



Atmospheric ECO-MAGNUM SERIES™

Ultra Low NOx Gas Water Heaters



SERVICE

MANUAL

Troubleshooting Guide
and Instructions for Service

(To be performed ONLY by
qualified service providers)

Models Covered by This Manual:

U175S*RN
U2XR75S*RN
U100T*RN
U75T80R*N
U100T88R*N
(* Denotes Warranty Years)

The Bradford White
Atmospheric ECO-MAGNUM
Ultra Low NOx Gas Water
Heaters

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ECO-MAGNUM

75/100-Gallon Atmospheric

▲ WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury, or death.

FOR YOUR SAFETY

Do not store or use gasoline or other flammable, combustible, or corrosive vapors and liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS

Do not try to light any appliance.

- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

▲ CAUTION

Incorrect operation of this appliance may create a hazard to life and property and will nullify the warranty.

▲ DANGER

Do not store or use gasoline or other flammable, combustible, or corrosive vapors and liquids in the vicinity of this or any other appliance.

IMPORTANT

Before proceeding, please inspect the water heater and its components for possible damage. **DO NOT** install any water heater with damaged components. If damage is evident then please contact the supplier where the water heater was purchased or the manufacturer listed on the rating plate for replacement parts.

▲ WARNING

Water heaters are heat producing appliances. To avoid damage or injury, do not store materials against the water heater or vent-air intake system. Use proper care to avoid unnecessary contact (especially by children) with the water heater and vent-air intake components. **UNDER NO CIRCUMSTANCES MUST FLAMMABLE MATERIALS, SUCH AS GASOLINE OR PAINT THINNER BE USED OR STORED IN THE VICINITY OF THIS WATER HEATER, VENT-AIR INTAKE SYSTEM OR IN ANY LOCATION FROM WHICH FUMES COULD REACH THE WATER HEATER OR VENT-AIR INTAKE SYSTEM.**

▲ CAUTION

If sweat fittings are to be used **DO NOT** apply heat to the nipples on top of the water heater. Sweat the tubing to the adapter before fitting the adapter to the water connections. It is imperative that heat is not applied to the nipples containing a plastic liner.

▲ WARNING

Hydrogen gas can be produced in an operating water heater that has not had water drawn from the tank for a long period of time (generally two weeks or more). Hydrogen gas is extremely flammable. To prevent the possibility of injury under these conditions, we recommend the hot water faucet to be open for several minutes at the kitchen sink before you use any electrical appliance which is connected to the hot water system. If hydrogen is present, there will be an unusual sound such as air escaping through the pipes as hot water begins to flow. Do not smoke or have open flame near the faucet at the time it is open.

▲ WARNING

DO NOT ATTEMPT TO LIGHT ANY GAS APPLIANCE IF YOU ARE NOT CERTAIN OF THE FOLLOWING:

- Liquefied petroleum gases/propane gas and natural gas have an odorant added by the gas supplier that aids in the detection of the gas.
- Most people recognize this odor as a "sulfur" or "rotten egg" smell.
- Other conditions, such as "odorant fade" can cause the odorant to diminish in intensity, or "fade", and not be as readily detectable.
- If you have a diminished sense of smell, or are in any way unsure of the presence of gas, immediately contact your gas supplier from a neighbor's telephone.

Gas detectors are available. Contact your gas supplier, or plumbing professional, for more information.

▲ WARNING

FAILURE TO INSTALL AND MAINTAIN A NEW, LISTED 3/4" X 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE WILL RELEASE THE MANUFACTURER FROM ANY CLAIM THAT MIGHT RESULT FROM EXCESSIVE TEMPERATURE AND PRESSURES.

Introduction

It is intended for this manual to be used by qualified service personnel for the primary purpose of troubleshooting and repair of the Bradford White Atmospheric Ultra Low NOx Series of water heaters.

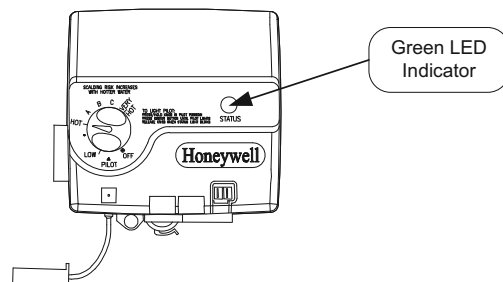
The Honeywell Gas Control will display error codes in the event of abnormal operation. Error codes are listed in the troubleshooting chart beginning on page 5 of this service manual. The troubleshooting chart will also indicate the probable cause for the error code and direct the service professional to a service procedure to properly diagnose the abnormal operation.

Contact the Bradford White technical support group immediately if diagnosis can not be made using the methods described in this service manual.

Tools Required for Service

Manometer:	A liquid "U" tube type or a digital type can be used. This device is used to measure gas and/or air pressure and vacuum.
Multi-Meter:	A digital type is strongly recommended. This device is used to measure electrical values. The meter you select must have the capability to measure volts AC, volts DC, Amps, micro-amps and ohms.
Electronic Probes:	In some cases, standard multi-meter probes will damage or simply not be effective to obtain certain voltage and ohm reading. It will be necessary to have special electronic "pin" type multi-meter probes. These probes are available at most electronic wholesale outlets.
Thermometer:	Used to measure water temperature. An accurate thermometer is recommended.
Water Pressure Gage:	Used to measure water supply pressure. Also used to determine tank pressure by adapting to the drain valve of the heater.
Various Hand Tools:	Pipe wrench, channel locks, open end wrenches (3/8", 7/16", 1/2"), 12" crescent wrench, Allen wrench set, screw drivers (common & Phillips), 1/4" nut driver, pliers (common & needle nose), socket set, side cutters, wire cutters, wire strippers, wire crimpers, torpedo level, small shop vac, step ladder, flashlight and 5 gallon pail.

Observe green LED indicator on gas control. Error flash codes are displayed with a three second pause before repeating. Check and repair the system as noted in the troubleshooting table below.



LED Status	Control Status	Probable Cause	Service Procedure
None (LED not on or flashing)	Gas valve is not powered.	1. Pilot flame is not present. Light pilot.	If the pilot will not stay lit replace thermopile, see page 11. If problem persists replace gas valve, see page 15.
One flash and three second pause.	1. If set point knob is in "PILOT" position then pilot flame is detected. Turn set point knob to desired setting 2. If set point knob is at desired setting the gas valve is waiting for a call for heat (no faults).	1. Gas valve is powered and waiting for the set point knob to be turned to a water temperature setting. 2. Temperature demand is satisfied.	Normal operation. Adjust thermostat to desired temperature level.
LED strobe (two quick flashes) and three second pause.	Thermostat calling for heat (no faults).	Tank temperature below setpoint of thermostat.	Normal operation.
LED on continuously.	Set point knob has been recently turned to the "OFF" position. Wait until LED goes out before attempting to relight	Set point knob was turned to "OFF" position.	LED will go out and the control will function normally when the pilot is lit.
Two flashes and three second pause.	Weak pilot flame detected. System will reset when pilot flame is sufficient.	1. Thermopile failure 2. Unstable pilot. 3. Pilot tube block or restricted. 4. Resettable thermal switch has opened.	1. See page 10. 2&3. See page 12. 4. See page 18.

<u>LED Status</u>	<u>Control Status</u>	<u>Probable Cause</u>	<u>Service Procedure</u>
Three flashes and three second pause.	Insufficient water heating. System will reset.	1. Thermowell sensor and chamber temperature sensor out of calibration. 2. Possible short.	1&2. Replace gas control, see page 15.
Four flashes and three second pause.	Excessive tank temperature. System must be reset.	1. Thermowell sensor out of calibration. 2. Faulty gas valve.	1. See page 14. 2. Replace gas control, see page 15.
Five flashes and three second pause.	Thermostat well fault.	1. Damage to the thermowell wire. 2. Thermowell sensor resistance out of range.	1&2. Replace gas control, see page 15.
Seven flashes and three second pause.	Gas valve electronic fault detected.	1. Control needs to be reset 2. Control is wet or physically damaged	1. Turn gas control knob to "OFF" position and then follow lighting instructions. 2. Replace gas control, see page 15.
Eight flashes and three second pause	False pilot flame present.	Pilot valve stuck in open position.	Replace gas control, see page 15.

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SERVICE PROCEDURE I

Burner and Inner Door/Gasket Removal, Inspection, Replacement and Reinstallation

Inner Door Removal Procedure

Step 1. Rotate the gas control knob to the "OFF" position.

Gas Control Knob Shown In "OFF" Position

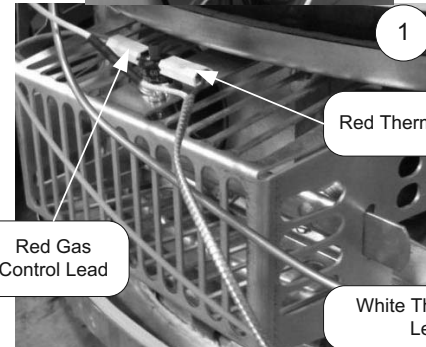


Step 2. Remove outer jacket burner access door.

Step 3. Remove wire clip from main burner feedline.

Step 4. Inner Door Removal.

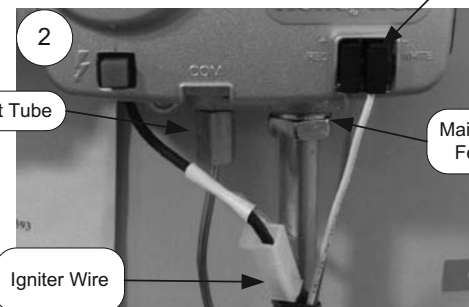
- Disconnect red thermopile lead and red gas control lead from resettable thermal switch. Disconnect white thermopile lead from the gas valve (see photos 1 and 2).
- Disconnect main burner feed line ($\frac{3}{4}$ " wrench), pilot tube ($\frac{7}{16}$ " wrench) and igniter wire from gas control (see photo 2).
- Remove (2) $\frac{1}{4}$ " hex drive screws from right side inner door (see photo 3).
- Remove (2) $\frac{1}{4}$ " hex drive screws from flange section of inner door (see photo 3).
- Remove (3) $\frac{1}{4}$ " hex drive screws from burner door (see photos 4&5). The burner door and burner are one-piece.



Red Thermopile Lead

Red Gas Control Lead

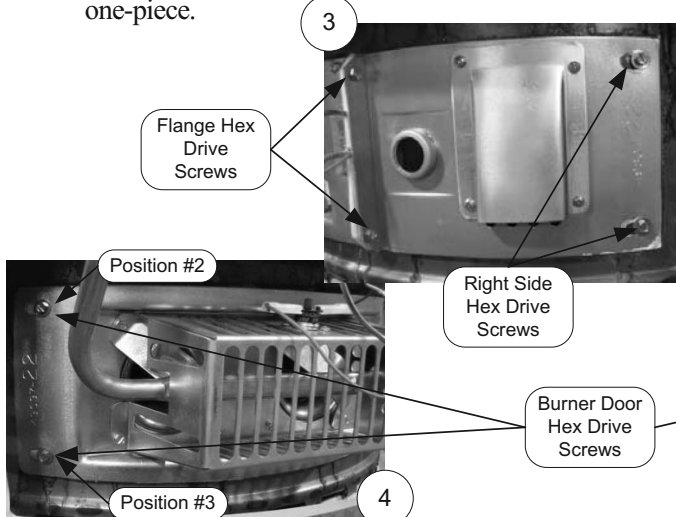
White Thermopile Lead



Pilot Tube

Main Burner Feedline

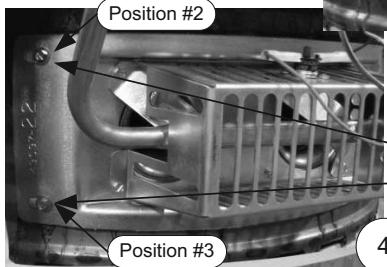
Igniter Wire



Flange Hex Drive Screws

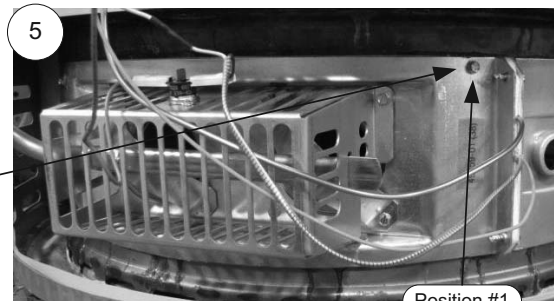
Right Side Hex Drive Screws

Burner Door Hex Drive Screws



Position #2

Position #3



Position #1

f) Remove burner and inner door and inspect per step 5.

Step 5. Fully inspect burner door and right side inner door gaskets for the following:

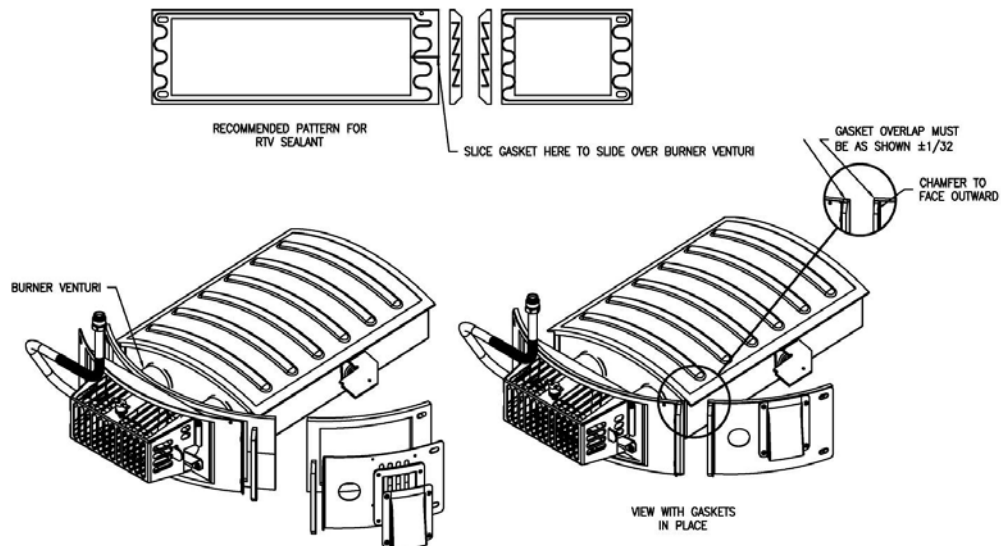
- >Tears
- >Missing Material
- >Cracks
- >Dirt or debris
- >Other imperfections that will inhibit proper seal
- >Gasket adhesion to inner door
- >Material left on combustion chamber (around opening)

If the gasket is not effected by any of the above, gasket replacement is not required. If replacement is required, proceed to **Inner Door Gasket Replacement Procedure.**

Inner Door Gasket Replacement Procedure**WARNING**

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

- Step 6. After inspection of inner door as noted in step 5, completely remove gasket and adhesive residue from burner door and right side inner door as needed.
- Step 7. Use RTV sealant (recommended bead size 1/8") to secure the inner door gasket to the inner door sections (right & burner). The burner door gasket must be sliced in the location shown on the illustration below in order to slide the gasket over the burner venturi. Refer to illustration below for proper RTV sealant application. Note the overlap configuration in the flange area of the inner door. Ensure that the chamfer of the gasket faces outward. Set the flange section first, this will help to achieve the proper overlap position.

**Re-installation of Inner Door With Gasket**

- Step 8. Clean any residual gasket residue or other debris from combustion chamber surface before re-installing the inner door/gasket assembly.
- Step 9. Place the burner door into position first. Tighten the feed line nut to the gas control. Use the 1/4" hex drive screw without the built-in washer to secure burner door to the chamber at position #1. Use the 1/4" hex drive screws with the built-in washer to secure the door at positions #2 & #3 (see photos 4&5, on page 7).
DO NOT OVER TIGHTEN SCREWS.

**WARNING**

Stripped fastener connections may allow for seal breach of inner door. A seal breach may result in a fire or explosion causing property damage, personal injury or death. Do not over tighten screws in steps 9, 11 and 12.

If a fastener connection is stripped, contact the manufacturer listed on the water heater rating plate.

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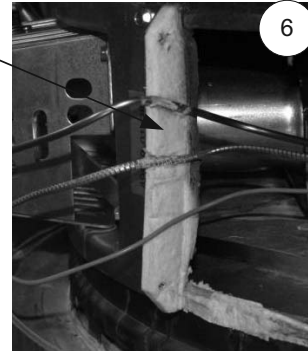
75/100-Gallon Atmospheric

SERVICE PROCEDURE I

Burner and Inner Door/Gasket Removal, Inspection, Replacement and Reinstallation

- Step 10. Position thermopile wires, pilot tube and igniter wire against burner door flange gasket (see photo 6).

Position Thermopile Wire,
Pilot Tube and Igniter Wire



- Step 11. Firmly place right side inner door flange against the burner door flange and secure with two 1/4" drive screws from step 4d (see photo 7). **DO NOT OVER TIGHTEN SCREWS.**
- Step 12. Align right side inner door to combustion chamber and verify the fastener holes of the combustion chamber are aligned with the right side inner door slotted opening (see photo 7). Verify seal integrity around combustion opening. Secure right side inner door using 1/4" hex drive screws from step 4c. **DO NOT OVER TIGHTEN SCREWS.** Verify both burner and right sides of the inner door are properly positioned and sealed against the combustion chamber.

Secure flange with 1/4"
drive screws.



Verify threaded hole
alignment with slotted
openings in inner door.

- Step 13. Reconnect red gas valve lead and red thermopile lead to resettable thermal switch. Reconnect white gas control lead to the gas valve (See photos 1&2 on page 7).
- Step 14. Reconnect the pilot tube to the gas control and tighten. Reconnect the igniter wire to the gas control.
- Step 15. Replace outer jacket burner access door.
- Step 16. To resume operation follow the instructions located on the lighting instruction label or the lighting instructions located in the installation and operation manual.

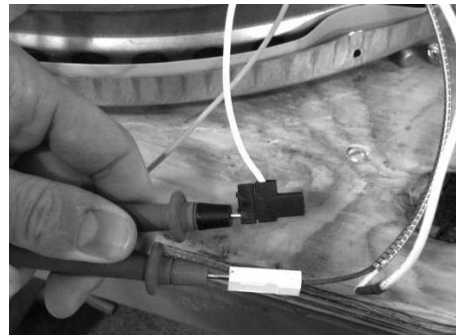
Closed Circuit Thermopile Testing

- Step 1. Closed circuit testing is the preferred method for testing thermopile. 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 (rotate the gas control knob to the pilot position, push and hold in) during this test.
- Step 2. Open the thermopile wire access covers. Using a multimeter capable of measuring DC millivolts, place one lead of the multi meter on the left side of the wire harness and place the second lead of the multi meter on the right side of the wire harness.
- Step 3. If the meter reads 300 DC millivolts or higher, the thermopile is OK. If reading is below 300 DC millivolts, replace the thermopile. For maximum thermopile life the thermopile should be replaced with a genuine Honeywell thermopile (BWC P/N 233-47063-00).



Open Circuit Thermopile Testing

- Step 1. Disconnect white thermopile wire from wire harness leading to the gas valve. Disconnect the red thermopile wire from the resettable thermal switch
- Step 2. Using a multimeter capable of measuring DC millivolts, connect one lead to the red thermopile wire and one lead to the white thermopile wire.
- Step 3. Following the lighting instruction label on the heater, proceed to light the pilot and allow to operate for three minutes. **It will be necessary to hold gas control knob down in the “PILOT” position continuously throughout this test.** Any reading over 400 DC millivolts indicates good thermopile output.



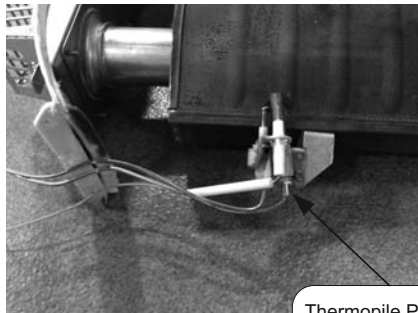
Thermopile Replacement

- Step 1. Turn off gas supply to water heater. Rotate gas control knob to the "OFF" position.

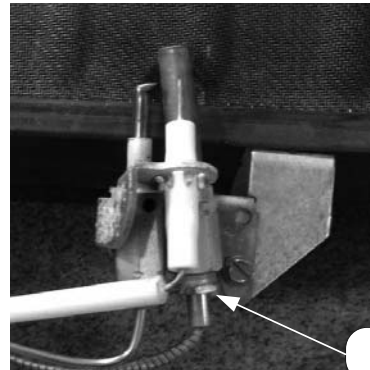


Gas Control shown in the "OFF" position

- Step 2. Remove outer jacket door.
- Step 3. Remove right side inner door and burner door per SERVICE PROCEDURE I, steps 3 and 4.
- Step 4. Follow the thermopile leads to the pilot bracket. Disconnect the thermopile from the pilot bracket (7/16" wrench).
- Step 5. Install new thermopile into pilot bracket and tighten the nut to the pilot bracket (7/16" wrench). Position thermopile wire against left side inner door flange at its original position. Connect the red thermopile wire to the red lead from the wire harness. Connect the white thermopile wire to the resettable thermal switch.
- Step 6. Install burner and inner door per SERVICE PROCEDURE I, steps 5 through 16.
- Step 7. To resume operation follow the instructions located on the lighting instruction label or the lighting instructions located in the installation and operation manual.



Thermopile Position



7/16" Thermopile Nut

SERVICE PROCEDURE III

Pilot Assembly Inspection, Cleaning and Replacement

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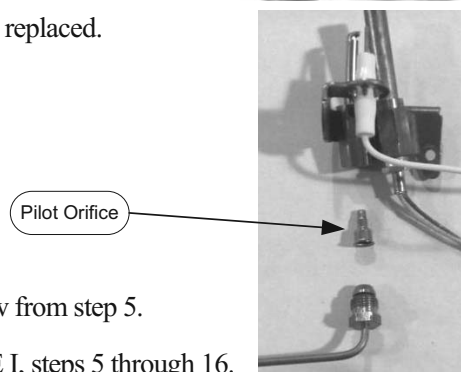
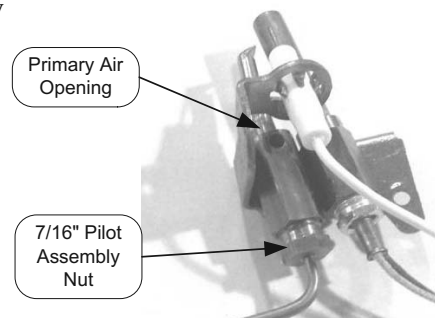
75/100-Gallon Atmospheric

Pilot/Electrode Assembly Inspection, Cleaning and Replacement



Gas Control shown in the "OFF" position

- Step 1. Turn off gas supply to water heater. Rotate gas control knob to the "OFF" position.
- Step 2. Remove outer jacket door.
- Step 3. Remove burner and right side of inner door per SERVICE PROCEDURE I, steps 3 and 4.
- Step 4. Remove burner assembly from combustion chamber.
- Step 5. Remove pilot/electrode assembly from burner (1/4" drive tool)
- Step 6. Inspect pilot for the following:
 - a) Primary air openings for blockage. Must be free from any debris (dirt, lint, etc).
 - b) Kinks or cracks in the pilot tube. If found, the pilot must be replaced.
- Step 7. Inspect pilot orifice:
 - a) Remove 7/16" nut from bottom of pilot assembly.
 - b) Remove pilot tube and pilot orifice.
 - c) inspect pilot orifice for blockage, must be cleaned or replaced.
- Step 8. Install pilot/electrode assembly to burner, secure with screw from step 5.
- Step 9. Install burner and inner door per SERVICE PROCEDURE I, steps 5 through 16.
- Step 10. To resume operation follow the instructions located on the lighting instruction label or the lighting instructions located in the installation and operation manual.

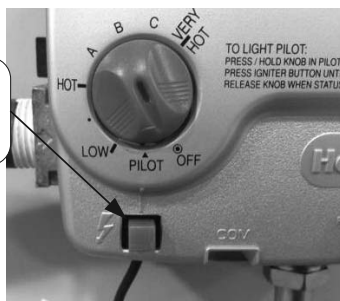


Igniter and Electrode Testing and Replacement

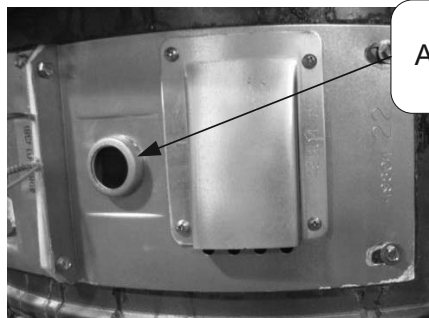
With the pilot not in operation (no pilot flame) you can check the igniter and electrode circuit by viewing pilot thru the sight glass located on the inner door and observing the spark action.

- Step 1. Remove outer jacket door.
- Step 2. Repeatedly depress the igniter button while viewing the pilot thru the sight glass. If a spark is present, the circuit is OK. If there is no spark, proceed to step 3.

Repeatedly
Depress
Igniter



View Spark
Action Through
Sight Glass



- Step 3 Remove white wire from igniter. Hold the igniter lead from the gas valve to an unpainted surface such as the feedline or gas control and depress the igniter. If there is a spark, the igniter is OK, the pilot is not functioning and must be replaced, see SERVICE PROCEDURE II for pilot replacement. If no spark is present the igniter is not functioning and the control must be replaced, see SERVICE PROCEDURE V

Igniter Lead



Manifold Pressure Testing (this procedure presumes a maximum line pressure of 14.0" w.c.)

- Step 1. Set the Gas Control to the "OFF" position.
- Step 2. Remove pressure tap plug and install 1/8" NPT pipe, coupling, & pressure tap.
- Step 3. Connect manometer to pressure tap.
- Step 4. Follow instructions located on the lighting instructions label and proceed to light the main burner and observe manometer reading.
- Step 5. Proper operating range for natural gas is: 5.0" \pm 0.5" w.c.
- Step 6. If pressure is within the range specified in the previous step, set Gas Control knob to the "OFF" position, remove manometer and pressure tap, and replace pressure tap plug. Check for gas leaks prior to placing water heater back into operation by following the instructions located on the lighting instruction label or the lighting instructions located in the installation and operation manual.
- Step 7. If gas pressure is outside the specification noted above, refer to "Honeywell Gas Control Testing, Disassembly, and Replacement" to replace Gas Control or valve body.



Gas Control shown in the "OFF" position

Pressure Tap
Shown Installed**Thermopile Testing**

See SERVICE PROCEDURE II

ECO (Energy Cut Out) Testing

The Honeywell Gas Control is designed with an ECO device that will reset.

To reset the Gas Control after an error code (4), turn the Gas Control knob to the "OFF" position and wait a minimum of (5) minutes before relighting following the instructions located on the lighting instruction label or the lighting instructions located in the installation and operation manual.

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SERVICE PROCEDURE V

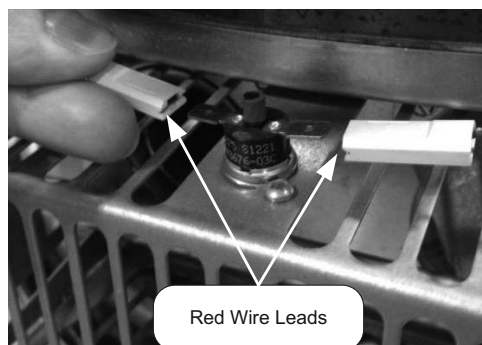
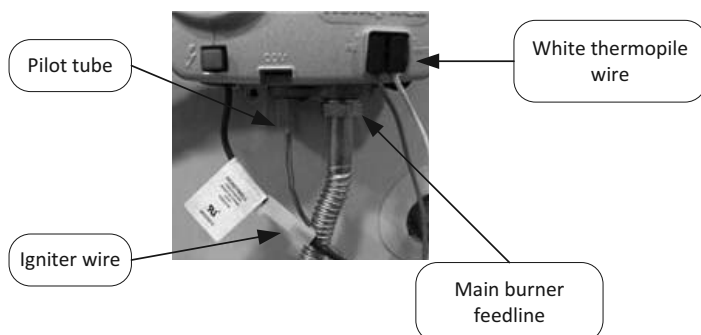
Gas Control Testing and Replacement

Gas Control Replacement

- Step 1. Rotate knob of the gas control to the "OFF" position.
- Step 2. Turn off gas supply to water heater.
- Step 3. Disconnect gas supply line from gas control.
- Step 4. Turn off water supply and drain water heater completely.
- Step 5. Remove the wire clip from the feedline.
- Step 6. Disconnect main burner feedline, pilot tube, white thermopile wire and igniter wire from gas control and bend the main burner feedline and pilot tube out of the way. Also disconnect the red wire leading from the thermopile from the red wire leading from the gas control.
- Step 7. Remove the gas control from the water heater by rotating counter-clockwise. It may be necessary to use a length of $\frac{1}{2}$ " NPT pipe threaded into the inlet of the gas control.



Gas Control shown in the "OFF" position



- Step 8. Install new gas control into the water heater.
 - a) Install gas control into water heater by rotating clockwise. DO NOT use a wrench on the gas control body or damage to the gas control may occur. If necessary, use a length of $\frac{1}{2}$ " NPT pipe threaded into gas inlet of gas control.
 - b) Position the main burner feedline and pilot tube back to the gas control and attach to the gas control. Connect the igniter wire and the white thermopile wire to the gas control. Connect the red wire from the gas control to the resettable thermal switch and connect the red wire from the thermopile to the resettable thermal switch.
 - c) Gather the igniter wire, white thermopile wire and red thermopile wire near the side of the feedline. Use the clip that was removed in Step 5 to secure the wires to the feedline.
 - d) Connect gas supply to inlet of gas control.
- Step 9. Resume the water supply to the water heater. Be sure that the tank is full before operation is resumed.
- Step 10. Check the main burner feedline and pilot feedline for gas leaks.
- Step 10. To resume operation follow the instructions located on the lighting instruction label or the lighting instructions located in the installation and operation manual.

Main Burner Inspection, Cleaning and Replacement

At periodic intervals (not more than 6 months) a visual inspection should be made of the main burner for proper operation and to insure no debris is accumulating.

Main burner should light smoothly from pilot and burn with a blue flame with a minimum of yellow tips. After 5 minutes of operation the burner screen will become radiant and the flame will soften and turn orange. If the burner screen does not become radiant after 5 minutes of operation it must be cleaned (see burner cleaning procedure below).

Main burner must be free from any debris accumulation that may effect burner operation (see burner cleaning procedure below).

⚠ DANGER

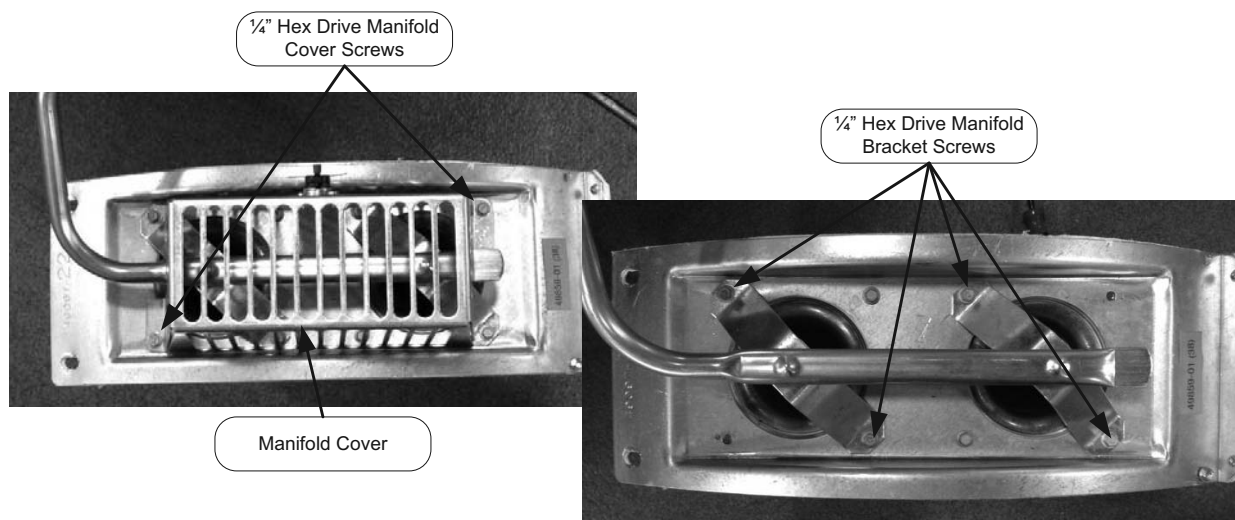
Under no circumstances shall flammable materials be used or stored in the vicinity of the water heater. If flammable vapors are present, a fire or explosion may result causing property damage, personal injury or death.

⚠ WARNING

Inner door and burner components may be HOT when performing this operation. Take necessary precaution to prevent personal injury.

Burner Cleaning

- Step 1. Remove burner and inner door assembly per SERVICE PROCEDURE I, steps 3 through 4.
- Step 2. Remove manifold cover from burner inner door by removing (2) 1/4" hex drive screws and then sliding manifold cover to the right. Use a stiff brush, compressed air and/or shop vacuum to remove any debris build up from the manifold mount.
- Step 3. Remove manifold brackets from burner by removing (4) 1/4" hex drive screws.



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SERVICE PROCEDURE VI

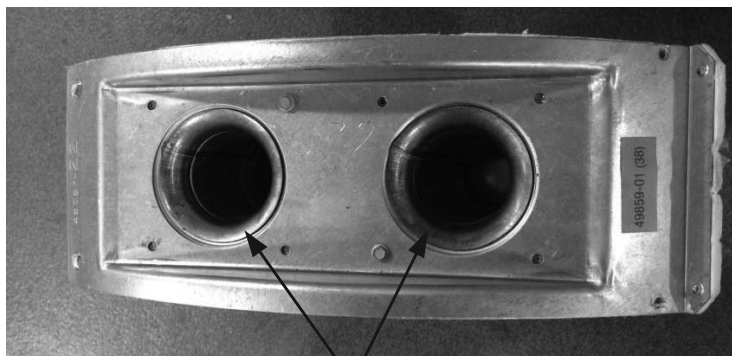
Burner Operation Inspection,
Cleaning and Replacement

Burner Cleaning (Continued)

- Step 4. Thoroughly inspect burner screen and burner venturis and remove any loose debris accumulation. Inspect burner screen for any openings larger than the normal screen openings.
- Step 5. Use compressed air and/or a vacuum to remove any scale or other debris accumulation from the burner screen and venturis.

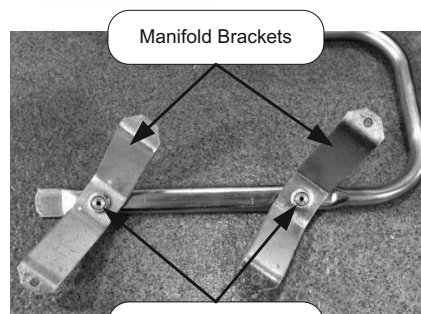


Burner Screen



Burner Venturis

- Step 6. Disconnect (unscrew) manifold brackets from main burner orifices.



Main Burner Orifices

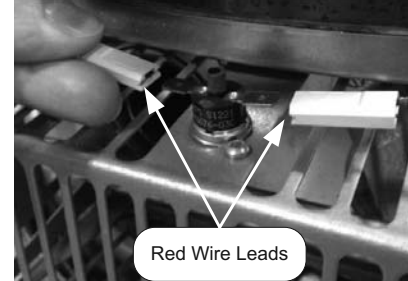
- Step 7. Remove main burner orifice from feed line (1/2" wrench). Inspect and clean if necessary



- Step 8. Remove pilot assembly, refer to SERVICE PROCEDURE III for cleaning and inspection.
- Step 9. Reassemble burner.
- Step 10. Reinstall burner and inner door per SERVICE PROCEDURE I, steps 5 through 16.
- Step 11. To resume operation, follow the instructions located on the lighting instruction label or the lighting instructions located in the installation and operation manual.

Resettable Thermal Switch Continuity Testing

- Step 1. Remove outer jacket door.
- Step 2. Disconnect red wire leads from resettable thermal switch.
- Step 3. Using a multimeter capable of measuring continuity (Ohms), place one probe of meter on one of the brass connection tabs of the resettable thermal switch, and the remaining probe on the other connection tab.
- Step 4. If continuity is indicated, the switch is closed, allowing millivolt current to pass.
- Step 5. If continuity is not indicated, the switch is open, possibly due to an over heating condition. The switch is designed to open at predetermined temperatures. An open switch can be reset by depressing the red colored button located at the center of the switch. The overheating condition must be determined prior to putting the water heater back in service.

**PROBABLE CAUSE FOR RESETTABLE THERMAL SWITCH ACTIVATION**

<u>PROBABLE CAUSE</u>	<u>CORRECTIVE ACTION</u>
Burner Failure	1. Inspect burner per SERVICE PROCEDURE VI 2. Replace burner per SERVICE PROCEDURE VI
Weak switch or switch out of calibration.	1. Replace resettable thermal switch

ECO-MAGNUM

75/100-Gallon Atmospheric

SERVICE PROCEDURE VII

Resettable Thermal Switch Testing and Replacement

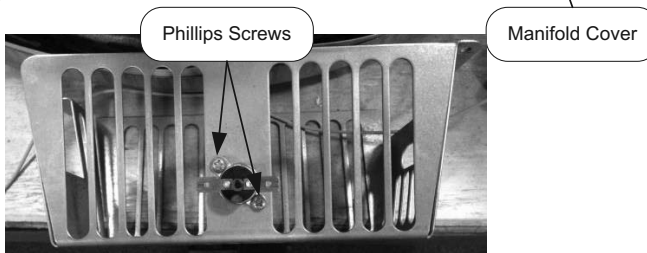
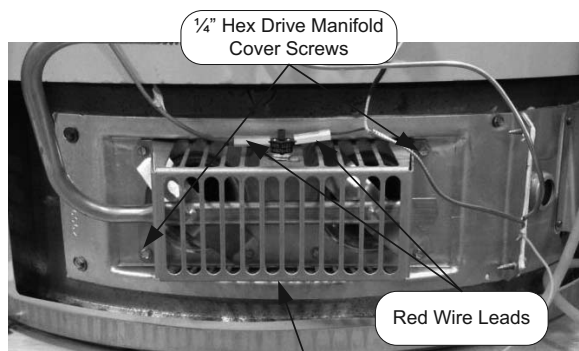
Resettable Thermal Switch Replacement

- Step 1. Rotate gas control knob to the “OFF” position.
- Step 2. Remove outer jacket door.
- Step 3. Disconnect red wire leads from resettable thermal switch.



Gas Control shown in the “OFF” position

- Step 4. Remove (2) 1/4” hex drive screws from the manifold cover and slid to the right to remove from burner assembly.
- Step 6. Remove resettable thermal switch from manifold cover (Phillips screw driver).



- Step 7. Place new resettable thermal switch in place. Be sure contact surface of resettable thermal switch and manifold cover are free of any debris. Secure resettable thermal switch into place using screws from step 6. **DO NOT OVER TIGHTEN SCREWS.**
- Step 8. Place manifold cover back in position and secure using the screws from step 4.
- Step 9. Reconnect wire leads from gas control and thermopile to resettable thermal switch.
- Note: Wire termination are interchangeable with either resettable thermal switch connection.
- Step 10. Replace outer jacket door.
- Step 11. To resume operation follow the instructions located on the lighting instruction label or the lighting instruction located in the installation and operation manual.

Dip Tube Inspection and Replacement**⚠ WARNING**

Water Heater components and stored water may be HOT when performing the following steps in this procedure. Take necessary precaution to prevent personal injury.

- Step 1. Rotate gas control knob to the “OFF” position.



Gas Control shown in the “OFF” position

- Step 2. Turn off cold water supply to water heater. Connect hose to drain valve of water heater and route to an open drain. Open a nearby hot water faucet to vent heater for draining. Open drain valve of water heater and allow water heater to drain to a point below the inlet connection nipple.
- Step 3. Disconnect inlet nipple from plumbing system.
- Step 4. With an appropriate wrench, remove inlet nipple/dip tube from the water heater. Use caution not to damage pipe threads.
- Step 5. Visually Inspect inlet nipple/dip tube. Inlet nipple/dip tube should be free of cracks and any blockage. Hydro-jets located near the bottom of the dip tube should be open and free of any blockage. Anti-siphon hole located approximately 6" from the bottom of nipple, should be free of any blockage.
- Any damage such as cracks, restriction due to deformation or unintentional holes are not field repairable and the inlet nipple/dip tube must be replaced.
- Step 6. Upon completion of inspection or subsequent replacement, reinstall inlet nipple/dip tube into heater. Connect nipple to plumbing system, resume water supply and refill water heater with water.
- Step 7. To resume operation follow the instructions located on the lighting instructions label or the lighting instructions located in the installation and operation manual.

Anode Inspection and Replacement



WARNING

Heater components and stored water may be **HOT** when performing the following steps in this procedure. Take necessary precaution to prevent personal injury.

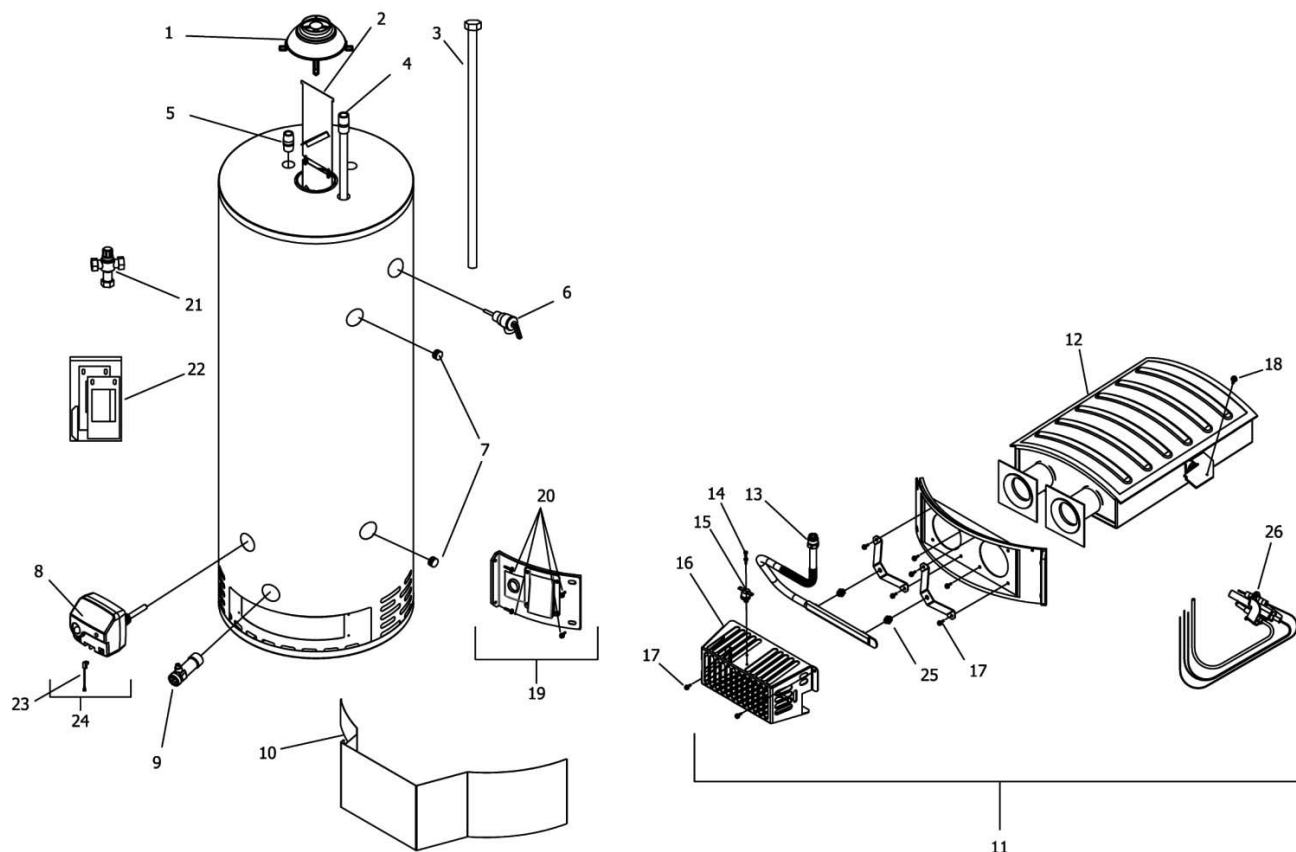
Step 1. Rotate gas control knob to the “OFF” position.



Gas Control shown in the “OFF” position

- Step 2. Turn off cold water supply to heater. Connect hose to drain valve of water heater and route to an open drain. Open a nearby hot water faucet to vent heater for draining. Open drain valve of hot water heater and allow heater to drain to a point below the outlet connection nipple.
- Step 3. Remove the anode cover from the jacket head to access the $\frac{3}{4}$ ” hex head anode. With an appropriate wrench, remove anode from the water heater.
- Step 4. Visually Inspect outlet nipple/anode. Outlet nipple/anode should show signs of depletion, this is normal. If depletion is $\frac{1}{2}$ of the original anode diameter (approximately $\frac{3}{4}$ ” diameter), replacement is recommended. If any of the steel core of the anode is exposed, replacement is recommended.
- Step 5. Upon completion of inspection or subsequent replacement, reinstall outlet nipple/anode into heater. Connect nipple to plumbing system, resume water supply and refill heater with water.
- Step 6. To resume operation, follow the instructions located on the lighting instructions label or the lighting instructions located in the installation and operation manual.

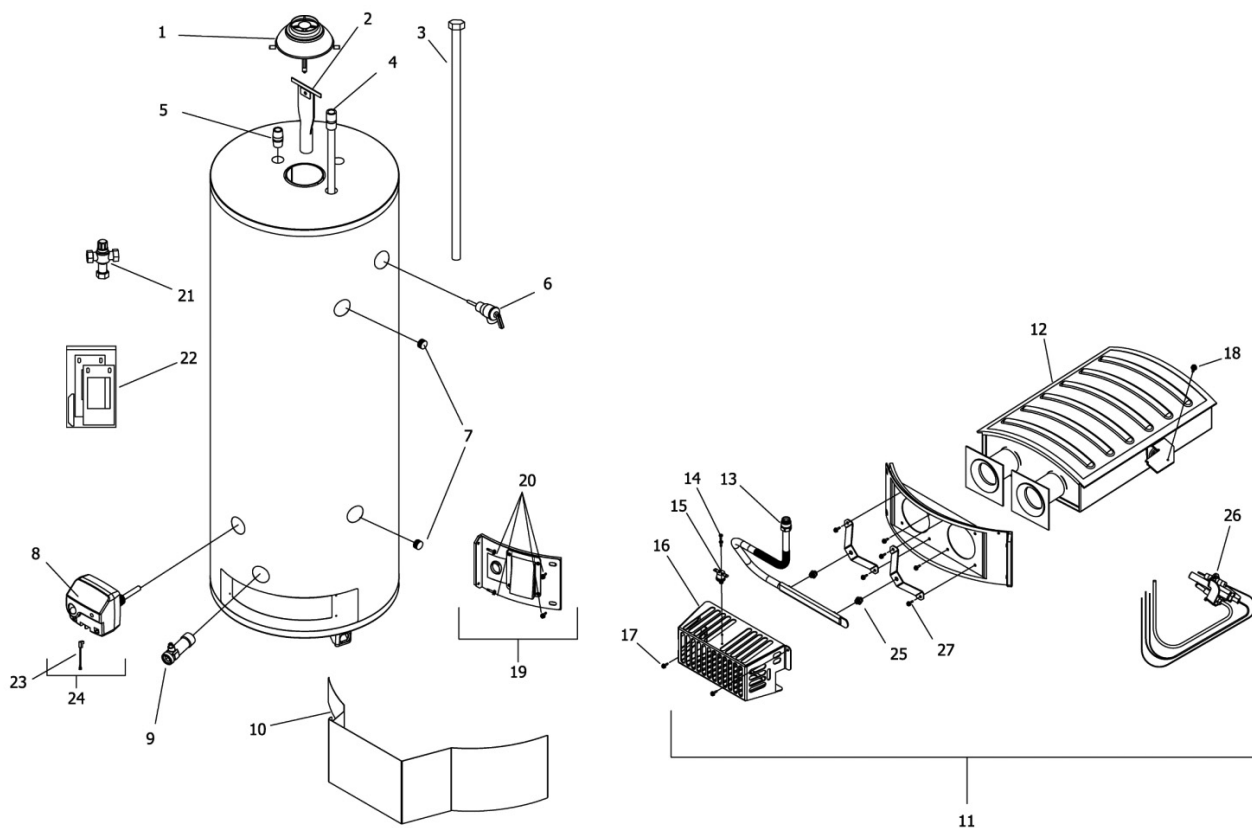
75-Gallon Models



- 1 Draft Diverter
- 2 Flue Baffle
- 3 Anode
- 4 Cold Water Inlet Tube
- 5 Hot Water Outlet Nipple
- 6 T&P Relief Valve
- 7 Space Heating Plug
- 8 Gas Valve
- 9 Brass Drain Valve
- 10 Outer Door
- 11 RN Burner and Door
- 12 RN Burner
- 13 Flexible Gas Feedline

- 14 Screw #6-20 x 3/8"
- 15 Resettable Thermal Switch
- 16 Manifold Cover
- 17 Screw #8-18 x 3/4"
- 18 Manifold bracket
- 19 Right Side Inner Door
- 20 Screw #10-12 x 3/4"
- 21 ASSE Approved Mixing Valve (Optional)
- 22 Inner Door Gasket Set
- 23 Intermediate Gas Valve Harness
- 24 Gas Control Kit
- 25 Main Burner Orifice
- 26 Pilot Assembly

100-Gallon Models



- 1 Draft Diverter
- 2 Flue Core
- 3 Anode
- 4 Cold Water Inlet Tube
- 5 Hot Water Outlet Nipple
- 6 T&P Relief Valve
- 7 Space Heating Plug
- 8 Gas Valve
- 9 Brass Drain Valve
- 10 Outer Door
- 11 RN Burner and Door
- 12 RN Burner
- 13 Flexible Gas Feedline

- 14 Screw #6-20 x 3/8"
- 15 Resettable Thermal Switch
- 16 Manifold Cover
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- 21 ASSE Approved Mixing Valve (Optional)
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- 23 Intermediate Gas Valve Harness
- 24 Gas Control Kit
- 25 Main Burner Orifice
- 26 Pilot Assembly

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