

Core Fitness Systems
2003-2004 Treadmill
Service Manual



CORE FITNESS SYSTEM

RT1
CFS Series

If you have any questions, please call the Sears Parts and Repair Center at
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TABLE OF CONTENTS

Warranty	3
Safety Instructions	4
Recommended Tools	7
Maintenance	8
Tensioning or Aligning the Running Belt	9
Tensioning the Drive Belt	11
Lubricating Procedures	12
CFS “5-Step” Diagnostic Process	14
Upper Board Troubleshooting	19
Console Cable Voltage Chart	20
Auto-Calibration Instructions	21
Lower board troubleshooting	32
Wiring Diagrams	36
Lower Control Board Diagnostic LED Chart	38
Manual Speed Calibration	41
Incline Motor Troubleshooting	42
Drive Motor and Roller Troubleshooting	46
Parts Replacement	50

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Important Safety Instructions

Warning statements indicate a particularly dangerous activity. You should be extremely cautious when doing the following:

- Removing power from the treadmill, the power cord being disconnected from the wall outlet. Always ensure that the treadmill is unplugged from the wall outlet when you inspect or adjust the treadmill, or when you isolate, remove, or replace a treadmill component.
- Removing the motor cover exposes high voltage components and potentially dangerous machinery. Exercise extreme caution when you perform maintenance procedures with the hood removed.
- During service operations you will be very close to moving machinery and high voltage components. When you perform maintenance procedures with the hood removed, remove jewelry (especially from ears and neck), tie up long hair, remove neck ties, and do not wear loose clothing.
- When the treadmill is operating, the capacitor will hold a lethal amount of charge. Do not touch the capacitor as serious injury or death might result.
- When the treadmill is turned off and the power cord is removed from the wall outlet, the capacitor will hold voltage for 30-60 seconds. Allow the capacitor to discharge for a period of one minute before you touch or work near the capacitor. Do not attempt to discharge the capacitor by any other means.
- Exercise caution when touching any wire or electrical component during treadmill operation.
- When it is necessary to lift the treadmill, ensure that the treadmill has adequate support. Do not lift the treadmill by the front.

Safety guidelines you should know and follow include:

- Read the owner's manual and follow all operation instructions.
- Operate the treadmill on a solid, level surface. Locate the rear of the treadmill at least four feet from walls or furniture. Keep the area behind the treadmill clear.
- Visually check the treadmill before beginning service or maintenance operations. If it is not completely assembled or is damaged in any way, exercise extreme caution while operating and checking the treadmill.
- When operation the treadmill, do not wear loose clothing. Do not wear shoes with heels or leather soles. Check the soles of your shoes and remove and embedded stones. Tie long hair back.
- Use care when getting on of off the treadmill. Use the handrails whenever possible. Do not get on or off the treadmill when the running belt is moving.
- Before starting the running belt, straddle the belt by placing your feet firmly on the sides of the treadmill. You should also step off the belt and onto the sides of the treadmill after turning off the running belt.
- Do not rock the unit. Do not stand or climb on the handrails, electronic console, or hood.
- Do not set anything on the handrails, electronic console, or hood. Never place liquids on any part of the treadmill.
- To prevent electrical shock, keep all electrical components, such as the drive motor, power cord, and circuit breaker away from water and other liquids.
- Do not use accessory attachments that are not recommended by the manufacturer-such attachments might case injuries.
- Turn off the treadmill when adjusting o working near the take-up roller. Do not make any adjustments to the running belt when someone is standing on the machine.
- Keep all loose items away from the treadmill running surface. A treadmill running belt will not stop immediately if an object becomes caught in the belt or rollers.

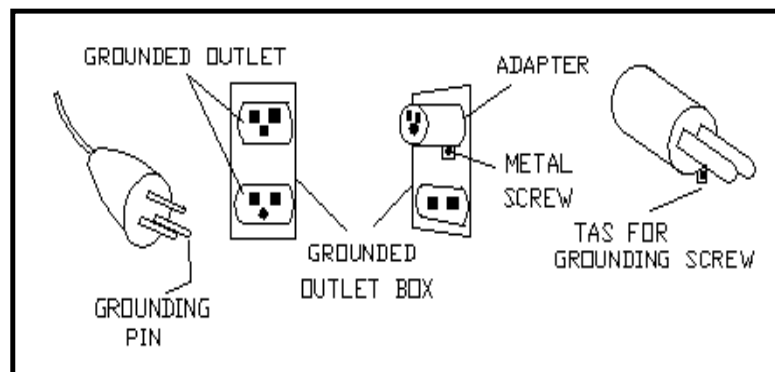
WARNING:

Connect this appliance to a properly grounded, dedicated 20 amp outlet only. See grounding Instructions.

GROUNDING INSTRUCTIONS

This product must be grounded. If a treadmill should malfunction or breakdown, grounding provides a path of least resistance for electrical current to reduce the risk of electrical shock. This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with local codes and ordinances.

DANGER - Improper connection of the equipment-grounding conductor 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.



SAFETY TIPS

- Never use the treadmill before securing the safety tether clip to your clothing.
- If you experience chest pains, nausea, dizziness, or shortness of breath, stop exercising immediately and consult your physician before continuing.
- Do not wear clothes that might catch on any part of the treadmill.
- Keep power cord away from heated surfaces.
- Keep children off of treadmill at all times.
- Do not use treadmill outdoors.
- Unplug treadmill before moving it.
- Do not remove the treadmill motor covers or roller covers. Service should be performed by an authorized Sears service provider only.
- Treadmill should be plugged into a dedicated 20amp circuit for optimal performance.

Required Tools and Equipment

The following list is a summary of the tools and equipment required by the procedures in this manual.

Phillips screwdrivers
anti-static wrist strap (when handling electronic parts)
flat-head screwdrivers
digital multi-meter
drive belt tension gauge
Allen wrench set (Metric)
open-end wrenches of assorted sizes (Metric)
clamp-on AC amp meter
½” drive ratchet and sockets of assorted sizes
blue loc-tite
cable ties
Motor commutator stone
needle nose pliers
damp cloth
rubber mallet
drop cloth
ruler
snap ring pliers
wire cutters

PREVENTATIVE MAINTENANCE PROCEDURES

Cleanliness of your CFS treadmill and its operating environment will keep maintenance problems and service calls to a minimum. For this reason, Sears recommends that the following preventive maintenance schedule be followed.

After Each Use

- Turn off the treadmill with the on/off switch, and unplug the power cord from the wall outlet.

Warning!

To remove power from the treadmill, the power cord must be disconnected from the wall outlet.

- Wipe down the running belt, deck, motor cover, and console casing with a damp cloth. Never use solvents, as they can cause damage to the treadmill.
- Inspect the power cord. If the power cord is damaged, contact Sears.
- Make sure the power cord is not underneath the treadmill or in any other area where it can become pinched or cut.
- Check the tension and alignment of the running belt. Make sure that the treadmill belt will not damage any other components on the treadmill by being misaligned

Every Week

Clean underneath the treadmill, following these steps:

- Turn off the treadmill with the on/off switch, then unplug the power cord at the wall outlet.
- Fold the treadmill into the upright position, making sure that the lock latch is secure.
- Move the treadmill to a remote location.
- Wipe or vacuum any dust particles or other objects that may have accumulated underneath the treadmill.
- Return the treadmill to its previous position.

Every Month

- Inspect all assembly bolts of the machine for proper tightness.
- Remove the motor cover and blow out the motor and lower board tray to remove any lint or dust particles that may have accumulated.

Each Year

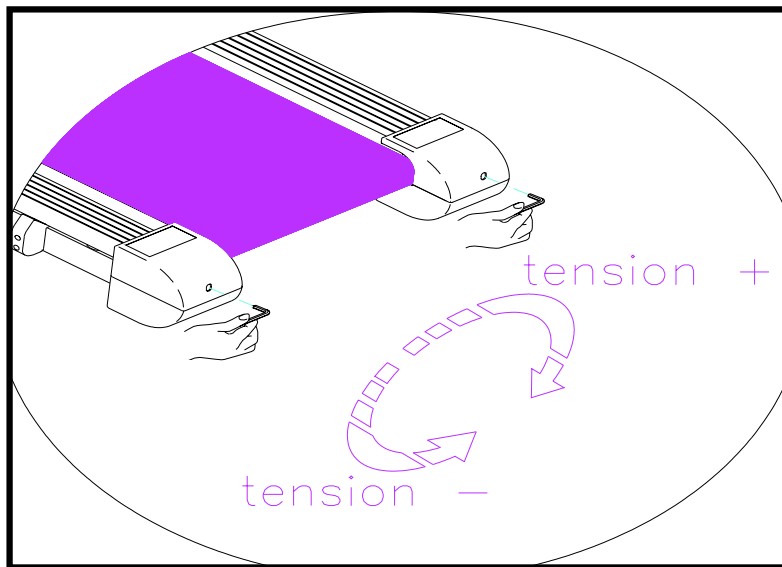
- Add lubrication to deck and running belt. Use lubrication provided by Sears only!
- Lubricate the air shocks with a Teflon based spray

Tensioning or Aligning the Running Belt

Tensioning the Running Belt:

If you can feel a slipping sensation when running on the treadmill, the running belt must be tightened. In most cases, the belt has stretched from use, causing the belt to slip. This is a normal and common adjustment. To eliminate this slipping, tension both the rear roller bolts with the appropriate sized Allen wrench, turning both the left and right bolt **1/4 TURN** as shown below. Try the treadmill again to check for slipping. Repeat if necessary, but **NEVER TURN** the roller bolts more than 1/4 turn at a time.

NOTE: The belt tension is set properly when the running belt is $\frac{1}{4}$ of an inch from the deck, towards the rear roller.



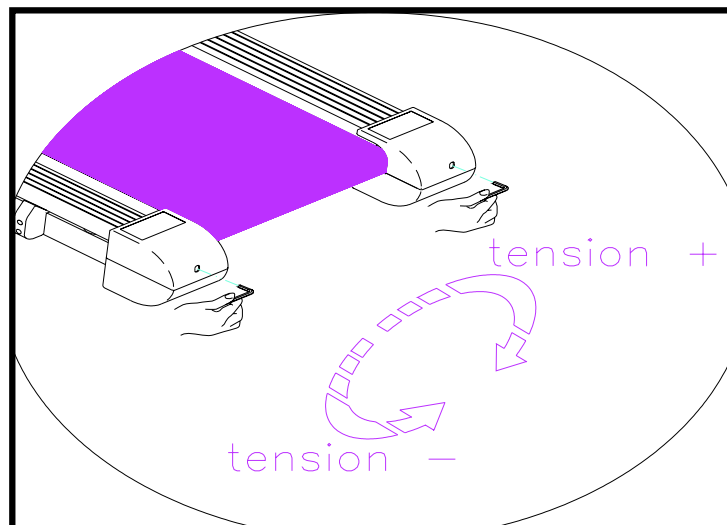
Aligning the Running Belt:

If the running belt moves rapidly to one side when performing the next step, press the Stop button immediately.

- Turn on the treadmill. With the treadmill speed between 6-8 mph, stand behind the treadmill and watch the movement of the running belt. As you watch the running belt, make sure that the belt runs without moving from one side to the other and that the belt is centered between the side rails.

If the running belt is not tracking properly follow the following procedures:

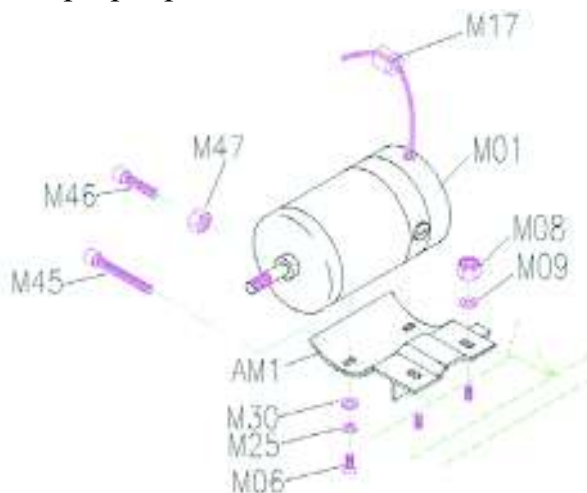
- If the running belt tracks to the left, turn the left roller bolt clockwise $\frac{1}{4}$ of a turn, keeping the belt tension in mind. Over-tightening the running belt may cause damage to the running belt and roller bearings.
- If the running belt tracks to the right, turn the right roller bolt clockwise $\frac{1}{4}$ of a turn, keeping the belt tension in mind. Over-tightening the running belt may cause damage to the running belt and roller bearings.



Tensioning the Drive Belt

Procedure:

1. Turn off the power to the treadmill and remove the power cord from the wall outlet.
2. With a Philips head screwdriver, remove the motor cover.
3. Unplug the motor wires from the lower board.
4. Before continuing, it is a good idea to weight down the treadmill deck to prevent the treadmill from springing up. Removing the weight of the motor will significantly reduce the weight in the front end of the treadmill.
5. With a 13mm wrench, loosen the attachment nuts (M08) and washers (M09) holding the motor to the frame.
6. With a 6mm Allen wrench, loosen the two motor bracket attachment bolts (M45, M46) and adjust to proper position.



7. Tighten the two motor attach bolts (M45, M46) with a 6mm Allen wrench.
8. Verify the proper tension on the drive belt. Using a timing belt tension gauge, the proper tension should be between 65 to 75 lbs. If a timing belt tension gauge is not available, the drive belt should have approximately 3/8 of inch deflection. If the drive belt tension is not set properly, loosen the motor attachment bolts and adjust.

Treadmill Deck Lubrication Procedures

There are three different applications in which you would be required to add lubrication to a CFS treadmill.

1. MAINTENANCE

A CFS treadmill does not need to be waxed regularly. However, Sears recommends that lubrication be applied once a year. This is not always necessary, but it will ensure long-life of the treadmill.

2. BELT REPLACEMENT

When lubrication is added to a treadmill deck at the factory it is impregnated into the filament backing of the running belt, providing a low friction, long lasting coat. When replacing the original belt on a treadmill, this new belt will not be properly coated. Always add lubrication when replacing the belt.

3. BREAKER TRIPS

With time, the lubrication between the running deck and running belt of the treadmill will wear down. The lack of lubrication between the deck and belt will cause a high amount of friction when running on the treadmill. This, in turn, will cause the treadmill breaker to trip. If this happens, lubrication should be added.

These three applications should be the only times lubrication is ever added to a CFS treadmill. Please contact the Sears service department to obtain the proper lubrication for reapplication. **Do not apply other manufacture's lubrication to a CFS treadmill**

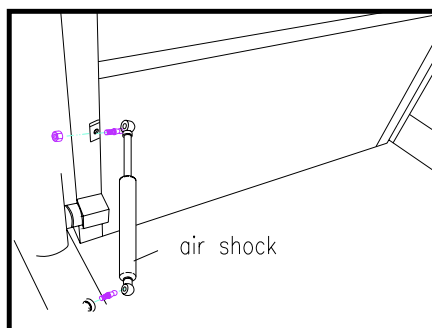
PROCEDURES

1. For optimal results, the running deck and belt should be warm before reapplication of lubrication. It is recommended to run the treadmill at 5mph for 10–15 minutes before proceeding.
2. With the appropriate sized Allen wrench, loosen the rear roller bolts on both the left and right side. It is a good idea to note the position of the roller to reassemble properly. For best results, place two removable marks on the left and right side of the deck and the running belt. When reinstalling, match up the marks for proper tension. It is not necessary to take off the roller, just loosen it enough so that you can fit your hands underneath the belt comfortably.
3. Once the belt is loosened, take a small amount of silicon oil (20 cc squeeze bottle provided by Sears) and apply it to the entire top surface of the running deck.
After the silicon oil has been applied to the top surface of the running deck, the roller can be tightened to the proper position. With a damp cloth, wipe off any excessive silicon oil that may have seeped out from underneath the running belt

Lubricating the Air Shock

Procedure:

1. Fold the treadmill to the upright position, making sure the treadmill is locked securely.
2. Add lubricating oil on the shaft of the air shock.
3. Lift the frame up and down, repeating this several times to allow the lubricating oil blend into air shock

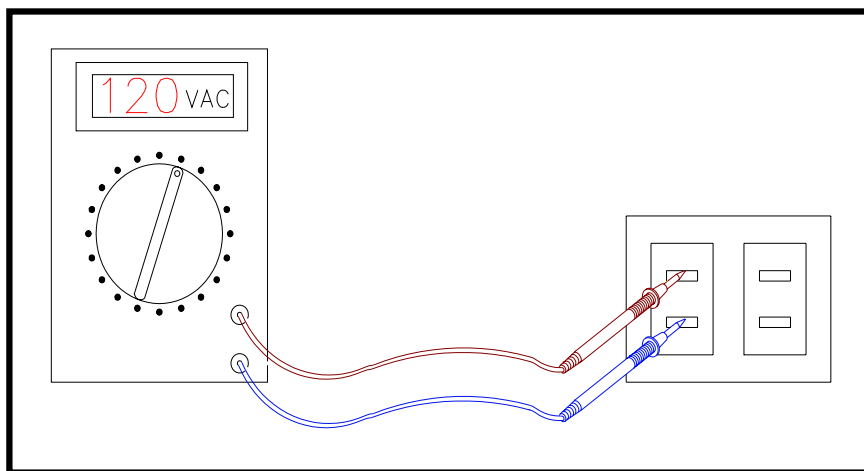


FIVE-STEP DIAGNOSIS PROCESS

The following steps are provided as routine checkpoints when diagnosing problems on a CFS treadmill. If followed correctly, these checkpoints should help diagnosis the majority of problems that may be encountered.

1. Proper supplying power to treadmill.

- Make sure the treadmill is not on an extension cord. Extension cords create energy loss, which prevents proper voltage from being supplied to the treadmill.
- Make sure the treadmill is on a dedicated circuit. Sears recommends a 20 amp dedicated circuit, but a 15 amp dedicated circuit may be sufficient.
- Make sure that proper voltage is being supplied from the wall outlet. Warning! Hazardous voltages will be tested in the following procedure. Exercise extreme caution when performing these procedures. Do not connect or disconnect any wiring, connectors, or other components with the power applied to the treadmill.
- Disconnect the treadmill power cord from the wall outlet. Using an AC voltmeter, verify that the proper AC voltage is present at the wall outlet. Nominal 120 volts AC may vary between approximately 105 volts AC and 135 volts AC. If the AC voltage is missing or incorrect, check the AC service or consult an electrician.



FIVE-STEP DIAGNOSIS PROCESS - Continued

2. Proper Wiring

- Verify that all wires are secure and attached in the correct position (reference wiring diagrams in table of contents).
- Verify that there aren't any pinches or cuts in any of the wires, especially the console cable connecting from the lower board to the upper board. Replace and wires that are pinched or cut.

3. Proper Sensor Wire Function

- Verify that the rpm sensor wire is positioned as close to the front roller pulley as possible. The factory standard is a distance of 2-4 mm between the sensor wire and the front roller pulley. Loosen the sensor bracket attachment screws and position sensor bracket closer to front roller pulley if the distance is greater than 2-4 mm.
- Verify that the sensor wire is attached to the sensor bracket properly. The proper position would be so that the sensor wire is protruding from the left hand side of the sensor and sensor bracket while facing the treadmill.



- Verify that the rpm magnet is positioned in the front roller pulley.

FIVE-STEP DIAGNOSIS PROCESS – Sensor Wire Function

- Verify that the lower control board is outputting the proper voltage (5 volts DC). See Voltage checkpoints in table of contents for voltage measurement instructions.
- Verify that the sensor wire is functioning properly in Diagnostics Mode. To enter Diagnostics Mode, follow the directions below:

Diagnostic Mode Instructions

- With the treadmill power on and the safety key in position on the console, press and hold the 1 & 10 quick speed keys for about 5 seconds to enter the Engineering Mode Menu. The console should beep three times and Auto Set should be displayed once in the Engineering Mode Menu.
- While in the Engineering Mode Menu, press the Select button until Hardware Test appears in the display.
- Press the “Start” button to select.
- Press “Start” to begin. At this time, the running belt should begin moving. The readout in the speed window will indicate the start speed of the treadmill, which should be 0.5 mph (+ or - .05 mph).
- Use Speed “+” or “-“ to increase or decrease the speed.
- Use Incline “+” or “-“ to increase or decrease the elevation.
- Press and hold the “Stop” button for three seconds to return to the Engineering Mode Menu.

FIVE-STEP DIAGNOSIS PROCESS – Continued

4. Proper Speed Calibration.

- Press Start. Verify that the treadmill motor begins moving within 1 second. If the treadmill motor begins hesitates and starts moving after 1 second, follow the auto-calibration instructions listed in the table of contents.
- Verify that the treadmill motor turns smoothly. There should not be any jerky or choppy movement of the motor. It may also be necessary to stand on the belt at a slow speed and ride the treadmill belt from the front roller to the rear roller to verify that the treadmill motor and running belt are traveling smoothly.
- Verify start up speed (0.5 mph) in Diagnostics Mode. To enter Diagnostics Mode, follow the directions below:
 - With the treadmill power on and the safety key in position on the console, press and hold the 1 & 10 quick speed keys for about 5 seconds to enter the Engineering Mode Menu. The console should beep three times and Auto Set should be displayed once in the Engineering Mode Menu.
 - While in the Engineering Mode Menu, press the Select button until Hardware Test appears in the display.
 - Press the “Start” button to select.
 - Press “Start” to begin. At this time, the running belt should begin moving. The readout in the speed window will indicate the start speed of the treadmill, which should be 0.5 mph (+ or - .05 mph).
 - Use Speed “+” or “-“ to increase or decrease the speed.
 - Use Incline “+” or “-“ to increase or decrease the elevation.
 - Press and hold the “Stop” button for three seconds to return to the Engineering Mode Menu.
- The start speed of the treadmill can also be determined by counting the revolutions/minute of the running belt. At 0.5 mph, the treadmill belt should make 4.5 revs/minute for the RT1. If the belt revolutions are incorrect, adjust the speed dial located on the lower control board (see speed calibration in table of contents).

FIVE-STEP DIAGNOSIS PROCESS – Continued

5. Voltage Checkpoints/Diagnostic LED's.

- Verify that the lower board is functioning properly by referencing the Diagnostic LED's located on the lower control board. A complete description for each Diagnostic LED can be found by referencing the lower control board Diagnostic LED chart in the table of contents.
- Verify that proper voltage is being transferred through the console cable (reference console cable voltage chart in the table of contents).

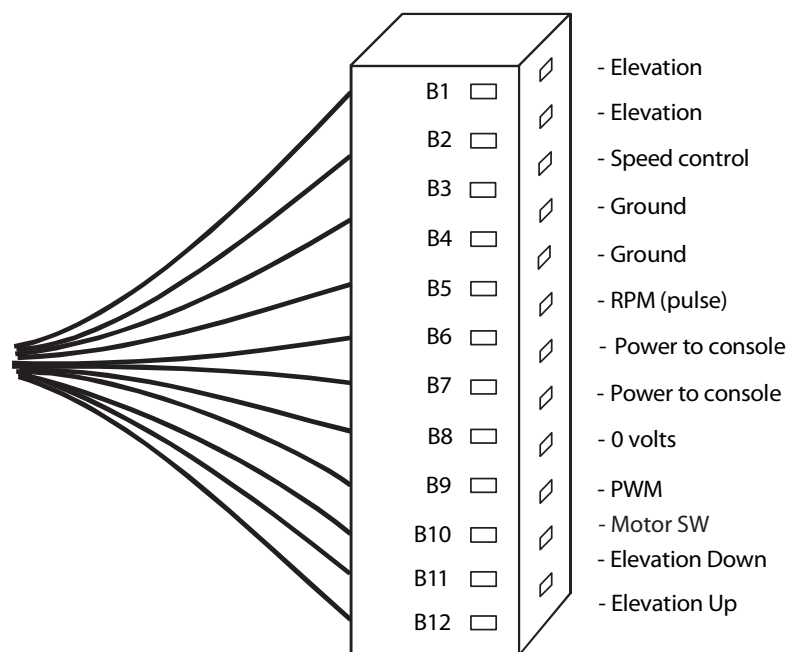
If the techniques described in the five-step diagnostic process did not resolve the problem, reference the symptoms in the table of contents and review other possible causes in the troubleshooting section.

CONSOLE TROUBLESHOOTING

CONTENTS

Console Cable Voltage Chart	20
Auto-Calibration procedures	21
No display on console	23
All or some of the keys on console will not work	25
Error-message "E1 or E2" on console	26
Diagnostics Mode	28
Heart-rate-control function does not work	29
Static shocks from upper board/heart rate grips	30
Console exploded diagram	31

Console Cable Voltage Chart (DC volts)



CORRECT VOLTAGE FOR WIRE HARNESS:

B1	Brown 5 volts	B7	Blue 12 - 16 volts
B2	Red 5 volts	B8	Dark Green 12 - 16 volts
B3	Pink 0 volts	B9	Light Green 0 volts
B4	Orange Ground	B10	Black 5 volts
B5	Yellow Ground	B11	Grey (action 5 volts, Normal 0 volts)
B6	Purple 5 volts	B12	White (action 5 volts, Normal 0 volts)

To check the voltage of a specific function (i.e. elevation, motor control, etc), place the negative lead of your multi-meter on pin B4 or B5, and place the positive lead on the desired pin. Follow the voltage chart above for the correct voltages. Note: Wire colors are subject to change.

Auto-Calibration Procedures

The RT1 model have a built-in auto-calibration sequence into the software programming. This will allow the rpm sensor reading to be detected and stored in the upper board. This process is performed at the factory and will not need to be repeated unless replacing the upper board or lower board in your Horizon Series treadmill. To perform the auto-calibration sequence, follow the instructions below:

Step 1. Adjusting the Speed Cube

With the treadmill power on and the safety key in position on the console, press and hold the 1 and 10 quick speed keys for about 5 seconds to enter the Auto Set Menu. The console should beep three times and Auto Set should be displayed once in the Auto Set menu.

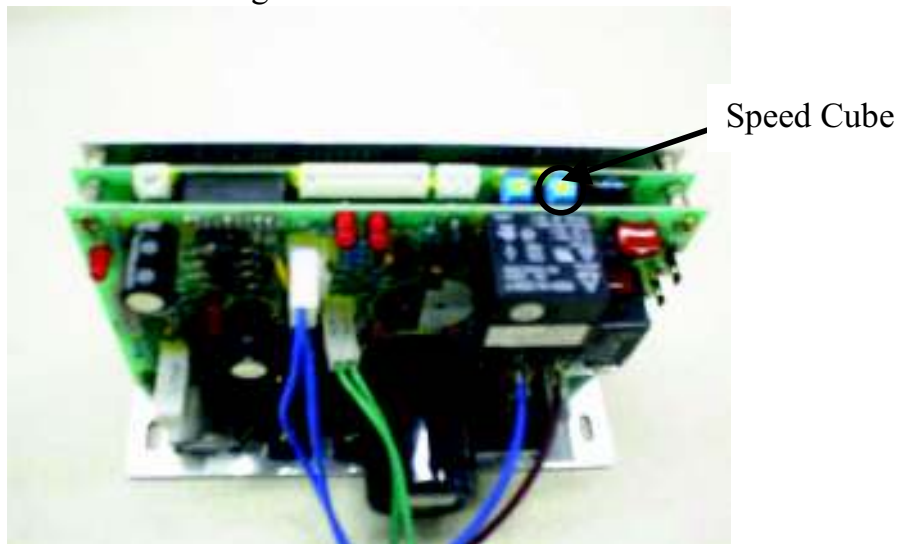
Press Select button until Hardware Test appears in the display.

Press the “Start” button to select.

Press “Start” to begin. At this time, the running belt should begin moving.

The readout in the speed window will indicate the start speed of the treadmill, which should be 0.5 mph (+ or - .05 mph). If the speed is not within the proper start speed range, adjust the Speed Cube located on the board under the motor cover until the speed is approximately 0.5 mph (+ or – .05 mph) in the Speed window.

*Refer to diagram.



Once the speed cube is set to the proper setting, press and hold the “Stop” button for three seconds to return to the Engineering Mode Menu.

Step 2. Auto Calibration

While in the Engineering Mode Menu, press the Select button until Auto Set appears in the display.

Press “Start” to select.

Press “Start” to begin.

The treadmill running belt will begin moving and will automatically begin the auto-calibration sequence to properly set and store the speed values.

*Note- This may take between 2 to 3 minutes to complete the auto-calibration sequence.

Upon successful calibration there will be four beeps and it will automatically exit Engineering Mode and will return you to the original screen.

Troubleshooting

If the Auto Calibration was unsuccessful - Repeat Step 1 to confirm that the Speed Cube is adjusted to 0.50 mph (+ or – 0.05 mph).

No Display on Console

If the console only displays dashes in the display window, follow the possible causes below:

Possible causes:

- Adjust the position of the safety key.
- Safety key polarity strength is not adequate. Replace the safety key.
- Reed Switch inside console is defective. Replace console.

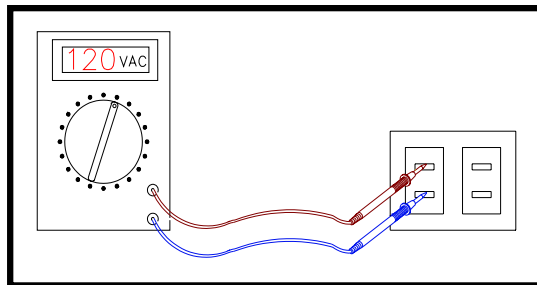
If the console does not have any display and is totally blank, follow the possible causes below:

Possible causes:

- Check voltage of wall outlet.

Warning! Hazardous voltages will be tested in the following procedure. Exercise extreme caution when performing these procedures. Do not connect or disconnect any wiring, connectors, or other components with the power applied to the treadmill.

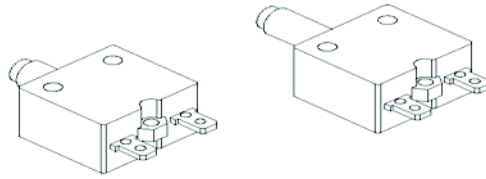
- Disconnect the treadmill power cord from the wall outlet. Using an AC voltmeter, verify that the proper AC voltage is present at the wall outlet. Nominal 120 volts AC may vary between approximately 105 volts AC and 135 volts AC. If the AC voltage is missing or incorrect, check the AC service or consult an electrician.



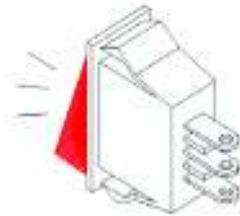
- Breaker is damaged. Inspect the circuit breaker to see if it has tripped off.

(If it is tripped off--like diagram A, reset the breaker.)

A



- ON/OFF switch is damaged. Make sure the ON/OFF switch is turned to the "ON" position and that the switch is lit. If the switch is not lit, check the power cord connection and function.

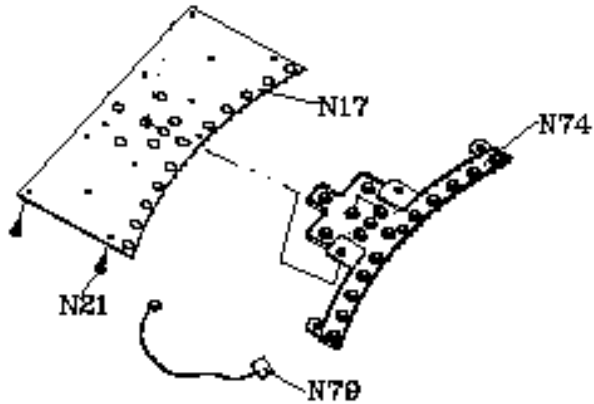


- Improper wiring. Check all wiring coming in from the power switch to the lower board, to the upper board. Refer to wiring diagrams.
- Inspect diagnostic LED's on lower board. Determine defective part according to chart.
- Check voltage of console cable. Determine defective part by using console cable chart. Refer to console cable voltage checkpoint in table of contents.

All or Some of the Keys on Console Will not Work

Possible causes:

- Keypad electrodes (N74) are not coming into proper contact with upper control board (N17). Remove keypad and reposition.



- The upper control board (N17) is defect. Replace entire console.

E-1 Error-message on the Upper Board

If there is belt movement upon start up of the treadmill, and an E-1 message occurs, follow the possible causes below:

Possible cause:

- Check all wire connections.
- Verify that the sensor magnet is positioned in the front roller pulley.
- Verify the distance between the RPM sensor wire and the front roller pulley (2-4 mm). Reposition the RPM sensor closer to the pulley if possible.
- Follow the auto-calibration instructions (reference auto-calibration in table of contents).
- Verify the signal of the RPM sensor by entering Diagnostics Mode. If there is no signal present, check the continuity of the RPM sensor wire. If there is no continuity, replace the sensor wire.
- If the problem persists, replace the entire console.

If there is no belt movement upon start up of the treadmill, and an E-1 message occurs, follow the possible causes below:

Possible cause:

- Verify that all wire connections are properly attached.
- Follow the auto-calibration instructions (reference auto-calibration in table of contents).
- Verify the diagnostic LED's on the lower board. Reference diagnostic LED chart for possible causes.
- If problem persists, replace the lower board.

E-2 Error-message on the Upper Board

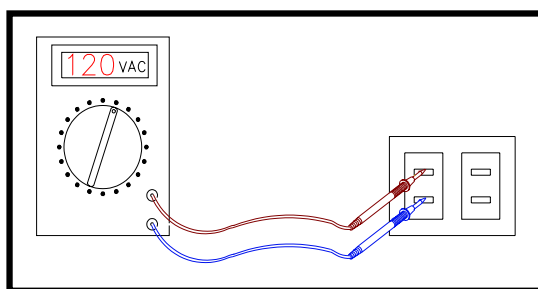
If there is belt movement upon start up of the treadmill, and an E-2 message occurs, follow the possible causes below:

Possible cause:

- Check voltage of wall outlet.

Warning! Hazardous voltages will be tested in the following procedure. Exercise extreme caution when performing these procedures. Do not connect or disconnect any wiring, connectors, or other components with the power applied to the treadmill.

- Disconnect the treadmill power cord from the wall outlet. Using an AC voltmeter, verify that the proper AC voltage is present at the wall outlet. Nominal 120 Vac may vary between approximately 105 Vac and 135 Vac. If the AC voltage is missing or incorrect, check the AC service or consult an electrician.



- Follow the auto-calibration instructions (reference auto-calibration in table of contents).
- If the problem persists, replace the lower board and entire console.

Diagnostics Mode

With the treadmill power on and the safety key in position on the console, press and hold the 1 & 10 quick speed keys for about 5 seconds to enter the Engineering Mode Menu. The console should beep three times and Auto Set should be displayed once in the Engineering Mode Menu.

LCD Test- Display/Button Check

Use to check the display and buttons.

While in the Engineering Mode Menu, press Select button until LCD Test appears in the display.

Press “Start” to select.

As any button is pressed, there should be a beep and the display should change.

Press “Start” to light entire display.

Press and hold the “Stop” button for three seconds to return to the Engineering Mode Menu.

Eng1- Hardware Test

Use to check running belt speed and deck elevation.

While in the Engineering Mode Menu, press Select button until Hardware Test appears in the display.

Press the “Start” button for three to select.

Press “Start” to begin. At this time, the running belt should begin moving.

The readout in the speed window will indicate the start speed of the treadmill, which should be 0.5 mph (+ or - .05 mph).

Use Speed “+” or “-“ to increase or decrease the speed.

Use Incline “+” or “-“ to increase or decrease the elevation.

Press and hold the “Stop” button for three seconds to return to the Engineering Mode Menu.

Heart-Rate-Control Function Does Not Work

When holding the heart rate handlebars, the display in the Pulse display window should register HR. If this does not register, follow the possible causes below.

Possible causes:

- Defective heart rate receiver/heart rate grips. Replace entire console.
- Defective upper board. Replace entire console.

When holding the heart rate handlebars, the display in the Pulse display window should register HR. If this registers, but the actual heart rate reading does not register or is erratic, follow the possible causes below.

Possible causes:

- Try standing off to the side of the treadmill and use a loose, cupping grip while pressing your palms against the heart rate handlebars.
- If the problem persists, replace the entire console.

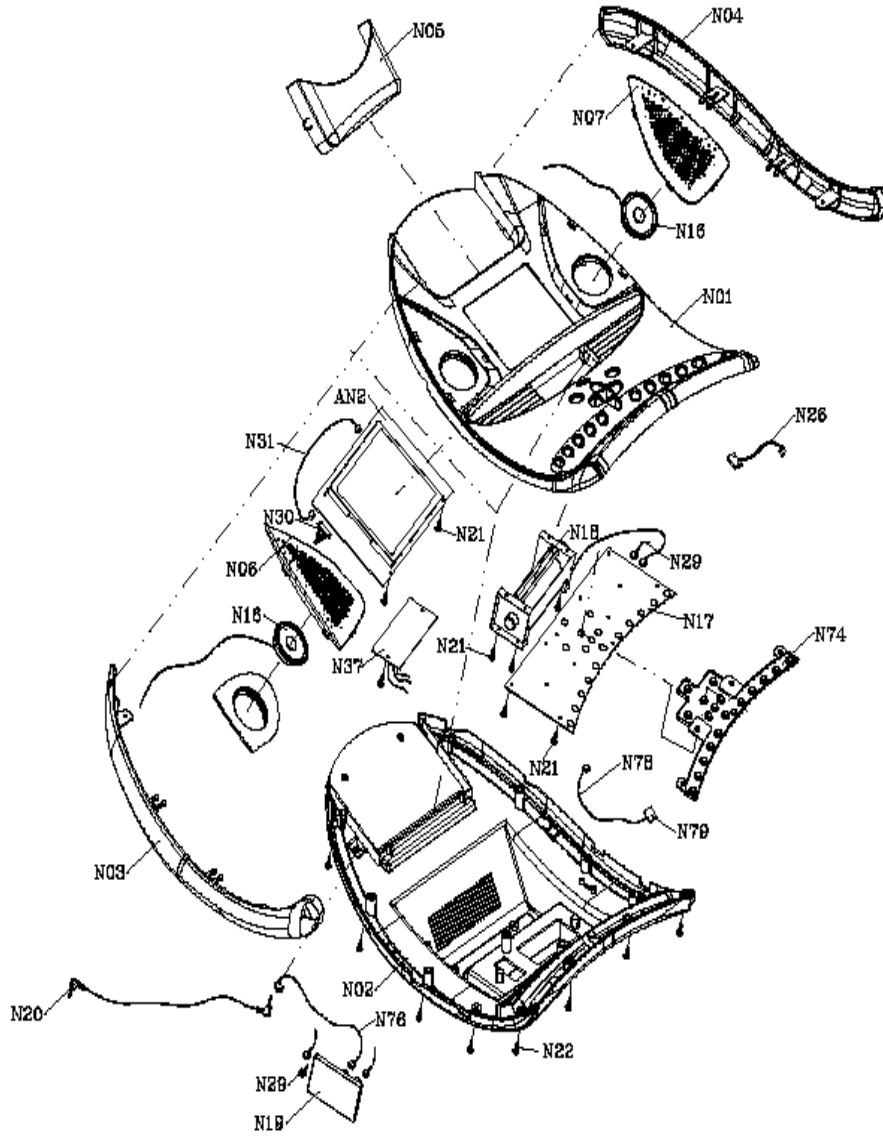
Static Shocks from Upper Board/Heart Rate Grips

Possible causes:

- Lubrication on running deck and running belt inadequate. Contact Sears for lubrication application.
- Defective grounding fibers in running belt. Replace running belt.

Note: Improper grounding of the upper board or running belt may also cause other symptoms like erratic speed, scrambled reading of the upper board, resetting of the treadmill, or erratic or non-responsive heart rate function.

Console Exploded Diagram



LOWER BOARD TROUBLESHOOTING

CONTENTS

Treadmill will not start.....33

Treadmill will reset.....34

Running speed is not stable.....35

Wiring diagram.....36

Lower board LED diagnosis.....38

Speed Calibration.....40

Treadmill Motor Will Not Start

Possible causes:

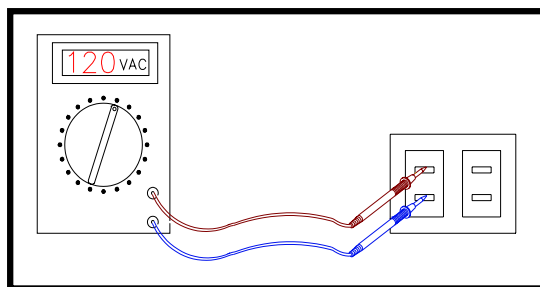
- Verify that all wire connections are properly connected.
- Follow the auto-calibration instructions (reference auto-calibration in table of contents).
- Verify the diagnostic LED's on the lower board. Reference diagnostic LED chart for possible causes.
- Measure voltage from motor (reference voltage checkpoints in table contents). If no voltage is present, unplug the treadmill and visually inspect the motor brushes and springs to make sure they are installed properly. Repeat voltage reading if necessary.
- If problem persists, replace the lower board.

Treadmill Will Stop and Reset

- Check voltage of wall outlet.

Warning! Hazardous voltages will be tested in the following procedure. Exercise extreme caution when performing these procedures. Do not connect or disconnect any wiring, connectors, or other components with the power applied to the treadmill.

- Disconnect the treadmill power cord from the wall outlet. Using an AC voltmeter, verify that the proper AC voltage is present at the wall outlet. Nominal 120 Vac may vary between approximately 105 Vac and 135 Vac. If the AC voltage is missing or incorrect, check the AC service or consult an electrician.



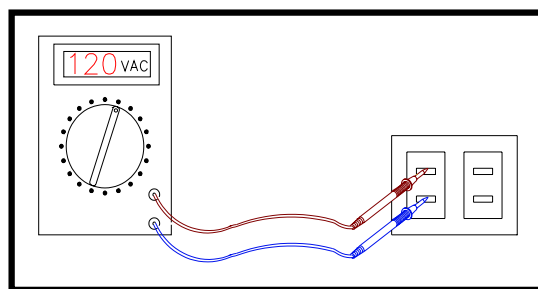
- Make sure that the treadmill is connected to a dedicated 20amp circuit, with out the use of an extension cord.
- Verify all wire connections for proper connection, including power cord.
- Inadequate lubrication on deck and belt. Refer to treadmill waxing procedures.

Running Speed Is Not Stable (erratic speeds)

- Verify that the running belt and drive belt tensions are adequate, preventing belts from slipping.
- Check voltage of wall outlet.

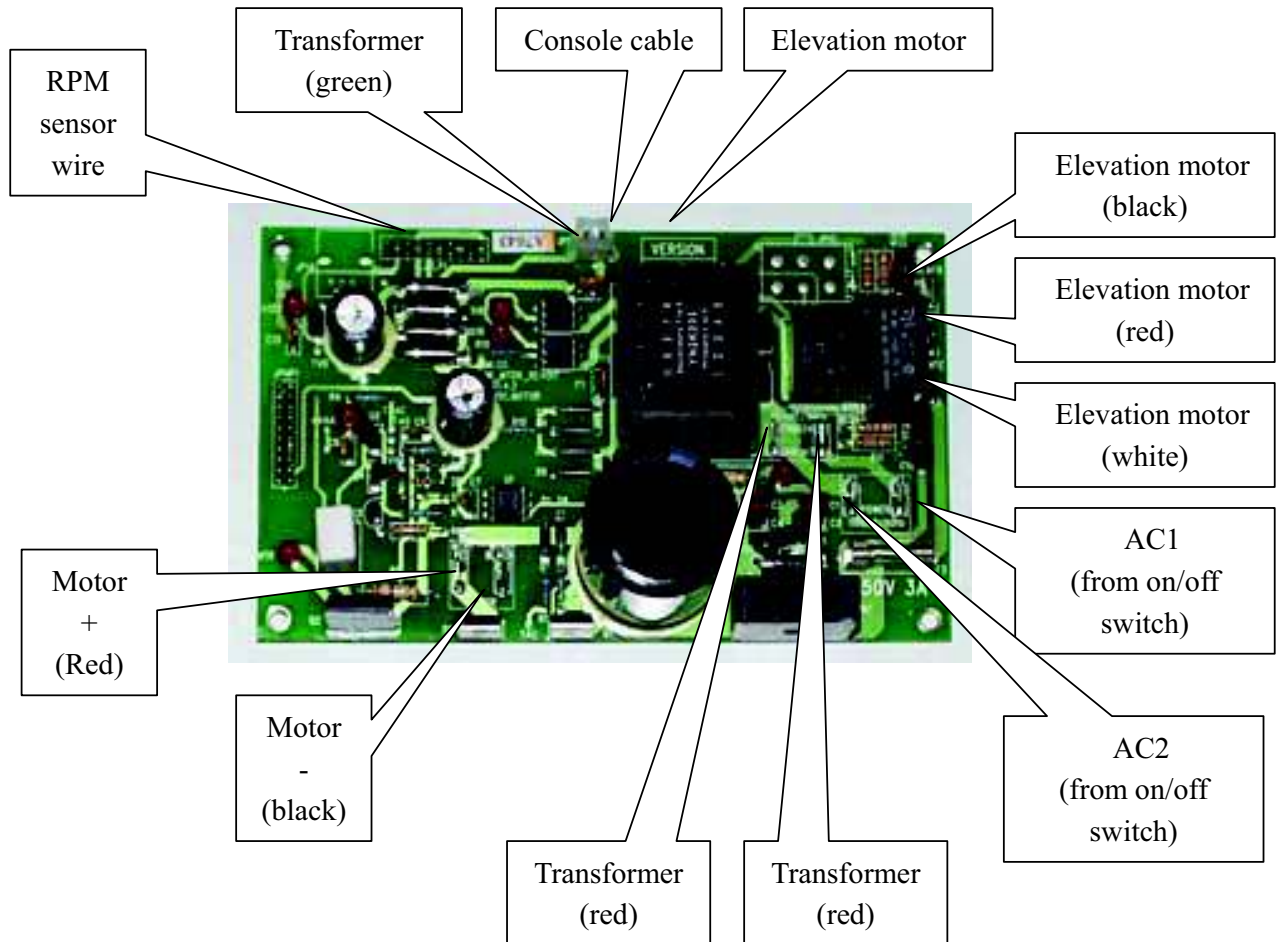
Warning! Hazardous voltages will be tested in the following procedure. Exercise extreme caution when performing these procedures. Do not connect or disconnect any wiring, connectors, or other components with the power applied to the treadmill.

- Disconnect the treadmill power cord from the wall outlet. Using an AC voltmeter, verify that the proper AC voltage is present at the wall outlet. Nominal 120 Vac may vary between approximately 105 Vac and 135 Vac. If the AC voltage is missing or incorrect, check the AC service or consult an electrician.

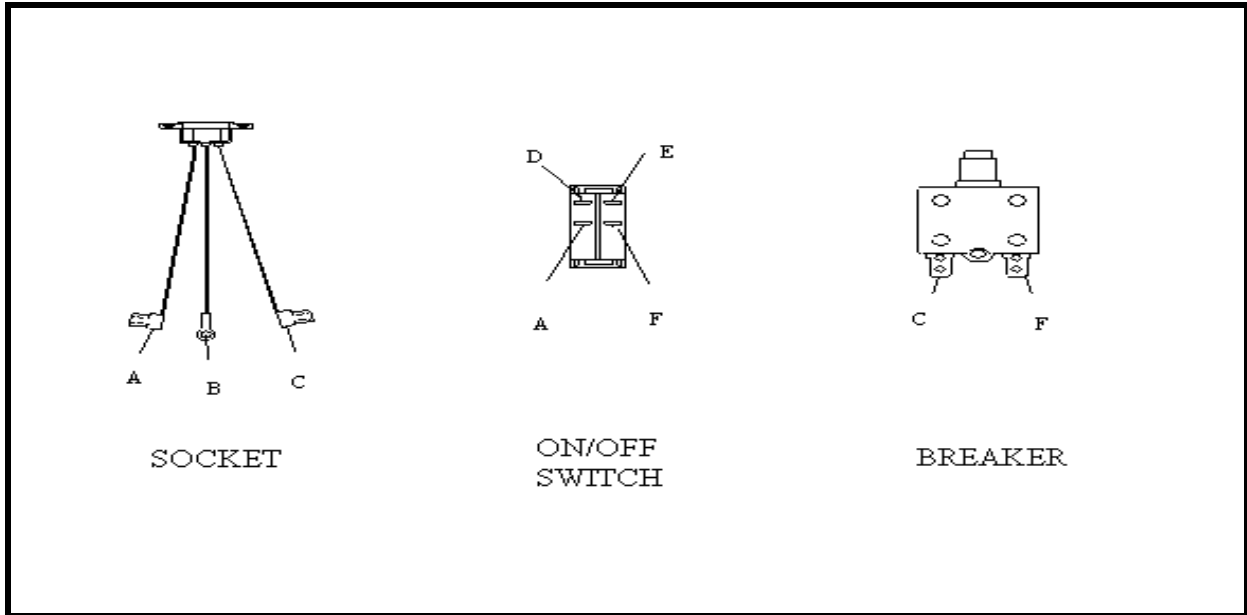


- Make sure that the treadmill is connected to a dedicated 20amp circuit, with out the use of an extension cord.
- Verify that there are not any pinches or cuts in power cord, motor wires, or console cable. Replace if necessary.
- Adjust IR Comp dial on lower board.
- Inadequate lubrication on deck and belt. Refer to treadmill waxing procedures.
- If problem persists, replace lower board.

Lower Control Board Wiring Diagram



Wiring Diagram



A – SOCKET WIRE TO ON/OFF SWITCH

B – GROUND

C – SOCKET WIRE TO BREAKER

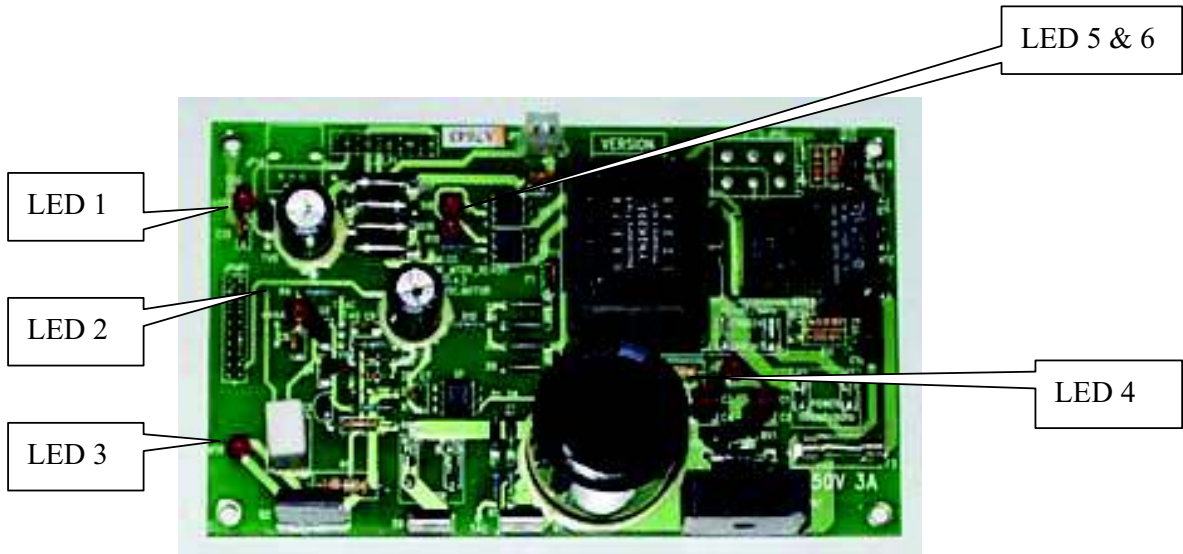
D – ON/OFF SWITCH TO LOWER BOARD (AC2)

E – ON/OFF SWITCH TO LOWER BOARD (AC1)

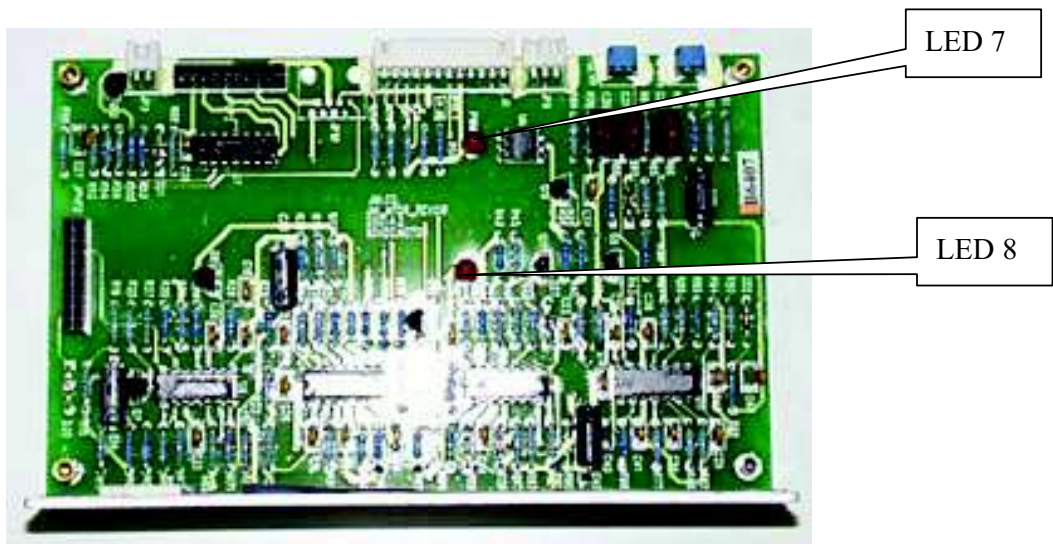
F – ON/OFF SWITCH TO BREAKER

Lower Board LED Diagnosis

Top layer of lower control board



Bottom layer of lower control board



Lower Board LED Diagnosis

LED 1 & 2: Transfer indicators. When the power switch is turned on, LED 1 & 2 light up, meaning that power is supplied to the lower board. These LED's should remain on while operating the drive motor and elevation motor. If the LED's are not lit, check the AC service from the wall outlet.

LED 3: Motor indicator. The LED goes on when the drive motor is operating. If the LED is not lit, voltage is not being supplied to the motor, and the lower board may need to be replaced.

LED 4: AC power indicator. When the power switch is turned on, LED 4 it will be lit, meaning that power is supplied to the lower board. This LED should remain on while operating the drive motor and elevation motor, but while shut off if an error message (E-1, E-2) is shown on the upper board. If this LED is not lit, and there is not an error message displayed on the upper board, verify that all wire connections have been properly attached. If the problem persists, check the AC service from the wall outlet.

LED 5 & 6: Incline Motor Indicator. When the upper board is commanding the incline motor to move UP or DOWN, the LEDs go on. LED 5 is for the UP function, and LED 6 is for the DOWN function. If the user is commanding the incline motor to increase (decrease) and the LED 5 (LED 6) is not lit, verify that all wire connections have been properly attached. If the problem persists, check the voltage of the console cable and reference the chart for possible causes. If the problem persists, replace the upper and lower boards.

LED 7: PWM signal indicator. LED 7 indicates the signal present (PWM) from the upper control board, and will light up as the speed commands as being used.

LED 8: Power protect indicator. LED 8 will be lit when the supplying power (current) to the lower control board too high. In most cases this current limit LED will indicate excessive amp draw caused by inadequate AC service from the wall outlet or inadequate lubrication on the deck and running belt. If this LED is lit, the lower control board will automatically shut the machine down to prevent damage to any key electrical components.

Manual Speed Calibration

There are two ways to verify that the treadmill speed is set properly. The first way is to count the running belt revolutions per minute. At 0.5 mph, the treadmill belt should make 4.5 revolutions per minute for the RT1 treadmill. If the belt revolutions are incorrect, adjust the speed dial located on the lower control board.

The other way to verify that the treadmill speed is set properly is to enter Diagnostics Mode. To enter Diagnostics Mode, follow the directions below:

With the treadmill power on and the safety key in position on the console, press and hold the 1 & 10 quick speed buttons for about 5 seconds to enter the Engineering Mode Menu. The console should beep three times and Auto Set should be displayed once in the Engineering Mode Menu.

Hardware Test

Use to check running belt speed and deck elevation.

While in the Engineering Mode Menu, press the Select button until Hardware Test appears in the display.

Press the Start button to select.

Press “Start” to begin. At this time, the running belt should begin moving.

The readout in the speed window will indicate the start speed of the treadmill, which should be 0.5 mph (+ or - .05 mph).

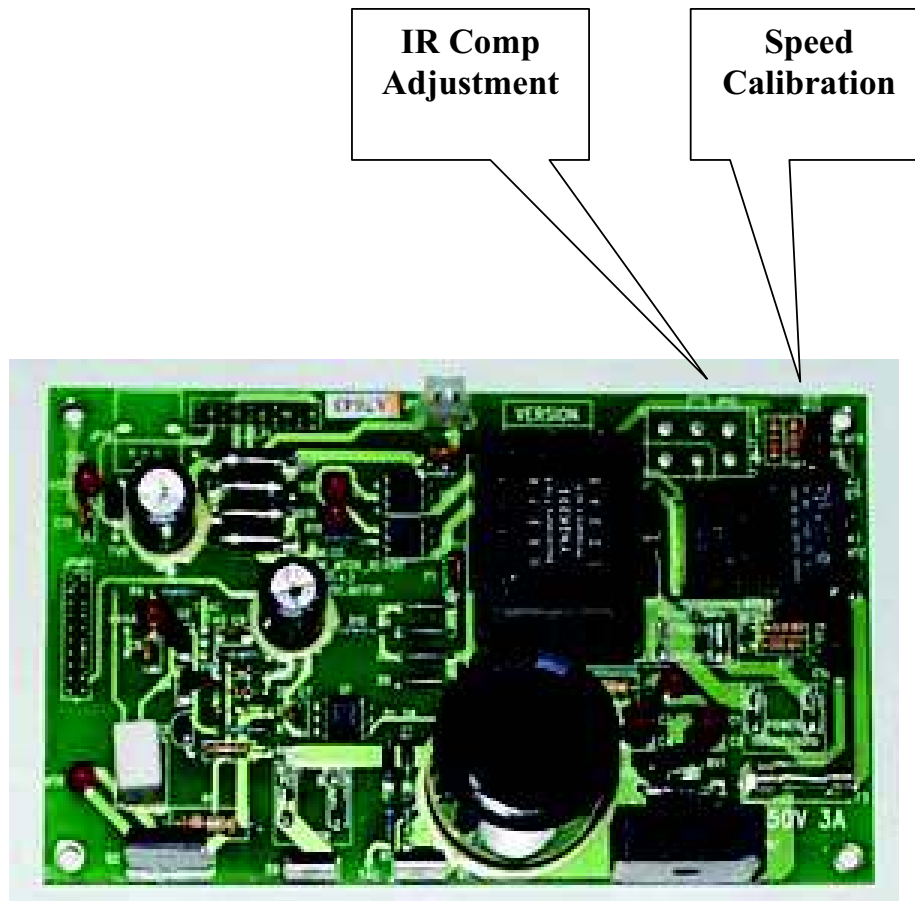
Use Speed “+” or “-“ to increase or decrease the speed.

Use Incline “+” or “-“ to increase or decrease the elevation.

Press and hold the “Stop” button for three seconds to return to the Engineering Mode Menu.

Manual Speed Calibration

To adjust the speed setting of the treadmill, turn the speed dial clockwise (to increase speed) or counterclockwise (to decrease speed).



The IR comp dial should only need to be adjusted if the treadmill belt is running in a jerky or choppy motion. To adjust the IR comp, turn the dial clockwise (to increase voltage to motor) or counterclockwise (to decrease voltage to motor). To verify proper adjustment, start the treadmill at 0.5 mph and ride the treadmill belt from the front to rear roller. If the treadmill does not have any apparent jerky or choppy movement, the IR comp is set properly.

INCLINE MOTOR TROUBLESHOOTING

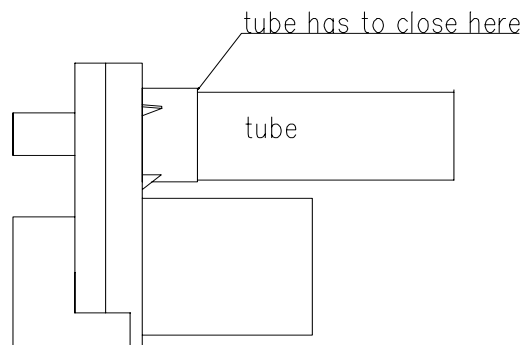
CONTENTS

Incline function does not work	43
Treadmill will incline up or down without command	44
Incline does not reach minimum or maximum settings	45

No Incline Function

Possible Causes:

- Verify that all wire connections are properly attached.
- Inspect console cable for damage.
- Check voltage of console cable. Determine defective part by using console cable chart.
- Verify diagnostic LED's on lower board. Reference Diagnostic LED chart for possible causes.
- Verify elevation motor shaft position. The elevation motor shaft should be flush with the bottom of the motor housing. If the position of the shaft is too close to the bottom motor housing, the shaft may have become jammed. To correct this, remove the bottom bolt from the elevation motor, and spin the shaft manually. If the elevation shaft has become jammed and can not be spun free to the proper position, replace the elevation motor.



- If problem persists, replace the lower and upper boards.

Treadmill Will Incline Up or Down Without Command

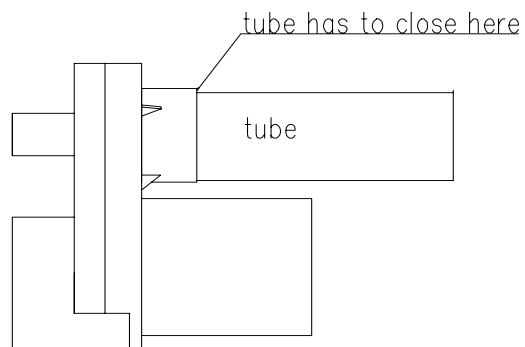
Possible causes:

- Verify that all wire connections are properly attached.
- Inspect console cable for damage.
- Check voltage of console cable. Determine defective part by using console cable chart.
- Verify diagnostic LED's on lower board. Reference Diagnostic LED chart for possible causes.
- Replace console cable.
- If problem persists, replace lower board and entire console.

Incline Does Not Reach Minimum or Maximum Settings

Possible causes:

- Incline motor is not installed properly
- Verify elevation motor shaft position. The elevation motor shaft should be flush with the bottom of the motor housing. If the position of the shaft is too close to the bottom motor housing, the shaft may have become jammed. To correct this, remove the bottom bolt from the elevation motor, and spin the shaft manually.



DRIVE MOTOR AND ROLLER TROUBLESHOOTING

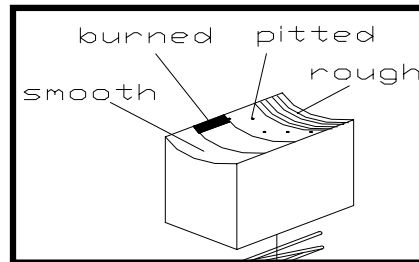
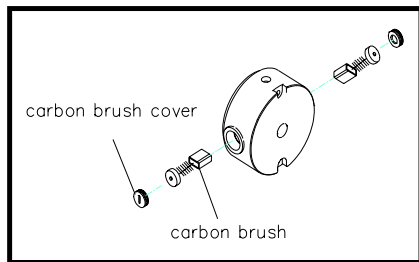
CONTENTS

Thumping noises generating from under motor cover.....	47
Cleaning the motor.....	48
Thumping noises generating from rear of treadmill.....	49

Noises Generating From Under Motor Cover

Possible causes:

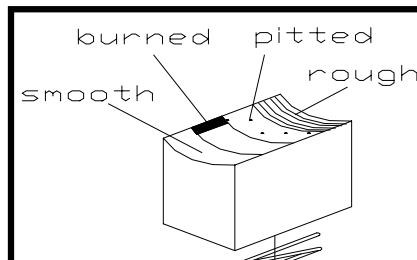
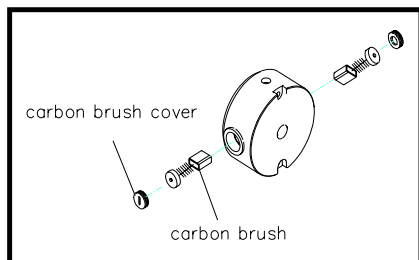
- Verify proper tension of the running belt. Excessive noise may be created by an over-tightened running belt.
- Remove motor cover and verify alignment of drive belt.
- Inspect for debris on drive motor pulley, front roller pulley, or on drive belt
- If this problem is being experienced on a new treadmill, let the treadmill run for about 30 minutes without load to break the treadmill in.
- Remove the brush covers on the drive motor and inspect the brushes and the motor commutator for any uneven wear.
(Make sure the treadmill is turned off before doing this procedure.)



- If the surface of the motor brush is pitted, rough, or has burn marks, replace the motor brush and stone the motor commutator.
- Do not plug in the power cord and do not turn on the treadmill when the motor brushes are removed from the drive motor.
- After you replace a motor brush, make sure the brush is seated securely and makes full contact with the commutator before you plug in the power cord and turn on the treadmill
- If the problem persists, replace the drive motor or front roller.

Stoning the Motor Commutator

- Unplug the power cord from the wall outlet.
- Remove the brush covers on the drive motor and inspect the brushes and the motor commutator for any uneven wear.



- If the surface of the motor brush is pitted, rough, or has burn marks, replace the motor brush.
- Do not plug in the power cord and do not turn on the treadmill when the motor brushes are removed from the drive motor.
- With the brushes removed, inspect the motor commutator for any unusual wear or burn marks. If there is any abnormal marks or wear, stone the motor commutator. Make sure to blow any dust or particles from the motor commutator when finished.
- After you replace a motor brush, make sure the brush is seated securely and makes full contact with the commutator before you plug in the power cord and turn on the treadmill.
- Run the treadmill for 15 minutes at 3-5 mph to seat the brushes properly. Inspect the motor commutator again for any unusual wear. Repeat stoning process if necessary.

Noises Generating From the Rear of the Treadmill

Possible causes:

- If this problem is being experienced on a new treadmill, let the treadmill run for about 30 minutes without load to break the treadmill in.
- Verify proper tension of the running belt. Excessive noise may be created by an over-tightened running belt.
- Verify that there is proper clearance between the rear roller and the bottom deck cover and frame.
- If problem persists, replaced the rear roller.

TREADMILL PARTS REPLACEMENT

CONTENTS

Running Belt / Deck	51
Roller	53
Motor	54
Motor Brush	56
Lower Board	57
Console Cable	58
Incline Motor	60
Upper Board	61
Keypad (Membrane Key)	63
Air Shock	65

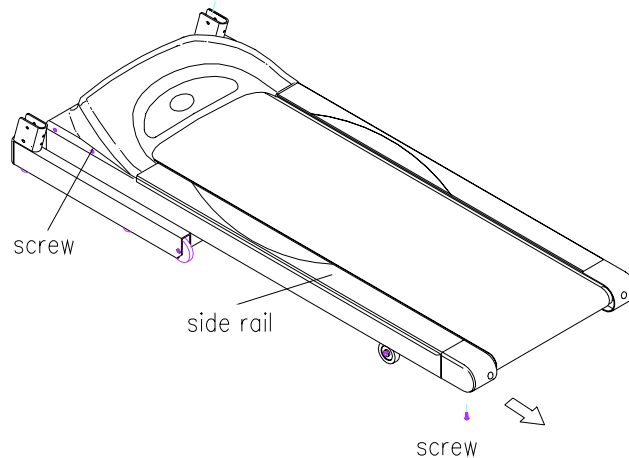
Running Belt/Deck Replacement Procedure

Tools required:

- *Philips screwdriver*
- *T-handle Allen wrench (5mm, 6mm)*

Procedure:

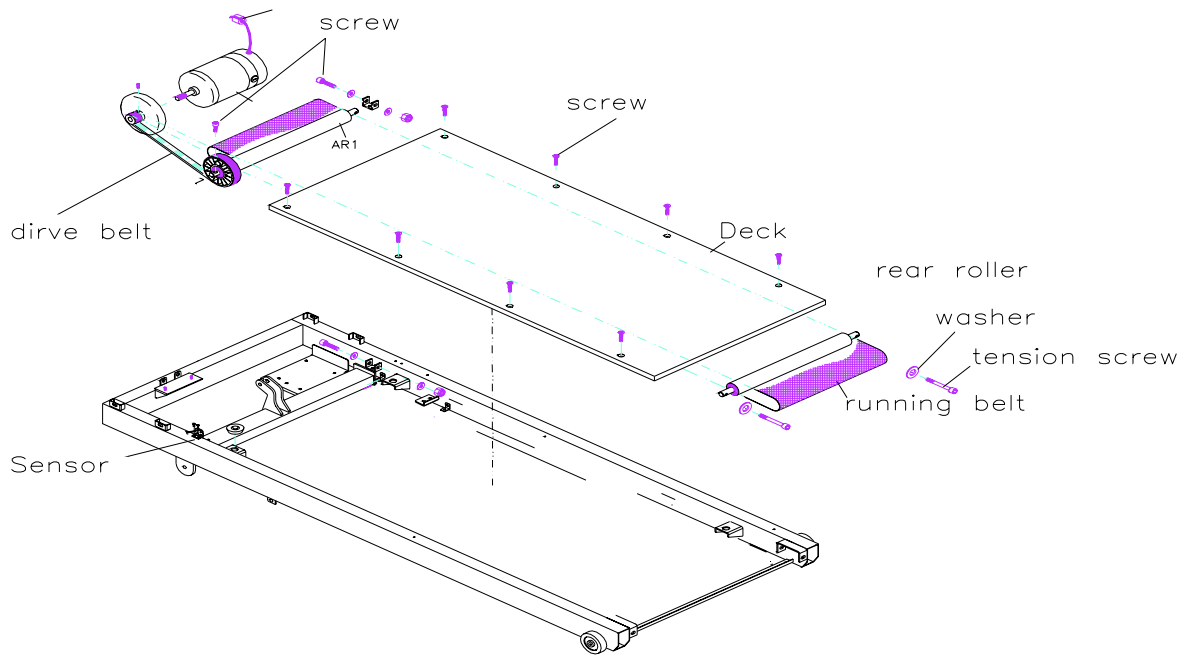
1. With a Philips head screwdriver, remove the motor cover, rear roller end caps, and left and right side rails.



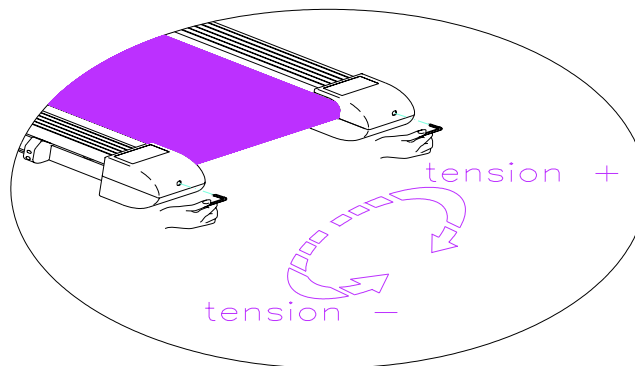
2. With the appropriate size Allen wrench remove the rear roller. It is a good idea to note the position of the rear roller before removing. For best results, place two removable marks on the left and right side of the deck and the running belt. When reinstalling, match up the marks for proper tension.
3. With the Philips screwdriver remove the speed sensor.
4. With a 6mm Allen wrench remove the front roller.
(It is a good idea to note the position of the rear roller before removing.)
5. Loosen the bolts that hold the deck to the frame and remove the running belt and deck. Replace the deck and running belt with a new one.

Running Belt/Deck Replacement Procedure - Continued

6. Tighten the deck bolts. Assemble the front roller first, but do not tighten completely. Then assemble the rear roller and drive belt idler.
7. Finish tightening the front roller.



8. Start the treadmill, and run it to ensure proper belt tension and side-to-side belt tracking. If there is a problem with the belt tension or tracking, adjust the rear roller position.



9. Install the sensor, side rails and all the covers.

Roller Replacement

Tools required:

- Philips screwdriver
- T-handle Allen wrench (6mm, 8mm)

Procedure:

Front roller

1. With a Philips head screwdriver, remove the motor cover.
2. With the Philips head screwdriver, remove the speed sensor. Press your finger against the drive belt and guide it towards the left until it is released from the front roller.
3. With the 6mm Allen wrench, remove the front roller and replace it with a new one. It is a good idea to note the position of the front roller before removing. For best results, place two removable marks on the left and right side of the deck and the running belt. When reinstalling, match up the marks for proper tension.
4. Reassemble the front roller and the drive belt. Install the motor cover.

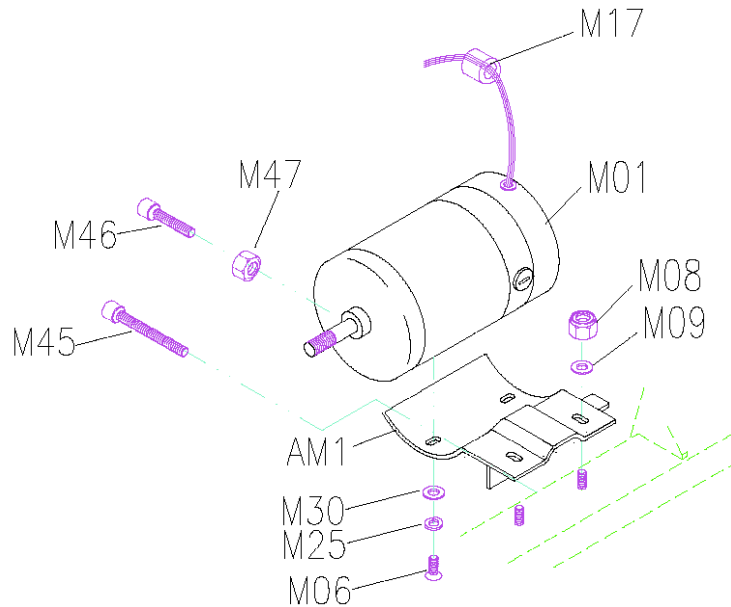
Rear roller

1. With a Philips head screwdriver, remove the motor cover.
2. With a 6mm Allen wrench, loosen and remove the front roller. It is a good idea to note the position of the front roller before removing. For best results, place two removable marks on the left and right side of the deck and the running belt. When reinstalling, match up the marks for proper tension.
3. With the appropriate size Allen wrench remove the rear roller and replace it with a new one.
It is a good idea to note the position of the rear roller before removing.
4. Start the treadmill, and run it to ensure proper belt tension and side-to-side belt tracking. If there is a problem with the belt tension or tracking, adjust the rear roller position.

Motor Replacement

Tools required:

- Philips screwdriver
- Socket wrench (13mm)
- Box wrench (8mm)
- Allen wrench (6mm)



Procedure:

9. Turn off the power to the treadmill and remove the power cord from the wall outlet.
10. With a Philips head screwdriver, remove the motor cover.
11. Unplug the motor wires from the lower board.
12. Before continuing, it is a good idea to weight down the treadmill deck to prevent the treadmill from springing up. Removing the weight of the motor will significantly reduce the weight in the front end of the treadmill.
13. With a 13mm wrench, remove the attachment nuts (M08) and washers (M09) holding the motor to the frame.
14. With a 6mm Allen wrench, loosen the two motor bracket attachment bolts (M45,

M46).

15. With a 6mm Allen wrench, remove the bolts (M06) and washers (M30, M25) holding the motor to the motor bracket, and replace it with a new motor.
16. Put the new motor in place on the frame, taking caution to properly align the motor flywheel pulley and the front roller pulley. Tighten with a 13mm wrench.
17. Place the drive belt on the drive motor, making sure that the motor pulley is aligned with the roller pulley.
18. Tighten the two motor attach bolts (M45, M46) with a 6mm Allen wrench.
19. Verify the proper tension on the drive belt. Using a timing belt tension gauge, the proper tension should be between 65 to 75 lbs. If a timing belt tension gauge is not available, the drive belt should have approximately 3/8 of inch deflection. If the drive belt tension is not set properly, loosen the motor attachment bolts and adjust.

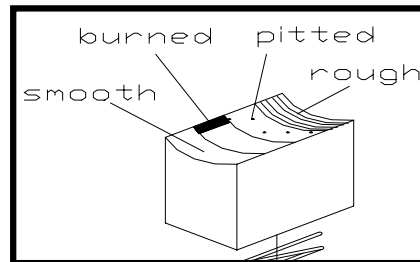
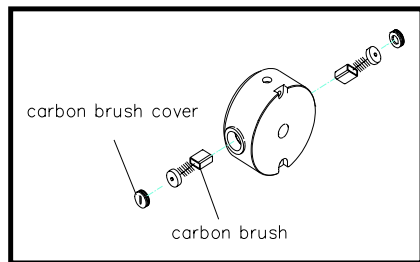
Motor Brush Replacement

Tools required:

- Flat blade screwdriver

Procedure:

1. Turn off the power to the treadmill and unplug the power cord from the wall outlet.
2. Remove the motor brush cover and the carbon brushes with a flat blade screwdriver.



3. Check the surface of the motor brush.
 - ◆ **If the surface of carbon brush is pitted, rough, or has burn marks, replace the motor brush.**
4. Stone the surface of the motor commutator and blow out particles inside motor with an air compressor.
5. Install the motor brush and the motor brush cover.
6. Plug-in the treadmill, and let the treadmill run for about 1 hour at 5mph to allow the proper seating of the brush.

Lower Board Replacement

Tools required:

- Philips head screwdriver

Procedure:

1. Turn off the power to the treadmill and unplug the power cord from the wall outlet.
2. With a Philips head screwdriver, remove the motor cover.
3. Verify that LED MTR is not lit on the lower board. If this LED is lit, please wait approximately 1 minute until the light is out. This is an indication that the stored power has left the board. Failure to do so may result in injury.
4. Unplug all the wires and cables from the lower board
(It is a good idea to note the position of all wiring before removing.)
5. With a Philips head screwdriver, remove the lower board, and replace it with a new one.
6. Reconnect all the wires to the lower board. **Please refer to lower control board wiring diagram.**
7. Install the motor cover.
8. Re-plug the power cord, and turn power on.

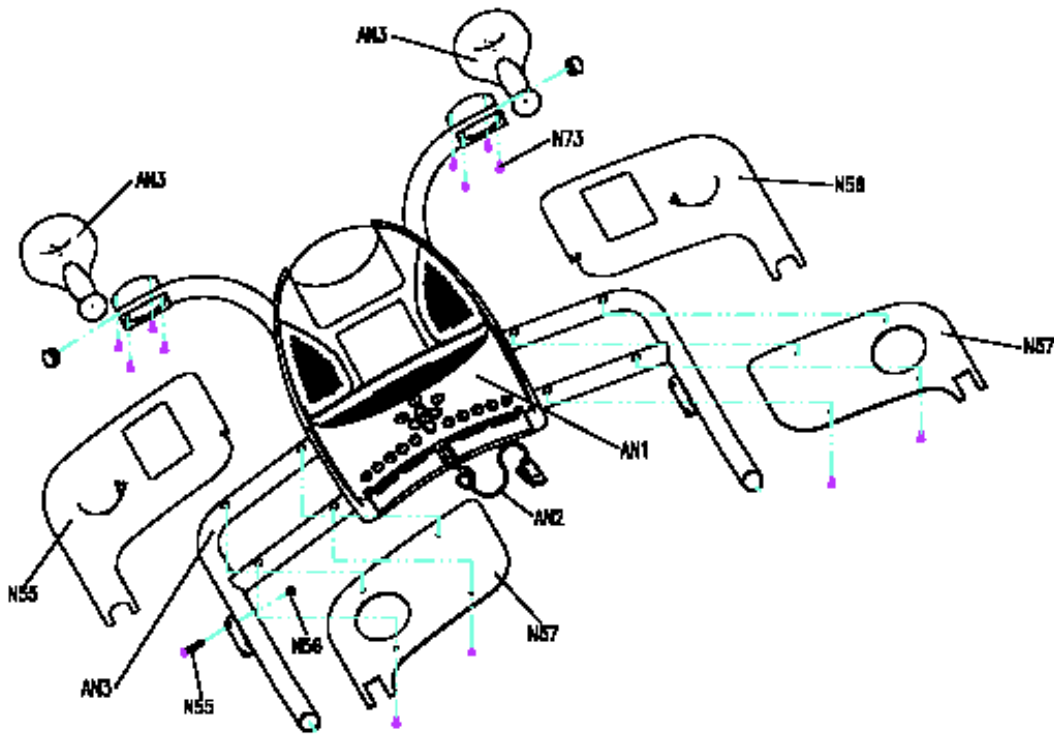
Console Cable Replacement

Tools required:

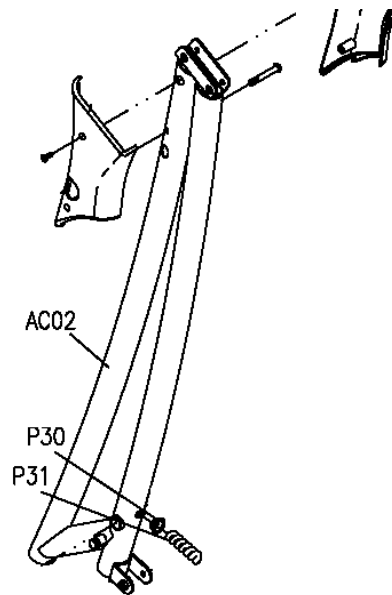
- Philips screwdriver
- Allen wrench (5mm)
- 13 mm wrench
- Needle nose pliers

Procedure:

1. Turn off the power to the treadmill and unplug the power cord from the wall outlet.
2. With a Philip head screwdriver, remove the motor cover and disconnect the console cable from the lower control board.
3. With a Philip head screwdriver, remove the console (AN1) from the console mast (AN3) and unplug the console cable from the console.
4. With a Philips screwdriver, remove the back console assembly panels (N57).



5. Remove the console assembly from the console mast (AC02) by removing the console mast covers on both the left and right side.



6. Remove the rear (closest to the back of the treadmill) 45 mm bolt and 13 mm nut that attaches the console assembly to the console mast (AC01).
7. Remove the console mast plug (P30) from the console mast.
8. Attach the new console cable to the existing cable and fish the new cable through the console mast.
9. Once the new console cable is installed through the console mast, connect the plugs to the lower board and upper boards.
10. Attach the console assembly to the console masts with the 45 mm bolts and 13 mm nut and attach the console mast covers.
11. Attach the back panel on the upper board.
12. Attach the motor cover, ensuring that the console cable is not being pinched.

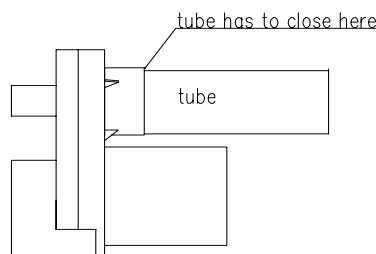
Incline Motor Replacement

Tools required:

- Philips screwdriver
- Qty 2 wrenches (17mm)

Procedure:

1. Turn off the power to the treadmill and unplug the power cord from the wall outlet.
2. With a Philips head screwdriver, remove the motor cover. Disconnect the incline motor wires from the lower control board.
3. Fold up the treadmill to the locking position.
4. With two 17mm wrenches, remove the bottom bolt attaching the motor shaft to the incline frame. It may be helpful to tip the treadmill on its side to release pressure from the shaft bolt.
5. Fold the treadmill down to the running position. Remove the top bolt from the incline motor. Remove the incline motor from the machine.
6. When installing the new incline motor, make sure the elevation shaft is flush with the motor casing (See diagram below).



7. Install the top bolt to the incline motor.
8. Install the bottom bolt to the incline shaft.
9. Reconnect the incline motor wires to the lower control board.
10. Attach the motor cover.

Upper Board Replacement

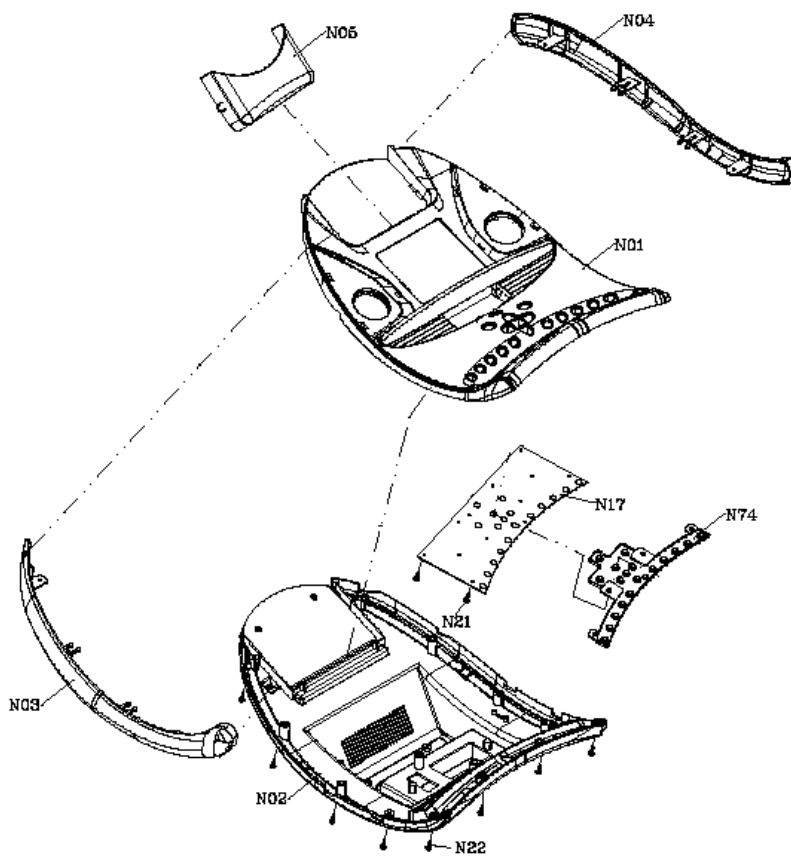
Tools required:

Philips screwdriver. Note: Diagram on following page.

Procedure:

1. Turn off the power to the treadmill and unplug the power cord from the wall outlet.
2. With a Philips head screwdriver, remove the console from the console mast.
3. Remove the console cable from the console connection.
4. With a Philips head screwdriver, remove the screws (N22) that attach the top console case (N01) to the bottom console case (N02).
5. Once all screws have been removed, remove the side accent pieces (N03, N04) and separate the top and bottom console cases.
6. Unplug all the cables connecting to the upper board (N17)
7. With the screwdriver, loosen screws (N21), remove the upper board (N17), and replace it with a new one.
8. Reconnect the console cables.
9. Attach the side accent pieces and top and bottom console cases together and secure with screws. Take caution so internal wires are not pinched.
10. Insert the console cable to the back of the console.
11. Attach console to the console mast and secure with screws.

Upper Board Replacement



Keypad Replacement

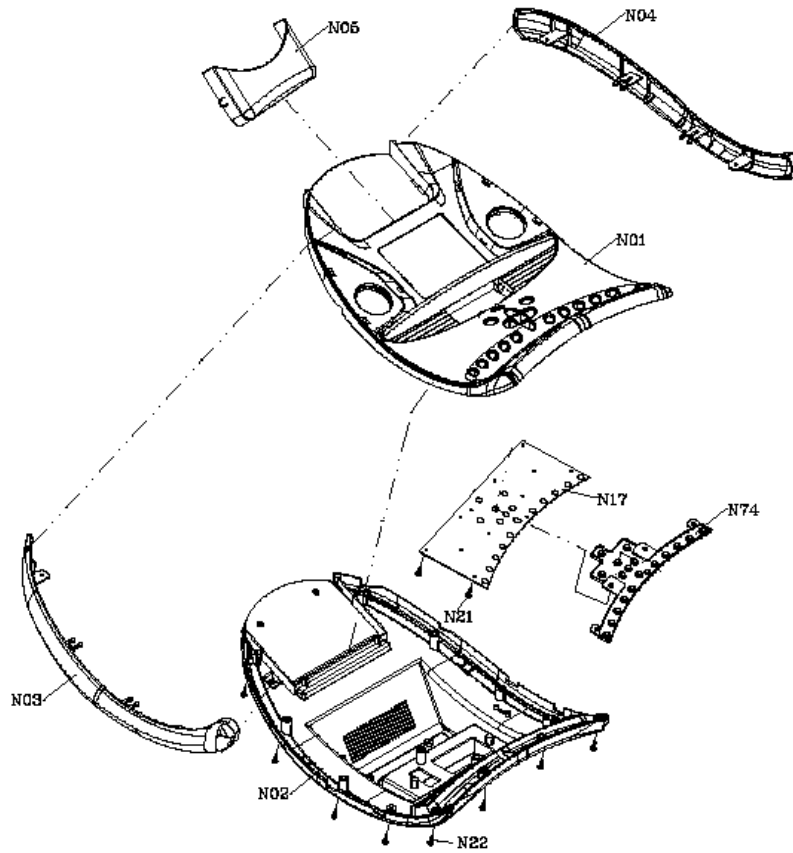
Tools required:

Philips screwdriver. Note: Diagram on following page.

Procedure:

1. Turn off the power to the treadmill and unplug the power cord from the wall outlet.
2. With a Philips head screwdriver, remove the console from the console mast.
3. Remove the console cable from the console connection.
4. With a Philips head screwdriver, remove the screws (N22) that attach the top console case (N01) to the bottom console case (N02).
5. Once all screws have been removed, remove the side accent pieces (N03, N04) and separate the top and bottom console cases.
6. Unplug all the cables connecting to the upper board (N17)
7. With the screwdriver, loosen screws (N21), and remove the upper board (N17).
8. Once the upper board has been removed, remove the keypad and replace with new one.
9. Attach the upper board and secure with screws. Reconnect the console cables.
10. Attach the side accent pieces and top and bottom console cases together and secure with screws. Take caution so internal wires are not pinched.
11. Insert the console cable to the back of the console.
12. Attach console to the console mast and secure with screws.

Keypad Replacement



Air Shock Replacement

Tools required:

Wrench (13mm)

Procedure:

1. Fold treadmill to locking position.
2. Use a 13mm wrench to loosen the nut that secures the top screws of the air shock to the frame.
3. Unscrew the entire air shock counterclockwise to remove it from the bottom screw attachment screw.
4. Remove air shock and replace it with a new one, screwing the new air shock into the bottom screw and then securing the top of the air shock with the 13 mm nut.

