



# Problem: Heater Will Ignite but Will Not Continue to Operate. EE6 Code Displayed.

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## **WARNING**

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## **Applies to: Toyostove Laser 30, 56, 60 and 73 and Oil Miser 22/23**

### **What Does This Mean?**

Toyostove Laser 30, 56, and 73 model Laser heaters cease operation and display the EE6 code on the control panel (instead of the clock or temperature settings) when the primary flame rod on the heater fails twice to sense a flame during the normal burning mode. (After the heater has ignited and operated through the ignition and pre-heat cycle that last about five minutes). The heater must ignite, sense a flame, go into the normal burning mode, sense a lack of flame, go into the purge cycle, re-start, sense flame again during the ignition mode, go into the normal burning mode, and then again sense a lack of flame. Then, it will go to EE6.

### **What Can Cause an EE6 Error?**

The primary flame rod is the only sensor in the heater that can cause the EE6 error. And, it can only happen if the primary flame rod has detected a flame twice in a row before failing. Thus, in most cases, the problem has nothing to do with the primary flame rod or the burner but is caused by an over-heating condition or more likely, something that causes the heater to “starve” for fuel (not enough fuel flowing into the heater, burner, or available to the pump). If the system is completely out of fuel, it will usually display the EE2 code, not EE6.

## What Can Be Done to Correct This Situation?

1. **Fuel supply problems.** Most EE6 problems are caused by inadequate flow of fuel to the heater. Therefore, the first things to check are listed below:
  - a. **Plugged Fuel Nozzle.** Carbon may build up inside the fuel nozzle and below the nozzle inside the burner. This will restrict the amount of fuel flow into the burner. Disconnect the fuel line from the nozzle and clean the nozzle. It may be necessary to dismantle the burner and clean the burner pot.
  - b. **Plugged fuel filter.** Check the filter on your fuel line from the tank to be sure plenty of fuel is getting through the filter.
  - c. **Damaged fuel line.** Check for leaks, breaks, crimped line, or partially closed valves to be sure nothing may be restricting the flow of fuel to the heater.
  - d. **Fusible link valve closed.** Make sure the fusible valve (located inside the right rear corner of the heater) is completely open. Turn it counter-clockwise until it is tight. About 1/8 inch of threads should show above the knob of the valve.
  - e. **Sump screen is partially plugged.** Shut off your fuel at the valve nearest to the heater. (It is best not to use the fusible valve in the heater for this purpose. This valve is an emergency shut off valve and should not be used to occasionally shut off the fuel line. There should be a valve at the tank and possibly another on the line near the heater.) Remove the diamond shaped brass plate through the access hole or door on the right side of the heater. Be prepared to catch dripping fuel. Carefully remove the sump screen and clean it if necessary.
2. **Overheating or a problem with the high limit switch.** (Toyostove Laser 56 and 73 only. Not the Laser 30.) The high limit switch may cause the EE6 code on the Toyostove Laser 56 and Toyostove Laser 73 heaters. On the Toyostove Laser 30 the high limit will cause an EE12. The high limit switch is a normally closed bimetal switch. Electric current flows through it and allows the main circuit board to provide power to the fuel pump. If the high limit switch is open, no power flows through it and the circuit board cannot operate the fuel pump. The

sequence of events is that the heater will ignite, pre-heat, and then go into the normal burning mode. Then the high limit switch will open, the fuel pump will stop, and the heater will stop. After it has gone through the purge cycle, it will try to ignite once again. If the high limit has re-closed, the heater will again ignite, pre-heat, and then go to the normal burning mode. If the high limit switch opens again, the heater will stop, purge, and display EE6. Thus, there are two possible situations. Either the unit is getting too hot, or the high limit switch is defective. Check these options in this order:

- a. **Too much heat inside the cabinet of the heater.** The heater will rarely get hot enough to open the high limit switch unless the heat is not blown out of the cabinet. Even though a heater is burning with very high flames and getting quite hot, the high limit will not open if the circulation fan is able to push the hot air out of the heater. Thus, there are two likely causes for an open high limit switch:
  - i. **Blocked airflow.** Something is preventing air from circulating through the heater. Check for drapes, dust, animal hair, etc. that may be covering or blocking the screen on the back of the heater. If it is dirty, clean it with a vacuum cleaner, damp cloth, or brush. Or, remove it and wash it with soap and water.
  - ii. **Stopped circulation fan.** If the large fan in the back of the unit does not spin shortly after the heater starts to burn, the heater will get too hot. Check the following:
    - a) **Jammed fan.** Make sure the protective screen or fan is not bent. Make sure that nothing is stuck in the mesh and stops or inhibits the fan.
    - b) **Defective circulation fan motor or circuit board.** This motor uses the same amount of power as the igniter. You can test the motor using the main circuit board. First shut off the heater, disconnect the heater from the outlet, and then disconnect the igniter (red wires – plug G) from the main circuit board. Connect the plug for the circulation fan (plug C) into the main circuit board where the igniter is usually

connected (position G). Plug in and activate the heater. If the circulation motor starts to spin, the motor is OK, and the problem is likely a defective circuit board. Check the output of the circuit board or replace it if you do not have a testing device. If it does not spin, replace the motor. Be sure to re-connect all wires to their proper positions before operating the heater.

- b. **Defective high limit switch.** If everything else is normal, the problem is likely a defective high limit switch. This is quite rare. To test this, you may either install a new switch or use a small solid jumper wire to temporarily replace the switch. Test the heater. Do not permanently replace the high limit switch with a jumper wire! For testing only!