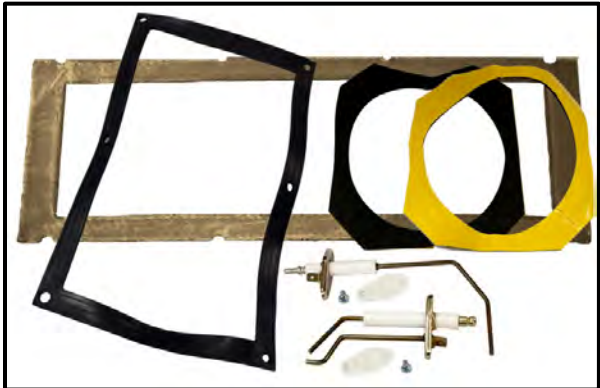


TECHNICAL INSTRUCTIONS

Procedure:
**Modulex
 Fireside (24-Month)
 Maintenance**



Modulex Fireside (24-Month) Maintenance Kit

Applies to Modulex Boiler Models:

- MLX-303
- MLX-454
- MLX-606
- MLX-757
- MLX-909
- MLX-1060

Description of Document:
 A Fireside Inspection (24-month maintenance) consists of an inspection and maintenance to the burner modules, flue collector, spark igniter, and flame detector.



Modulex MLX Series Boiler

NOTE
 For Modulex 12-Month maintenance instructions (Annual Inspection), see **Document TID-0026**.

Modulex Models and Associated Fireside Maintenance Kit P/Ns

MLX-303 Fireside Maintenance Kit	Kit 58019-07
MLX-454 Fireside Maintenance Kit	Kit 58019-08
MLX-606 Fireside Maintenance Kit	Kit 58019-09
MLX-757 Fireside Maintenance Kit	Kit 58019-10
MLX-909 Fireside Maintenance Kit	Kit 58019-11
MLX-1060 Fireside Maintenance Kit	Kit 58019-12

Revised: 05/19/2011

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1. Fireside (24-Month) Maintenance Instructions

Following are the procedures necessary to perform the Fireside Inspection (24 month) maintenance on all Modulux MLX boiler models and sizes. Each Fireside Maintenance Kit contains a flame detector, spark igniter, and associated gaskets for burner modules, flue collector, and condensate tray.

A correctly adjusted Modulux boiler needs very little care other than yearly maintenance. The frequency of cleaning needed depends on the cleanliness of the air used for combustion. Note that dust present in the air at the combustion intake will result in reduced burn efficiency and, consequently, reduced heat output.

This document provides instructions for a Fireside (24-Month) maintenance, including maintenance to the burner modules, flue collector, spark igniter, and flame detector. These instructions contain all procedures described in the Annual (12-Month) maintenance instructions (P/N **TID-0026**) as well as additional procedures concerning the burner modules. For each of the different Modulux boiler models, there is an associated maintenance kit P/N, as shown in the table on the cover and at the end of these instructions.

REQUIRED Tasks:

- Inspect igniter and flame sensor (replace, Igniter: **P/N 95251245**, Detector: **P/N 95251246**)
- Check flame detection circuitry (See **paragraph 1.3**)
- Inspect and clean burner modules (clean if needed) (see **Section 1.4**)
- Inspect flue collector (clean if needed) (see **Section 1.5**)
- Wash heat exchanger (clean if needed)
- Inspect air filters (replace if needed, AERCO **P/N 95261879**)
- Inspect condensate drain lines (clean if needed)
- Check for gas leaks using a soapy solution
- Inspect igniter and flame sensor (replace, Igniter: **P/N 95251245**, Detector: **P/N 95251246**)
- Check pH of boiler system water (refer to **Appendix C**, Boiler Water Chemistry and Maintenance in MLX boiler manual **GF-115-H**).

RECOMMENDED Tasks:

- Inspect condensate tray (clean if needed)
- Inspect vent pipe (clean if needed)
- Check and adjust air/fuel ratio (see MLX boiler manual **GF-115-H**, **paragraph 7.5.5**)
- Inspect heat transfer surfaces (clean if needed)
- Clean strainer mesh (Monthly)
- Check inlet gas pressure. Changes in gas pressure require combustion recalibration (see MLX boiler manual **GF-115-H**, **paragraph 7.5.5**)
- Check vent and inlet air terminations
- Check electrical supply voltages

Tools Required

Common hand tools, plus a spark gap feeler gauge are required to perform the annual maintenance tasks described in this bulletin.



Prior to performing the following disassembly and inspection procedures, ensure that all electrical power to the boiler has been turned off and the external gas shut-off valve is fully closed.

1.1 - Disassembly for Fireside Maintenance

Disassemble the unit per **Instruction 1.1**, below, and locate the electrical components to be replaced.

INSTRUCTION 1.1

Unit Disassembly for Annual Maintenance

1. Disconnect electrical power to the unit by turning off the external circuit breaker.
2. Turn off the external gas supply shutoff valve.

NOTE

The cover is secured with spring clips and pins to front, back and side panels of the unit. In addition, two (2) groups of ground wires from the frame of the boiler are attached with clips to the underside of the top cover. Use care when disconnecting these ground wire clips. Note that all lugs have capture spring clips that are released by pressing a small nub under lug itself.

3. Remove the top cover from the boiler. A screwdriver may be needed to pry the cover from the two pins on either end.
4. Carefully detach the ground wire clips from the underside of the cover (see note above).
5. Remove the front panel from the boiler to provide access to the spark igniter and flame detector for each heat module of the boiler (see **Figure 1**).
6. Refer to **Figure 2** and **Figure 3** and locate the installed locations of the igniters and flame detectors. These Figures show a Modulex MLX-757 containing five (5) igniters and five (5) flame detectors.

END

NOTE

The number of burner sections, and thus the electrical components, varies by model.

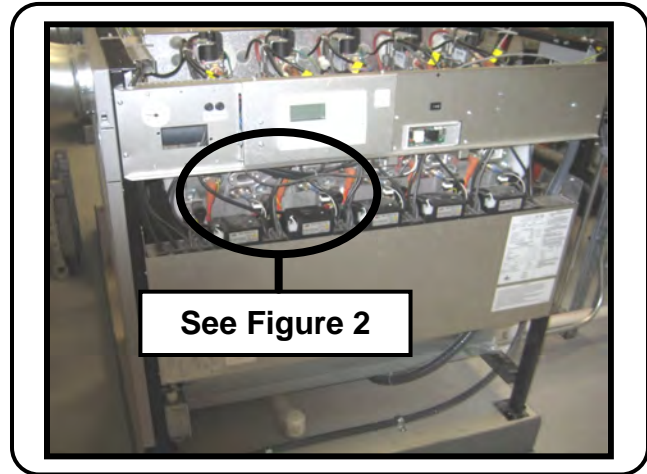


Figure 1: Cover Removed (Rear)

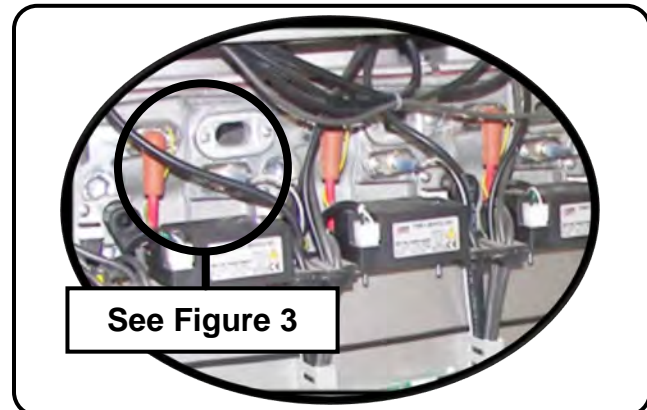


Figure 2: Electrical Connections

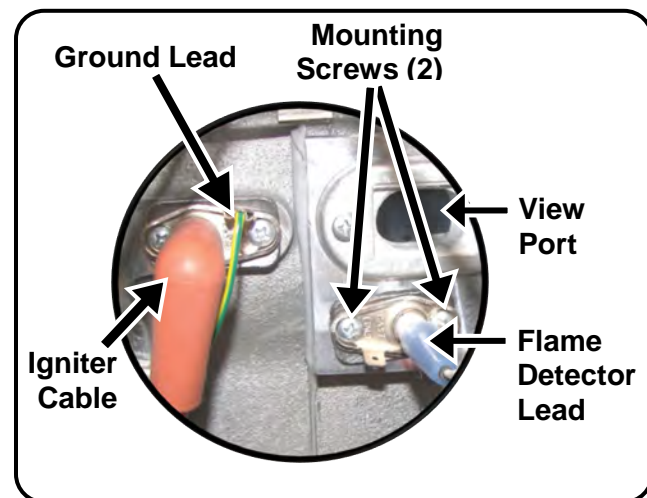


Figure 3: Electrical Components

1.2 Replacing the Spark Igniters and Flame Detectors

The Spark Igniter and Flame Detector are replaced per **Instructions 1.2 A** and **1.2B** below.

INSTRUCTION 1.2 A

Replacing the Spark Igniter

The spark igniter for each heat module is installed to the left of the view port as shown in **Figure 3**. Remove and replace as follows:

1. Disconnect the spark igniter ground wire and unplug the igniter cable.
2. Using a Phillips head screwdriver, remove the two (2) screws securing the igniter and remove it from the boiler.
3. Obtain a replacement igniter from the maintenance kit. Using a spark gap feeler gauge, ensure that the igniter spark gap is 4mm to 5 mm.
4. Install the replacement igniter and secure it in place with the two (2) screws removed in step (b).
5. Reconnect the igniter cable and ground wire
6. Repeat steps (1) through (5) for each igniter in the Modulex boiler.

END

INSTRUCTION 1.2 B

Replacing the Flame Detector

The flame detector for each heat module is installed beneath the view port as shown in **Figure 3**. Remove and replace as follows:

1. Disconnect the flame detector wire lead.
2. Using a Phillips head screwdriver, remove the two (2) screws securing the flame detector and remove it from the boiler.
3. Obtain a replacement flame detector from the maintenance kit.
4. Install the replacement flame detector and secure it in place with the two (2) screws removed in step (b).
5. Reconnect the flame detector wire lead.
6. Repeat steps (1) through (5) for each flame detector in the boiler.

END

1.3 Testing the Flame Detection Circuitry

The Modulex boiler is designed to automatically shut down in the absence of a flame to prevent the buildup of unburned fuel in the combustion chamber. Test the circuit by removing a flame detector lead from any of the burner sections (**Figure 3**) while the unit is running. If the unit shuts down after a few seconds, the flame detection circuitry is functional. If boiler does not automatically shut down, there is a problem with the circuit. In this case, manually shut down the boiler and contact appropriate technical help to resolve the problem.

1.4 Burner Module Inspection and Cleaning

This section provides instructions for disassembly of the unit, as well as inspection and cleaning of the burner modules. Before performing this procedure, it is advised to check the CO₂ percentage at the boiler input. If the CO₂ percentage is within 5% of the value shown in **Table 1**, then the burner modules do not need to be inspected and cleaned. The operation then can be limited to the inspection and cleaning of the flue collector.

Table 1: Acceptable Combustion Gas Ratios at Boiler Input

GAS SUPPLY	OXYGEN (O ₂)	CARBON DIOXIDE (CO ₂)	CARBON MONOXIDE (CO)
NATURAL GAS	4.7% to 5.3%	9.1% to 8.8%	<100 ppm
PROPANE	4.4% to 5.0%	10.7% to 10.4%	<100 ppm

Note that a reduction of airflow at the input may indicate the burners need cleaning, but first check the flue outlet and the air intake for any physical obstruction. If there is no obstruction, then proceed with the maintenance procedures starting with unit disassembly per **Instruction 1.4.1** on the next page.

1.4.1 – Unit Disassembly for Burner Maintenance

Tools required: Phillips head screwdriver, 13mm socket wrench (with extender), and an Exacto blade (or small sharp knife). Access to a steel brush and water jet are also recommended. **See Instruction 1.4.1.**



Prior to performing the following disassembly and inspection procedures, ensure that all electrical power to the boiler has been turned **OFF** and the external gas shut-off valve is fully **CLOSED**.

INSTRUCTION 1.4.1

Unit Disassembly for Fireside Inspection

1. Disconnect electrical power to the unit by turning off the external circuit breaker.
2. Turn off the external gas supply shutoff valve.
3. Remove the top cover from the boiler. A screwdriver may be needed to pry the cover from the two pins on either end. The cover is secured with spring clips and pins to the front, back and side panels of the unit. In addition, two (2) groups of ground wires from the frame of the boiler are attached with clips to the underside of the top cover. Use care when disconnecting these ground wire clips. Note that all lugs have capture spring clips that are released by pressing a small nub under the lug body.
4. Remove the front panel from the boiler to provide access to the fan assembly cover (**Figure 4**).
5. Remove the screws from the various locations on the fan assembly cover. A sampling of screw locations is shown in **Figure 4**.
6. Remove the plastic cap bolt covers (**C**) from the bottom of the fan chamber to access the bolts holding the fan assembly in place (**Figure 5**).
7. Using a 13 mm socket wrench, remove the bolts **D1**, **D2**, **D3**, and **D4** that secure the fan chamber cover onto the burner assembly (**Figure 6**).

(Continued on Next Page)

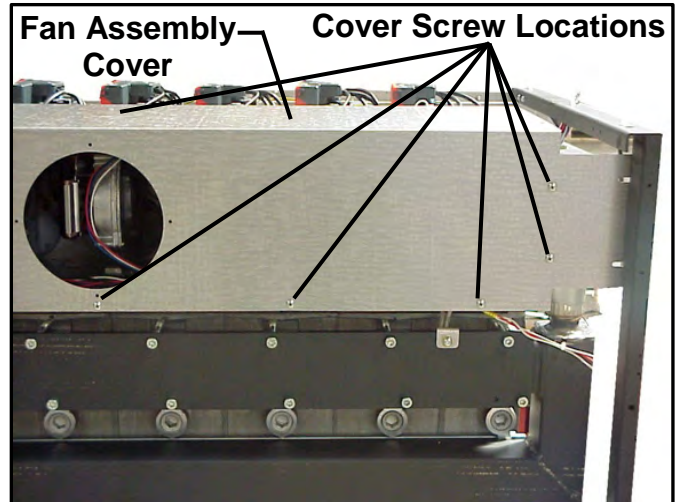


Figure 4: Remove Fan Assy Cover

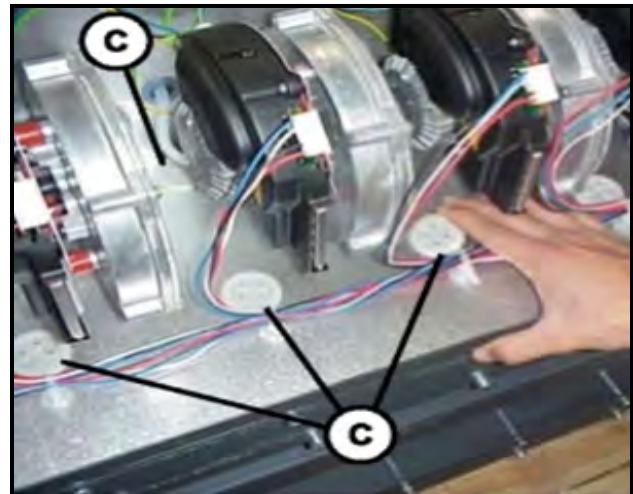


Figure 5: Remove Plastic Bolt Covers (C)

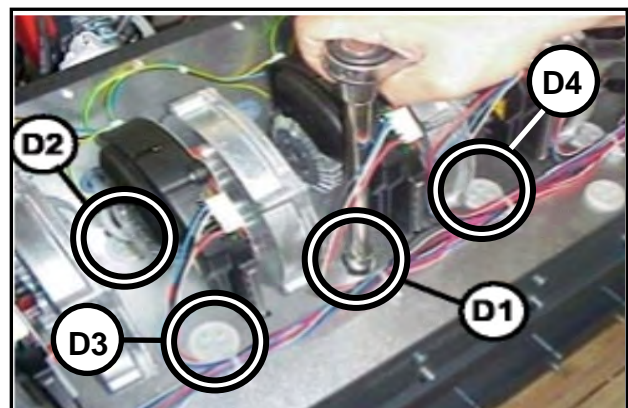


Figure 6: Remove Plastic Bolt Covers (C)

INSTRUCTION 1.4.1

Unit Disassembly for Fireside Inspection
 (Continued From Previous Page)

8. Unscrew the two air filters from each end of the burner manifold (Figure 7).
9. Remove the two screws and the sheet metal cover from each of two ends of the burner manifold (Figure 8).
10. Position burner manifolds, at each end, 3/8" (10mm) higher than the standard position (Figure 8, left). Line up the "E" hole of the gas pipe flange with the "G" hole of the side support panel and affix with one of the two screws previously removed.
11. Lift up the fan group (L) by rotating it on the gas manifold axis and keep it up by inserting the support rods (I), attached to the frame, in the holes (M) (Figure 10).

NOTE

There are six boiler models with two, three, four, five, six, or seven burner modules. Figure 12 shows a Modulex MLX-606 with four modules.

12. Access the condensate tray (N, Figure 11) and remove the cleaning plate (O) from the side opposite from the flue collector (depends on which side it was originally installed). Remove the screw securing the baffle (P) and lower the baffle onto the tray bottom.

END

Two Filters Located on Both Ends of Burner Manifold

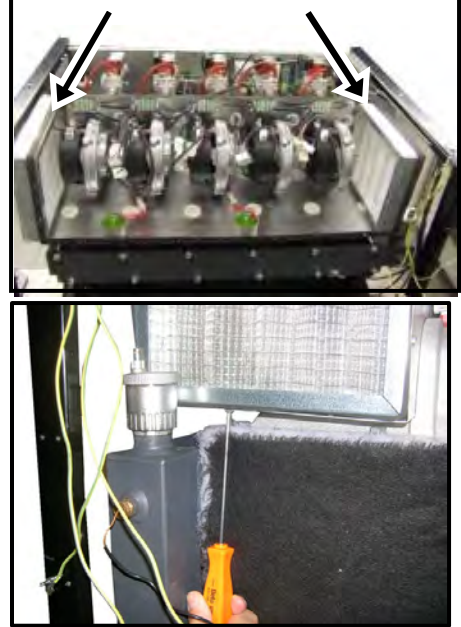


Figure 7: Removing Intake Filters



Figure 8: Removing End Plates

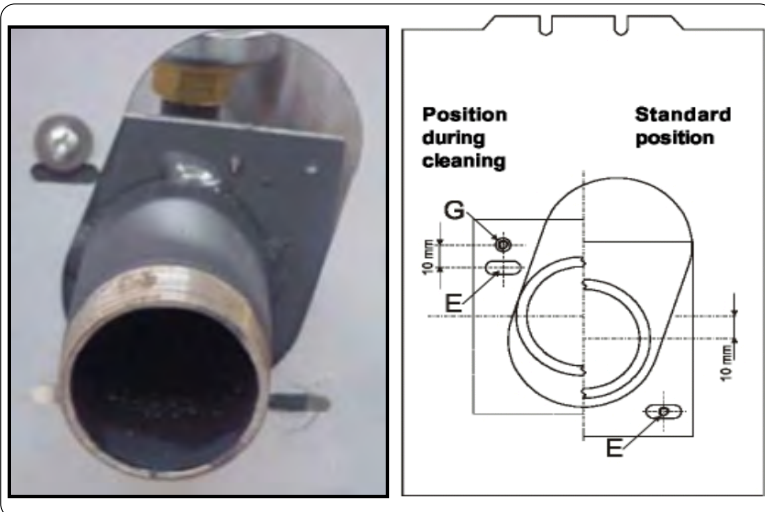


Figure 9: Reposition Endplates to Offset

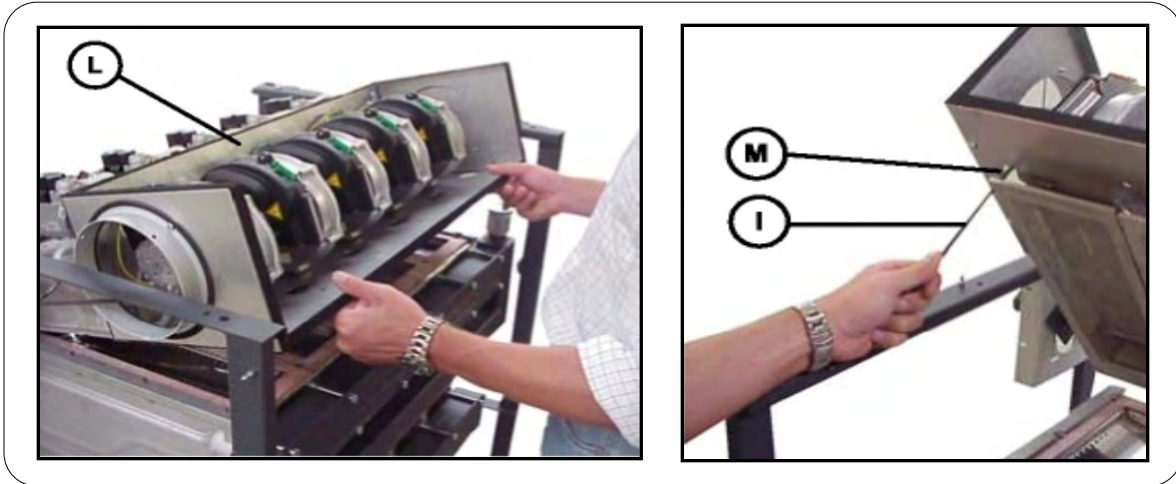


Figure 10: Fan Assy (L), Support Rod (I) and Holes (M)

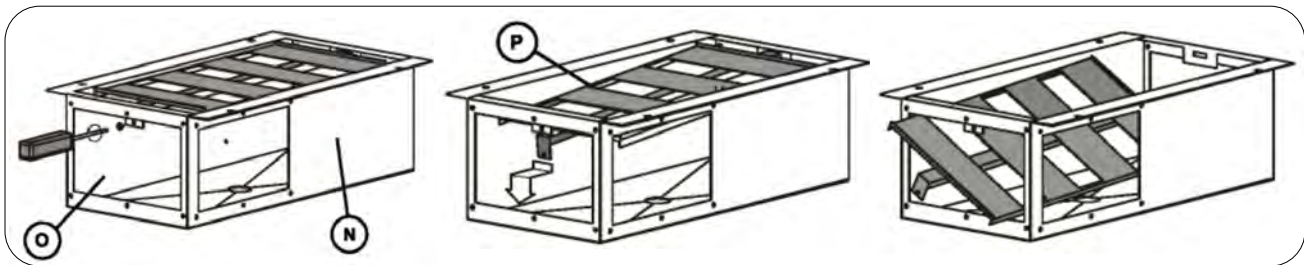


Figure 11: Accessing Condensate Tray

Burner Modules

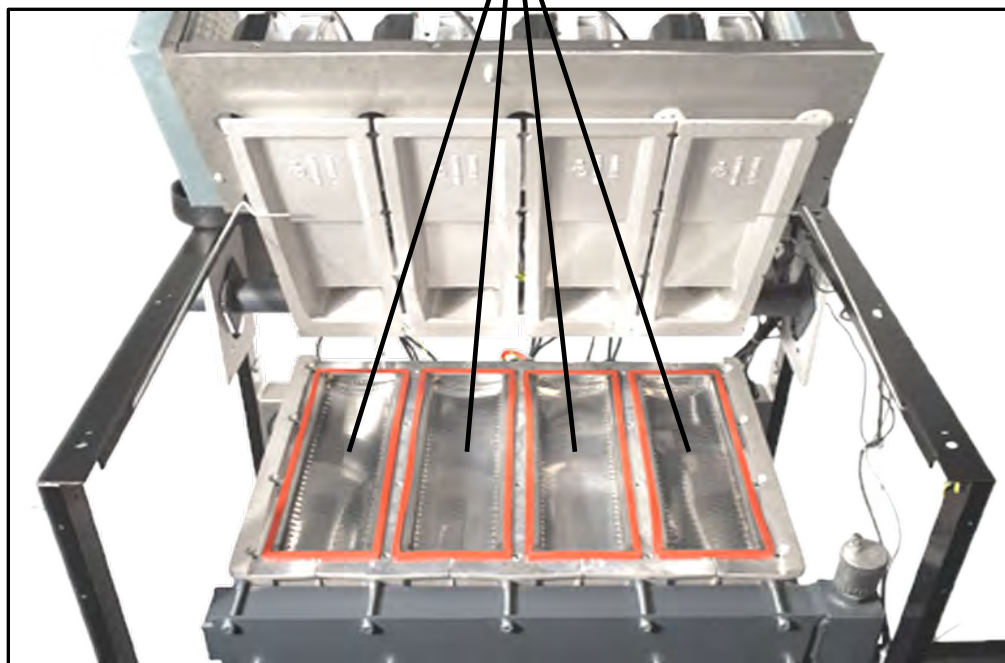


Figure 12: Fan Assembly Lifted to Access Burner Modules

1.4.2 - Removing The Burner Modules

To remove the burner modules and gaskets, refer to **Instruction 1.4.2**, below.

NOTE

Before removing the burners and gaskets, verify if the gaskets have been glued to the aluminum surface. If they have, apply an appropriate solvent and let set for the recommended time before attempting to remove the gaskets.

INSTRUCTION 1.4.2

Removing Burner Module(s)

1. If present, remove all the grounding tabs (**Figure 13**) at the rear of the burner modules (one per burner and screwed onto the boiler body) and discard. These are no longer needed as the new replacement gaskets are self-grounding. Use only the newer style gaskets as replacements.

▲ CAUTION ▲

Ensure that the small plaited copper grounding used on OLD gaskets is completely removed along with old gaskets from the burner mounting surfaces.

2. Remove each burner module from its seat by inserting a cutter between the gasket and the aluminum body on which it rests, and then carefully running the cutter down three sides of the burner. The photos in **Figure 14** show the (1) cutter being run along the shorter front edge, (2) along right long edge, and (3) along left long edge.
3. Next, remove the burner by carefully rotating it upward **ONLY** along the left or right long edge axis (#4 in **Figure 14**). Take care to avoid deforming the burner module as it is removed.

END

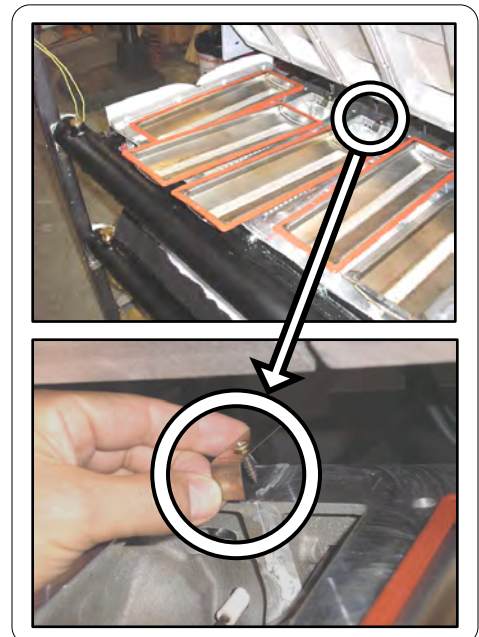


Figure 13: Remove Ground Tabs

NOTE

Old style gaskets are orange.
Newer style gaskets are grey.

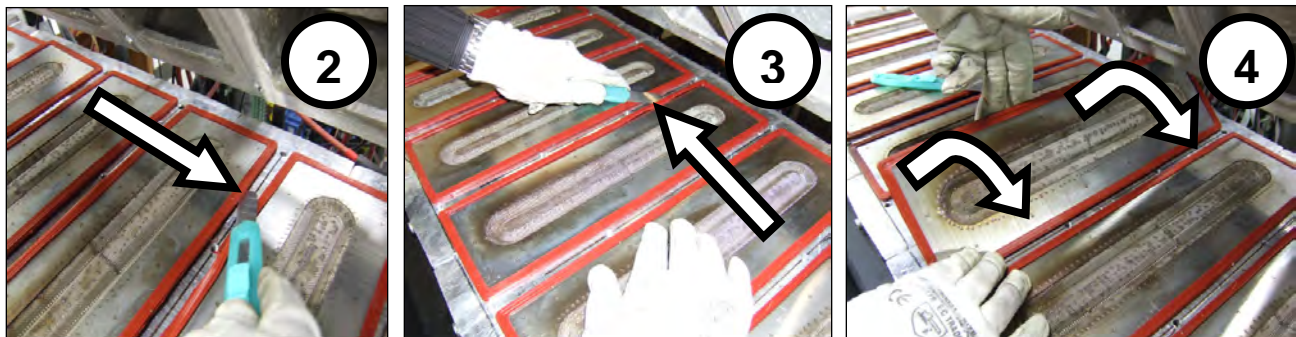


Figure 14: Cutting the Gasket (1-3) and Removing a Burner Module (4)

1.4.3 - Maintenance of Burner Modules and Combustion Chamber

After disassembly of the boiler, do the procedures as described in **Instruction 1.4.3**.

INSTRUCTION 1.4.3

Maintenance of Burner Modules and Combustion Chamber

1. After removing the burner modules and sealing gaskets from the recesses, use compressed air and blow the modules from the convex side to the dished side to blow away debris. Inspect for deformations and damage to the mesh and the module body.
2. Inspect the combustion chamber below the burners for scale and ash. Using compressed air, blow out the combustion chamber between the sections to remove all dirt and foreign particles from the aluminum protrusions. Use a water jet to wash the chamber out. Use care to avoid wetting the electrical wiring.
3. Inspect the flue duct and flue collector. During this operation, ensure that the condensate drain pipe is free of blockage so water does not accumulate in the tray. Clean out the condensate tray of any scale or ash collected from cleaning the combustion chamber.



The burner sealing gaskets **MUST BE REPLACED** after each and every burner cleaning.

END

1.4.4 - Reassembly After Burner Maintenance

After maintenance reassemble the unit per **Instruction 1.4.4**.

INSTRUCTION 1.4.4

Unit Reassembly After Maintenance

1. **The burner sealing gaskets must be replaced after each burner cleaning.** When positioning the replacement gaskets (**P/N 95261173**), place them on *top* of the burner modules and not between the burner modules and aluminum boiler body.
2. Reassemble all other components previously removed by reversing order of disassembly steps.
3. Before starting the boiler, **verify that the condensate siphon and boiler are filled with water and pump is running.**
4. Before opening the gas cock on the burner manifold, make sure that the coupling is securely tightened. To do this, open the gas cock and check the union for leaks using a soap solution.
5. As soon as a burner is put into operation, check immediately for leakage between the gas valve and the relevant premixing chamber.
6. Perform the combustion analysis and check combustion parameters per **paragraph 7.5.5** in Modulex boiler Manual, **GF-115-H**.

END

NOTE

Make sure that all gas pressure test nipples previously open, are closed and tight.

1.4.5 - Testing the Flame Detection Circuitry

The Modulex boiler is designed to automatically shut down in the absence of a flame to prevent the buildup of unburned fuel in the combustion chamber. Test the circuit by removing a flame detector lead from any of the burner sections (**Figure 3**) while the unit is running. If the unit shuts down after a few seconds, the flame detection circuitry is functional.

1.5 Inspection and Maintenance of the Flue Collector

Depending on the installation configuration, the flue collector may be installed on the left side, right side or rear of the Modulex boiler. Inspect the flue collector per **Instruction 1.5** below.

INSTRUCTION 1.5

Disassembly, Inspection, and Maintenance of the Flue Collector

1. Disconnect flue starter section from the flue collector by loosening the hose clamp (Figure 15).
2. Remove the flue collector and flue collector gasket from the condensate tray (Figure 15). The collector is secured to the tray with three (3) M4 bolts (bottom flange) and three M4 hex nuts (top flange). You will need to use a 7mm socket wrench with universal joint and extender to reach and remove the nuts and bolts.
3. Disconnect exhaust connector and exhaust connector gasket from the flue collector by removing the four (4) M5-20 bolts and washers shown in Figure 15.
4. Inspect and then clean the flue collector using a water jet or wet cloth.
5. Following inspection and cleaning refer to Figure 15, then reconnect the flue collector to the condensate tray using a **new** flue collector gasket (P/N 95250612).
6. Install the exhaust connector using a **new** exhaust connector gasket (P/N 95250632).
7. Connect the flue starter section to the flue collector and secure it using the clamp removed in Step 1.

END

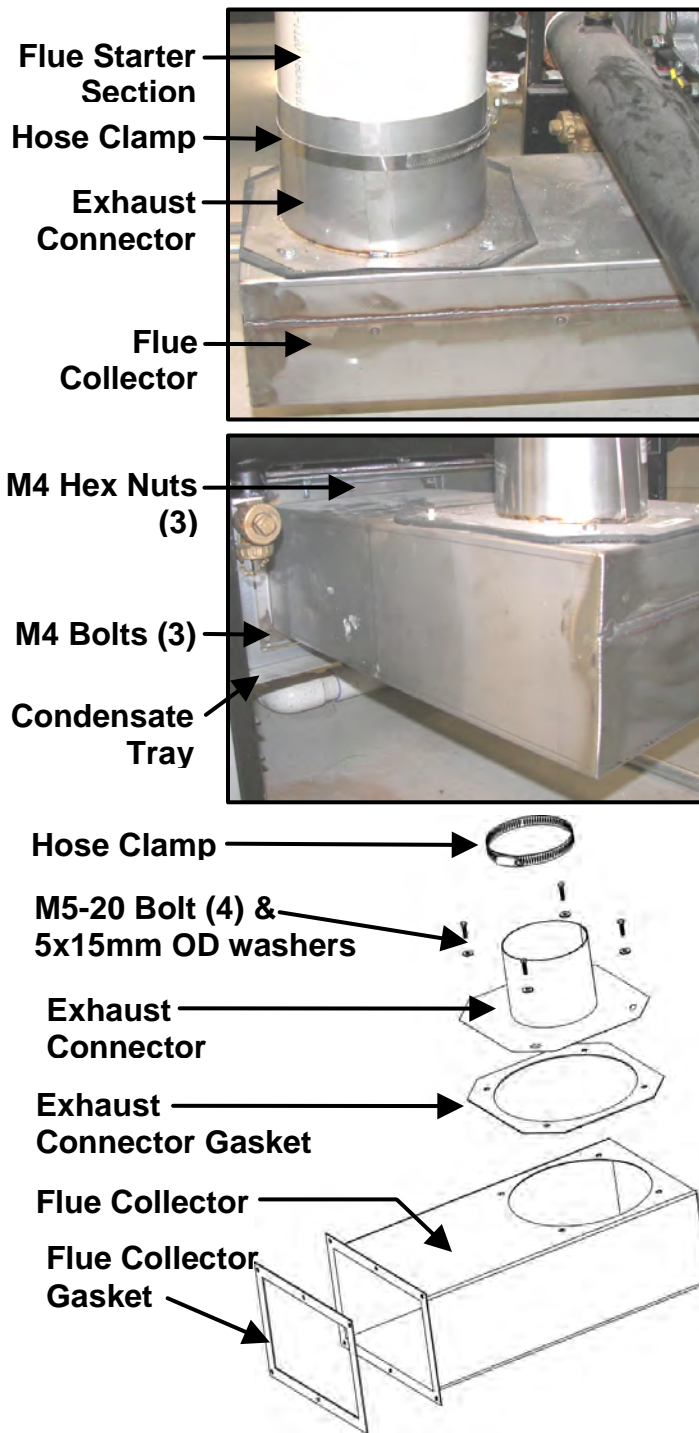


Figure 15: Flue Collector Parts and Assembly

Modulex Annual (12 Month) Maintenance

Technical instruction Document

TID-0026_99

Modulex Models and Associated Fireside Maintenance Kit P/Ns

MLX-303 Fireside Maintenance Kit	Kit 58019-07
MLX-454 Fireside Maintenance Kit	Kit 58019-08
MLX-606 Fireside Maintenance Kit	Kit 58019-09
MLX-757 Fireside Maintenance Kit	Kit 58019-10
MLX-909 Fireside Maintenance Kit	Kit 58019-11
MLX-1060 Fireside Maintenance Kit	Kit 58019-12



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