

There are various configurations of electric pre-heaters and thermostiches available for the Fuel Pro/Diesel Pro. These include 12VDC pre-heaters, 24VDC pre-heaters, 120VAC pre-heaters/thermostiches, and combination pre-heater thermostiches. The voltage and wattage ratings are stamped either on the sheath or the hex of each component for identification.

**Equipment Needed**

- A precision low resistance ohm meter capable of measuring 1/10th ohm or less.
- Current flow meter (clamp-on type for DC current).
- Ice, dry-ice, CO<sub>2</sub> or some means of chilling the thermostat.
- A flameless source of heat. (ie: infrared heat lamp, etc.)  
Note: A Vortex tube is a good tool to heat and cool for testing.

⚠ DO NOT USE a test light that has a wire probe for any of these tests. If the wiring insulation is punctured, moisture and road salt can penetrate into the wires creating a corrosion issue and potential failure.

**Draining the Fuel Pro**

- Step 1:** Shut off the engine and set the parking brake.
- Step 2:** Attach a length of hose to the drain valve and place a receptacle under the Fuel Pro/Diesel Pro.
- Step 3:** Loosen the vent cap on top of the clear housing. Open the drain valve and drain the fuel into the receptacle.
- Step 4:** When the fuel is drained, close the drain valve.

**Pre-heater Operation Test**

- Step 1:** Disconnect the pre-heater from the harness.
- Step 2:** Connect the ohm meter leads to the pins of the pre-heater. For heaters with one pin, connect to the pin and the bushing.
- Step 3:** Use Table 1 to determine whether the pre-heater resistance value is in the acceptable range.

Electric Pre-heater	Watts	Resistance Range (ohms)
12VDC (two pin)	250 W	0.6 to 0.8
12VDC (single pin)	250 W	0.6 to 0.8
12VDC (single pin)	150 W	0.8 to 1.1
12VDC (two pin)	150 W	0.8 to 1.1
24VDC (two pin)	250 W	2 to 2.5
24VDC (single pin)	250 W	1.8 to 2.3
24VDC (single pin)	150 W	3.6 to 4.1
24VDC (two pin)	150 W	3.6 to 4.1
120VAC	75 W	173 to 203
120VAC	37 W	369 to 411

Table 1

**12VDC Thermostat Performance Test**

- Step 1:** Disconnect the harness from the thermostat.
- Step 2:** Connect the ohm meter leads to the pins of the thermostat.
- Note:** This test requires the thermostat temperature to be below 40°F. Use one of the cooling devices listed under "Equipment Needed" to obtain the required temperature. The resistance should be less than 0.01 ohm.
- Step 3:** Using one of the heating devices listed under "Equipment Needed" increase the temperature above 60°F. The resistance should be more than 10M ohms.

**Combination Pre-heater Thermostat Performance Test**

- Step 1:** Disconnect the harness from the heater/thermostat combination unit.
- Step 2:** Using one of the cooling methods listed under "Equipment Needed", reduce the temperature of the thermostat to below 40° F.
- Step 3:** Connect the ohm meter leads to the pre-heater pins. Use Table 1 to determine whether the pre-heater resistance value is in the acceptable range.
- Step 4:** Using one of the pre-heating devices listed under "Equipment Needed", raise the temperature of the combination pre-heater to 70°F. The ohm meter should read "open circuit" for the combination units.

### Fluid Heater Thermovalve Test

**Step 1:** Drain the Fuel Pro completely.

**Step 2:** Remove the fluid hoses attached to the bottom plate. These will either be engine coolant hoses or return fuel hoses. Engine coolant hoses will have to be plugged when removing them from the Fuel Pro.

**Step 3:** Remove the bottom plate.

**Step 4:** While looking into the fluid port of the bottom plate (see Figure 1), run cold water over the thermovalve for 30 seconds, then run hot water over the thermovalve to determine whether the thermovalve spool is opening and closing.

**Step 5:** Replace the bottom plate seal and install the bottom plate onto the Fuel Pro.

**Note:** There are two styles of bottom plates.

- Torque the bolts of the bolt-on version bottom plate to 10 ft-lbs.
- Torque the collar of the collar version to 50 to 60 ft-lbs. Note: Applying 2-3 drops of Loctite 406 to secure the bottom collar is recommended.

**Step 6:** Reconnect the fluid hoses to the bottom of the Fuel Pro.

**Step 7:** Fill the Fuel Pro with fuel and restart the engine.

**Step 8:** Check for leaks.

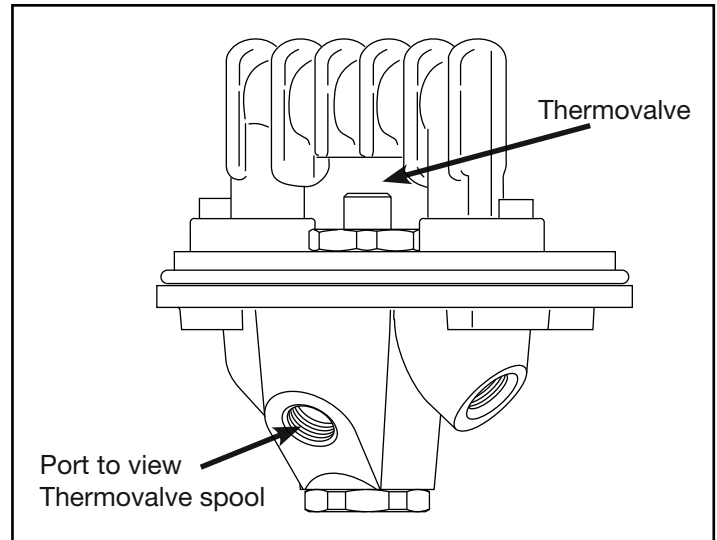


Figure 1