# Section VII. Troubleshooting



## General:

⚠**NOTE:** These instructions are intended for the use of qualified personnel trained and experienced in the installation and servicing of this type of heating equipment and its related system components. Some states may require installation and service personnel to be licensed. Persons not qualified should not attempt to repair this equipment according to these instructions.

⚠**WARNING:** Never leave a jumper wire connected to keep a heater running. A jumper wire should be used as a test device only, as it is not a cure for a defective control.

⚠**CAUTION:** Never allow the main burner to operate more than five seconds with the filter system shut off. Serious damage to the heater will result. Anytime the heater bangs or knocks, it indicates a water void or lack of water flow. Shut off heater immediately if this occurs.

## ⚠Wiring:

As a preliminary check, make sure that all wire connections are clean and tight and that all wiring conforms to the wiring diagrams. See Figures 30 and 33.

# Troubleshooting Chart

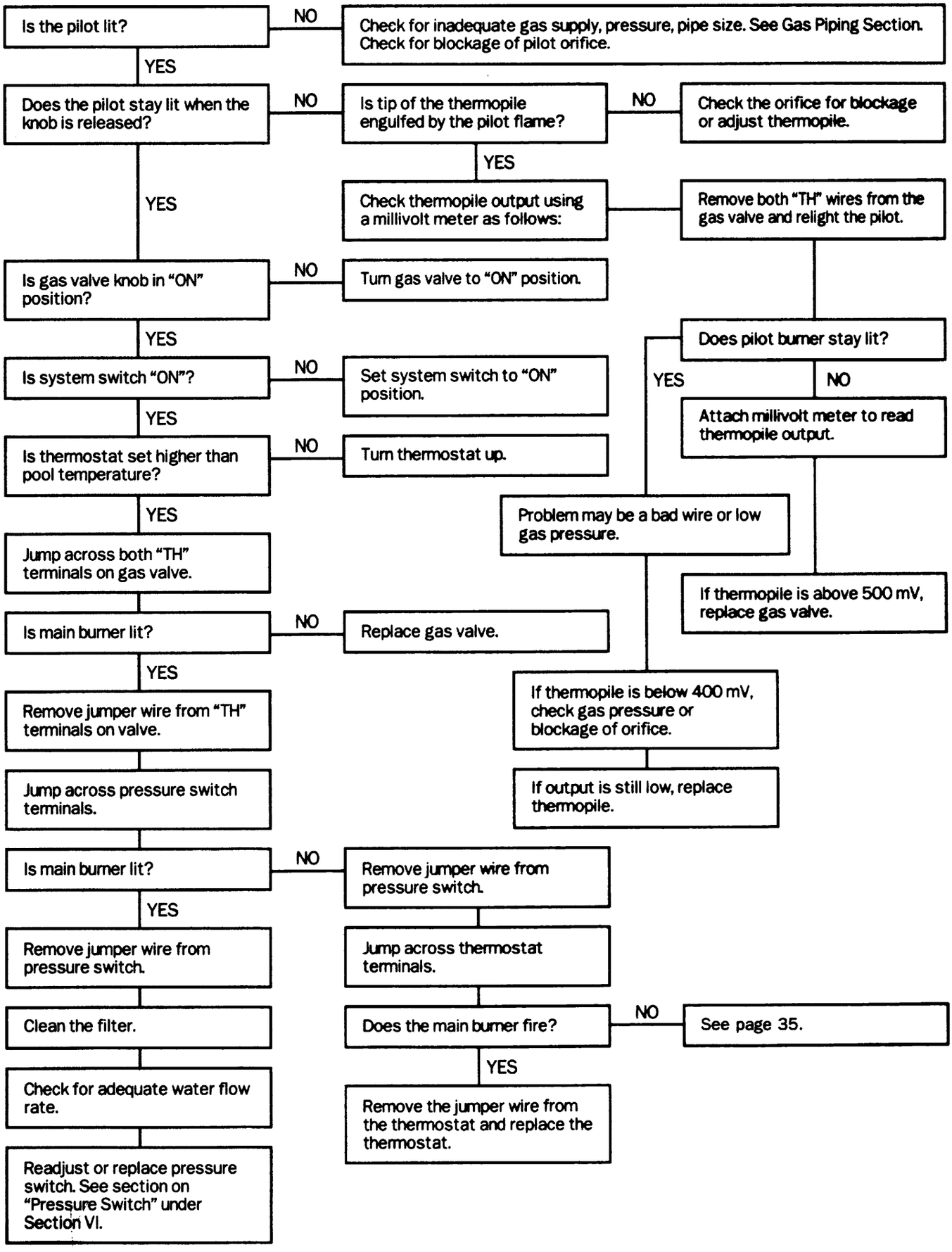
This chart may be used as a quick reference guide for maintenance and service problems. FOR QUALIFIED SERVICE PERSONNEL ONLY.

| PROBLEM | POSSIBLE CAUSES | REMEDY |
|---|---|---|
| HEATER WILL NOT FIRE UP. | | See Troubleshooting Procedure That Pertains To Your Heater, (Millivolt or Electronic Ignition). |
| HEATER CYCLING ON AND OFF CONTINUOUSLY. | Time Clock Set Wrong. | Reset Clock. |
| | Filter Is Dirty. | Clean Filter. |
| | External By-Pass Out Of Adjustment, (Where Used). | Adjust By-Pass. |
| | Pressure Switch Out Of Adjustment. | Adjust Pressure Switch. |
| SOOTING OF THE HEAT EXCHANGER. | High Water Flow Rates (Above 125 GPM). | Reduce Flow Rate By Adding A Manual By-Pass Valve. |
| | Internal By-Pass Stuck Open. | Check For Excessive Hardness Or Acidity That May Have Damaged Valve. Repair Or Replace. |
| | Lack Of Air For Combustion. | Provide Adequate Air. See Venting Installation. |
| | Low Fuel Volume. | Correct With Proper Gas Line Sizing. |
| | Improper Venting. | Provide By Proper Venting. See Section II. |
| | Burner Inlet Throat Blocked. High Pressure/Low Pressure. | Clean Burners Adjust Gas Pressure. |
| | Collapsed Combustion Chamber. | Replace Combustion Chamber. |
| PILOT OUTAGE (MILLIVOLT ONLY). | Low Gas Pressure. | Increase Pressure. |
| | Restricted Gas Flow. | Clean Pilot Orifice Or Tubing. |
| | Weak Thermopile. | Replace Thermopile. |
| JACKET SURFACE TEMPERATURES EXCESSIVE. | Broken Refactory. | Replace Refactory. |
| LIME SCALE. | By-Pass Valve Stuck Open. | Inspect By-Pass Movement And Repair. |
| | Thermal Control Valve Not Working. | Check For Movement. Replace If No Movement. |
| | Water Chemistry Out Of Balance. | See Section On Pool Water Chemistry. |
| | Unecessary External Manual By-Pass Installed Or Out Of Adjustment. | Close Manual By-Pass Valve And Remove Or Adjust Properly. See Section On By-Pass Valve. |
| HEATER WILL NOT BRING POOL TO DESIRED TEMPERATURE. | Gas Line Too Small. | Check Gas Pipe Size In Figure 20. |
| | Heater Too Small. | Check Sizing Chart. Install Larger Heater If Necessary. |
| | Time Clock Is Set Incorrectly. | Reset Time Clock. |
| | Filter Not Cleaned Often Enough. | Clean Filter More Frequently. |
| | Thermostat Out Of Adjustment Or Defective. | Test Thermostat. Replace If Necessary. |
| | Pressure Switch Inoperative. | Test Pressure Switch. Replace If Necessary. |
| LEAKING HEAT EXCHANGER. | Overly Acid Water Or Freeze-Up. | Replace Heat Exchanger And Maintain Water Chemistry Properly. |
| LEAKING AT WELL. | Overly Acid Water Or Freeze-Up. | Replace Well. Maintain Water Chemistry. |
| LEAKING AT UNION NUT CONNECTIONS. OVERHEATED O-RINGS (BRITTLE). | Heater Continues To Run After Pump Shuts Off. | See Pressure Switch Adjustment. Replace Leaking O-Rings. |
| | Refactory Damage. | Replace Refactory. |

# Heater Will Not Fire - (Millivolt)

**⚠WARNING: For qualified service personnel ONLY!**

This procedure assumes that the filter system is operating. Jumper wires are used for system checkout only. Remove all jumper wires following system checkout or damage to heater may result.



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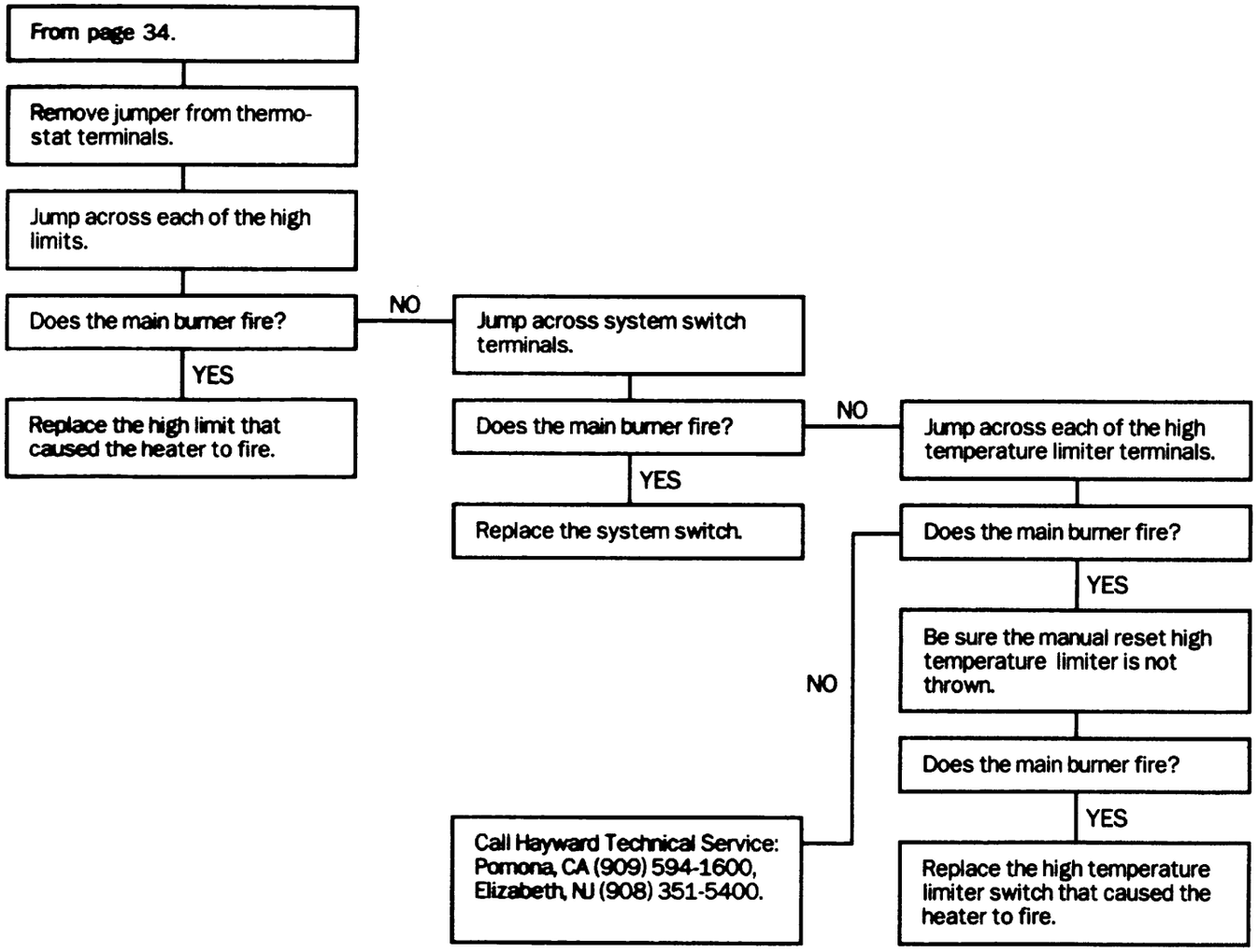
This procedure assumes that the filter system is operating. Jumper wires are used for system checkout only. Remove all jumper wires following system checkout or damage to heater may result.



# Troubleshooting Chart (Electronic)

## H-Series Heater Diagnostic Guide

| Code | Fault | Diagnosis Step | Remedy |
|---|---|---|---|
| LO | Water Pressure Switch Fault | 1. Verify that pump is running. | This is a normal display when the pump is off. Turn pump on. LO code should clear. If LO does not clear, proceed to step 2. |
| | | 2. Check for faulty wiring or connection. | Inspect water pressure switch wiring. Ensure wire harness terminals are securely fastened to spade terminals. If OK, proceed to step 3. |
| | | 3. Verify state of water pressure switch contacts. | Remove wire leads from switch and jumper leads. Measure continuity across switch with pump on. If closed, LO code is not caused by water pressure switch fault. If open, proceed to step 4. Remove jumper from wire leads and reconnect wire leads. |
| | | 4. Ensure that low pump pressure does not exist. | Clean filter or clear blockages. Check position of valves in plumbing system. If OK, proceed to step 5. |
| | | 5. Check for correct water pressure switch setting. | Adjust switch setting per installation manual. If LO does not clear, proceed to step 6. |
| | | 6. Water pressure switch is defective. | Replace water pressure switch. |
| | Automatic Temperature Limiter Switch Fault | 1. Check for faulty wiring or connection. | Inspect switch wiring. Ensure wire harness terminals are securely fastened to spade terminals. If OK, proceed to step 2. |
| | | 2. Verify state of temperature limiter switch's contacts. | Remove wire leads from switch and jumper leads. Operate heater. Measure continuity across switch. If closed, LO code is not caused by temperature limiter switch fault. If open, proceed to step 3 for outdoor units, and step 4 for indoor units. Remove jumper from leads and reconnect leads to temperature limiter. |
| | | 3. Check for high winds or severe downdrafting. | Check for high winds or severe downdrafts. If present, install HWS High Wind Stack. Otherwise proceed to step 5. |
| | | 4. Check for restricted or blocked vent on indoor units. | Check for restricted or blocked vent. If OK, proceed to step 5. |
| | | 5. Check for sooted or damaged heat exchanger. | Check for sooted or damaged heat exchanger. If OK, proceed to step 6. |
| | | 6. Temperature limiter switch is defective. | Replace temperature limiter switch. |
| | Manual Temperature Limiter Switch Fault | 1. Check for faulty wiring or connection. | Inspect switch wiring. Ensure wire harness terminals are securely fastened to spade terminals. If OK, proceed to step 2. |
| | | 2. Verify state of temperature limiter switch's contacts. | Remove wire leads from temperature limiter switch and jumper leads. Operate heater. Measure continuity across temperature limiter switch. If closed, LO code is not caused by temperature limiter switch fault. If open, proceed to step 3 for outdoor units, and step 4 for indoor units. Remove jumper from leads and reconnect leads to temperature limiter. |
| | | 3. Check for high winds or severe downdrafting. | Check for high winds or severe downdrafts. If present, install HWS High Wind Stack. Otherwise proceed to step 5. |
| | | 4. Check for restricted or blocked vent on indoor units. | Check for restricted or blocked vent. If OK, proceed to step 5. |
| | | 5. Check for sooted or damaged heat exchanger. | Check for sooted or damaged heat exchanger. If OK, proceed to step 6. |
| | | 6. Reset switch. | Reset switch. If switch trips again, proceed to step 7. |
| | | 7. Temperature limiter switch is defective. | Replace temperature limiter switch. |
| | Limit Switch Fault | 1. Check for faulty wiring or connection. | Inspect limit switch wiring. Ensure wire harness terminals are securely fastened to spade terminals. If OK, proceed to step 2. |
| | | 2. Verify state of temperature limits' contacts. | Remove wire leads from limit switches and jumper leads. Operate heater. Measure continuity across limit switches. If closed, LO code is not caused by temperature limit switch fault. If open, proceed to step 3. Remove jumper from leads and reconnect leads to temperature limits. |
| | | 3. Verify that water flow is adequate. | Verify that water flow rate to heater is above minimum required (25 GPM). If OK, proceed to step 4. |
| | | 4. Temperature limit switch is defective. | Replace limit switch. |

# Troubleshooting Chart

**H-Series Heater Diagnostic Guide**

| Code | Fault | Diagnosis Step | Remedy |
|---|---|---|---|
| BO | Bypass Operation | 1. Check state of #2 dip switch on back of control module. | This is a normal display when heater is being controlled by a remote thermostat. No service is required. If heater is not being controlled by remote thermostat, change setting of #2 dip switch to "Off" position. |
| IF | Ignition Failure | 1. Ensure gas supply shutoff valves are open. | Ensure that main gas shutoff installed adjacent to heater is open. Ensure that knob on gas valve inside unit is in "On" position. If OK, proceed to step 2. |
| | | 2. Check for low gas supply pressure. | Ensure inlet gas supply pressure exceeds minimum value indicated on rating plate. If OK, proceed to step 3. |
| | | 3. Check for faulty igniter wiring or connection. | Inspect igniter wiring. Ensure igniter plug is securely plugged into back of control module. If OK, proceed to step 4. |
| | | 4. Check for faulty gas valve wiring or connection. | Inspect gas valve wiring. Ensure wire harness terminals are securely fastened to spade terminals on gas valve. If OK, proceed to step 5. |
| | | 5. Check for gas valve failure or gas valve relay failure. | 1. Measure voltage across gas valve during trial for ignition. If 24 vac is present and gas valve does not open, gas valve is defective. Replace gas valve. |
| | | | 2. If 24 vac is not present, gas valve relay on control module is defective. Replace control module. |
| SF | Temperature Sensor Input Failure | 1. Check for faulty wiring or connection. | Inspect sensor wiring. Ensure sensor is plugged into back of control module. If OK, proceed to step 2. |
| | | 2. Sensor is defective. | Replace temperature sensor. |
| HS | Maximum Return Water Temperature Exceeded | 1. Pool water temperature exceeds 104° F. | Verify set point setting of remote thermostat is at or below 104° F. If set point setting of remote thermostat is OK, or if heater is not configured for remote thermostat proceed to step 2. |
| | | 2. Verify that water flow is adequate. | Verify that water flow rate to heater is above minimum required. |
| HF | Flame Sense Fault | 1. Flame sense failure. | Replace igniter. |