

## Toyostove Error Code EE 2 (EE 6)

### Applies to models:

**Toyotomi Laser Heaters: L-30, L56, L-60, L-73**

**Oil Miser Models: OM22, OM23**

The purpose of this document is to supplement the Service Manual (SM) published by the manufacturer. L30, L56, L60, L73, and Oil Miser 22, 23 stoves have self-diagnostic codes. A code directs the technician to the problem area. Each code is tied to a specific device or condition:

<b>Flame Rod</b>	EE 2, EE 6, EE 22, EE 10, and All Lamp Flashing
<b>Room Temperature Sensor (Thermistor)</b>	HI and LO
<b>BMAC Revolution Sensor</b>	EE 8
<b>High Limit Switch</b>	EE 12
<b>Burner Thermistor</b>	EE 13
<b>Connector "F" not connected to MCB</b>	EE 30
<b>Factory Testing</b>	41 11
<b>Commercial AC Power Problem</b>	EE EE

When the stove is in the Self-clean mode, a CL 10, 9, 8..., 1 will be displayed. This is a normal operation.

### Ignition

Ignition requires three components (fire triangle) a hot igniter, fuel, and oxygen.

### Ignition Sequence

Power On, Set Temperature greater than Room Temperature.

### **WARNING**

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**Pre-heat: Combustion Blower Motor ON; Igniter ON.**

Toyostove Laser 56, 60, 73: On/Off lamp flashing = pre-heat; post-purge.

Toyostove Laser 30, Oil Miser 22, 23: Power lamp flashing 1Hz = pre-heat

**Pre-heat timing is determined by room temperature.**

Toyostove Laser 56, 60, 73: > 60F = 3 min.; 34F to 60F = 6 min.; < 34 F = 9 min.

Toyostove Laser 30, Oil Miser 22, 23: > 60F = 1.5 min.; 34F to 60F = 3 min.; < 34 F = 4.5 min.

**Pre-combustion:**

Toyostove Laser 56, 60, 73: Medium Lamp Flashes = Fuel Pump ON.

L or M lamp ON = Flame Rectification

Toyostove Laser 30, Oil Miser 22, 23: Power Lamp Flashes at 2 Hz: = Fuel Pump ON

Power Lamp ON = Flame Rectification.

**Normal Burn:**

Toyostove Laser 56, 60, 73: L or M or H lamp ON = Flame Rectification.

Toyostove Laser 30, Oil Miser 22, 23: Power Lamp ON = Flame Rectification.

**Flame Rectification:**

When the flame physically contacts the flame rod, the electrons travel through the flame's ionized particles to the ground completing the circuit. The ionized particles are like thin wire. Electron current flow must be greater than 3u Amps. A solid Burn Lamp (L/M/H) or Power Lamp indicates flame rectification- the flame is conducting electrons. If the flame cannot or does not physically contact the flame rod, the stove will shut down and display an EE 2 or EE 6 depending on burn time.

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### Pre-heat

Each stove has a set pre-heat timing determined by the room temperature. See Service Manual or Owner's Manual for specific timings- Igniter on, Combustion Blower Motor on low.

<b>Toyostove Laser 56, L60, L73</b>	<b>&gt; 61F</b>	<b>180 seconds</b>
<b>Toyostove Laser 30, Oil Miser 22, 23</b>	<b>&gt; 61F</b>	<b>90 seconds</b>

### Pre-combustion (ignition)

The pre-combustion timing starts when:

1. Medium Lamp flashes
  - a. Toyostove Laser 56, L60, L73 (fuel pump on) 360 seconds
2. Power Lamp 2 (Hz) flashes per sec.
  - a. Toyostove Laser 30, Oil Miser 22, 23 (fuel pump on) 300 seconds

### Normal Burn

After the pre-combustion cycle is complete, the stove is in normal burn mode. The burn level (L/M/H) is determined by set temperature and room temperature. See Owner's Manual or Service Manual for details.

### EE 2

If Flame Rectification fails during pre-combustion, an EE 2 will display. (Note: On the L56, L60, and L73, an EE 2 may not display until after the second flame rectification failure.)

- 1) No flame visible in view window when Medium Lamp or Power Lamp (2Hz) flashes, fuel pump makes a loud pumping sound, and a EE 2 is displayed.

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**No fuel in fuel sump. Check:**

- tank level
- valves
- fuel filter
- line
- fuel sump strainer

2) No flame visible in view window when Medium Lamp or Power Lamp (2Hz) flashes, fuel pump makes a quiet clicking sound, and an EE 2 will display.

**Warning- Do not touch the igniter. A hot igniter will cause serious burns.**

**Is the igniter hot? No. Check:**

- Igniter =  $\sim 18 \Omega$  at room temperature
- Large 10-amp fuse on MCB.

If igniter is cracked, check filter for water and drain fuel sump (large screw next to sump filter strainer).

3) Blue Flame is visible in the view window when Medium Lamp or Power Lamp (2Hz) flashes, fuel pump makes a quiet clicking sound and EE 2 or EE 6 is displayed.

- Flashing L/M/H or Power Lamp = NO flame rectification.
- Check flue pipe for blockage or corrosion damage.
- Check air intake hose for signs of exhaust gas contamination (brown or black stain).
- Polish flame rod (remove outer layer)
- Clean fuel nozzle (use a wire no longer than 3 inches.)

If this solves the problem, it is only a temporary fix. An EE 2 or EE 6 can be an indication it is time to service the stove (Clean burner assembly, heat chamber, heat exchanger, and exhaust fan (L56, 60, 73); Replace burner mat (Laser 73) or burner coating (all other models) and gaskets.)

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**Warning: Do not use coating in Toyostove Laser 73. The coating will cause the burner assembly bottom to warp and crack.**

- An EE 2 or EE 6 can also be caused by:
- Soot below the flame rod
- Low quality fuel
- Contaminated fuel
- Cracked flame rod
- Warped burner ring
- Plugged holes in the burner assembly wall
- Deteriorate burner mat
- Carbon on burner assembly bottom
- Buckled burner mat
- Missing air damper or incorrect air damper

**EE 6**

When flame rectification fails during normal burn (after ignition cycle), a EE 6 will be displayed. EE 2 and EE 6 are caused by the same problems. See EE 2 for possible solutions. If the stove overheats, the high limit switch will turn off the fuel pump and a EE 6 will be displayed.

Overheating can be caused by:

- Blocked circulation fan cover.
- Exhaust gas being pulled in the burner air intake hose (large rubber hose on back of stove).
- Contaminated fuel.
- Dirty combustion blower motor exhaust squirrel cage fan.
- Blocked Exhaust pipe or Flue Pipe (part that goes through the wall).
- Carbon in the burner pot.

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### **Manual Clean**

The self-clean cycle can be manually activated on Toyostove Laser 56, 60, 73. When the stove is off, hold the hour and minute button down until CL 10 is displayed. See Owner's Manual.

### **P1, P2, P3**

Toyostove Laser 56, L60, L73: The burn level (L/M/H) can be manually controlled in the normal burn mode. Hold hour and minute button until P1 is displayed. The burn level can be changed by pushing hour or minute button. P1 = low burn; P2 = medium burn; P3 = high burn.

To deactivate manual burn hold hour and minute button until set temperature is displayed.

Toyostove Laser 30, Oil Miser 22, 23: The burn level (L/M/H) can be manually controlled in the normal burn mode. Hold up-hour and down-minute button until P1 is displayed. P1 = low burn; P2 = medium burn; P3 = high burn. The burn level can be changed by pushing up-hour or down-minute button.

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