JOHNSON®	Troubleshooting Guide: E2 Error/Erratic Speed
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Symptom	Possible Cause	Test Procedure	Repair
E2 error on a unit with an analog speed sensor (The analog speed encoder signal indicates speed is 20% higher than the set point.)	Failed speed sensor	- Decrease the voltage and the actual speed is 20% lower than the set point. - Increase the voltage and the actual speed is 20% higher than the set point.	Replace speed sensor.
	Failed motor control board (MCB)		Replace MCB.
	Failed drive motor		Replace drive motor.
After pressing start, the belt speed increases without command and does not stop.	Failed MCB	--	Replace MCB.
The belt speed goes beyond the speed set on the console and then slows back down.	**If unit has an optic/digital speed sensor—**Failed optic sensor	-Test voltage from optic sensor. - Follow the directions below, Troubleshooting the Optic Speed Sensor.	Replace optic sensor.
	If unit has an analog speed sensor—Failed speed sensor or console cable	-Check to see if the speed sensor is properly connected to the lower board. -Check the position of the sensor: • Wire coming from the sensor should point toward the front of the machine. • Sensor is as close to the front roller as possible without touching it. • The sensor bracket is at a 90-degree angle and otherwise not bent. -Verify that there is a magnet in the front roller. -Check console cable for pinches and make sure it is properly connected to both the upper and lower boards.	Replace analog sensor or console cable as necessary.
After pressing start, the belt runs for a few seconds and then comes to a complete stop.	Failed speed sensor	**If unit has an optic/digital speed sensor—** -Test voltage from optic sensor. - Follow the directions below, Troubleshooting the Optic Speed Sensor.	Replace optic sensor.

Symptom	Possible Cause	Test Procedure	Repair
		If unit has an analog sensor— -Check to see if the speed sensor is properly connected to the lower board. -Check the position of the sensor: • Wire coming from the sensor should point toward the front of the machine. • Sensor is as close to the front roller as possible without touching it. • The sensor bracket is at a 90-degree angle and otherwise not bent.	Replace analog sensor.
The running belt speed fluctuates.	Inadequate power	-Check for a dedicated circuit (20 amp is ideal) and check wall outlet voltage (120 VAC). -Make sure the machine is not on an extension cord, surge protector, or GFCI circuit.	If the AC voltage is missing or incorrect, check the AC service or consult an electrician.
	Failed or improper wiring	-Verify that there are no pinches or cuts in the power cord, power wires, motor wires, or console cable. -Verify the connections of the wires and cords.	Replace parts as needed.
	-Running belt is too loose or too tight. -Drive belt is too loose or too tight.	-Make sure the running belt does not slip when the machine is in use. -The drive belt should have approximately 3/8-inch of deflection.	Set proper drive belt and running belt tension.
	Inadequate lubrication on deck and running belt. (This does not apply to pre-waxed, maintenance-free running belts.)	Place hand underneath running belt and feel for adequate silicone application.	Apply silicone.
	Failed motor control board (MCB).	--	Replace MCB.
	If unit has an analog speed sensor—Unit is not calibrated properly.	Run auto-calibration.	If unit fails to auto-calibrate, refer to auto-calibration troubleshooting.
The belt speed increases without command, and the console beeps and displays speed changes.	Unit has a program set	-Remove safety key, then replace. -Start the treadmill in P1 (manual mode) and see if symptom occurs again.	--
	Stuck button	--	See membrane keypad and overlay troubleshooting.
	Failed upper board	--	Replace UCB.

Symptom	Possible Cause	Test Procedure	Repair
The motor feels choppy and the running belt stutters.	-Running belt is loose. -Torque adjustment on MCB is incorrect.	-Tension the running belt. (If the belt continues to stutter, do not overtighten.) -**Technician Only:** Adjust the torque on the MCB until the belt runs smoothly.	Replace MCB.
The running belt continues to move after Stop is pressed.	Torque adjustment on MCB is incorrect.	**Technician Only:** Adjust the torque on the MCB until the belt stops.	Replace MCB.

Troubleshooting the Optic Speed Sensor

1) Unplug the treadmill power cord from the wall socket.
2) Use a Phillips screwdriver to remove the screws holding the motor cover to the frame and remove the motor cover (Figures A & B).

Figure A

Figure B

3) Locate the optic speed sensor mounted to the motor (Figure C).
4) Verify that the speed sensor is plugged into the lower control board (Figure D). If it is not, plug the speed sensor into the board and re-test the treadmill.

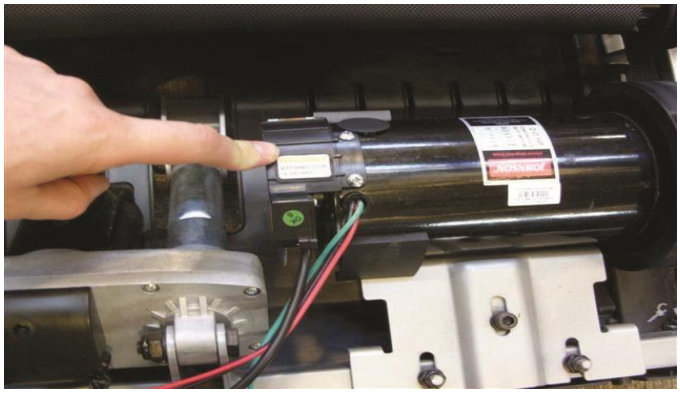

Figure C

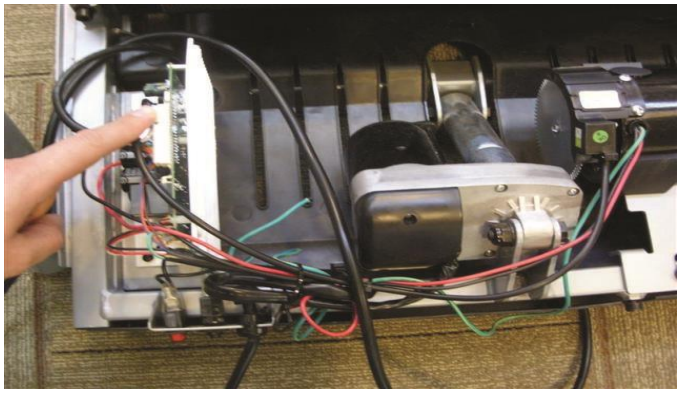

Figure D

5) Unplug the speed sensor from the lower control board (Figure E) and use a small cutting pliers or knife to cut any wire ties holding the speed sensor wire in place.
6) Remove the two screws holding the speed sensor to the motor (Figure F).

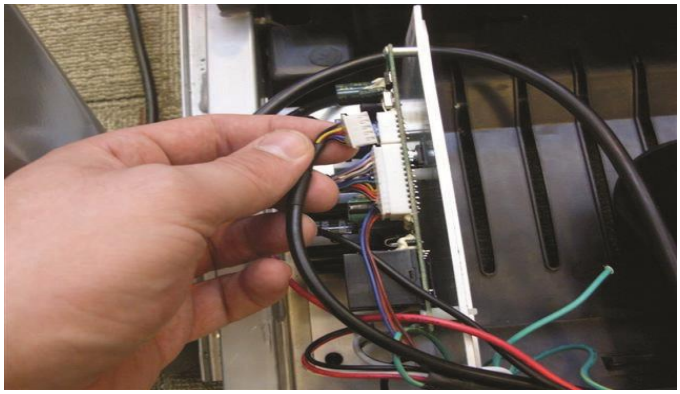

Figure E

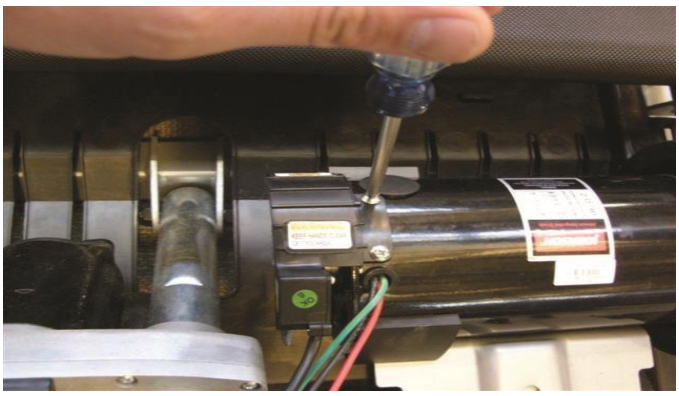

Figure F

7) The speed sensor can now be removed from the motor (Figure G).
8) Inspect the speed sensor for any dust or debris. Clean the optical sensor gap with a cotton swab or clean cloth to remove any dust or debris (Figure H).

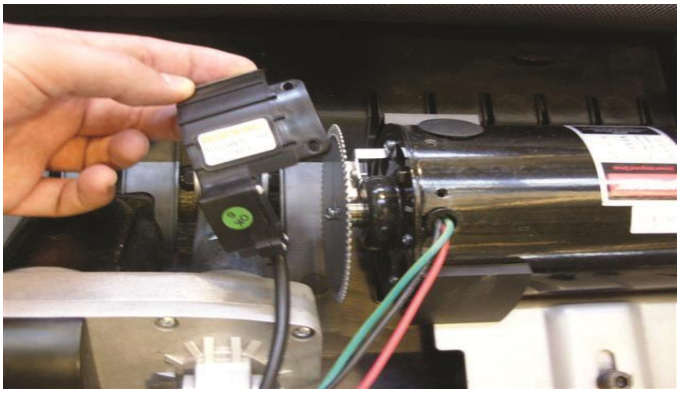

Figure G

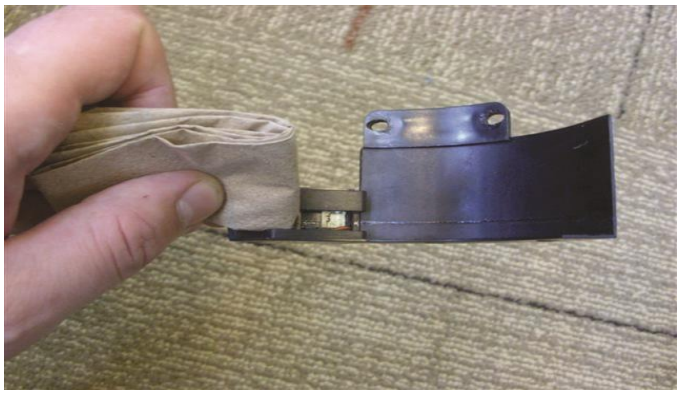

Figure H

9) Before re-installing the speed sensor, spin the optical disc on the motor (Figure I). Inspect the movement of the optical disc to ensure that the disc is not warped or bent.

NOTE: Be careful as the optic disc can be sharp. Replace the optic disc if needed.

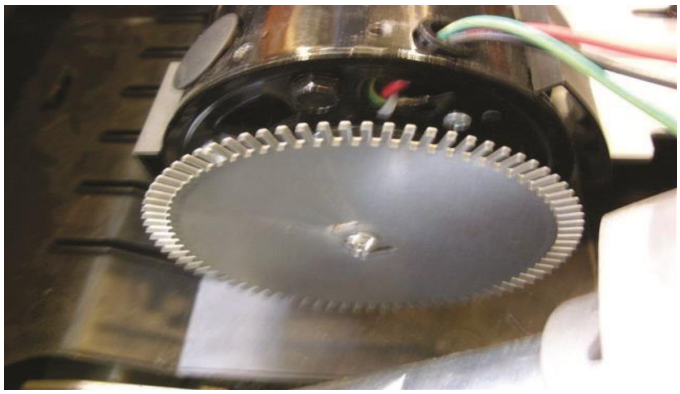

Figure I

10) Re-install the speed sensor to the motor and plug the speed sensor wire into the lower control board. Test the treadmill for function. If the treadmill is still having issues with the speed sensor, replace the speed sensor.