



HORIZON SERIES TREADMILL SERVICE MANUAL



◦ **PAGARON**

◦ **QUANTUM**

◦ **OMEGA**



TABLE OF CONTENTS

■ SECTION 1: MAINTENANCE PROCEDURE	
□ PREVENTIVE MAINTENANCE LIST.....	1-1
□ TENSION THE BELT PROCEDURE.....	1-2
□ DECK RE-WAXING PROCEDURE.....	1-3
□ CLEAN THE GROOVES PROCEDURE.....	1-4
□ LUBRICATING THE AIR SHOCK PROCEDURE.....	1-5
■ SECTION 2: IMPORTANT SAFETY INSTRUCTIONS	
□ GROUNDING INSTRUCTIONS.....	2-1
□ POWER VOLTAGE INSTRUCTIONS.....	2-1
■ SECTION 3: WIRING DIAGRAM	
□ WIRING DIAGRAM (TERMINAL END, CE).....	3-1
□ WIRING DIAGRAM (TERMINAL END).....	3-2
□ WIRING DIAGRAM (MCB).....	3-3
■ SECTION 4: MCB LED INSTRUCTIONS	
□ MCB LED INSTRUCTIONS.....	4-1
■ SECTION 5: CONSOLE INSPECTING MODE GUIDE	
□ PARAGON.....	5-1
□ QUANTUM.....	5-1
□ OMEGA.....	5-1



TABLE OF CONTENTS

■ SECTION 6 : TROUBLESHOOTINGS

□ NO DISPLAY ON CONSOLE.....	6-1
□ ALL OR SOME OF THE KEYS ON CONSOLE WILL NOT WORK...	6-2
□ HEART-RATE-CONTROL FUNCTION DOES NOT WORK.....	6-2
□ ERROR-MESSAGE "E1" ON CONSOLE.....	6-3
□ ERROR-MESSAGE "E2" ON CONSOLE.....	6-4
□ TREADMILL WILL NOT START.....	6-5
□ TREADMILL WILL START TO RUN BY ITSELF.....	6-6
□ TREADMILL WILL STOP BY ITSELF.....	6-6
□ RUNNING SPEED IS NOT STABLE.....	6-7
□ TREADMILL CHANGES THE SPEED BY ITSELF.....	6-8
□ INCLINE FUNCTION DOES NOT WORK.....	6-8
□ TREADMILL WILL INCLINE UP OR DOWN BY ITSELF.....	6-9
□ NOISES GENERATED UNDER MOTOR COVER.....	6-10

■ SECTION 7 : PARTS REPLACEMENT

□ RUNNING BELT / DECK.....	7-1
□ ROLLER.....	7-2
□ MOTOR.....	7-3
□ MCB (MOTOR CONTROL BOARD).....	7-4
□ CONSOLE CABLE.....	7-5
□ INCLINE MOTOR.....	7-6
□ PCB (CONSOLE CONTROL BOARD).....	7-7
□ KEYPAD (MEMBRANE KEY).....	7-8
□ AIR SHOCK.....	7-9
□ MOTOR BEARINGS / CARBON BRUSH.....	7-10
□ HAND PULSE SET.....	7-11

■ SECTION 8 : SERVICE FORM

□ MCB LED INDICATION.....	8-1
□ PWM MCB LED CHART.....	8-2
□ MCB LED TROUBLESHOOTING CHART.....	8-3



SECTION 1
MAINTENANCE PROCEDURE



PREVENTIVE MAINTENANCE SCHEDULE

HORIZON TREADMILL

<i>Item</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>	<i>Quarterly</i>	<i>Biannual</i>	<i>Annual</i>
<i>Console Mounting Bolts</i>					Inspect	
<i>Frame</i>	Clean				Inspect	
<i>Running Belt Top</i>		Clean (Vacuum)			Inspect	
<i>Power Cord</i>			Inspect			
<i>Display Console</i>	Clean		Inspect			
<i>Handlebar</i>	Clean				Inspect	
<i>Handrail & Handlebar</i>				Inspect		
<i>Front Roller</i>				Clean	Inspect	
<i>Rear Roller</i>					Inspect	
<i>Safety Key</i>	Test					
<i>V Belt</i>				Clean	Inspect	
<i>Deck Re-waxing</i>			Inspect & Re-waxing			
<i>Running Belt</i>					Inspect	
<i>Control Box</i>					Clean (Vacuum)	
<i>Air Shock</i>				Lubricate		
<i>Motor</i>				Clean		

Tension the Belt

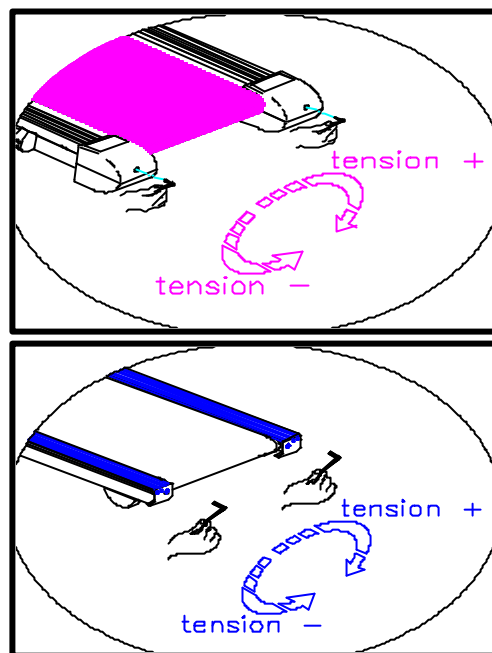
Caution:

Over-tightening of the roller will severely shorten the life of the belt and may cause further damage to other components.

Running Belt:

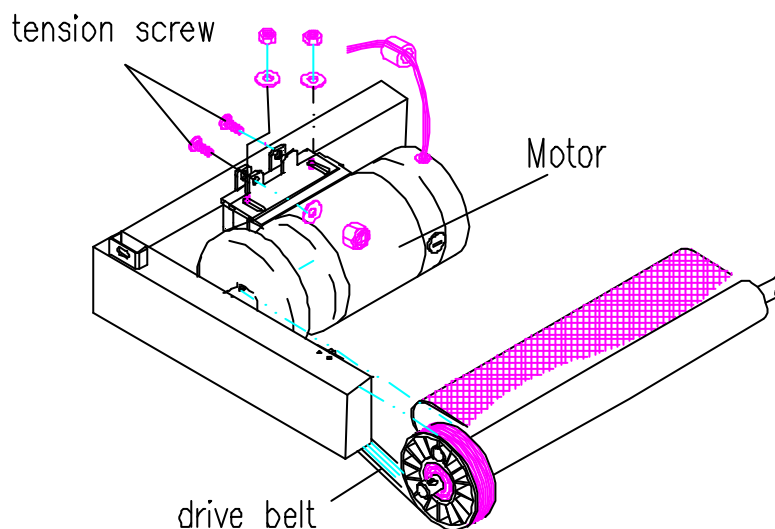
If when you plant your foot on the belt, you can feel a slipping sensation then the belt has stretched and is slipping across the rollers. This is a normal and common adjustment on a new treadmill. To eliminate this slipping, tension both the rear rollers Allen bolts **1/4 TURN** as shown above. Try the treadmill again to check for slipping. Repeat if necessary, but **NEVER TURN** the

roller bolts more than 1/4 turn at a **time**.



Drive Belt:

If you have tensioned the running belt and are still experiencing a slipping, adjust the tension screw. Then try the treadmill again to check for slipping



Deck Re-waxing Procedure

Frequency:

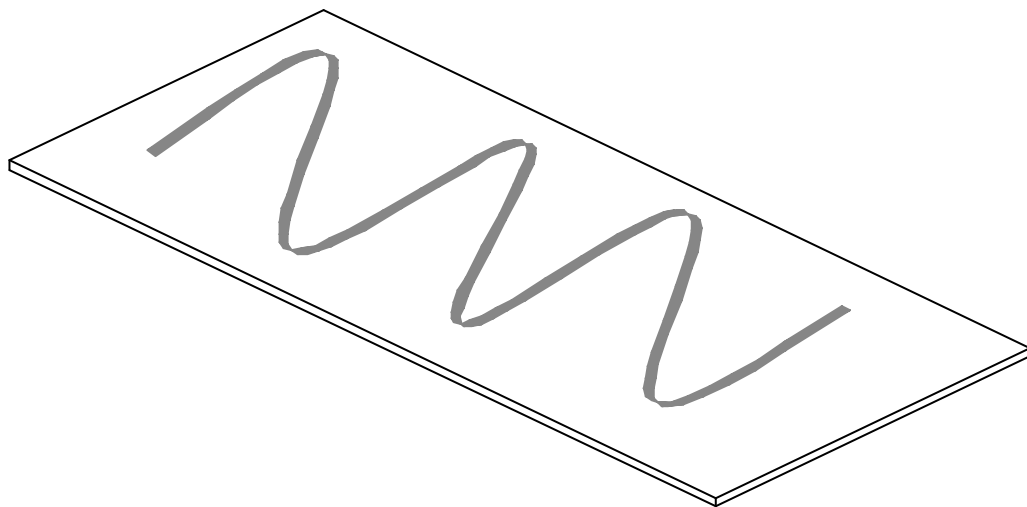
Every 1 month.

LUBE

Name: DOW CORNING 350 SILICON

Procedure:

1. After removing the running belt, clean the deck and belt by using a clean towel.
2. Place the (new) running belt.
3. Apply some lubricant on the deck, in such way that the lubricant is evenly distributed across the deck.
4. Tighten the deck screws and assemble the rear roller first, then assemble the front roller.
5. Replace the drive belt on the transmission pulley by turning the Flywheel clockwise by using left hand and use right hand to push the drive belt on to grooves of the front roller pulley.
6. Install the front / rear rollers. Adjust the roller fixed bolts to center the running belt at speed 4mph (6.4kph).
7. Turn on the power and then press the start key, then hold down the fast key until the window indicates **2 mph (3 kph) and then step on the belt for 5 minutes** to ensure the lubricant has been evenly distributed underneath the belt.



Clean the Grooves Procedure

Frequency:

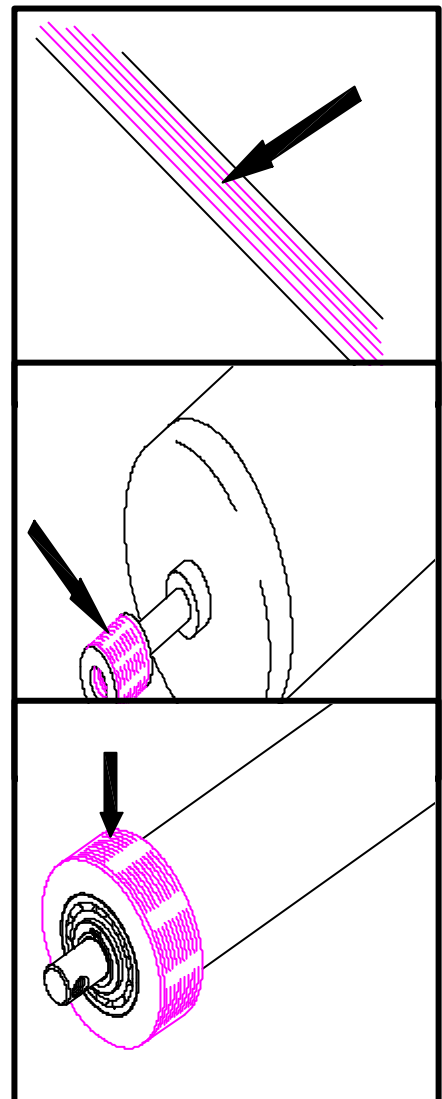
Every 3 months.

Notice:

If dirty grooves in the drive belt, motor and roller pulley, there will be noises while running.

Procedure:

- 1 Remove the drive belt and check the grooves in belt for dirt or dust and clean it.
- 2 Check the grooves in motor pulley for dirt or dust and clean it.
- 3 Check the grooves in roller pulley for dirt or dust and clean it.



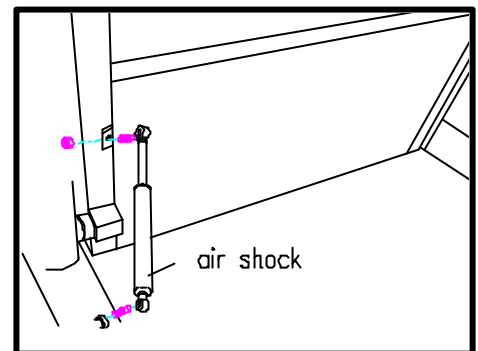
Lubricating the Air Shock

Frequency:

Every 3 months.

Procedure:

1. Fold up and engage the frame to the left support by using the deck-locking knob.
2. Add the 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





SECTION 2

IMPORTANT SAFETY INSTRUCTIONS



IMPORTANT SAFETY INSTRUCTIONS

Notice:

This product must be grounded

WARNING:

Connect this appliance to a properly grounded outlet only. See grounding Instructions.

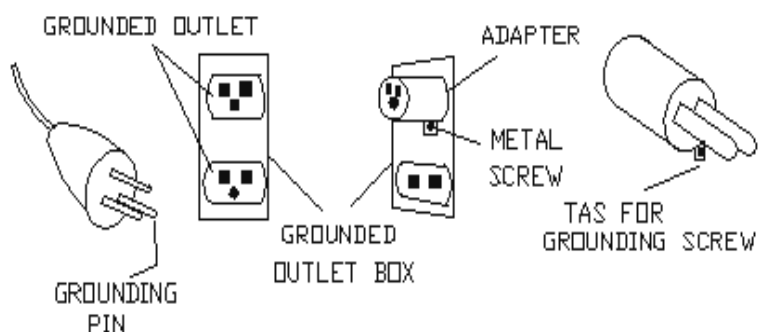
Note:

Power voltage 110v model:

95v ~ 140v

Power voltage 220v model:

210v ~ 250v



When using an electrical product, basic precautions should always be followed, including the following:

GROUNDING INSTRUCTIONS

This product must be grounded. If it 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 fit the outlet, have a proper outlet installed by a qualified electrician.

POWER VOLTAGE INSTRUCTIONS

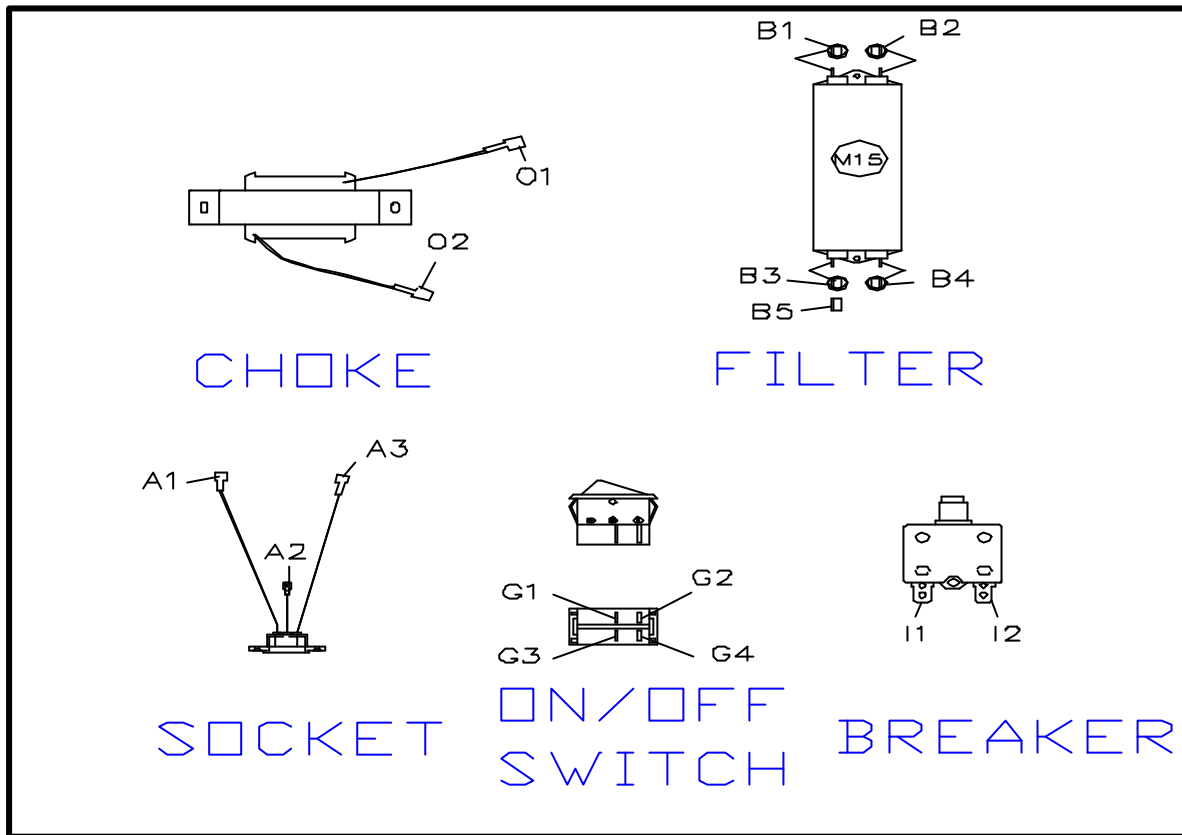
Power voltage 110v model: 95v ~ 140v

220v model: 210v ~ 250v



SECTION 3
WIRING DIAGRAM

Wiring Diagram (Terminal End, CE)

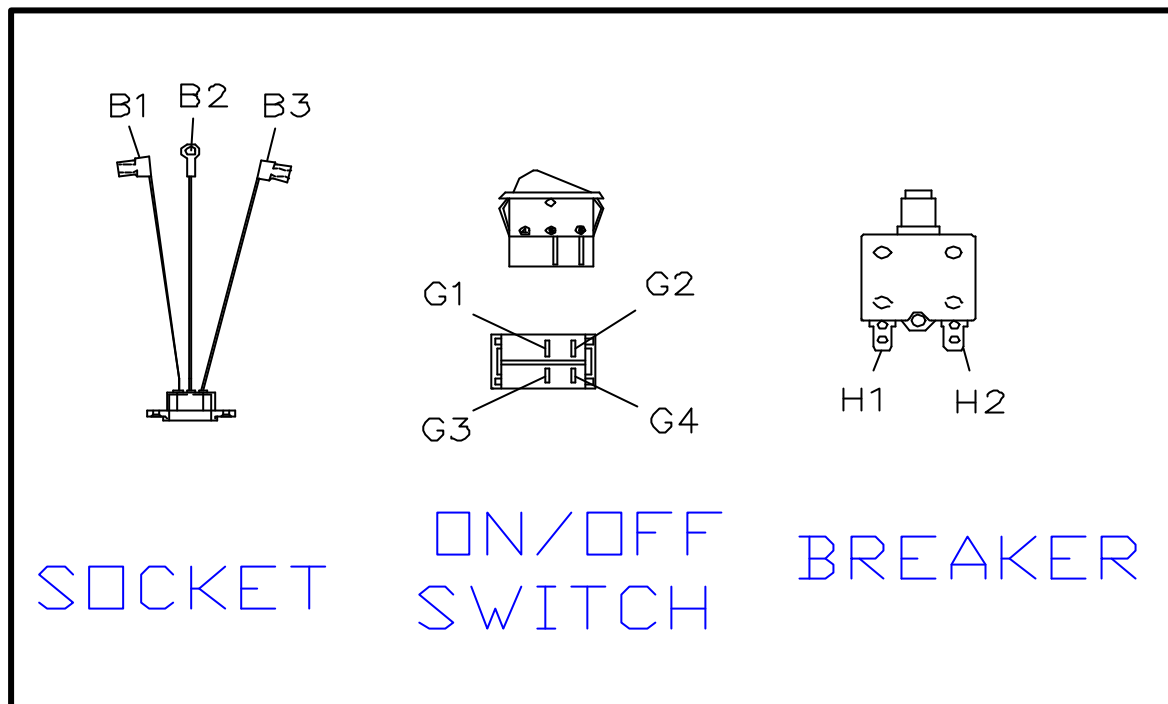


Note: the bushing instead of socket for 110 voltages mode

A1-----I1
A2-----Ground
A3-----G2
G1-----B3
G3-----B4

G4-----I2
B1-----O1
B2-----AC1 of MCB
B5-----Ground
O2-----AC2 of MCB

Wiring Diagram (Terminal End)

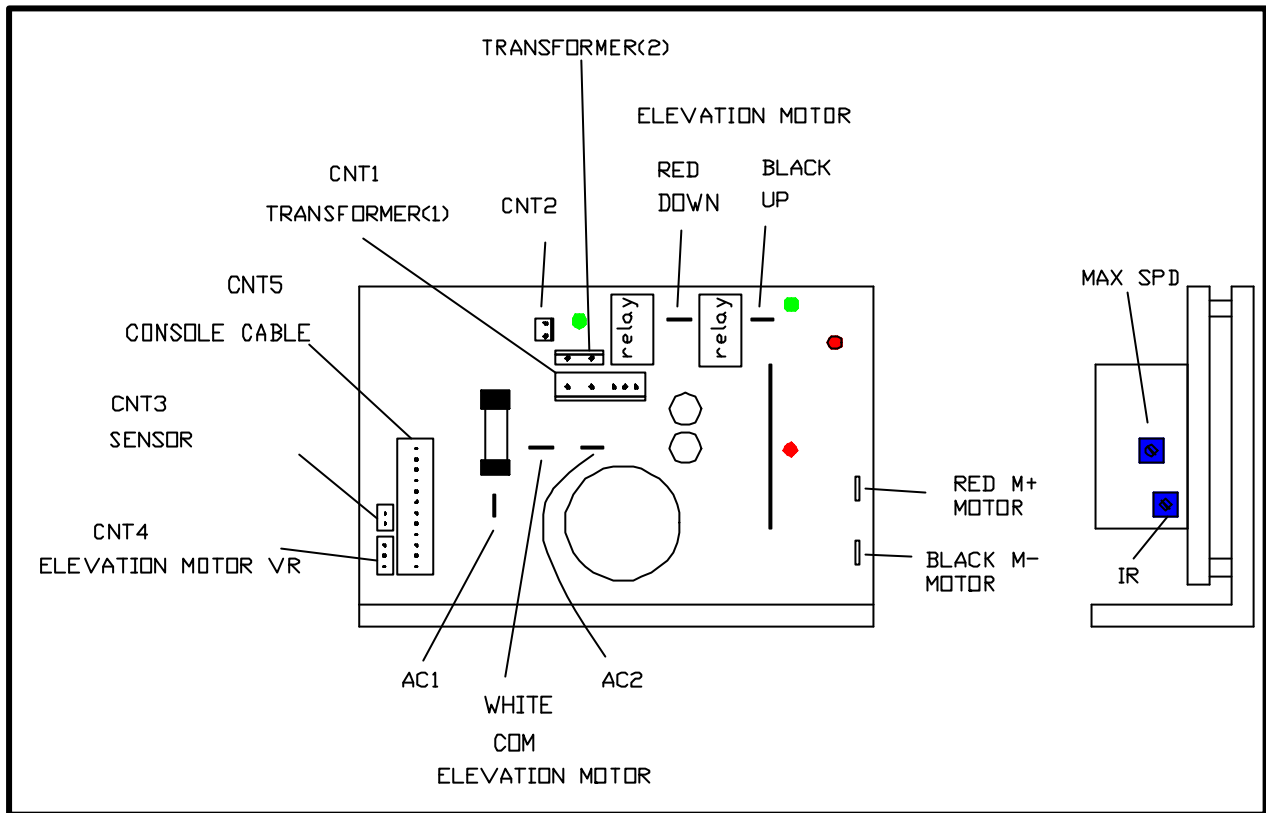


Note: the bushing instead of socket for 110 voltages mode

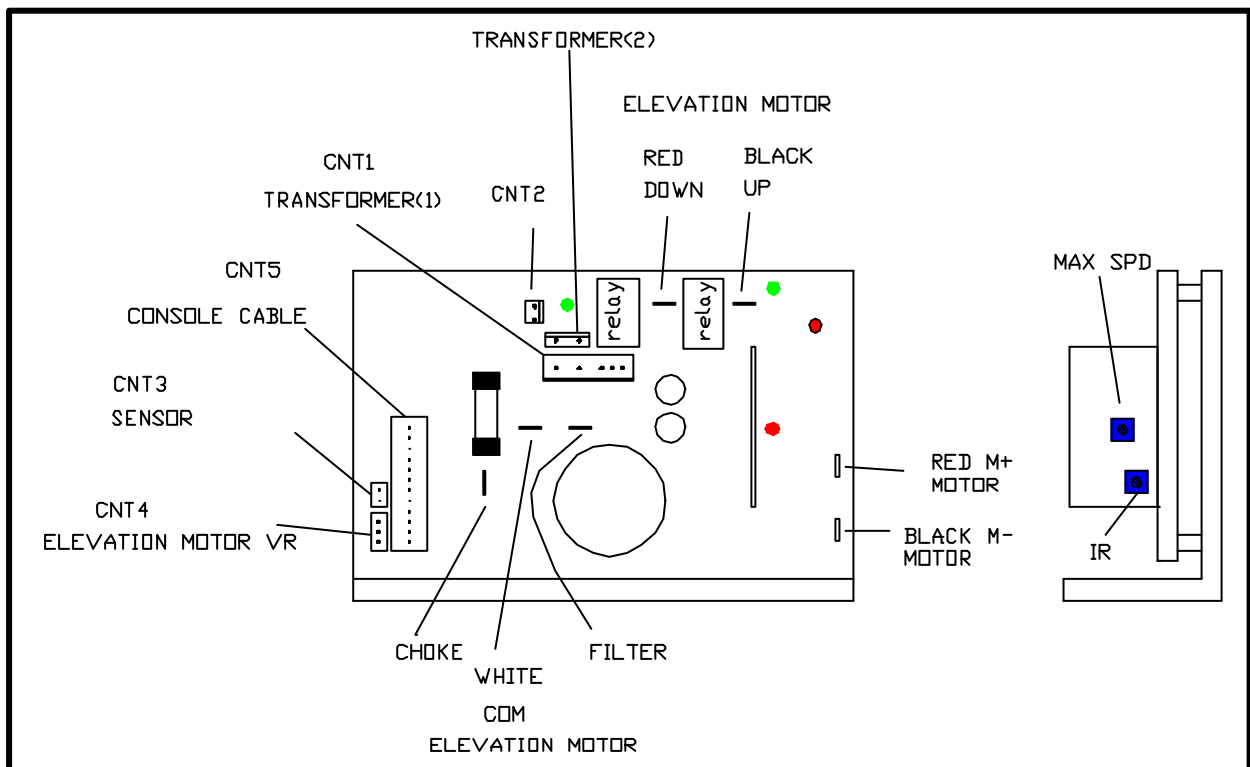
- **B1-----H1**
- **B2-----Ground**
- **B3-----G2**
- **G1-----AC1 of MCB**
- **G3-----AC2 of MCB**
- **G4-----H2**

Wiring Diagram (MCB)

110V



220V

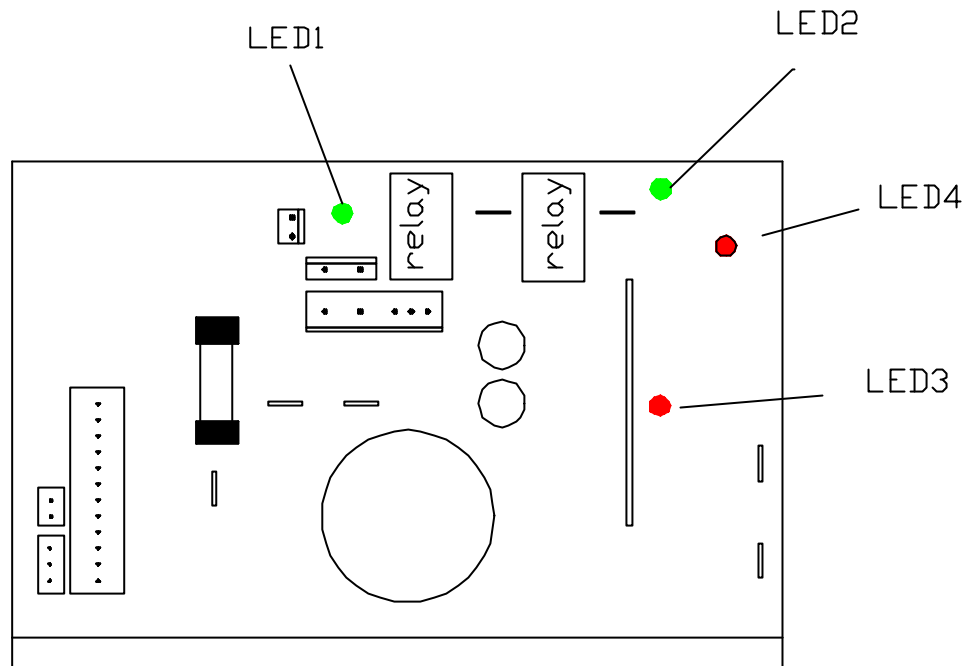




SECTION 4

MCB LED INSTRUCTIONS

MCB LED INSTRUCTIONS



LED 1: Indicates the PCB is commanding the incline motor to move up. If the User is commanding the incline to decrease and this light is not lit, check cabling, verify proper PCB operation and replace it if either is defective. If the problem persists, replace the MCB. If the light is lit but the incline is not moving, check and verify incline motor and its connection to the board; If this problem persists replace MCB

LED2: Indicates the PCB is commanding the incline motor to move down. If the User is commanding the incline to increase and this light is not lit, check cabling, verify proper PCB operation and replace it if either is defective. If the problem persists, replace the MCB. If the light is lit but the incline is not moving, check and verify incline motor and its connection to the board; If this problem persists replace MCB

LED3: N/A

LED4: Indicates the control PWM from the PCB is present. It will light at the control frequency used by the PCB when the PCB commands speed. If the control signal should exceed 95 percent duty cycle, the PWM light shuts off and sets the MCB to a safe shutdown mode. In the event this should occur, the power to the treadmill should be removed, the cabling checked for shorts and the PCB replaced. If this problem persists, replace the MCB.



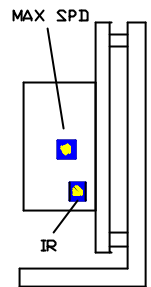
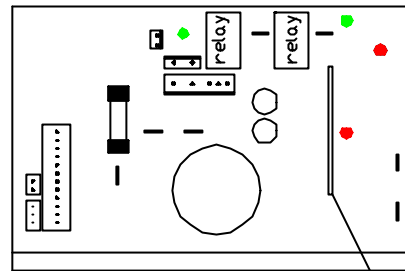
SECTION 5

CONSOLE INSPECTING MODE GUIDE

CONSOLE INSPECTING MODE

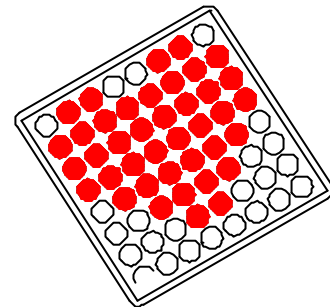
1. Turn power on with the safety key placing on the console.
2. Press and hold down the UP & SLOW key for about 5 seconds. You will listen “beep” 5 times from buzzer, and then you have get to the Console Inspecting Mode.

3. Press “START” key. The motor should start. When you press “Fast” or “Slow” key, the “Time-Window” should be showing you the variable numbers. And the “Speed-Window” should be showing the actually speed. If the motor can't run, adjust the “MAX SPD” button on MCB until it starts.



SMALL IC BOARD

4. Press “UP” or “DOWN” key the incline motor should incline and the “Distance-Window” window should be showing you for the variable numbers. That mean is incline function on normal state.
5. When you hold the Hand-pulse Bar, the center window should be showing you the heart-rate figure.



- “Calories-Window”Software Version
- “Distance-Window”Variable number of incline
- “Time-Window”Variable number of speed
- “Speed-Window”Actually speed values



SECTION 6

TROUBLESHOOTINGS

No display on console

Possible causes:

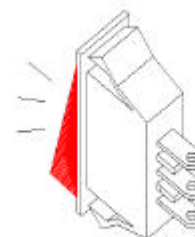
1. Breaker is damaged.
2. ON/OFF switch is damaged.
3. Transformer (2pin&3pin) is damaged.
4. MCB is damaged.
5. Console cable is damaged.
6. PCB is damaged

Fix:

1. (**refer to MCB LED layout & indication**) Verify if LED 115vAC(AC) is lit. If this LED is lit, YES: Next step
NO: Verify the following

- ◆ Inspect the circuit breaker to see if it has tripped off.

**(If it is tripped off--like diagram B reset the breaker.
And check which part is short-circuited. Then replace the short-circuited part.)**

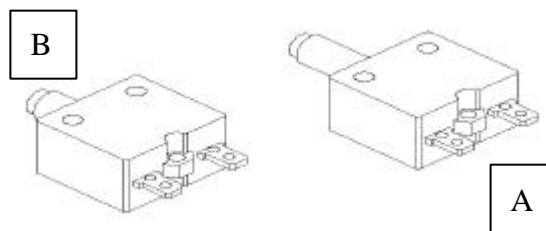


2. The switch is turned to the "ON" position.
(If the switch light isn't lit, replace the switch.)

- ◆ Verify wire connection AC1 & AC2 on the MCB.

(Refer to wiring diagram)

- ◆ Verify the ON/OFF switch, breaker & socket wires are connected.

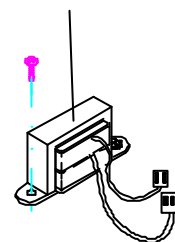


3. Transformer is damaged, replace it with a new one.

4. MCB is damaged, replace MCB.
Verify if fuse is broken. If it is, replace fuse.

5. Replace console cable.
Verify if the 5th pin (yellow) and 8th pin (white) of console cable is more than 10 voltage.

Transformer



6. Replace PCB.



All or some of the keys on console will not work

Possible causes:

1. Keypad connecting plug is not fit-in properly.
2. Keypad is damaged.
3. PCB is damaged.

Fix:

1. Disconnect the keypad and replace the keypad, and check again.
2. Replace the keypad.
3. Replace the PCB.

Heart-Rate-Control function does not work

Possible causes:

1. Hand pulse sensor set is damaged.
2. Heart-rate-control board is damaged.
3. PCB is damaged

Fix:

1. Replace hand pulse sensor set with a new one.
2. Replace the heart-rate-control board with a new one.
3. PCB is damaged. Replace the PCB.

Error-message "E1" on console

E1: motor doesn't work

Possible cause:

1. Motor hesitates to move.
2. Console cable has not been connected well or is damaged.
3. Sensor cable has not been connected well or is damaged.
4. Magnet of the front roller has fallen down.
5. Damaged PCB
6. Damaged MCB
7. Sensor is out of alignment

Fix:

1. Adjust the "SPD" button on MCB until the motor start.
2. Check the console control cable has been connected well or not.
 - ◆ If it has not been connected well, connect it or change the cable.
3. Check the Sensor cable has been connected well or not.
 - ◆ If it has not been connected well, connect it or change the cable.
4. Check the magnet of front roller has been fallen down or not.
 - ◆ If it has fallen down, re-install it.
5. Replace the PCB.
6. Replace the MCB.
6. Re-install the sensor.



Error-message "E2" on console

E2: max velocity is too low

Possible cause:

1. Console cable has not been connected well or is damaged.
2. Sensor cable has not been connected well or is damaged.
3. Magnet of the front roller has fallen down.
4. Damaged PCB
5. Damaged MCB
6. Sensor is out of alignment
7. City power is too low.

Fix:

1. Check the console control cable has been connected well or not.
 - ◆ If it has not been connected well, connect it or change the cable.
2. Check the Sensor cable has been connected well or not.
 - ◆ If it has not been connected well, connect it or change the cable.
3. Check the magnet of front roller has been fallen down or not.
 - ◆ If it has fallen down, re-install it.
4. Replace the PCB.
5. Replace the MCB.
6. Re-install the sensor.
7. Check the power voltage by using voltage-meter to see if it is within 120V+15% or 230V+15%.
 - ◆ **If the power voltage isn't within the range, look for a qualified electrician for help**

Treadmill will not start

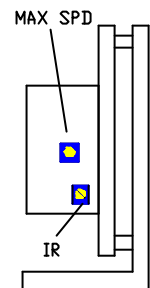
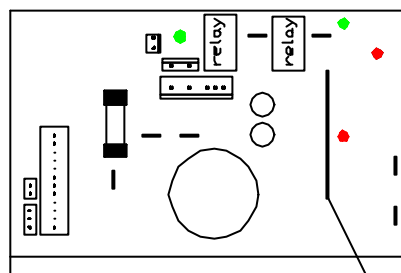
Possible causes:

1. Max SPD button has not been adjusted properly.
2. Console cable or PCB is damaged.
3. MCB is damaged.
4. Transformer (7-pin) is damaged.
5. Motor is damaged.

Fix:

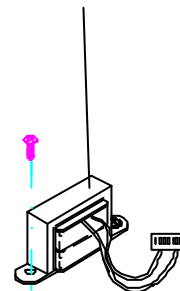
Open motor cover, verify wire connection **M+** and **M-** (motor wire) and transformer (7-pin) on the MCB then plug in the power cord and turn on the power switch. Then press “POWER, START, FAST“ buttons.

1. Adjust the “SPD” until the motor start to run.
2. Verify the LED indicator of **LED4** is lit. If that **LED4** is not lit, replace console cable or PCB.
3. Replace MCB
4. Replace transformer (7-pin).
5. Replace Motor.



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Transformer





Treadmill will start to run by itself

Possible causes:

1. The console cable is broken.
2. PCB is out of order.
3. MCB is out of order.

Fix:

1. Replace the console cable with a new one.
2. Replace the PCB.
3. Replace the MCB.

Treadmill will stop by itself

Possible cause:

1. Poor interconnection.
2. ESD.
3. PCB (especially true when stop in the scanning mode).
4. Low magnetism of the safety switch.
5. Bad motor

Fix:

1. Verify the interconnection between wires.
2. Advise JMI.
3. Replace the PCB.
4. Replace the safety switch.
5. Replace the motor

Running speed is not stable

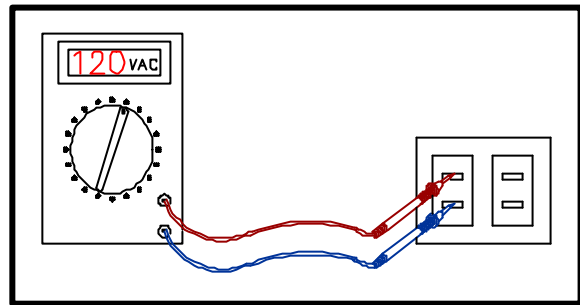
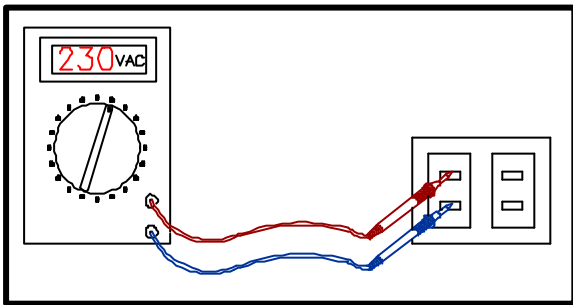
Possible causes:

1. AC power voltage is too low.
2. Tension of drive belt or running belt is too loose. Poor adjustment of MCB.
3. MCB is damaged.
4. Motor is damaged.
5. Poor lubrication between the deck and the belt

Fix:

1. Check the power voltage by using voltage-meter to see if it is within 120V+15% or 230V+15%.

◆ If the power voltage isn't within the range, look for a qualified electrician for help.



2. Open the motor cover, if the belt has stretched and is slipping across the rollers when running.

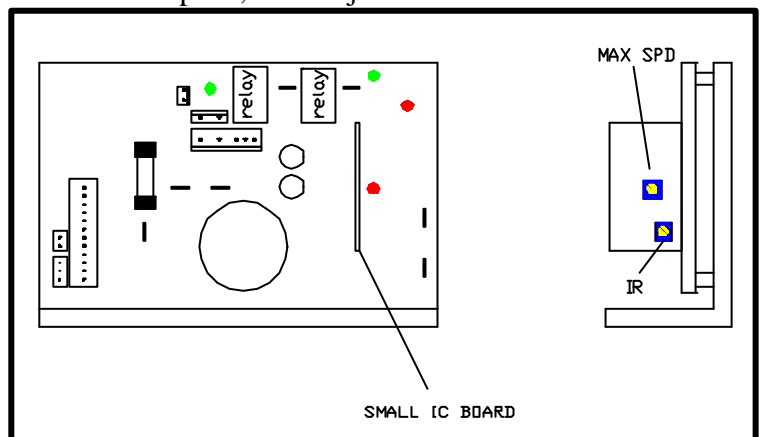
◆ Adjust the belt tension.

3. Remove the motor cover and run the machine at low speed, then adjust the IR COMP and MAX SPD on MCB.

◆ If it hasn't been improved, replace new MCB.

4. Replace new motor.

5. Relubrication.





Treadmill Changes the Speed by Itself

Possible causes:

1. Keypad is damaged.
2. PCB is damaged.

Fix:

1. Remove the keypad and verify it is stuck.
- ◆ **If it is stuck, replace with a new keypad.**
2. If speed is changes by itself, replace the PCB with a new one.

Incline function does not work

Possible causes:

1. Console cable is damaged.
2. Incline motor is damaged.
3. PCB is damaged.
4. MCB is damaged.

Fix:

1. Use a new console cable to connect PCB and MCB. Then press "FAST" and "SLOW" key to see if the incline motor will be activated.
OR
2. Replace the incline motor.
OR
3. Replace PCB.
OR
4. Replace MCB.



Treadmill will incline up or down by itself

Passable causes:

1. The console cable is damaged.
2. MCB is damaged.
3. PCB is damaged.
4. Incline motor is damaged

.

Fix:

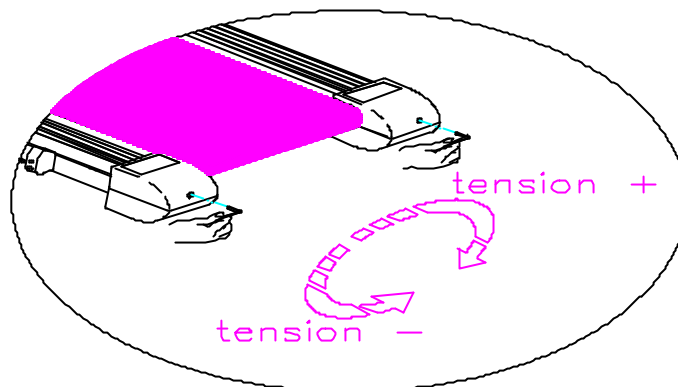
1. Use a new console cable to connect PCB to MCB. Then turn power on, press "UP" and "DOWN" key to see if the incline motor will be OK. **(If the treadmill still works by itself go to next step)**
2. MCB is damaged.
 - 2.1 Check if relay parts (REL1, REL2) failed with a multimeter to measure the resistance of REL1 and REL2.
 - ◆ Replace REL1 & REL2 if either failed.
 - 2.2 Replace MCB.
3. **OR:** Replace PCB.

OR: Replace incline motor.

Noises generated under motor cover

Possible causes:

1. The running belt tension is adjusted too tight.
2. The bearing of front roller is not installed correctly.
3. Dirty grooves of drive belt.
4. The motor is damaged.



Fix:

1. Adjust the belt tension so that the belt does not start slipping and then check if the noise has disappeared.
 - ◆ **Let the treadmill run, without using it, for at least 5 days because sometimes the bearing will settle and become quiet then check if the noise has disappeared.**
2. Replace the front roller with a new one to see if the noise disappear.
3. Remove drive-belt and check the grooves in belt for dirt or dust and clean if necessary. Clean also the motor pulley and the roller pulley groove and check if the noise has disappeared.
4. The motor bearing is damaged.
 - (Refer to "motor bearings replacement procedure")
 - ◆ Replace the motor.



SECTION 7
PARTS REPLACEMENT

Running belt/deck replacement procedure (1/2)

Tools required:

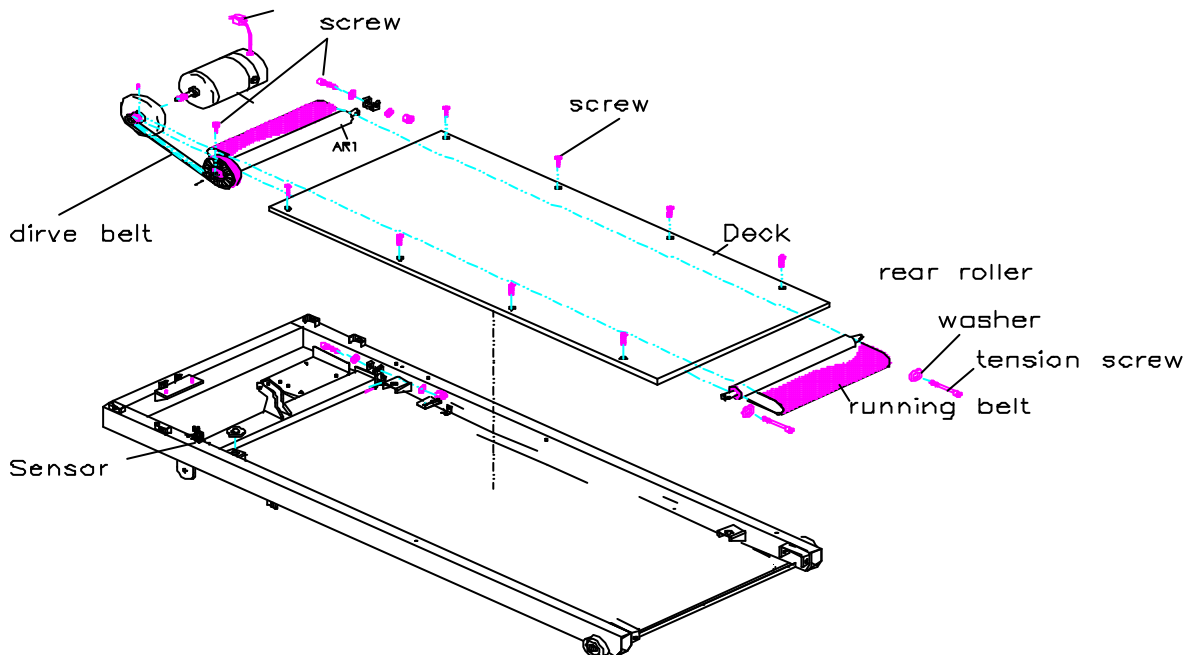
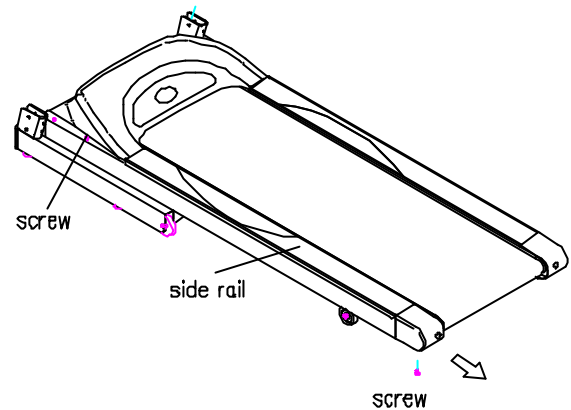
- *Philips screwdriver*
- *T-handle key (6mm,8mm,5mm)*

Symptoms with which running belt needs to be replaced:

1. Circuit breaker tripping due to reasons other than parts being short-circuited.
2. Edges of the running belt being frayed.
3. Seam is separated

Procedure:

1. Fold up the frame about 45 degree, then with the screwdriver removes the motor cover. Put down the frame.
2. With the philips screwdriver remove the end caps. Then put out the two side rails.
3. With the hex key(8mm) remove the rear roller
(IF replacing the deck go to step 8)





Running belt/deck replacement procedure (2/2)

4. With the philips screwdriver remove the speed sensor. Release the drive belt.
5. With the hex key (6mm) remove the front roller.
6. Loosen the screws that hold the deck to frame and remove the running belt and deck. Replace the deck and running belt with a new one.
7. Tighten the deck screws and assemble the rear roller first, then assemble the front roller and drive belt, then adjust the drive belt tension between 60 and 70 lbs.*(go to step 9)*
8. Replace the deck with a new one. Tighten the deck screws and assemble the rear roller
9. Adjust the running belt tension screws to center the running belt at high speed.
10. Try to step on the belt at low speed to check if the belt slips.
11. Install the sensor, side rails and all the covers



Roller Replacement

Tools required:

- Philips screwdriver
- T-handle key (6mm)

Procedure:

Front roller

1. Fold up the frame about 45 degree, then with the screwdriver removes the motor cover. Put down the frame
2. With the philips screwdriver remove the speed sensor. Release the drive belt.
3. Loosen the tension screws of rear roller.
4. With the hex key (6mm) remove the front roller
5. Assemble the front roller and assemble the drive belt, then adjust the drive belt tension between 60 and 70 lbs.
6. Tighten the belt tension screw from both the front and rear rollers
7. Adjust the belt tension screw to center the running belt at high speed (about 6 km/hr)
8. Try to step on the belt at low speed to check if the belt slips.
9. Install the motor cover.

Rear roller

1. With the hex key (8mm) loosen the tension screws of rear roller, then remove the rear roller.
 2. Replace it with a new one.
 3. Adjust the belt tension screw to center the running belt at high speed (about 6 km/hr)
 4. Try to step on the belt at low speed to check if the belt slips.
- flywheel clockwise by using your left hand and place the drive belt onto grooves of

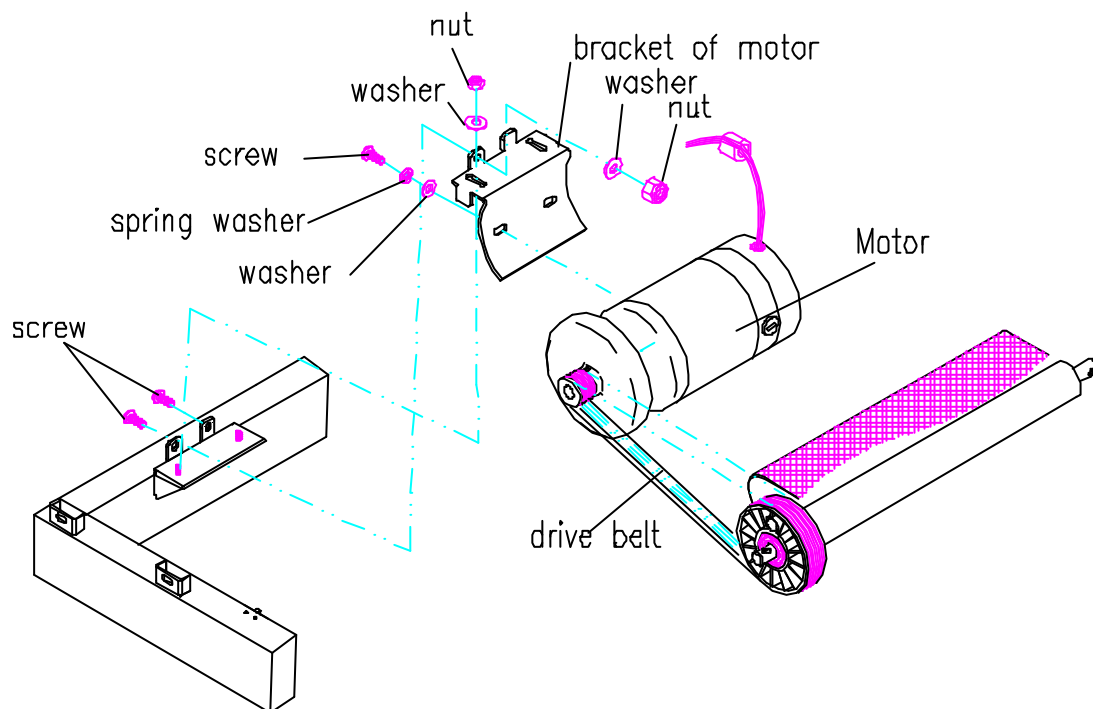
Motor Replacement

Tools required:

- Philips screwdriver
- T-handle wrench (14mm)
- Open end Wrench (13mm)
- Hex key (6mm)

Procedure:

1. Fold up the frame about 45 degree, then with the screwdriver removes the motor cover. Put down the fame.
2. Loosen the drive belt.
3. Unplug the wire of the motor.
4. Remove the tension screws of drive belt.
5. Remove the screws holding the motor to the frame. Then replace the motor with a new one.
6. Reverse the step 1-5 to install the parts.



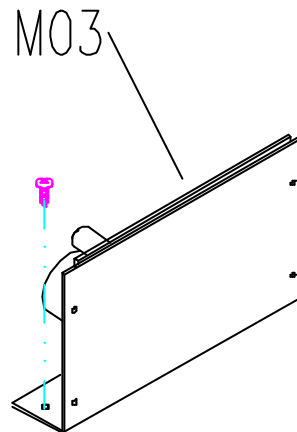
MCB Replacement

Tools required:

- Philips screwdriver

Procedure:

1. Unplug the power cord.
2. Fold up the frame about 45 degree, then with the screwdriver removes the motor cover. Put down the frame.
3. Unplug the all wires and cables connecting to the MCB.
4. With the screwdriver removes the MCB.
5. Replace it with a new one. Then reconnect all the wires and cables to the MCB by referring to wiring diagram.
6. Re-plug the power cord, and turn power on, then enter to inspect mode.
7. Press “start” key, then adjust the “SPD” button on the MCB, until the motor start
8. Turn power off.
9. Install the motor cover



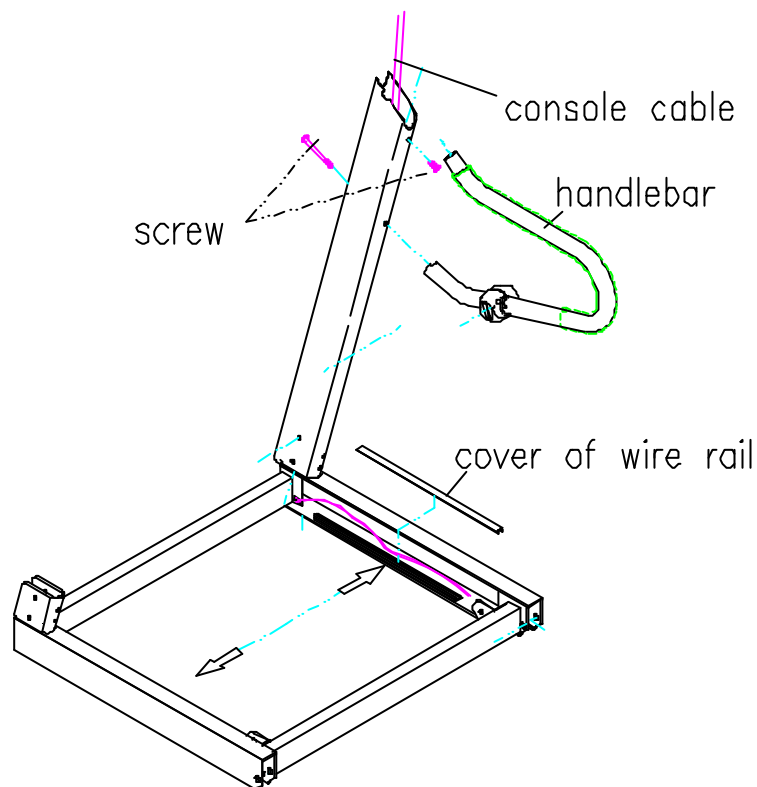
Console Cable Replacement

Tools required:

- Philips screwdriver

Procedure:

1. Remove the motor cover by using the screwdriver.
2. Use the screwdriver to remove the console covers and unplug the console control cable from the connectors.
3. Fold up the deck and remove the cover of wiring rail
4. Remove the screws holding the right handlebar to the support and remove the handlebar.
5. Remove the snap bushing. Tie the new console control cable to the old one with a solid string at the rear end.
6. Pull the old cable continuously until the new cable comes out of the right support.
7. Install the right support and tighten the screws.
8. Reconnect the console cable and install the cover of wire rail.
9. Install all covers.



Incline Motor Replacement

Tools required:

- Philips screwdriver
- Wrench (17mm)*2

Procedure:

1. At first, press “**START**” key, then press “**UP**” key until the deck raises to max incline.
2. Fold up the frame about 45 degree, then with the screwdriver removes the motor cover. Then Fold up and engage the treadmill by using the deck- locking knob
3. Remove the motor lower cover. Then put down the frame and press “**START**” key, until the deck lowers to min incline.
4. Disconnect the incline motor wires.
5. With the wrench (17mm) remove the incline motor.
6. Replace it with a new one. And reconnect all the wires of incline motor.
- ◆ Check if the position of tube of incline motor is same as figure1. If it is not, connect the incline motor wire to MCB, and turn power on and enter to the inspecting mode, then press “**DOWN**” or “**UP**” key to adjust it reaches exactly position.
7. Reverse step 1-5 to install the parts

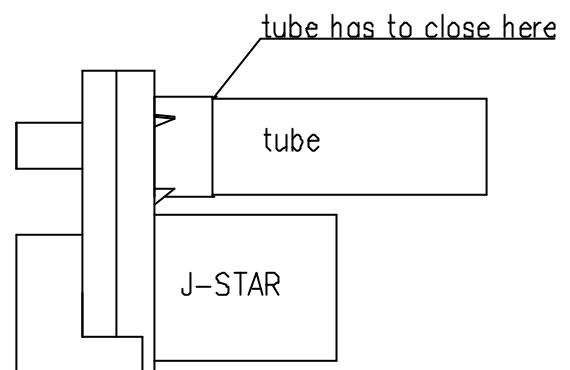
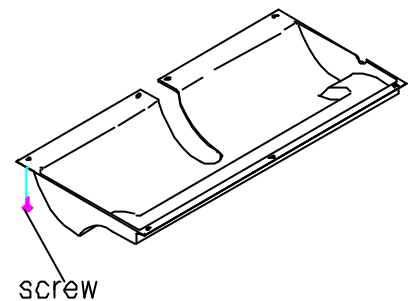


Fig 1

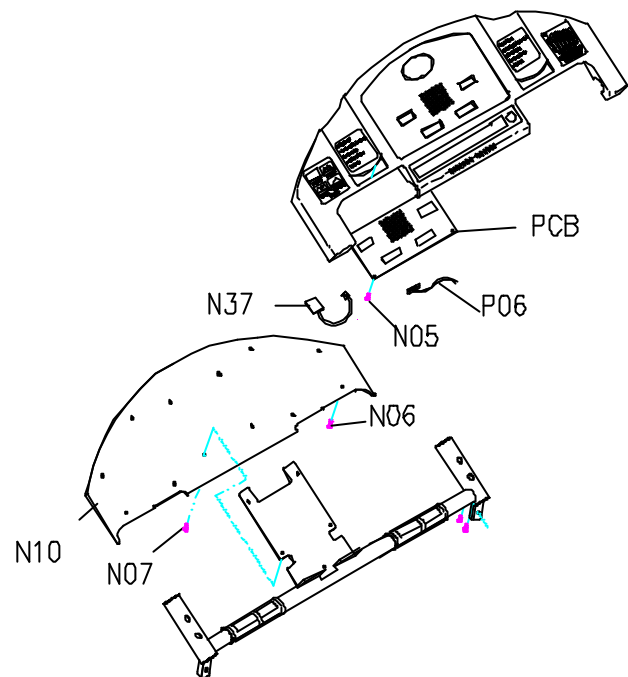
PCB Replacement

Tools required:

Philips screwdriver

Procedure:

1. Use the screwdriver to loosen the screws (N07 and N06) from console bottom cover. then remove the bottom cover
2. Unplug all the cables connecting to the PCB (P08).
3. With the screwdriver loosen the screws (N05) then remove the PCB.
4. Replace the PCB with a new one.
5. Reconnect cables.
6. Install the console bottom cover and tighten all screws.



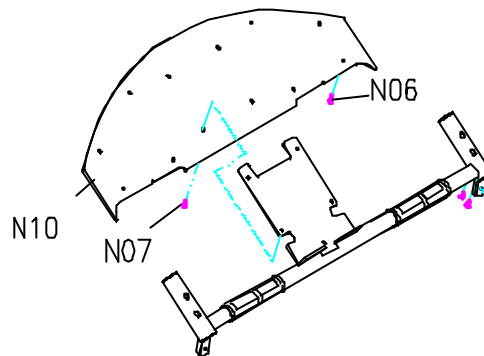
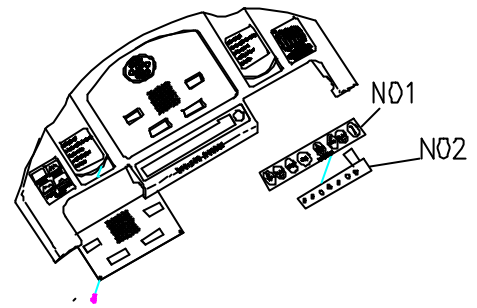
Keypad Replacement

Tools required:

Philips screwdriver

Procedure:

1. Remove screws (N06 and N07) from the console bottom cover.
2. Disconnect the plug of the keypad (N02) from the PCB.
3. Remove the overlay (N01) and the tape residue on the console thoroughly
4. Replace the keypad and plug the new keypad with the PCB.
5. Install the console bottom cover and tighten the screws.
6. Tear off about 2 cm-wide of the protective paper on the backside of the overlay, align the overlay to the top of the console, press the overlay firmly on the portion with no paper on the backside then tear the remaining paper slowly. Press the overlay down to the console simultaneously.



Air Shock Replacement

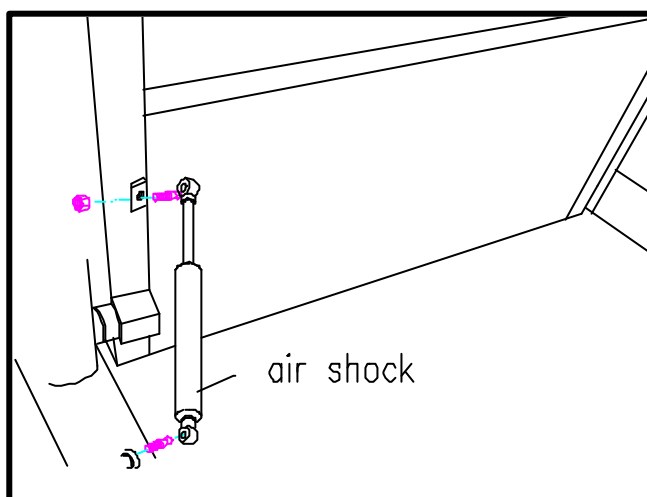
Tools required:

Wrench (13mm)

Procedure:

1. Fold up and engage the treadmill by using the deck- locking knob.
2. Use wrench (13mm) to loosen screws holding air shock to the frame, and remove the air shock.
3. Replace with a new air shock.
4. Add some lubricating oil on the shaft of the air shock.

Lift the frame up and down, repeating this several times to allow the lubricating oil blend into air shock.



Motor Bearings & Carbon Brush Replacement

Tools required:

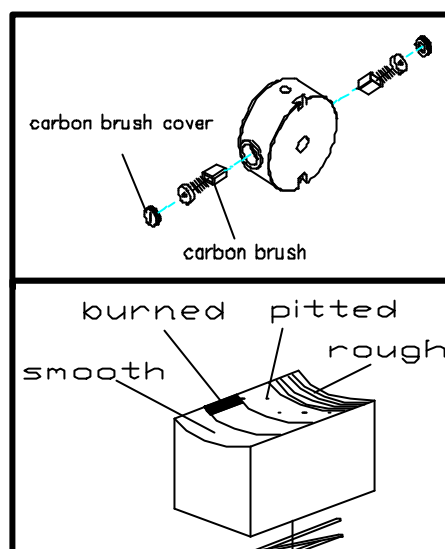
- Nutdriver (10mm)
- Bearing puller
- Wooden-hammer
- Coin

Procedure:

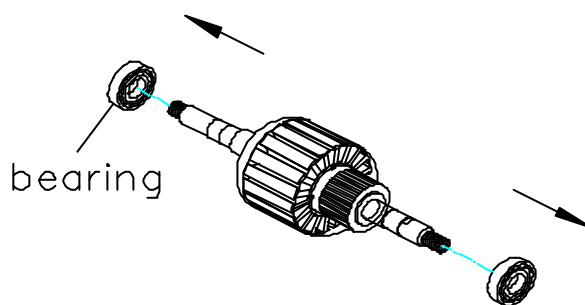
1. Remove the screws of carbon brush cover and the carbon brushes with the coin.
2. Check the surface of carbon brush if smooth.
- ◆ **If the surface of carbon brush is pitted, rough or with burn marks replace the carbon brush.**
(If replacing the carbon brush, go to step 10.)
3. Prior to disassembling the end caps, you must make a mark on the end cap.
4. Use the nutdriver (10mm) to remove bolts holding end caps to the main enclosure of the motor.
5. Tap the shaft carefully with a wooden hammer to remove the end caps.
6. Remove the bearings of both sides by using the bearing puller.
7. Install the new bearings to the shaft by using the wooden hammer
8. Put on the two end caps and use the nutdriver(5/16inch) to lock the caps to the main enclosure.
9. Install the carbon brush and the carbon brush cover.

(The end of the procedure.)

10. Replace the carbon brush with a new one.
11. Install the carbon brush and the carbon brush cover.
12. Turn the power on, let the treadmill run for about 1 hour at 3.0kph to allow the proper seating of the brush.



the



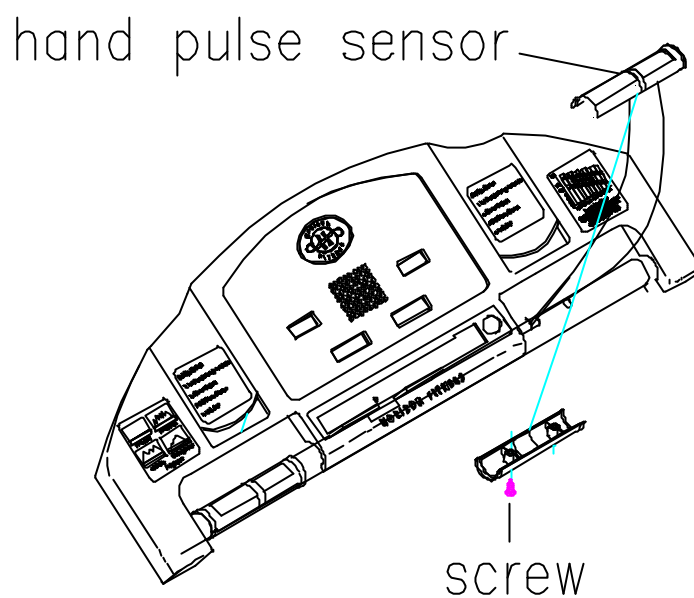
Hand Pulse Set Replacement

Tools required:

- Philips screwdriver

Procedure:

1. Open the lower cover of console, then disconnect the wires of hand pulse sensor set.
2. With the philips screwdriver remove the screws of hand pulse sensor set.
3. Replace it with a new one.
4. Install the parts





SECTION 8
SERVICE FORM



Field Failure Report

Name of Distributor : Report #

Warranty () Yes () No Failure () Intermittent
() Persistent

Product : Serial number:

Failure Symptom : (Pls refer to the service manual for the symptom of failure.)

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.....
.....

Cause of Failure :

.....
.....
.....

Parts Replaced* :

Suggestions to prevent Failure :

.....

.....

.....

* When parts needed please fill out a ~~Parts Order Form~~ as detailed as possible.

Date : **Place :** **Prepared By :** **Company Stamp :**

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