

# Marathon<sup>®</sup> WATER HEATERS

## Service Technician's Troubleshooting Guide

**Note:** *This guide is intended for experienced contractors and service staff familiar with electric and plumbing test and service equipment, and proper safety procedures. Do not attempt any service work unless you are a qualified service technician!*

Symptom	Possible Cause	Test	Remedy
<b>No Hot Water</b>	<ol style="list-style-type: none"> <li>1. Tripped breaker at service panel</li> <li>2. Upper limit (ECO) on top thermostat has tripped</li> <li>3. Failed top element</li> <li>4. Malfunctioning upper thermostat</li> </ol>	<ol style="list-style-type: none"> <li>1. Check service panel</li> <li>2. Check reset button at upper thermostat</li> <li>3. Check element(s) resistance and continuity using VOM meter (see Element Guide). If good, check for voltage at element.</li> <li>4. Check for power to thermostat; If no power examine breaker and circuit</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset breaker</li> <li>2. Re-set ECO</li> <li>3. Replace elements if out of spec</li> <li>4. Replace thermostat, if necessary</li> </ol>
<b>Not enough hot water</b>	<ol style="list-style-type: none"> <li>1. Thermostat setting is too low</li> <li>2. Failed lower element</li> <li>3. Malfunctioning thermostat</li> <li>4. Heater is on load control program</li> <li>5. Dip tube failure</li> <li>6. Loose wire connection</li> <li>7. Incorrect sizing</li> <li>8. Incorrect plumbing (cold going into hot connection)</li> </ol>	<ol style="list-style-type: none"> <li>1. Check thermostat setting</li> <li>2. Check resistance/continuity of element</li> <li>3. Cool tank and then monitor if power is switched to top (first) and then to bottom.</li> <li>4. Research control hours</li> <li>5. Check faucet screens for particles. Run draw test with thermometer. Does hot water run out after just a few minutes?</li> <li>6. Check all wire connections.</li> <li>7. Is tank large enough for demand?</li> <li>8. Check for "cross-over" in plumbing lines</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to Page 9 of Owners Manual</li> <li>2. Replace failed element</li> <li>3. Replace thermostat if necessary</li> <li>4. Adjust control period</li> <li>5. Replace failed dip tube and flush tank.</li> <li>6. Tighten any loose connections.</li> <li>7. Increase tank capacity</li> <li>8. Separate Hot and Cold mixing</li> </ol>

Symptom	Possible Cause	Test	Remedy
<b>Repeated element failure</b>	<ol style="list-style-type: none"> <li>1. Sediment build up in bottom of tank</li> <li>2. Very hard water</li> <li>3. Watt density of elements too high</li> <li>4. Aggressive (Extreme pH) water</li> <li>5. Loose wire connection</li> </ol>	<ol style="list-style-type: none"> <li>1. Drain tank to check for sediment</li> <li>2. Perform water hardness/pH/dissolved solids test</li> <li>3. Refer to Element Data</li> <li>4. Check element series and wattage</li> <li>5. Check connections</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove sediment from tank bottom. See Tank Cleaning Instruction sheet.</li> <li>2. Install water softening equipment</li> <li>3. Install lower watt density elements (3800 or 3000 watt)</li> <li>4. Install Titanium sheathed elements</li> <li>5. Tighten any loose connections</li> </ol>
<b>Pressure relief valve leaks</b>	<ol style="list-style-type: none"> <li>1. Thermostat set too high</li> <li>2. Excessive water pressure</li> <li>3. Malfunctioning T&amp;P</li> </ol>	<ol style="list-style-type: none"> <li>1. Check thermostat settings</li> <li>2. Is back flow prevention installed?</li> <li>3. Examine for signs of mineral deposits</li> </ol>	<ol style="list-style-type: none"> <li>1. Lower thermostat setting – Refer to Page 8 – section titled: Water Temperature Setting</li> <li>2. Add expansion tank to water system</li> <li>3. If any concern about the condition of the T&amp;P valve, replace it. It is a safety device.</li> </ol>
<b>High electric bill ...or Water is Too Hot</b>	<ol style="list-style-type: none"> <li>1. Hot water leak somewhere in plumbing system</li> <li>2. Above normal use</li> <li>3. Element shorted to ground</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect water system</li> <li>2. Review patterns of use</li> <li>3. Check element filament wire for continuity/resistance (See Element Guide) Check resistance terminals to brass element screw plug (ground)</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair leaks</li> <li>2. Monitor hot water usage</li> <li>3. Replace element if necessary</li> </ol>

Symptom	Possible Cause	Test	Remedy
<b>Water on the floor near heater</b>	<ol style="list-style-type: none"> <li>1. Overhead leak in plumbing</li> <li>2. Weeping T&amp;P valve</li> <li>3. Union connections at top of heater leaking</li> <li>4. Element seal leaking</li> <li>5. Tank has failed</li> <li>6. Hydrostatic pressure – New cement floor – Water appears as narrow halo.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for plumbing leaks</li> <li>2. Check T&amp;P drain pipe for water</li> <li>3. Examine union connections; seal rings</li> <li>4. Inspect elements</li> <li>5. Carefully observe source of water leaking from heater.</li> <li>6. Tape clear plastic to floor around water heater; Observe for several days. Presence of moisture on underside of plastic is from concrete.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten or repair connections</li> <li>2. See “Relief Valve Leaks” above</li> <li>3. Repair/tighten connections, or replace damaged seal rings</li> <li>4. Tighten element, or replace gasket</li> <li>5. Replace heater if determination is made it is an internal leak</li> <li>6. Further aging of concrete</li> </ol>