



MARKET FORGE

M24G & M36G GAS OPERATED BOILERS PARTS AND SERVICE MANUAL

EFFECTIVE AUGUST 30, 2017

Superseding All Previous Parts Lists.

The Company reserves the right to make substitution in the event that items specified are not available.

ERRORS: Descriptive and/or typographic errors are subject to correction.

MARKET FORGE

Telephone: (802) 658-6600 Fax: (802) 860-3732

www.marketforge.com

P/N 14-0308 Rev A

TABLE OF CONTENTS

| | |
|---|----|
| TROUBLESHOOTING..... | 3 |
| GAS PRESSURE ADJUSTMENTS | 5 |
| WATER CONTROL BOARD TESING PROCEDURE | 6 |
| WIRING DIAGRAM..... | 8 |
| ILLUSTRATED PART LIST | |
| 24" BOILER BASE CABINET..... | 10 |
| PRESSURE SWITCH BOX, WITHOUT COVER..... | 11 |
| CONTROL BOX ASSEMBLY, WITH AND WITHOUT COVER..... | 12 |
| PLUMBING, LEFT SIDE GAS BOILER, 24"..... | 13 |
| FRONT VIEW GAS BOILER, 24", 200K | 14 |
| GAS TRAIN, 200K BTU BOILER SHOWN..... | 15 |

TROUBLESHOOTING

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|--|--|--|
| Pilot will not ignite or does not hold. | Gas not reaching unit. | Check to make sure gas is on and gas line is purged of air. |
| | Main "gas cock knob" not in ON position. | Depress and turn "main gas cock" to pilot position - (refer to lighting instructions). |
| | Air pocket or clog in gas line. | Purge or blow out gas line. |
| | Defective wiring or poor connection at pilots at power unit. | Check - replace or tighten. |
| | Defective switching across either the water level control or pressure switches. | Make continuity check – replace units that are defective. |
| | Defective gas valve. | Replace gas valve. |
| Water enters boiler very slowly. | Clogged strainer screen on water fill solenoid valve | Clean or replace strainer screen. (P/N 08-4871). |
| | Debris or lime accumulation on seat of water fill valve. | Clean valve seat |
| Boiler overfills with water. | Probes scaled. | Clean. |
| | Water supply valve fails to close. | Clean valve seat or replace valve. |
| | Defective water level control. | Follow the test procedure. Replace if defective. |
| Main Burners will not ignite or will not remain lighted. | No water in boiler. | Check to be sure water switch is on. Check to be sure main water supply is on and the electrical supply to unit is on. |
| | Main gas cock or supply line not open. | Open. |
| | Pressure switch set too low. | Reset - if continuity check shows to be defective - replace. |
| | No voltage to gas valve. | Check main fuse. |
| | Gas valve defective. | Replace. |
| Boiler fails to build up any pressure when the water is at the correct level and the fuel switch is turned on. | Check to see that main gas is turned on. | Turn on. |
| | Check to see that gas valve is in burners "on" position. | Turn to burners "on". |
| | Current flow is broken at water level control (ascertain with continuity check). | Check for voltage thru right side of control board, replace if defective. |
| | Current flow is broken at pressure control or high limit control switches (ascertain with continuity check). | Re-adjust to proper setting -refer to instruction for re-adjustment, replace if defective. |
| Boiler fails to cut off after reaching operating pressure. | Pressure switch set too high or defective. | Adjust or replace if defective. |
| | Gas valve fails to cut off gas supply when demands of pressure switch have been met. | Replace gas valve. |
| Water level in gauge glass fluctuates up and down. | Top shutoff valve on water gauge glass is closed. | Open. |

TROUBLESHOOTING

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|--|---|--|
| Boiler fails to reach full operating pressure of 5 lbs. or 15 lbs. | Pressure gauge reads inaccurately. | Replace. |
| | Pressure control and high limit control switches are out of adjustment. | Follow instructions for readjusting |
| | Safety valve not seating properly. | Purge manually or replace. |
| | Water level too high. | Adjust water level control - check water feed valve for sticking - clean or replace. |
| | Air vent not venting properly. | Replace. |
| | Insufficient flames on burners or improper gas supply. | See instructions on gas adjustments |
| Safety valve blows off prematurely. | Pressure set too high. | Readjust pressure control. |
| | Pressure gauge reads incorrectly. | Replace. |
| | Lime or debris on seat of valve | Purge or replace. |
| Boiler builds up to pressure, shuts down, fails to come back on. | High limit switch set to low or operating pressure control switch set too high. | Follow instructions for readjusting Replace if defective. |
| Water does not enter boiler. | Main water supply off. | Turn on. |
| | Power not reaching unit. | Check main fuse or circuit. |
| | Probes Dirty. | Remove & Clean |
| | Water level control board defective. | See test procedure. |
| | Solenoid valve defective | If Voltage is verified at solenoid coil, but fails to open, replace solenoid. |
| Cold water condenser does not function. | Main water supply off. | Turn on. |
| | Thermostat defective. | Replace if defective. |
| | Loose coil nut. | Tighten coil nut. |
| | Solenoid coil not energized. | Check coil for continuity, if open replace. |
| Air vent leaking. | Not closing. | Replace. |

GAS PRESSURE ADJUSTMENTS

If gas pressure is too low

Check your gas supply line for a restriction. If no restriction exists, check with your Natural gas supplier to provide at least 5" of water column pressure in the gas supply line. If no restriction exists and Propane gas is being used, the tank pressure regulator should be adjusted to supply at least 11" of water column pressure in the gas supply line. If this adjustment cannot be made to your satisfaction, the gas supplier should be notified.

If gas pressure is too high

Adjust the pressure regulator on the boiler gas valve to reduce the pressure if Natural gas is being used. If Propane gas is being used, adjust the pressure regulator supplied by the gas supplier. If the regulator cannot be adjusted, notify the gas supplier.

Pressure control switch adjustment

If boiler fails to maintain steam pressure in operating range, pressure control switch may require adjustment.

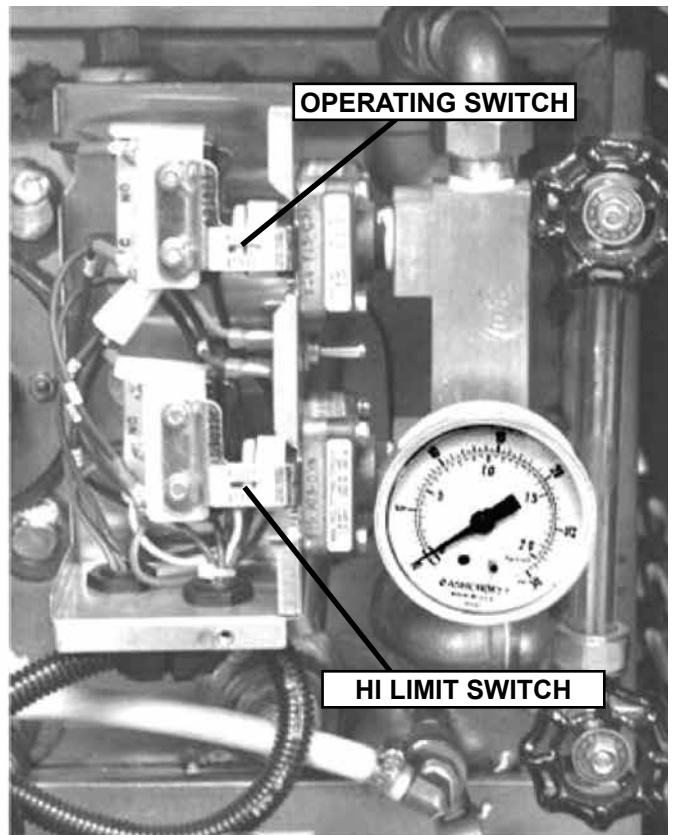
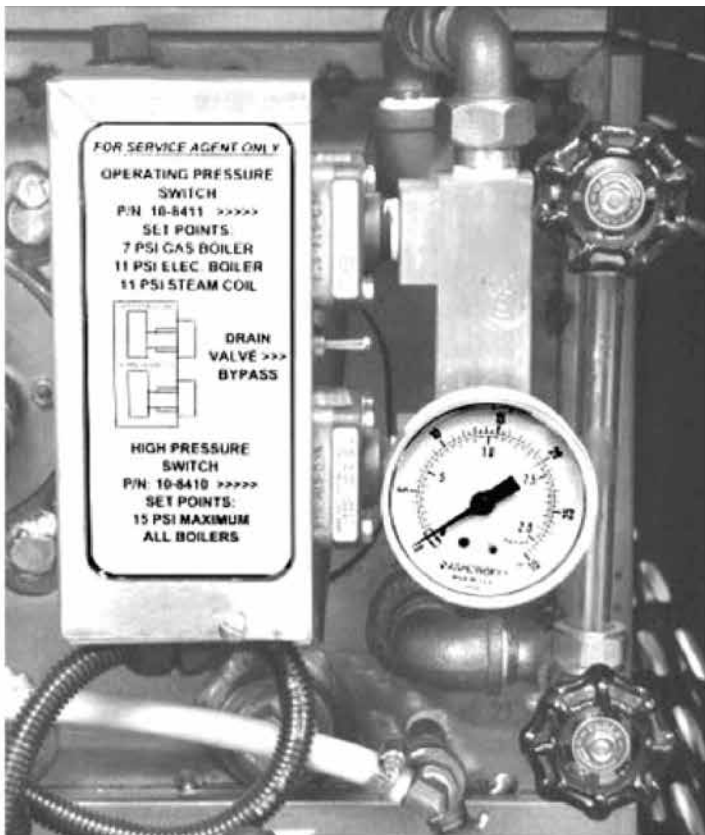
1. Start boiler and allow pressure to build up to operating level - 7 PSI (1kg/cm²).
2. Check boiler pressure gauge. The gas burners should cycle ON at 5 PSI and cycle OFF at 7 PSI.
3. If boiler does not come on when pressure gauge reads 5 PSI and does not go off when pressure gauge reads 7 PSI, proceed as follows:



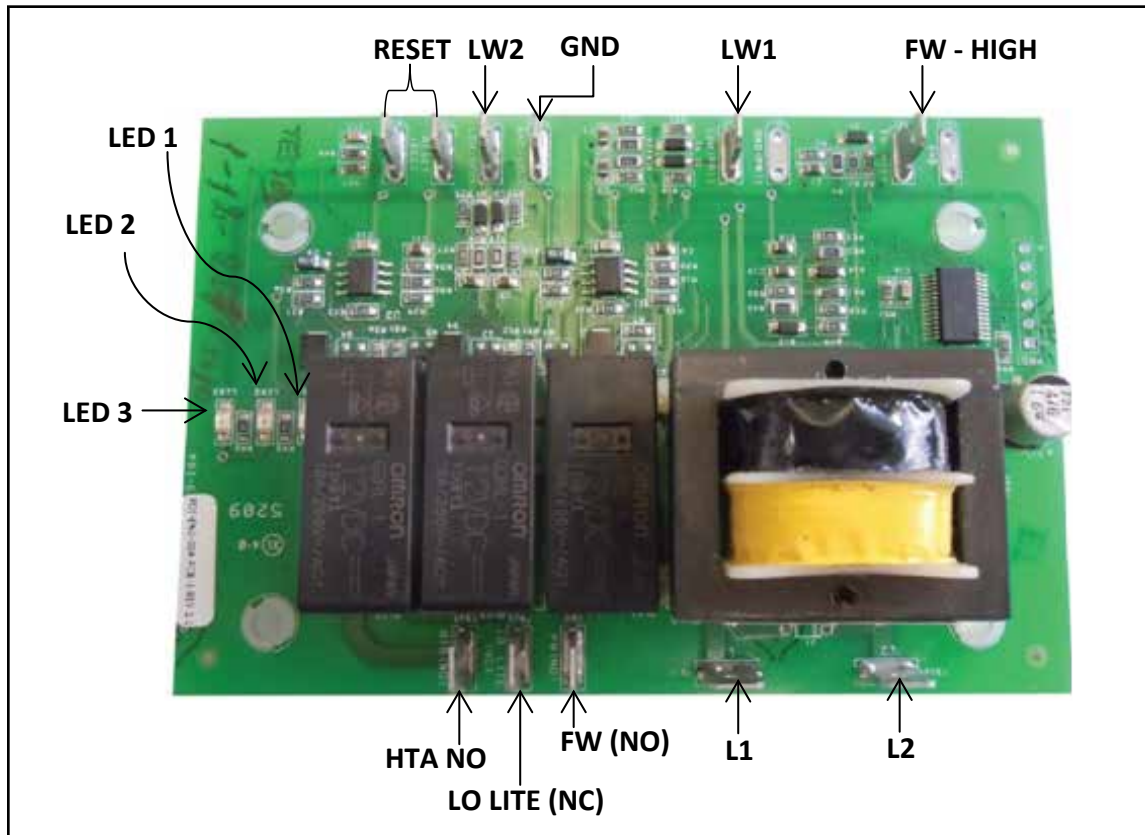
WARNING

Because power must be on to adjust pressure switches, be sure to protect against electrical shock.

- a. Remove screw and lift front cover off control box.
- b. Hand adjust operating pressure control switch and high limit pressure control switch by turning adjusting nut (Knurled knob) clockwise to raise and counter clockwise to lower actuation point. Switch should be set so that boiler comes on when boiler pressure gauge reads 5 PSI and goes off when gauge reads 7 PSI. Hi limit switch should be set so that boiler will shut off if pressure reaches 15 PSI.
- c. The actuation value (differential) is factory set and cannot be changed.
- d. The cold water condenser thermostat is preset at factory.
- e. Repeat steps, 1, 2, and 3. If 5 to 7 PSI boiler pressure gauge reading is obtained during boiler operation, adjustment is correct. If proper adjustment cannot be made contact an authorized service agent.
- f. After making adjustments, replace cover on pressure switch box and screw.



WATER CONTROL BOARD TESTING PROCEDURE



This test procedure is to be used to determine if the control is working properly. It is not intended to determine why the control may have failed.

If testing shows that the control is operating properly, check all probe and solenoid wiring and the condition of the electrodes in the steam chamber.

Contact the factory if the boiler still does not operate properly after completing the testing.

Tools Needed:

- Digital or Analog V-O-M meter.
- Alligator clip type test jumpers (2 sets min.).

Turn Off Power to Control:

- Use V-O-M to verify there is no power at terminals L 1 & L2.
- Use V-O-M to verify that there is no power at terminals 'FW(NO)', 'LO LITE(NC)' & 'HTR(NO)'. If there is power at any of these terminals, you will need to find the source and turn it off.

Remove Wires from Probe and Relay Switch Terminals:

- DO NOT remove wires from L 1 & L2 terminals.
- Tag wires and remove from probe and relay contact

terminals including 'GND' terminal.

- Tag and remove wires from 'RESET' terminals.
- Connect jumper wire to both 'RESET' terminals.

Turn Power On to Terminals L 1 & L2:

- 'LED 1' should turn on.
- 'LED 2' should be off.
- 'LED 3' should be off.
- Use V-O-M to verify that there is power at 'FW(NO)' & 'LO LITE(NC)' terminals and no power 'HTR(NO)' terminals Test Feedwater Function:
- Connect jumper wire to 'FW HIGH and 'GND' terminals.
- 'LED 1' should turn off after a 10 second delay.
- Use V-O-M to verify that there is no power at the 'FW (NO)' terminal.
- Remove jumper from 'FW HIGH' and 'GND' terminals. . 'LED 1' should turn on.
- Use V-O-M to verify that there is power at the 'FW(NO)' terminal.

WATER CONTROL BOARD TESTING PROCEDURE

Test Primary Low Water Function:

- Connect jumper wire to 'LW(1)' and 'GND' terminals.
- 'LED 2' should turn on.
- Remove jumper wire from 'LW(1)' and 'GND' terminals.
- 'LED 2' should turn off after a 3 second delay.
- Connect jumper wire to 'LW(1)' and 'GND' terminals.
- 'LED 2' should turn on.
- Use V-O-M to verify that there is power at the 'LO LITE(NC)' terminal and no power at the 'HTR(NO)' terminal.
- Remove the jumper wires from the 'RESET' terminals.
- 'LED 3' should turn on.
- Use V-O-M to verify that there is no power at the 'LO LITE(NC)' terminal and power at the 'HTR(NO)' terminal.
- Connect jumper wire to 'RESET' terminals.
- Remove jumper wire from 'LW(2)' and 'GND' terminals.
- 'LED 3' should turn off after a 3 second delay.
- USE V-O-M to verify that there is power at the 'LO LITE(NC)' terminal and no power at the 'HTR(NO)' terminal.
- Connect jumper wire from 'LW(2)' and 'GND' terminals.
- 'LED 3' should remain off.

Test Secondary Low Water Function:

- Connect jumper wire to 'LW(2)' and 'GND' terminals.
- 'LED 3' should remain off.

IF ALL FUNCTIONS WORK, TROUBLE-SHOOTING OTHER COMPONENTS WILL BE REQUIRED!

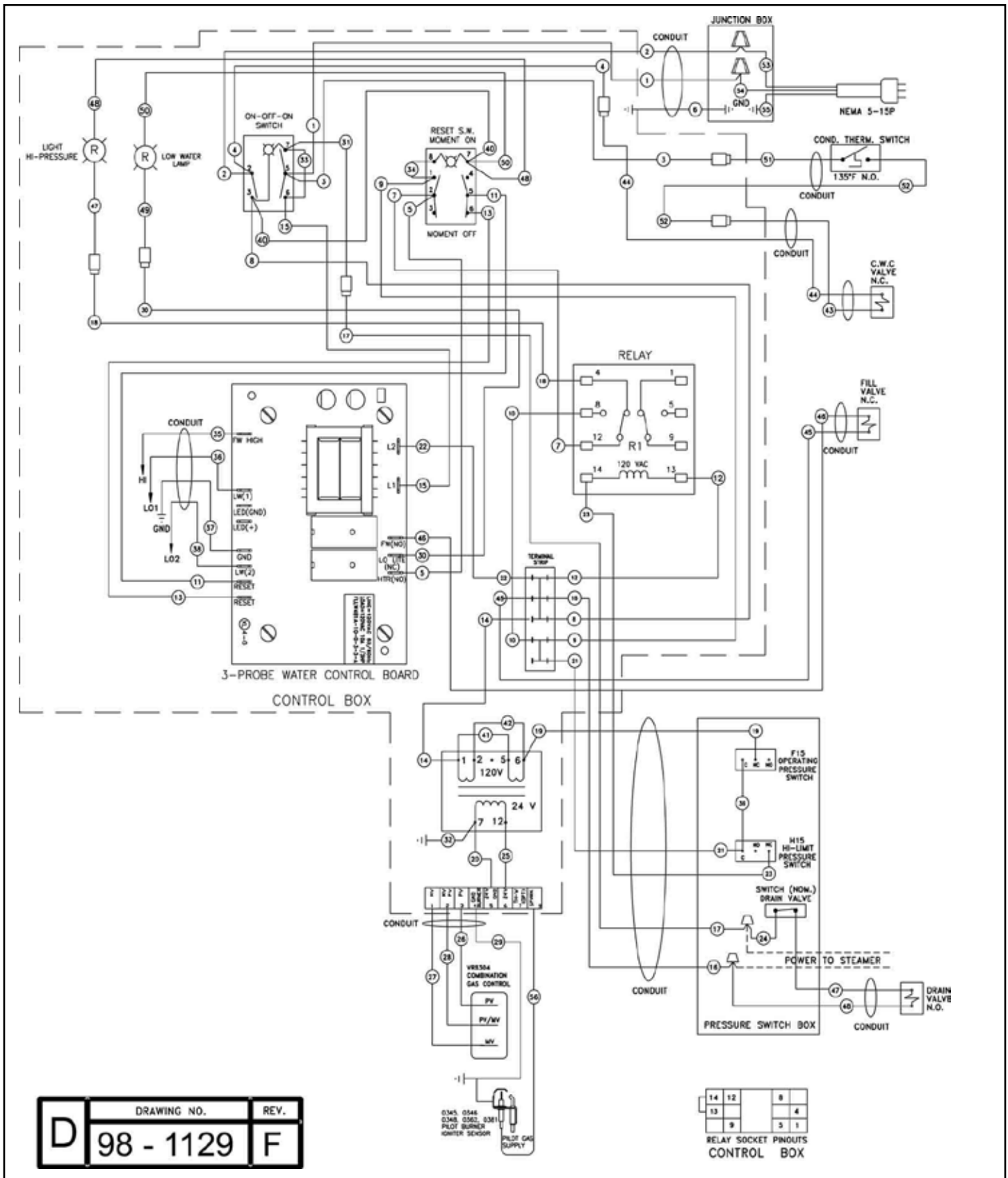


IMPORTANT

Jumper wire between 'LW(1)' and 'GND' terminals must remain in place to test secondary low water function. IF ANY OF THE FUNCTIONS DO NOT WORK, REPLACE THE BOARD!

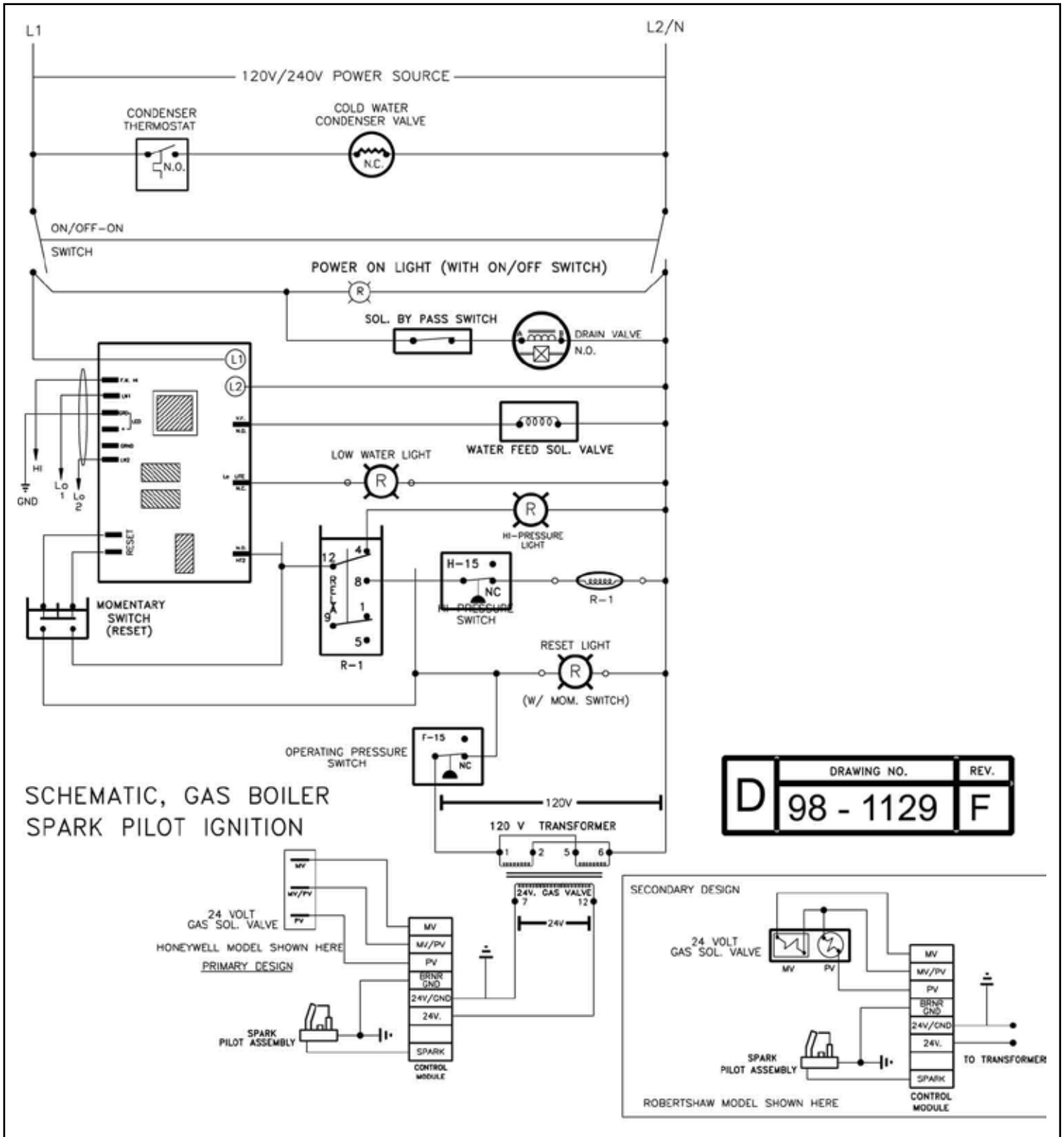
WIRING DIAGRAM

WIRING DIAGRAM FOR NEW GENERATION BOILERS – 100K, 200K, 300K BTU

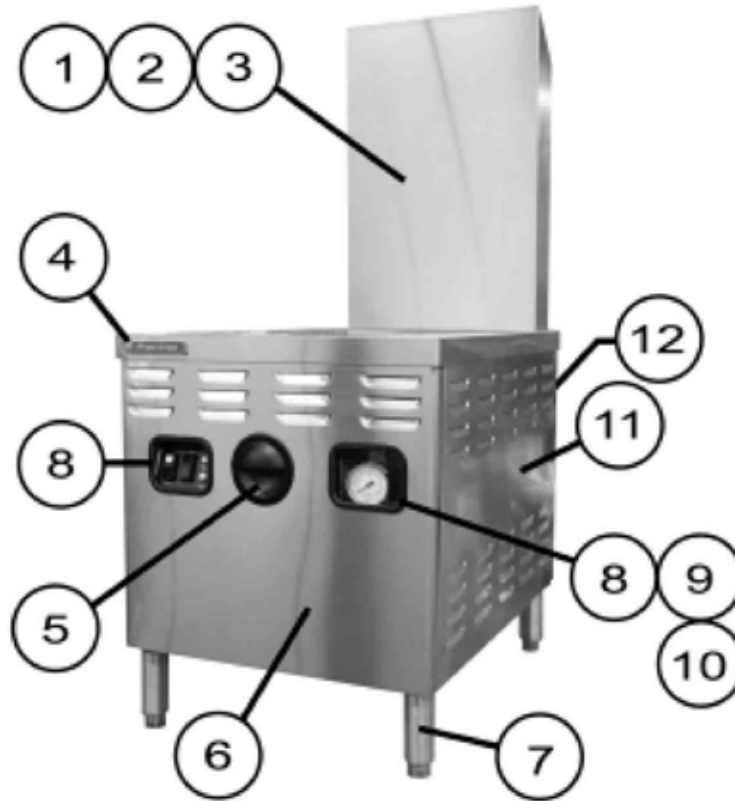


WIRING DIAGRAM

SCHEMATIC DIAGRAM FOR NEW GENERATION BOILERS – 100K, 200K, 300K BTU

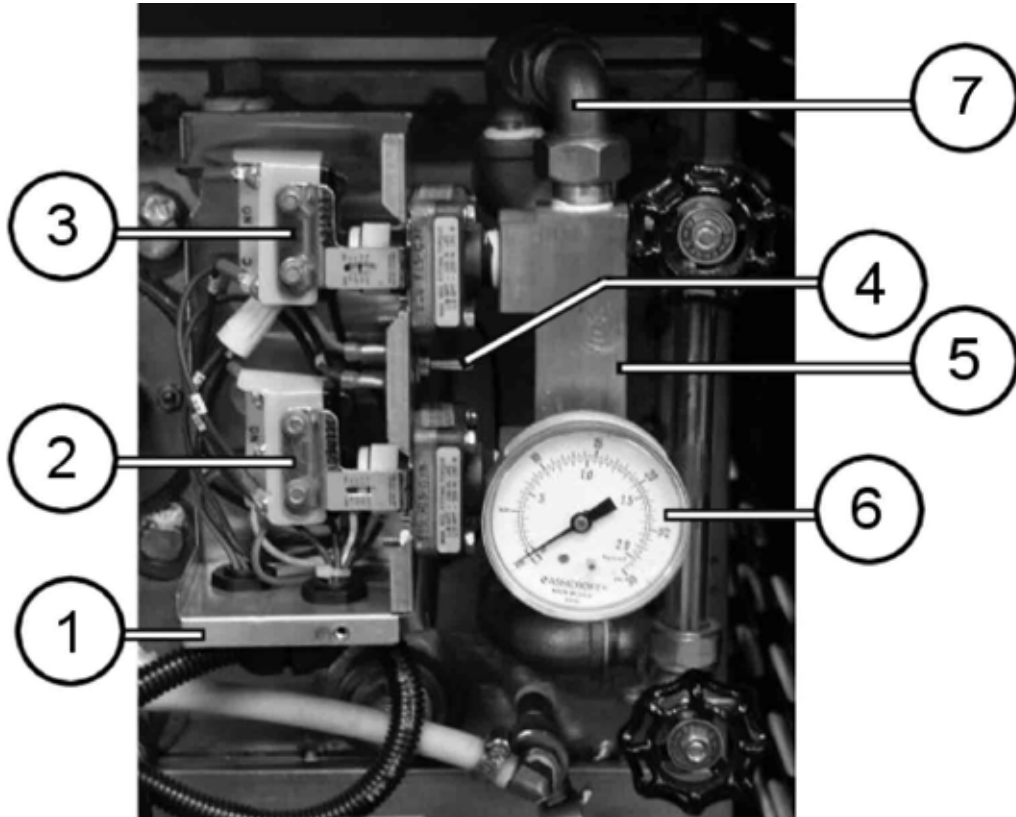


24" BOILER BASE CABINET



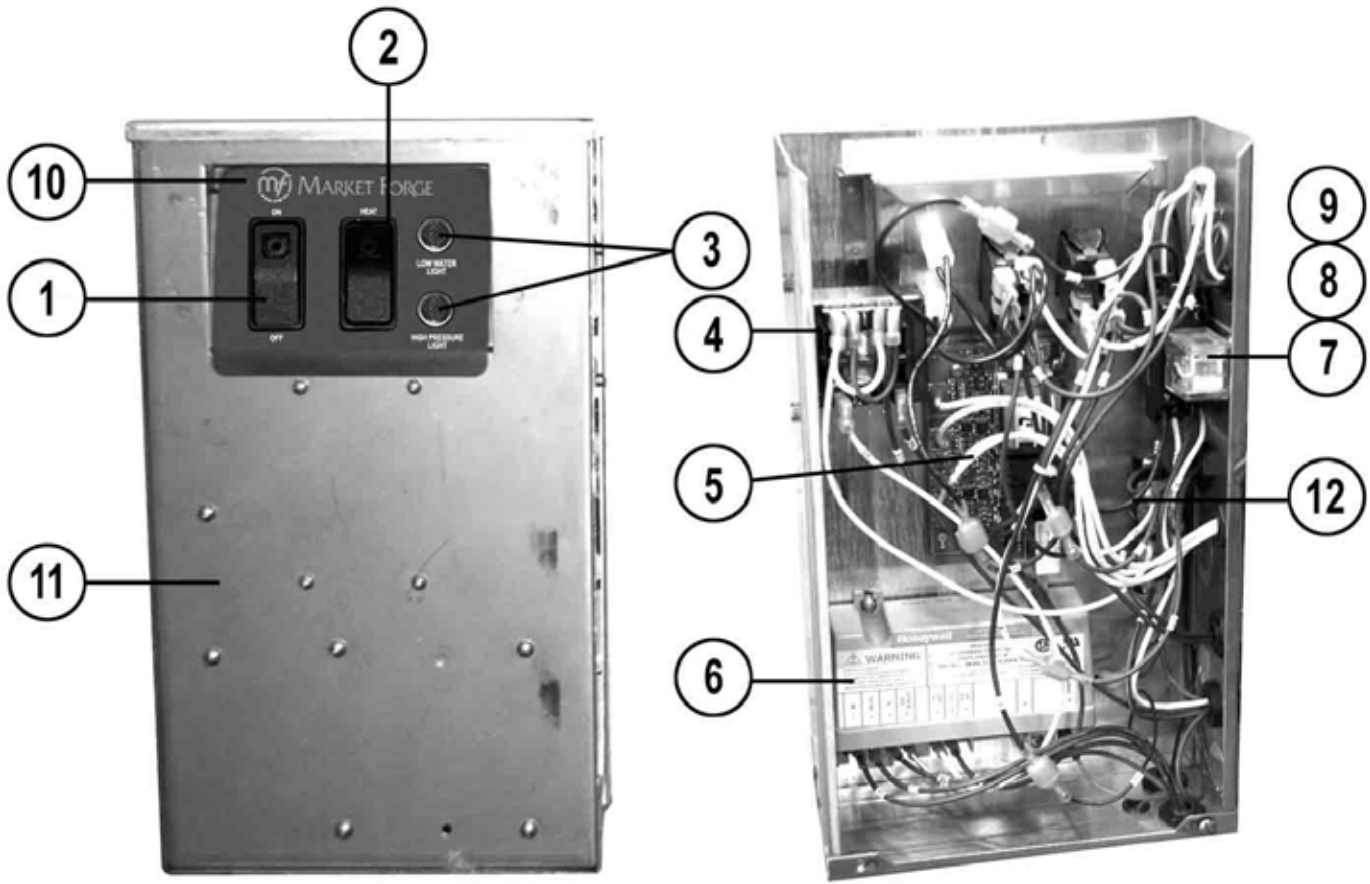
| ITEM | PART NO. | DESCRIPTION |
|------|-------------------------|--|
| 1 | 91-8892 | Flue Outer, 24" Front |
| 1 | 91-8938 | Flue Outer, 36" Front |
| 2 | 91-8893 | Flue Outer, 24" Back |
| 2 | 91-2713 | Flue Outer, 36" Back |
| 3 | 98-0593 | Flue Inner Assembly, 100 & 200k Boiler |
| 3 | 91-8936 | Flue Inner Assembly, 300k Boiler |
| 4 | 08-5894 | Market Forge Nameplate Logo |
| 5 | 91-5795 | Handle, Front |
| 6 | 94-5007 | Panel, Front Assembly, 24" |
| 6 | 94-5006 | Panel, Front Assembly, 36" |
| 7 | 10-0631 | Leg, 6" |
| 7 | 08-5206 | Leg, 8" |
| 7 | 08-5211 | Leg, 10" |
| 7 | 08-5208 | Leg, Flanged 6" |
| 7 | 10-0326 | Caster, 5" |
| 8 | 98-3968 | Trim, Edge |
| 9 | 98-3978 | Glass |
| 10 | 98-3991 | Gasket, Adhesive |
| 11 | 98-4010 | Panel, Side (<i>Single Panel</i>) |
| 12 | 98-3995 | Panel, Rear Assembly, 24" |
| 12 | 98-3996 | Panel, Rear Assembly, 36" |
| 13 | 94-5011 | Panel Clips (<i>not shown</i>) |

PRESSURE SWITCH BOX, WITHOUT COVER



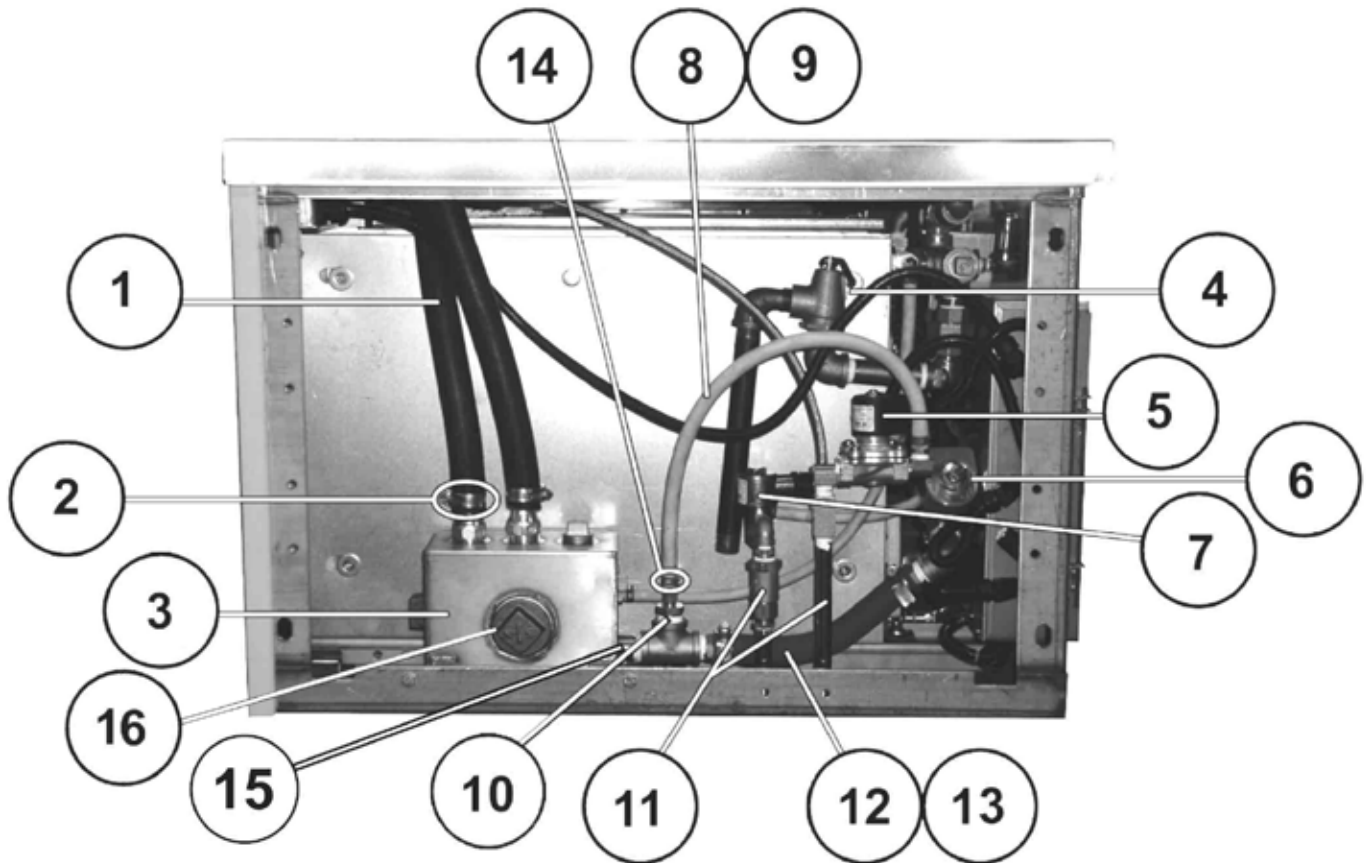
| ITEM | PART NO. | DESCRIPTION |
|------|-------------------------|-----------------------------|
| 1 | 94-5064 | Box, Pressure Switch |
| 2 | 10-8410 | Pressure Switch, Hi-Limit |
| 3 | 10-8411 | Pressure Switch, Operating |
| 4 | 98-3875 | Switch, Drain By-Pass |
| 5 | 08-7933 | Manifold, Pressure Switches |
| 6 | 10-4804 | Pressure Gauge |
| 7 | 09-4844 | Union Elbow, 1/2" |

CONTROL BOX ASSEMBLY, WITH AND WITHOUT COVER



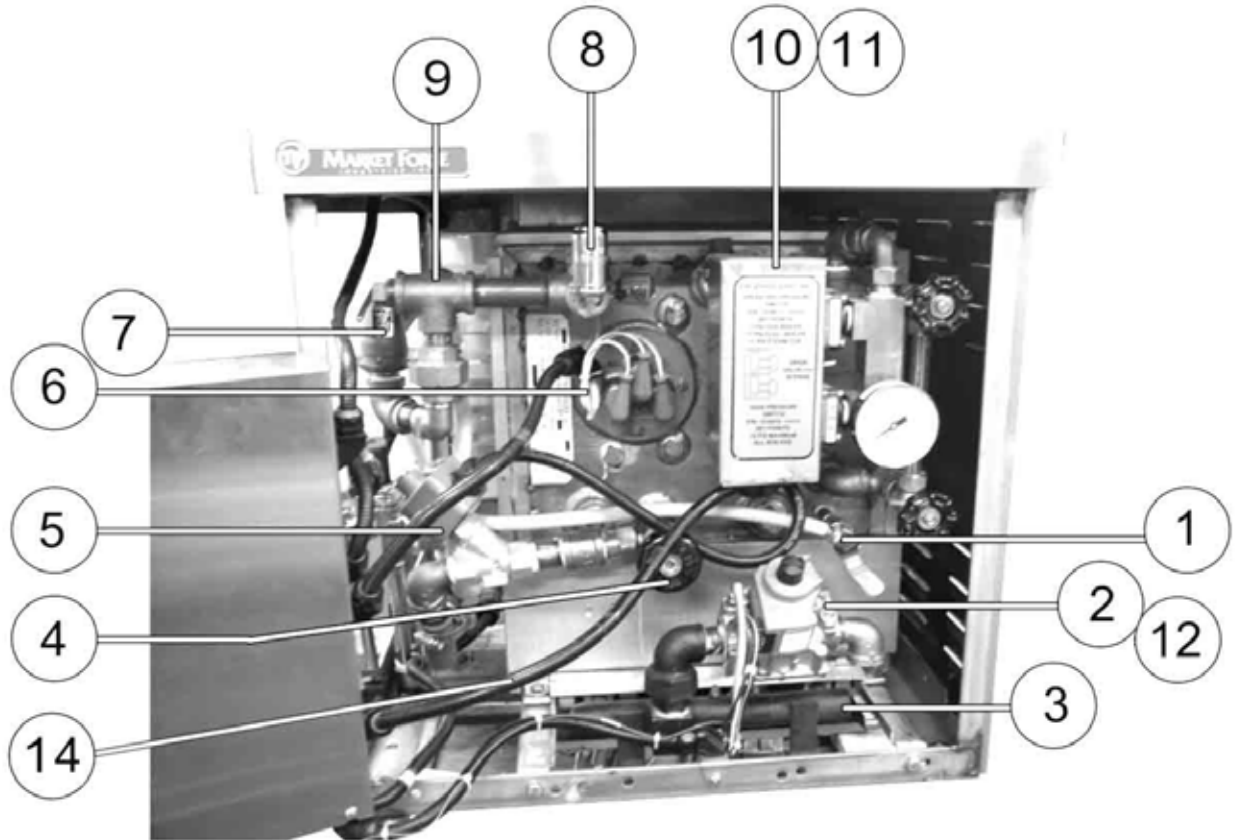
| ITEM | PART NO. | DESCRIPTION |
|------|-------------------------|----------------------------|
| 1 | 08-6549 | Switch, Power |
| 2 | 94-5127 | Switch, Manual Reset |
| 3 | 10-5052 | Light, Red |
| 4 | 08-6450 | Transformer, 120-240V |
| 5 | 98-1680 | Board, Water Level Control |
| 6 | 94-5022 | Ignition Module |
| 7 | 08-6472 | Relay Tube |
| 8 | 08-6475 | Relay Base |
| 9 | 98-3877 | Relay Bracket |
| 10 | 94-5003 | Artwork, Control Box |
| 11 | 94-5066 | Cover |
| 12 | 94-5069 | Terminal Strip |

PLUMBING, LEFT SIDE GAS BOILER, 24"



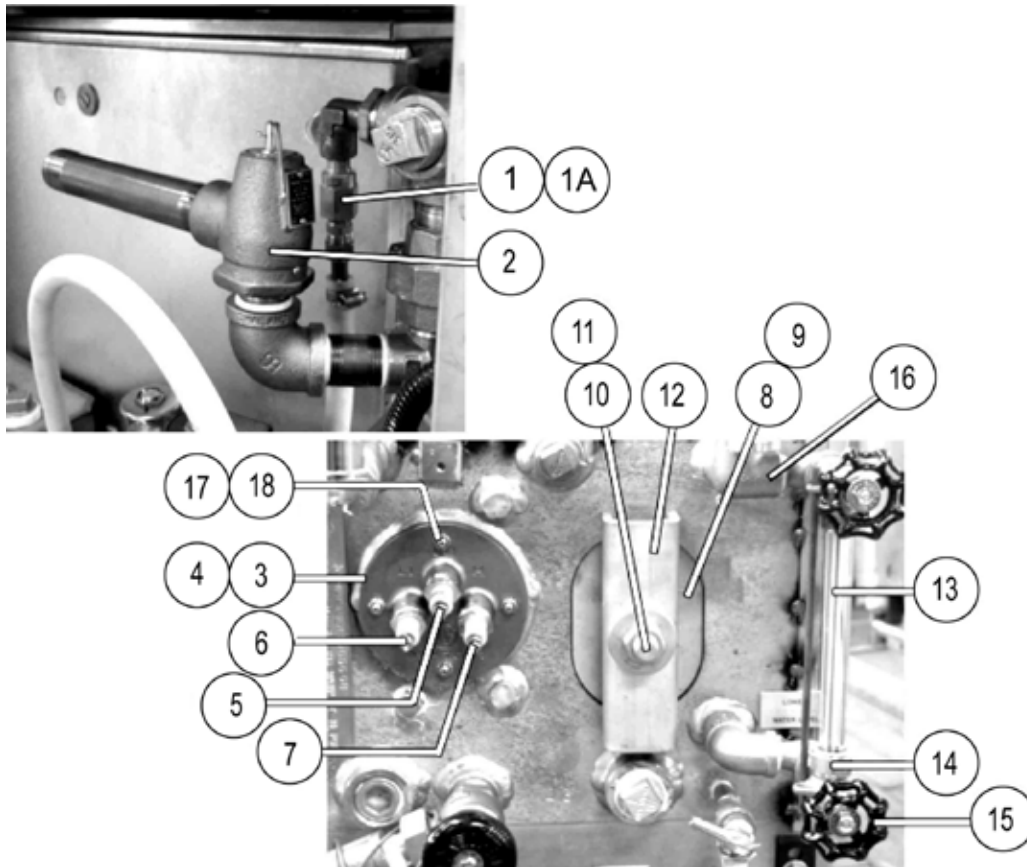
| ITEM | PART NO. | DESCRIPTION |
|------|-------------------------|-----------------------------------|
| 1 | 10-0239 | Hose, Drain 1" |
| 2 | 10-4137 | Clamp Hose |
| 3 | 91-6927 | Box Drain Assembly |
| 4 | 10-7955 | Valve, Safety, 15 PSI |
| 5 | 10-1058 | Valve, Cold Water Condenser, 120V |
| 6 | 10-1311 | Valve, Drain, 120V |
| 7 | 08-4822 | Valve, Boiler Feed |
| 8 | 08-7959 | Condenser, 3/8" Hose, 21" Long |
| 9 | 98-3894 | Copper, Nozzle |
| 10 | 98-3914 | Comp Fitting, 3/4" |
| 11 | 98-1401 | Valve, Check |
| 12 | 10-0287 | Hose, Drain, 3/4" |
| 13 | 10-4137 | Clamp, Hose |
| 14 | 08-7974 | Clamp, Hose |
| 15 | 98-3892 | Condenser Thermostat |
| 16 | 10-1152 | Plug |

FRONT VIEW GAS BOILER, 24", 200K



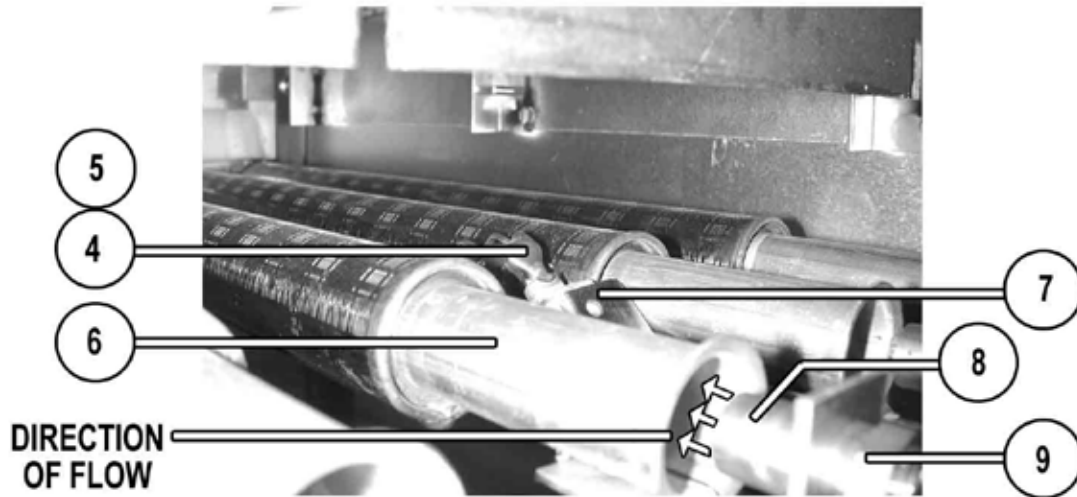
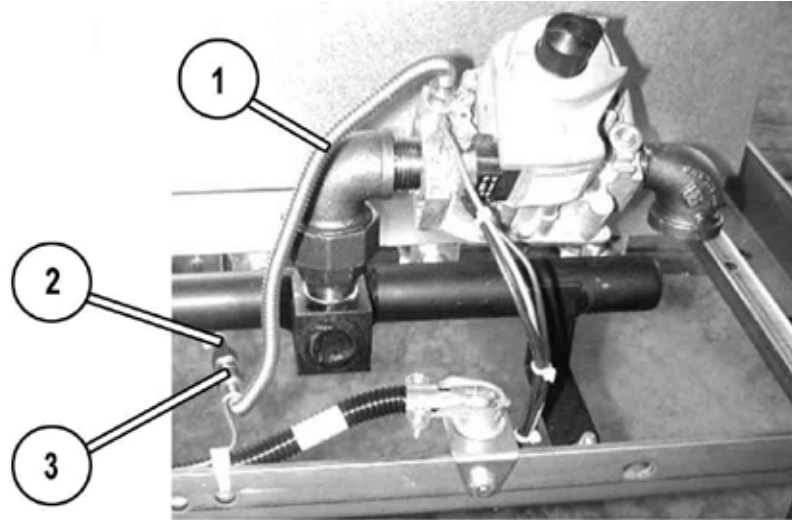
| ITEM | PART NO. | DESCRIPTION |
|------|-------------------------|-----------------------------------|
| 1 | 08-4900 | Water Inlet, Manual Valve |
| 2 | 94-5023 | Gas Valve |
| 3 | 94-5033 | Gas Manifold, 100K & 200K Boilers |
| 3 | 94-5034 | Gas Manifold, 300K Boilers |
| 4 | 10-3661 | Drain Valve, Manual |
| 5 | 10-1311 | Drain Valve, Automatic |
| 6 | 91-5112 | Probe Plate Assy |
| 7 | 10-7955 | Safety Valve |
| 8 | 10-4556 | Air Vent |
| 9 | 08-4991 | Tee, 3/4", Side Outlet |
| 10 | 94-5065 | Cover, Pressure Switch Box |
| 11 | 94-5010 | Label, Pressure Switch Box |
| 12 | 94-5128 | Gas Valve, 120V, Propane Kit |
| 13 | 08-7970 | Hose, Water, 20" |
| 14 | 98-3864 | Flex Conduite |

GAS TRAIN, 200K BTU BOILER SHOWN



| ITEM | PART NO. | DESCRIPTION |
|------|-------------------------|---------------------------------------|
| 1 | 98-3923 | Vent, Bleeder |
| 1A | 08-7970 | Bleeder Hose |
| 2 | 10-7955 | Valve, Safety, 15 PSI |
| 3 | 91-7031 | Probe Plate |
| 4 | 08-4413 | Gasket, Probe Plate |
| 5 | 08-6399 | Probe, Lowest Probe |
| 6 | 08-6398 | Probe |
| 7 | 08-6364 | Probe |
| | 91-5112 | KIT that includes items 3, 4, 5 and 6 |
| 8 | 91-8810 | Cover Hand Hole |
| 9 | 08-4415 | Gasket Hand Hole |
| 10 | 10-2414 | Nut |
| 11 | 10-2310 | Washer |
| 12 | 91-8811 | Yoke |
| 13 | 10-4754 | Glass, Sight Gauge, 6" |
| 14 | 90-0039 | Rubber & Brass Washer Set |
| 15 | 10-2728 | Kit, Complete Includes: Valves, Glass |
| 16 | 98-3928 | Elbow 1/2", Side Outlet |
| 17 | 98-3944 | Stud, 1/4-20 |
| 18 | 98-3945 | Kep Nut |

GAS TRAIN, 200K BOILER SHOWN



| ITEM | PART NO. | DESCRIPTION |
|------|-------------------------|----------------------------------|
| 1 | 08-7832 | Tube, Flex, Gas Line |
| 2 | 10-1154 | Compression Coupling |
| 3 | 98-3890 | Pilot Tube |
| 4 | 94-5133 | Spark Pilot and Igniter |
| 5 | 94-5129 | Pilot Orifice, Prop. |
| 6 | 94-5046 | Burner |
| 7 | 94-5052 | Pilot Brkt |
| 8 | 08-7119 | Orifice, Natural Gas (Brass #30) |
| 8 | 08-7120 | Orifice, Propane (#45 Black) |
| 9 | 08-7118 | Orifice Hood |