



# Problem: The Heater Will Not Operate. EE12, 13, or 22 Code Displayed.

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## 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 and Oil Miser 22, 23

### Laser 30, OM 22, 23 Ignition Sequence

- Power switch on
- Room temperature is less than set temperature (example: set = 70, room = 68).
- [Pre-heat] Power lamp flashes at 1 Hz, combustion blower on low, igniter on.
- Pre-heat timing:

<b>Room temperature above 59° F</b>	= 90 seconds
<b>Room temperature between 32° F and 59° F</b>	= 120 seconds
<b>Room temperature below 32° F</b>	= 240 seconds

- [Pre-combustion] Power lamp flashes at 2 Hz, combustion blower increases to high, FUEL PUMP ON.
- Power lamp changes to solid when the flame contacts (touches) the flame sensor. (If the system does not sense a flame, it will purge and start Pre-heat cycle. If system does not sense a flame during second ignition cycle, the Digital Indicator will display error code EE-2. NOTE: An EE-22 error code will occur if there are

three sequential ignition failures. You must disconnect power cord for 30 minutes to erase this code.)

- Medium burn, combustion blower in medium, circulation fan starts in 120 seconds.
- After 300 seconds in medium burn, system checks room temperature and determines burn level: [Normal Combustion]

<b>Room temperature below set temperature</b>	= high burn
<b>Room temperature 1° F above set temperature</b>	= low burn

- System shuts off when room temperature is 4° F above set temperature.

## Error Code EE12

The Overheat protection switch (high limit switch) is rated at 195°F. It is located on the front top heat shield. If the high limit switch opens, the fuel pump stops and EE12 error code will be displayed on the digital indicator.

### Causes:

- Circulation air is blocked on the back or front of heater (most common problem).
- High limit switch is faulty.
- Circulation fan dragging or failed circulation fan.
- Stove requires internal cleaning. Carbon and soot accumulation are causing a higher than normal heat exchanger temperature.
- Stove is over firing. Fuel pump controller may need adjustment.
- Main circuit board is faulty.

### Solutions:

Allow heater to cool. High limit switch should reset when temperature drops below 150°F.

- Remove any object that is blocking circulation air. Restart heater. If an error code EE12 is displayed, the high limit switch may be open.
- Test high limit switch and check wiring connection on the main circuit board (B). To access main circuit board, remove two screws on top back. Slide top panel forward and lift.

- If high limit switch is closed and wiring harness is good, the problem may be in the main circuit board. To test the main circuit board, remove connector “B” and short the two pins. If the heater continues to display EE12, the problem should be in the main circuit board. If the heater operates without an EE12 failure, retest the high limit switch and wiring harness.

### **Error Code EE13:**

This code indicates that the burner assembly is not at the correct temperature after pre-heat cycle. The burner thermistor is located on the left bottom side of burner assembly.

#### **Causes:**

- Ignition is attempted when the room temperature and/or outside temperature is extremely low.
- Thermistor connector at burner assembly or on main circuit board is loose or faulty.
- Thermistor is faulty.
- Main circuit board is faulty.

#### **Solutions:**

- If room temperature or outside temperature is extremely low, preheat room. Or disconnect air intake pipe and preheat intake air.
- Check connector on wiring harness and at main circuit board (5, BT, CN17).
- Thermistor should test below 200K ohms after preheating.
- If thermistor and connections test correctly, short connector 5, BT, on main circuit board with a ¼ watt 20K ohm resistor. If the heater continues to display EE13, the problem should be in the main circuit board. If the heater operates normally, the problem is in the burner thermistor or wiring harness.

### **Error Code EE22:**

This error code occurs when the heater fails to ignite three times in a row. It can occur when the fuel tank runs out of fuel. The heater will try to ignite twice and then will display an EE2 code on the digital indicator. The owner sees the code, turns stove off/on, stove starts ignition cycle, does not ignite, and digital indicator displays EE22.

#### **Cause:**

Heater failed to ignite three times in a row.

**Solution:**

- Unplug stove for 30 minutes to erase memory (main circuit board can store memory for 20 minutes).
- Determine reason stove is not igniting: fuel, dirty flame rod, igniter failure.