

Section 4:

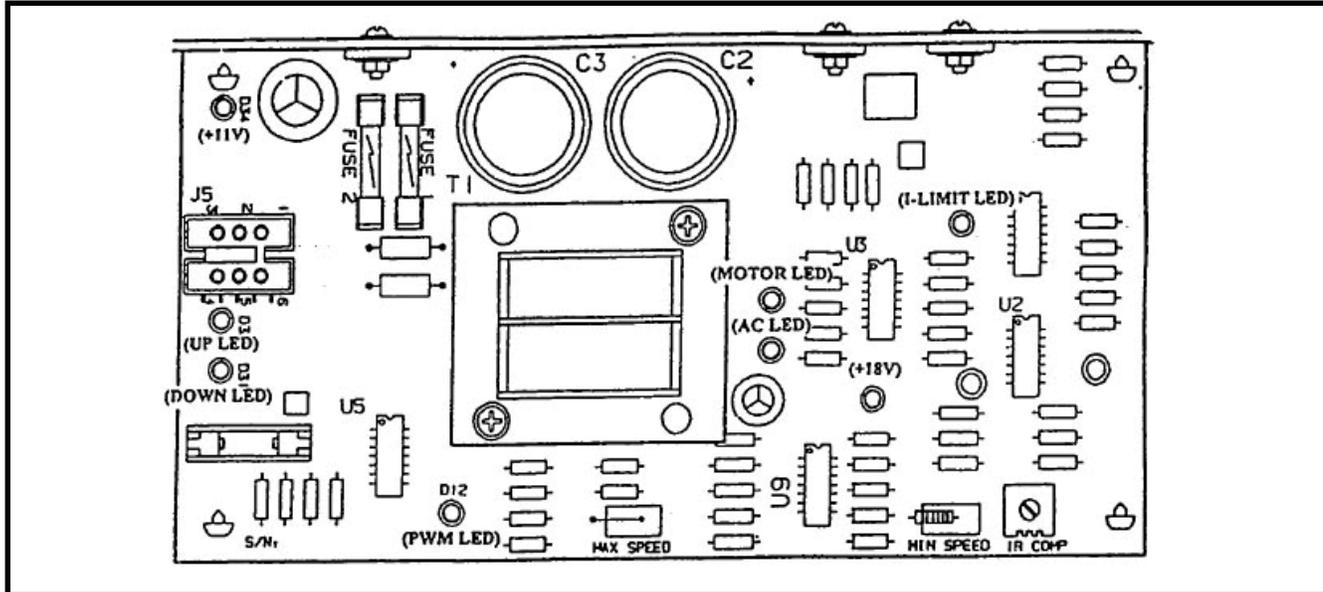
Troubleshooting

Should the **STAR TRAC** 4500 Treadmill experience a problem or a display code appear, the following procedures will help determine the precise reason for the problem. Included are flow charts breaking down each individual display code with problem statements and solutions.

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110v MCB LED Layout

The Following LEDs will help diagnose if the MCB has failed or causing intermittent problems.



**** CAUTION ****

Several of the following troubleshooting require dealing with live voltage. Have the treadmill turned off and unplugged when checking wire connections.

NOTE: The display console may still power up with the AC LED off.

AC LED - Indicates that AC power has been applied to the MCB. It does not give indication of voltage level, if this LED is not lit and the treadmill does not power up, verify the following:

1. The treadmill is plugged into a wall outlet.
2. The ON/OFF switch is turned to the "ON" position.
3. Verify with a VOLT METER that 110VAC is present at the outlet. Units with step-down transformers need 220VAC.
4. Verify 110v (+/- 10%) AC voltage at AC1 & AC2 wires.

After the above have been verified and the AC LED is still "OFF", the MCB should be replaced.

+18v LED - Indicates the presence of an acceptable level of voltage to operate the MCB. If this LED is off or dim, the AC voltage level is not acceptable to properly power the MCB. Verify the following:

1. Verify with a VOLT METER that 110VAC is present on pins AC1 & AC2.

After the above step has been verified and the + 18V LED is still "OFF", and the display does not power up, replace the MCB.

+11v LED - Indicates there is +11 volts supplied to the display board. If this LED is not lit verify the following:

1. The display cable is damaged or pinched, disconnect the display cable and verify if the LED lights up. If LED lights up replace the cable.

After the above has been verified and the +11 LED is still "OFF", the MCB should be replaced.

110v MCB LED Layout

NOTE: Engage Motor Test Mode and manually push on the running belt to verify RPM feedback.

MOTOR LED - Indicates the presence of acceptable voltage to the motor.

If this LED is not lit one of the following conditions exists:

1. Verify AC voltage is being applied.
2. Verify that MTR1/MTR2 wires are connected to the MCB.

(This should be done with the treadmill unplugged and turned off)

After the above have been verified and the MOTOR LED is still 'OFF", the MCB should be replaced.

PWM LED - Indicates that there is a valid control command from the display to the MCB (this LED flashes only when the treadmill is operating) If this LED is not lit verify the following:

1. Verify if the display cable is connected.
2. Verify if the display cable is damaged or pinched.

(see page 4.17 in this section for Display Cable symptoms)

After the above have been verified and the PWM LED is still "OFF" , the MCB should be replaced.

NOTE: If the current limit is reached, the MCB will shut the treadmill down and the I-LIMIT LED will remain on until it resets.

I-LIMIT LED - Indicates that an excessiveload is being placed on the motor. Amp readings of 26 or higher will cause the LED to light. If this LED is lit one of the following conditions exists:

1. Running belt is worn.
2. Belt and deck require lubrication.
3. Drive motor drawing over the 26 amp peak.

After the above has been verified and the I-LIMIT LED is still "ON", the MCB should be replaced.

UP LED - Indicates that the incline is being commanded up. If this LED is not lit and the elevation motor will not respond, verify the following:

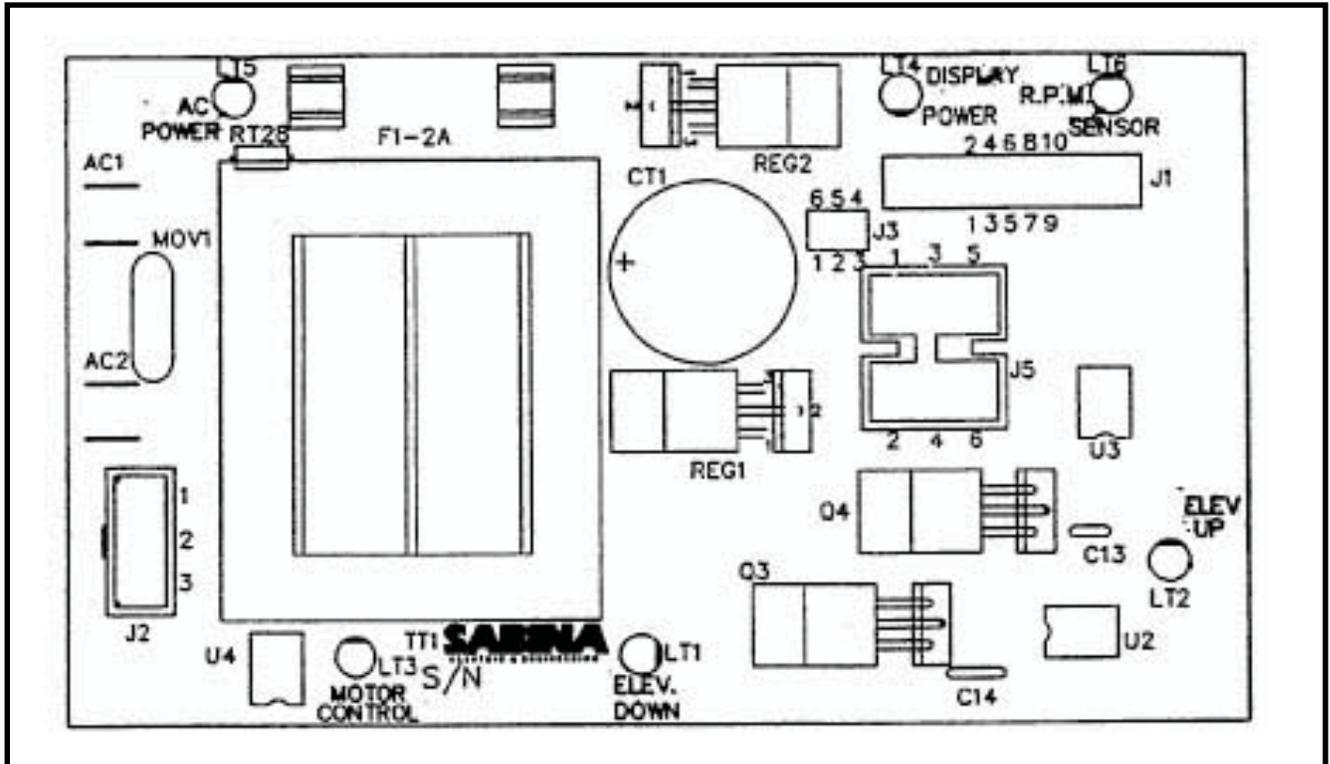
1. Display cable for possible pinch or tear (see page 4.17 in this section for Display Cable symptoms)
2. Replace MCB.

DOWN LED - Indicates that the incline is being commanded up. If this LED is not lit and the elevation motor will not respond, verify the following:

1. Display cable for possible pinch or tear (see page 4.17 in this section for Display Cable symptoms)
2. Replace MCB.

220v MCB LED Layout

The Following LEDs will help diagnose if the MCB has failed or causing intermittent problems.



**** CAUTION ****
 Several of the following troubleshooting steps require dealing with live voltage. Have the treadmill turned off and unplugged when checking wire connections.

NOTE: The display console may still power up with the AC PWR LED off.

AC PWR - Indicates that AC power has been applied to the MCB. It does not give indication of voltage level, if this LED is not lit and the treadmill does not power up, verify the following:

1. The treadmill is plugged into a wall outlet.
2. The ON/OFF switch is turned to the on position.
3. Verify with a VOLT METER that 110VAC is present at the outlet. Units with step-down transformers need 220VAC.
4. Verify 220v (+/- 10%) AC voltage at AC1 & AC2 wires.

After the above have been verified and the AC LED is still "OFF", the MCB should be replaced, if the treadmill is not operating.

DISPLAY PWR- Indicates there is +11 volts supplied to the display board. If this LED is not lit verify the following:

1. The display cable is damaged or pinched, disconnect the display cable and verify if the DISPLAY PWR LED lights up. If the LED lights up replace the cable.

After the above has been verified and the DISPLAY PWR LED is still "OFF", the MCB should be replaced.

220v MCB LED Layout

NOTE: Engage Motor Test Mode and manually push on the running belt to verify RPM feedback.

RPM SENSOR - Indicates input signal from the RPM Sensor to the MCB. If this LED is not flashing during operation, verify the following

1. RPM sensor disconnected from connector J3 at the MCB.
2. RPM sensor gap misaligned.
3. RPM sensor faulty

After the above have been verified and the RPM LED is still "OFF", the MCB should be replaced.

MOTOR CONTROL - Indicates that there is a valid control command from the display to the MCB. If this LED is not lit verify the following:

1. Verify if the display cable is connected.
2. Verify if the display cable is damaged or pinched.

After the above have been verified and the MOTOR CONTROL LED is still "OFF", the MCB should be replaced.

UP LED - Indicates that the incline is being commanded up. If this LED is not lit and the elevation motor will not respond, verify the following:

1. Display cable for possible pinch or tear (see page 4.17 in this section for Display Cable symptoms).
2. Replace MCB.

DOWN LED - Indicates that the incline is being commanded down. If this LED is not lit and the elevation motor will not respond, verify the following:

1. Display cable for possible pinch or tear (see page 4.17 in this section for Display Cable symptoms).
2. Replace MCB.

Troubleshooting

The following steps help troubleshoot in case Auto-Calibration procedures fail to give the correct reading or response.

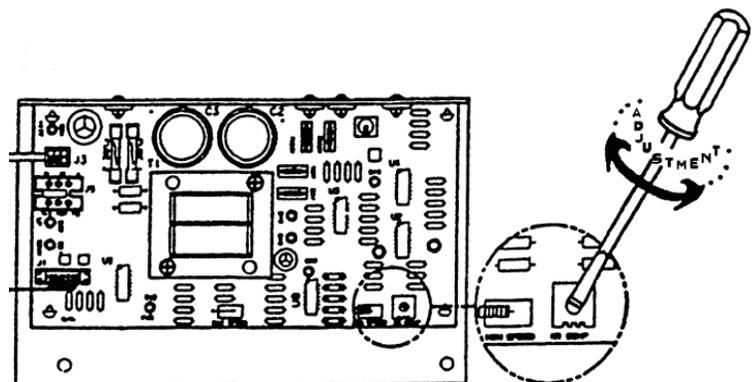
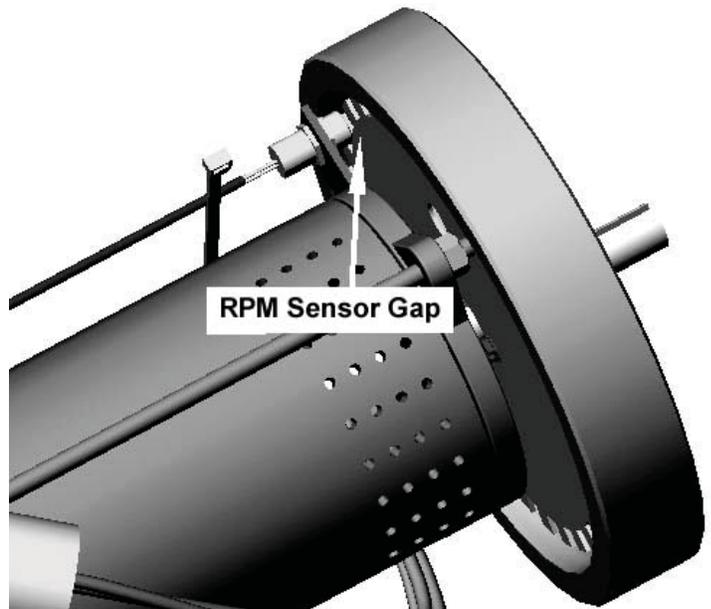
Symptom: Auto-Calibration fluctuates.

1. Verify line voltage for sufficient voltage supply.
 - If wall voltage is less than 10% than what is required, this will cause speed fluctuation.
2. Verify unit is on a dedicated circuit breaker.
 - Treadmills sharing the same circuit line will cause intermittent problems and variation in speed.
3. Verify the following parameters are set correctly in the Configuration Mode:
(Configuration Mode details in Section 3)
 - CNT/RV : 31 = Magnetic/Cherry RPM Sensors
 - 10 REV: 29.1" for 1.7" dia. motor pulley (110v)
 - 10 REV: 35.8 for 2.1" dia. motor pulley (220v)NOTE: If not sure what your 10 REV settings should be, manually measure your drive motor pulley diameter. Above measurements are done in inches.

4. Verify RPM Sensor alignment.
 - Hall Effect/Cherry RPM Sensor is being used, verify the gap is no more than 1/8 inch.NOTE: See Diagram # 1.

5. Adjust IR COMP potentiometer.
NOTE: See Diagram #2, adjustment.

REPLACE: MCB if symptom continues.



Calibration Troubleshooting

Symptom:

Will not Calibrate to MAX speed.

- 1.** Verify line voltage for sufficient voltage supply.
 - If wall voltage is less than 10% than what is required, this will cause speed fluctuation.
- 2.** Verify unit is on a dedicated circuit breaker.
 - Treadmills sharing the same circuit line will cause intermittent problems and variation in speed.
- 3.** Verify the following parameters are set correctly in the Configuration Mode. (Configuration Mode details in Section 3)
 - MN SPD: 0.5 MPH or 1.0 KM/PH
 - MX SPD: 10.0 MPH (110v) or 20.0 KM/PH (220v)
 - CNT/RV : 31 = Magnetic/Cherry RPM Sensors
 - 10 REV: 29.1" for 1.7" dia. motor pulley (110v)
 - 10 REV: 35.8" for 2.1" dia. motor pulley (220v)

NOTE: To reach 20.0 KM/PH on 220v units, drive motor pulley must be 2.1". If not sure what your 10 REV settings should be, manually measure the drive motor pulley diameter.

- 4.** Verify RPM Sensor alignment.
 - Hall Effect/Cherry RPM Sensor is being used, verify the gap is approximately 3 business cards or 1 credit card. If adjustment is necessary loosen the flywheel to re-position.

NOTE: See Diagram #1.

REPLACE: RPM Sensor if RPM reading is sensitive or feedback appears erratic.

- 5.** Adjust the MAX SPEED potentiometer.

NOTE: See Diagram #2. (220v units only)

GO TO: Section 3.7 Manual Calibration if problem continues.

Diagram #1

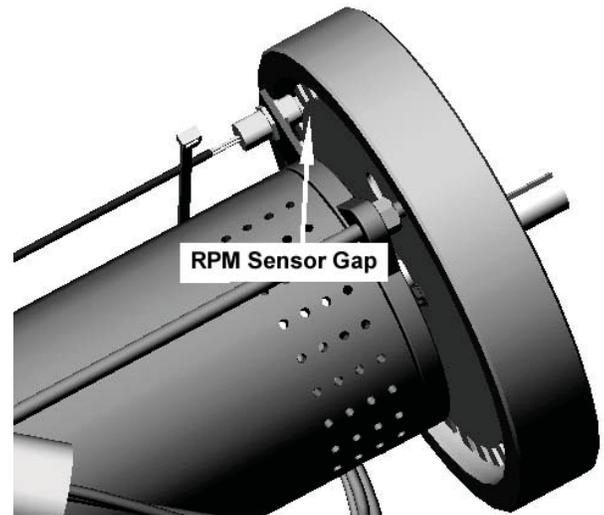
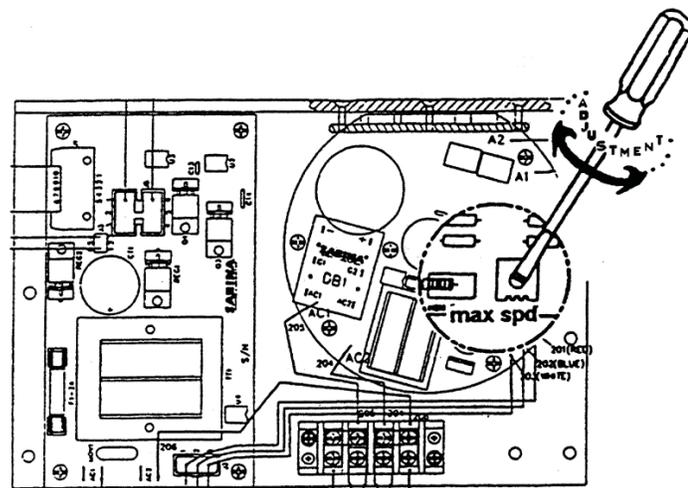


Diagram #2



The following procedure allows the treadmill to manually calibrate Minimum and Maximum speeds, only in the case Auto-Calibration is not functioning correctly.

Symptom:

Will not calibrate to MN or MX speed, in the Auto-Calibration Mode.



CAUTION

Do not stand on the running belt while performing these steps.

NOTE: Alternative mode to enter Motor

Test Mode; turn the power switch "ON" while pressing

the "8" key simultaneously on the display.

NOTE: The MN SPD should not exceed .5 MPH

or 1KPH. The 1/2 MX SPD should be exactly half of the desired MX SPD. The MX SPD must not exceed 10 MPH or 20 KPH (220 units).

NOTE: Speed Command 255 is the maximum the treadmill will reach.

1. Engage TEST MODE. Press and hold the " 0 ", " 1 " & " START " keys together (or the "0" , "2"). While holding the " 0 " & " START " keys down, release the " 1 " (or 2) key. The display will beep and display **SETTINGS (or CONFIGURE)** momentarily, then **UNITS** will be displayed.
2. Press and release the "8" key. Display will read: **XXX 3 .0** XXX is a variable number depending on the elevation position the treadmill is at. **3** indicates Speed Command, 0 indicates RPM. If the treadmill is at 0% the display will read: **240 3 .0**
3. Press the "+" key (speed) to the desired MN SPD, 1/2 MX, and MX SPD. Write down the corresponding Speed Command number displayed for each desired setting.
4. Press the "STOP" key. Engage Configuration/Settings Mode as described in STEP 1.
5. Using the "UP ELEVATION" key go to MN PWM parameter and enter the new MN SPD Speed Command number by using the "+" or "-" keys, then press the "START" (enter) key to save the new setting. Do this for the 1/2 MX and MX SPD.
6. Press the "STOP" key to exit.

No Display Power

The following steps help troubleshoot in case the display board fails to power up, during or before regular operation.

110v UNIT

Diagram A

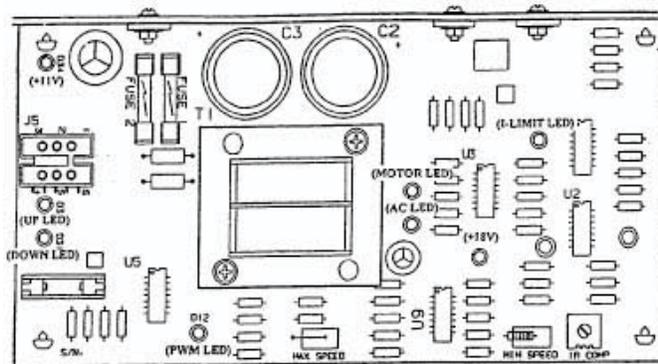
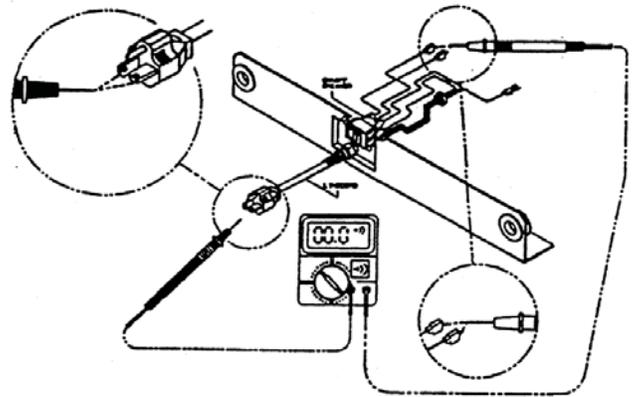


Diagram B



****CAUTION****

The following steps are performed with the treadmill "ON".

1. Lift and suspend the motor shroud.
2. Verify if LED AC is lit. AC LED indicates that AC power is being applied to the MCB, does not indicate voltage level. If this LED is lit go to step 3. If LED is not lit verify the following: (see diagram A)
 - The treadmill is plugged into the wall.
 - The ON/OFF Switch is turned to the "ON" position.
 - Verify wire connection AC1/AC2 on the MCB.
 - Verify the ON/OFF Switch Breaker wires are connected.
 - Verify 110v (+/- 10%) AC voltage at AC1/AC2. if the voltage is 0 or less than 90v, check wall voltage, verify unit is on a dedicated line.
 - If wall voltage is correct, verify linecord continuity. (see diagram B)

REPLACE: MCB if all the above check OK.

3. Verify if LED +18 is lit. LED +18 indicates the presence of an acceptable level of voltage for MCB operation.

REPLACE: MCB if +18 is not lit.

4. Verify if LED +11 is lit. LED +11 indicates 11v are being applied to power the display board. If the LED is lit go to step 5.

REPLACE: MCB if +11 is not lit.

5. Verify display cable connection.

- Verify display cable for possible pinch or tear mark.

REPLACE: Display board if display cable checks OK.

No Display Power

The following steps help troubleshoot in case the display board fails to power up, during or before regular operation.

220v UNIT

Diagram A

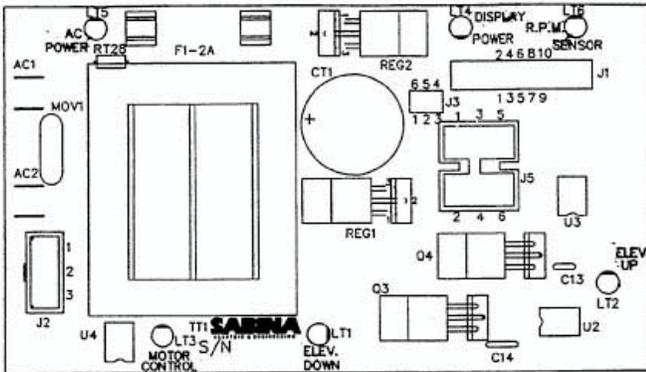
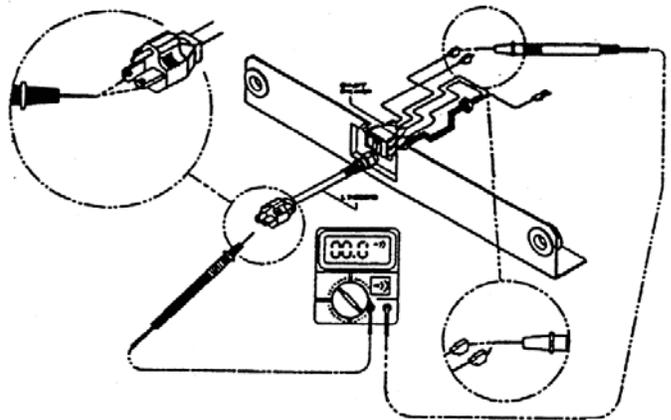


Diagram B



****CAUTION****

The following steps are performed with treadmill "ON".

1. Lift and suspend the motor shroud.
2. Verify if LED AC is lit. AC LED indicates that AC power is being applied to the MCB, does not indicate voltage level. If this LED is lit go to step 3. If LED is not lit verify the following: (see diagram A)
 - The treadmill is plugged into the wall.
 - The ON/OFF Switch is turned to the "ON" position.
 - Verify wire connection AC1/AC2 on the MCB.
 - Verify the ON/OFF Switch Breaker wires are connected.
 - Verify 220v (+/- 10%) AC voltage at AC1/AC2. if the voltage is 0 or less than 200v, check wall voltage, verify unit is on a dedicated line.
 - If wall voltage is correct, verify linecord continuity. (see diagram B)

REPLACE: MCB if all the above check OK.

3. Verify if LED DISPLAY POWER is lit. This LED indicates 11v are being applied to power the display board. If the LED is lit go to step 4.

REPLACE: MCB if DISPLAY POWER LED is not lit.

4. Verify if LED MOTOR CONTROL is lit. This LED indicates there is a valid control command from the display to the MCB. Verify the following if LED is off:

- Verify display cable connection.
- Verify display cable for possible pinch or tear mark.

REPLACE: Display board if display cable checks OK.

Elevation Motor



NOTE: Activation of the thermal protection breaker does not cause damage to the elevation actuator or other treadmill components.

The following procedure explains the elevation system Thermal Protection and limitations.

Symptom:

Elevation system shuts-off when used consistently.

1. The Star Trac Model 4500 elevation system actuator is protected from overheating by a thermal protection circuit. In the event that the thermal protection breaker is activated, the treadmill's elevation system is temporarily disabled, and an "EL STL" display codes is displayed.
 - A simple resetting of the treadmill restores full operation once the elevation actuator has been allowed to cool for a few minutes.
2. The pre-defined workout programs 1 through 8 as well as other typical workout regimens include elevation changes that easily fall within the operating limits of the Model 4500's elevation system actuator. The following information serves as a guide for users that may wish to set a custom program that requires frequent and/or large changes in incline.
 - Incline changes greater than 5 percent should not be programmed for intervals less than 1 minute.
 - Full range incline changes (from 0 percent to 15 percent, or vice-versa) should not be programmed for intervals less than 3 minutes.

Elevation Motor

The following procedure verifies elevation motor potentiometer response.



**** CAUTION ****

Do not stand on the running belt while performing these steps.

NOTE: Several of the following steps require dealing with "live" voltage. Have the treadmill turned off and unplugged when checking wire connections.

NOTE: The potentiometer values can be read in Motor Test Mode, 240 = 0%, 57 = 15% for 110v units or 80= 15% for 220v units.

NOTE: The values in diagram A were taken from a properly functioning elevation system. You may expect slight variation from machine to machine. If the values are 0, check display cable for possible short see page 4.17 Display Cable Symptoms. If values are erratically different replace the Elevation Motor.

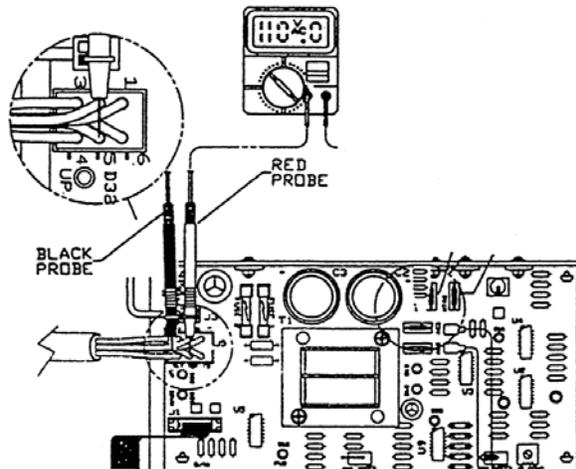
Symptoms:

Elevation motor hesitates during operation.
No elevation count reading in Test Mode.

- The elevation motor potentiometer may have failed or register incorrect values causing the motor to hesitate while operating. The chart below (see diagram A) is a guide for the correct elevation readings on the TR 4500.
 - Using a Volt Meter verify the following values from the elevation motor at certain elevation grades (see the chart for elevation grades). The voltage readings may vary by +/- .05 volts. The ohms may vary by +/- .01 k ohms. See diagram B for meter reference.

Diagram A.

% Grade	Incline number in Motor Test Mode	DC Voltage across Blue and Orange wire on the Elev. motor connector	Ohm reading between the Blue and Orange (elev. motor unplugged)	DC Voltage on Pin 4 of the display electronics
0	240	4.68	9.76k	4.8
1	228	4.44	9.33 k	4.58
2	216	4.21	8.86 k	4.37
3	204	3.98	8.41 k	4.12
4	192	3.75	7.92 k	3.88
5	180	3.51	7.48 k	3.64
6	168	3.27	6.95 k	3.42
7	156	3.04	6.48 k	3.18
8	144	2.81	6.01 k	2.95
9	132	2.57	5.50 k	2.71
10	120	2.34	4.98 k	2.48
11	108	2.11	4.48 k	2.26
12	96	1.88	3.99 k	2.03
13	84	1.64	3.52 k	1.79
14	72	1.41	2.97 k	1.55
15	60	1.17	2.48 k	1.33



Elevation Troubleshooting



**** CAUTION ****
Do not stand on the running belt while performing these steps.

220v treadmill Incline Range Adjustment for Free-wheeling symptom.

Symptom:

Treadmill free-wheels at high elevation, causing the running belt to slowly accelerates beyond the selected speed.

1. This symptom may be easily fixed by changing certain values in the Configure Mode. Engage Manager/Maintenance Mode by holding down the “0”, “1” and “Start” keys at the same time, and then release the “1” key only.
2. Press the elevation “↑” key until the display window reads “EL MAX 57”. Change the “57” to “80” by pressing the “+” key.
3. Press the “START” key and the display window will show “UPDATING”. This will save the “80” in the parameter.
4. Press the “STOP” key to exit the Manager or Maintenance Mode. Procedure completed.

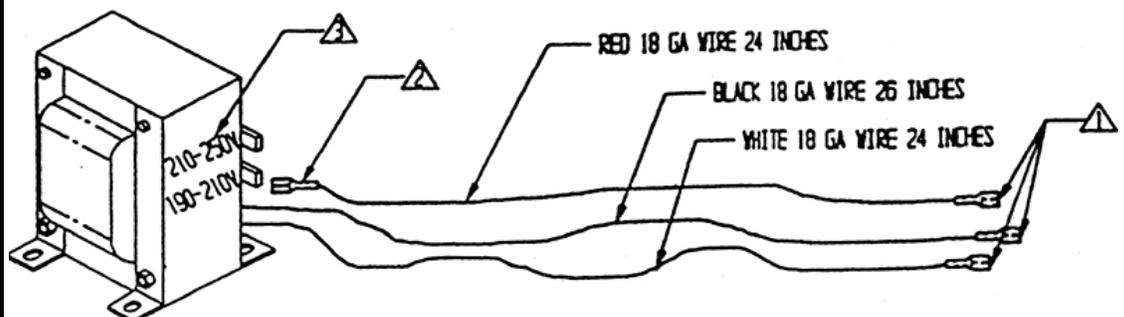
Symptom:

Elevation Motor overheats and blows the MCB fuse.

1. The elevation motor on the 4500 series treadmill uses 115 VAC. On 230 volt treadmills, there is an autotransformer which will lower the voltage to operate the elevation system.
2. Line voltage may vary from location to location. Some locations have line voltages as low as 195 VAC or as high as 250 VAC. The autotransformer has been manufactured with two taps to accommodate these variations in voltage. The two taps are:

- 190 to 210 VAC line voltage
- 210 to 250 VAC line voltage

NOTE: These ranges were chosen to optimize the output voltage to the elevation motor within an acceptable operating range, while still using the present manufacturing tolerances of the transformer manufacturer.





Note: This symptom may be easily fixed by verifying certain values in the Configure Mode.

Note: For each value changed the "ENTER" key must be pressed to be saved.

Symptom:

Treadmill appears/feels faster/slower than other **STAR TRAC** treadmills.

1. Engage Maintenance Mode by holding down the "0", "2" and "Start" keys at the same time, and then release the "1" key only. Display will read MAINTENANCE momentarily then display UNITS.
2. Using the elevation "↑" key to go through the parameteres, verify the following parameterts have the correct values.

	110V / 220V Units English	220v Units Metric
• UNITS	ENGLISH	METRIC
• MN SPD	0.5	1.0
• MX SPD	10.0	20.0
• ENTRY	UNITS/TENTHS	UNITS/TENTHS
• 10 REV	30.7	35.8
• CNT/REV	31	31

3. If any values have been changed or set back to default settings, re-engage Auto-Calibration and re-calibrate.

Speed Troubleshooting



Note: This symptom may be easily fixed by verifying certain values in the Configure Mode.

Note: For each value changed the "ENTER" key must be pressed to be saved.

Note: All 110v units are designed to reach a maximum speed of 10.0 MPH. 220v units set in metric will reach a maximum 20.0 KM/PH.

Note: Wall voltage is very critical when dealing with maximum speed. Voltages under 100v for 110v units will cause speed variation, voltages under 200v for 220v units will cause the same problem.

Note: Each unit must be on its own dedicated circuit, very main wall breaker.

Symptom:

Treadmill will not reach maximum speed.

1. Engage Maintenance Mode by holding down the "0", "2" and "Start" keys at the same time, and then release the "1" key only. Display will read MAINTENANCE momentarily then display UNITS.
2. Using the elevation "↑" key to go through the parameters, verify the following parameters have the correct values.

	110V / 220V Units English	220v Units Metric
• UNITS	ENGLISH	METRIC
• MN SPD	0.5	1.0
• MX SPD	10.0	20.0
• ENTRY	UNITS/TENTHS	UNITS/TENTHS
• 10 REV	30.7	35.8
• CNT/REV	31	31

3. If any values have been changed or set back to default settings, re-engage Auto-Calibration and re-calibrate.

IF the problem continues verify the following.

1. Wall voltage. (+/- 10%)
2. Dedicated Circuit Breaker.
3. Adjust MAX SPEED potentiometer (220v units). See Diagram below:

Speed Troubleshooting



**** CAUTION ****

Running belt will be moving at high speed during Step 1 & 3.

**** CAUTION ****

When checking motor brushes have the treadmill turned off and unplugged.

Note: Brushes should show a smooth pattern of wear, cracks or unusual wear will cause motor to jerk, replace if brushes if needed.

Symptom:

Treadmill jerks or hesitates during operation.

1. Verify the running belt / drive belt are not loose or slipping.
 - Accelerate the running belt to 3.0 (5.0 kph). Stand on the side of the treadmill, while grasping the handrails firmly, place one foot on the running belt with a very sharp impact. Running belt should not stop, instead slip for a split second forcing your foot back. Drive belt should never stop rotating over the headroller during this procedure.
 - If running belt or drive belt appears loose, see page 4.26 in this section.
2. Verify motor brushes are making contact and are seated correctly.
 - Remove the motor brush cover, check brushes are seated correctly by removing the brush clip and verify contact. See diagram A for removal instructions.
 - Cleaning the motor armature with a commutator stone is highly recommended to remove any possible carbon dust build up, causing the the brushes to skip over resulting in a brief motor hesitation.
3. Adjust the IRCOMP potentiometer, located on the MCB, see diagram B.
 - Bring the treadmill to its minimum speed.
 - Stand on the running belt, if the belt feels jerky / hesitates adjust the IRCOMP potentiometer until running belts feels smooth.

Symptom:

Treadmill hesitates during initial speed start-up.

1. Manually calibrate the minimum PWM as described in page 4.7 in this section.

Heart Rate Troubleshooting



**** CAUTION ****

Do not stand on the running belt while performing these steps.

Before any troubleshooting is performed, verify that the heart rate grips are being used and maintained properly.

Symptom:

Intermittent or erratic heart rate reading.

- 1.** User failing to grip all four rings completely with both left and right hands
- 2.** An excessively tight grip on the rings can cause erratic readings. The probability of erratic readings can be therefore lessened by:
 - reduced upper torso movement
 - a proper grasp on the grips
 - clean hands
 - clean grips
- 3.** Excessive foreign matter (dirt) on the hands can generate electrical interference which will cause erratic readings.
- 4.** Clean and wipe heart rate grips after each use, for optimum results.

Heart Rate Troubleshooting

Symptom:

No Heart Rate reading.

1. **Engage HEART RATE TEST.** Turn the power switch "on" while pressing key "5" simultaneously on the display. All the display LEDs will light up when engaged.
 - Press the HEART key once, EPROM version will be displayed. HEART key twice, displays Heart/ Seeking HR.
 - Grip heart rate handles, The negative (-) symbol will begin to flash indicating heart rate system is being registered. Do not squeeze excessively to avoid excessive muscle contraction (false readings). If no reading is displayed go to **STEP 2**.

2. **Verify Contact Heart Rate settings.** Engage MANAGER MODE, Hold the "0", "1", and "START" keys together and release the "1" key only. Display will read MANAGER MODE momentarily, then UNITS will be displayed.
 - Scroll through the parameters using the elevation "UP" key until display reads: CONTACT= contact heart rate. BOTH = both contact and polar can be used (if software available).
 - Press the "+" or "-" key to change, "START" key to save.

3. **Verify Heart Rate receiver connection.**
 - Remove the display board, verify wire connections.

NOTE: See diagram #1 Display removal.
 NOTE: See diagram #2 Wire connection.
 Connection is wrong or loose, reconnect and repeat step 1.

4. **Verify Heart Rate grip cables.**

NOTE: See diagram #3. If connections are wrong or loose, reconnect and repeat step 1.

Diagram 1

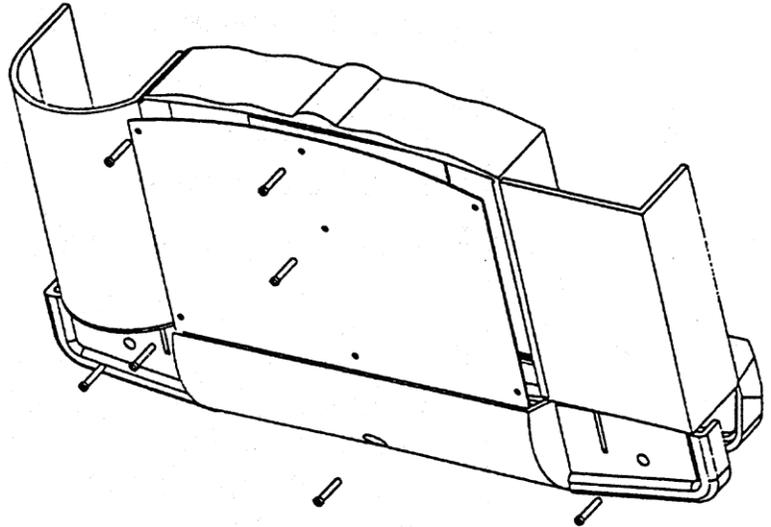


Diagram 2

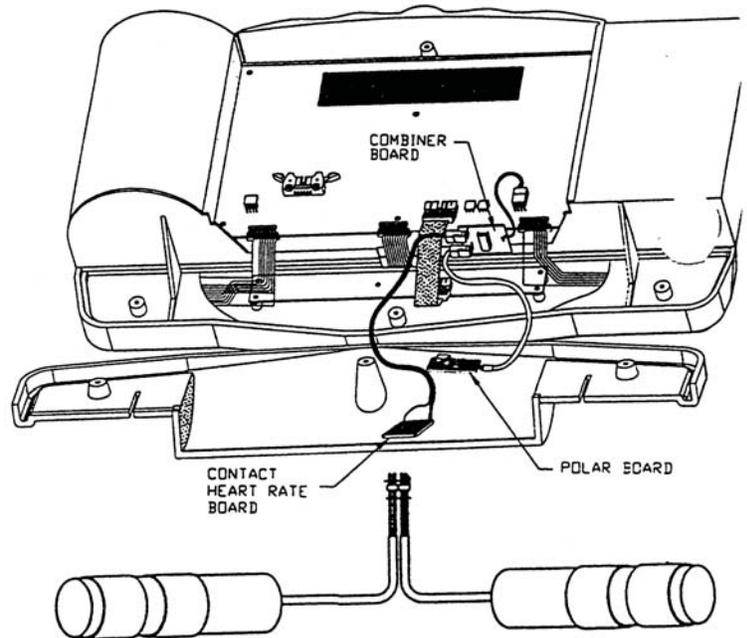


Diagram 3

Heart Rate Troubleshooting

5. Connect Heart Rate Board straight to the display input.

- By-pass the Combiner Board, insert the heart rate wires straight to the display.

See Diagram #3 & 3a. After connection has been repeat step 1.

REPLACE: Combiner Board if Heart Rate registers. If no Heart Rate is registered go to step 6.

NOTE: Step 5 can only be performed if the software includes both Polar and Contact.

6. Check continuity/resistance between Heart Rate grip rings and input wires.

- Disconnect both heart rate grip inputs (red & black wires) from back of display.
- Using a Multi-meter check continuity between the heart rate rings and its corresponding output wires.
- Red wire = outside rings.
- Black wires = inside rings.

NOTE: See Diagram #4.

REPLACE: Heart Rate grip(s) if reading is greater than 1.0Ω

7. Check continuity/resistance of each hand rate grip.

- Using a Multi-meter check continuity between the two rings on the same grip.
- Black meter probe to inside ring and red meter probe to outside ring.

NOTE: See diagram #5.

REPLACE: Heart Rate grip(s) if reading is lower than $3\text{ M}\Omega$.

8. Check continuity/resistance between the two hand rate grips.

- Measure the resistance between the two outside rings.

NOTE: See diagram #6.

REPLACE: Heart Rate grip(s) if reading is less than 18.0Ω

Diagram 4

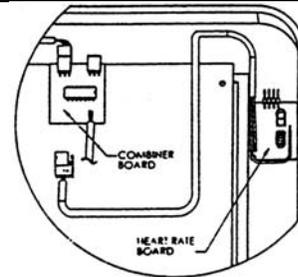


Diagram 5

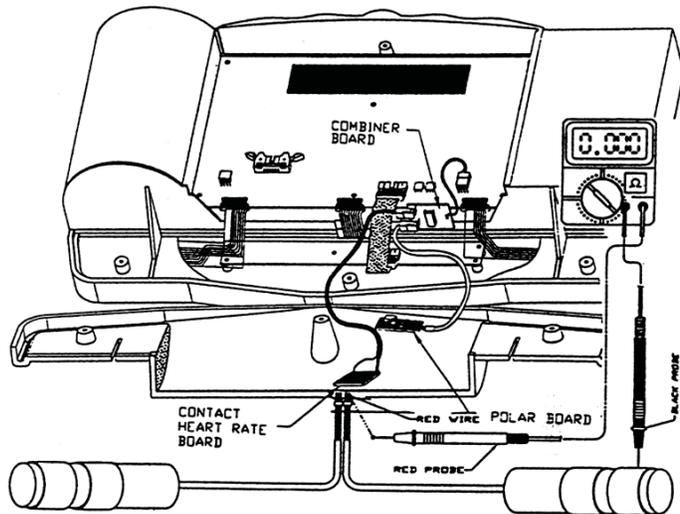


Diagram 6

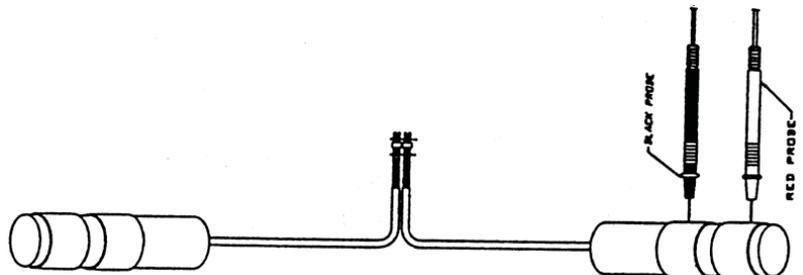
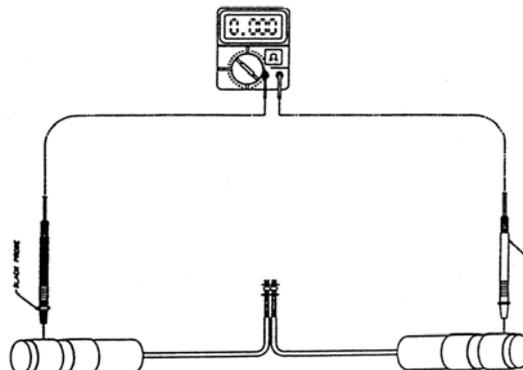


Diagram 7



Polar Heart Troubleshooting



**** CAUTION ****
 Do not stand on the running belt while performing these steps.

NOTE: Secure the chest strap transmitter as high under the pectoral muscle (breast) as is comfortable and allow normal breathing.

NOTE: Wet the electrodes (the two grooved rectangular areas) thoroughly with water.

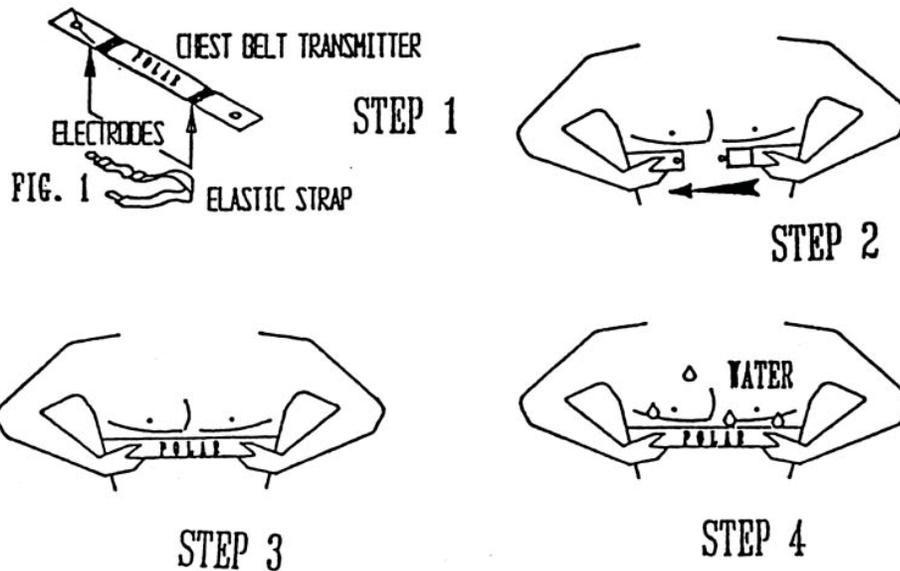
NOTE: Verify heart rate response without operating the running belt. Straddling the treadmill press the HEART key. If heart rate is not picked up engage Heart Rate Test, refer section 2.8

If the display is having difficulty picking up polar heart rate readings, verify proper usage.

Symptom:

Intermittent or erratic polar heart reading.

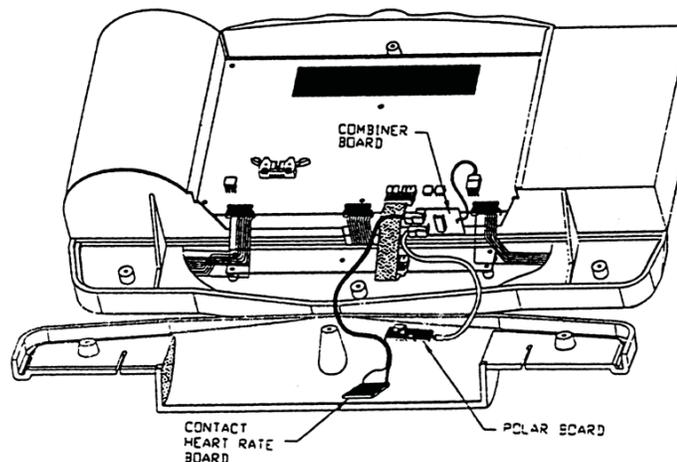
1. The maximum distance for polar heart rate to receive a signal is 3 feet.
2. Verify chest strap is correctly positioned. Chest strap electrodes must be properly positioned and wet. See below diagrams.



3. Connect Polar Board straight to the display input.

- By-pass the Combiner Board, insert the heart rate wires straight to the display. See Diagram 1 # 1a

REPLACE: Polar Board if Heart Rate registers. If no Heart Rate is registered go to .



Display Cable

The following symptoms indicates a faulty or pinched display cable.

Symptom:



****CAUTION****

Do not stand on the running belt while performing these steps.

NOTE: Alternative mode to enter Motor Test Mode; turn the power switch "ON" while pressing the "8" key simultaneously on the display.

No display power related.

1. No display power, treadmill elevation bottoms out during start-up.
2. No display power, MCB LED +11 remains lit on 110v units. MCB LED Display remains lit on 220v units.

Intermittent or no elevation.

1. In Test Mode only up direction works, MCB LED "UP" remains lit.
2. In Test Mode no elevation count (elevation motor pot), will elevate both directions reads EL LOST across display in regular operation mode.
3. In Test Mode no elevation response, reads EL STL across display in regular operation mode.
4. In Test Mode elevation count registers slow to actual elevation response.
5. Treadmill elevation without command in regular operation mode.
6. Elevation motor hesitates in between elevation percents, MCB LEDs "UP" & "Down" toggle back and forth.
7. Elevation intermittently responds, registers different elevation display codes in regular operation mode.

Intermittent or no speed reading

1. In Test Mode belt movement, but no RPM reading. MCB LED RPM remains of on 220v units. registers NO RPM code across display in regular operation mode.
2. In Test Mode or regular operation mode, RPM reading intermittently flashes.
3. In Test Mode or regular operation mode, RPM speed fluctuates.
4. In Test Mode MCB LED PWM (110v units) or MOTOR CONTROL (220v units) remains off and no RPM reading is registered.

Drive Motor

The following symptoms indicates a faulty drive motor.

Symptom:



****CAUTION****

Do not stand on the running belt while performing these steps.

NOTE: If the ON/OFF switch trips only with a load, running belt may be worn.

Tripping the ON/OFF switch breaker.

1. Disconnect the drive motor belt.
2. Run the drive motor for ten minutes at a high speed (6 MPH/ 10 KPH). If the ON/OFF switch trips, verify if the MCB LED I-LIMIT lights up (110v units), this would indicate Drive Motor pulling higher amps than desired.

Drive Motor making noise.

1. Disconnect the drive motor belt.
2. Isolate the noise. Bellow is a list of discriptions related to motor noise:
 - Knocking; Noise described for bearing failure or motor magnet.
 - Grinding ; Noise describing bearings, motor brush wear.
 - Squeaking; Motor brushes installed incorrectly, flywheel loose, motor bearings.
 - Howling; Usually described when motor increases to higher speeds.

Head / Tail Roller

You may need to replace the head or tail roller if the following symptoms are observed.

Symptom:

Thumping, knocking noise as the running belt goes over the roller.

Verify the following:

- Delron end caps are loosening.
- Bearings are grinding or knocking.
- Lagging (coating) is loose.
- Thumping sounds (may also indicate a possible wax build up).

The running deck surface is coated with a special wax. During breaking period (first 20 – 30 hours of operation), some wax may form on the tail roller causing a loud thumping noise. In worse cases, this may cause mis-tracking. If the thumping noise continues, remove the wax buildup. With the following procedure:

1. Loosen or remove the tail roller by backing of the Allen screws. Use a ¼" Allen wrench.
2. Remove the largest buildup of wax deposits from the tail roller. Use a plastic scraper, credit card or piece of wood. Never scrap with a sharp metal object.

Note: Do not remove all the wax as it is required to lubricate both the running belt and deck.

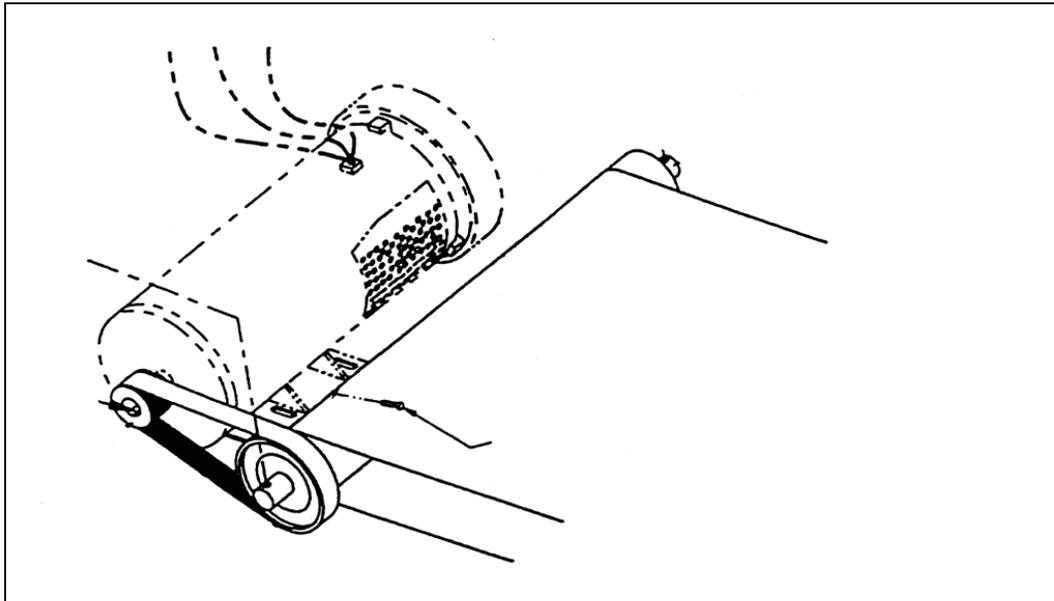


The drive belt tension may require tightening if a slipping problem occurs on the drive pulley.

Symptom:

Running belt slips when running or walking.

1. Loosen the four motor mount kep nuts and washer using a 5/16 " wrench.
2. Adjust the drive belt tension by turning the motor mount adjustment (socket head cap) screw. See diagram below. Tension should be no more than 90 lbs.
 - If too tight, turn the belt tension screw counter-clockwise.
 - If too loose, turn the belt tension screw clockwise.
3. Simultaneously tighten the belt tension lock nut while holding the belt tension screw with a 5/16" wrench.
4. Simultaneously tighten the right, rear, motor mount nut, then tighten the remaining bolts.
5. Verify if the belt is tensioned properly.



Running Belt Troubleshooting

Note: For optimal performance during the lifetime of the treadmill,

running belt adjustments may become necessary. All adjustments are performed by adjusting the tail roller Allen screws with a 1/4" Allen wrench.

To prevent belt problems from occurring, verify the running belt is properly adjusted and working smoothly by performing the following steps:

1. Feel the underside center of the running belt, for glaze. Glaze is described as a smooth glass texture, the correct feeling should be a rough texture such as found on the undersides of the belt.

If glazed, replace the running belt. Contact your local retailer or act **STAR TRAC** Product Support Department at 800-501-1221 or through our web site at <http://www.startrac.com>.

2. Activate the treadmill. Stand at the back of the treadmill and visually inspect the running belt. The running belt should move smoothly, without drifting to far to the left or right. This will cause fraying or damage to the running belt. For proper tension and tracking, refer to **Running Belt Tension and Running Belt Tracking in this section**.

If you observe the following symptoms, running belt needs to be replaced

1. On/off switch tripping to the "off" position after treadmill is used for short period of time.
2. Running belt continues to slip after tightening . (Provided the drive belt has been checked for proper tension)
3. Edges of the running belt are frayed.
4. Running belt seam is coming apart.
5. Running belt beginning to fold in the middle.

Running Belt Tracking

Note: The running belt may mis-track due to the style of the walker or runner.

Note: The running belt will track to the side less tensioned.

Note: To ensure proper tracking, the treadmill leveling feet must be adjusted to conform to the floor surface. For proper procedure see **Feet Leveling** in this section.

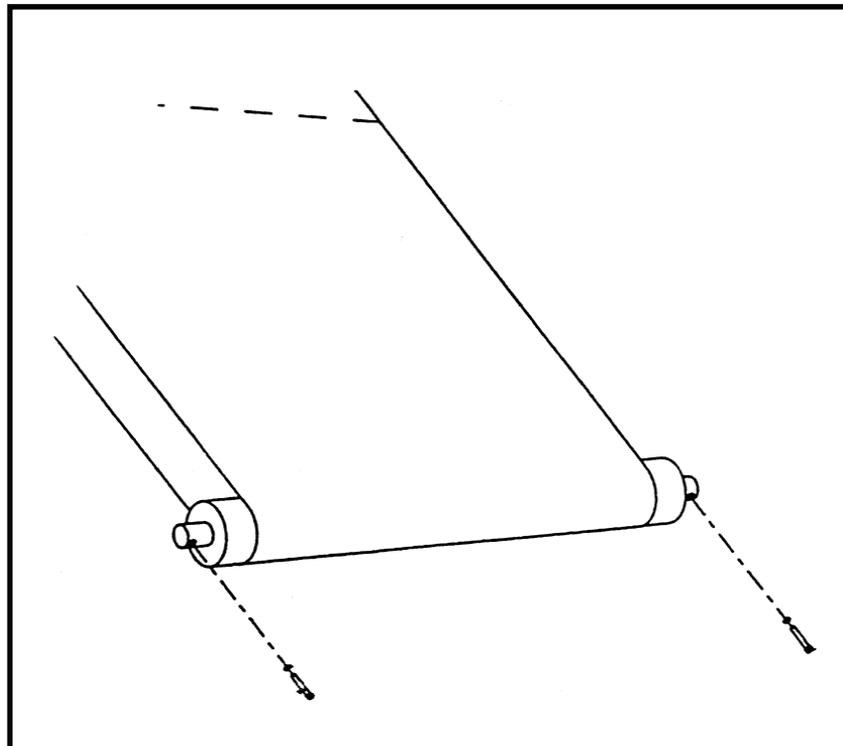
If the running belt is not centered on the tailroller and is either too far left or right, adjust tracking using the following steps:

1. Turn treadmill on. Increase speed to 3.0 mph (5.0 kph).
2. Adjust tracking by adjusting the tailroller Allen screws located at the back sides of the tail roller with a 1/4" Allen wrench in 1/4 turn increments.
(See below diagram)

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

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

3. After running belt appears to be tracking properly, increase speed to 10 mph (16 kph) and verify belt stays centered.
4. Verify correct running belt tension as outlined in the **Running Belt Tension** procedure in this section.



Running Belt Tension

Note: Prior to making any adjustments to the running belt tension, verify the drive motor belt is properly tensioned.

The running belt tension may need to be adjusted over time to keep the the belt from slipping with each jogging step or at high speeds. Use the following procedure for testing belt tension.

1. Accelerate the running belt to 3.0 mph (5.0 kph).
2. Stand on the side of the treadmill. Grasping the handrails firmly, place one foot on the running belt with a very sharp impact. The running belt should not come to a complete stop. The running belt should slip for a split second, then forcing your foot back.

If the running belt does not stop with impact, the running belt may be to tight and cause the belt and other components to premature fail. Loosening the tail roller Allen screws a 1/4 of a turn counter-clockwise and re-checking will be necessary.

If the running belt stops and noticeable slippage occurs, check the location of the slippage. It can be slipping due to the drive belt slipping over the drive motor pulley and head roller or from the running belt slipping over the rollers.

---- If the slippage is caused from the drive belt slipping over the drive motor pulley, loosen the motor mount bolts located at the mount of the drive motor and tighten the adjustment bolt. For detail more details refer to **Drive Belt Tension** procedure in this section.

--- If the slippage is caused by the running belt slipping over the rollers, tighten the running belt.

Note: If you do not tighten Allen screws in equal increments, you will mis-track the running belt. Verify correct belt tracking procedure.

3. Tighten the left and right tail roller Allen screws clockwise in equal 1/4 increments. Repeat Step Two until running belt is tensioned properly.

The running belt has been tightened too much and may require loosening, if:

Note: Do not over tighten the running belt. Over tightening will cause premature failure.

Note: If the running belt creaks in spite of being loosened, apply dry lubricant, such as TFE Teflon or powdered wax to the deck.

1. The edges of the running belt curls down or up, causing the middle of the belt to bubble up.
2. Running belt creaks as it goes over the rollers.
3. Treadmill trips the circuit breaker (on/off switch) after tensioning.

The following procedure will help determine and properly adjust the deck bumpers.



Symptom:

Running deck squeaks when running.

- 1.** When properly located, the side bumpers (two on each side) bear against the delrin rods in the frame rails. The rear bumpers bear against the steel posts at the end of the frame rails. If the bumpers are not located so they bear against the rods as described, the running deck may shift to one side or the other during use. This allows the rear edge of the deck to rub against the steel post. This causes a high-pitched squeak as the user runs on the treadmill.
- 2.** To determine if a deck has the bumpers properly located, look under the end cap/finger guard to see if the bumpers on the end of the deck bear against the steel posts. A problem definitely exists if the bumpers are to one side of the steel posts and the edge of the deck is bearing against the posts.
- 3.** Remove the screws securing each of the four delrin rods and pull them out. Look through the hole in the frame to see if the running deck bumper is adjacent to the hold, such that it would bear against the delrin rod if it was reinstalled in the hole. If all bumpers are properly located, replace the delrin rods and examine the treadmill further for the other causes of squeaks. If one or more bumpers is misalign, follow the procedure given below.

Running Deck



Symptom:

Running deck squeaks when running (continued).

Correcting the problem:

1. Position the deck with the rear bumpers properly aligned with the steel posts. With a pencil, make a mark on the deck adjacent to each of the four delrin rods (as seen from the top of the side rails).
2. Reach under the running deck, shift the deck as far as possible to one side. On the side that now has the edge of the deck exposed from under the frame, pull the rear edge of the deck upward until it is just above the frame rail. Use a screwdriver or putty knife to hold the deck above the frame. Using another screwdriver, raise and hold the front of the deck.
3. Remove the bumper(s) that are not aligned with the pencil marks by carefully prying them away from the deck with a screwdriver, knife or putty knife.
4. Position the bumpers (removed in the previous step) so they are adjacent to the pencil mark(s), and drive them into the edge of the deck using a hammer.
5. Once the bumpers on the side have been installed in the proper locations, remove the screwdrivers used to hold the deck above the frame.
6. Repeat process on opposite side of the treadmill.
7. After the bumpers have been properly installed on both sides of the running deck, position the deck properly, and verify that all bumpers have adjacent to the holes. Reinstall the delrin rods.
8. Test the treadmill thoroughly. The squeak should be gone.



NOTE: Verify that the treadmill is level before isolating any specific component

NOTE: Ensure all assembly screws are tight:

1. Handrails.
2. Display board.
3. Motor shroud.

NOTE: When doing the stethoscope method, be careful of body placement. Ensure all loose items (hair, clothing, jewelry etc) are secure and away from moving parts.

Sounds travel throughout the treadmill making it difficult to isolate the cause of a sound. The following procedure will help determine where a noise may be coming from.

Isolate the noise.

1. If the noise seems to be coming from two different parts (drive motor or roller etc.), isolate the noise by disconnecting the drive belt. Then run the drive motor by itself. If the noise goes away, manually push the running belt to see if the noise returns. If it does, then it is coming from the rollers.
2. Isolate the rollers. Adjust the tension on the tail roller screws until the running belt is loose. Spin each roller by itself to determine where the noise is coming from.

The Stethoscope Method

1. Using a long screwdriver as a stethoscope put the handle of the screwdriver to your ear. Place the opposite end of to the area where you are listening. This will help locate where a specific noise is coming from.

Symptoms:

Rumbling

- Wax buildup on the rollers.
- Head / tail roller bearings.
- Adjustable feet / leveling.
- Floor condition; thick carpet or wood floors.
- Elevation screws dry.
- Elevation motor stripped.

Squeaking

- Deck rubbing against the frame.
- Adjustable feet / leveling.
- Head roller and drive motor pulleys not aligned.
- Drive belt tensioning.
- Running belt tensioning.
- Drive motor brushes.

Knocking

- Drive motor bearings.
- Head / tail roller bearings.
- Running belt hitting the back or front of the frame.
- Missing or worn deck cushions.

Grinding

- Drive motor bearings.
- Head / tail roller bearings.

Motor brushes worn.

Leveling



NOTE: If a leveling foot does not make contact with the floor or if it lifts upwards as weight is applied to one corner of the deck, this will cause the running belt to mis-track.

To ensure proper tracking of the running belt, treadmill leveling should be verified.

Symptoms:

- **Running belt travels to one side.**
- **Treadmill vibrates.**

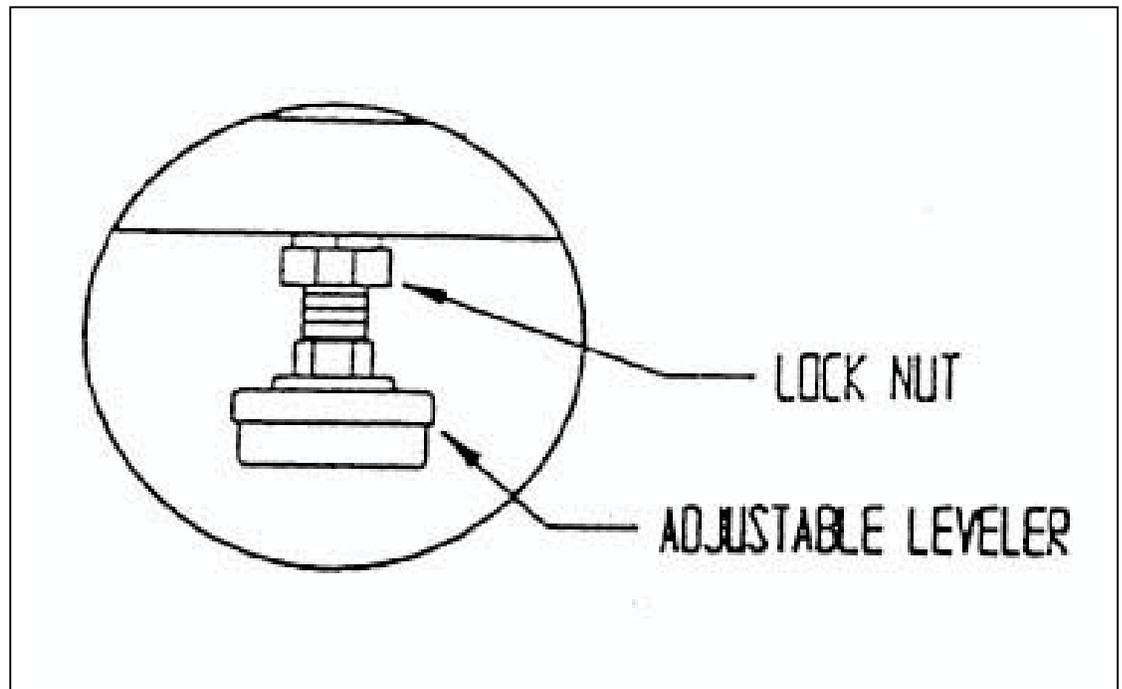
Leveling feet must be adjusted to conform to the floor surface. After the treadmill has been leveled, tracking of the belt must be tested and adjustments made as necessary. This two step procedure is particularly important for treadmill installed in a residence, where floors are commonly uneven. When a treadmill is installed on carpet, a repeat adjustment may be required after the carpet and padding have been compressed by the treadmill feet.

1. Place the treadmill in the exact location where it is to be used.
2. Check the leveling feet at each corner of the treadmill to ensure that they make contact with the floor surface. It may be helpful to have one person bear their weight at one corner of the running belt, then move to another corner, etc., while another person notes whether one or more corners lift from the floor as weight is applied.

---- Using a 9/16 inch open end wrench, loosen the lock nut (see diagram).

---- Adjust leveler height by turning the leveler base. The wrench may be used on the lower nut for this purpose.

---- Tighten the lock nut.





A treadmill vibrates during use if the floor or leveling feet are uneven or when assembly bolts are loose.

Symptom:

Unit vibrates while running.

- 1.** Verify the treadmill is on an even, uncarpeted floor.
 - If no, move the treadmill to an even floor.
 - If floor is carpeted, place the treadmill on a rubber mat.
- 2.** Verify that the Leveling feet are adjusted correctly.
- 3.** Verify the following assemblies.
 - Handrails
 - Slick deck
 - Display board
 - Motor mount
 - Flywheel
- 4.** Remove the drive belt and isolate the motor.
 - If the drive motor vibrates, check motor mount bolts.
 - Verify that the motor brushes aren't cracked.

NOTE: For complete leveling procedure, see the following page.

NOTE: When checking motor brushes, the treadmill must be turned off and unplugged.

Static Shock



****CAUTION****

When checking motor brushes, always turn the treadmill off and unplug.

The treadmill may cause a slight shock from the display panel or handrails, due to a faulty ground wire or a worn running belt and deck.

Symptom:

Slight shock from handrails or when using the display panel.

- 1.** Check the line cord and plug prongs for signs of damage.
 - Verify no prongs are broken, loose or missing.
- 2.** Check the green ground wires attached to the frame for the following:
 - Motor
 - Line cord
- 3.** Check running belt condition.
 - Check for glazing. Replace the running belt if glazed.
 - Wax slick deck.
- 4.** Check drive motor conditions
 - Verify motor brush wear.

Display Codes Chart



**** CAUTION ****

Do not stand on the running belt, while performing these steps.

NOTE: Treadmill should be turned off and unplugged from the wall when looking under the motor shroud.

NOTE: Contact STAR TRAC Product Support Department at 1-800-501-1221 or through our web site at <http://www.startrac.com> Please have your serial number and display code available.

STAR TRAC recommends that you refer your questions about your STAR TRAC 4000 TREADMILL operation and suspected malfunctions to STAR TRAC's PRODUCT SUPPORT DEPARTMENT. However, you may wish to investigate display codes that appear on the display. You may do so by reviewing the below chart or follow the step-by-step flowcharts for the corresponding display code.

Display Codes/Symptoms

KEY DN

- This code generally occurs when a key other than "5" or "8" is held pressed while turning the treadmill ON using the on/off switch.
- It may also happen if a key becomes stuck.

NO STO

- This code generally occurs when the Stop Switch is not connected tightly to the electronic board of the Display.
- It may also happen if the circuitry associated with the switch develops a fault.

NO RPM / SP CNG

- These codes generally occur when the RPM (speed sensor) is disconnected, faulty, or misaligned.
- They may also happen if the RPM Sensor cable is damaged.
- Motor Control Board (MCB) is misadjusted, miscalibrated. or faulty.
- Pinched or faulty Display Cable.
- Drive Motor arcing or faulty.

EL STL, EL RNG, EL LOST and EL NOZ

- These display codes generally occur when the elevation (incline) potentiometer is faulty or out of limits.
- Elevation motor disconnected or receiving low power.
- May also happen if the MCB is miscalibrated or faulty.
- Display Cable pinched or faulty.
- Elevation Belt damaged or binding.

Code: KEY DN Flowchart

Definition: "KEY STUCK"
Possible Cause: Damaged or shorted key/keypad.

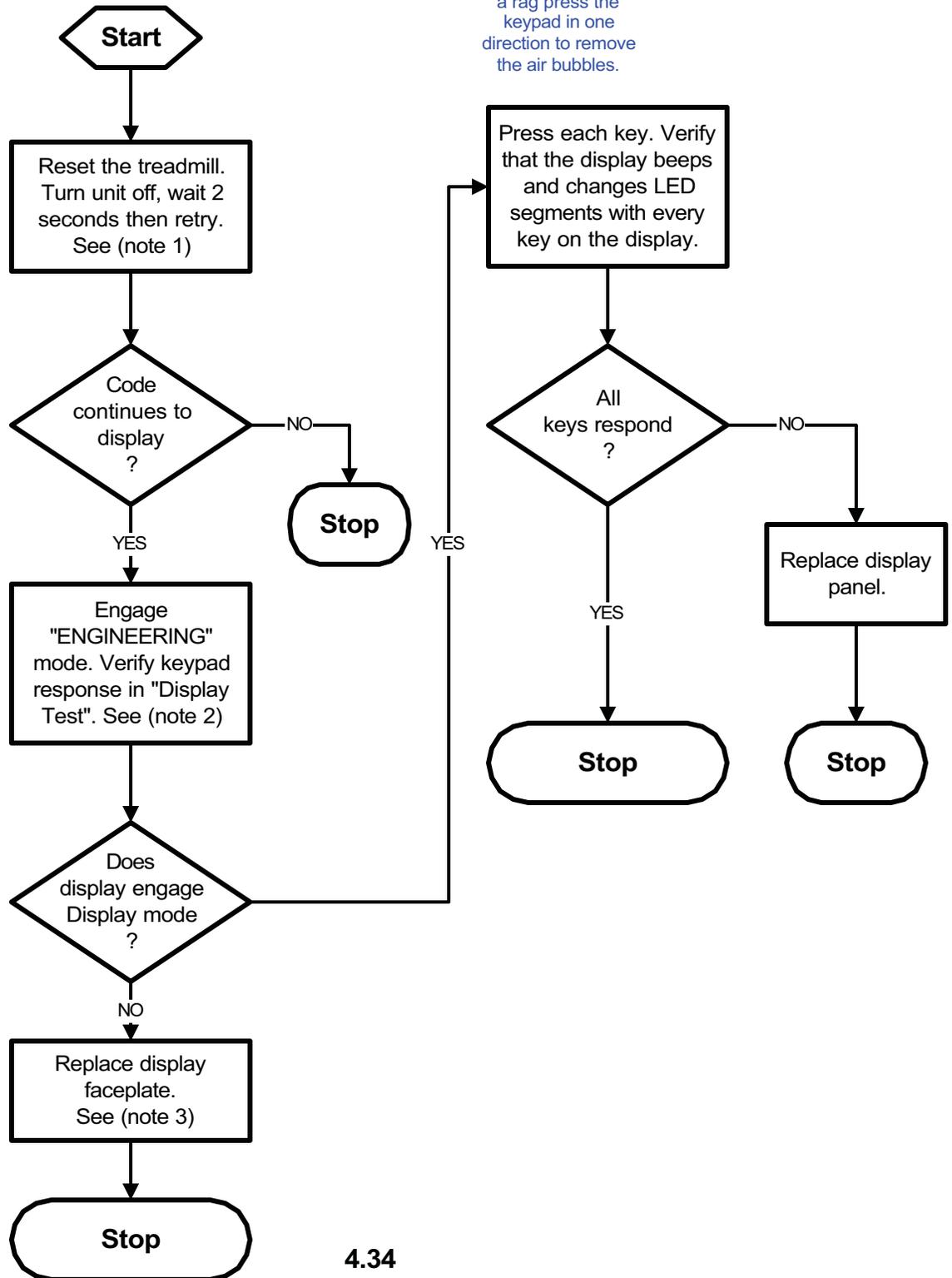
Note4 : Carefully peel off the affected keypad. Wipe the display surface with degreaser (Windex works well). Re-apply the keypad starting from one edge and using your fingers or a rag press the keypad in one direction to remove the air bubbles.

Note 1: This code may occur when a user tried entering "Test Mode" or "Display Test Mode" using the wrong key. Look for any indentations on any of the keys. The plus or fast key are used most often and may cause this error.

Note 2: Press and hold the "0", "2" & "START" keys down at the same time, then release the "2" key. The display will read: MAINTENANCE. Press and release the 5 key. Or manually hold the 5 key and simultaneously turn the treadmill on by the on & off switch.

Note 3: If you are unable to enter the "ENGINEERING" or "Display Test", the panel may have a key that is permanently stuck. Replace the display panel. If any of the LED segments do not light up, there may be a failure in the electronics and you will need to replace the electronic board only.

Note 4: Verify that the PWM LED is flashing, while the treadmill is on. The PWM LED indicates a valid control command is being sent from the Display Board to the PWM Board. If the LED is not flashing, check connection and look for pinch or tear marks.

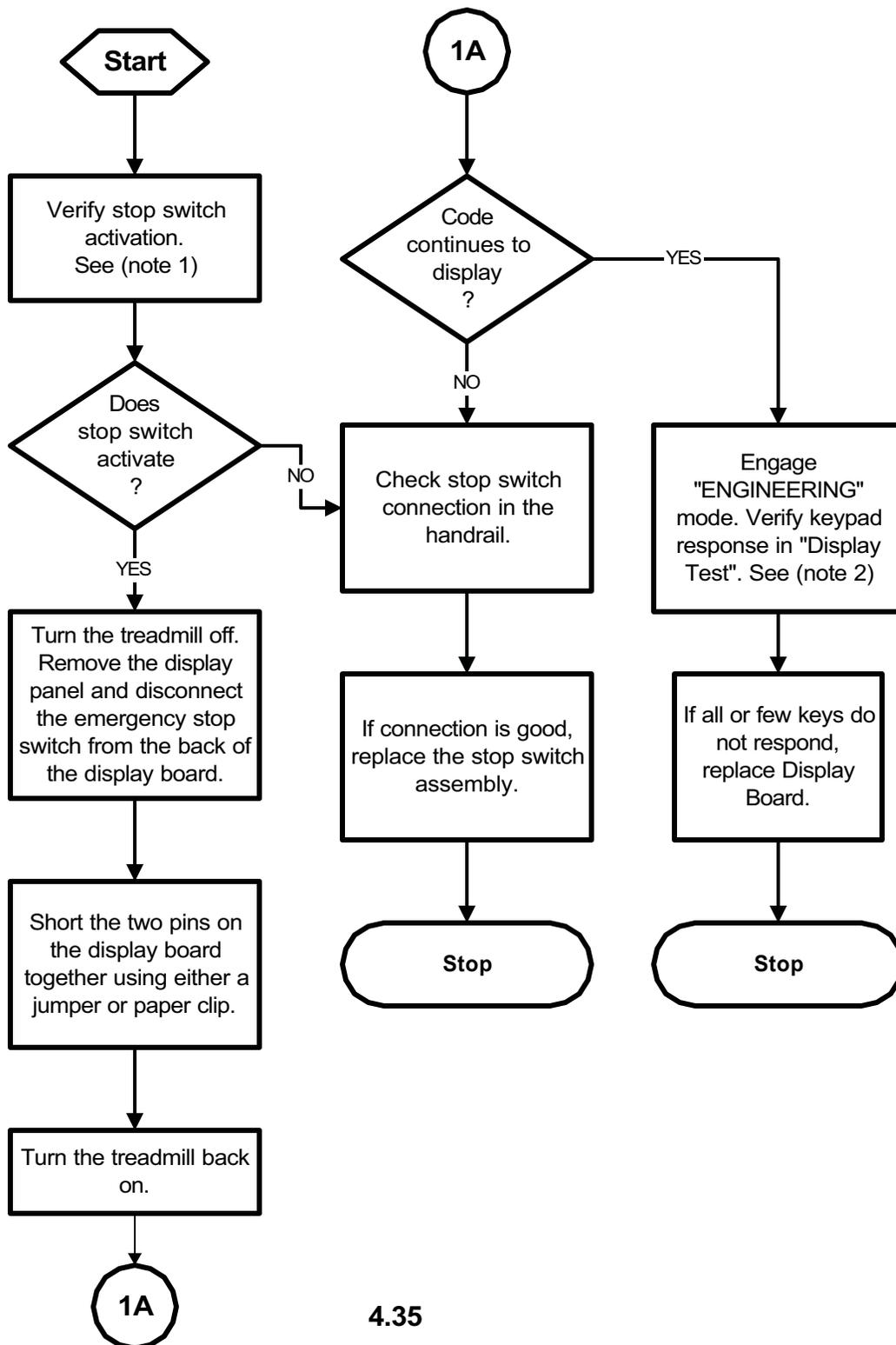


Code: NO STO Flowchart

Definition: "NO STOP KEY"
Possible Cause: Disconnected or shorted stop switch.

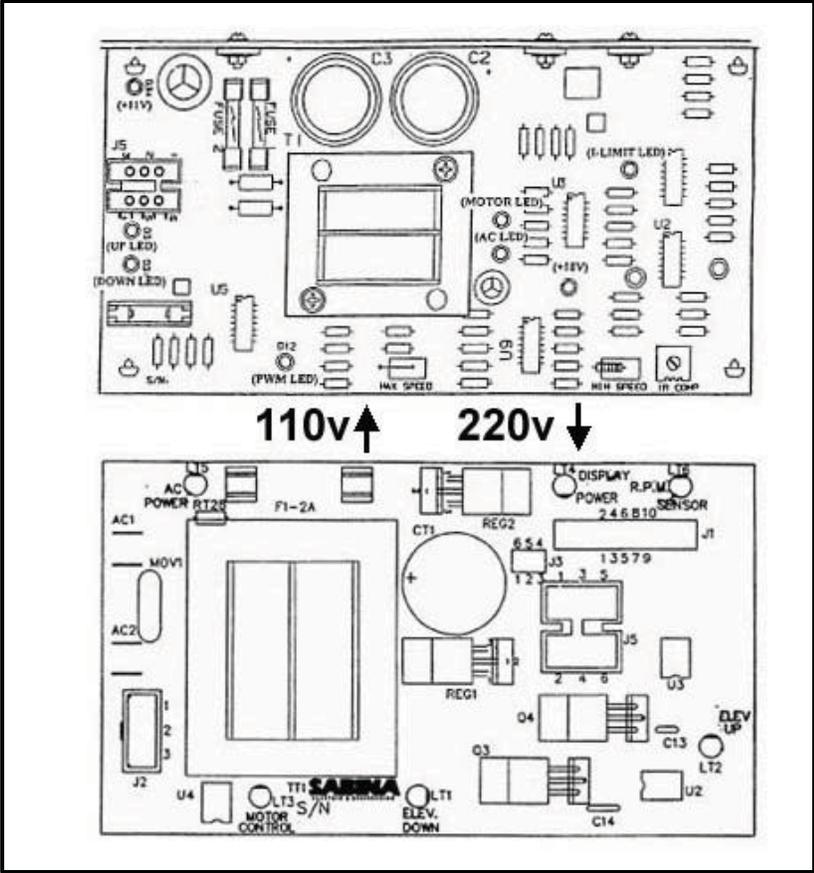
Note 1: Try pushing the emergency stop switch on & off. If switch appears to stick, replace stop switch assembly.

Note 2: Press and hold the "0", "2" & "START" keys down at the same time, then release the "1" key. The display will read: MAINTENANCE. Press and release the 5 key.



Code: NO RPM Flowchart

Definition: "RPM LOSS"
Possible Cause: Damaged or misaligned RPM sensor.

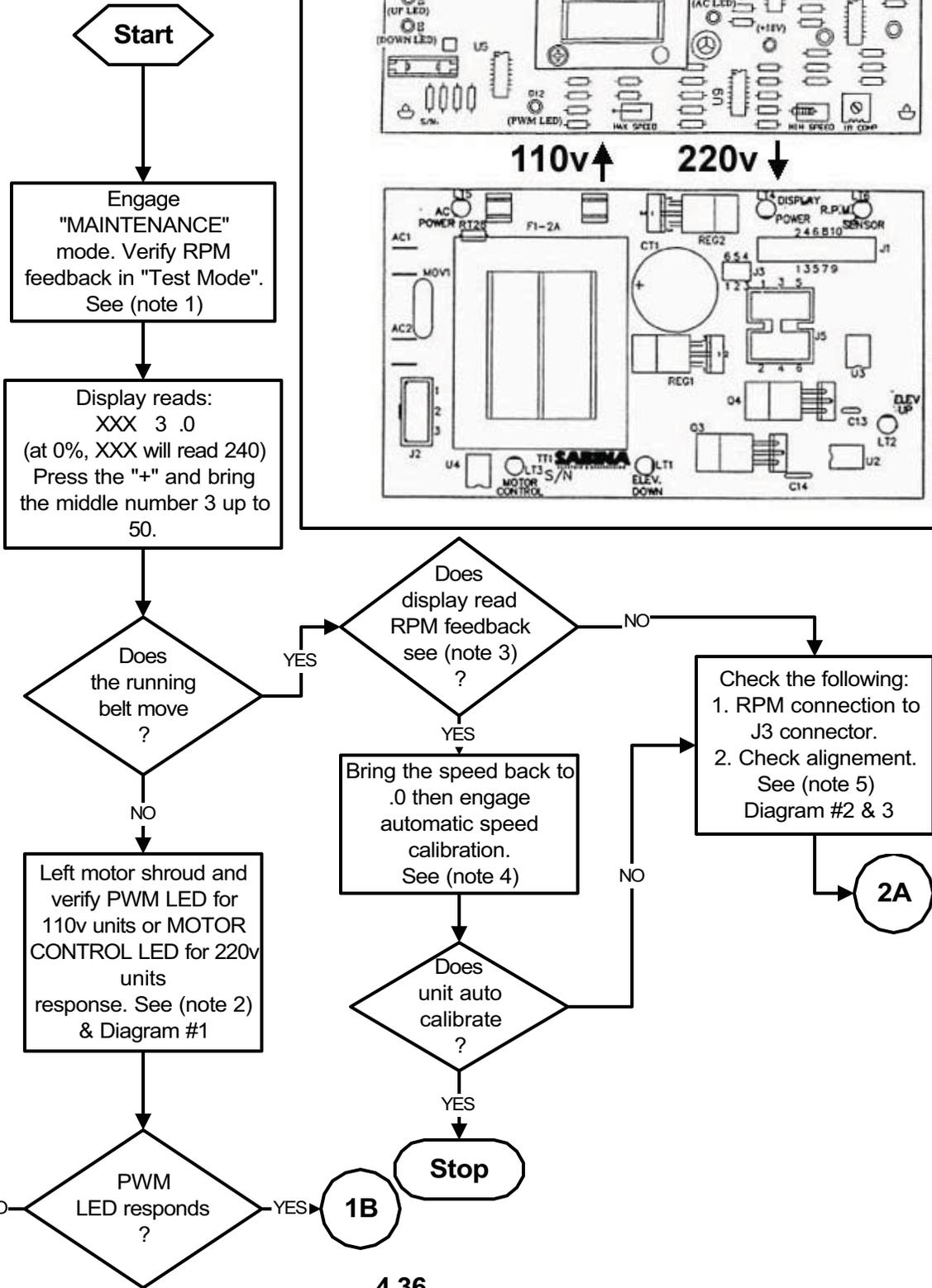


Note 1: Press and hold the "0", "1," & "START" keys down at the same time, then release the "1" key. The display will read: MAINTENANCE. Then press and release the 8 key.
 Or manually hold the 8 key and simultaneously turn the treadmill on by the on & off switch. Both methods will engage "Test mode".

Note 2: Verify that the PWM LED is flashing, while the treadmill is on. The PWM LED indicates a valid control command is being sent from the Display Board to the M.C.B. If the LED is not flashing, check connection and look for pinch or tear marks on the display cable.

Note 3: Verify that RPM feedback is being displayed under speed as the running belt moves.

Note 4: To engage automatic speed calibration, press the "HEART" key. Display will read: CALI. Treadmill will then go into a self auto speed calibration. This will automatically calibrate MIN PWM, 1/2 max, and MAX PWM for min and max speed. This will take less than 3 minutes. Treadmill will be in motion, during this test.



Code: NO RPM Flowchart

Note 5: RPM Sensor gap between the Hall Effect pickup and the flywheel should be no more than 1/8 inch. If not, adjust the RPM sensor to correct gap.

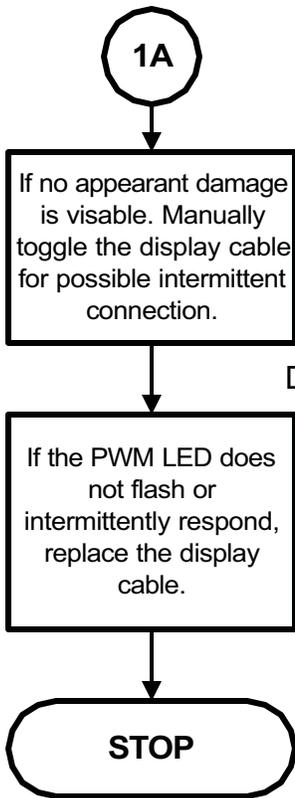
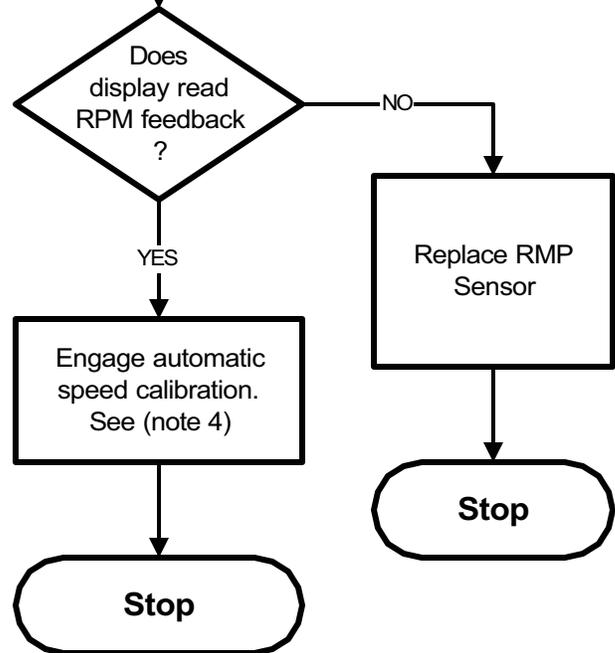
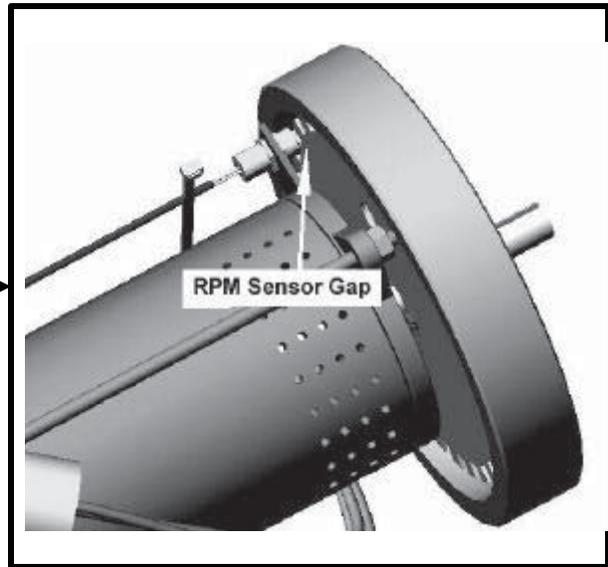
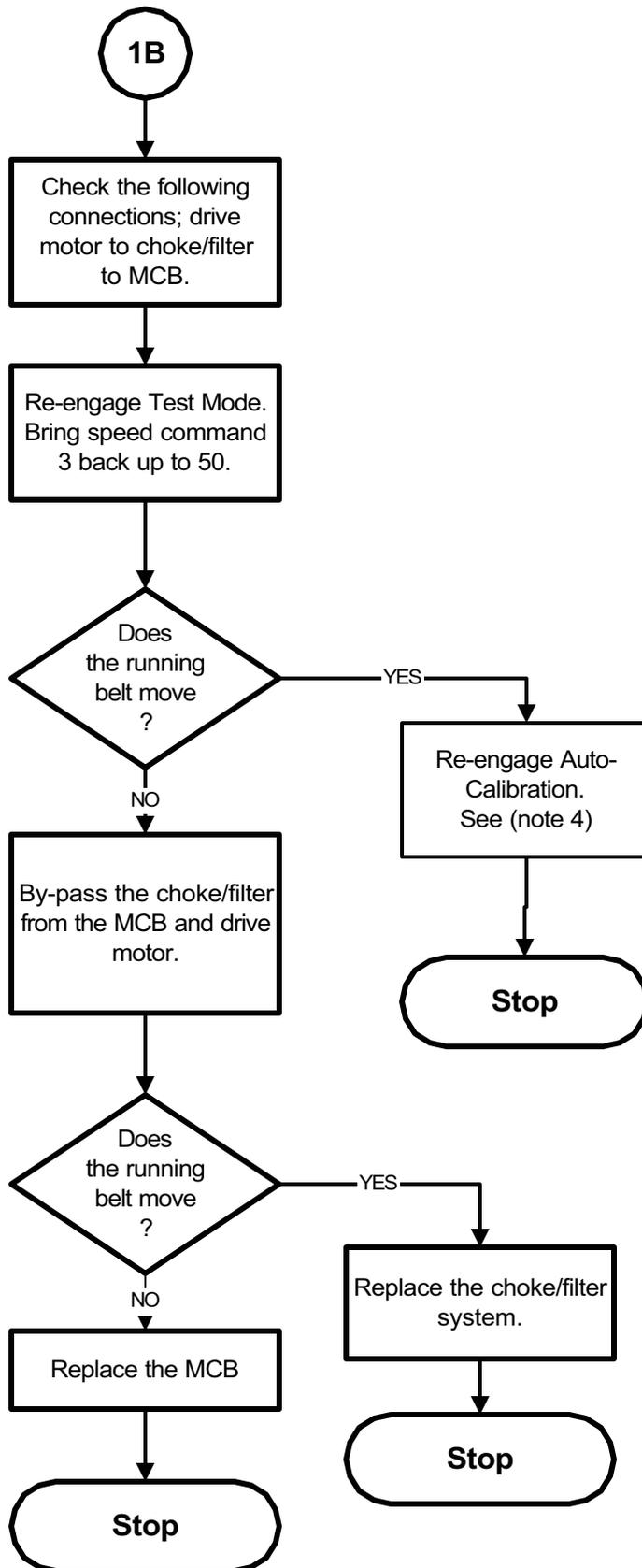


Diagram #2



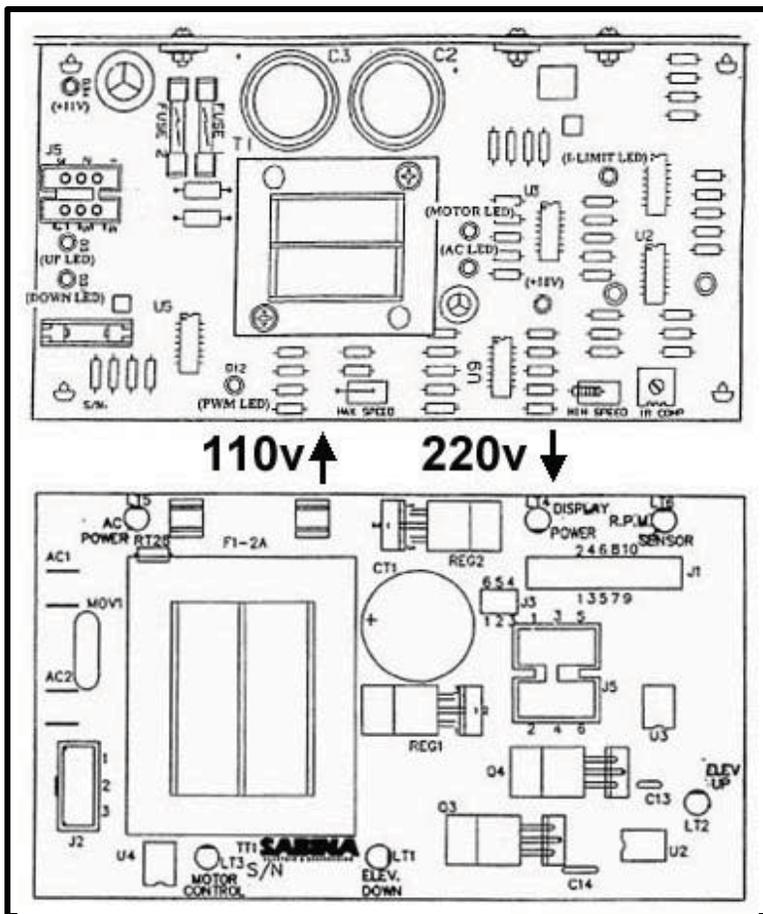
Code: NO RPM Flowchart



Code: SP CNG Flowchart

Definition: "SUDDEN SPEED CHANGE."

Possible Cause: RPM pick-up misaligned.



110v ↑ 220v ↓

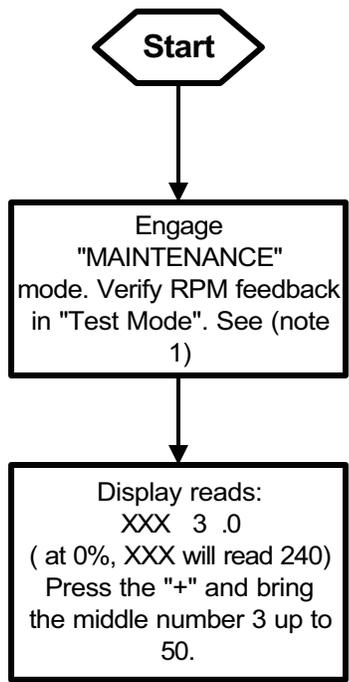
Diagram #1

Note 1: Press and hold the "0", "1", & "START" keys down at the same time, then release the "1" key. The display will read: MAINTENANC, then press and release the "8" key. Or, manually hold the "8" key and simultaneously turn the treadmill on by the on & off switch. Both methods will engage "Test Mode".

Note 2: Verify that the PWM LED is flashing, while the treadmill is on. The PWM LED indicates a valid control command is being sent from the Display Board to the M.C.B. If the LED is not flashing, check connection and look for pinch or tear marks.

Note 3: Adjust the potentiometer clockwise or counterclockwise.

Note 4: Verify that RPM feedback is being displayed under speed as the running belt moves.



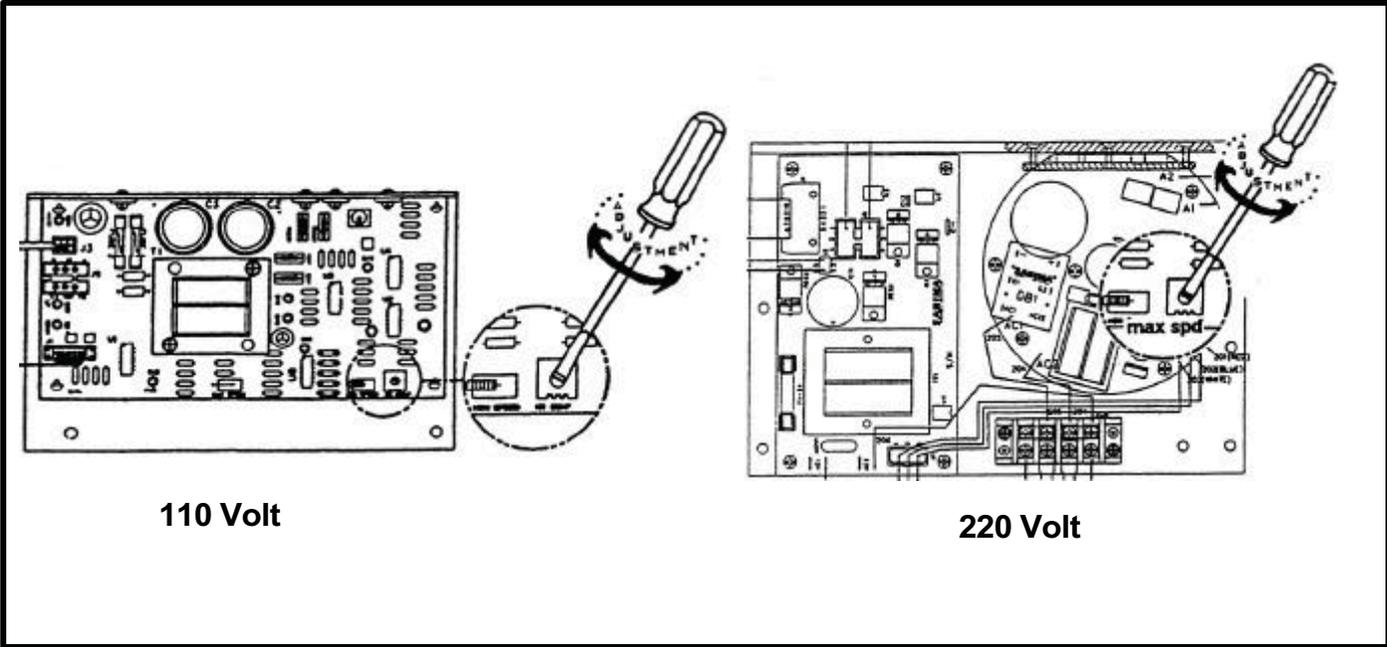
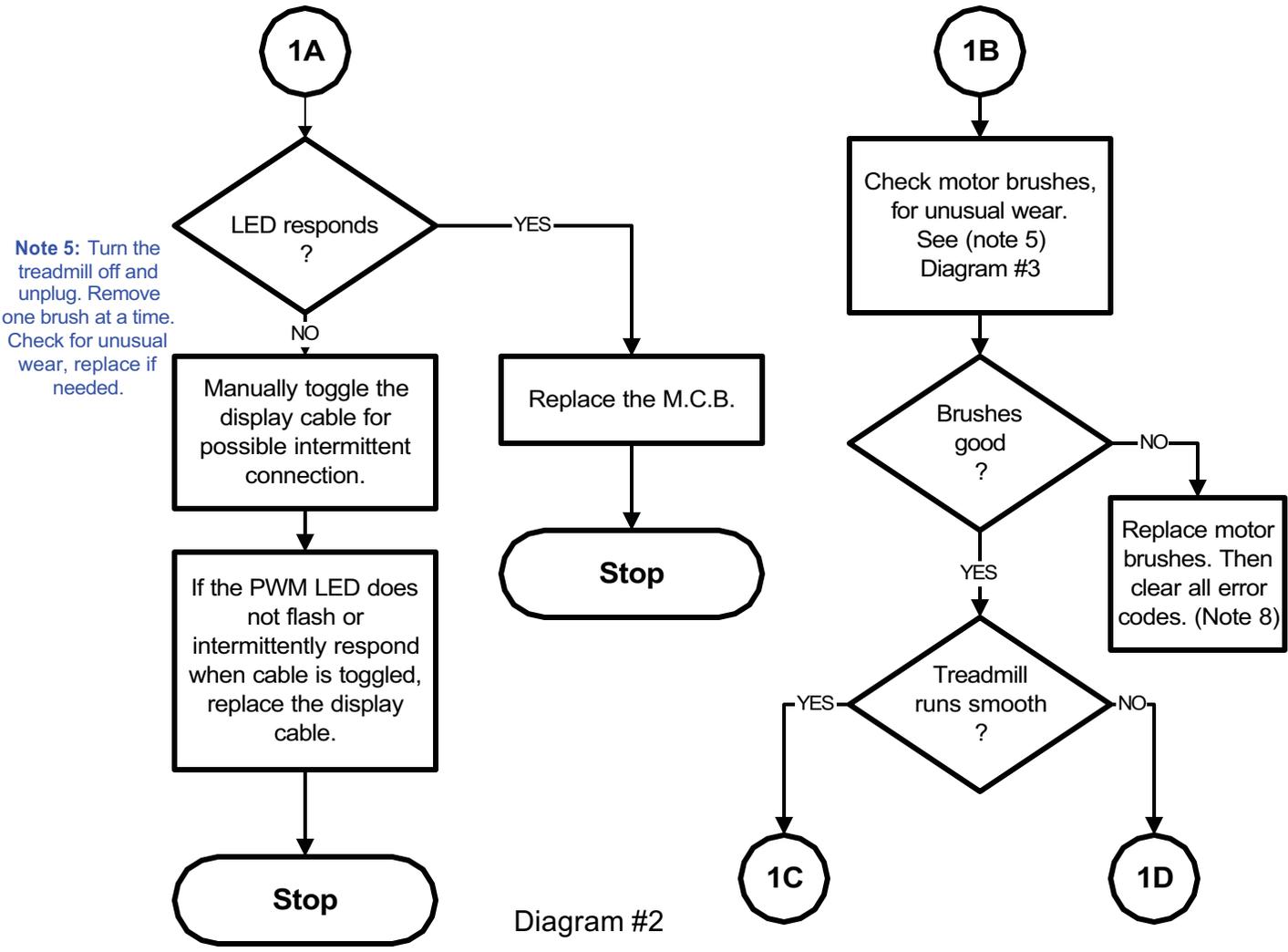
1A

1B

1C

1D

Code: SP CNG Flowchart



Code: SP CNG Flowchart

Note 6: To engage automatic speed calibration, press the "HEART" in Test Mode. The display will read: CALI. Treadmill will then go into a self auto speed calibration. This will automatically calibrate MIN PWM, 1/2 MAX, and MAX PWM for min and max speed. This will take less than 3 minutes. Treadmill will be in motion, during this test.

Note 7: The RPM sensor gap between sensor and flywheel is no more than 1/8 inch wide. If not, adjust the sensor.

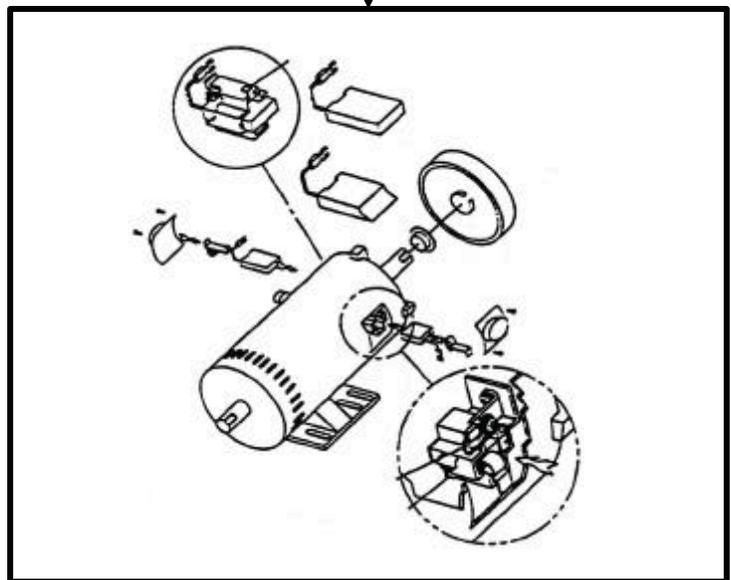
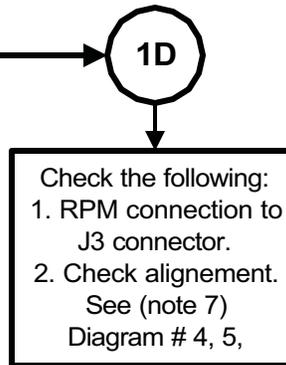
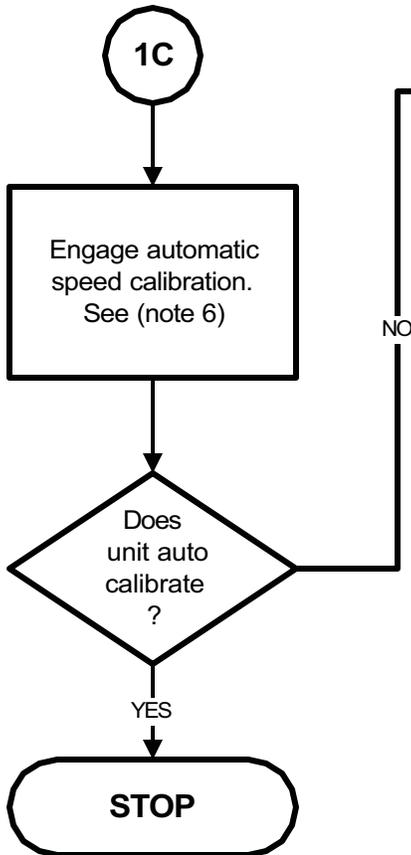
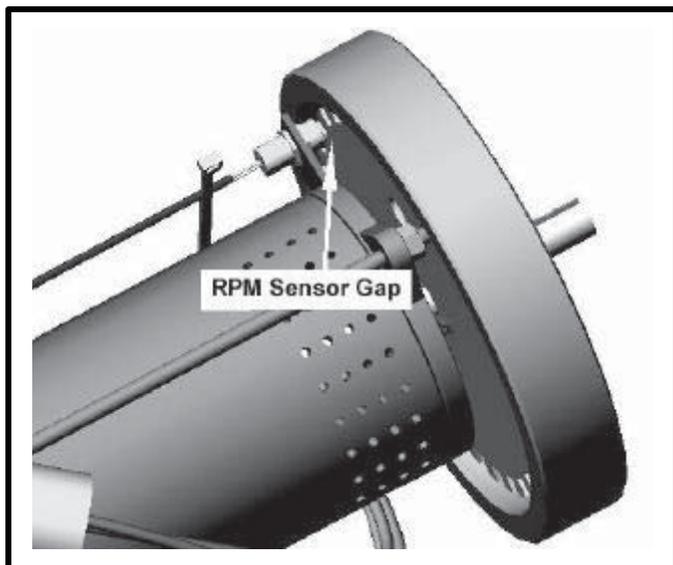
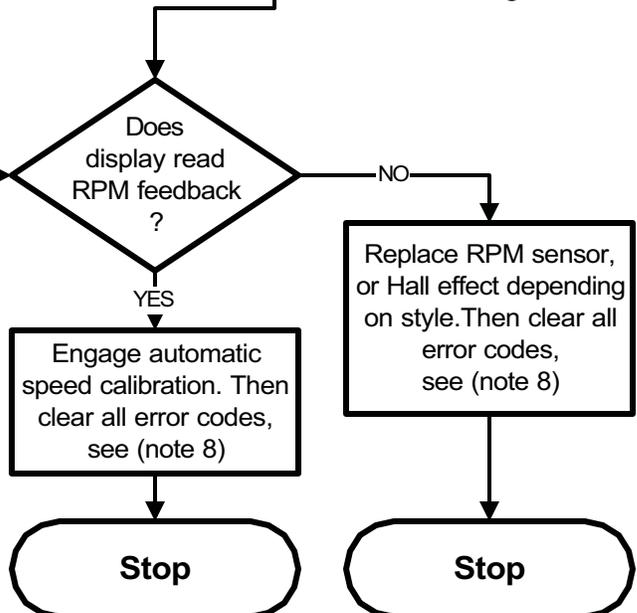


Diagram #4

Diagram #3



4.41



Code: SP CNG Flowchart

Note 8: Engage "Maintenance Mode"
Scroll up through the menu to the different error references by using the "UP" elevation key. Clear all error codes by pressing the "HEART" key.

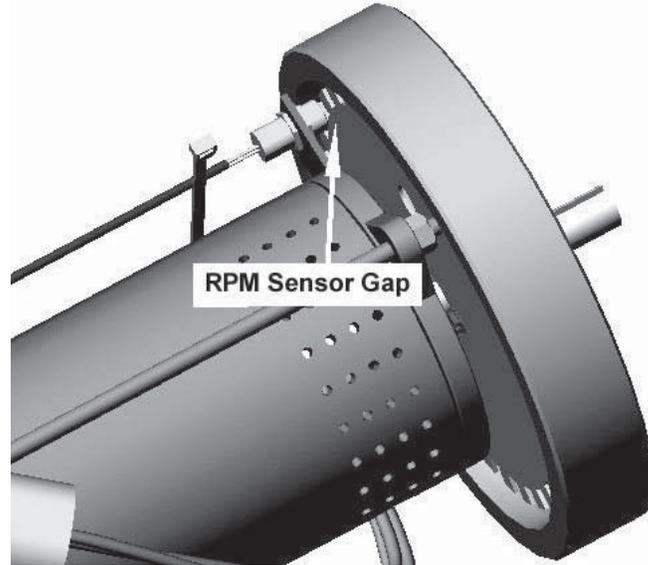
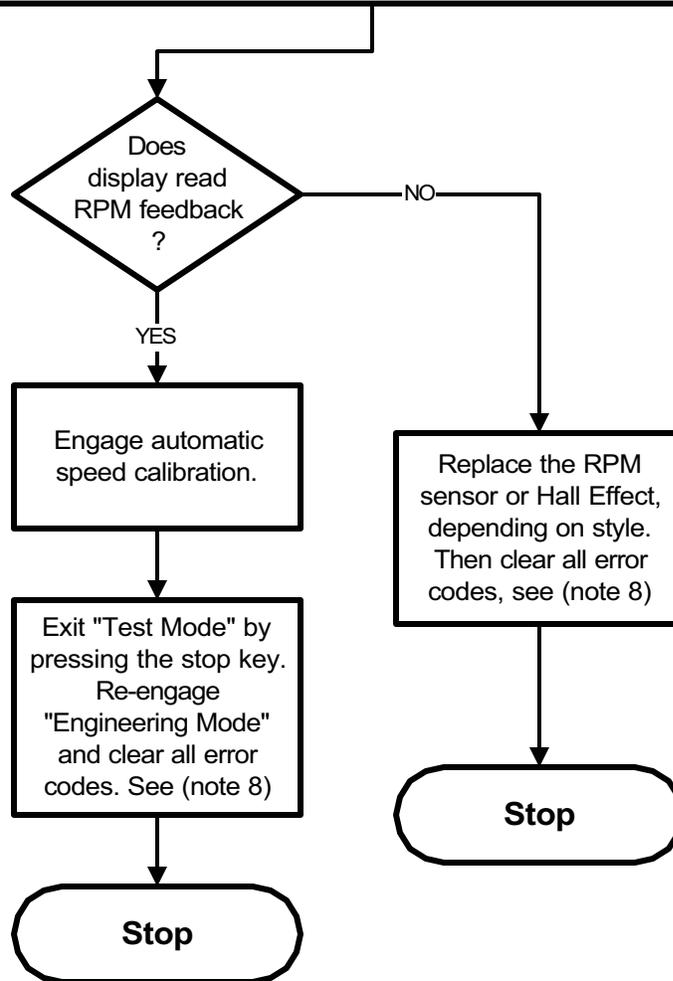


Diagram #5



Code: EL LOST Flowchart

Definition: "ELEVATION LOST BEYOND 0% or 15% RANGE"

Possible Cause: Out of range elevation count or elevation system malfunctioned.

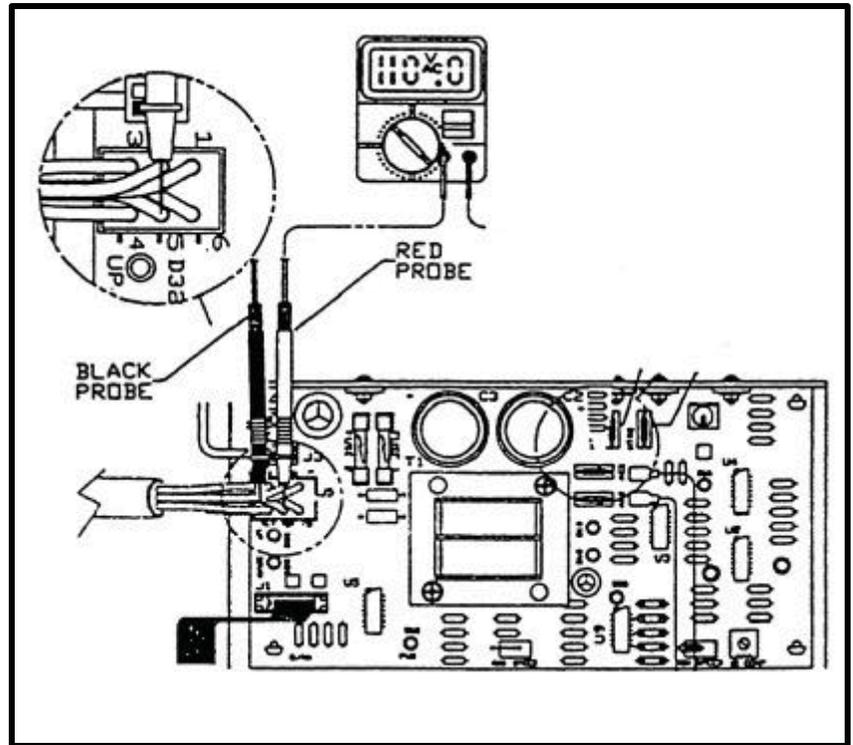


Diagram #1

Start

Engage "TEST MODE"
Verify elevation response in "Test Mode".
See (note 1)

Note 1: Press and hold the "0", "2" & "START" keys down at the same time, then release the "1" key. The display will read: MAINTENANCE. Press and release the "8" key.
Or manually hold the "8" key and simultaneously turn the treadmill on by the on & off switch. Both methods will engage "Test Mode".

Is incline within range?
See (note 2)

NO

If incline reading is less than 20 verify elevation motor potentiometer readings.
See (note 4)

If elevation motor readings register 0, check display cable for possible pinch or tear. Manually toggle the cable, if readings are now registered replace the display cable.

If no readings are registered by toggling the display cable replace the elevation motor.

Stop

YES

Clear display code.
See (note 3)

Stop

Note 2: When treadmill is at physical 0% the elevation range will read 240 across the display screen. Pressing the elevation "UP" key the elevation range number will decrease, 57 = 15% for 110v units, 80 = 15% for 220v units.

Note 3: Engage MAINTENANCE mode scroll up through the menu to the different error references by using the "UP" elevation key. Clear all error codes by pressing the "HEART" key.

Note 4: The elevation motor potentiometer may have failed or register the incorrect elevation value causing the motor to hesitate while operating. Using a Volt Meter, see diagram #1, use the chart in diagram #2 to instruct you in verifying the correct elevation values.

% Grade	Incline number in Motor Test Mode	DC Voltage across Blue and Orange wire on the Elev. motor connector	Ohm reading between the Blue and Orange (elev. motor unplugged)	DC Voltage on Pin 4 of the display electronics
0	240	4.68	9.76k	4.8
1	228	4.44	9.33 k	4.58
2	216	4.21	8.86 k	4.37
3	204	3.98	8.41 k	4.12
4	192	3.75	7.92 k	3.88
5	180	3.51	7.48 k	3.64
6	168	3.27	6.95 k	3.42
7	156	3.04	6.48 k	3.18
8	144	2.81	6.01 k	2.95
9	132	2.57	5.50 k	2.71
10	120	2.34	4.98 k	2.48
11	108	2.11	4.48 k	2.26
12	96	1.88	3.99 k	2.03
13	84	1.64	3.52 k	1.79
14	72	1.41	2.97 k	1.55
15	60	1.17	2.48 k	1.33

Diagram #2

Code: EL RNG Flowchart

Definition: "ELEVATION RANGE BEYOND 0% or 15% RANGE"
Possible Cause: Out of range elevation count or elevation system malfunctioned.

Note 1: Press and hold the "0", "2" & "START" keys down at the same time, then release the "1" key. The display will read: MAINTENANCE/. Press and release the "8" key.

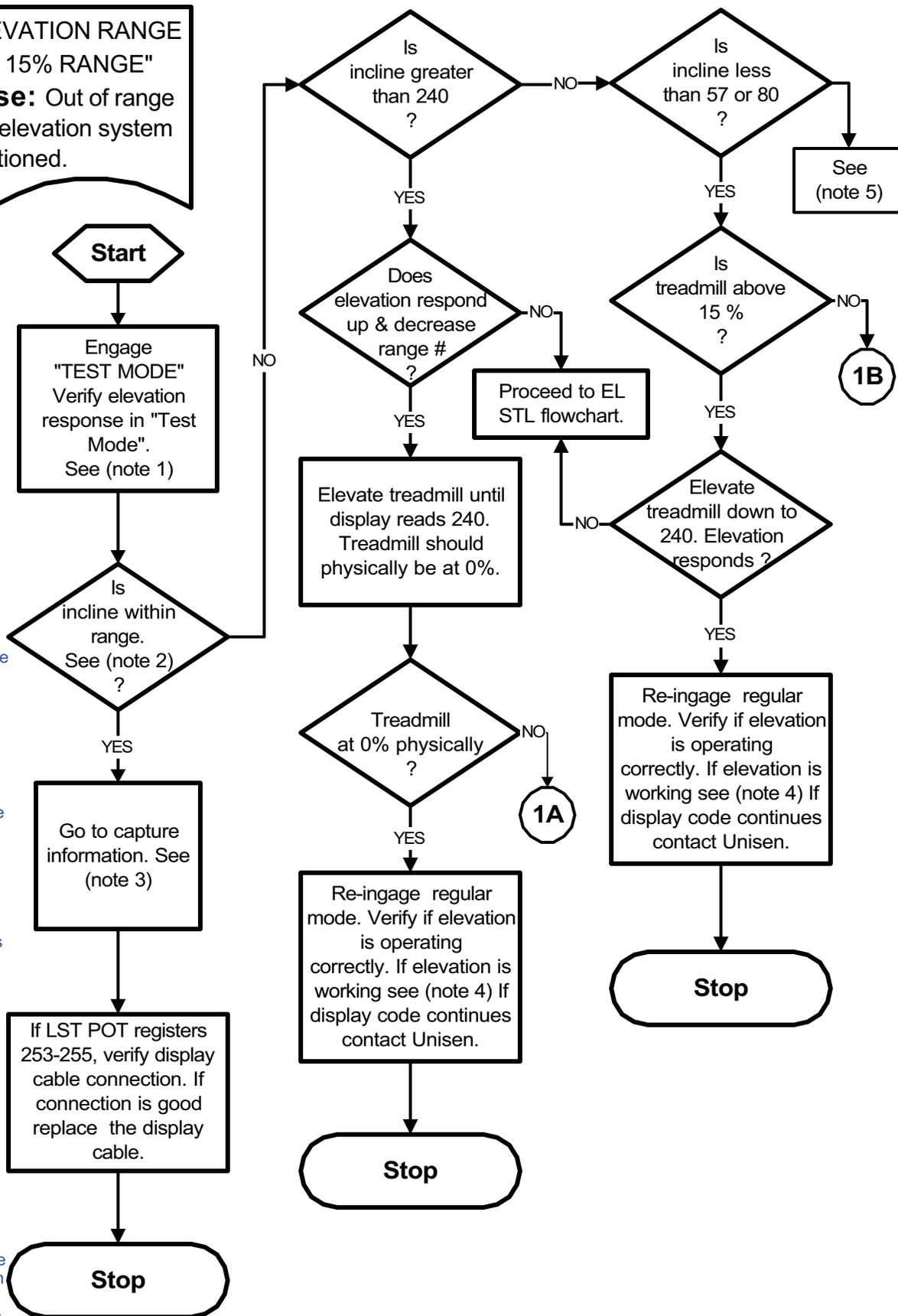
Or manually hold the "8" key and simultaneously turn the treadmill on by the on & off switch. Both methods will engage "Test Mode".

Note 2: In "TEST MODE" the number under "ELAPSED TIME" on the display, represents the elevation range. When physically at 0%, the range will register 240. When elevating the range will fluctuate from 240-80. Elevation range 80 represents 15% for 220v units. 57 represents 15% for 110v units. Do not elevate beyond the range.

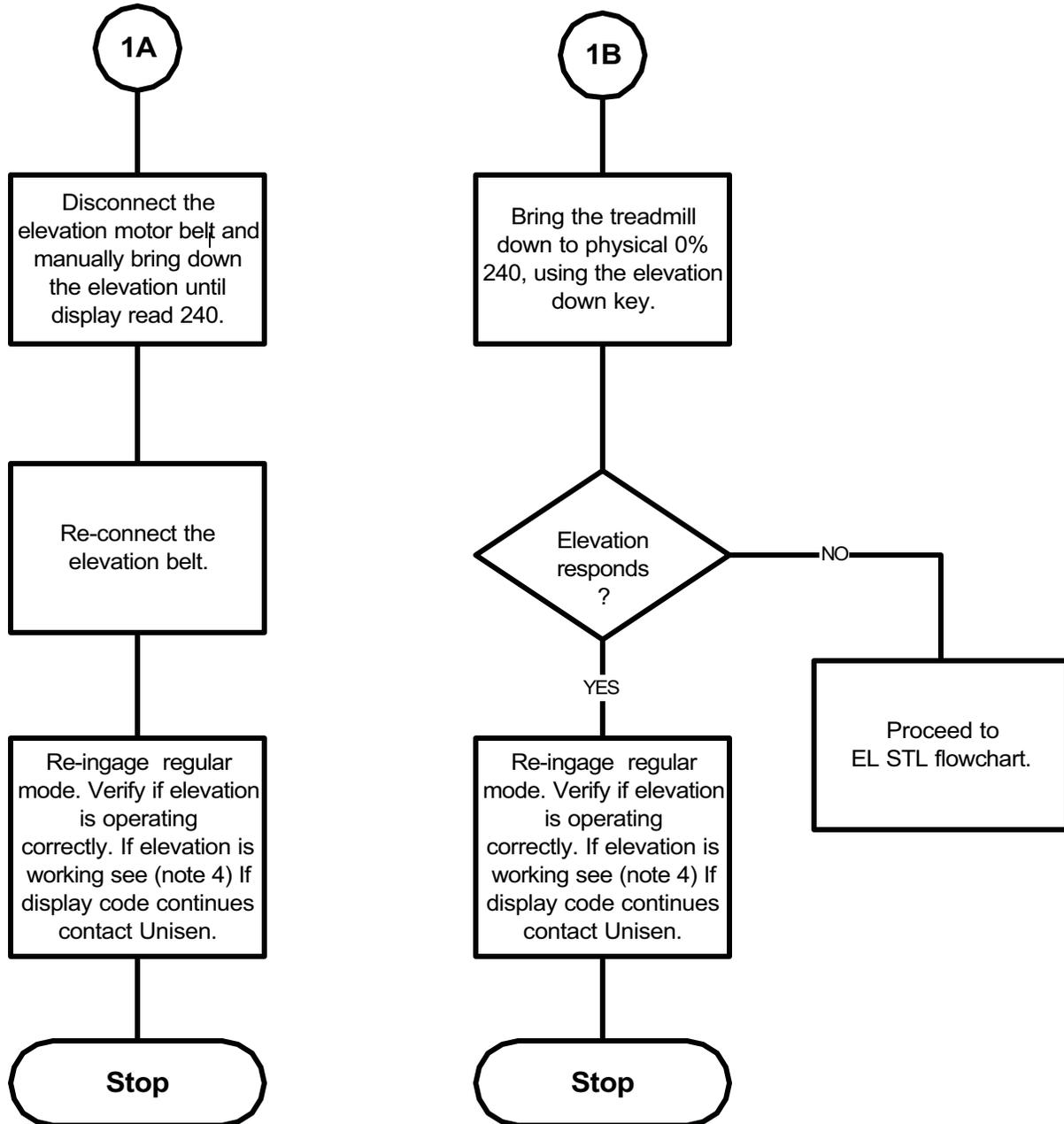
Note 3: Exit out of TEST MODE. Re-engage "MAINTENANCE Mode" scroll through the menu using your elevation keys until display reads LST POT. The following variables store the condition when the last display code occurred.

Note 4: Engage "MAINTENANCE Mode" scroll up through the menu to the different error references by using the "UP" elevation key. Clear all error codes by pressing the "HEART" key.

Note 5: Thi would indicate that the elevation is within range and should be operating correctly, if not contact Unisen.



Code: EL RNG Flowchart



Code: EL STL Flowchart

1A

Note 4: Diagram #2

Place your (red) meter probe into the black wire of pin 4, located at connector J5. Then place your (black) meter probe to AC1 on the M.C.B. Voltage should read +/-110v. or +/-220v depending on model.

When pressing the elevation "DOWN" key, the voltage should drop down to 0v or 1v. This would indicate a good response from the M.C.B.

Do the same for pin 5 (red wire), as shown in Diagram #4. Then press the elevation "UP" key. Voltage should drop down to 0v or 1v.

Using a multi-meter, verify voltage at the following pins (4&5) from the Elevation Motor connector J5. See (note 4) Diagram #2 & 3

Does voltage change at pins 4 & 5 ?

Replace the Elevation Motor. Then clear all error codes, see (note 3)

Stop

Replace the M.C.B. Then clear all error codes, see (note 5)

Stop

Diagram #2

