



SERVICE PROCEDURE RG-V
Gas Valve
Testing and Replacement (White Rodgers/Robertshaw)

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The gas valve is a non-repairable device. If trouble shooting has determined a problem with the gas valve, it must be replaced.

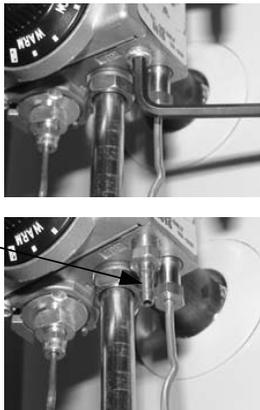
If the burner and/or pilot do not function, service checks for gas pressure, thermocouple output, magnet assembly and ECO are to be performed. If these check OK, the gas valve may be faulty.

LINE PRESSURE

The gas valve is designed for a maximum line pressure of 14.0" w.c. and a minimum line pressure of 1.0" w.c. over the water heater rated manifold pressure (check rating plate). Line pressure must be checked with burner on and burner off to assure proper readings.

MANIFOLD PRESSURE TESTING (this procedure assumes a maximum line pressure of 14.0" w.c.)

- Step 1. Set gas valve to "OFF" position.
- Step 2. Remove pressure tap plug and install pressure tap.
- Step 3. Connect manometer to pressure tap.
- Step 4. Follow lighting instructions and proceed to light main burner and observe manometer reading.
- Step 5. Proper operating range for natural gas is 4.0 ± 0.3" W.C.
Proper operating range for L.P. gas is 10.0 ± 0.5" W.C.
- Step 6. If pressure is OK, set gas valve to "OFF" remove manometer and pressure tap and replace pressure tap plug. Check for gas leaks before placing water heater back in operation. If pressure is out of the specification noted in step 5, proceed to step 7 or 8 for proper service procedure.
- Step 7. For White Rodgers control, the manifold pressure is not adjustable. If manifold pressure is outside the range in step 5, the control must be replaced.
- Step 8. For Robertshaw control, the manifold pressure is adjustable, proceed to step 9 for adjustment procedure
- Step 9. While burner is in operation, remove regulator access cap to expose the regulator adjusting screw. With small screw driver, rotate adjusting screw clockwise to increase pressure and counter clockwise to decrease pressure.



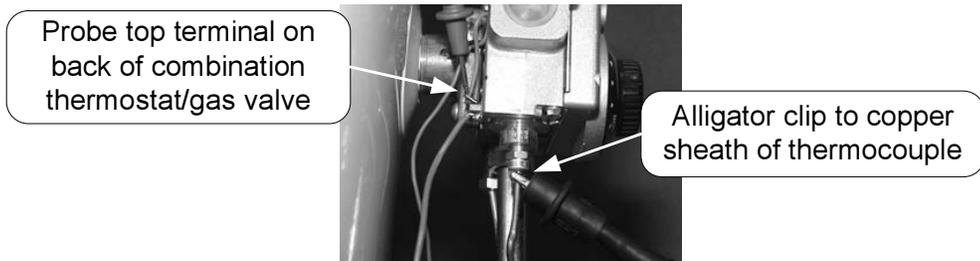
- Step 10. Replace regulator access cap, set gas valve to "OFF". Remove manometer and pressure tap and replace pressure tap plug. Check for gas leaks before placing water heater back in operation.

THERMOCOUPLE TESTING

See SERVICE PROCEDURE RG-II

MAGNET ASSEMBLY TESTING (White Rodgers Control)

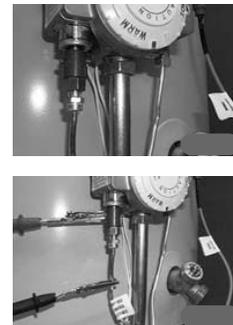
- Step 1. Following the lighting instruction label on the heater, proceed to light the pilot and allow to operate for three minutes. If the pilot will not stay lit, hold the pilot button (located on the gas valve) down during this test.
- Step 2. Using a multimeter capable of measuring millivolts, connect one lead using an alligator clip to the copper sheath of the thermocouple, use the second lead of the multi meter to probe the top terminal located at the back of the gas valve.



- Step 6. With a meter reading of 13 millivolts or greater, rotate knob of combination thermostat/gas valve to the “OFF” position.
- Step 7. The magnet should remain closed for a drop of at least 6 millivolts. You will here a “snap” or “click” sound when the magnet opens, if you hear this sound prior to a drop of 6 millivolts, the magnet is out of specification and the gas valve should be replaced.

MAGNET ASSEMBLY TESTING (Robertshaw Control)

- Step 1. Disconnect thermocouple from gas valve.
- Step 2. Connect a thermocouple adaptor (BWC P/N 239-44642-00, Robertshaw P/N 75036) at the thermocouple location in the gas valve.
- Step 3. Reconnect thermocouple to adaptor. Make certain all connections are tight (finger tight plus 1/4 turn).
- Step 4. Using a multimeter capable of measuring millivolts, connect one alligator clip to the set screw of the adaptor and the other alligator clip to copper portion of the thermocouple.
- Step 5. Following the lighting instruction label on the heater, proceed to light the pilot and allow to operate for three minutes.
- Step 6. With a meter reading of 13 millivolts or greater, rotate knob of gas valve to the “OFF” position.
- Step 7. The magnet should remain closed for a drop of at least 6 millivolts. You will here a “snap” or “click” sound when the magnet opens, if you hear this sound prior to a drop of 6 millivolts, the magnet is out of specification and the gas valve should be replaced.



ECO (Energy Cut Off) TESTING

- Step 1. Disconnect thermocouple from gas valve.
- Step 2. Using a multimeter capable of measuring Ohms (or continuity), attach one lead (alligator clip) to the pilot tube. Insert the other lead (probe) fully into the magnet opening. Be sure the probe makes contact only at the top center of the magnet opening. Do not allow the probe to make contact with the threaded sides of the opening.
- Step 3. If continuity is indicated, the ECO is OK. If continuity is not indicated, the ECO has opened and the gas valve must be replaced.



COMBINATION THERMOSTAT/GAS VALVE REPLACEMENT

- Step 1. Rotate knob of the gas valve to the “OFF” position.
- Step 2. Turn off gas supply to water heater.
- Step 3. Disconnect gas supply line from gas valve.
- Step 4. Turn off water supply and drain water heater completely.
- Step 5. Remove outer jacket burner access door.
- Step 6. Right side inner door removal.

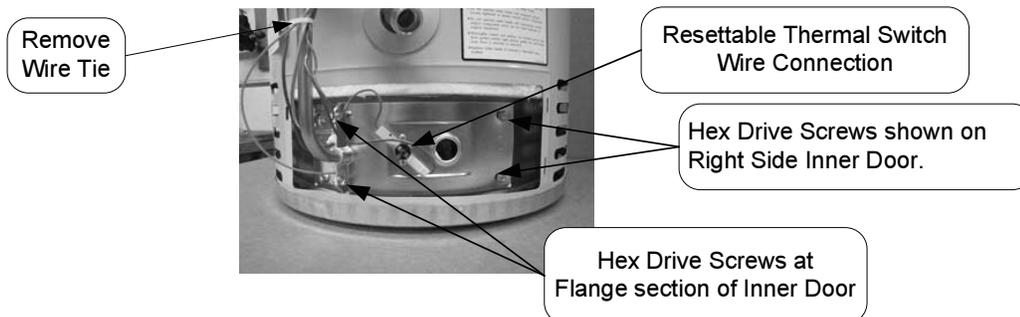
For White Rodgers Control, depress knob slightly and rotate clockwise to the “OFF” position.



For Robertshaw Control, rotate knob clockwise to the “OFF” position.



- a) Disconnect resettable thermal switch wire leads (leading from gas valve) and remove wire tie from feedline.
- b) Remove (2) hex drive screws from right side inner door.
- c) Remove (2) hex drive screws from flange section of inner door.
- d) Remove right side inner door and set aside. Be careful not to damage gasket material on inner door.



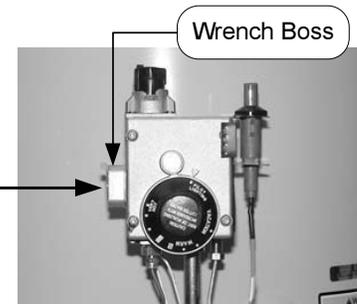
Step 7. Removal of gas valve.

- a) Disconnect main burner feedline, pilot tube and thermocouple from gas valve & remove burner from combustion chamber.

NOTE: Feed line nut for natural gas control uses right hand threads, LP control uses left hand thread.

- b) Remove piezo bracket with piezo igniter (refer to SERVICE PROCEDURE RG-IV) from gas valve.
- c) Remove gas valve from water heater, rotating counter clockwise using a control body wrench or a length of ½" NPT pipe threaded into inlet of control.

To remove or install control, insert only ½" NPT threaded pipe into inlet and use to loosen or tighten control.



Step 8. Installation of gas valve.

- a) Install new gas valve using a control body wrench or a length of ½" NPT pipe threaded into inlet of control. **DO NOT OVER TIGHTEN.** Use caution not to damage cast aluminum body of gas valve. Be certain not to damage the bundled wire leads.

Note: Gas valve must be installed in proper upright position to assure the feedline will align properly at the inner door flange. **DO NOT OVER TIGHTEN.** If control is turned past proper alignment, do not reverse direction to align.

- b) Reattach Piezo bracket with Piezo igniter to gas valve.
- c) Reattach main burner feedline, pilot tube and thermocouple to gas valve.

NOTE: Feedline nut for natural gas control uses right hand threads, LP control uses left hand thread.

- d) Gather wire leads of gas valve and Piezo igniter and secure along side of feedline using new wire tie provided.
- e) Connect gas supply piping to inlet of control. Use back up wrench on wrench boss of control, never use back up wrench on body of control.

Step 9. Reinstallation of inner door assembly.

- a) Prior to reinstallation of inner door, fully inspect inner door gasket for the following:
- > Tears
 - > Missing Material
 - > Cracks
 - > Dirt or debris
 - > Gasket Adhesion to inner door
 - > Other imperfections that will inhibit proper seal
 - > Material left on combustion chamber

If the gasket is not effected by any of the above, gasket replacement will not be required. If replacement is required, replace using new gasket kit following the instructions provided with kit.