

ELECTRIC HEATER AND THERMOSWITCH TESTS

There are various configurations of electric heaters and thermostats available for Diesel Pro and Fuel Pro. These include 12 VDC heaters, 24 VDC heaters, 120 VAC heaters, thermostat, and combination heater thermostat. 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 is recommended.
- Current Flow Meter (Clamp-on type for DC current).
- Ice, dry-ice, CO2 or some means of chilling the thermostat.
- A flameless source of heat such as an infrared heat lamp or a heat gun.
- **DO NOT USE** a test light that has a wire probe for any of these tests. If the insulation of the wiring is punctured, moisture and road salt can penetrate into the wires creating a corrosion issue and potential failure.

To test the heaters:

1. Disconnect the heater from the harness.
2. Connect the Ohm meter leads to the pins of the heater (connect to a pin and the bushing for heaters with one pin).
3. Using the chart below read the value of the resistance and determine if the heater is within the acceptable range.

ELECTRIC HEATER	WATTS	RESISTANCE RANGE IN Ohms
12 VDC (two pin)	250 W	0.6 to 0.8
12 VDC (single pin)	250 W	0.6 to 0.8
12 VDC (single pin)	150 W	0.8 to 1.1
12 VDC (two pin)	150 W	0.8 to 1.1
24 VDC (two pin)	250 W	2 to 2.5
24 VDC (single pin)	250 W	1.8 to 2.3
24 VDC (single pin)	150 W	3.6 to 4.1
120 VAC	75 W	173 TO 203
120 VAC	37 W	369 TO 411

To test the 12 VDC Thermostat:

1. Disconnect the thermostat harness.
2. Connect the Ohm meter leads to the pins of the thermostat.
3. This test requires the thermostat to be below 40 degrees F. (use one of the cooling devices listed above to reach that temperature). The resistance should be less than 0.1 Ohm.
4. Raise the temperature above 60 degrees F (use one of the heating devices listed above to raise the temperature). The resistance should be more than 10M Ohms.



To test the Combination Heater Thermostat:

1. Disconnect the heater/thermostat combination unit from the harness.
2. Connect the Ohm meter leads to the heater pins.
3. This test requires the thermostat to be below 40 degrees F. (use one of the cooling devices listed above to reach that temperature).
 - The 12 VDC 150 W (two pin) heater should read 0.8 to 1.1 Ohms.
 - The 24 VDC 250 W (two pin) heater should read 0.2 to 2.5 Ohms.
4. Now raise the temperature of the combo heater above 70 degrees F (use one of the heating devices listed above to raise the temperature).
5. The combination units should read an open circuit.



FLUID HEATER TESTS

To test the fluid heater thermovalve in the 382 Fuel Pro:

1. Drain the Fuel Pro completely.
2. Remove the fluid hoses going 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. **USE CAUTION** when removing fluid heater hoses when the coolant is still hot.
3. Remove the bottom plate.
4. While looking into the fluid port of the bottom plate (see diagram), flow cold water over the thermovalve for 30 seconds, then run hot water over the thermovalve and determine if the thermovalve spool is opening and closing.
5. Replace the bottom plate seal and install onto the Fuel Pro. There are two styles of bottom plates, torque the collar version to 50 – 60 ft lbs (the use of 2-3 drops of Loctite 406 is recommended to secure the bottom collar). Torque the bolts on the bolt-on version bottom plate to 10 ft lbs.
6. Reconnect the fluid hoses to the bottom of the Fuel Pro.
7. Fill the Fuel Pro with fuel and restart the engine.

