

# **ERROR CODES:**

**ERROR 1:** SPEED SIGNAL ERROR – CHECK MOTOR OPERATION AND OPTIC SENSOR

**ERROR 2:** COMMUNICATION ERROR – CHECK CONNECTION BETWEEN DISPLAY AND DRIVE BOARD

**ERROR 3:** SPEED SIGNAL ERROR: DISPLAY AND OPTIC SENSOR SPEEDS DO NOT MATCH

**ERROR 5:** POWER SUPPLY ERROR – CHECK POWER SUPPLY

**ERROR 6:** INCLINE ERROR – CHECK INCLINE OPERATION AND CALIBRATION

**ERROR 7:** VR MOTOR ERROR – VR MOTOR HAS EXCEEDED SET LIMIT RANGE

**ERROR 8:** DISPLAY ERROR – IC COMMUNICATION ISSUE

**ERROR 9:** MAINTENANCE ERROR – MAINTENANCE REQUIRED (LUBE & CLEAN)

**ERROR 10:** SPEED SIGNAL ERROR – OPTIC SENSOR SPEED IS TOO HIGH

**ERROR 11:** MOTOR ERROR – DISPLAY AND DRIVE MOTOR DIRECTIONS DIFFER

**ERROR 12:** HTR ERROR – HTR SIGNAL IS TOO WEAK TO PICK UP

# **ADDITIONAL ERROR CODES:**

**ERROR 1-1:** AC SERVO ERROR – AC SERVO MOTOR ENCODER HAS FAILED

**ERROR 1-2:** AC SERVO ERROR – MOTOR IS OVERHEATING (SPEED RESTRICTED TO HALF)

**ERROR 1-3:** AC SERVO ERROR – MOTOR SUDDENLY ACCELERATED (RESTART UNIT)

**ERROR 2-1:** IGBT ERROR – IGBT CURRENT IS TOO HIGH. REPLACE DRIVE BOARD (IC CHIP FOR MED)

**ERROR 2-2:** IGBT ERROR – REPLACE DRIVE BOARD

**ERROR 3-1:** ELEVATION ERROR - CHECK INCLINE OPERATION AND CALIBRATION

**ERROR 4-1:** POWER SUPPLY ERROR – POWER SWITCH IS OFF

**ERROR 4-2:** POWER SUPPLY ERROR – POWER SUPPLY VOLTAGE IS TOO LOW (RESTART UNIT)

**ERROR 4-3:** POWER SUPPLY ERROR – POWER SUPPLY VOLTAGE IS TOO HIGH (RESTART UNIT)

**ERROR 8-1:** COMMUNICATION ERROR – CHECK CONNECTION BETWEEN DISPLAY AND DRIVE BOARD. REPLACE DRIVE BOARD

**ERROR 8-2:** COMMUNICATION ERROR - CHECK CONNECTION BETWEEN DISPLAY AND DRIVE BOARD. REPLACE DRIVE BOARD

**SERVICE NEEDED: APPLY LUBE:** MILEAGE COUNTERS – LUBE MACHINE WITH 25-50CC OF LUBE TO CLEAR MESSAGE – RESTART UNIT, HOLD INCLINE UP&DOWN + 0 KEY FOR 3 SECONDS

**SERVICE REQUIRED: SHUTTING DOWN:** AMP-DRAW/OVERHEATING ERROR – CHECK ALL AMP-DRAW RELATED COMPONENTS, ALLOW MOTOR TO COOL DOWN OR APPLY JUMPER WIRE/REPLACE MOTOR

# Error Codes in General

Error codes alert users to product malfunctions or abnormal operation. They are an aid to troubleshooting.

If you looked at a history of error codes, you would note one trend – to have fewer error codes. In new products, there are two main error codes:

- ERR1 – a speed system error in treadmills.
- ERR7 – a VR error in treadmills, bikes, and elliptical trainers.

While SportsArt error codes are usually consistent – an ERR7, for instance, always indicates a VR issue, regardless of the unit being a treadmill, bike, or elliptical trainer – not all models have the same error codes. The list below shows error codes listed by category: treadmills, bikes, elliptical trainers.

Treadmill Model	Error Codes	Codes Removed, Date
1096N / 1098N	1, 3, 6, 7	
1190	1, 3, 6, 7, 10	
1210	1, 3, 7, 10	
1200 / 1250 / 1260	1, 3, 6, 7, 10	
1200N	1, 3, 6, 7, 10	
3007	1, 2, 3, 5, 6, 7	
3100 / 3120 / 3150	1, 3, 6, 7, 10	
3106 / 3108 / 3110	1, 3, 7, 12	
3200	1, 3, 6, 7, 8, 10	Cancel 6, 8, 9 - 04-20-00
3250	1, 3, 6, 7, 8, 9, 10	Cancel 6, 8, 9 - 04-20-00
6005	1, 2, 3, 5, 6, 7, 8, 9	Cancel 6, 9 - 05-04-01
6100	1, 3, 6, 7, 8, 10	Cancel 8, 9 - 04-30-00
6150 & E versions	1, 3, 6, 7, 8, 9, 10	Cancel 8, 9 - 04-30-00
6200	1, 3, 6, 7, 10, 11	
6300/6310/6320	1, 3, 7, Service	
TR32/TR33	1, 3, 7, Service Required	

Bike Model	Error Codes	Notes
506P/508P	7	Indicates resistance VR error; replace VR
C51U/C51R	7	Indicates resistance VR error; replace VR
C52U/C52R	Pedal to Start	Indicates no reed switch signal
C53U/C53R	Pedal to Start	Indicates no reed switch signal

Elliptical Model	Error Codes	Codes Removed, Date
803P	7	Cancel 6 - 07-02-01
805P	6, 7	Cancel 6 - 07-02-01
807P	7	
E82/E820	7	
8300/E8300	7, 12, SERVICE BATTERY	
XT20/XT10	SERVICE BATTERY	

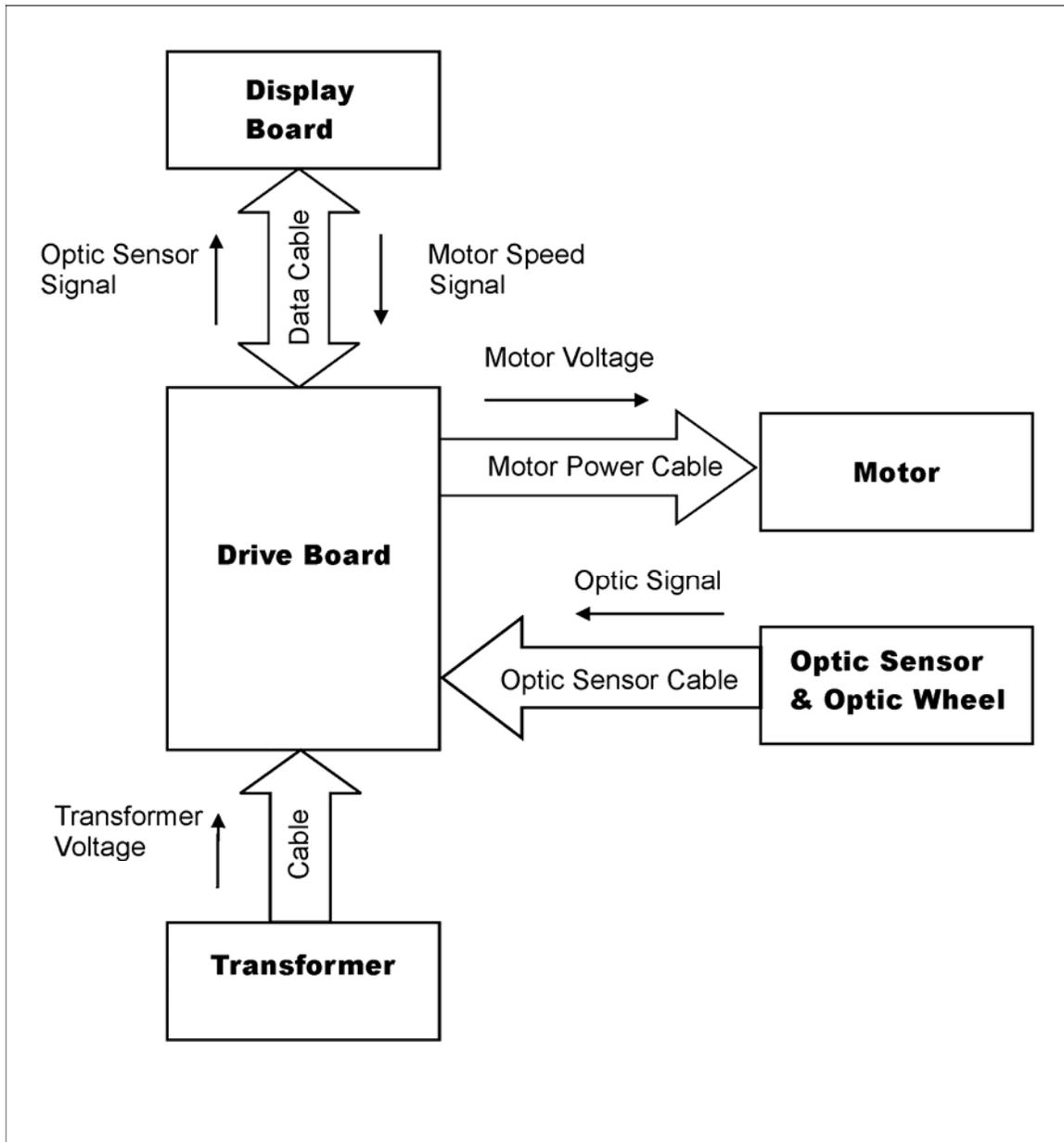
## **Treadmill Error Codes**

Like all error codes, error codes in treadmills alert the user to component malfunctions or inappropriate operation.

In the following, a visual representation of an error code is presented for main error codes, followed by an explanation of the error code definition. Troubleshooting steps are broken down according to the symptom. One symptom can lead the technician to inspect one group of components, while another symptom may lead the technician toward another item. Carry out steps in the order presented. For safety, turn off and unplug the machine while swapping components. After completing one step, turn on the unit. Check it. If the issue hasn't been resolved, proceed to the next step.

Some of the instructions in the following apply mainly to older units. "Old" refers to any treadmill made before the 3106/3108/3110 series. 3106/3108/3110 and 6300/6310/6320 are considered new. Instructions that may not apply to new units are marked with the \*.

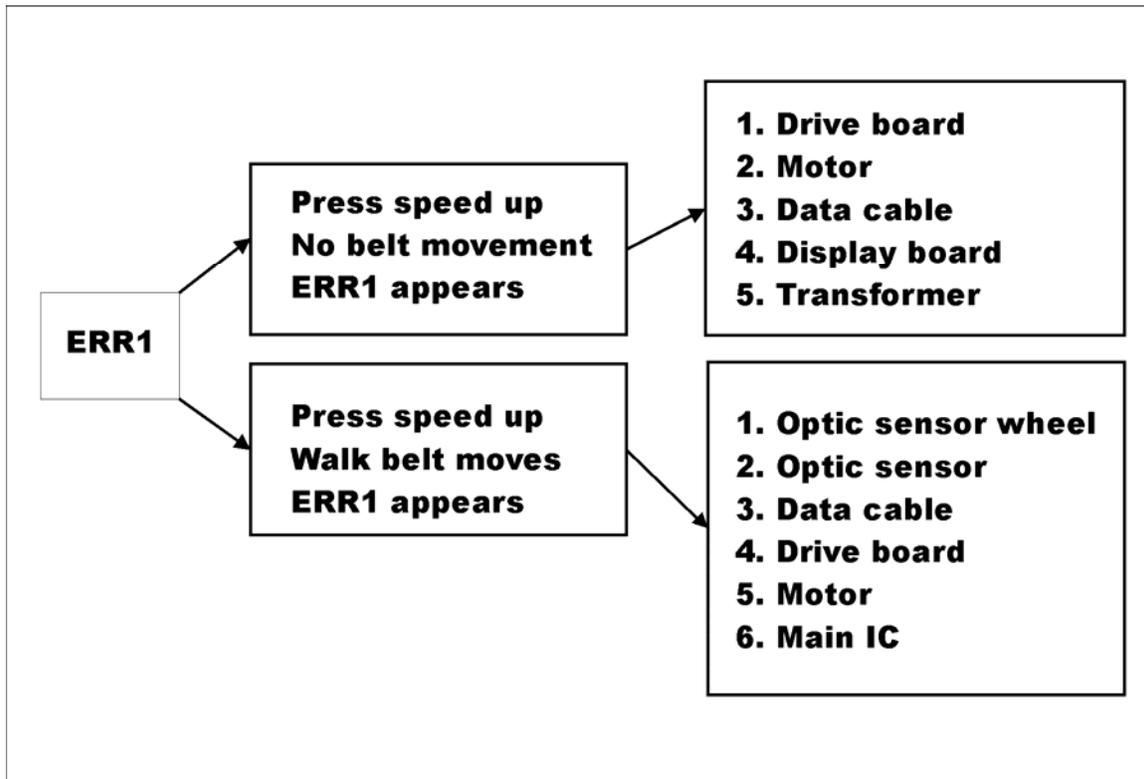
# ERROR 1



**Definition:** The main IC (also called the CPU) on the display board did not receive the optic sensor signal.

**Explanation:** After processing by the drive board, the optic sensor signal travels the data cable to the display board CPU, which determines motor speed. Components involved include the optic sensor, optic sensor wheel, data cable, drive board, display board, and connections.

# ERR1 Diagnostics



**ERR1 Condition 1:** Press speed key; walk belt doesn't move; ERR1 appears.

## 1. Drive Board

- a) Inspect drive board components for signs of damage, like bulging, burnt or cracked spots.
- b) Inspect connections to the drive board, including the data cable (at the display and drive boards), drive motor, incline motor, etc. Loose connections are a common cause of ERR1.
- c) Check the drive board LED indicators. Turn on the unit. The power LED should be lit. The EMG indicator should light up and then extinguish after the unit powers up.\* A lingering EMG light indicates drive circuit trouble, but it can also light up if drive board connections to motors and other components aren't secure.
- d) Test whether the drive board is sending power to the motor. Put the voltmeter to the DC setting. Disconnect the motor M+M- wires from the drive board. Place probes on the drive board M+ M- terminals. Put the treadmill safety key in place; turn on the power; walk on the treadmill so that the CLK LED lights (this preempts the display from detecting no optic sensor signaling and immediately showing an ERR1 message. It allows you to get a power reading\*); press the speed up key. The meter should show some voltage. If there's no voltage, inspect the data cable and display board. If they appear OK, suspect the drive board.
- e) Test drive board components for a short. Or replace the drive board.

## **2. Data Cable**

a) Check the data cable and its connections. Link a spare cable from the drive board to the display board, outside the unit. Test the unit. If it works with the spare cable, replace the original cable.

b) Or, if you don't have a spare data cable, test data cable continuity. Wrap solder wire around each probe so you can insert probes into the data cable connector, testing one wire at a time for continuity.

## **3. Display Board**

a) Press down on the display board ICs. If you have a working unit of the same kind, swap the display board onto this unit. Test. If all works well and no ERR message appears, replace the original display board.

a) Reed switch (Applies to models with magnetic safety keys.\*)

Put the safety key in place over the reed switch. Put the meter to the 200 Ohm setting. Place probes on both ends of the reed switch. Meter should show 0 Ohm. If the meter doesn't get a reading, replace the reed switch.

## **4. Treadmill Motor**

a) Rotate the motor. It should rotate smoothly. Grinding or sticking indicates wear.

b) Check the motor brushes. Uneven wear indicates worn brushes. Minimum brush length: 1/2 inch. Turn the brushes around and reinsert them. Rotate the flywheel. If the motor grinds or sticks, put brushes back in their original position.

c) Check motor resistance: Turn off unit. Disconnect the motor M+ M- cables from the drive board. Put voltmeter setting to Ohms. Place probes into the motor wire M+ M- ends. Normal reading: 1 Ohm. Move the flywheel slightly and take another reading. Take a few readings, moving the flywheel slightly after each. Readings should be consistent. If the meter shows OL at any test point, replace the motor.

## **5. Transformer**

a) Put the meter to the AC setting. Place the meter probes on the transformer input wire connectors. Then test the output wire connectors. Turn on the unit. If there is input but no output, replace the transformer.

- 11XX/12XX brown-brown: 10.5VAC
- 31XX/32XX/61XX/62XX white-white: 12.5 VAC
- 6005 yellow-yellow: 11.0 VAC

If ERR1 is not resolved, see ERR1 with walk belt movement.

**ERR1 Condition 2:** Press speed key; walk belt moves; ERR1 appears.

## **1. Optic Sensor Wheel**

Make sure the optic sensor wheel:

a) Rotates in the middle of the optic sensor.

- b) Is clean and free of cobwebs and dust.
  - c) Doesn't have broken or bent teeth.
  - d) Is fastened securely on the motor bracket
- If the wheel has visible damage, replace it.

## **2. Optic Sensor**

Make sure that the optic sensor signal is getting to the drive board.

- a) With power on, turn the drive motor. The optic sensor LED, often marked CLK, on the drive board should light. This means that the optic sensor signal is reaching the drive board. If the optic sensor indicator doesn't light, replace the optic sensor.
- b) Push the treadmill belt while pushing speed up key. If ERR1 doesn't appear until you stop pushing the belt, and the display speed values increase, then the optic sensor is good.

(On units without a CLK indicator, check optic sensor input and output voltage. There should be five volt power supply to the optic sensor and varying voltage output when the motor is moving: (a) put probes on optic sensor output wires; (b) turn the motor; (c) if voltage doesn't vary with speed, replace the optic sensor.)

## **3. Data Cable**

- a) Check the data cable and its connections. Link a spare cable from the drive board to the display board, outside the unit. Test the unit. If it works with the spare cable, replace the original cable.
- b) Or, if you don't have a spare data cable, test cable continuity. Wrap solder wire around each probe so you can insert probes into the data cable connector, testing one wire at a time for continuity.

## **4. Drive Board**

Check whether drive board components are burnt or cracked. Check component connections. A drive board power component short usually results in a huge burst of power, making the walk belt speed dangerously, before ERR1 appears. If the walk belt moves before ERR1 appears, but not very, very fast, suspect the optic sensor.

## **5. Treadmill Motor**

- a) Rotate the motor. It should rotate smoothly. Grinding or sticking indicates wear.
- b) Check motor resistance. Turn off unit. Disconnect the motor M+ M- cables from the drive board. Put voltmeter setting to ohms. Place probes into the motor cable M+ M- ends. Normal reading: 1-2 ohm. If there's no reading (OL), replace the motor.
- c) Check the motor brushes. Uneven wear indicates worn brushes. Minimum brush length: 1/2 inch. Turn brushes around and reinsert them; rotate the flywheel by hand. If it rotates worse than before, put brushes back in their original position.

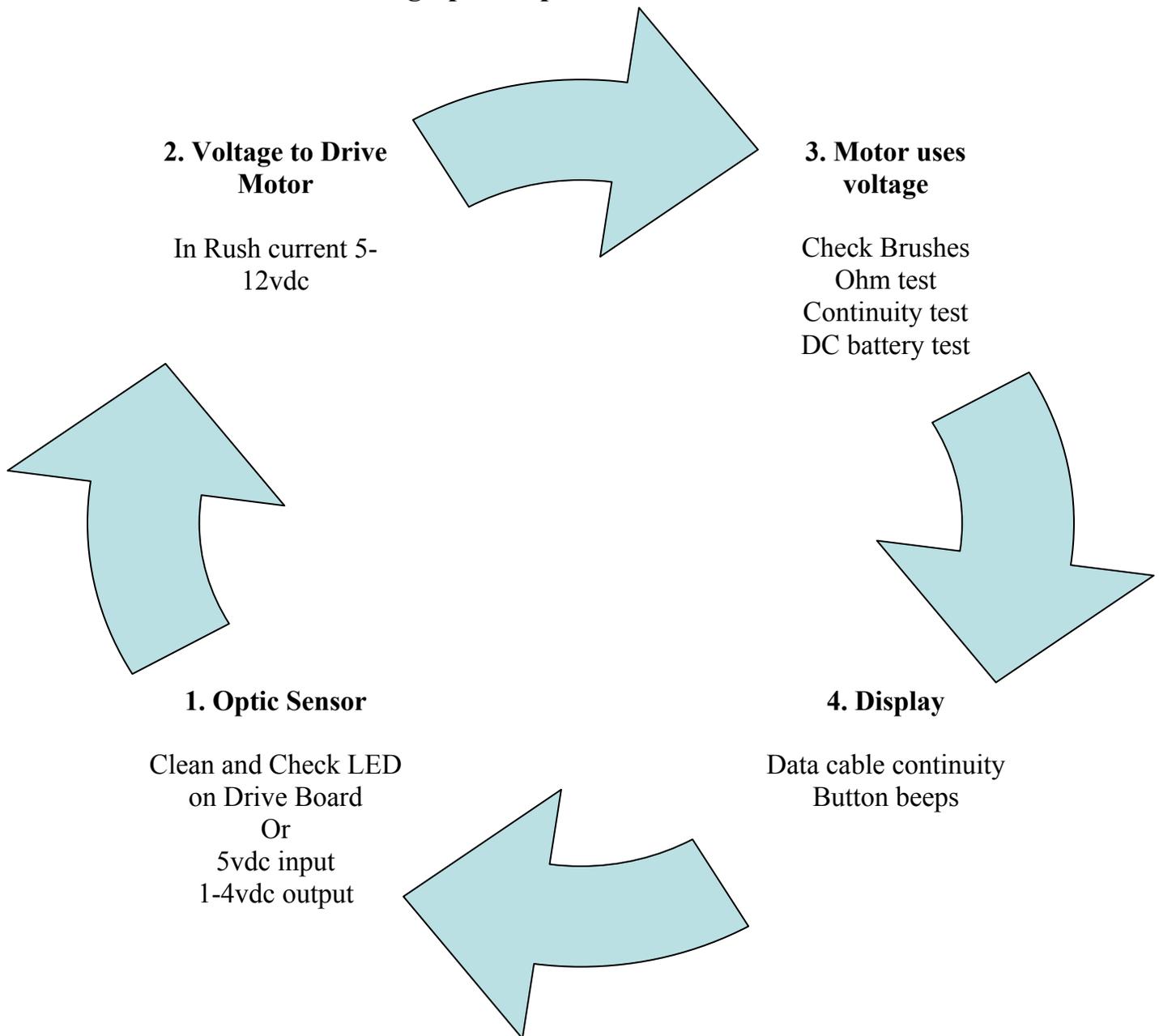
d) High amp draw can indicate a bad motor. Other factors would be a worn walk belt and deck. Run unit power through a current meter. Turn on the unit. Normal amp draw at 3 MPH with no load on the walk belt is 1/2 to 1 Amp.

### 6. Display Board ICs

Make sure that IC contacts on the display board are good. Press firmly on the ICs. Make sure you have the latest CPU version.

If ERR1 is not resolved, see ERR1 no walk belt movement.

### ERR 1 Troubleshooting tips and process



## ERROR 2\*

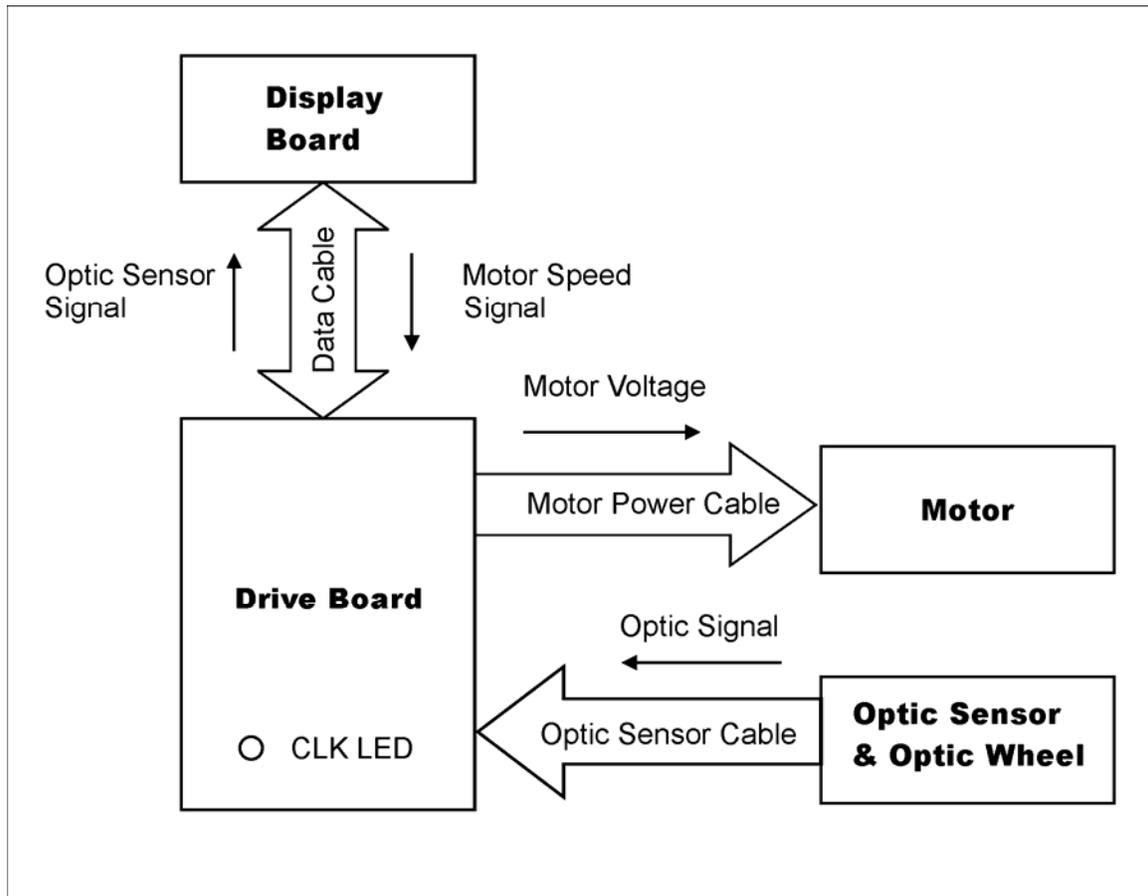
**Definition:** Base signal error -- The display board main IC didn't receive the base level signal from the drive board.

**Explanation:** The drive board sends a base level signal to the display board through the data cable.

**Condition:** Turn on power; ERR2 appears

**Diagnostics:** Inspect drive board IC PC814 and IC 40106 soldering. If loose, re-solder. Or replace drive board.

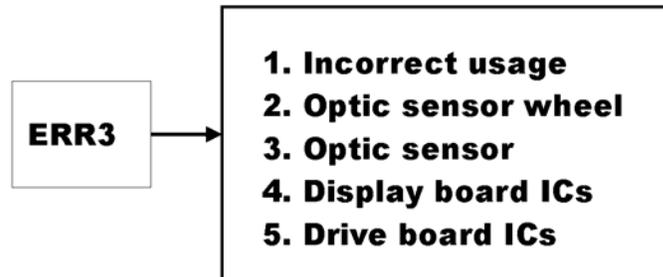
## ERROR 3



**Definition:** Speed signal error -- the speed signal from the optic sensor and the display speed setting differ.

**Explanation:** ERR3 appears when the optic sensor speed signal and the display board speed setting differ too much.

## ERROR 3 Diagnostics



**ERR3 Condition:** Unit operates; ERR3 appears.

### 1. Incorrect Usage

Make sure that the user is not pulling the belt faster than the speed setting. This happens most often when operated at high incline at a slow speed with a heavy user. As the user steps down, his or her weight pulls the belt faster. Stop pulling the belt. Turn off the unit, then turn it on again. ERR3 will disappear.

### 2. Optic Sensor Wheel

Make sure the optic sensor wheel:

- a) Rotates in the middle of the optic sensor.
- b) Is clean and free of cobwebs and dust.
- c) Doesn't have broken or bent teeth.
- d) Is fastened securely on the motor bracket

If the wheel has visible damage, replace it.

### 3. Optic Sensor

Make sure that the optic sensor signal is getting to the drive board.

- a) With power on, turn the drive motor flywheel. The optic sensor indicator LED, marked CLK on some units, should light. This means that the optic sensor signal is reaching the drive board. If the optic sensor indicator doesn't light, replace the optic sensor.

#### **4. Display Board ICs**

Make sure that IC contacts on the display board are good. Press firmly on the ICs. Re-solder if necessary.

#### **5. Drive Board ICs**

Make sure that IC contacts on the drive board are good. Press firmly on the ICs. Re-solder if necessary.

Note: ERROR 4 does not exist.

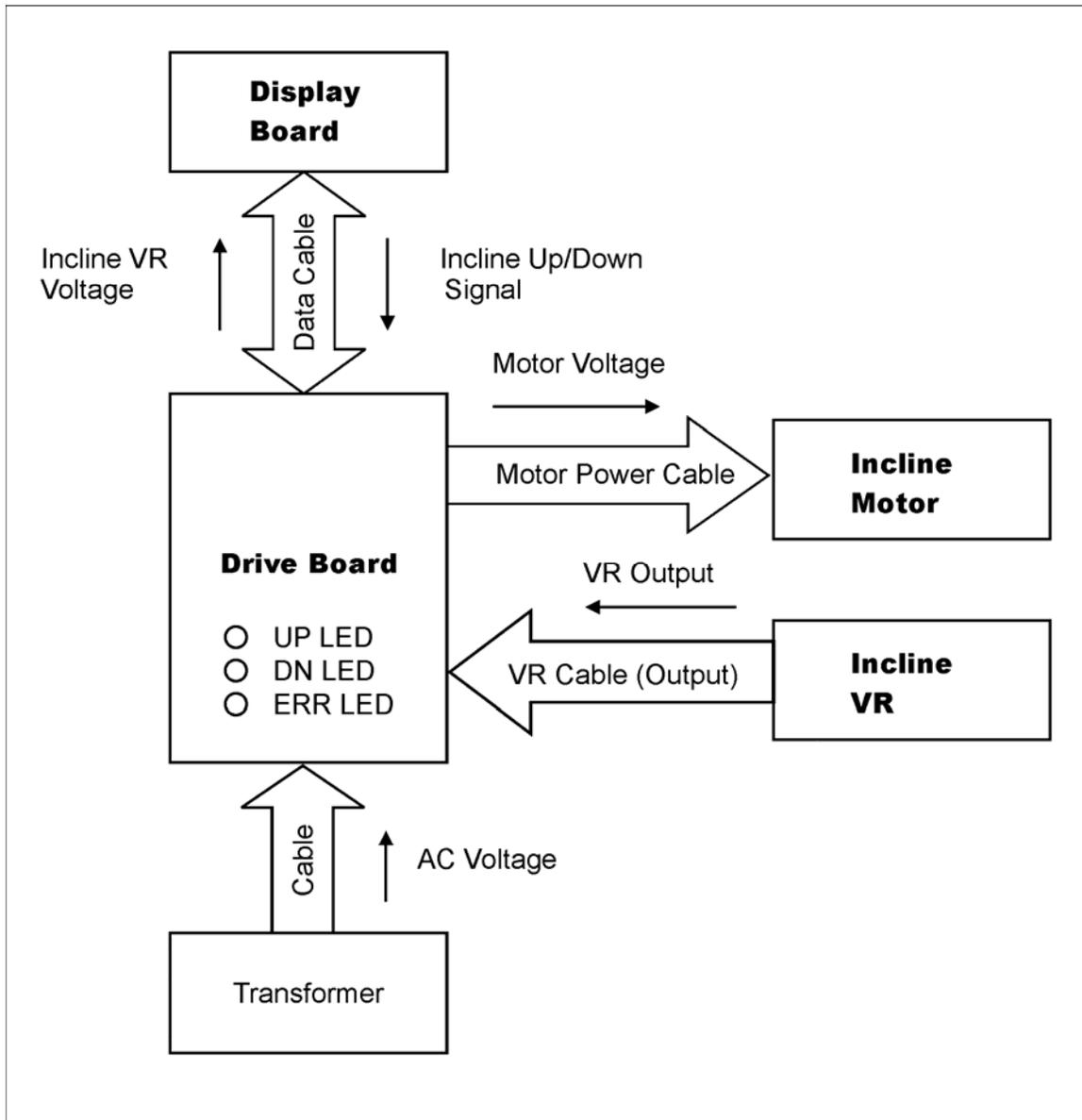
## **ERROR 5\***

**Definition:** Exterior power supply is irregular.

**Explanation:** Exterior power supply irregularity prevents the unit from operating properly; ERR5 appears.

**Diagnostics:** Turn unit power off and on. The treadmill should reset and ERR5 should disappear. Make sure the unit is on a dedicated, grounded circuit of the proper amperage. Avoid power strips, long or light extension cords. If problem persists, have an electrician inspect power supply and ground at the wall.

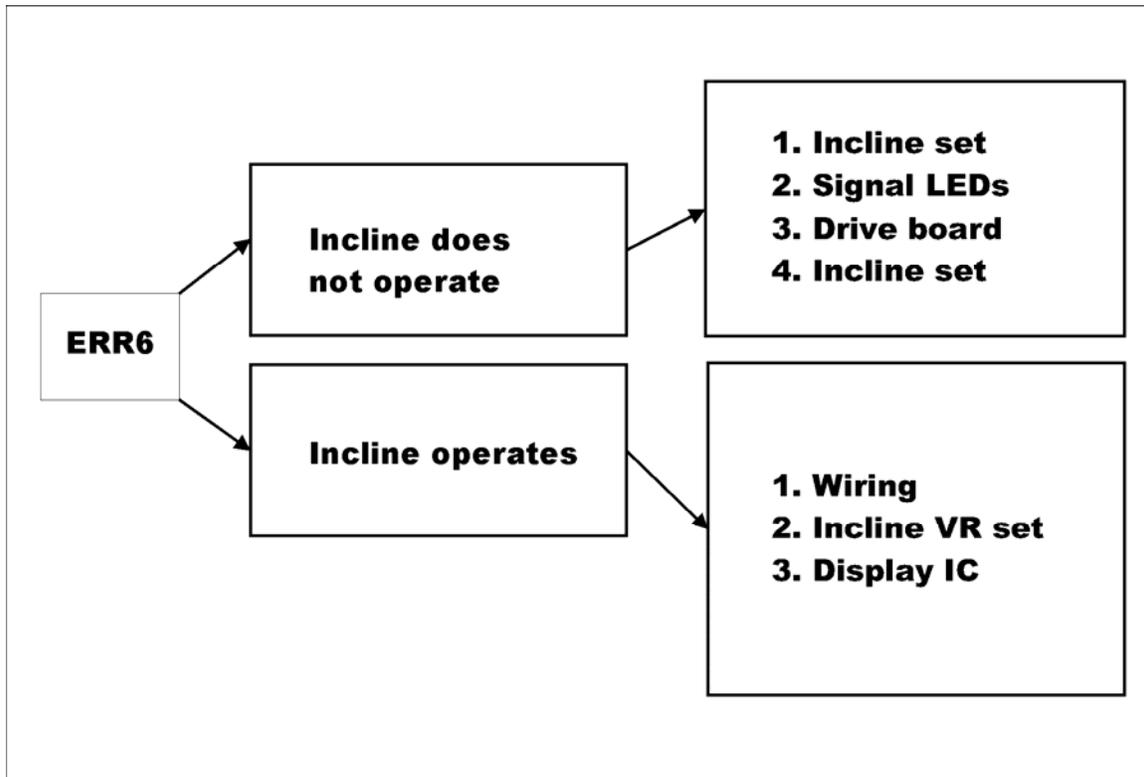
## ERROR 6\*



**Definition:** The incline system isn't responding to commands from the display.

**Explanation:** The display sends signals via the data cable to the drive board, and the drive board sends power to the incline motor. As the incline operates, the incline variable resistor (VR) moves, changing its voltage signal to the display. In ERR6, the display is sending commands to the incline but the VR signal indicates no response.

## ERROR 6\* Diagnostics



**ERR6 Condition 1:** Press incline UP or DN key; incline doesn't operate; ERR6 appears.

### 1. Incline Motor Set

- a) Inspect incline fuse. If broken, replace it. (Incline fuse locations differ: On old units, look by the main power fuse; On new units, look on the drive board.)
- b) Inspect incline motor set wire connections to the drive board.
- c) Inspect whether the incline motor makes noise after incline UP or DN is pressed. If motor engages, but the worm gear doesn't turn, inspect the nylon gears inside the incline set. (See **Incline Troubleshooting Manual** for details.) One of two nylon gears is apt to break. If broken, replace the gear and recalibrate the incline set, or replace the whole incline set.
- d) Inspect whether the incline set is physically stuck. If so, dislodge it. If not possible, replace the incline set.

### 2. Signal: LEDs

- a) Determine whether the incline signal arrives at the drive board. Press the UP or DN incline key. The drive board incline UP or DN LED should light. If it doesn't light, the signal hasn't arrived at the drive board. Inspect the data cable, connections, and display keypad. Also, press down on the display board CPU.

b) Inspect whether the Incline ERR LED on the drive board lights. Inspect whether the incline set mechanically exceeds range. If so, recalibrate the incline set. Refer to **Incline Calibration** in the **Incline Troubleshooting Manual**.

### **3. Drive Board**

a) Inspect power to the incline motor set. Clear ERR6 by turning off and on unit power once. Place voltmeter probes on the wires from the drive board to the incline motor. Press incline UP or DN key. If there is no voltage and incline UP or DN LED lights, the drive board isn't providing power to the incline motor. Replace the drive board.

b) (31XX, 32XX, 61XX, 62XX) Check incline relay on the drive board. Press Incline UP, then DN keys. The relay should click. If it doesn't click but the LED lights, the relay is not operating. Tap it. Try again. If it still doesn't work, replace the drive board.

**ERR6 Condition 2:** Press incline up or down key; incline operates; ERR6 appears.

### **1. Wiring**

a) Make sure that wires from the incline set to the drive board are connected securely. Make sure that the data cable from the drive board to the display board is connected securely and not damaged.

### **2. Incline Variable Resistor (VR) Set**

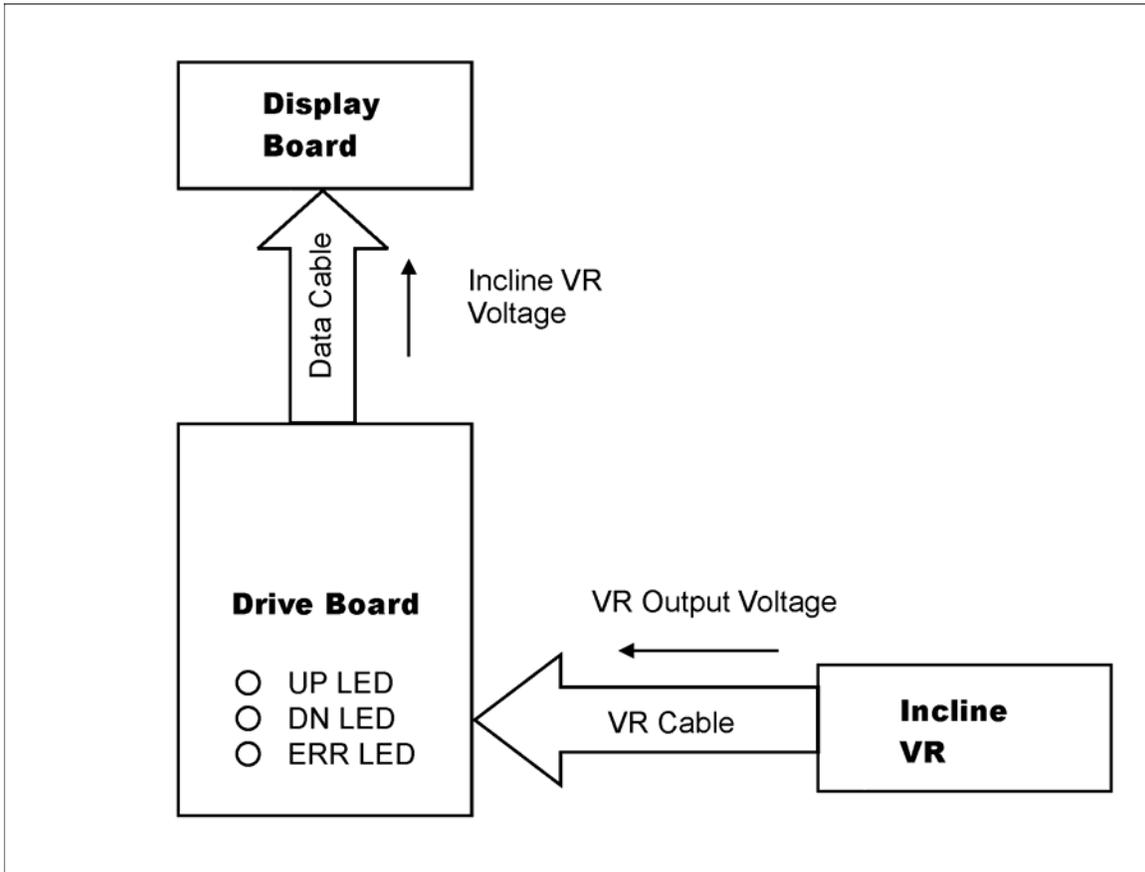
a) Inspect whether the incline ERR LED on the drive board lights. If the incline ERR LED lights, recalibrate the incline set. See **Incline Calibration** in the **Incline Troubleshooting Manual** for instructions.

b) Check the variable resistor (VR) output. Put voltmeter to the DC setting. Back probe on the incline VR blue and green wires. Press incline UP or DN key. While the motor operates, VR values should change, but remain within the prescribed range. See the **Incline Troubleshooting Manual** for incline range specifications. If VR voltage exceeds the prescribed range, recalibrate according to **Incline Calibration** in the **Incline Troubleshooting Manual**.

### **3. Display Board ICs**

Make sure that IC contacts on the display board are good. Press firmly on the ICs. Re-solder if necessary.

# ERROR 7

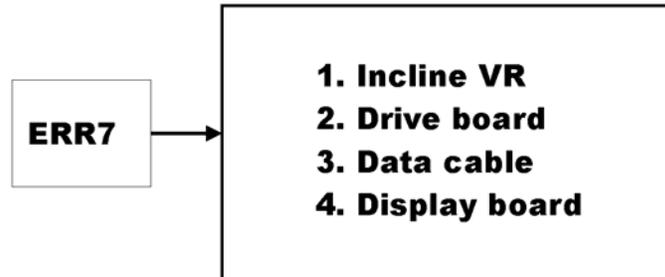


**Definition:** The display board main IC didn't receive the incline variable resistor (VR) value, or the value exceeds the set range.

**Explanation:** The incline VR voltage changes as the incline motor operates, and the display board CPU uses the VR voltage to calculate the incline position. Without this value, the CPU cannot instruct the incline motor what to do, so ERR7 appears. Or when the incline set is out of alignment, the VR value exceeds the set range; ERR7 appears.

# ERR7 Diagnostics

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**ERR7 Condition:** ERR7 appears

## 1. Incline VR

a) Inspect whether the Incline ERR LED on the drive board lights. This LED indicates that the incline set has exceeded the range.

b) Inspect whether the incline set mechanically exceeds range. On DC incline motors, at the 0% position, the line on the thin incline pipe will not align with the end of the thick pipe. On AC motors, at the 0% position, the red line will not appear even with the bottom of the incline window in the incline set. See **Incline Troubleshooting Manual** for details.

c) Inspect whether the incline VR voltage exceeds the range: Put voltmeter probes on the incline VR set blue and green wire connectors, while keeping the wires connected. Refer to **Incline Troubleshooting Manual** for the voltage range for your treadmill. If the incline range is exceeded, either mechanically or electronically, calibrate the incline set. Refer to the **Incline Calibration** in the **Incline Troubleshooting Manual** for directions. If the incline set cannot be calibrated electronically, replace the incline VR. If the incline set is stuck and cannot be unstuck, replace the whole incline set.

## 2. Drive Board

Inspect incline voltage on the blue and green wires at the drive board. If voltage is within range, and ERR7 appears, inspect drive board component connections and components for wear.

### 3. Data Cable

Inspect data cable for breaks. Inspect connections at the display and drive boards.

### 4. Display Board

Inspect IC connections. Push down to secure connections. Re-insert ICs.

## ERROR 8\*

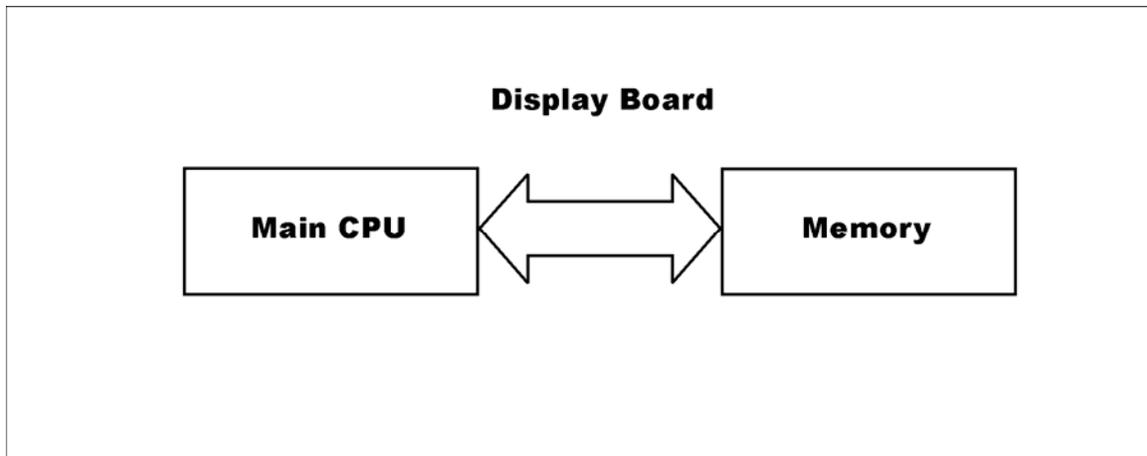
**Definition:** The message between ICs on the display board was not clear.

**Explanation:** Outside interference prevents the transmission of messages between ICs on the display board.

**Response:**

1. Press down on ICs to ensure good connections. Update program ICs.
2. Make sure the unit is grounded properly.
3. Make sure display board wire connections are good.
4. Inspect soft keys and their connections to the display.
5. Replace program IC or display board.

## ERROR 9\*



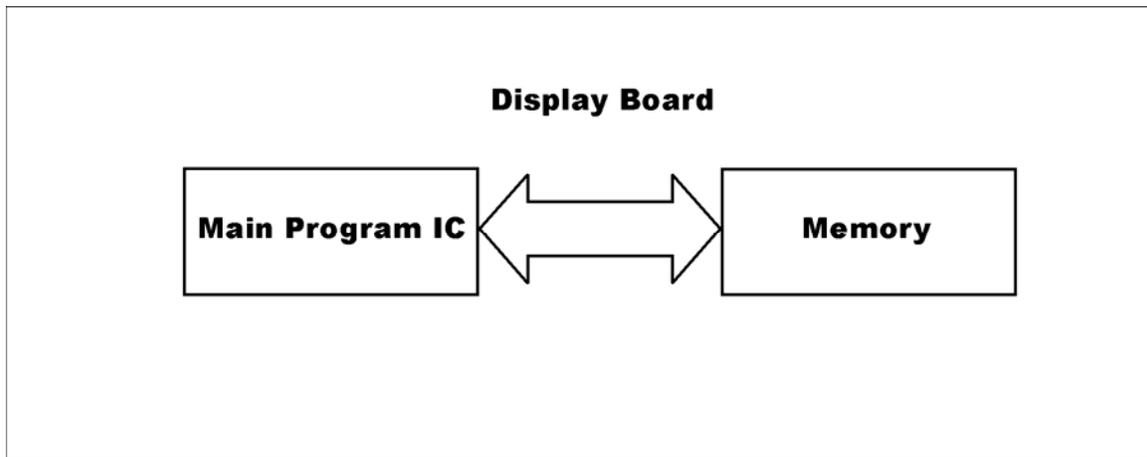
**Definition:** Unit operation exceeds the distance setting; ERR9 appears to indicate that routine maintenance is required.

**Explanation:** Some units have a distance setting. When the treadmill is operated a certain distance, ERR9 appears to indicate that servicing is required.

**Response:**

- a) When ERR9 appears, replace the walk belt if necessary. Turn or replace the deck if necessary.
- b) Erase distance memory to cancel ERR9. Refer to **How to See and Clear Mileage Memory** in **Reference**.

## ERROR 10



**Definition:** The speed signal from the optic sensor is too high.

**Explanation:** The speed exceeds a set range; ERR10 appears.

**Diagnostics:**

- 1. Inspect whether the drive board IGBT or MOS has a short. See **Components**.
- 2. Inspect drive board for burnt components. Inspect connections. Replace drive board if necessary.
- 3. Inspect the display board ICs. Press on them to ensure a good connection. Make sure wire connections are good.
- 4. Inspect grounding in display, pedestal, and wall.

**Note: Error 10 has a different meaning in 1210 units.** In other units, the CPU detects excessively high speed (due to IGBT or motor short); then ERR10 appears. In the 1210, the CPU detects relay operation and no motor operation; then ERR10 appears.

In 1210 model treadmills, ERR10 can appear if the motor windings are bad. In 1210 treadmills with error 10, do an ohm test on the motor to confirm a motor issue.

## ERROR 11\*

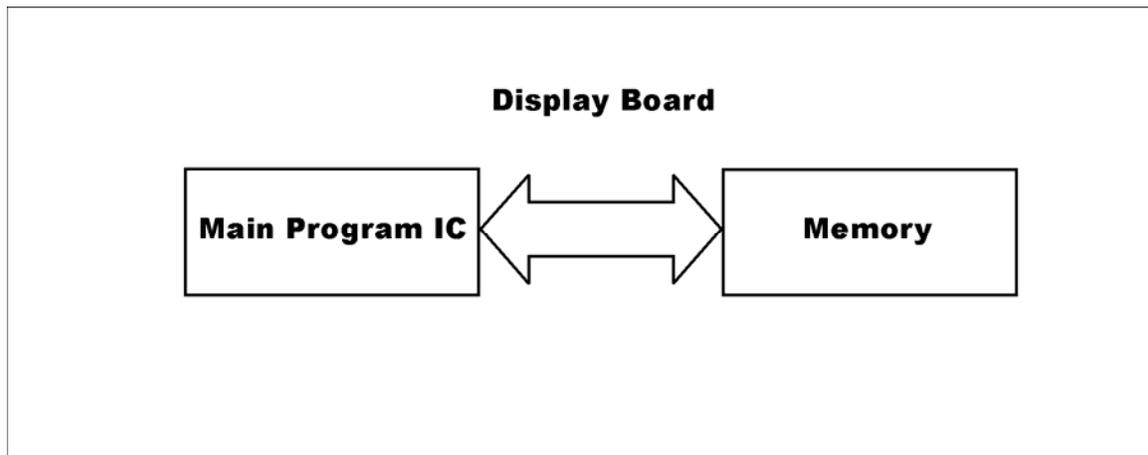
**Definition:** The direction of the drive motor differs from the display setting.

**Explanation:** The main IC detects a direction error from the optic sensor signal.

**Diagnostics:**

1. Inspect the M+M- wires to the drive motor. The M+ motor wire should be connected to M+ terminal on the drive board? The M- motor wire should be connected to the M- terminal on the drive board.
2. Inspect the display board IC for good contact. Inspect the data cable for good contact. Inspect the optic sensor and its wires.

## ERROR 12\*



**Definition:** The heart rate signal is not clear enough to calculate heart rate.

**Explanation:** The HTR board detects (1) whether the user is holding the HTR handlebars and (2) the incoming pulse signal. If the user is holding the HTR handlebars but the pulse signal is muddled, ERR12 appears. It reminds users to hold onto the HTR handlebars without moving.

**Diagnostics:**

Keep your hands in one spot on the HTR handlebars and don't move them. ERR12 will disappear. If it doesn't, inspect HTR wiring. Update the HTR board version or display board main IC version if necessary.

For more information, see inspect the product manual in reference to the HTR function.