

## WARNING

Rural Energy Enterprises, Inc. (R.E.E.) 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.

### **Toyostove Annual Maintenance**

#### 1. CHECK FOR LEAKS/CHANGE FILTER

- a. Start by inspecting the fuel storage tank for leaks. Signs include oil stains or puddles and/or a strong odor in the vicinity of the tank.
- b. Inspect the water-block filter for leaks/damage and replace the filter element. If the element is severely contaminated, you may need to flush the entire fuel line and the fuel sump inside the Toyostove to remove any impurities. If a water-block filter is not installed at the fuel tank, now is the time to install one. R.E.E. recommends the Goldenrod 496 Water-block Fuel Filter, part# FF, or a similar 15 micron **water-block** fuel oil filter.
- c. Continue checking for leaks along the entire length of the fuel line. Wipe your finger on the underside of every fitting. If you get an oily sheen on your finger, you may have an oil leak. To confirm this, wipe the fuel line/fittings thoroughly with paper towels, wait a few minutes, and then check again with your finger. If your finger comes away again with an oily sheen, you have a leak, and it **must** be repaired immediately.

#### 2. INSPECT FLUE

- a. Inspect the flue for signs of degradation of the inner wall that separates the exhaust from the combustion air. If there are any visible perforations/holes in this inner wall, the flue **must** be replaced immediately.
- b. Inside the building, inspect the rubber air intake elbow **where it attaches to the Toyostove** (photo 1). If you find a brownish stain inside this elbow, or if it smells of exhaust gases, the flue is compromised and **must** be replaced.



air intake elbow

#### 3. INSPECT EXHAUST

- a. Inspect the full length of the exhaust piping. Exhaust leaks will often discolor the insulating sock(s) that should cover the entire length of the exhaust run (photo 2). (If the exhaust is not properly insulated, it can result in condensation of exhaust gases and early failure of exhaust components.) **Any leaking exhaust component must be replaced.** There is no such thing as a “small exhaust leak” indoors.



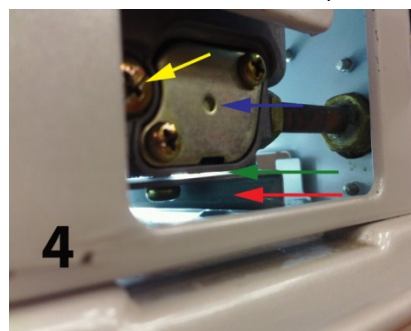
exhaust insulating sock

#### 4. CLEAN SCREEN

- a. At the Toyostove, **unplug the heater** and turn off the fuel at the shutoff valve on the incoming fuel line. **If there is not a shutoff valve at the unit, one should be installed.** The round-handled “fusible link” safety valve (photo 3) is for fire protection, not for servicing. Using this valve as a service valve will damage it. It is not designed to be opened and closed repeatedly.
- b. Install the plastic oil catch **between the sump and the mounting bracket** (photo 4, green arrow). If the oil catch is positioned **below** the sump mounting bracket (photo 4, red arrow), you will have an oil spill to clean up. Place a small container under the oil catch (photo 5) to contain the fuel (a tuna can works well).
- c. Remove the 2 screws on the diamond-shaped plate on the side of the sump (photo 4, blue arrow). There is a small screen in the sump that needs to be removed and cleaned. Use a pair of needle nose pliers to remove the screen. Note the direction of the screen when removing. The open side of the screen faces the incoming fuel pipe.
- d. Clean the screen thoroughly with a Q-tip and fresh fuel. Alternatively, brake or carburetor cleaner works well.
- e. With the screen removed, open the shutoff valve. Fuel should flow freely from the hole that the screen came out of. If fuel flows freely, close the valve and reinstall the screen and plate. If fuel does not flow freely, the water-block filter at the tank is probably plugged and the filter needs to be replaced, or there may be an air lock or ice plug preventing the fuel from flowing properly.
- f. Empty out the small catch can of fuel for the next step.



fusible link valve



fuel sump



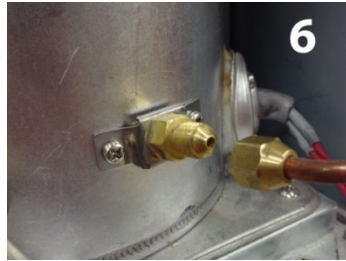
oil catch

#### 5. INSPECT SUMP

- a. Remove the larger Phillips head screw (photo 4, yellow arrow) to drain the sump. Do not lose the gasket on this screw. **You should get about 1/3 to 1/2 of a tuna can of fuel.**
- b. Once the sump has been drained, open the shutoff valve. Fuel should flow freely from the drain screw hole. This proves fuel flow thru the filter and sump. **If fuel does not flow freely from this screw hole, the sump needs to be serviced. Detailed instructions are available from R.E.E.**

**Technical Support.**

- c. Close the fuel valve, reinstall and tighten the drain screw.
  - d. Open the fuel shutoff valve.
  - e. Press down on the red button on the top of the sump **one time** and release.
6. CHECK FUEL NOZZLE
- a. Remove the front panel of the heater.
  - b. There is a copper line that runs from the fuel pump to the burner assembly. Loosen and remove the 12mm flare nut on the copper line from the fuel nozzle on the burner assembly (photo 6).
  - c. Push a small drill bit or a coat hanger into the nozzle to clean it out. **Do not push farther than 3 inches**, as this will damage the burner mat or burner coating at the bottom of the burner assembly.
  - d. Reinstall and tighten the flare nut.



fuel nozzle

7. CLEAN FLAME SENSOR
- a. The flame sensor is located at about the 10 o'clock position on the burner assembly, in relation to the fuel nozzle. After **verifying that the heater is unplugged**, gently pull the white wire off of the flame sensor. To do this, grasp the metal connector at the end of the flame sensor wire firmly between your thumb and forefinger and apply downward pressure. The wire connector should slide right off the flame sensor. **Take care not to bend the flame sensor**, as bending it will damage it.
  - b. Remove the 2 Phillips head screws from the flame sensor.
  - c. Rotate the flame sensor to the 3 o'clock position and remove it from the burner assembly. Again, be careful not to bend it.
  - d. Clean the flame sensor off with sand paper or emery cloth, or lightly file it clean.
  - e. Reinstall the sensor and wire (photo 7).



flame sensor

8. TEST IGNITER – WITH METER
- a. You will need a multimeter to test this properly (photo 8). Set the meter to read Ohms ( $\Omega$ ). The igniter should be at room temperature, approximately 70° F.
  - b. The igniter should read between 16 and 19 Ohms. If it does not, it should be replaced. If the meter reads OL, the igniter is burned out or broken. If it has an Ohms reading higher than 19, the igniter is in the process of failing, it is weak, and will not light the stove reliably.
9. TEST IGNITER – WITHOUT METER
- a. If you do not have a multimeter, plug the stove into an outlet.
  - b. Power up the stove and turn up the set temperature so the stove will try to light.
  - c. After it has been in its pre-heat cycle for about a minute, the area above the igniter should be very hot to the touch. Use extreme caution as it may be hot enough to burn skin upon

- contact. **Do not touch the flame sensor. It is uninsulated and energized with 120VAC.**
- d. If the area above the igniter is slightly warm or cold you may have a burnt out, weak, or broken igniter, and it will need to be replaced.
  - e. **Unplug the heater again before continuing.**



#### 10. VACUUM HEATER

- a. Using a shop vacuum, clean any dust/debris that may have accumulated inside the heater.
- b. Don't forget the circulation fan blades and the air filter. Be careful to avoid bending the blades on the circulation fan.
- c. Go to the flue termination on the outside of the building and vacuum out the exhaust end of the flue.

#### 11. TEST-FIRE

- a. Put the front cover back on the heater.
- b. Plug the heater in.
- c. Set the temperature to the desired setting so that the Toyostove will go into the heating mode. The heater should fire after the pre-heat stage. If not, take it to your local Toyostove servicer for repair.

Your Toyostove manual has a parts list and blowup (expanded view) that you can use to identify parts and their corresponding part numbers. Manuals can be found at [://www.rural-energy.com](http://www.rural-energy.com) ... navigate to your heater's details page; the Owner's and Installation manuals can be found under the "Documents" tab.

*For more information, contact R.E.E. Technical Support at (907) 868-7952 or by email [service@rural-energy.com](mailto:service@rural-energy.com)*