

Crow Wing Power

Trouble Shooting Electric Water Heaters

An electric water heater is a reliable device capable of providing years of trouble-free operation. However, if your water heater malfunctions, here are some suggestions on how to diagnose and fix common problems.

CAUTION!

These steps assume you have the training and tools to work safely around energized electric circuits. If in doubt, please contact a professional!

SYMPTOMS-- NO HOT WATER

- Check for **240 Volts** at the water heater
 - No Voltage**
 - 1) Check for tripped circuit breakers or blown fuse
 - 2) Reset **RED** high limit button
 - 3) If you have controlled water heating, Crow Wing Power radio control may have one leg of the 240V circuit turned off so 120V may still be present.
- **240 Volt** power to the heater (still will not heat)
 - 1) Turn Power **Off** and check with ohm meter
 - 2) Disconnect two leads from the top element
 - Check continuity of element with ohm meter from terminal to terminal-should read approximately 13 ohms
 - Check continuity from each terminal to the metal tank-should read **0**. Any reading other than zero, the element should be replaced.
 - Check the bottom element, the same way as the top
 - Reconnect all wires to the terminals

240 Volt Power **OFF** (testing the thermostat, assume tank is cold)

- Both elements tested ok
- Move the thermostats out away from the tank, leaving all wires attached and not touching anything. Adjust the thermostat setting to **zero**.
- Using a clamp-on amp meter, attach it around a power wire on the top element. (0-60 amp scale)
- Turn the 240 volt power to the water heater **"ON"**. There should be current flowing into the tank (assume water temp is below thermostat setting).
- Using a match or torch, apply heat to the back of the top thermostat until it clicks. The amp meter should still show current draw as the circuit to the top element opens and the circuit closes to the bottom element.
Repeat the same steps to test the bottom thermostat.

Remember the top element heats first; the bottom element secondly.

SYMPTOMS-- LIMITED HOT WATER

If the temperature of the water appears normal, but the quantity is limited, then you should focus your troubleshooting on the lower element, thermostat and related wiring

- Follow the above steps for the lower element
- If the components check out electrically, then the "limited" hot water may actually be caused by excessive usage. Look for changes in usage patterns, leaking faucets, and malfunctioning mixing valves on the toilets.
- Verify thermostats and/or mixing valves are adjusted properly.

WATER QUALITY ISSUES (Note: Turn OFF power before any maintenance)

Heating water can magnify quality problems caused by mineral content and other contaminants. Here are some common water quality issues in our service territory:

- "Rotten Egg" smell. This is a very distinctive hydrogen sulfide odor caused by naturally occurring sulfates in the water reacting inside the tank. You can contact a Crow Wing Power customer service rep for details on how to remove and replace the anode rod.
- Musty or decaying smell. This may vary with seasons or local weather conditions and is likely caused by organic material decaying inside the tank. In some instances, it can affect your health so you need to correct the problem as soon as possible. Consult with a water quality professional to find the source of contamination and hopefully eliminate it.
- Rust and Mineral build-up. Most water has minerals in it, which can settle as the water is heated up. Over time, these settlings can build-up at the bottom of the tank, eventually plugging it up, ruining the lower element, and reducing water quality. You can reduce mineral build-up by regular flushing of the tank; open the bottom drain valve and let the water run until it is clear. Depending upon water quality, you may have to flush the water heater 1-2 times per year. If you have never done this, the drain valve may already be plugged shut. In that case, you can either try removing the valve or the bottom element (which creates a large, watery mess) or leave it alone and hope for the best.

WATER LEAKAGE

A good quality water heater may give up to 15-20 years of trouble-free service before rusting out. If a relatively new tank is leaking, here are some items to check:

- Water travels downwards, so start checking for leaks at the top of the tank. Look for loose fittings, bad soldered joints and plastic fittings. Avoid plastic pipe for water heater connections; these are prone to leaking from expansion & contraction.
- If a lot of water is coming out of the relief valve and if the water is excessively hot, this indicates an electrical problem causing the tank to overheat. See above tips for electrical trouble-shooting. Do Not attempt to remove and/or plug up a relief valve, uncontrolled pressure in a tank can cause a catastrophic failure. Normal water temperatures along with slight leakage may indicate a mineral build-up in the relief valve. If so equipped, you can flip up the release handle to flush out the minerals, which should stop the leak. If not, the valve will have to be replaced, be sure to buy an identical unit for safe operation.
- If the leak appears to be coming from the bottom, switch OFF the power, remove both access covers and check for leakage around the element gaskets. If this is the problem, drain the tank down, remove the element and replace the gasket (available at most hardware stores). If the element is questionable, now is the time to replace it. CAUTION, if you drain the tank, be sure to completely fill it with water and purge all the air from the lines before switching the power ON.

--WATER TEMPERATURE SAFETY NOTE--

For an off-peak system, a customer could set their thermostats from 140-160F for maximum capacity. If a scald danger exists, Crow Wing Power recommends installing an automatic mixing valve to limit temperatures at the faucet.

Hot water can cause scalding, especially with children; here's how quickly:

150F	-	2 seconds
140F	-	6 seconds
130F	-	30 seconds