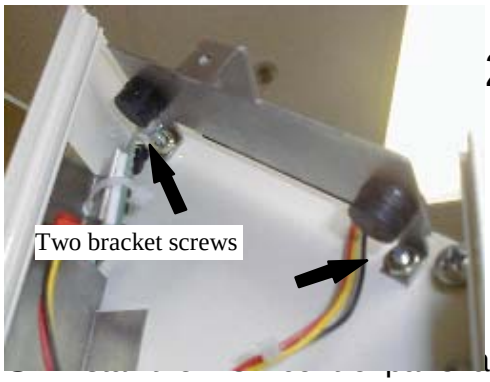
L8

10. Elevate treadmill to Maximum Elevation
11. Remove Motor Cover (4 Philips head screws)
12. Remove Frame Rail Cap from left side (4 Philips head screws) and rear (2 Philips head screws).
13. Loosen Take-up Roller (9/16 wrench) so Treadbelt is loose. Note: See section on **Tracking and Tensioning**
14. Loosen tension on Drive Belt adjustment screw. This nut (7/16 wrench) is located underneath motor pan. Note: See section on **Tracking and Tensioning**
15. Tilt motor toward rear of treadmill so drive belt is loose enough to come off Drive Roller Pulley.
16. Remove Philips Head Screws (2) that hold Drive Roller in place.
17. Remove Drive Roller.
18. Reverse to install.

DISPLAY CONTROL PACKAGE (DCP) INSTALLATION

1. Attach Heart Rate Control (HRC) module and bracket assembly to left upright leg. You will need to remove the control panel attachment screw in order to mount bracket.

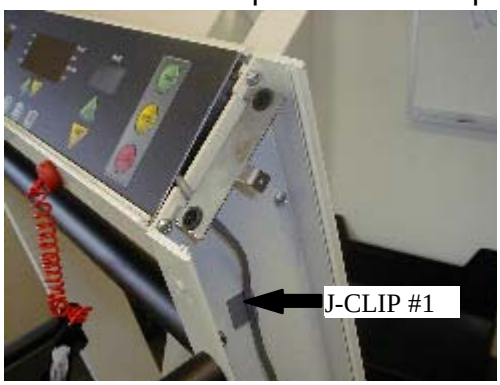
Next route the Pulse Bracket through the end cap bracket and reassemble it to the treadmill.

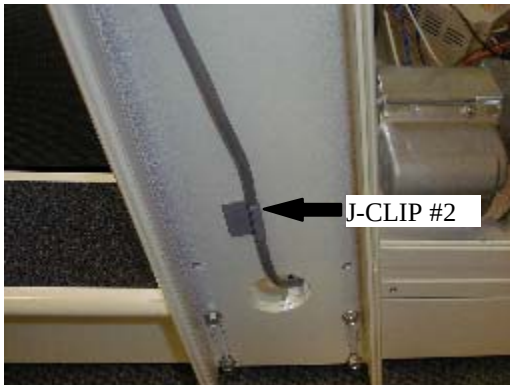


2. The HRC wire harness needs to be routed between the end cap bracket and control panel frame. Remove the control panel end cap bracket in order to properly route this harness. There is a notch in control panel frame for harness to pass through.

ssembly into the control panel frame.

4. Insert upper wire harness (located on the right hand side upright) into the display board. The harness connection has a locking clip designed to keep the harness connection tight. Make sure this clip is locked into place.



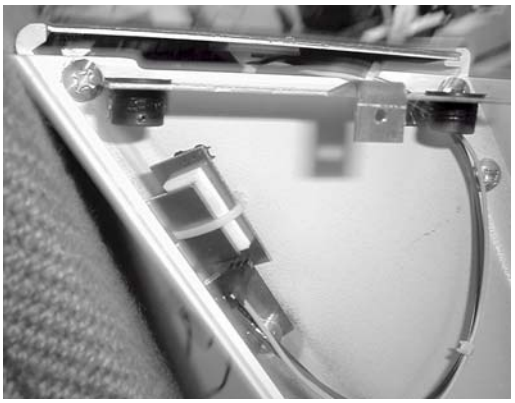


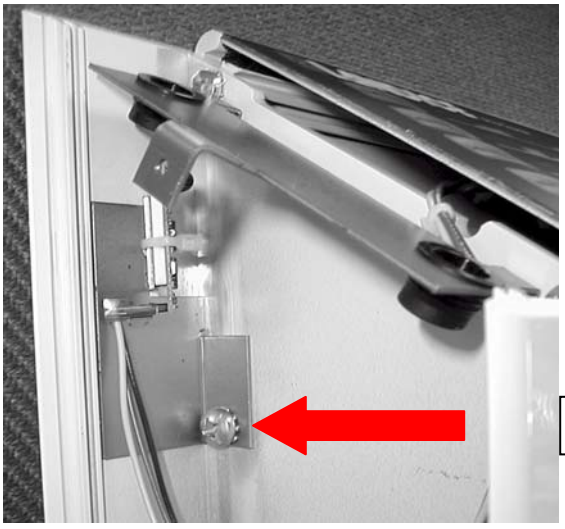
5 Secure upper wire harness to upright leg. The harness snaps intotwo “J-clips” mounted to the upright leg.

6. Refer to your owner’s manual for remaining assembly instructions.

INSTALLATION OF HEART RATE CONTROL COMPONENTS

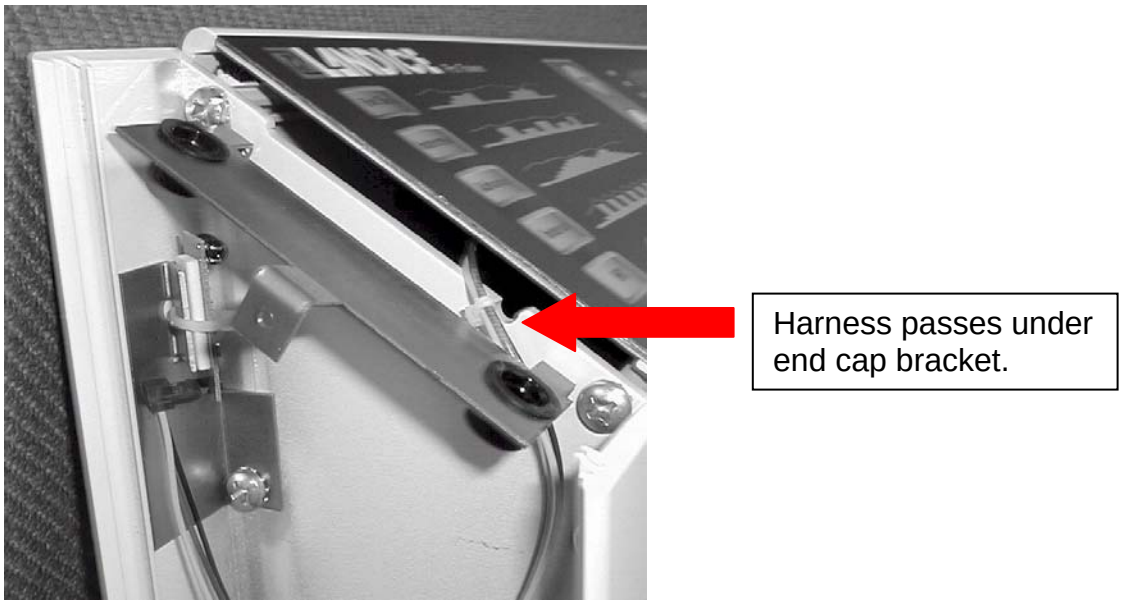
Step 1: UNPLUG the treadmill.
Step 2: Remove the left-hand control panel end cap.
Step 3: Remove the left-hand upright cover.
Step 4: Remove the membrane panel / display board assembly.
Step 5: Mount the heart rate receiver board & mounting bracket to the left-hand upright leg. The receiver is already secured to the bracket. The bracket mounts to the upright leg utilizing the existing frame screw.



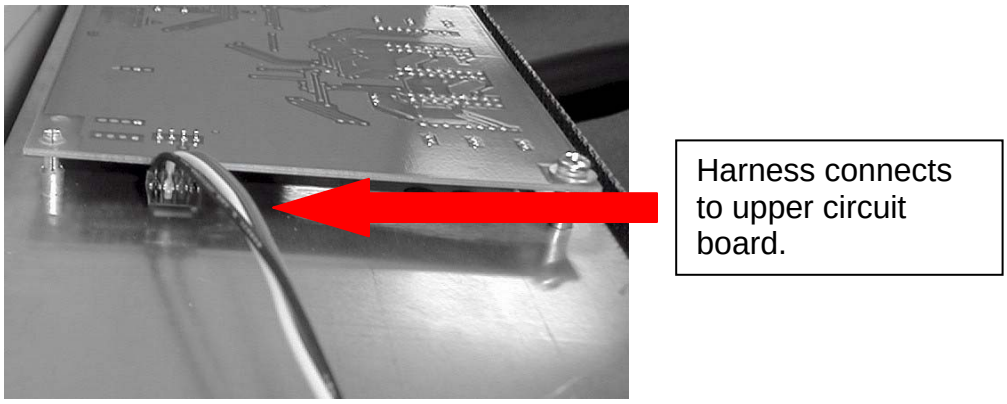


Existing frame screw.

Step 6: Route the harness between the control panel end cap mounting bracket and the upright leg.



Step 7: Attach the HRC harness to the upper display circuit board.



Step 8: Re-secure the membrane panel / display board assembly to the upper control panel frame.

NOTE: Before assembling the rest of the treadmill, check the operation of the HRC function

HRC TROUBLESHOOTING

The heart rate receiving hardware consists of two components, the receiver or pulse PCB (part #70283) and the pulse cable (part #70313). The pulse cable connects the pulse receiver to the upper display board.

Before attempting to troubleshoot the "receiving portion" of the HRC feature, CONFIRM THE TRAMSITTER BELT IS WORKING PROPERLY**. You can test the user's transmitter belt on another Landice treadmill or a Polar® wristwatch. If the transmitter is faulty, replace battery or return to Landice for replacement (if treadmill is under warranty).**

If the transmitter belt is functioning properly, proceed with the following steps.

1. **UNPLUG THE TREADMILL!**
2. **Remove the right hand upright cover to gain access to the heart rate components.**
3. **Confirm the heart rate components are present and in good visual condition.**
4. **Remove pulse cable from PCB board. Check for loose wires or bent/faulty pins. If all looks good, reconnect pulse cable to PCB card.**
5. **Remove pulse cable from Upper Display board (you will have to open control panel to gain access). Check for loose wires or bent/faulty pins. If all looks good, reconnect pulse cable to Upper Display board.**
6. **Test the HRC feature for proper operation.**
7. **If the HRC does not work replace the pulse cable (part#70313) and pulse PCB (part#70283)**

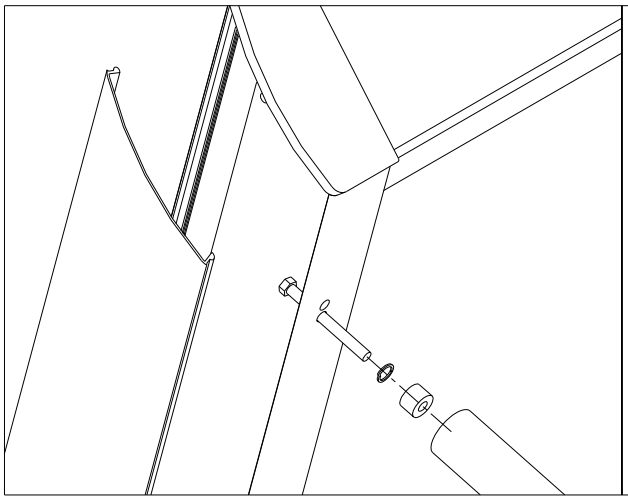
L7 MEDICAL RAIL FIELD INSTALLATION PROCEDURES

Tools needed for this installation:
Electric / Battery powered drill
Drill bit size 5/16" & 1/4"
Open end / combination wrench size – 7/16th
Allen wrench size – 3/16th (should be included with hardware kit)

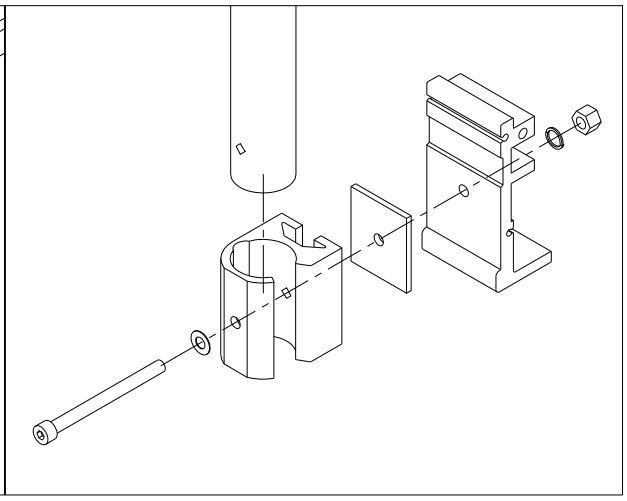
1. Turn treadmill ON and elevate to 15% grade.
2. Turn treadmill OFF and UNPLUG from power source.
3. Remove the left and right upright cover.
4. Remove existing u-shape handrail assemblies.
5. Install new medical rail to upright as shown in assembly drawing A.
   Drill Upright Mounting Holes:
   A. Measure 5 5/16" down from the line where each endcap meets the upright leg.
   B. Measure 1 5/16" from inside of upright leg. Using the 5/16" drill bit punch and drill the new holes at the marked points directly below the original top mounting points of the U-shaped handles.
   C. Use the white/black plugs to fill the bottom holes left by the U-shaped handles. The new medical rails will conceal the top holes.
   D. Install the handrails to the upright legs. This will allow you to mark the frame for lower mounting of the medical rail.

Drill Bed Mounting Holes:

6. Tighten medical rail to upright frame. You will need to drill a 1/4" hole in the treadmill frame in order to mount the lower medical rail. Use the hole in the lower medical rail as your template for drilling the mounting hole.
7. Install the lower medical rail mounting hardware as shown in assembly drawing B.



Assembly Drawing – A

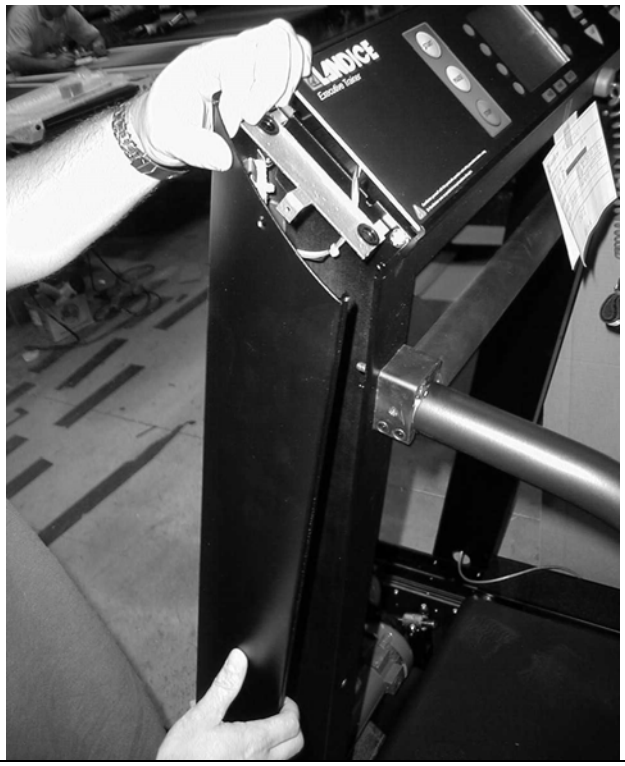


Assembly Drawing – B

L8 MEDICAL RAIL INSTALLATION INSTRUCTIONS

	1. Insert the side rail into the upper rail clamp and tighten the bolts using a 3/16” allen wrench.
	2. Fit the side rail to the bottom rail clamp.
	3. Use a soft mallet to firmly set the rails inside the clamp.

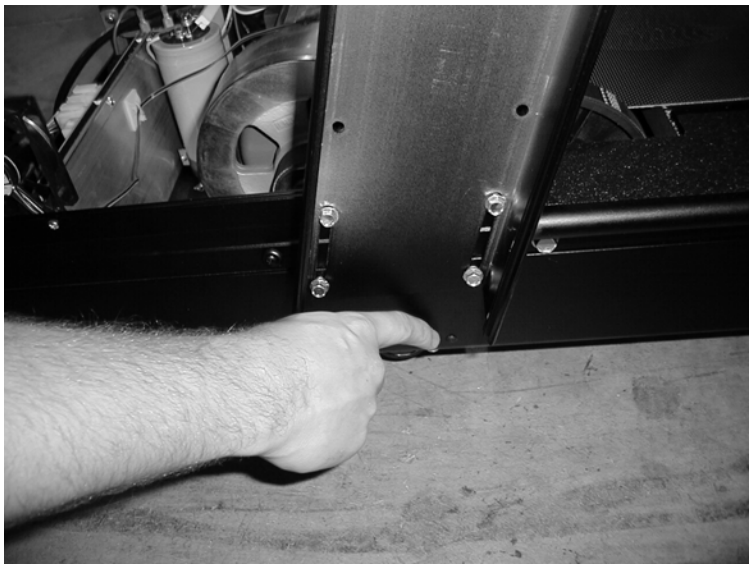
L8 MEDICAL RAIL INSTALLATION INSTRUCTIONS PART 2

	4. Again, use a 3/16” allen wrench to tighten the rail clamp bolts.
	5. Line up the upright side covers and firmly snap them into place.
	6. Place the plastic endcaps on the top corners of the control panel. Use the two small philips head screws stapled to the owner’s manual to secure the endcaps.

L9 HAND RAIL INSTALLATION INSTRUCTIONS

	1. Remove upright side covers.
	2. Slide upright legs onto the three bolts on either side of the frame.

L9 Hand Rail Installation Instructions PART 2

	3. Insert the fourth bolt (taped inside one of the upright legs) on either side of the frame.
	4. Tighten the four bolts on each side using a 7/16” socket wrench.
	5. **NOTE:** The two bottom holes on either side are unused on L9 models.

L9 Hand Rail Installation Instructions PART 3

	6. Insert the side rail into the upper rail clamp and tighten the bolts using a 3/16” allen wrench.
	7. Fit the side rail to the bottom rail clamp.
	8. Use a soft mallet to firmly set the rails inside the clamp.

L9 Hand Rail Installation Instructions PART 4

	9. Again, use a 3/16” allen wrench to tighten the rail clamp bolts.
	10. Line up the upright leg side covers and firmly snap them into place.
	11. Place the plastic endcaps on the top corners of the control panel. Use the two small philips head screws stapled to the owner’s manual to secure the endcaps.

NOISES

Many times a treadmill will tell you what's wrong with it by the noises it makes. We strongly recommend the use of an automotive stethoscope.

Service Tip: Treadmill making noise but can't tell from where.
Solution: Must isolate all moving parts.

1) Unplug treadmill.
2) Disconnect Drive Belt.
3) Turn treadmill on, listen for noise.
    a)If noise is not present proceed to next step.
    b)If noise is present, drive motor must be source.
4) *Reconnect the Drive Belt and loosen the Treadbelt completely.
5) Turn treadmill on, listen for noise.
    a)If noise is not present, Rear Roller must be source. (bearings)
    b)If noise is present, Drive Roller must be source. (bearings)
6) With Treadmill off, bounce or jog in place on Deck. If noise is present then deck or frame is making the noise.

* The Treadbelt must be loose enough that when the treadmill is powered up the Treadbelt does not move.

Rollers (Drive and Take up)- Rollers only have two moving parts, i.e. the bearings located on either end of the roller. The place to check for noise is on the shaft coming out of the roller since it is close to the bearings and doesn't move. Many technicians will hold the blade end of screwdriver onto the shaft and their ear next to the handle end to be sure they are identifying the location of the noise. The most common sound is a clicking that comes from a bearing that is no longer round. Other noises can be a rumbling (like rolling something around in a metal drum) and in worse cases a grinding metallic noise.

Treadbelt noises

Questions to ask:

1. Has the belt been broken in correctly? Treadbelts need to be walked on to have wax penetrate them. Starting at the back walk from side to side and up and down for at least 20-30 minutes to break in belt.

2. Is treadbelt tracked correctly? If belt is off to one side it may be rubbing, making noise. Track using bolts on rear roller.

3. Is treadbelt over-tightened? This is the most common cause of groaning type noises. First, loosen treadbelt and see if noise goes away. If noise goes away, tighten belt only until there is no slippage when walking.

4. On L7 models check that end cap is not mis-aligned. Re-align end caps so they are flush with side frame covers. If that doesn't solve problem replace rear roller bolts.

5. Is belt rubbing on cross brace underneath treadmill? Sometimes these get bent during shipping. Bend back so belt will not rub.

6. Is there excess wax build up on deck, belt, and rear roller? Remove belt and wipe down deck and rear rollers.

7. Is there excess Slip Cote? If you see Slip Cote oozing from sides of belt or off end of deck remove belt and wipe down deck, belt, and rollers.

8. Is it a commercial treadmill? Landice uses a stiffer belt on Club models to increase treadbelt life. These stiffer belts make more noise and are considered normal.

9. On older machines check that the treadbelt and deck are not worn excessively and making noise. We recommend the replacement of both deck and belt if either is worn.

10. Does noise occur when seam passes over roller? A slight amount of noise is normal. If it is excessive check the seam for damage or for wax buildup on roller.

11. If noise occurs when walking, check that customer is not walking too far to the rear causing the belt to drag over the rear of the deck.

12. Noises can travel. Make sure noises are not coming from rollers, drive belt, drive motor, rear roller touching frame, mis-aligned end caps, or deck. Use automotive stethoscope and or process of elimination to be sure where noise is coming from.

13. Check that Drive roller is parallel to Take Up roller. If its not, the belt will be tensioned unevenly. Some adjustment is possible on front roller (try side opposite motor and pulley first) and should be enough to bring Drive and Take Up roller into correct alignment.

14. Check that frame is square. Sometimes mills can be jarred out of square and this can causetracking and noise problems. Check frame corners with square.

Note: Always make sure you have a new deck surface when replacing treadbelt. Also if deck appears higher than usual so that it seems to be rubbing against frame, try installing additional felt washers between the frame and rear of the deck.

Special Note: ***Most Treadmills built between July of 2001 and January 2002 had a "floating" Take up roller design in which the roller would rest solely on the tension bolts. Occasionally if a customer stepped on the rear roller as they got off the machine they would bend the roller down. This caused a variety of problems including sheared holes in the bed end caps, and treadbelt rubbing noises because of the belt being bent down and catching the safety brackets on the back of the deck as it rolls. The solution to this problem was a new Take up roller with a "wing tipped" shaft that rested against the inside of the treadmill frame. This way there is no play and customer cannot bend the take-up roller down anymore.***

Decks and VFX - Decks are solid pieces of wood with a phenolic coating that rest on the VFX cushioning system.

1. The deck can make a squeaking noise when the VFX hardware is not properly tightened or lubricated. You can test for this by bouncing on the deck when the machine is not running.
2. Sometimes the deck will need to be lubricated on the sides that go into the frame rails. Use Lubriplate grease sparingly.
3. If a part on the VFX system is broken the deck will make a clunky noise when it bounces against the damaged part.
4. A deck can also make a scraping noise when it is worn out.

Drive Belts- Drive belts make a high pitched squeal when they are worn or improperly tensioned. It can also happen when the drive pulley and Drive roller are mis-aligned.

Elevation Motor- Elevation Motors consist of an electric motor and screw shaft.

1. Elevation Motor makes a crunchy noise when the main screw gear is dirty or corroded.
2. It may make a grinding noise if the gearbox is damaged.
3. Always check that the motor itself is not damaged and making noises because of broken mounts, etc.

Drive Motor- The Drive Motor is an electric motor with a flywheel and pulley attached. The only serviceable parts are the Drive Motor Brushes.

1. Drive Motors can make a clicking noise if the bearings in the motor shaft are no longer round.
2. Grinding noise if the bearings are shot.
3. Thumping, clunky noise if the drive shaft is bent or broken.
4. Tinny or clicking sound if the fan is rubbing against the fan cover.
5. Metallic grinding noise if the motor brushes are very worn.
6. Buzzing noise if the brushes are hung up in the brush holder.
7. Whining noise from bearings or internal problems.
8. Humming noises could be a faulty Capacitor, Choke Filter, or lower board affecting motor.

Visual Clues-

To paraphrase Yogi Berra, sometimes you can see a lot just by looking. The following is a breakdown of things to look for when troubleshooting these components.

Decks- Check for wood showing through black phenolic. Check for ridges or cupping of deck especially in front middle of deck. Both of these indicate that deck should be replaced or reversed if other side is unused.

Drive Motors-

1. Motor Brushes-
   a. Are they worn so that less than 3/8 of an inch is left? Replace Brushes.
   b. Are they wearing on an angle? Check that brushes are seated correctly and that motor brush holder and spring are installed properly.
2. Commutator-
   a. Is it burnt, scratched, or scored? Use commutator stone to clean. If it is too badly damaged motor must be replaced.
3. Motor Shaft-
   a. Does it seem to wobble? Check that flywheel and pulley are tight and in line.
   b. Is shaft visibly bent? Replace motor.

Electronic Boards-

1. Any burn marks? Check for correct voltage coming in and out of board. If voltage is incorrect replace board.
2. Loose or detached components? Reattach if possible or replace if not.

Elevation Motor-

1. Check for fractured housing or broken motor mounts- Replace if necessary

Treadbelts-

1. Check for fraying on sides of belt. Likely cause is improper tracking. Check if tracked correctly. If minor, cut frayed ends off. If major, replace belt.
2. Lines or wear or top of belt one or two inches in from sides. Caused by user standing on side rails and letting heel of shoe rub on belt. Instruct user on proper use of treadmill.
3. Running on diagonal. Check the belt is tracked correctly. Check that front roller is properly aligned. Rarely, treadmill frame may be out of square.
4. Underneath belt- If belt is glazed, has black lines running through it, or is worn through backing, replace belt and use new deck surface.

Treadmill- Does it appear to be off level? Check that wheels in front are not broken. Check that feet in back are installed properly. Check that mill is on level surface and shim accordingly.

VOLTAGE TESTS

Variance in voltage affects treadmill performance

1. Confirm incoming line voltage: 120/220VAC –
   PWM Units: Measuring between **Hot and Neutral** on relay board.
   Measuring between **L1** and **L2** wires on PWM board.
   SCR Units: Measuring between **Hot and Neutral** on SCR board.

For 115V and 230V rated PWM's acceptable variance is + or - 8%. For SCR's acceptable variance is + or - 10%.

2. Confirm 12-17 VDC (plug into outlet) output voltage from DC (Transformer) pack.

3. Confirm 10 VDC (for 110V) and 20 VDC (for 220V) out of Motor Control Board per mile per hour. See example

Example:
SCR: Measure between MTR+ and MTR-
PWM: Measure between A+ and A-
In both of these examples we have should have a voltage reading of 30VDC for 110V and 60VDC for 220V @3mph.

4. Confirm 12-17 VDC between Black and Green wires on main wire harness. This is power being delivered to the upper display board.

5. Confirm incoming voltage: 6-7 VDC between V+ and P1, 0-7VDC between P1and P2 (will vary in relation to speed indicated)

DIAGNOSTIC GUIDE

To Enter Diagnostics
L7 and L8- Press and hold **Display Key** then press **Start Key.**
L7 and L8 Executive model only- Press and hold **Menu Key,** then press **Start Key.**

Error Codes shown on Display

LS (can look like L5)- Loss of signal. See Flowchart for LS pages 63,64,69,70

OS (can look like O5)-
An OS or 05 error indicates a treadmill Over Speed condition. This occurs when the actual treadbelt speed is faster than the desired selected speed. There is a potential for this to occur under the following circumstances:

1. User weight is over 200 lbs., treadmill elevation is set between 10% and 15% grade, and selected speed is set between .5mph and 3.0mph.
2. If user pushes against treadbelt causing it to go faster than speed set.
3. Defective MCB or mis-aligned speed sensor.

Gravitational force will enable the user's weight to move the treadbelt faster. The speed sensor will pick up this increase in flywheel speed and send this up to the display board electronics. The microprocessor will then compare the actual speed to the displayed speed, determine a runaway speed condition and shut the treadmill down. An OS or 05 will be displayed in the two-digit selectable display window. This is a safety feature built into all treadmills that utilize our closed loop speed circuitry (ALL current production treadmills).

The only way to remedy an over speed condition due to gravity is to have the user decrease the treadmill elevation under 10% grade or increase the speed.

If user is holding onto handrails and pushing the treadbelt (using it like a manual treadmill rather than a motorized one) it will cause an O5 error. Solution: Don't push on the treadbelt.

It's possible a blown Motor Control Board is the problem. This occurs more frequently with PWM drives than SCR drives. However, this problem is becoming rare due to the PWM circuitry which senses this condition and shuts itself down before the Drive Motor receives any DC voltage at all. This means you'll get an LS or L5 error if your PWM is blown, not an OS or 05 error. This is a safety feature on all Landice Home treadmills with PWM Motor Control Boards. The SCR Motor Control Boards also have internal protection to prevent an over speed condition from occurring due to an internal component failure.

OS can also be caused by a maladjusted Speed Pot. Go into **OLS** and check speed. Adjust pots as necessary to bring up correct speed.

Finally, in the rarest of cases, on home treadmills, a faulty relay board can cause an **OS**. To verify this, using a digital voltmeter, and with the treadmill turned on, measure the DC voltage between V+ and P1 on the PWM board. The reading should be between 6-7VDC. Also measure the DC voltage between P1 and P2 on the PWM. The reading should be between 0.5VDC and 6-7VDC. If either of these voltages measure zero the relay board needs to be replaced.

PO- Elevation Potentiometer is out of range. See Flowchart for PO

The following codes apply only to mills with SCR Control boards

CE- Communication Error resulting from upper/lower board failure or harness connection problem.

When in Diagnostic mode and an error is detected the following codes will appear:

ERR 1- Upper board Ram error. Replace board.

ERR 2- Upper board ROM error (try replacing E Prom)
ERR 4- Upper Board NVRAM error. Replace board
ERR 8- Upper board serial port pin error (check harness connections)
ERR 16- Communication Error
Note: If two or more errors are detected, the code will be the sum of the individual error codes. Example: Err 12= Err 8 + Err 4

L-SERIES EXECUTIVE TRAINER ERROR CODES:

The Executive Trainer software is designed with special error codes to display when experiencing a system failure. Here is a list of error codes, their meanings and diagnostics.

Error Code: SAFETY SHUTDOWN / Loss of signal (**WITH belt movement**)
Meaning: upper display is not receiving signal from speed sensor.
Diagnostics: Refer to diagnostic guide: LS error, treadbelt movement.

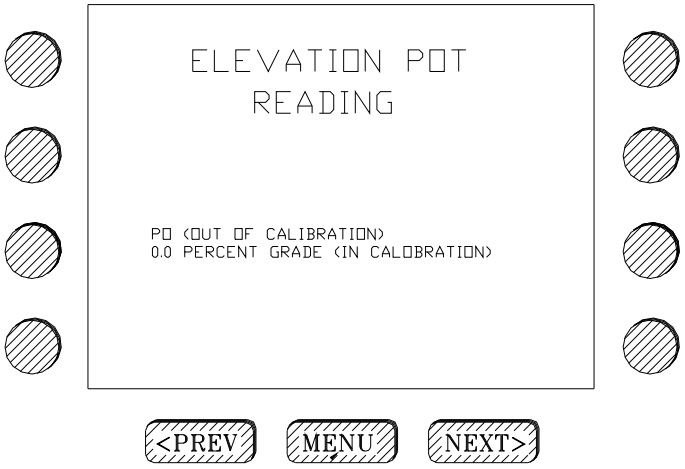
Error Code: SAFETY SHUTDOWN / Loss of signal (**NO belt movement**)
Meaning: upper display is not receiving signal from speed sensor because the drive motor is not moving.
Diagnostics: refer to diagnostic guide: LS error, treadbelt does NOT move.

LS will appear in the two-digit displayed speed window

Error Code: SAFETY SHUTDOWN / Error detected in elevation controller
Meaning: Elevation potentiometer is out of calibration and/or system failure.
Diagnostic: Refer to diagnostic guide: Elevation system failure, “PO”

PO will appear in two-digit speed window.

NOTE: Regular start up: pressing the OK button will over ride the error and allow the treadmill to run.



This screen will be displayed in diagnostic mode after OK button is pressed.

Diagnostic Mode: you must press the OK button in order to proceed with troubleshooting the elevation system failure.

Error Code: SAFETY SHUTDOWN / Over Speed
Meaning: The actual belt speed is exceeding the user's set speed.
Example: User sets speed to 1.0mph, the actual belt speed registers 2.0mph.
The treadmill will shut down and display an error in both upper displays.
Diagnostics: Refer to diagnostic guide and proceed with checking the speed calibration.

OS will appear in the two-digit speed window

Error Code: SAFETY SHUTDOWN / Replace Safety Key
Meaning: The display board does not sense the presence of the safety key.
Diagnostics: Make sure the safety key is installed in the proper location.

Instructions for Rebooting Executive Trainer Software

Executive Trainers with Version 2.0 Software or older (circa 12/2001).

While the treadmill is off, you must hold down three (3) buttons simultaneously:

1. PREV
2. The third circular gray button down on the left side of the LCD screen.
3. START

Release the buttons after you see “Booting” show on the LCD screen.

This will reset the on board computer and all saved programs will be lost.

Executive Trainers with Version 2.1 Software and after (after 12/2001).

Follow the same procedure listed above but replace with these three buttons.

1. DOWN
2. PAUSE
3. START

Symptom: Executive Trainer LCD is too dim or too bright
Possible Cause: Needs to be adjusted

Follow setup menu to adjust contrast of LCD. If display is still bad (too bright / too dim), continue to step 1

STEP 1:

A. Make sure that the power connector is securely connected from the LCD Screen to the display board.
B. The notches on the display board meet with the notches on the LCD cable connector (yellow wires should come out away from membrane).

STEP 2:

A. Top yellow LCD extension cable should be aligned with the top white LCD cable.
B. Bottom yellow LCD extension cable should be aligned with the bottom white LCD cable.

STEP 3:

A. The ribbon cable connector should be placed on the LCD leaving the last two pins to the right open.

STEP 4:

A. Disconnect the brown LCD connector from the black LCD extension cable connector.
B. Using a volt meter set to AC Voltage, check the voltage between the two yellow LCD extension cables (can be tested on the two exposed prongs on black connector.
C. It should be 130 Volts AC

***If 130 volts, replace LCD; not 130 volts, replace display board.

LANDICE TREADMILLS

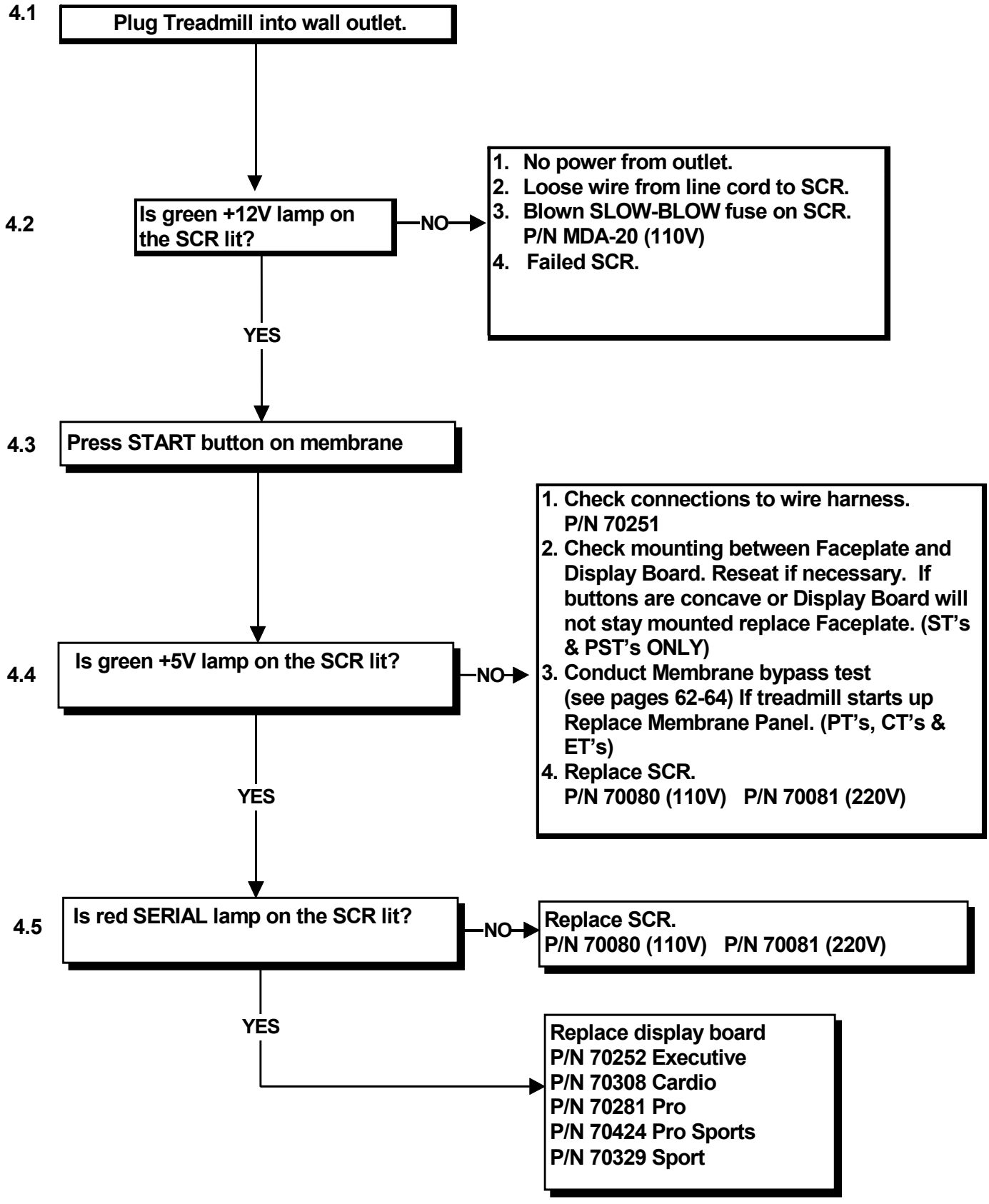
111 Canfield Avenue • Randolph, New Jersey 07869 • 800-LANDICE • FAX 973-927-0630

L – Series Commercial Diagnostic Flow Charts

L7, L8, & L9
EXECUTIVE TRAINER
CARDIO TRAINER
PRO TRAINER
PRO SPORTS TRAINER
SPORT TRAINER

TECHNICAL SUPPORT CALL 1-800-LANDICE

Upper display fails to light when START is pressed.



Display lights up; treadbelt does not move; L5 error.

5.1 Plug Treadmill into wall outlet and press START. Is "SAFE" displayed?

YES →
1. Red Saftey Lanyard is not in the correct position.
2. Replace display board.

NO ↓

5.2 Is red SERIAL lamp on the SCR lit?

YES →
1. Check wiring harness connection between Upper display and SCR.
2. Replace display board.

NO ↓

5.3 Place the treadmill in Speed Override Mode:
WARNING: DO NOT STAND ON THE TREADBELT IN THIS MODE.
1. L7 & L8 ET - Press MENU and START simultaneously.
2. All other L7 & L8 - Press FAST and START simultaneously.
3. Hold the fast button until the display reads 11.

5.4 Is the yellow RLC lamp on the SCR lit?

NO →
1. Unplug the treadmill from its outlet.
2. Walk on the belt manually. (push)
3. Does the yellow MOTOR lamp light ?

YES ↓ Go back into Speed Override Mode. → YES

NO → Bypass Filter Choke by pulling PURPLE and RED wires off of choke. Jump wires and start treadmill. Does Treadmill Start?

YES → Failed Filter Choke.

NO → Bypass Capacitor by removing PURPLE and BLACK wires off of Possitive (+) side of Cap. Tape wires and start treadmill. Does Treadmill Start? **YES = Bad Capacitor, NO = Perform Generation Test on drive motor (See page 60) PASS = bad SCR, FAIL = bad Drive Motor.**

5.5 Is yellow MOTOR lamp on the SCR lit?

YES →
1. Loose wire connection to motor, capacitor, or choke.
2. Loose brush holder screw on motor. (Check both)
3. Failed drive motor.

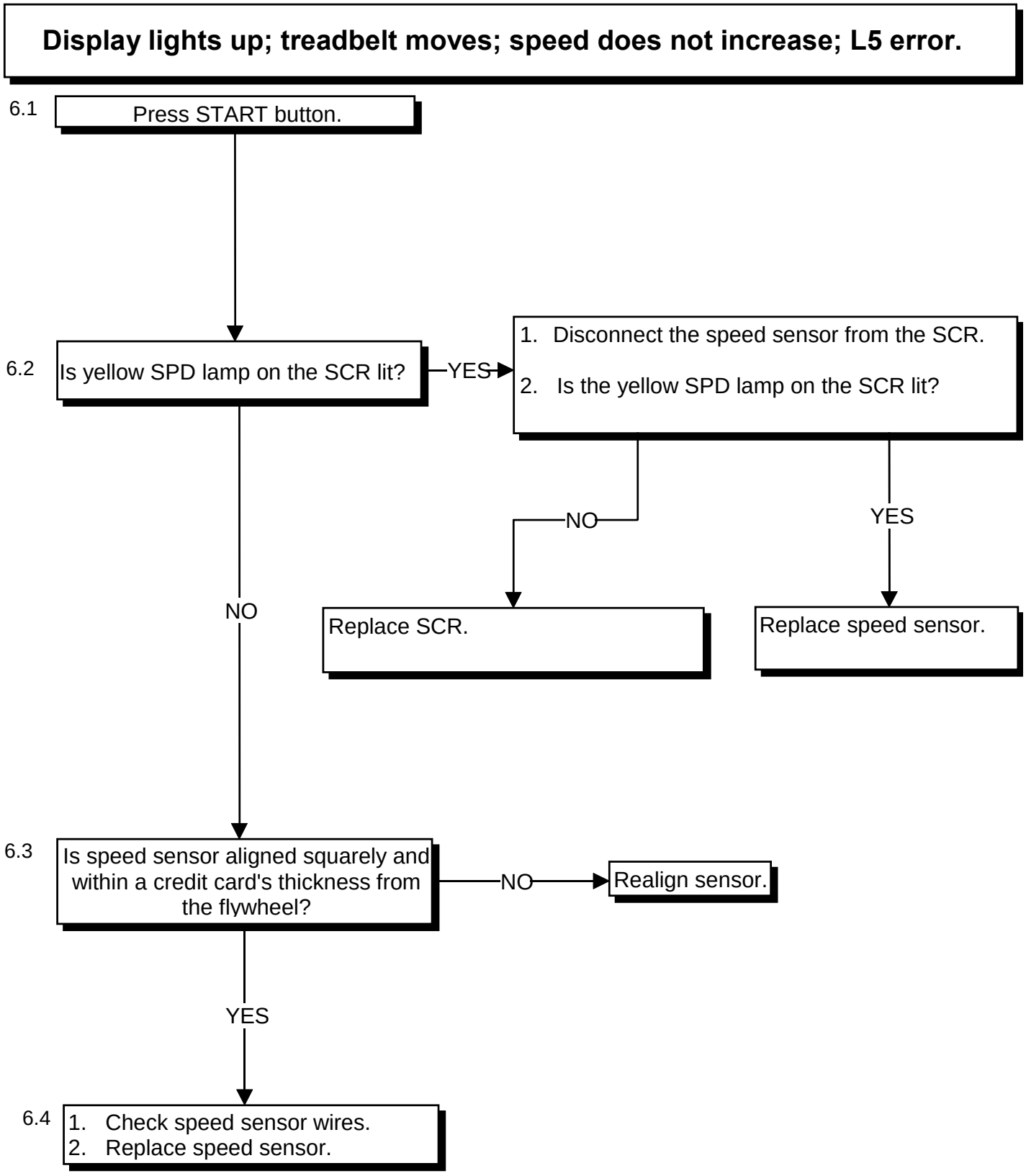
NO ↓

5.6
1. Unscrew motor control board.
2. Take red IND wire out of terminal block.
3. Take MTR+ wire out and put it in the IND terminal.
4. Press START. Does the treadmill run?

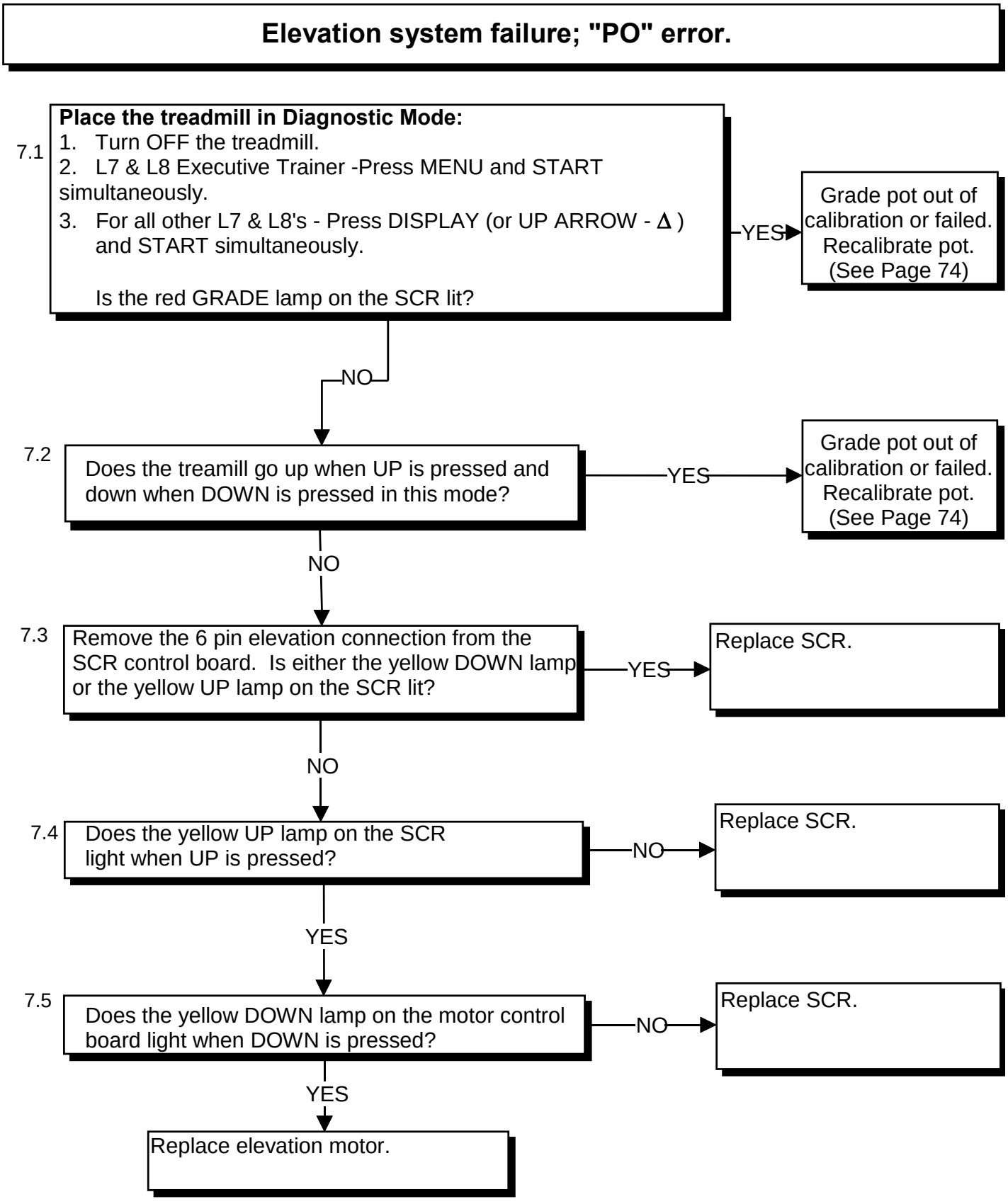
NO → Failed drive motor.

YES ↓

5.7 1. SCR is Bad. Replace SCR.


Display lights up; treadbelt moves; speed does not increase; L5 error.
6.1
Press START button.
6.2
Is yellow SPD lamp on the SCR lit?
YES
1. Disconnect the speed sensor from the SCR.
2. Is the yellow SPD lamp on the SCR lit?
NO
YES
Replace SCR.
Replace speed sensor.
NO
6.3
Is speed sensor aligned squarely and within a credit card's thickness from the flywheel?
NO
Realign sensor.
YES
6.4
1. Check speed sensor wires.
2. Replace speed sensor.

Elevation system failure; "PO" error.



LANDICE TREADMILLS

111 Canfield Avenue • Randolph, New Jersey 07869 • 800-LANDICE • FAX 973-927-0630

L - Series Home Treadmill Diagnostic Flow Charts

L7 & L8
EXECUTIVE TRAINER
CARDIO TRAINER
PRO TRAINER
PRO SPORTS TRAINER
SPORT TRAINER

TECHNICAL SUPPORT CALL 1-800-LANDICE

Upper display fails to light when START is pressed.

4.1 Is the green AC PWR light on the relay board lit?

NO

1. Plug a lamp into the wall outlet to confirm it it is live.
2. Check line cord condition and connection.
3. Unplug treadmill and use a multimeter to check the fuse. If it is bad, swap with a spare MDA-20 fuse.
4. Plug in treadmill and use a multimeter to check for 120VAC across HOT and NEUT terminals of relay board.

YES

4.2 Is the green VDC light on the relay board lit?

NO

1. Check all connections to black 12VDC power supply.
2. Confirm the wire with a dashed white line (or ribbed black) is plugged into +VDC terminal on the relay board.
3. Confirm the solid black wire is plugged into SGND terminal on the relay board.
4. Replace 12VDC power supply.

YES

4.3

1. Unplug the 9 wire connector from the relay board and inspect all wires for a loose or pushed pin. Be sure harness is routed under the elevation motor and secured with a plastic zip-tie.
2. Unplug the 12 wire connector from the upper display board and inspect all wires for a loose fit or pushed pin. Check for 12 to 15VDC across the Black (+) wire and the Green (-) wire.

Are harness wire connections intact?

YES

4.4

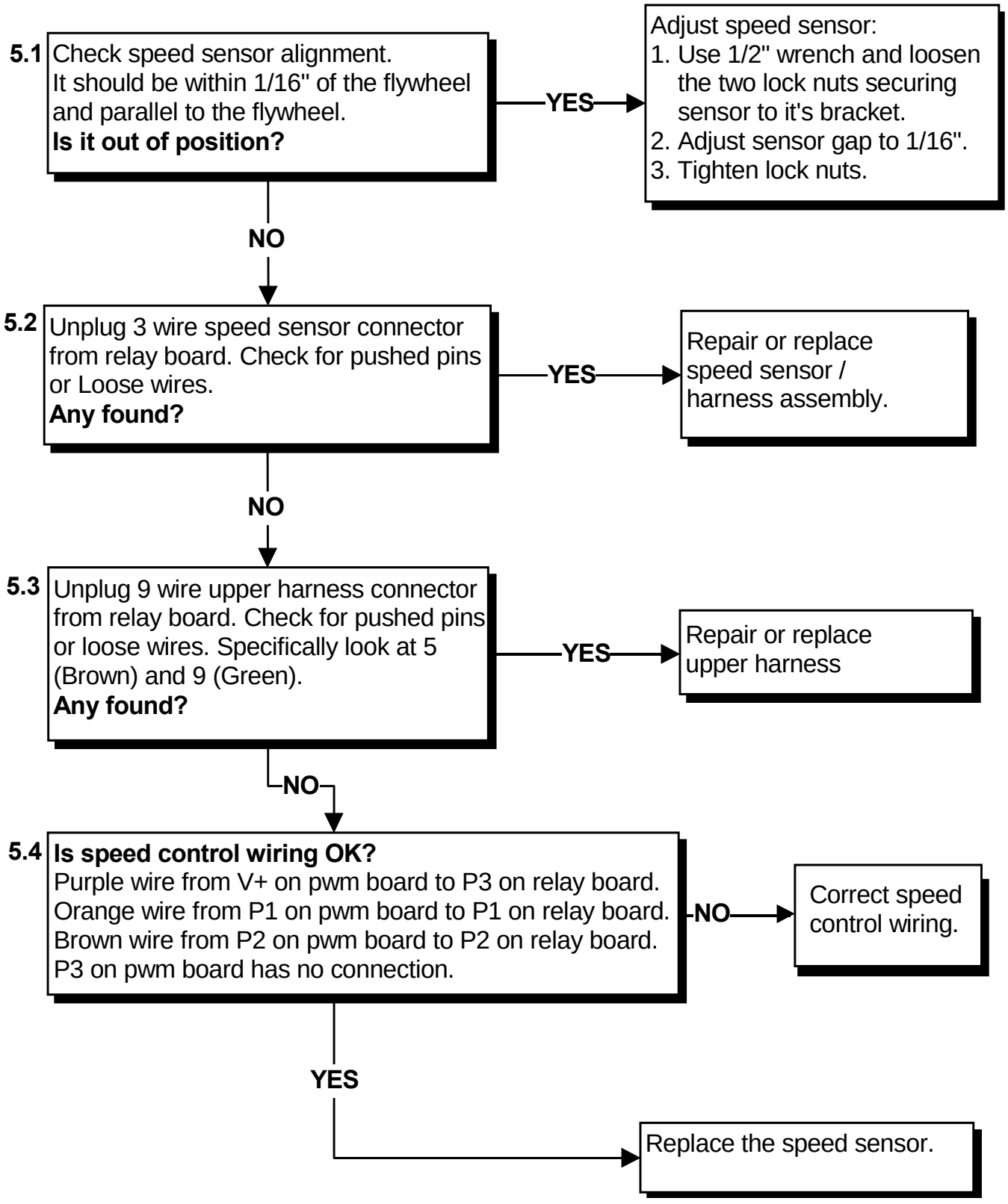
1. On PST's and ST's only, remove Faceplate from the display board and press START button on display board. If treadmill starts use a phillips head screwdriver or x-acto knife to spread fastener pins. If display board will not stay mounted or any buttons are concave replace the faceplate.

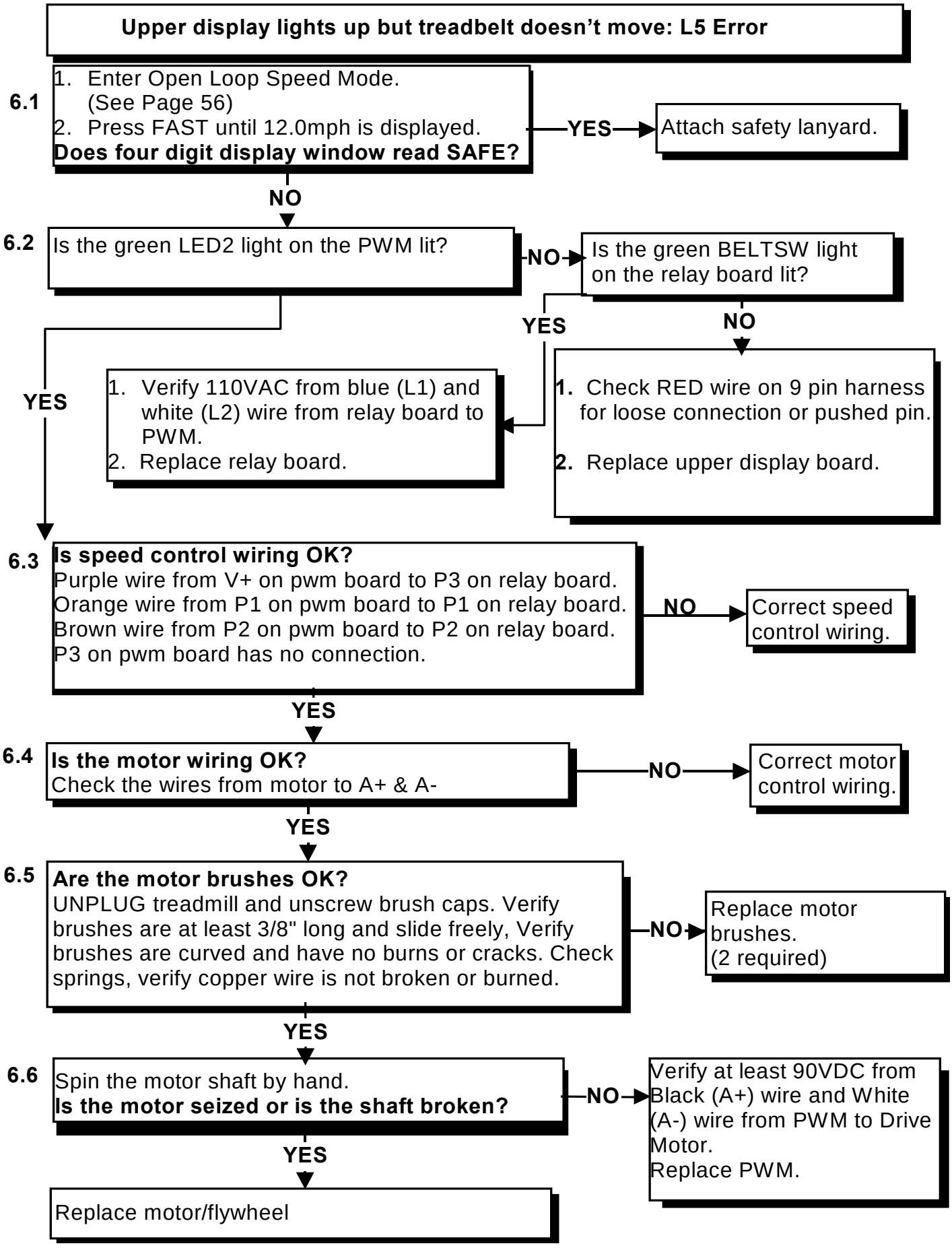
2. On PT's, CT's & ET's conduct Membrane bypass test (See pages 63,64) If treadmill starts replace Membrane Panel. If not replace the upper display board.

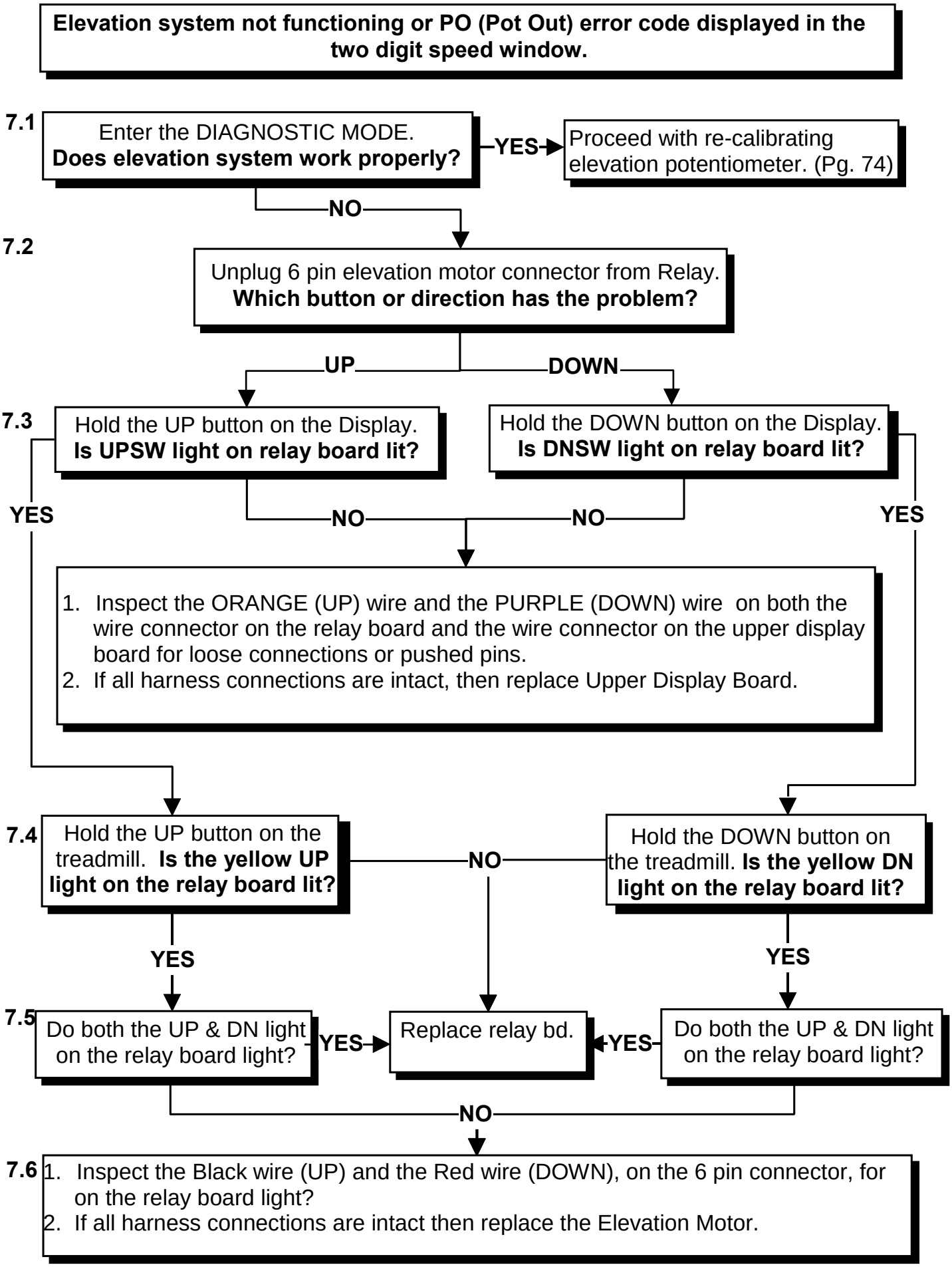
NO

Repair upper harness or replace upper harness.

Upper display lights up; treadbelt moves; speed will not increase; L5 error.




Upper display lights up but treadbelt doesn't move: L5 Error
6.1
1. Enter Open Loop Speed Mode. (See Page 56)
2. Press FAST until 12.0mph is displayed.
Does four digit display window read SAFE?
YES
Attach safety lanyard.
NO
6.2
Is the green LED2 light on the PWM lit?
NO
Is the green BELTSW light on the relay board lit?
YES
NO
YES
1. Verify 110VAC from blue (L1) and white (L2) wire from relay board to PWM.
2. Replace relay board.
1. Check RED wire on 9 pin harness for loose connection or pushed pin.
2. Replace upper display board.
6.3
Is speed control wiring OK?
Purple wire from V+ on pwm board to P3 on relay board.
Orange wire from P1 on pwm board to P1 on relay board.
Brown wire from P2 on pwm board to P2 on relay board.
P3 on pwm board has no connection.
NO
Correct speed control wiring.
YES
6.4
Is the motor wiring OK?
Check the wires from motor to A+ & A-
NO
Correct motor control wiring.
YES
6.5
Are the motor brushes OK?
UNPLUG treadmill and unscrew brush caps. Verify brushes are at least 3/8" long and slide freely, Verify brushes are curved and have no burns or cracks. Check springs, verify copper wire is not broken or burned.
NO
Replace motor brushes. (2 required)
YES
6.6
Spin the motor shaft by hand.
Is the motor seized or is the shaft broken?
NO
Verify at least 90VDC from Black (A+) wire and White (A-) wire from PWM to Drive Motor.
Replace PWM.
YES
Replace motor/flywheel


Elevation system not functioning or PO (Pot Out) error code displayed in the two digit speed window.
7.1
Enter the DIAGNOSTIC MODE. Does elevation system work properly?
YES
Proceed with re-calibrating elevation potentiometer. (Pg. 74)
NO
7.2
Unplug 6 pin elevation motor connector from Relay. Which button or direction has the problem?
UP
DOWN
7.3
Hold the UP button on the Display. Is UPSW light on relay board lit?
Hold the DOWN button on the Display. Is DNSW light on relay board lit?
YES
NO
NO
YES
1. Inspect the ORANGE (UP) wire and the PURPLE (DOWN) wire on both the wire connector on the relay board and the wire connector on the upper display board for loose connections or pushed pins.
2. If all harness connections are intact, then replace Upper Display Board.
7.4
Hold the UP button on the treadmill. Is the yellow UP light on the relay board lit?
NO
Hold the DOWN button on the treadmill. Is the yellow DN light on the relay board lit?
YES
YES
7.5
Do both the UP & DN light on the relay board light?
YES
Replace relay bd.
YES
Do both the UP & DN light on the relay board light?
NO
7.6
1. Inspect the Black wire (UP) and the Red wire (DOWN), on the 6 pin connector, for on the relay board light?
2. If all harness connections are intact then replace the Elevation Motor.

LANDICE TREADMILLS

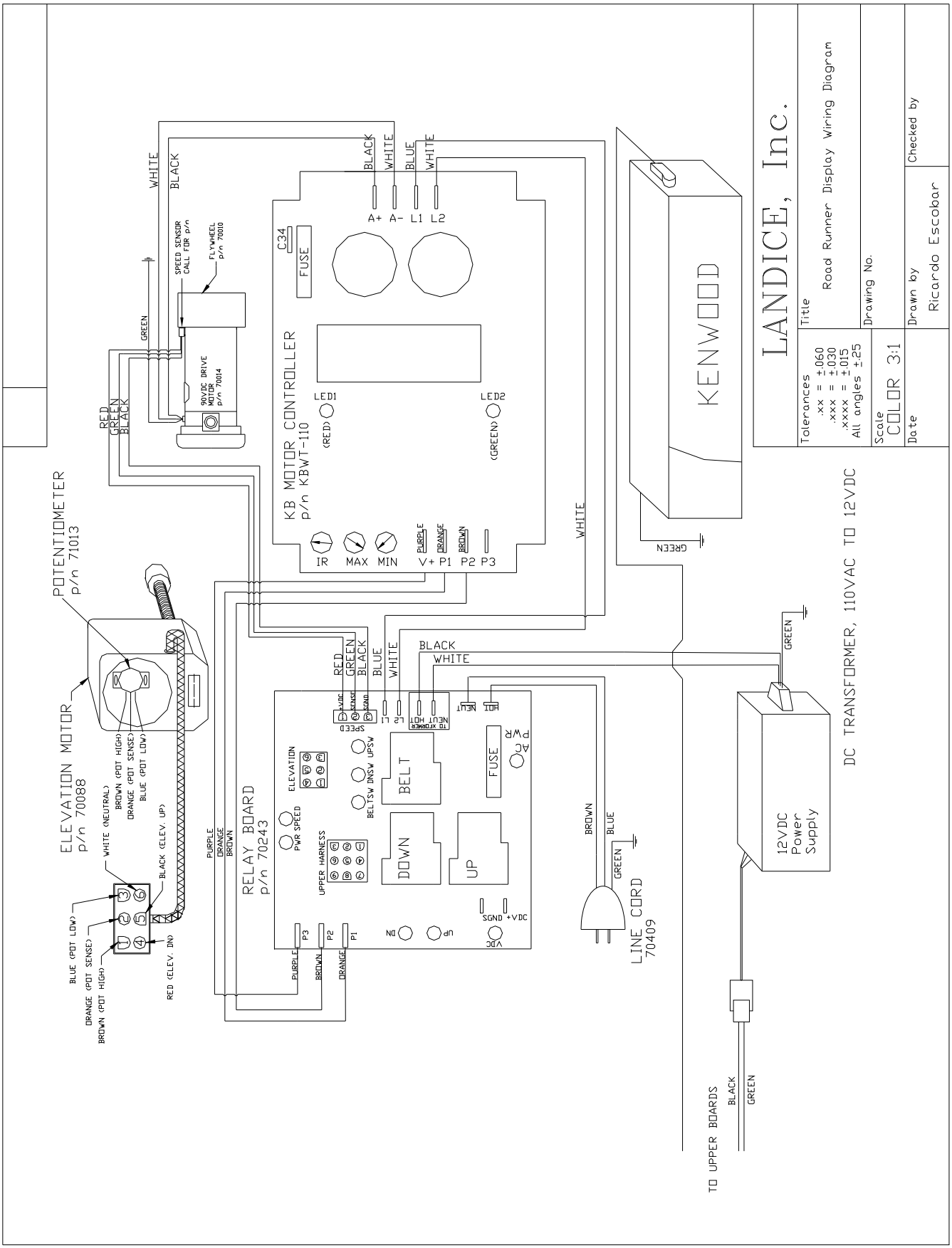
111 Canfield Avenue • Randolph, New Jersey 07869 • 800-LANDICE • FAX 973-927-0630

L - Series Home Treadmill
Road Runner
Diagnostic Addendum

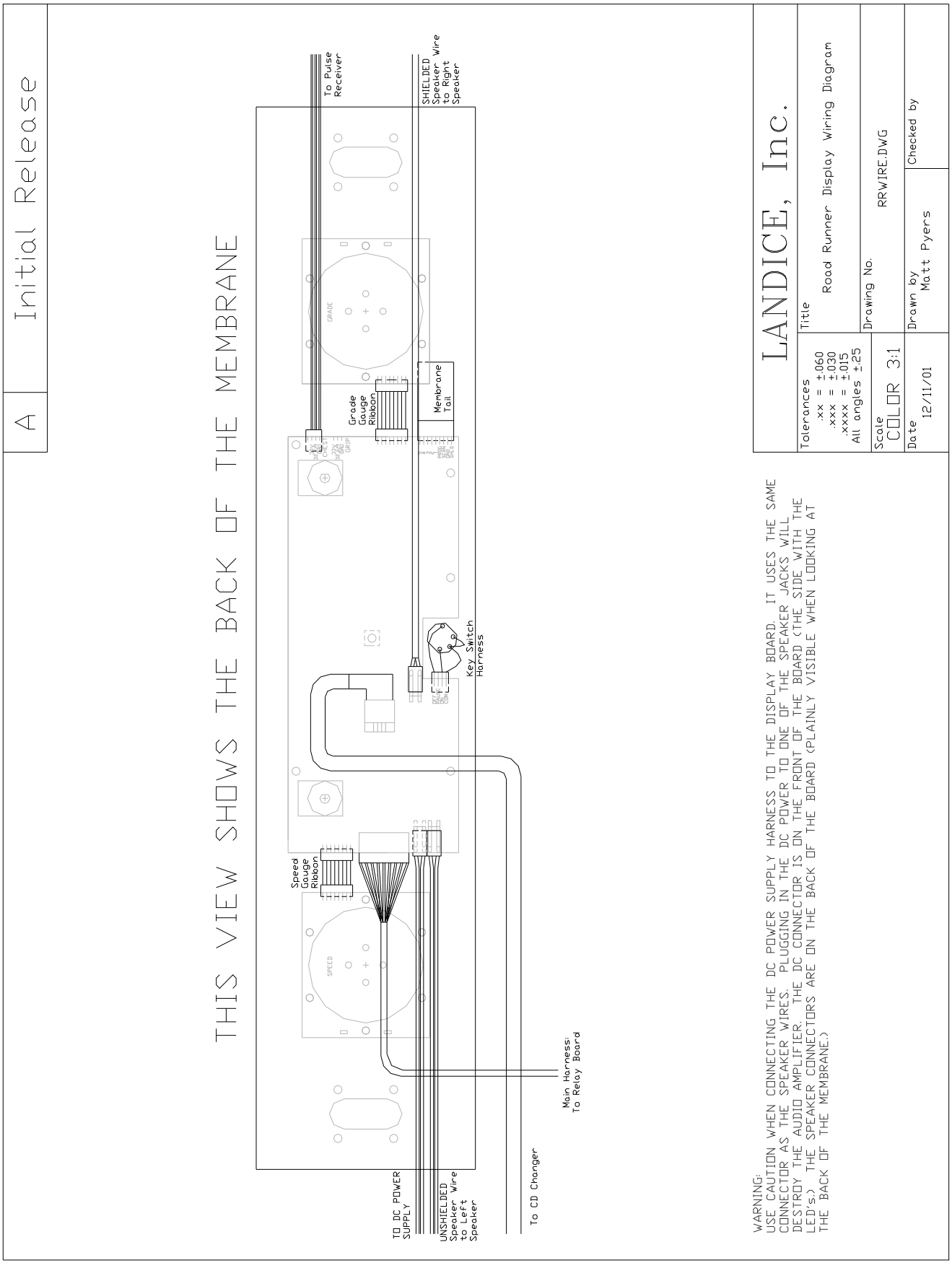
L7 & L8
Road Runner

TECHNICAL SUPPORT CALL 1-800-LANDICE

L-SERIES ROAD RUNNER LOWER WIRING DIAGRAM



L-SERIES ROAD RUNNER UPPER WIRING SCHEMATIC

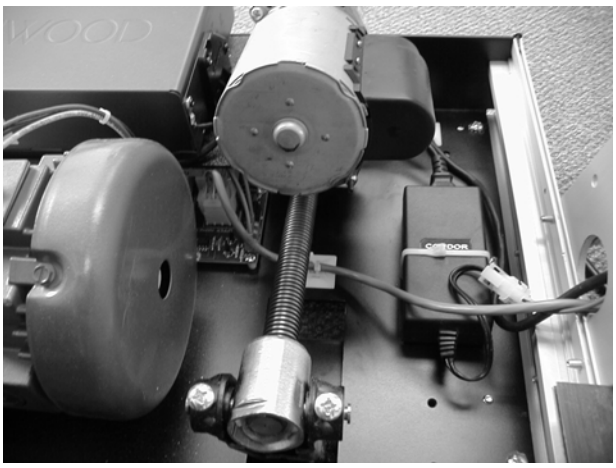


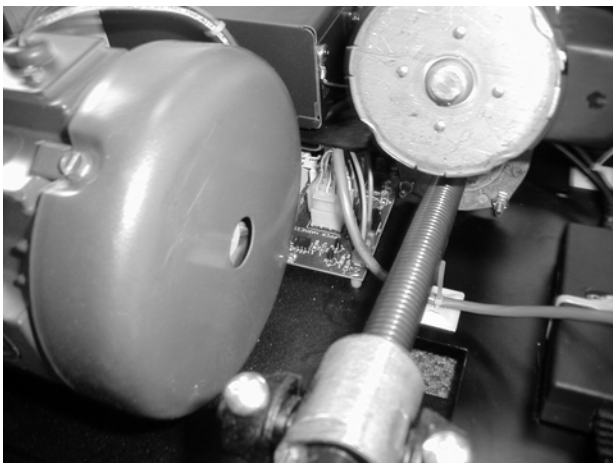
ROAD RUNNER SUPPLEMENTAL ASSEMBLY INSTRUCTIONS

(Follow these instructions in conjunction with Step 10 on page 3 of your manual.)

On the Road Runner, there are three wire harnesses that must be connected after the upright assembly is mounted to the frame of the treadmill.

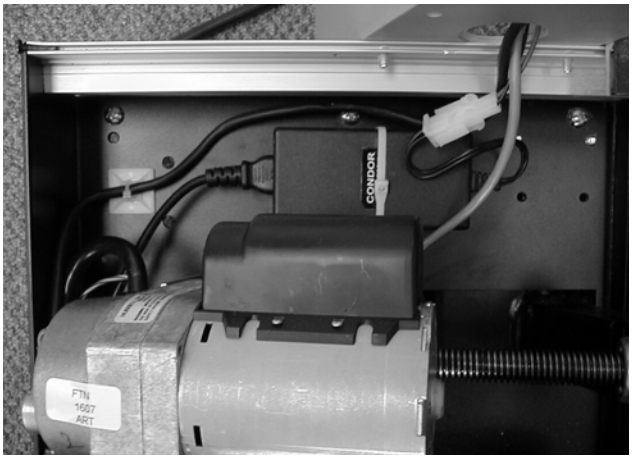
1. The main harness (9 multicolored wires in a gray sheath) should be routed under the elevation motor and secured with the supplied harness restraint clip or wire tie. It is plugged into the circuit board partially hidden by the CD changer.



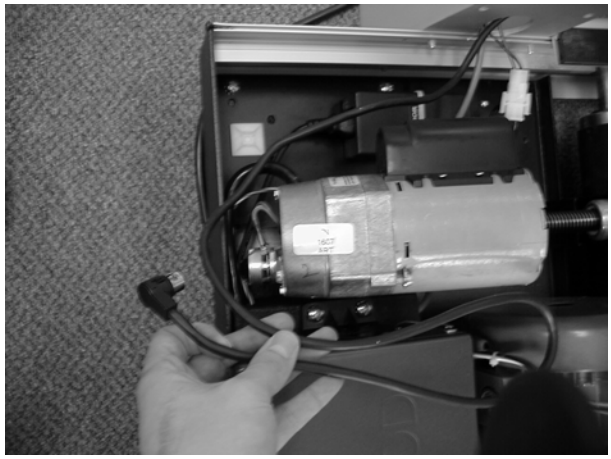


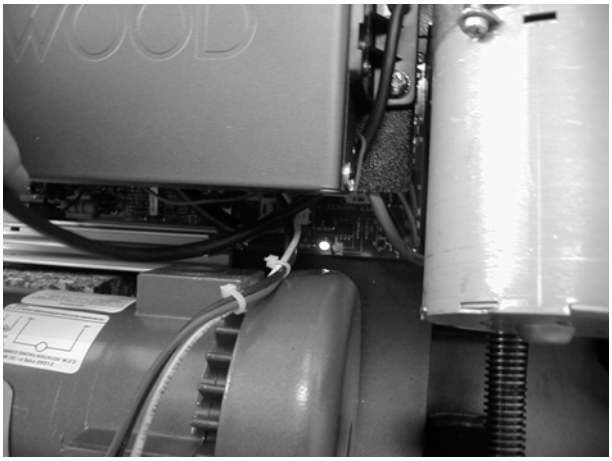
---

2. Snap the DC power supply harness (two black wires with a large snap-on connector) into the mating connector on the DC power supply.



3. Route the CD changer harness behind the elevation motor, then around the back of the CD changer.





---

4. Insert the connector into the side of the changer. It will snap when properly connected. Examine all wires around the elevation motor and drive motor to be sure they will not contact any moving parts.

ROAD RUNNER DIAGNOSTIC ADDENDUM

The following information should be used **IN ADDITION TO** standard PWM diagnostic information when diagnosing the Road Runner.

Software version display:
-Hold elevation lever in UP position and turn key from OFF to PAUSE. Version is displayed in main window.

Reboot display:
-Hold elevation lever in the DOWN position and turn key from OFF to PAUSE. Display reads BOOTING and user weight and user program are restored to factory defaults.

General Diagnostics:
-Hold speed lever in the SLOW position and turn key from OFF to PAUSE. All LED's light up while the microprocessor performs a self-check. Any error codes (in the format of "Err ##") indicate an upper board failure.
-Then you can begin the switch test. Activating the following switches displays a corresponding error code:

BUTTON/DIAL/LEVER/KEY	DISPLAY
Off	Turns unit off
PAUSE	PAUSE
RUN	RUN
Button 1 (Time)	1
Button 2 (Distance)	2
Button 3 (Calories)	3
Button 4 (Pace)	4
Button 5 (Pulse)	5
Scan	6
Program	7
CD/Track (clockwise)	TRUP
CD/Track (counter clockwise)	TRDN
Volume (clockwise)	VOUP
Volume (counterclockwise)	VODN
Grade UP	GRUP
Grade DOWN	GRDN
Speed FASTER	SPUP
Speed SLOWER	SPDN
Remove Safety Key	SAFE

Speed and Grade Diagnostics:
-Hold speed lever in the FAST position and turn key from OFF to PAUSE.
-Belt begins moving at minimum open loop speed.
-Speed and elevation levers function.
-Press TIME to view commanded grade (displays either UP or DOWN).
-Press DISTANCE to view actual grade. *** This is what you view to calibrate the elevation pot.**
-Press PACE to view actual open loop speed.
-Press PULSE to view commanded speed.
*** Elevation potentiometer setting should read 0.0 @ zero percent grade.**

DC VOLTAGE CHECK:
The RoadRunner utilizes a 12V 5A DC transformer instead of the standard 12V 1A model. The additional amperage requires more substantial connector pins, therefore the transformer has a separate wire harness. The DC output harness has a Molex connector in the motor pan area. To verify DC output, check voltage across the pins of the Molex connector. It should be 12V +/- 0.5V.

TREADMILL DOESN'T TURN ON WHEN THE KEY IS TURNED TO PAUSE OR RUN.
Check DC voltage from the transformer as explained above. If good, remove shifter knobs and display electronics. Check key switch harness for damage. When the key is set to OFF, there should be continuity across the green and white wires only. When set to PAUSE, there should not be any continuity across any wires. When set to RUN, there should be continuity across the green and red wires only. If the key switch and harness check good, the display is bad.

Voltage readings:	Switched to PAUSE:	GREEN with respect to WHITE = 3.7vdc
		GREEN with respect to RED = 5.0vdc
	Switched to RUN	GREEN with respect to WHITE = 3.7vdc
		GREEN with respect to RED = 0vdc

PHYSICAL SPEED OR ELEVATION DOES NOT INCREASE OR DECREASE.
Verify lever function in General Diagnostic Mode. If the proper codes are displayed, troubleshoot as usual. If the proper codes are not displayed, remove shifter knobs and the display electronics from the control panel. Verify the shifter magnet is at the far end of its mounting bolt. It should be less than 3/15" away from the edge of the gauge board when it's installed.

SPEED OR ELEVATION GAUGES DO NOT MOVE BUT TREADMILL WORKS CORRECTLY.
Replace both the gauge and gauge board.

SPEED OR ELEVATION CHANGES ON IT'S OWN.
-Enter General Diagnostic Mode to see if the display is being commanded by the levers to change speed or elevation. If it's not, proceed with normal diagnosis. If it is, there is probably a problem with the shifter mechanism.
-Remove display and examine the shifter apparatus. If it does not automatically recenter, there may be a foreign object inhibiting its movement or the spring may have failed. There should be very little slack in its centered position. Also check that there are no foreign metal objects stuck on the shifter magnet which could alter the magnetic field.

SOUND ONLY COMES FROM ONE OF THE TWO SPEAKERS

Check speaker harness connections on the back of the display board. Swap the left and right connections. If the same speaker doesn't play, the speaker is bad. If the other speaker doesn't play, the display board is bad.

MUSIC DOESN'T SEEM TO PLAY AT ALL.

-The display will show "CDERR" if it cannot communicate with the changer. If you see that error, try to eject the CD cartridge. If it does not eject, check and reset the changer harness connections. If the harness looks good, the most likely part to replace is the changer itself. If that doesn't work, replace the display board.

-Turn the volume knob clockwise, volumes below 8-12 may be inaudible depending on ambient noise.

-Turn the CD/TRACK knob to see if its possible to change tracks. If you can change tracks but no music plays, the display board audio amp may be blown so replace the display board.

-If the display shows "–LOAD" after you turn the CD/TRACK knob, it is still looking for a CD. It searches the cartridge in order from slot 1 to slot 6, so if you only have a CD in slot 6, it will take a while to get there before it begins to play.

-Try another CD, this one may be scratched.

-Some, but not all CD copies (CDR, CDRW) will play in the changer. If a copied CD is not playing, try an original CD.

HOW TO REMOVE CD CHANGER: To gain access to relay board and pwm motor control.

1. Unplug treadmill from wall.
2. Remove motor cover.
3. Unplug AC power cord going to DC power pack.
4. Remove (3) Philips head screws securing CD mounting rack to motor pan.
5. Carefully lift CD changer and mount, as an assembly, and rotate out of the way.
   NOTE: Be very careful not to damage the wires running though the access port on the CD mount.
   NOTE: When installing, make sure not to crimp any of these wires between the CD mount and motor pan.

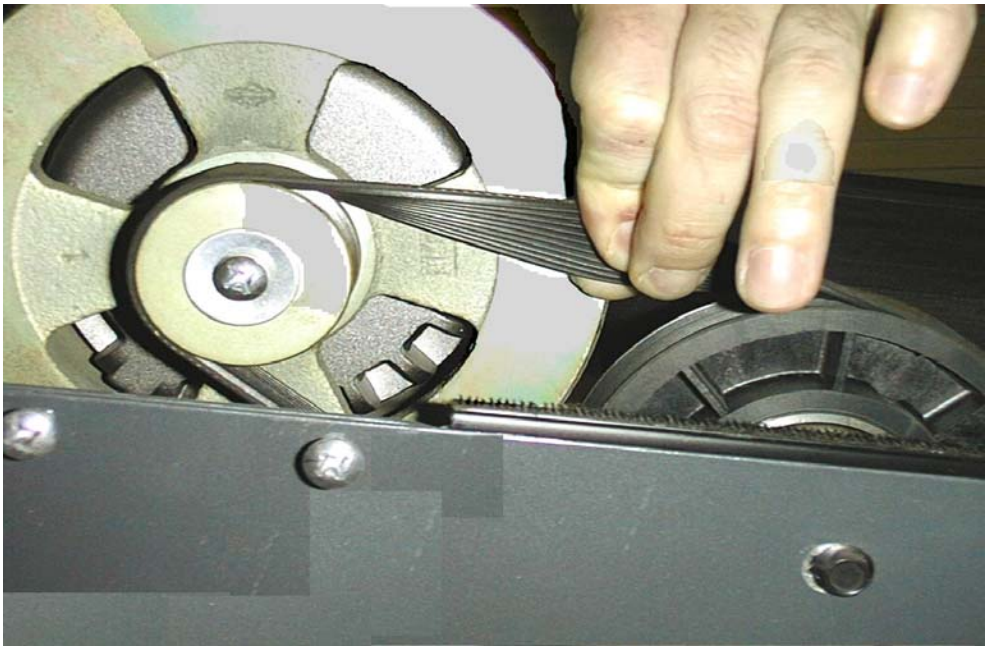
HOW TO REMOVE MEMBRANE PANEL ASSEMBLY:

1. Unplug treadmill from wall.
2. Remove speed and elevation control knobs (grip and turn in a ccw direction).
3. Remove control panel end caps.
4. Remove membrane panel assembly by lightly pulling towards you to release Velcro.
   NOTE: Be very careful not to damage any wires.
   NOTE: When installing the speed and elevation knobs, elevation is black and speed is red.

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 pretensioned before the treadmill leaves the factory. Adjustments are ONLY necessary when Drive Belt is slipping during use.
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.

Check the tension on the Drive Belt by placing the Drive Belt between your thumb and forefinger and twisting.

The proper twist is 45°. 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.

CAUTION: NEVER OVERTENSION 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 TRACKING

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 treadbelt 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:

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.

TREADBELT TENSIONING

Treadbelts are tensioned at the factory and normally need no adjustment. To determine if 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 / DRIVE BELT! 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.

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

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. First try to move treadmill to more level flooring. If that is not an option use leveling shims. You 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.

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. 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.

Recommended Maintenance

Home Models- Vacuum around and underneath the treadmill on a monthly basis. Vacuum or wipe down the deck area between the treadbelt and frame. Wipe down display and handrails after every use. No other maintenance is required.

Maintenance for Commercial Treadmills

Once a week
1. Wipe down display with soft cotton cloth and mild soap and water. Cloth should be damp not wet. Once a week or as needed.
2. Wipe down handrails and traction strips with soft cotton cloth and mild soap and water. Cloth should be damp not wet. Once a week or as needed.
3. Vacuum or wipe down the Deck area between treadbelt and frame. Once a week.

Once a Month
1. Take off Motor cover and vacuum.
2. Slide clean towel under Treadbelt and wipe deck and under the belt. Rotate belt 180 degrees and repeat.
3. Slipcoat under Treadbelt.
4. Check Drive Belt Tension
5. Check Treadbelt Tension and Tracking

Every Six Months
1. Check Motor Brushes for wear. Dress Commutator if needed.

Cleaning display- Use mild solution of **Non-Phosphate** cleaner on damp soft cotton cloth.

Cleaning Treadbelt Walking Surface- Treadbelts can become dirty and unsightly when users track dirt onto them. If vacuuming doesn't remove dirt, we recommend the use of a medium stiff nylon bristle brush to remove dirt trapped in treadbelt surface. A damp (not wet!) sponge can be used to finish the cleaning process.

SLIPCOAT APPLICATION INSTRUCTIONS

SlipCoat lubricant is designed to reduce friction between the treadbelt and deck. It is required for all institutional treadmills. Proper and timely application of **SlipCoat** will prevent premature failures due to excessive wear and load. Items affected by inadequate lubrication are the treadbelt, deck, motor, and motor controller.

When to lubricate:

Landice L-Series institutional treadmills should be inspected on a monthly basis. By sliding your hand underneath the treadbelt you can feel if the surface of the deck is dry. If the deck surface feels dry then the treadmill should be lubricated. Typically heavy-use facilities (where usage is more than 5 hours-per-day) will require lubrication on a monthly basis. Light commercial settings may not require lubrication for 2-3 months at a time **(but should still be checked every month).** Lubrication is not required for home usage, but if desired, should not be done more than once per year unless otherwise instructed by a Landice factory representative. Only use SlipCoat by Landice. Most standard greases, waxes, and silicon sprays will build up on the rollers and effect belt slippage and tracking.

How to Lubricate:

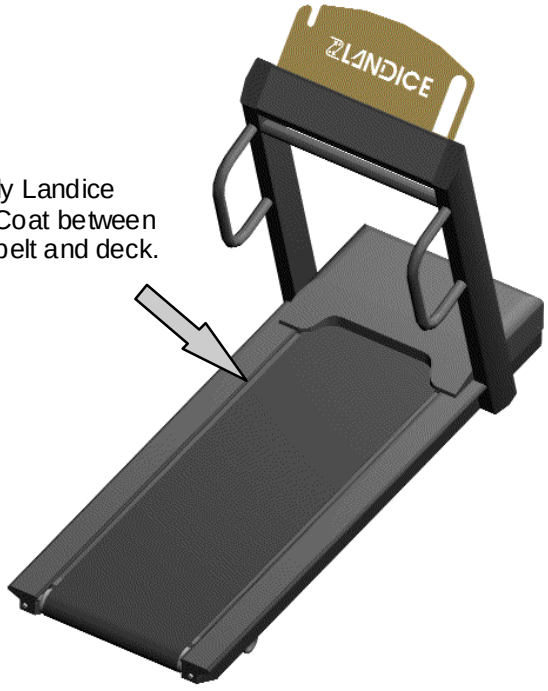
Lift up the edge of the treadbelt and squeeze one full packet of SlipCoat underneath the center of the treadbelt.

Walk about 10 steps on the treadmill at a speed of 1.0 mph. This will moisten approximately an 8" track underneath the center of the entire treadbelt.

Turn off the treadbelt and allow it to dry for approximately 10 minutes.

NOTE: Do not use SlipCoat on any other area of the Treadmill.

Note: Do not get Slipcote on TOP of Treadbelt. This will make the treadbelt very slippery and makes the treadmill dangerous to use. We recommend using rubbing alcohol applied to a sponge to remove any SlipCoat on the treadbelt.



Apply Landice SlipCoat between the belt and deck.

INSTITUTIONAL DRIVE MOTOR MAINTENANCE

Yearly Institutional Maintenance: Replace the Drive Motor Brushes.
Failure to do so will result in premature Drive Motor failure.

1. Unplug Treadmill.
2. Remove Motor Brush caps (2).
3. Remove Motor Brushes and inspect. They should be replaced if 1/4 inch or less. Inspect motor Commutator for wear (Black-scoring present on copper segments) Try to dress out (clean up) Commutator with a Commutator stone or emery cloth.
4. When you reinstall motor brushes make sure the brush does not bind up in its holder. The motor brush must move freely the full length with zero resistance. If resistance is present you must carefully dress out the brush until the correct tolerance is achieved.

Motor brushes should be checked every 6 months on institutional treadmills and after 6 years on home units.

SERVICE CHECK-LIST

- Check treadbelt tension and tracking
- Wipe underneath treadbelt
- Lubricate treadbelt
- Check drive belt tension
- Check motor brushes and commutator
- Vacuum under motor hood
- Vacuum around and under treadmill

Index

Description	Page Number
Assembly Instructions	
DCP (Display Control Package	77
Treadmill	23,24
Medical Handrails, L7	81
Medical Handrails, L8	82,83
Medical Handrails, L9	84-87
Reading Rack	25
Accutrack Contact Heart Rate	55
5V LED	
Defintion	39
Picture	38
Troubleshooting	92
12 VDC Power Supply	
Definition	57
Picture	41,42
Removal/Replacement	70
Troubleshooting	102
Testing	62, 92
Capacitor	
Definition	57
Picture	35-37
Removal/Replacement	70
Troubleshooting	92, 101
Wiring	36, 37
CE Error Code	94
Choke (Inductor)	
Definition	57
Picture	35-37
Removal/Replacement	70
Troubleshooting	92, 101
Wiring	36, 37
Components	
Definitions	57-59
Parts list	31-34
Testing	60-62
Deck	
Definition	57
Removal/Replacement	75

Pro-rating 11
Troubleshooting 38,39,65,66,88-90

Diagnostic Features
Accessing 56

Diagnostic Flow Charts
Commercial Units 99-103
Home units 104-108

Digital Multimeter 12, 14

Dimensions
Treadmill 26

Display Panels
Pictures of ST,PT,CT,ET 51-54

Drive Belt
Definition 57
Picture 24, 30, 117
Tensioning 117
Troubleshooting 65, 66

Drive Motor
Definition 57
Picture(Motor Pan) 30,35,41
Removal/Replacement 72
Testing 60
Troubleshooting 38,65,66,90,91,101,107

Drive Motor Brushes
Maintenance 119, 121
Removal/Replacement 72
Troubleshooting 65,66,101,107

Drive Roller w/Sheave
Definition 57
Picture 27,28
Removal/Replacement 75
Troubleshooting 66,88,89,118

Elevation Leg Assembly
Definition 57
Picture 30
Removal/Replacement 75

Elevation Motor
Calibration 74
Definition 57

Picture 30,35,41
Removal/Replacement 72,73
Testing 60
Troubleshooting 38,46,90,103,108
Wiring 36,37,42,47,74,110

Elevation Potentiometer
Calibration 74
Definition 57
Picture 74
Testing 61
Troubleshooting 39,103,108

Error Codes 93,94,101-103,106-108

Face Plate
Definition 58
Removal/Replacement 71
Testing 62, 105

Frame (Side)
Definition 58
Picture 27, 28

Frame Covers (Side)
Definition 58
Picture 27, 28

Fuses
Picture 35,41,48
Troubleshooting 100,105

Heart Rate Control
Contact Heart Rate 55
Installation 78,79
Troubleshooting 80

IR Potentiometer
Definition 67
Adjustments 58
Picture 41,42,43,44,47
Troubleshooting 66,67

L5 (LS) Error Code
Definition 93
Troubleshooting 93,95,101,102,106,107

LCD Display Executive Trainer
Picture 53
Troubleshooting 95-98

Wiring 50

LED LIGHTS
SCR 38, 39
PWM 44
RELAY 46

Maintenance 119-121

Medical Rails
Installation-L7 81
Installation-L8 82,83
Installation-L9 84-87

Membrane Panel
Button codes 63
Bypass Test 63-64
Definition 58
Picture 51-54
Removal/Replacement 71
Testing 62
Troubleshooting 101

Noises 88-91

O5 (OS) Error Code 93,94,96

Parts List 31-34

PO Error Code 95,96,103,108

Power Cord (Line Cord)
Removal/Replacement 69
Troubleshooting 100,105

PWM Motor Control Board
Definition 58
LED Lights 44
Picture 41,48
Removal/Replacement 69
Testing 61
Troubleshooting 43,44,61,67,68,91,92,106,107
Wiring 42,47,110
Voltage 43

Rebooting
Executive Trainer 56,

Relay Board
Definition 56

LED Lights 46
Picture 41
Removal/Replacement 70
Testing 61
Troubleshooting 105-108
Wiring 42,47
Voltage 45

Road Runner
Installation (Supplemental) 112, 113
Troubleshooting 114-116

Safety Lanyard
Definition 58
Troubleshooting 67,96,101,107

Safety Shutdown Error Code 95,96
(Executive Trainer Only)

SCR Motor Control Board
Definition 58
LED Lights 38,39
Picture 35
Removal/Replacement 69
Testing 61
Troubleshooting 92,93,94,101-103
Wiring 36,37

Slipcote Lubricant
Definition 59
Use 120

Speed Calibration 68

Speed Sensor
Definition 59
Picture 41
Testing 62
Troubleshooting 39,46,102,106
Wiring 36,37,42,47,110

Take Up Roller
Definition 59
Picture 27,28
Removal/Replacement 75
Troubleshooting 66,88,89,118

Tools (Repair) 17

Treadbelt
Cleaning 119,120
Definition 59
Picture 27,28
Pro-rating 11
Removal/Replacement 75
Tracking/Tensioning 117, 118
Troubleshooting 66,88,89,118

Upper Display Board
Definition 59
Executive Trainer LCD Wiring 50
Picture 29
Removal/Replacement 71
Troubleshooting 67,100,101,105,107,108
Testing 62

Uprights (Frame)
Definition 59
Picture 29

Upper Wire Harness
Definition 59
Troubleshooting 39,100,101,105-108

VFX System
Definition 59
Picture 27,28
Removal/Replacement (treadbelt/deck) 75
Troubleshooting 90

Voltage
Specifications 20
Requirements 22
Testing 92
Troubleshooting 60-62,66,68

Warranty
Cards 6-9
Policy 10-13
Timetable 14