



Problem: The heater will not operate. CL code, Hi, Lo, or All Lamps Flashing

WARNING

Rural Energy Enterprises, Inc. does not accept liability for the improper use of this information. Installation, service, and maintenance of heating equipment should be performed by a qualified technician. Improper installation, adjustment, alteration, service, or maintenance can cause property damage, personal injury, or loss of life.

Applies to: Toyostove Laser 30, L56, L60AT, L73, and Oil Miser 22, 23.

If problems arise during ignition or operation of the Toyostove Laser 30, L56, and L73 heaters, they will display a code on the Digital Indicator or Indicator Lamps. The Digital Indicator and Indicator Lamps also display codes during normal operation. This bulletin is organized by Normal Operation Codes and Abnormal Operation Codes.

Normal Operation Codes displayed on Indicator Lamps Toyostove Laser 56/73.

ON/OFF lamp	Flashing	Pre-heating, pre-purging, and post-purging mode
	Lit	Heater in operation
AUTO lamp	Flashing	Power loss of more than 10 seconds
	Lit	Heater in operation at auto
LOW lamp	Lit	Heater in operation at low combustion
MED. lamp	Flashing	Pre-purging mode (Fuel Pump On, and flame not touching Flame Sensor)
	Lit	Heater in operation at medium combustion
HIGH lamp	Lit	Heater in operation at high combustion
NORMAL	Lit	Heater in operation at normal (manual) mode

SET-BACK lamp Lit Heater in operation at set-back mode

Normal Operation Codes displayed on Indicator Lamps L30/OM 22

Power lamp	Flashing	1 Hz, pre-heating (90 sec. To 240 sec), igniter on
	Flashing	2 Hz, ignition, fuel pump on, flame not touching flame rod
	Lit	Heater is operating, flame touching flame sensor
Temperature Lamp	Lit	Digital Indicator shows set and room temperature
	Flashing	Set temperature can be changed
Clock Lamp	Lit	Digital Indicator shows current time
	Flashing	Current time can be changed
Timer Lamp	Flashing	Timer setting can be changed
Power Saver Lamp	Lit	Heater operating in Power Saver Mode
1st Timer Lamp	Lit	Heater operating in 1st Timer Mode
2nd Timer Lamp	Lit	Heater operating in 2nd Timer Mode

Normal Operation Codes displayed on Digital Indicator (CL 10, 9, 8,...)

Power OFF: Time

Power ON: Set temperature, and Room temperature as determined by the location of the room temperature sensor (thermistor).

CL10, CL9, etc. is displayed on Digital Indicator. IF THE CLOCK IS SET, the heater will automatically clean igniter for ten minutes every day at 2:00AM. The Digital Indicator will display a CL 10, CL 9, (down to 0) during the cleaning cycle.

Abnormal Operation Codes displayed on Digital Indicator.

Hi code is displayed on Digital Indicator.

Causes:

- Room temperature is over 95°F.
- Room temperature sensor is located where the temperature is over 95°F.

- Room temperature sensor or main circuit board is malfunctioning.

Solution:

- Check room temperature with an independent thermometer.
- Check location of room temperature sensor.
- Procedure for testing room temperature sensor (thermistor) and main circuit board:
 - Turn stove off.
 - Disconnect power cord.
 - Disconnect room temperature sensor (connector 2) from main circuit board.
 - Test resistance of room temperature sensor (10,000 ohms at 77°F). If resistance test is not within 5%, replace room temperature sensor. A Hi code usually is caused by a short circuit in the room temperature sensor (thermistor).
 - With room temperature sensor disconnected, connect power cord and turn on stove. If Digital Indicator displays Lo after one-minute, main circuit board is functioning correctly.
 - If Digital Indicator displays Hi code with thermistor disconnected, the main circuit board may be malfunctioning.

Lo code is displayed on the Digital Indicator.

Causes:

- Room temperature is lower than 14°F.
- Room temperature sensor (thermistor) is disconnected from main circuit board.
- Room temperature sensor is malfunctioning (wire broken).
- Main circuit board is malfunctioning.

Solutions:

- Test room temperature with independent thermometer.
- Turn heater off and disconnect power supply cord. Check thermistor connection (2) at main circuit board.
- Test resistance of room temperature sensor (10,000 ohms at 77°F). If resistance test is not within 5%, replace room temperature sensor. A Lo code usually is caused by an open circuit in the room temperature sensor (thermistor).

- Carefully short the two pins on main circuit board thermistor connection (2). Connect power supply cord. If Digital Display reads Hi, main circuit board is operating normally.

Abnormal Operation Codes displayed on Indicator Lamps

Low/Med/High lamps all flash on Toyostove Laser 56/73. **Temperature/Clock/Timer** lamps flash on Toyostove Laser 30/Oil Miser 22, 23.

The main circuit board is sensing a flame in the burner assembly when there should be no flame (during pre-heat).

Causes:

- Fuel in burner assembly after post purge or flame during pre-heat. (Fuel pump OFF).
- Very short power interruption has left unburned fuel in burner that re-ignites during the pre-heat cycle.
- Flame rod ceramic is cracked and shorted to burner assembly.
- Soot on burner assembly wall is grounding flame sensor to burner assembly.

Solutions:

- Wait until heater has purged. The lamps may stop flashing after a few minutes. If not, restart the unit or go to item B.
- Remove front panel. Observe interior of burner assembly through window on heat chamber. If there is flame in the burner assembly, turn power switch off and wait until fire burns out. This problem can occur if there is a large accumulation of carbon (caused by age, #2 fuel and/or water) in the bottom of the burner assembly. The burner assembly must be cleaned, and a new burner mat installed.
- Remove flame rod. Clean ceramic insulator and inspect for cracks. Clean rod with 200 sandpaper. Blow through flame rod mounting hole to remove soot that might be contacting the flame rod. This generally solves the problem.

If the soot is below the flame rod, you may need to disassemble unit and clean burner assembly. Heavy soot is a sign that the combustion air and fuel ratios are incorrect. This can occur if snow, insects or other foreign objects block the exhaust flue and/or air supply.

