TECHNICAL INSTRUCTIONS

Benchmark® 3.0LN Boiler 24-Month Maintenance Kit P/N 58025-04

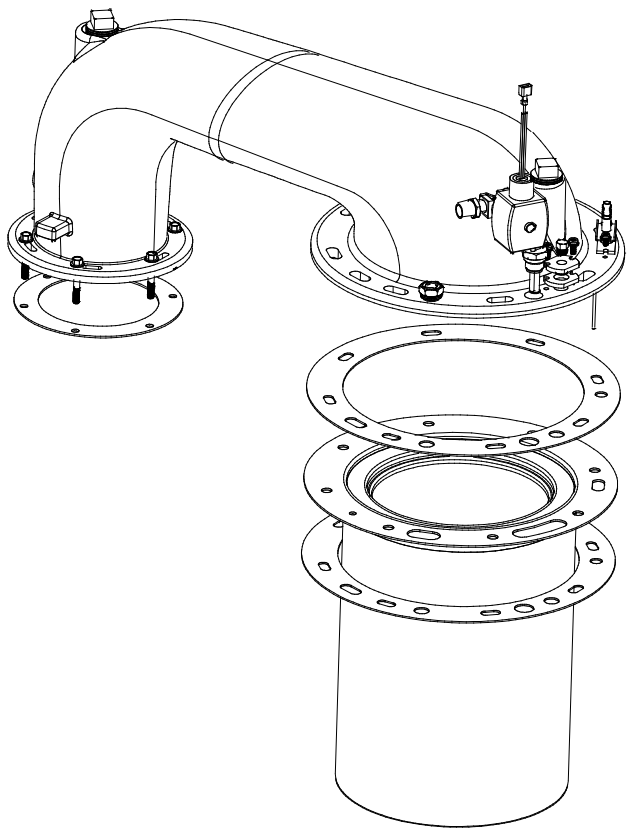
Description of Document:

This TID provides the procedures to perform recommended 24-Month maintenance on the following Benchmark Low NOx Boiler Models:

- Benchmark 3.0LN
- Benchmark 3.0LN Dual-Fuel

This kit applies to units with Staged Ignition (Ignitor-Injector P/N 58023).

For units equipped with an Ignitor (P/N GP-122435-S) and a separate gas injector, see Kit 58015-04 and TID-0135.



BMK 3.0LN Burner Assembly

Latest Update: 10/12/2017

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1. INTRODUCTION

This Technical Instruction Document (TID) provides the procedures to perform waterside and fireside inspections of the heat exchanger contained in Benchmark 3.0LN and 3.0LN Dual-Fuel boilers equipped with an Igniter-Injector. For units equipped with an Ignitor (P/N **GP-122435-S**, a component of Kit 58015-04) and a separate gas injector, see TID-0135.

This kit provides the parts required to perform the waterside and fireside inspections on the Benchmark 3.0LN and Dual-Fuel Boilers.

2. CONTENTS OF 24-MONTH MAINTENANCE KIT

The items included in the 24-Month Maintenance Kit are listed in Table 1.

Table 1: Benchmark 3.0LN 24-Month Maintenance Kit, Part No. 58025-04

ITEM	QTY	PART NO.	DESCRIPTION
1	1	58023	**IGNITER-INJECTOR REPLACEMENT KIT:** 1 x IGNITER-INJECTOR – P/N **66026** 1 x NUT, COMPRESSION – P/N **56047** 3 x WASHERS, CLOCKING (INDEXING) – P/N **53033** 1 x LUBRICANT, ANTI-SEIZE - **89012**
2	1	24356-1	**FLAME DETECTOR REPLACEMENT KIT:** 1 x FLAME DETECTOR – P/N **66034** 1 x FLAME DETECTOR GASKET – P/N **81048**
3	1	49102	EXHAUST MANIFOLD SEAL
4	2	81030	BURNER GASKETS
5	1	84017	CONDENSATE TRAP O-RING
6	1	81092	CONDENSATE TRAP ORIFICE GASKET (.25" I.D.)
7	1	81098	EXHAUST MANIFOLD CONDENSATE TRAP ORIFICE GASKET (.75" I.D.)
8	1	81019	BURNER HOUSING GASKET
9	1	69126	LWCO / CAPACITOR ASSEMBLY KIT
10	1	81129	PLUG GASKET

3. TOOLS, TEST EQUIPMENT AND MATERIALS REQUIRED

The items required to perform the inspections, replacements and tests specified in these instructions are listed in paragraph 3.1, 3.2 and 3.3 which follow.

3.1 Tools

Common hand tools, plus the items listed below are required:

- Small Wire Brush
- Flashlight
- Wrench set (box or open-ended)

3.2 Test Equipment

No test equipment is required to perform the 24-month inspections and maintenance included in these instructions. However, following completion of these inspections, the Benchmark Boiler should be tested using the combustion calibration procedures provided in O & M Manual GF-116, or GF-117 (Dual-Fuel).

3.3 Materials

Expendable materials required to perform the procedures described in this bulletin are not included in the 24 -Month Inspection Kits. These materials may include such items as:

- Pipe joint compound
- Teflon tape
- Cleaning solvents and materials
- Loctite 246

4. PRELIMINARY INSPECTION PROCEDURES

The detailed procedures required to perform the waterside and fireside inspections included in these instructions are provided in sections 5 and 6. However, prior to performing the procedures in section 5 and 6, perform the preliminary safety, set-up and disassembly procedures described in the following steps:

WARNING!
FAILURE TO FOLLOW SAFETY INSTRUCTIONS REGARDING PREPARATION OF THE UNIT, AS DESCRIBED BELOW, MAY RESULT IN INJURY, DEATH, OR DAMAGE TO EQUIPMENT.

Preliminary Inspection Instructions

1. At the front panel of the unit, set the **ON/OFF** switch on the C-More Control Panel to the **OFF** position.
2. Disconnect electrical power to the unit by turning off the external circuit breaker.
3. Turn off the external gas supply shutoff valve.
4. Close the water supply and return valves to the unit.
5. Refer to Figure 1 and remove the top and side panels of the unit.
6. With the top and side panels removed, the Benchmark 3.0LN Burner, heat exchanger and Exhaust Manifold can be accessed to prepare the boiler for the required waterside and fireside inspections described in sections 5 and 6.

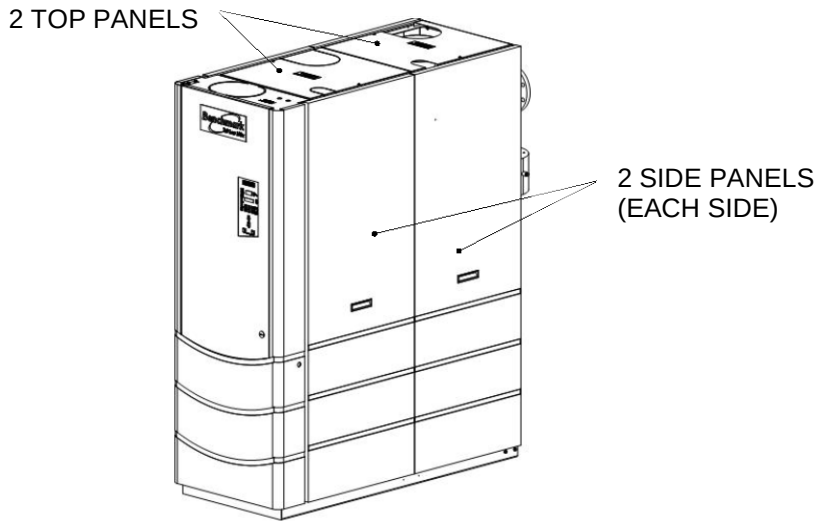

Figure 1: Benchmark 3.0 Low NOx (LN) Boiler

5. WATERSIDE INSPECTION OF THE HEAT EXCHANGER

Benchmark 3.0LN Models contain both a primary and secondary heat exchangers, as shown in Figure 2. Perform the waterside inspection as follows:

Burner Preliminary Disassembly and Inspection Instructions

1. Ensure that the preliminary safety, set-up, and disassembly procedures in section 4 have been performed to provide access to the heat exchanger of the unit.
2. Allow the unit to cool prior to proceeding.
3. At the rear of the unit (Figure 3), slowly open the drain valve and drain the boiler water from the heat exchanger.
4. Open the P&T relief valve (Figure 2) to allow air to enter the heat exchanger during draining.
5. After both heat exchangers have been drained, remove both 2-1/2 inch access port plugs on the right side of the heat exchangers as shown in Figure 2.
6. If waterside inspection is required by your local inspector, follow the inspector's instructions. Upon satisfactory completion of the inspection, proceed to step 7.
7. Apply pipe compound to the threads of the access port plugs and replace them using a pipe wrench.
8. Close the drain valve at the rear of the boiler.
9. Close the P&T relief valve.
10. Open the water supply and return valves to the unit and refill the heat exchangers. This completes the waterside inspection for the unit.

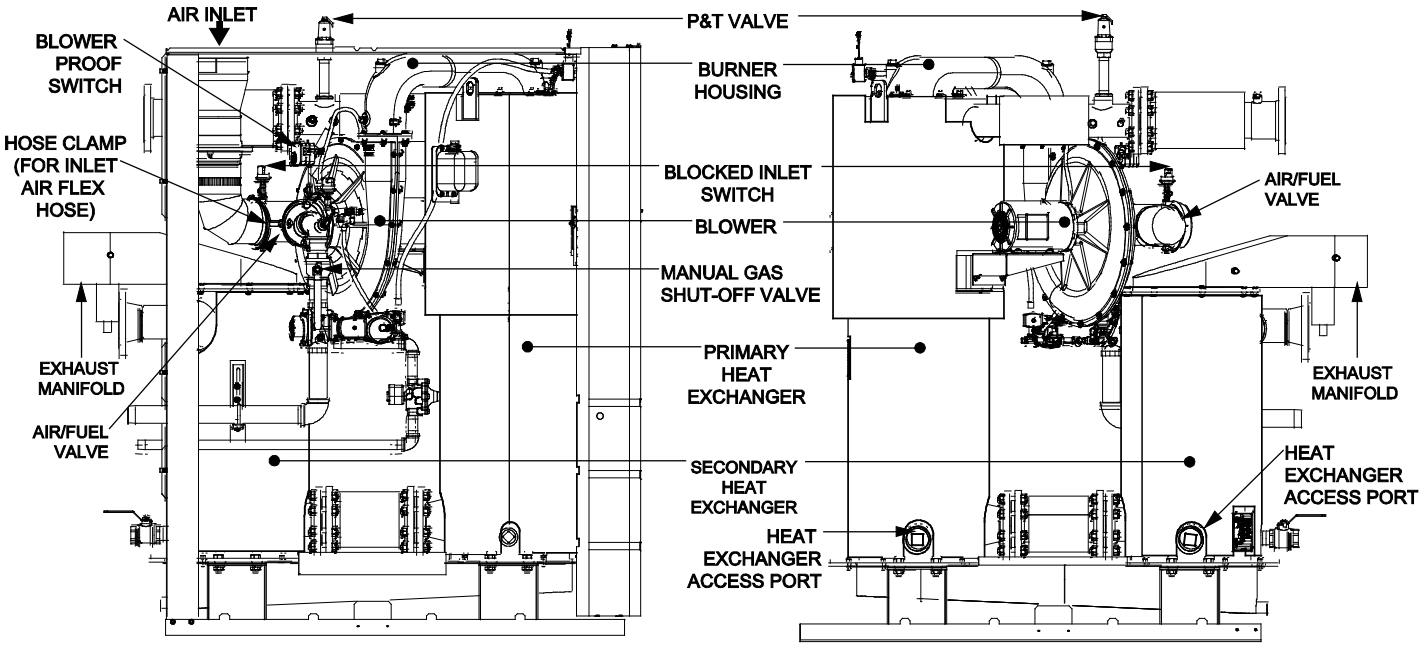

Figure 2: Benchmark 3.0LN - (Left Side and Right Side Views)

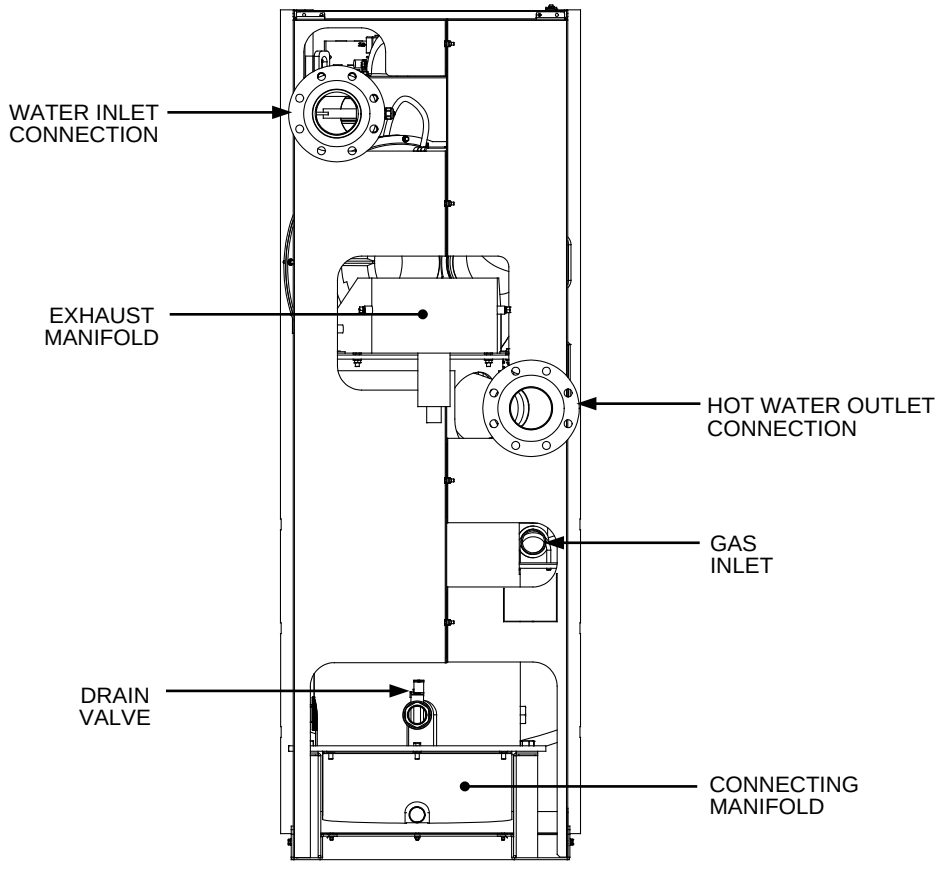

Figure 3: Benchmark 3.0LN - (Rear View)

6. FIRESIDE INSPECTIONS & COMPONENT REPLACEMENT

The heat exchanger fireside inspection includes removal of the Burner and recommended replacement of Burner components and inspection of the Exhaust Manifold assembly and replacement of Condensate Trap components. The 24-Month Maintenance Kit includes the recommended replacement parts for annual maintenance, which should also be performed at this time. Therefore, the procedures in this section are organized as follows:

Burner Maintenance:

- Burner Disassembly and Inspection
- Preliminary Burner Reassembly
- Burner Component Replacement
- Final Burner Reassembly

Exhaust Manifold & Condensate Trap Maintenance:

- Exhaust Manifold (with Integral Condensate Trap) Disassembly and Inspection
- Exhaust Manifold Reassembly
- External Condensate Trap Component Replacement

The procedures for the listed maintenance actions are provided in the following paragraphs.

6.1 Burner Maintenance

Perform the fireside inspections of the low NOx Burner and replacement of Burner component parts using the procedures in the following paragraphs, 6.1.1 and 6.1.2.

6.1.1 Burner Disassembly and Inspection

The Burner Assembly is located at the top of the heat exchanger as shown in Figure 4. Figure 4 shows the Burner Assembly mounting details looking down onto the top of the boiler and Figure 5 shows an exploded diagram of the complete Burner Assembly removed from the unit.

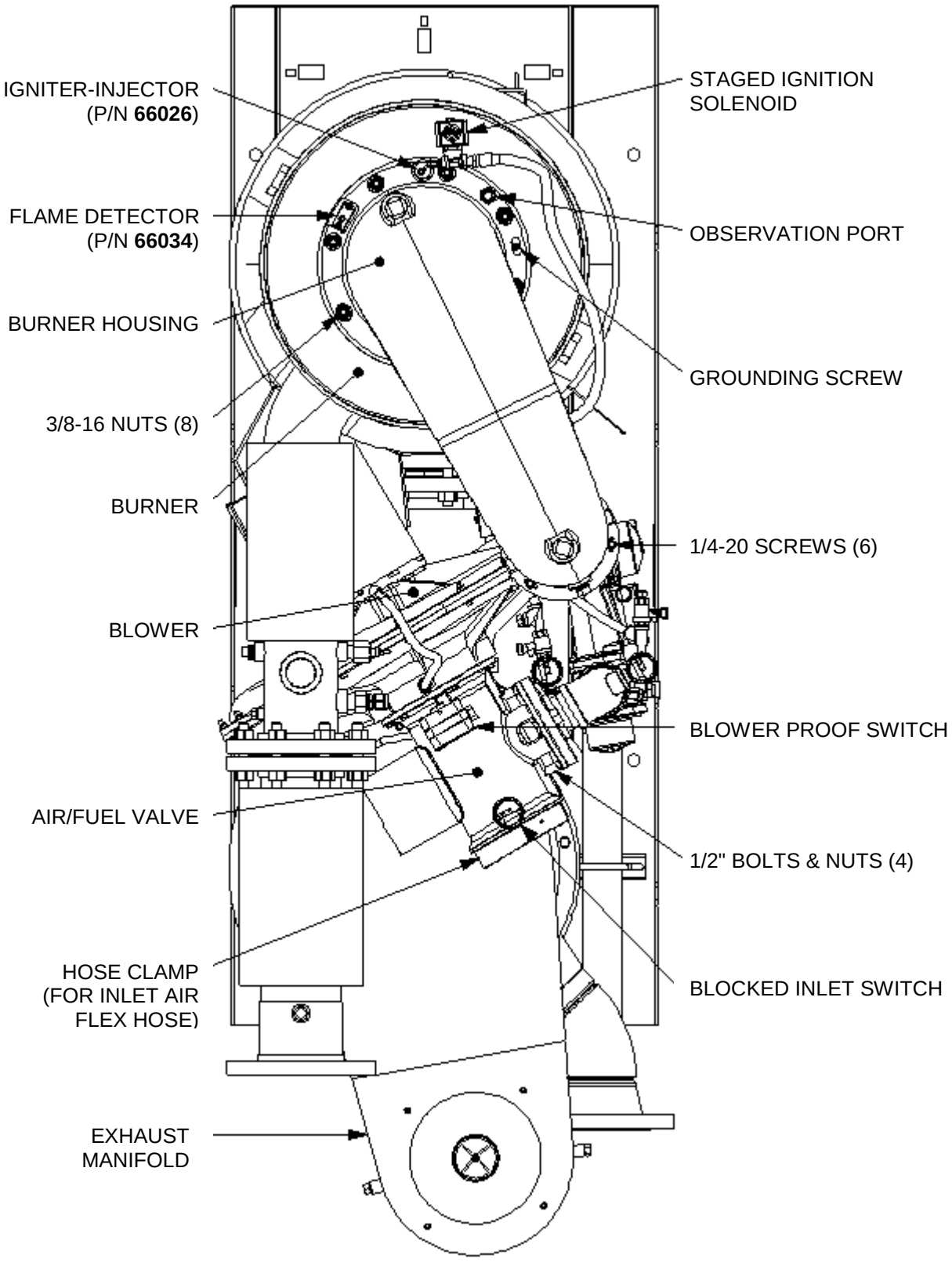

Figure 4: Benchmark 3.0LN - Top View

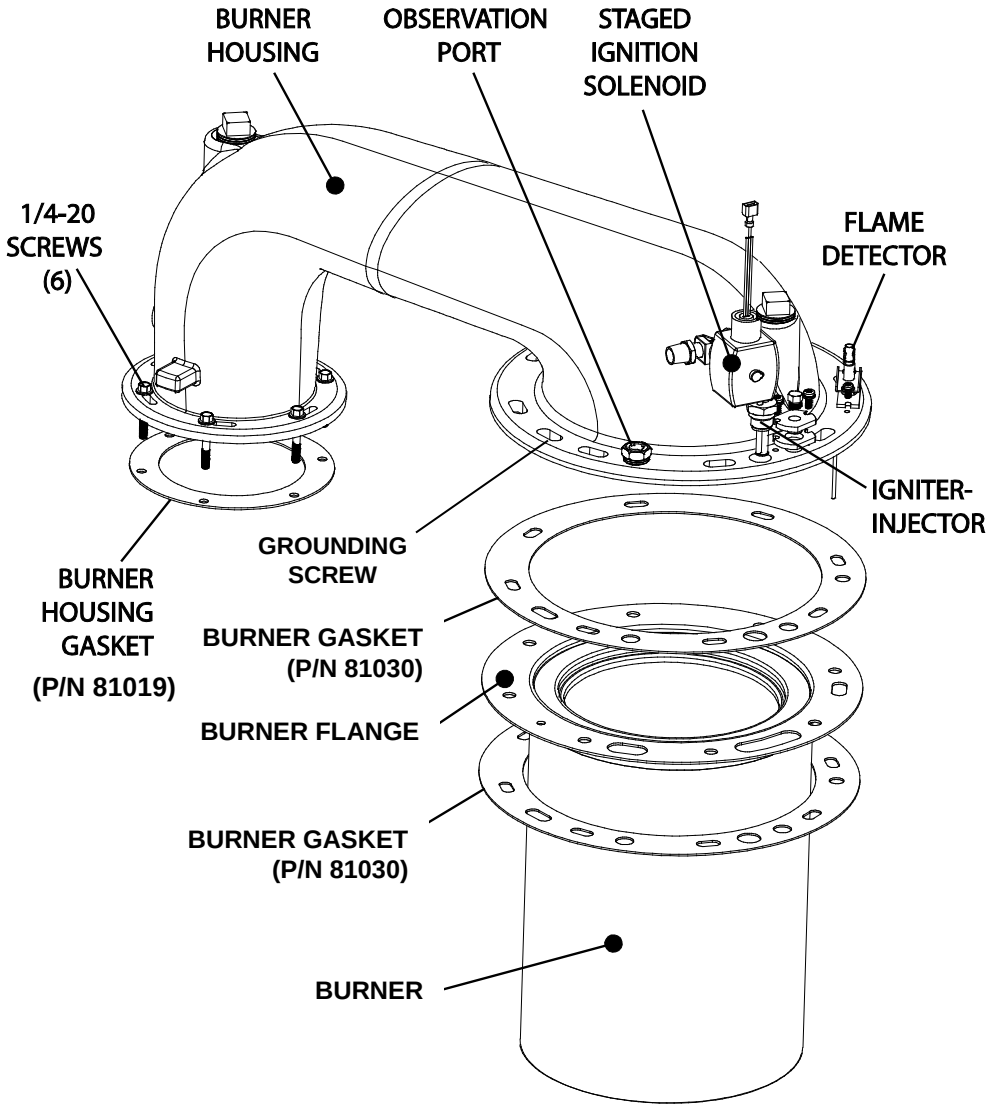

Figure 5: BMK3.0LN Burner Assembly - Exploded View

Remove and inspect the Burner assembly as follows:

Burner Preliminary Disassembly and Inspection Instructions

1. Ensure that the preliminary set-up and disassembly procedures in section 4 have been completed.

   WARNING

   THE BURNER ASSEMBLY MAY BE EXTREMELY HOT. TO AVOID BURNS, ALLOW IT TO COOL SUFFICIENTLY BEFORE ATTEMPTING TO REMOVE IT FOR INSPECTION.

2. Disconnect the lead wire from the Flame Detector, shown in Figure 6. Unscrew the two screws and remove the Flame Detector and gasket.

3. Disconnect the igniter cable from the Igniter-Injector (Figure 6).

4. Refer to the partial view in Figure 6. Using a 7/16" open-end wrench, disconnect the compression nut securing the Gas Injector Tube of the Igniter-Injector to the elbow of the Staged Ignition Assembly. Remove the compression nut from the elbow and discard, as it will be replaced with a new one from the kit at reassembly. Disconnect the Staged Ignition assembly from the Igniter-Injector.

5. Next, loosen and remove the Igniter-Injector from the burner housing using a 1" open-end wrench. This will be replaced at reassembly with a new one from the kit.

6. Remove the two (2) screws securing the Flame Detector to the burner housing and retain. Remove the Flame Detector and gasket and discard. Both will be replaced at reassembly with new ones from the kit.

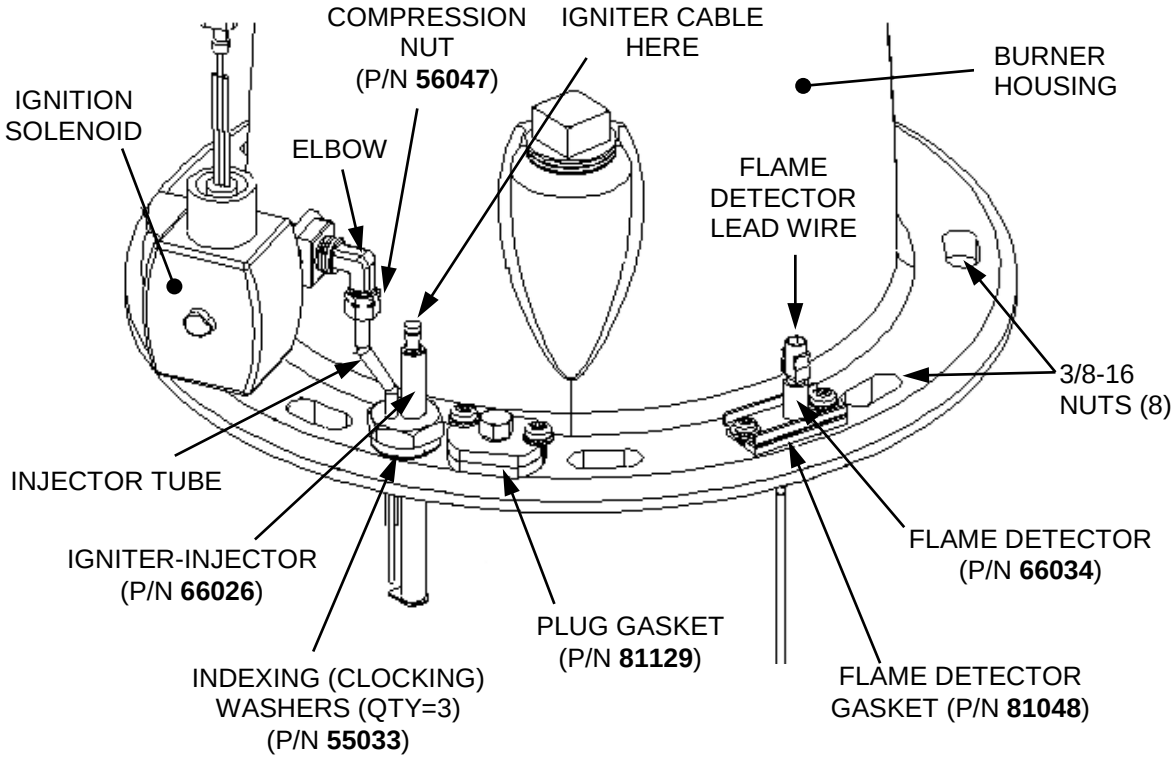

Figure 6: Partial View Showing Flame Detector, Igniter-Injector, and Staged Ignition Assembly on Burner Housing Flange

7. Remove the two screws securing the Plug Gasket (P/N **81129**), remove the existing Plug Gasket and replace it with one from the kit (P/N **81129**), and then secure it with the two screws.

8. Disconnect the burner housing from the blower by removing the six (6) 1/4-20 screws using a 3/8" wrench (Figures 4 and 5).

9. Remove the eight (8) 3/8-16 nuts from the burner housing flange (Figure 5) using a 9/16" wrench.

NOTE
The Burner Plate is heavy, weighing approximately 20 pounds.

10. Remove the grounding screw (Figures 4 and 5).
11. Remove the burner housing and burner housing gasket by pulling straight up.
12. If there is an extension ring around the burner, remove it.
13. Remove the burner by pulling straight up. Be sure to remove and discard the two (2) burner gaskets. At reassembly, these gaskets will be replaced with new ones from the kit. Figure 5 shows an exploded view of the burner assembly for a Benchmark 3.0LN Boiler.
13. Inspect the Burner for damage, warping or discoloration. If the Burner is damaged, especially in the Observation Port or Staged Ignition Assembly area of the flange, it must be replaced with a new assembly. Inspect the Burner Mesh with a flashlight inside for evidence of clogging or sagging.
14. Inspect lower Burner Gasket for leak paths, gouges, or damage. An undamaged lower gasket may be left in place without causing any adverse issues.

IMPORTANT!
Follow appropriate local and state regulations as pertains to inspection of critical boiler parts.

During inspection, if the Burner and/or mesh appear damaged, contact AERCO technical support for information regarding Burner replacement. If undamaged, proceed to section 6.1.2.

6.1.2 Preliminary Burner Reassembly

Before replacing the Burner components, the Burner must be partially reassembled. This will replace the following parts:

- Burner Gaskets (2 x P/N **81030**)
- Burner Housing Gasket (P/N **81019**)

Preliminary Burner Reassembly Instructions

1. Replace the old Burner Gaskets with two new Burner Gaskets (P/N **81030**) from the kit, one above and one below the burner flange.

IMPORTANT!
When installing new Burner Gaskets, it is imperative that the gaskets be properly aligned to assure that the cutouts for the Observation Port, Igniter-Injector, and Flame Detector line up with those in the heat exchanger top plate, burner flange and burner housing. Failure to properly align these items may result in damage to the gaskets or interference with the components.

2. Place the Burner back into the heat exchanger.
3. Place the new Burner Housing Gasket (P/N **81019**) on top of the blower. Ensure that it is positioned correctly in relation to the mounting holes in the burner housing.
4. Position the burner housing on the burner and blower, aligning it with both burner and blower.

5. Reinstall the the six (6) 1/4-20 screws that connect the burner housing to the blower, but only hand-tighten them at this point, to ensure proper positioning.

6. If there was an extension ring around the burner at disassembly, replace it.

7. Add one 3/8" flat washers to each of the eight (8) mounting studs coming up through the burner flange, removed during disassembly.

IMPORTANT!

It is imperative that the burner housing is fully tighten to the top of the heat exchanger ***BEFORE*** its other end is secured to the blower.

8. Apply Loctite 246 to the Burner mounting studs and then loosely tighten the eight (8) 3/8-16 nuts attaching the burner housing to the burner, and then **torque the eight nuts in a star (or alternating) pattern to 35 ± 5 ft./lbs.** to to ensure a uniform seal.

9. Fully tighten the the six (6) 1/4-20 screws hand-tighten in step 5 to fully connect the burner housing to the blower. **DO NOT ATTEMPT** to pull the burner housing down to meet the blower. If there is a gap, adjust the blower mounting plate till the blower contacts the housing.

10. After servicing is complete, perform a water bubble test during purge to ensure the Burner gaskets are providing a good seal, as specified in section 7.2.

6.1.3 Burner Component Replacement

The old components that need to be replaced have already been removed during the disassembly process in section 6.1.1. The following instructions show how to install the new parts during the Burner reassembly process.

6.1.3.1 Igniter-Injector Installation

The Igniter-Injector (P/N **66026**) installation is accomplished as follows:

Igniter-Injector Installation Instructions

1. Burner and burner housing must first be completely reassembled to the Burner.

2. Prior to installing the replacement of the Igniter-Injector, high temperature, you must apply conductive, anti-seize lubricant to the Igniter-Injector threads. A small tube of this lubricant is included in the Igniter-Injector replacement kit (P/N **58023**).

NOTE

The Igniter-Injector kit contains a compression nut (P/N **56047**) with a built-in ferrule and three clocking (indexing) washers (P/N **53033**). These washers are used, as needed, to properly position the Igniter-Injector's gas injector tube, as described in the following step.

3. Reinstall the Igniter-Injector and, if necessary, install 1, 2 or 3 clocking washers to properly position the Gas Injector Tube within the 120° angle shown in Figure 7. Torque the Igniter-Injector to 15 ft-lbs. **Do not over tighten.**

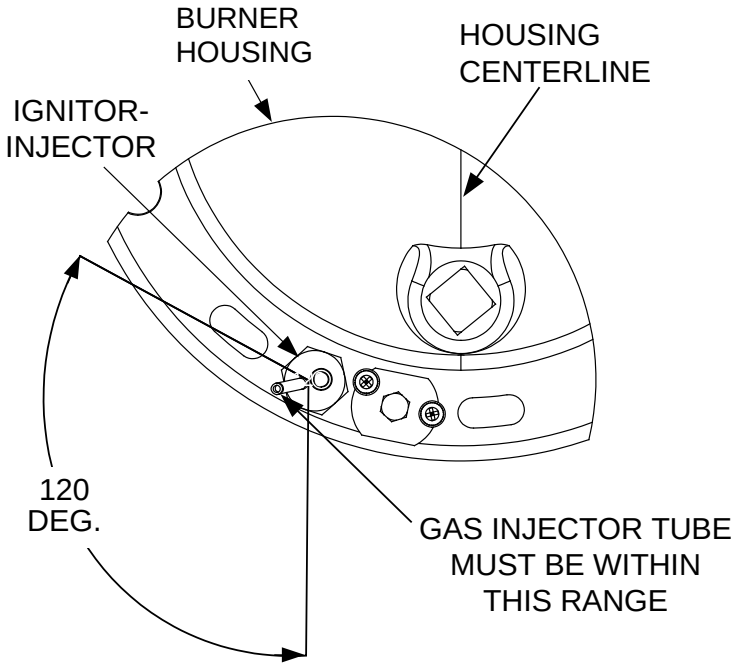

Figure 7: Benchmark 3.0LN Igniter-Injector Orientation

4. Connect the Staged Ignition Assembly to the Gas Injector Tube of the Igniter-Injector by securing the compression nut (P/N 56047) to the elbow of the Staged Ignition Assembly using a 7/16" open-ended wrench. Position the Staged Ignition Solenoid so it is not contacting any other components of the Burner Assembly or heat exchanger.

6.1.3.2 Flame Detector Installation

Flame Detector (P/N **66034**) and gasket (P/N **81048**) installation is accomplished as follows:

Flame Detector Installation Instructions

1. Refer to Figures 4, 5, and 6 to locate the Flame Detector installation location.
2. Install the replacement Flame Detector and gasket in the location shown. Secure the Flame Detector to the burner housing flange using the two screws removed previously.

6.1.4 Final Burner Reassembly

After Burner component replacement (Section 6.1.3), continue Burner reassembly as follows:

Final Burner Reassembly Instructions

1. Reinstall the grounding screw to the burner housing (Figure 4).
2. Connect lead wire to the Flame Detector (Figure 6).
3. Attach igniter cable to the Igniter-Injector assembly (Figure 6).
4. During the burner maintenance process, the following items (included in the maintenance kit) should have been replaced:
   - Burner Gaskets (2 x P/N **81030**)
   - Burner housing Gasket (P/N **81019**)
   - Igniter-Injector (P/N **66026**, a component of kit P/N **58023**)
   - Flame Detector and gasket (P/N **66034** & **81048**)
5. This completes the burner maintenance for the BMK3.0LN boiler. Proceed to section 6.2 for Exhaust Manifold maintenance instructions.

6.2 Exhaust Manifold and Condensate Trap Maintenance

There are two Condensate Trap locations in a BMK 3.0LN boiler; the Exhaust Manifold with integral condensate trap and a lower connecting manifold with connections for an external Condensate Trap (P/N **24060**). Both locations are shown in Figure 8.

6.2.1 Exhaust Manifold/Integral Condensate Trap Disassembly and Inspection

To remove and inspect the Exhaust Manifold with integral Condensate Trap:

Exhaust Manifold Disassembly and Inspection Instructions

1. Remove the four (4) bolts securing the flue starter section collar to the top of the exhaust manifold.
2. Disconnect the flue starter section from the exhaust manifold.
3. Disconnect the condensate trap drain hose from the 1-1/2" O.D. pipe on the bottom of the exhaust manifold.
4. Using a 3/4" socket wrench, remove the five (5) bolts securing the exhaust manifold to the heat exchanger (Figure 8). Also, remove the three (3) hex nuts from the manifold PEM studs. Remove the complete exhaust manifold from the unit.
5. Remove the silicone rubber seal from the recess in the flange of the exhaust manifold. Ensure that all seal residue is removed from the flanges of the exhaust manifold and secondary heat exchanger.
6. From the opening at the top of the manifold, remove the condensate trap float (with guide attached). Also, remove the orifice gasket located beneath the float.
7. Inspect and clean the exhaust manifold as necessary.
8. Replace the exhaust manifold seal (part no. 49102) with the new seal provided in the kit. Install the adhesive-backed seal in the recess of the exhaust manifold flange (Figure 8) so that the adhesive side is in contact with the exhaust manifold.
9. Align the exhaust manifold with the upper flange of the secondary heat exchanger. Secure the manifold in place using the five (5) bolts removed in step 4. Also, replace the hex nuts on the three (3) PEM studs. Alternately tighten the bolts and nuts to obtain a uniform seal.
10. From the opening at the top of the manifold, install the new orifice gasket (0.75" I.D.) provided in the kit. Ensure that the gasket is lying flat in the bottom of the condensate trap.
11. Next, insert the condensate float (with guide attached) into the trap.
12. Reconnect the 1-1/2" I.D. drain hose to the condensate trap drain opening.
13. Reconnect the flue starter section and collar to the top of the exhaust manifold using the bolts removed in step 1.

14. The Benchmark 3.0LN also contains an additional condensate trap which is used on all Benchmark units. This trap is attached to the connecting manifold at the rear of the unit using an adapter. Disconnect this trap from the manifold and perform the procedure described in paragraph 6.2.2.

15. Upon completion of the procedure described in paragraph 6.2.2, reconnect the condensate trap to the 1-1/2" pipe on the connecting manifold.

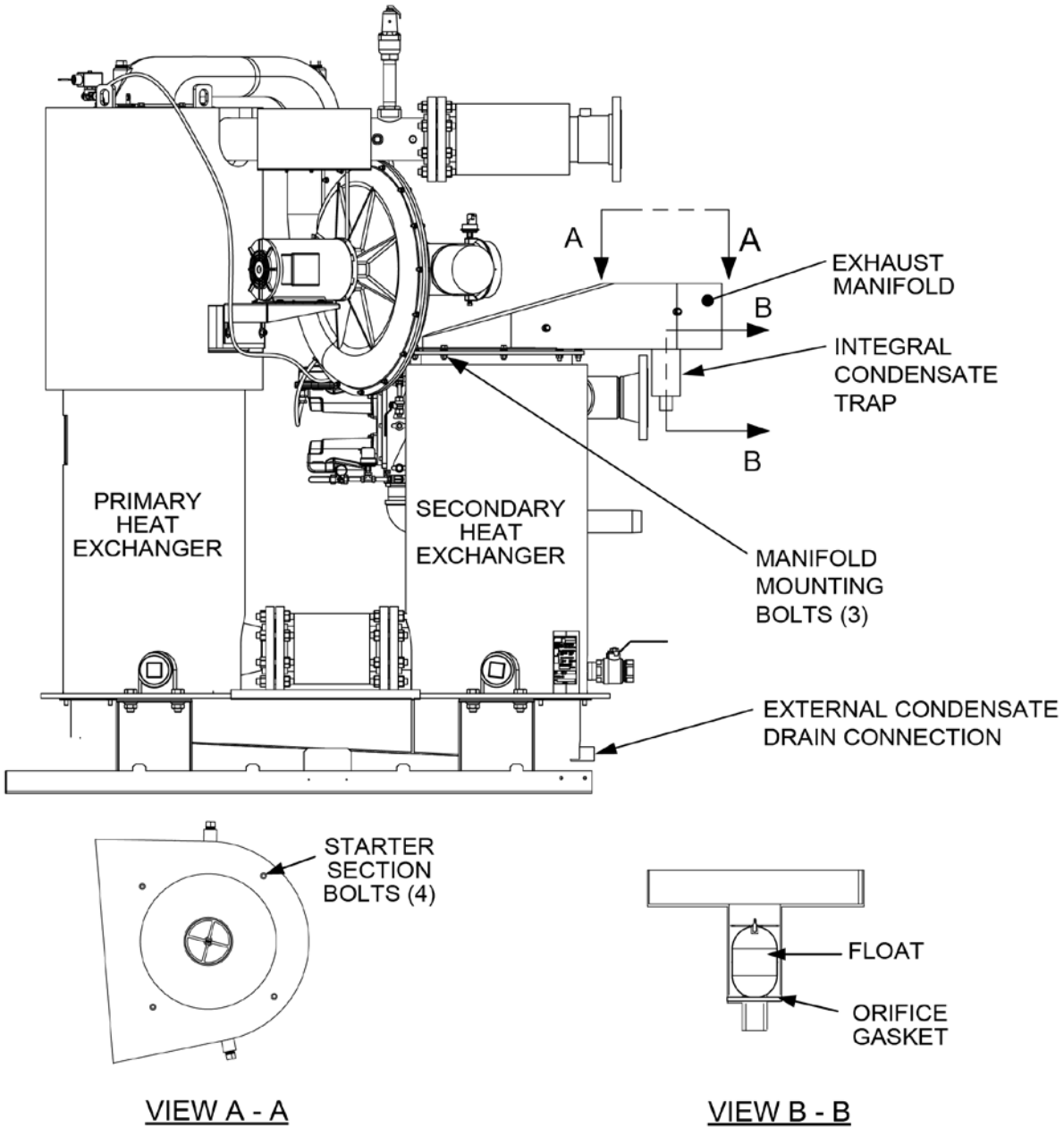

Figure 8: Benchmark 3.0LN Exhaust Manifold & Condensate Drain Locations

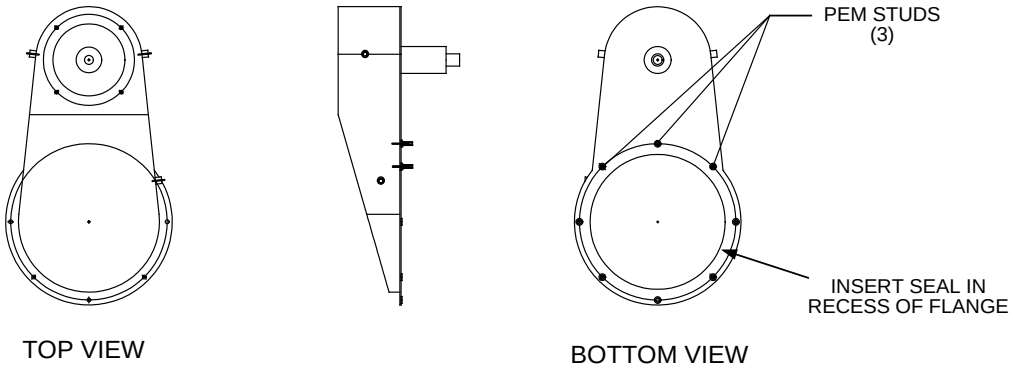

Figure 9: Benchmark 3.0LN Exhaust Manifold

6.2.2 Exhaust Manifold Reassembly

To reassemble the Exhaust Manifold:

Exhaust Manifold Reassembly Instructions

1. Replace the exhaust manifold seal (part no. 49102) with the new seal provided in the kit. Install the adhesive-backed seal in the recess of the exhaust manifold flange (Figure 9) so that the adhesive side is in contact with the exhaust manifold.
2. Align the exhaust manifold with the upper flange of the secondary heat exchanger. Secure the manifold in place using the five (5) bolts removed in step 4. Also, replace the hex nuts on the three (3) PEM studs. Alternately tighten the bolts and nuts to obtain a uniform seal.
3. From the opening at the top of the manifold, install the new 0.75" I.D. condensate trap orifice gasket (P/N **81098**) provided in the kit. Ensure that the gasket is lying flat in the bottom of the condensate trap.
4. Next, insert the condensate float (with guide attached) into the trap.
5. Reconnect the 1-1/2" I.D. drain hose to the condensate trap drain opening.
6. Reconnect the flue starter section and collar to the top of the exhaust manifold using the bolts removed in step 1.
7. The Benchmark 3.0LN also contains an additional condensate trap which is used on all Benchmark units. This trap is attached to the connecting manifold at the rear of the unit using an adapter. Disconnect this trap from the manifold and perform the procedure described in paragraph 6.2.3.
8. Upon completion of the procedure described in paragraph 6.2.3, reconnect the condensate trap to the 1-1/2" pipe on the connecting manifold.

6.2.3 External Condensate Trap Component Replacement

For Benchmark 3.0 boilers, the external Condensate Trap (P/N **24060**) is attached to the connecting manifold drain pipe using a special adapter (Figure 10).

NOTE

There are two slightly different types of Condensate Traps that may be used in your configuration; an older style with a separate inlet adapter, and a newer style with a built-in adapter (see Figure 10). Maintenance is the same, except that the newer style does not need an orifice gasket (Step 5).

This trap should be disconnected from the connecting manifold and serviced as follows:

Condensate Trap Component Replacement Instructions

1. Remove the connections on the inlet and outlet sides of the Condensate Trap shown in Figure 11.
2. Refer to Figure 10 and loosen the four (4) thumbscrews securing the cover on the Condensate Trap. Remove the cover.
3. Remove and discard the O-ring gasket currently installed in trap. It will be replaced with the new O-ring included in the Maintenance Kit during reassembly.
4. Remove the float (with float guide attached) from the Condensate Trap.
5. For ***Old Style*** Condensate Trap, remove, discard, and replace the currently installed 0.25" I.D. orifice gasket from the trap with the new one (P/N **81092**) provided in the kit (Figure 10). The **New Style Trap** does NOT use an orifice gasket, so this step is not necessary for that type.
6. Thoroughly clean the trap and float. Also inspect the drain piping for blockage. If the trap cannot be thoroughly cleaned, replace the Condensate Trap.
7. Check the condensate drain port on the Exhaust Manifold (Figure 11) to ensure it is clear of blockage.
8. After the above items have been inspected and thoroughly cleaned, replace the orifice gasket (use new gasket) and float in the Condensate Trap. Replace the O-ring (use new O-ring) and replace the trap cover.
9. Reassemble all piping and hose connections to the Condensate Trap inlet and outlet. Reconnect trap to condensate drain connection on the connecting manifold.

IMPORTANT

When reinstalling the condensate trap, ensure that the trap inlet is level with or below the condensate outlet of the boiler. Use a suitable support to insure that the bottom surface of the trap is horizontal and level.

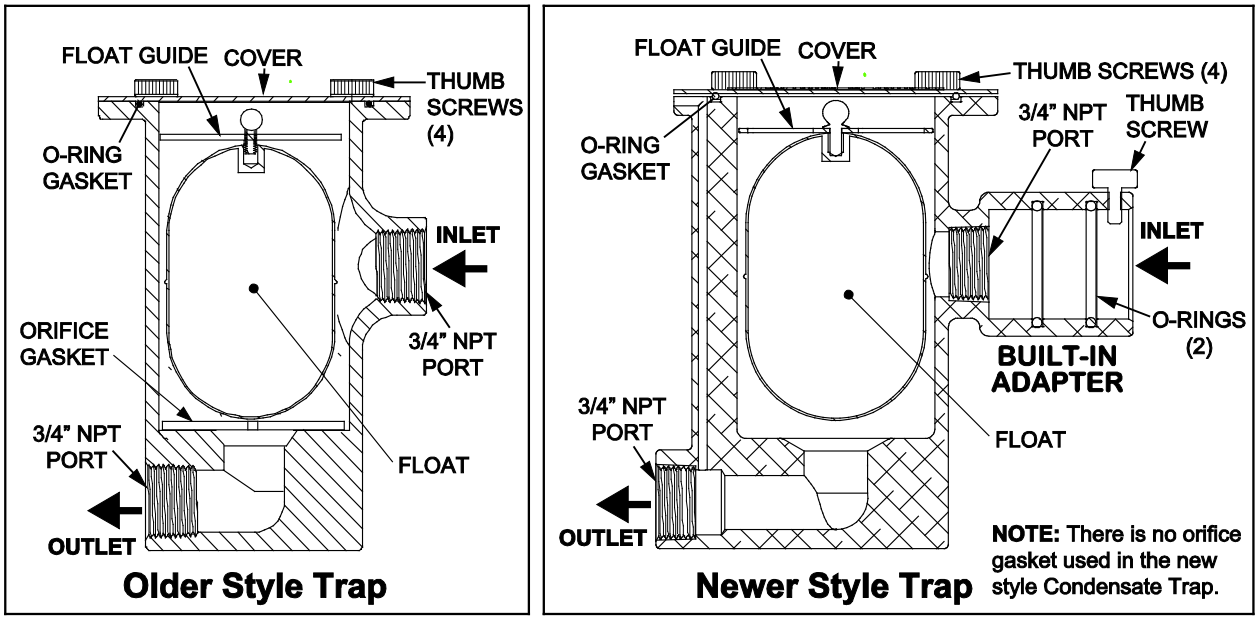

Figure 10: Condensate Trap P/N 24060 (Old and New Styles)

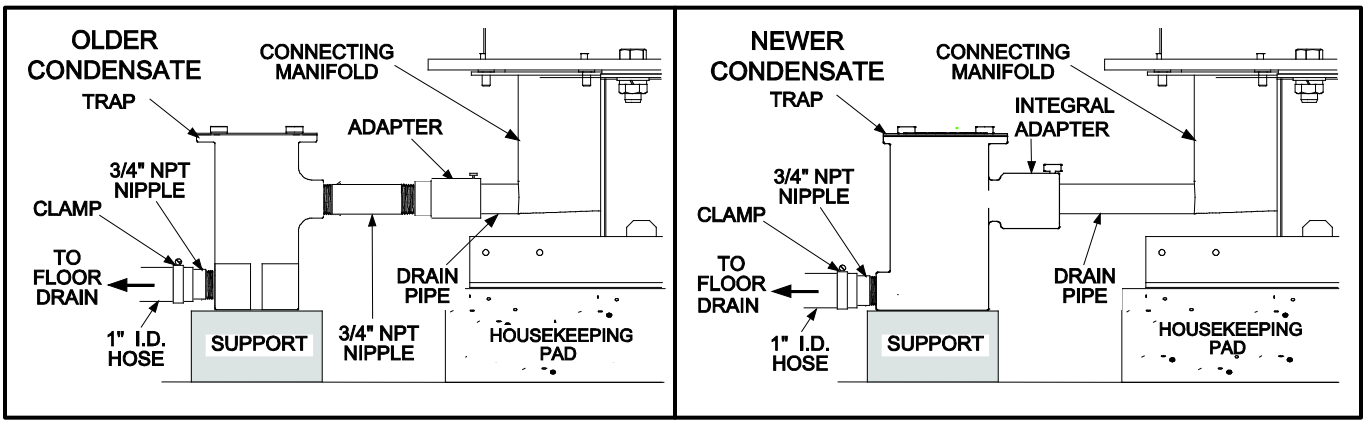

Figure 11: Exhaust Manifold Condensate Drain Connections. Old (left) and New (right) Style Trap – BMK3.0LN Partial Left Side View

6.3 Replacing the LWCO Probe/Capacitor Assembly

The replacement LWCO probe sensor comes with a capacitor assembly attached. This procedure replaces an old probe assembly with a new probe assembly (P/N **69126**).

Replacing the LWCO Probe/Capacitor Assembly

1. Cut the shell harness wire just below the female spade connector (Figure 12). The new LWCO assembly includes a new female connector to crimp onto the shell harness wire.

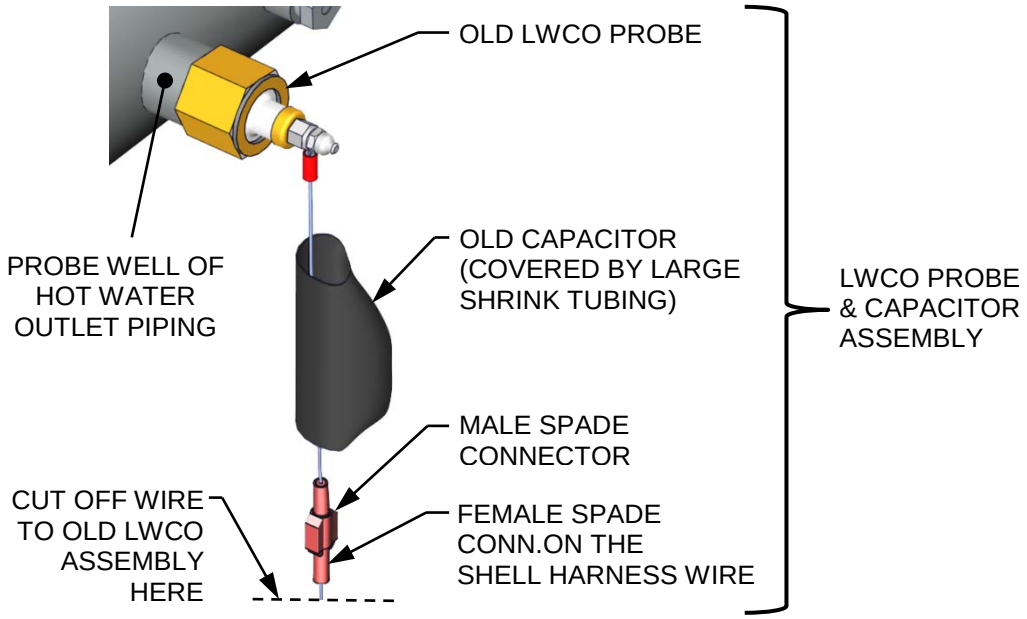

Figure 12: Removing Old LWCO Probe/Capacitor Assembly

2. Remove the LWCO probe from the recess well on the hot water outlet piping by unscrewing the brass coupling to which it is attached.
3. Retrieve the new LWCO probe from the kit and sparingly apply an NSF approved pipe dope to the threads of the brass coupling (Do NOT use Teflon tape) and install into the probe well vacated by the old LWCO probe.
4. The new LWCO assembly comes with a spare female connector already inserted into the male connector, and this should be crimped onto the stripped end of the shell harness wire.

6.3.1 Low Water Cutoff (LWCO) Capacitor Integrity Test

The LWCO capacitor should be tested for electrical shorts after it has been replaced. The LWCO Capacitor test consists of two parts as described in the next two sections. The first procedure explains how to test for electrical shorting of the LWCO probe capacitor, while the second procedure instructs how to perform the standard Low Water Cutoff test using the C-More controls.

6.3.1.1 Low Water Cutoff (LWCO) - Capacitor Electrical Short Test

This test determines if there is an electrical short between the LWCO capacitor and the heat exchanger. Perform the capacitor electrical short test as described below.

LWCO Capacitor Electrical Short Test

1. Turn OFF AC power to the unit.

> **--WARNING! -**
> High voltages are used to power these units and so it is required that power applied to these units is removed first before performing the procedure described in this instruction. Serious personal injury or death may occur if this warning is not observed.

2. Remove the Shell Harness Cable (male) connector from the P-5 (female) connector on the rear panel of the C-More controller (see Figure 13).

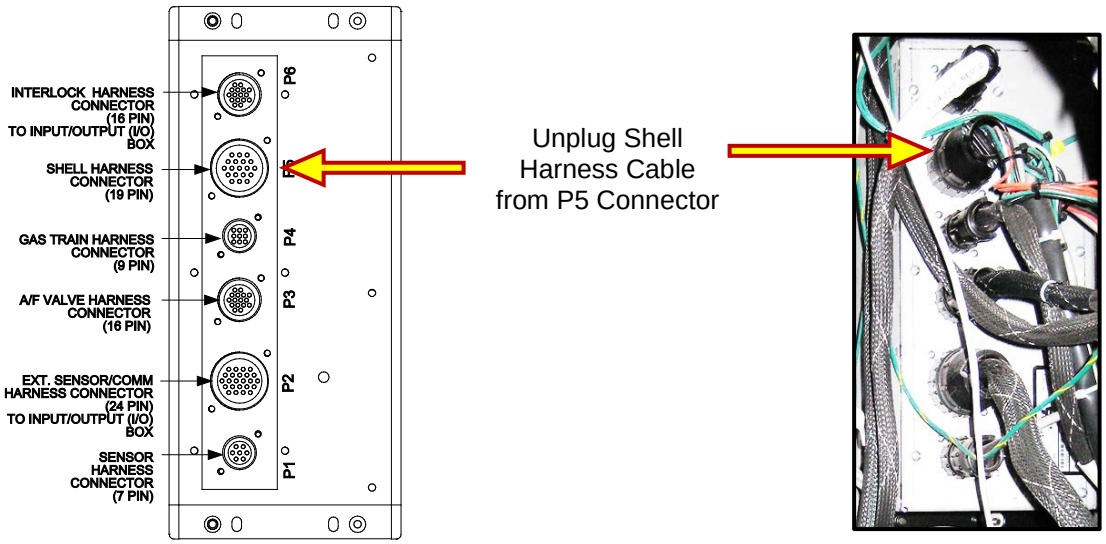

Figure 13: Removing Cable from P5 Connnector

3. Using an ohmmeter, connect one ohmmeter probe to the LWCO capacitor terminal on the unit shell as shown on left in Figure 14.
4. Connect the second ohmmeter probe to Pin #6 of Shell Harness Connector (removed from the C-More controller) as shown on right in Figure 14.

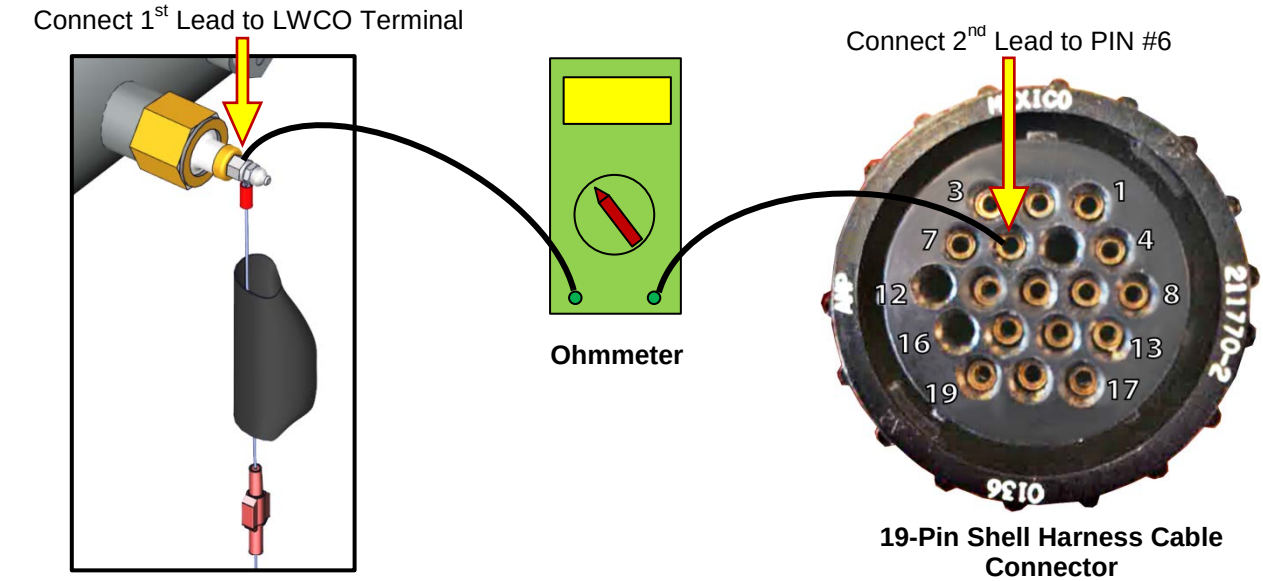

Figure 14: Connecting Ohmmeter Between LWCO Probe & Shell Harness Cable

5. Confirm that the ohmmeter does NOT read a short.

NOTE

If the ohmmeter reads a short, the capacitor assembly needs to be replaced. See section 6.3 for replacement instructions or contact AERCO technical support for more information.

6. Remove both ohmmeter probes and reconnect the Shell Harness connector to the P5 connector on the rear of the C-More controller.

6.3.1.2 Low Water Cutoff (LWCO) - Standard C-More Test

Perform the standard Low Water Cutoff test using the C-More controls as described below.

Standard Low Water Cutoff C-More Test

1. Turn on the AC power to the unit.
2. Press the TEST switch on the C-More controller and confirm that the blinking "Low Water Level" message appears on the C-More display within 4 seconds.
3. Press the RESET key, followed by the Clear button, and confirm that the "Low Water Level" message is cleared.

7. FINAL REASSEMBLY AND TESTING

Upon completion of all inspections and component replacement, reassemble the unit and perform the tests specified in paragraphs 7.1 and 7.2.

7.1 Set-Up and Reassembly After Maintenance

Following completion of the all required inspections and replacements, perform the following reassembly and setup procedures:

Setup and Reassembly After Maintenance Instructions

1. Ensure that the heat exchanger has been filled and the water supply and return valves have been opened.
2. Turn ON the external circuit breaker to the unit.
3. At the front panel of the unit, set the **ON/OFF** switch on the C-More Control Panel to the **ON** position.
4. Press the **LOW WATER LEVEL RESET** button to reset the low water cutoff.
5. Press the **CLEAR** switch to reset the fault relay. This will turn off the **FAULT** LED and clear any displayed error message.
6. Replace the unit side panels and top panels.

7.2 Final Testing After Maintenance

Upon completion of the inspections and replacements specified in this Technical Service Bulletin, perform the Combustion Calibration Tests specified in Chapter 4 of the O & M Manual GF-116, or GF-117 (Dual-Fuel).

Perform a water bubble test during purge to ensure the burner gaskets, replaced in section 6.1.2, are providing a good seal.

Following successful completion of the Combustion Calibration Tests, return the Benchmark 3.0LN Boiler to service use.

Change Log

Date	Description	Changed By
06/03/2016	Rev D: **DIR 335**: Clarified reassembly order in section 6.1.2, added water bubble test to section 7.2	Chris Blair
10/12/2017	Rev E: **DIR 335**: Changed “Blower Plenum” and “Blower Plenum Gasket” to “Burner Housing” and “Burner Housing Gasket” P/N 81019, modified section 6.1.2.	Chris Blair