

HEATER RETROFIT FOR 1995 - 1996 HOT SPRING AND TIGER RIVER SPAS

Watkins Manufacturing recommends the No-Fault Cartridge heater in 1995 to 1996 Hot Spring and Tiger River spa be replaced with a No Fault[®] Heater.

IMPORTANT: When performing this retrofit, always use a No Fault[®] Heater that has insulated wires on the cord. Yellow insulators identify the insulated wires over the flag terminals.

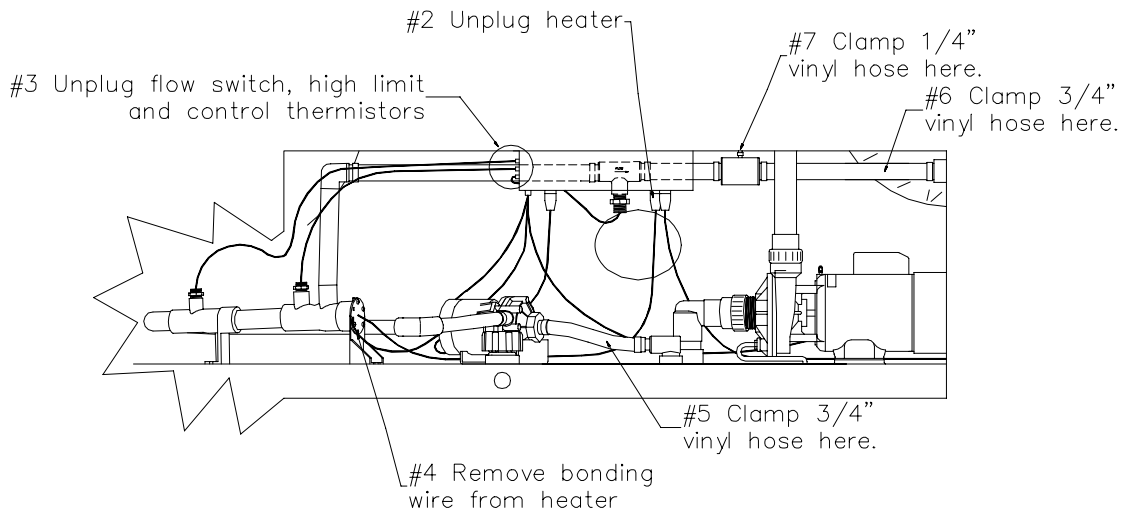
NOTE: While kit contains the necessary plumbing fitting (elbows, hose, spring clamps, etc.) to complete this retrofit. It does not include the No Fault[®] Heater or the heater cord adapter required. These items must be ordered separately. The part numbers for the No Fault[®] Heater and cord adapters are:

- No Fault[®] Heater, 6 KW – 73790
- No Fault[®] Heater, 4 KW – 73791
- Cord Adapter for 115 volt spas with square plugs – 71536
- Cord Adapter for 115 volt spas with Molex plugs - 71538
- Cord Adapter for 230 volt spas with square plugs – 71537
- Cord Adapter for 230 volt spas with Molex plugs - 71539

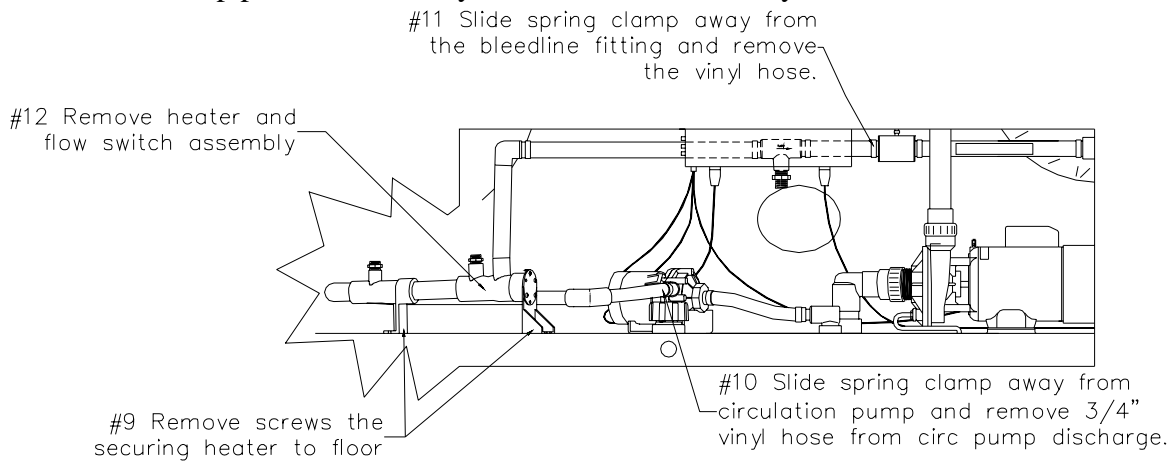
TOOLS REQUIRED:

4 pair Hose Clamp Pliers	1 pair Spring Clamp Pliers	1 pair Hose Cutters	1 Philips Screwdriver
1 Standard Screwdriver	1 Heat Gun	Rags for drying	Glue and Primer

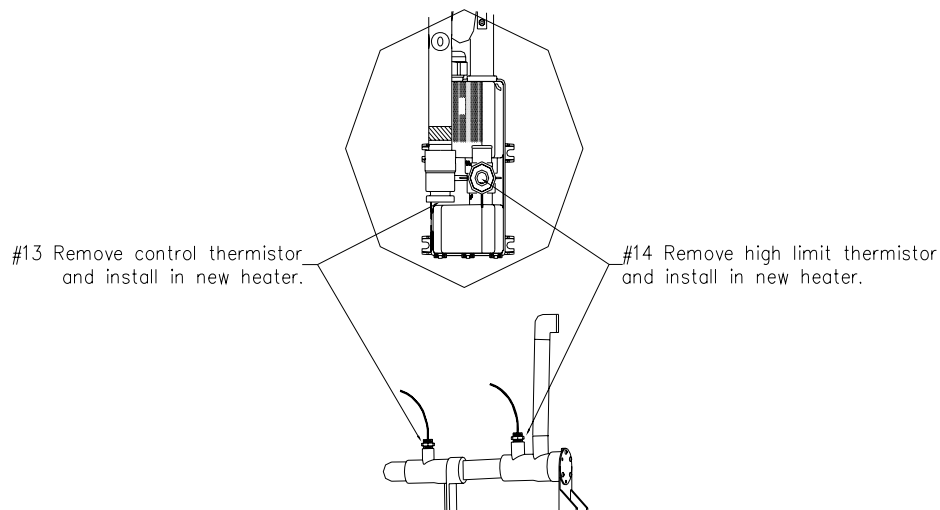
1. Disconnect power to the spa.
2. Unplug the cartridge heater from the control box.
3. Unplug the flow switch, high limit and control thermistors from the control box.
4. Using a standard screwdriver, remove the copper bonding wire from the bonding lug located on the heater.



5. Using the first pair of hose clamp pliers, clamp the 3/4" vinyl hose at the inlet of the circulation pump.
6. Using the second pair of hose clamp pliers, clamp the 3/4" vinyl hose on the discharge side of the bleed line coupling.
7. Use the third pair of hose clamp pliers to clamp the 1/4" vinyl hose attached to the bleed line coupler.
8. On TIGER RIVER Spas only: Clamp the 1/2" vinyl hose from the jet pump bleed line.
9. Using a philips screwdriver, remove the screws securing the cartridge heater and housing to the floor.
10. Using spring clamp pliers, slide the spring clamp away from the discharge of the circulation pump. Remove the vinyl hose from the discharge of the circulation pump. NOTE: Some water will drain from the vinyl hose and the circulation pump. This is normal. If the water does not stop or slow to a trickle after 10 to 20 seconds, ensure the hose clamp pliers are securely fastened around the vinyl hoses.

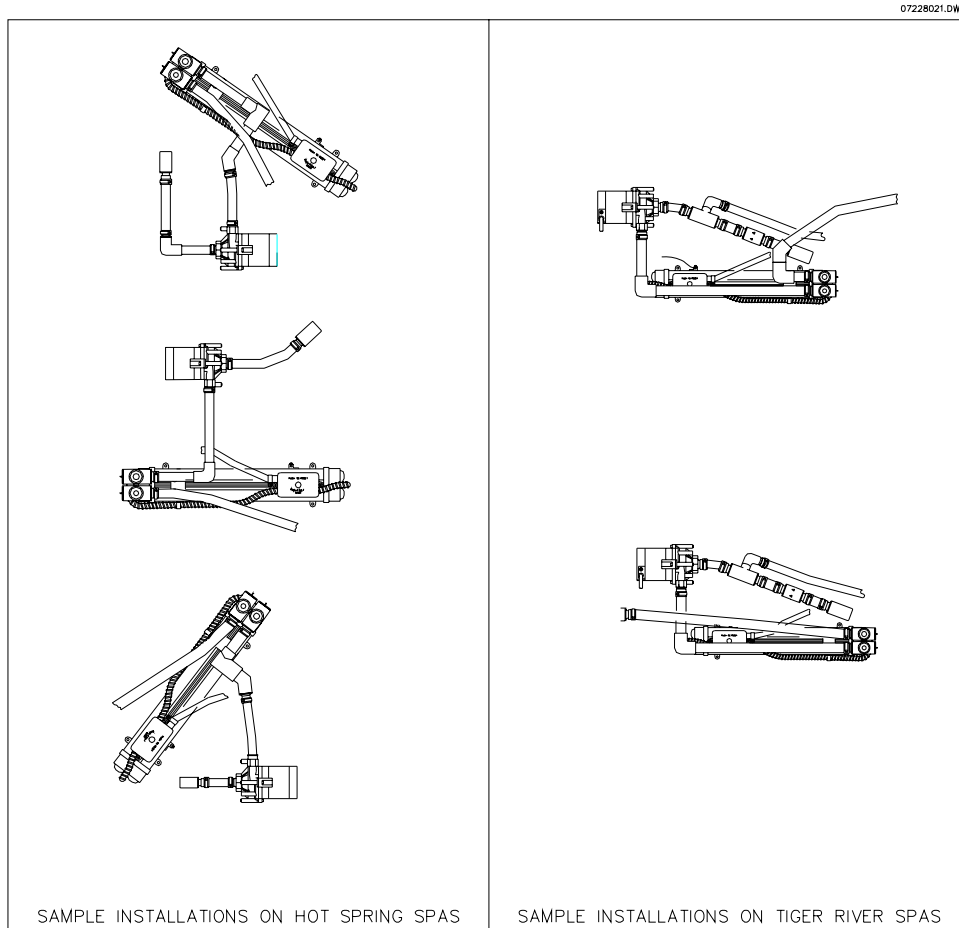


11. Using spring clamp pliers, slide the spring clamp away from the inlet of the bleed line coupling. Remove the 3/4" vinyl hose from the inlet of the bleed line coupling.
12. Carefully remove the entire heater/flow switch assembly from the equipment compartment.
13. Remove the control thermistor and o-ring from the old No-Fault heater and install it in the new No-Fault heater.



14. Remove the high limit thermistor and o-ring from the old No-Fault heater and install it in the new No Fault[®] heater.
 15. Test fit the No-Fault heater into the equipment compartment. The heater should be positioned to satisfy all of the following:
 - The high limit and control thermistor plugs can be plugged into the control box.
 - The heater inlet is attached to the circulation pump discharge. See Figure 1 on following page.
 - Ensure that the vinyl hose, installed between the heater inlet and circulation pump discharge, will not be kinked.
 - Ensure the routing for the heater discharge tubing to the bleed line is free of all kinks and obstructions.
- NOTE: In some cases, it may be necessary to use 90° or 45° elbows to plumb the inlet or discharge properly.
- Ensure the vinyl tubing on both the inlet and outlet of the No Fault[®] Heater does not form a loop where an air blockage can occur.
 - Examples of various plumbing configurations can be seen below.

DIAGRAM FOR THE DOMESTIC REPLACEMENT

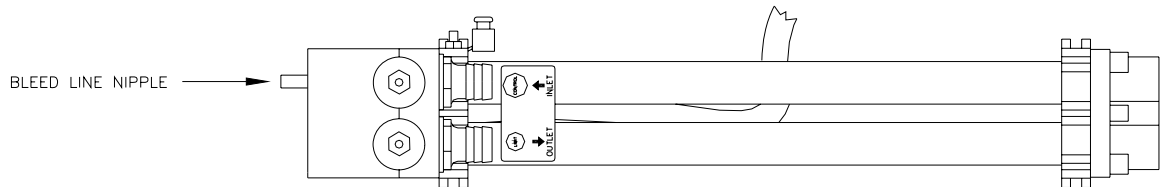


NOTE: The illustrations above are suggested configurations only. If you need to plumb the heater differently, try to prevent kinking of the vinyl hose and keep the number of plumbing fitting used to a minimum.

16. Connect the circulation pump discharge and the heater inlet using new 3/4" vinyl hose. Secure this hose using two 3/4" spring clamps.
17. Connect the heater discharge and the bleed line inlet using 3/4" vinyl hose. Secure this hose using two 3/4" spring clamps.
18. Plumbing the heater bleed line:

On HOT SPRING Spas, perform the following steps

- Attach the 1/4" vinyl hose to the heater bleed line and secure using 1/4" spring clamp.
- Using hose clamp pliers, clamp the 1/4" heater bleed line.
- Locate the jet pump bleed line.
- Using two hose clamp pliers, clamp the jet pump bleed line approximately 1" apart.
- Cut the 1/4" jet pump bleed line.
- Install the 1/4" bleed line tee and secure using 1/4" spring clamps.
- Connect the 1/4" vinyl hose from the heater bleed line to the 1/4" bleed line tee and secure using a 1/4" spring clamp.



On TIGER RIVER Spas, perform the following;

- Attach approximately 2" of 1/4" vinyl hose to the heater bleed line nipple.
 - Secure heater plug using 1/4" spring clamp.
 - Insert the 1/4" hose plug into the end of 1/4" vinyl hose and secure using 1/4" spring clamp.
19. Remove the hose clamp pliers and check for leaks.
 20. Secure the heater to the floor.
 21. Connect high limit and control thermistors to the control box.
 22. Determine which flow switch jumper is to be used in this retrofit;
 - If this retrofit is being performed on 115 volt spa, use the flow switch jumper with the red wire.
 - If this retrofit is being performed on a 230 volt spa, use the flow switch jumper with the blue wire.
 23. Install the flow switch jumper on the control box.
 24. Slide the heat shrink over the heater cord and slide it down the cord until it is well away from the end.
 25. Connect the heater cord to the heater adapter. Ensure the black, white and green wires of the heater are all connected to the same color on the heater adapter.
 26. Slide the heat shrink up the cord until terminals and the wires on the heater and heater adapter are covered.

27. Use a heat gun (or hair dryer) to shrink the heat shrink around the terminals and wires.
28. Plug the heater adapter into the heater receptacle on the control box.
29. Reattach the copper bonding wire from the control box to the heater.
30. Reconnect power to the spa.
31. Verify spa operation and verify the following;
 - Test the circulation pump flow. This is to ensure the new plumbing does not cause a low flow condition to exist. The flow rates are;
 - ✓ 20 seconds per gallon for 115 volt models.
 - ✓ 30 seconds per gallon (low speed) or 20 seconds per gallons (high speed) on 230 volt models.
 - Turn the thermostat up and test the amperage draw of the heater. This ensures the heater is connected to the spa and the flow switch jumper is in place.
32. Remove the following No Fault[®] retrofit addendum from these instructions and give it to the customer. This addendum review the new troubleshooting procedures for spas equipped with a No Fault[®] retrofit (specifically the operation of the power down reset).

Tri-Bend No Fault[®] Heater Retrofit Owner's Manual Addendum

Dear Spa Owner:

Your original No-Fault heater has been replaced with the new No Fault[®] Heater. The use of the new No Fault[®] Heater allows the flow switch to be eliminated from the spa. However, the No Fault[®] Heater contains a power down reset (PDR), which performs the same function as the flow switch: preventing heater operation during a no or low water flow condition.

If such a condition exists, the PDR on the No Fault[®] Heater may trip. To reset it, simply turn off power to the spa on both the 20 amp and 30 amp breakers located in the subpanel for approximately 30 seconds. If the heater energizes once you turn the power back on, this indicates a reduced water flow through the heating system. Tripping of the PDR is normally a result of one or a combination of these problems:

- 1) a clogged filter cartridge,
- 2) blockage within the system plumbing,
- 3) the power was not disconnected to the spa before it was drained, or
- 4) An air lock in the plumbing lines.

Once the problem has been identified and corrected, the PDR will be able to reset, which will energize the heater.