



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

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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

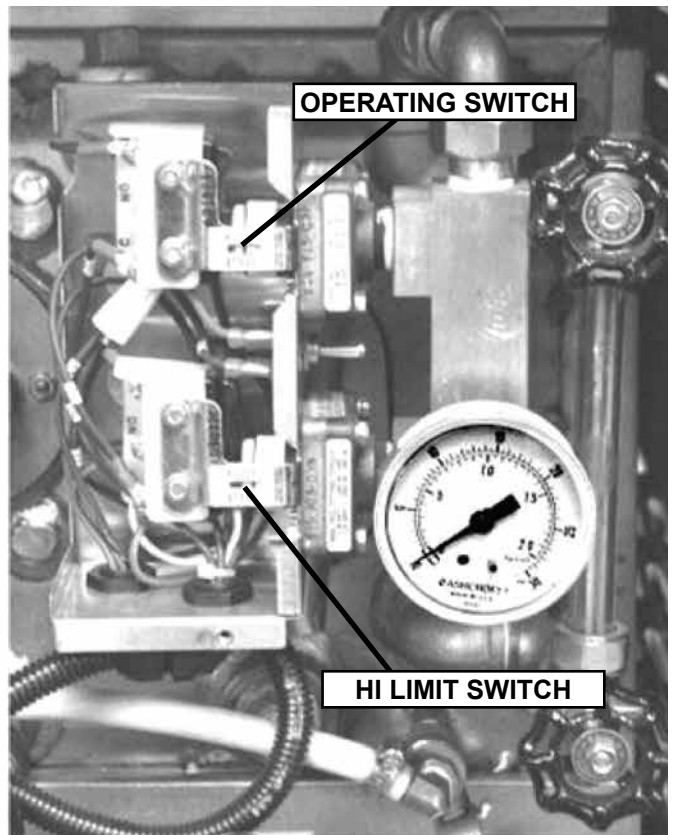
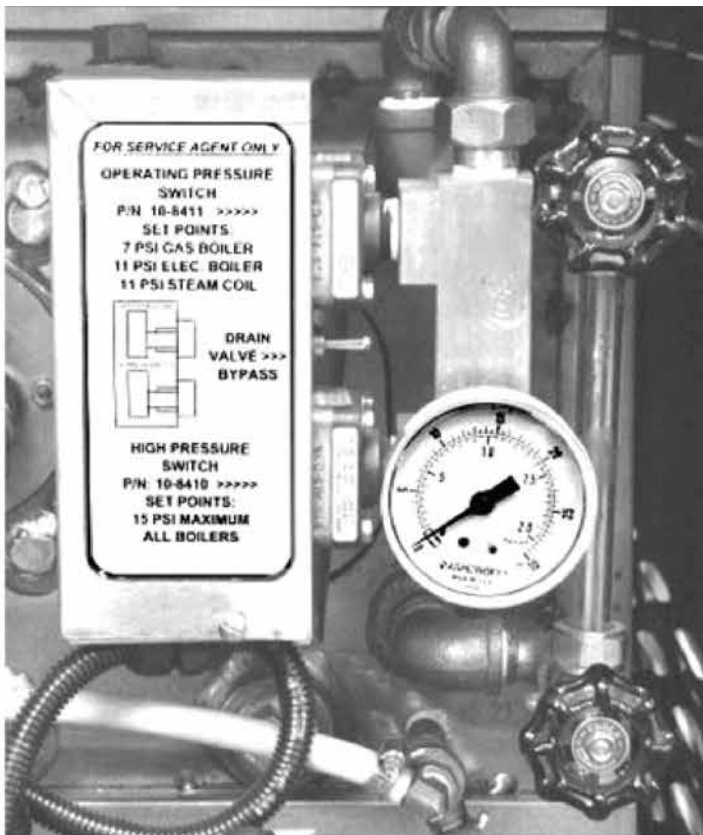
If boiler fails to maintain steam pressure in operating range, pressure control switch may require adjustment.

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:

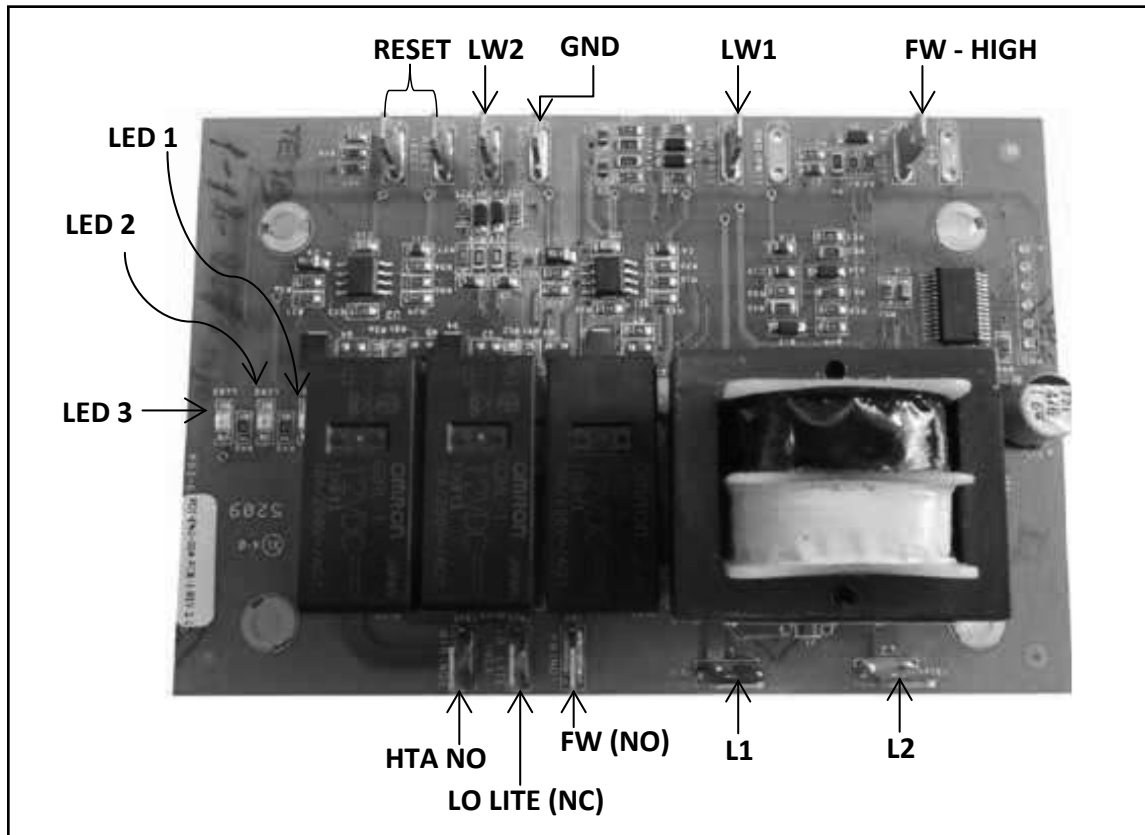
WARNING

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!

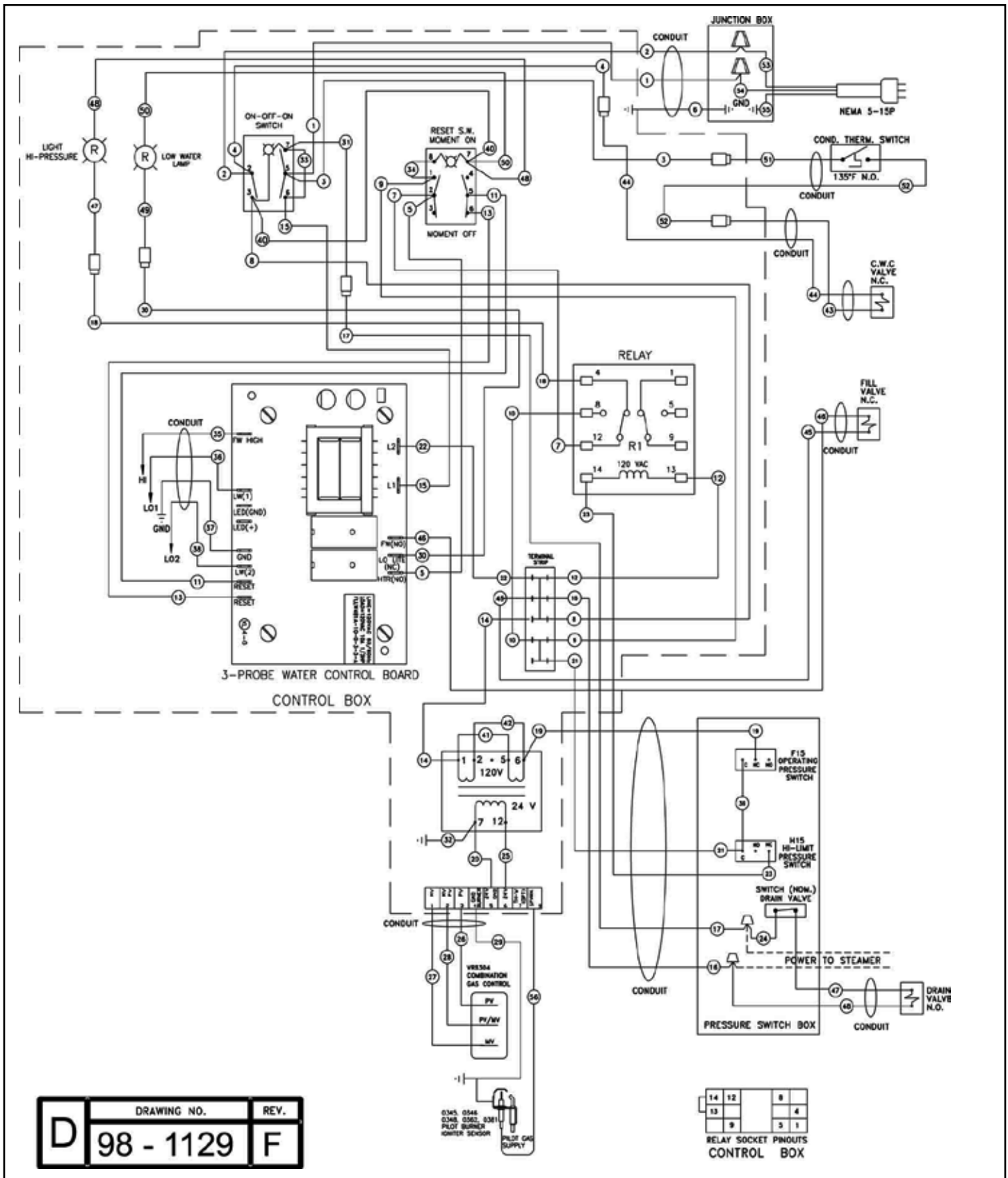


IMPORTANT

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

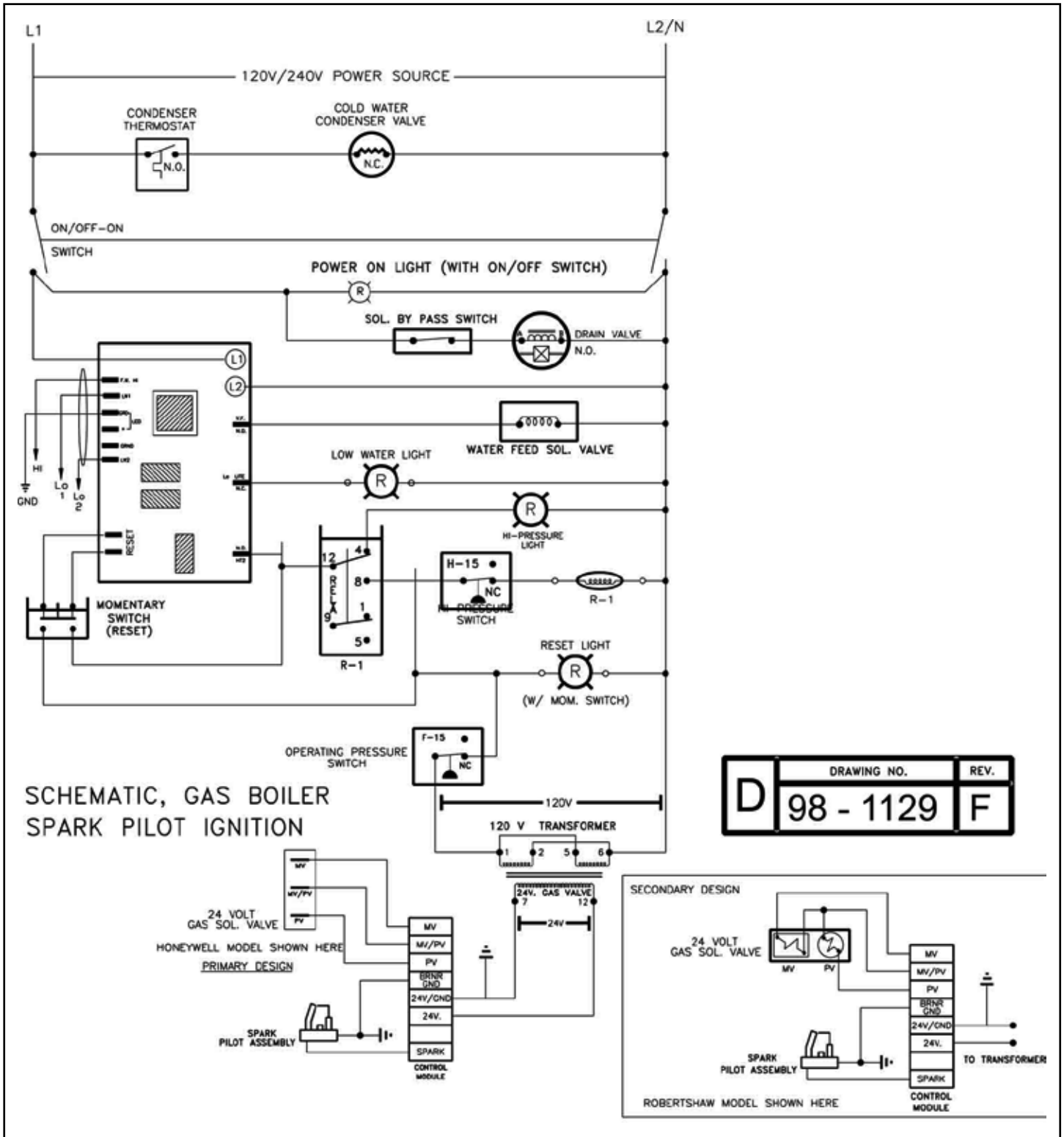


D	DRAWING NO.	REV.
	98 - 1129	F

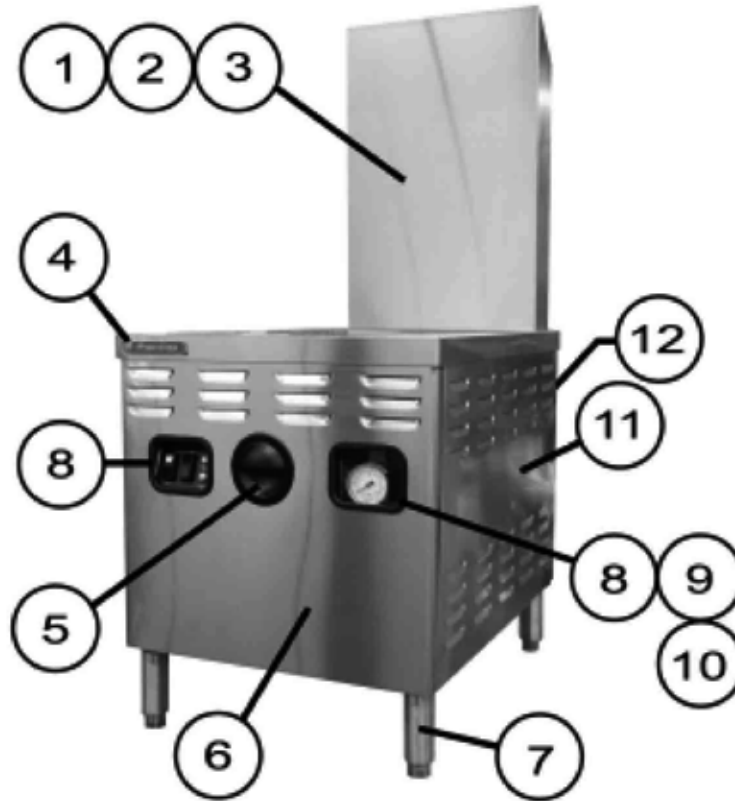
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WIRING DIAGRAM

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

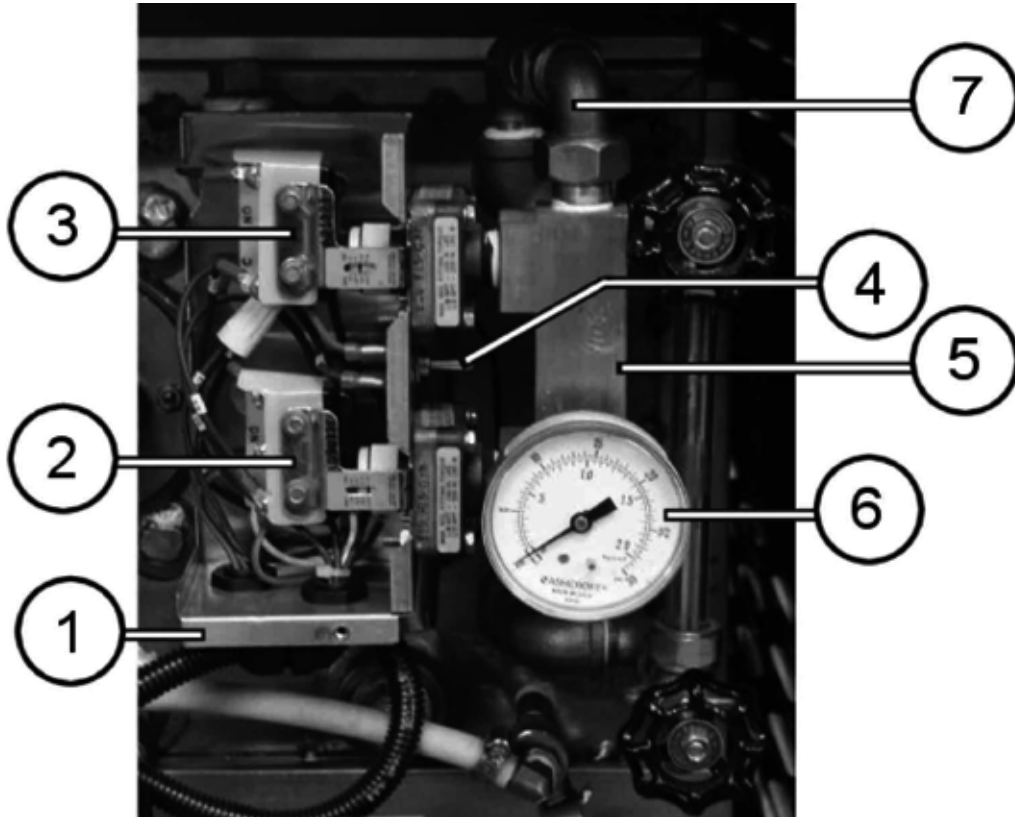


24" BOILER BASE CABINET



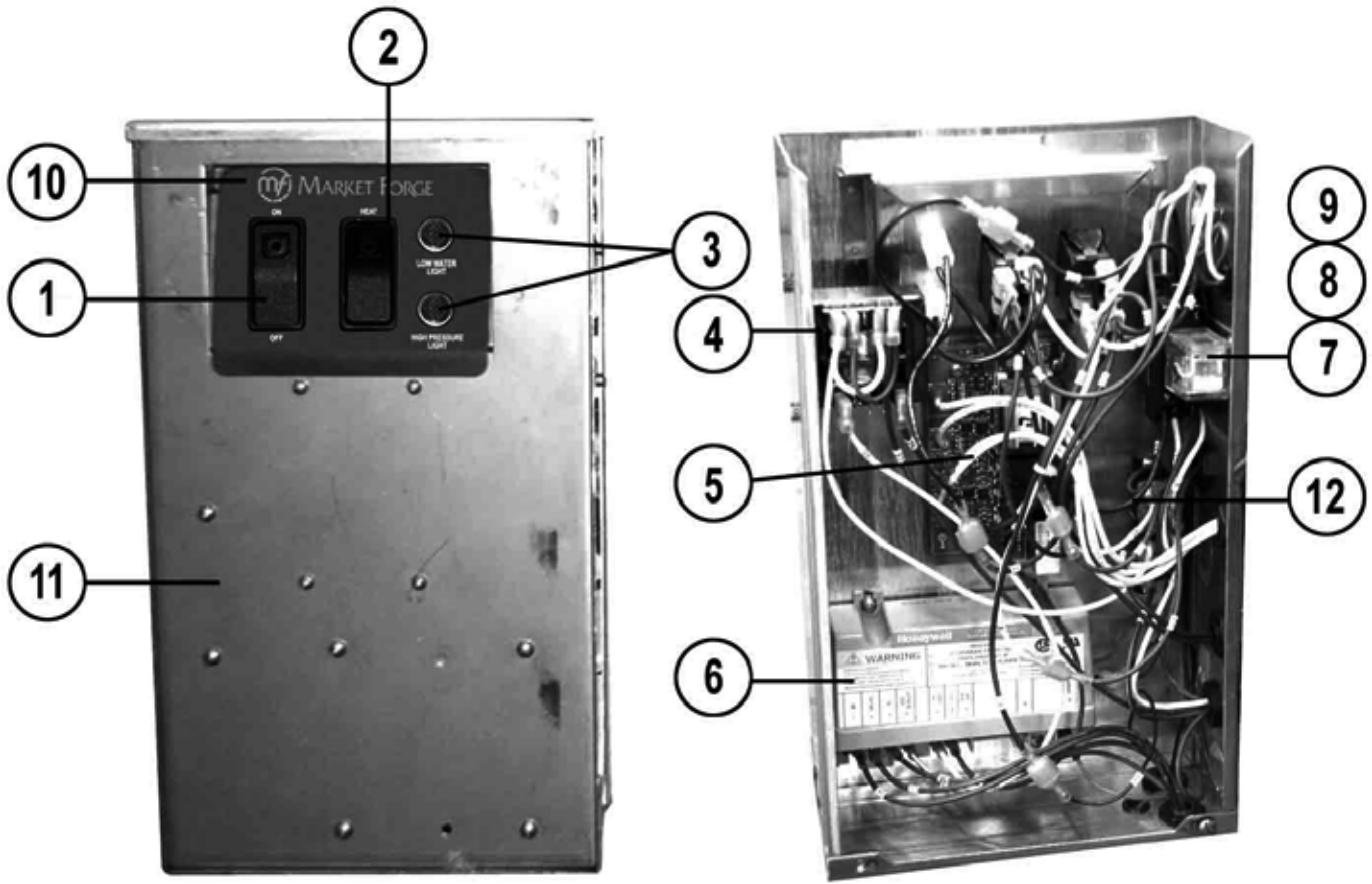
ITEM	PART NO.	DESCRIPTION
1	91-8892	Flue Outer, 24" Front
1	91-8938	Flue Outer, 36" Front
2	91-8893	Flue Outer, 24" Back
2	91-2713	Flue Outer, 36" Back
3	98-0593	Flue Inner Assembly, 100 & 200k Boiler
3	91-8936	Flue Inner Assembly, 300k Boiler
4	08-5894	Market Forge Nameplate Logo
5	91-5795	Handle, Front
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



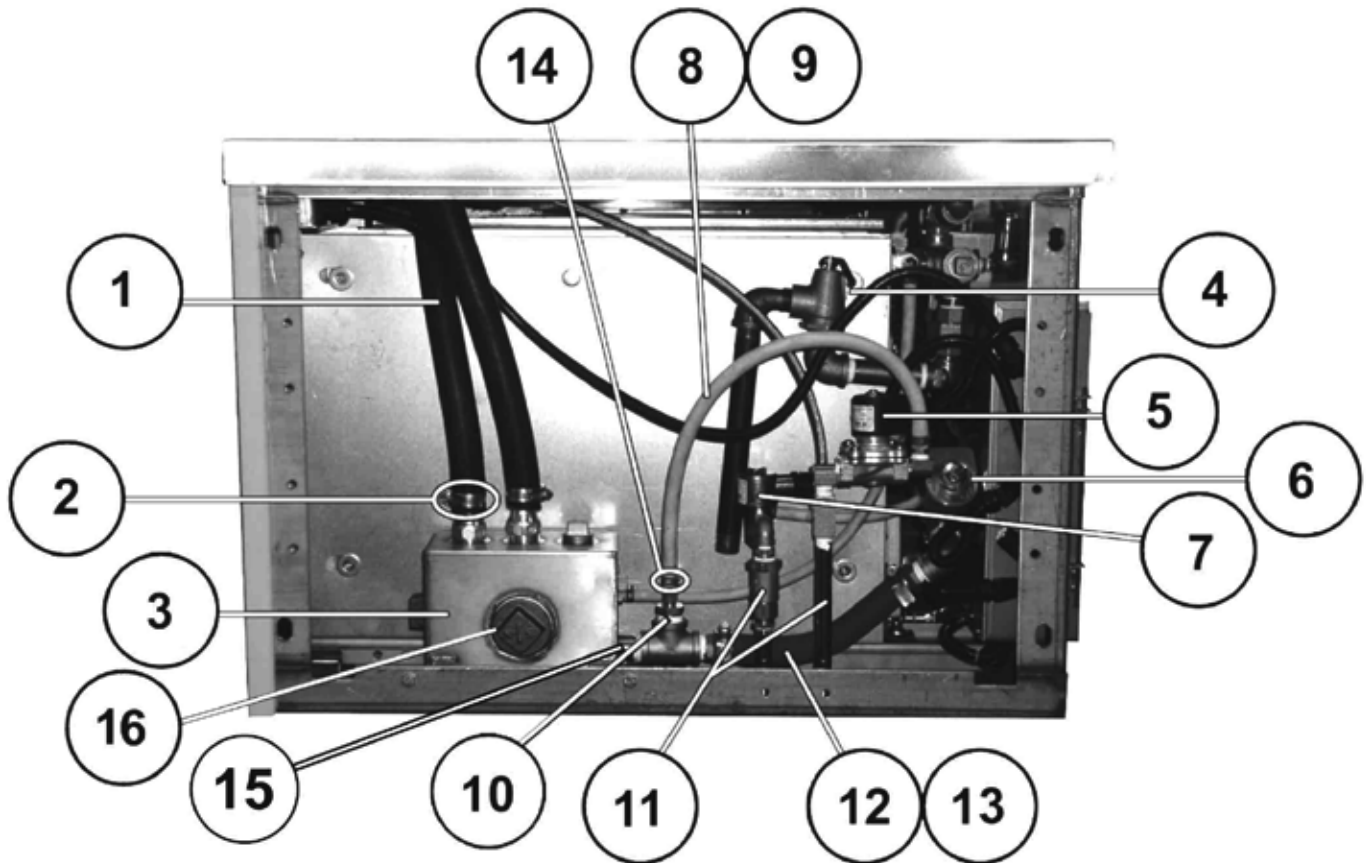
ITEM	PART NO.	DESCRIPTION
1	94-5064	Box, Pressure Switch
2	10-8410	Pressure Switch, Hi-Limit
3	10-8411	Pressure Switch, Operating
4	98-3875	Switch, Drain By-Pass
5	08-7933	Manifold, Pressure Switches
6	10-4804	Pressure Gauge
7	09-4844	Union Elbow, 1/2"

CONTROL BOX ASSEMBLY, WITH AND WITHOUT COVER



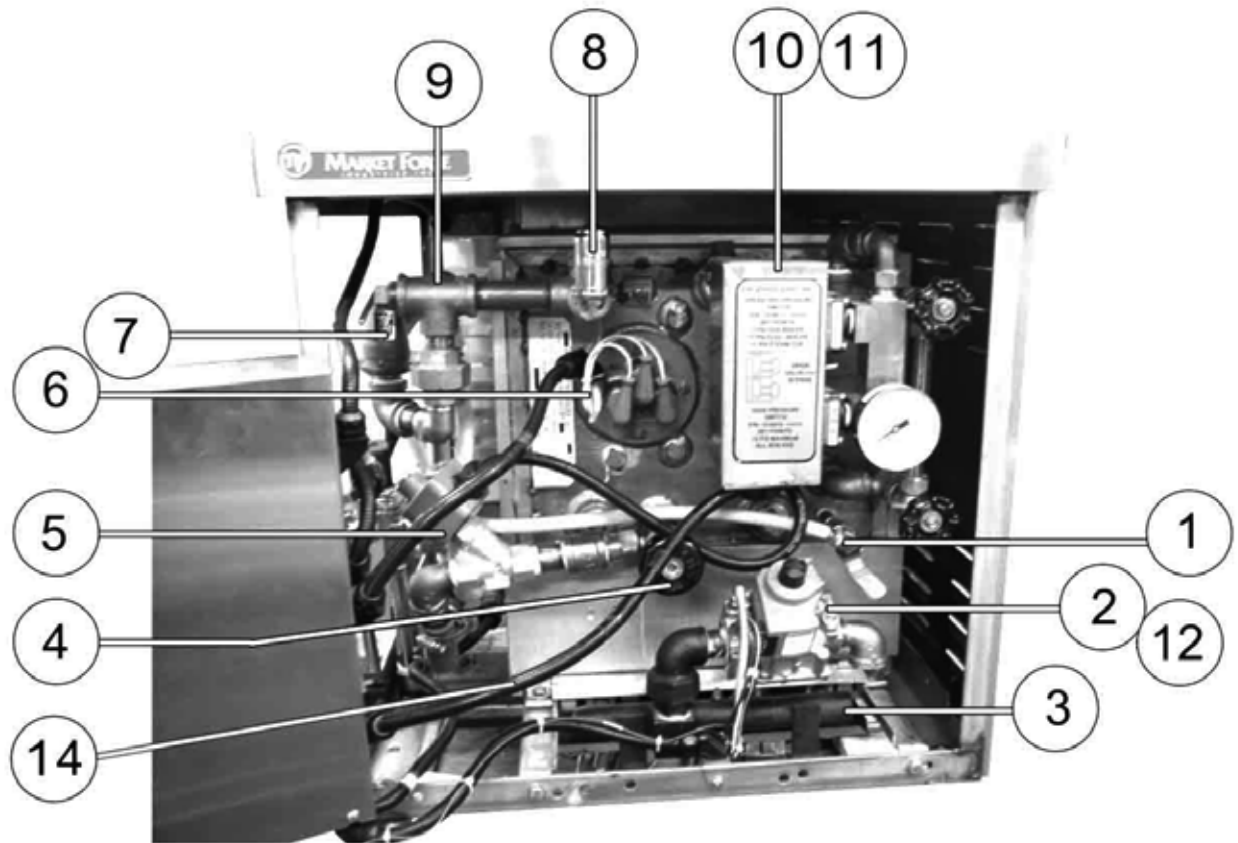
ITEM	PART NO.	DESCRIPTION
1	08-6549	Switch, Power
2	94-5127	Switch, Manual Reset
3	10-5052	Light, Red
4	08-6450	Transformer, 120-240V
5	98-1680	Board, Water Level Control
6	94-5022	Ignition Module
7	08-6472	Relay Tube
8	08-6475	Relay Base
9	98-3877	Relay Bracket
10	94-5003	Artwork, Control Box
11	94-5066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

PLUMBING, LEFT SIDE GAS BOILER, 24"



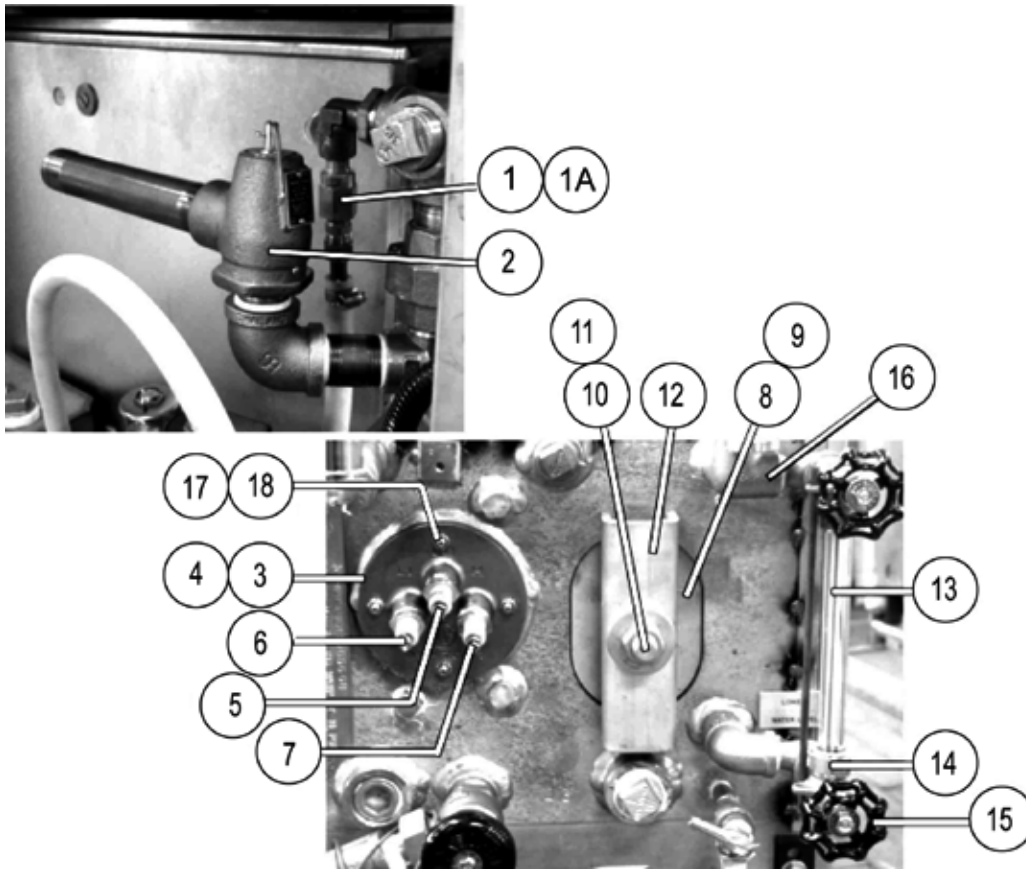
ITEM	PART NO.	DESCRIPTION
1	10-0239	Hose, Drain 1"
2	10-4137	Clamp Hose
3	91-6927	Box Drain Assembly
4	10-7955	Valve, Safety, 15 PSI
5	10-1058	Valve, Cold Water Condenser, 120V
6	10-1311	Valve, Drain, 120V
7	08-4822	Valve, Boiler Feed
8	08-7959	Condenser, 3/8" Hose, 21" Long
9	98-3894	Copper, Nozzle
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



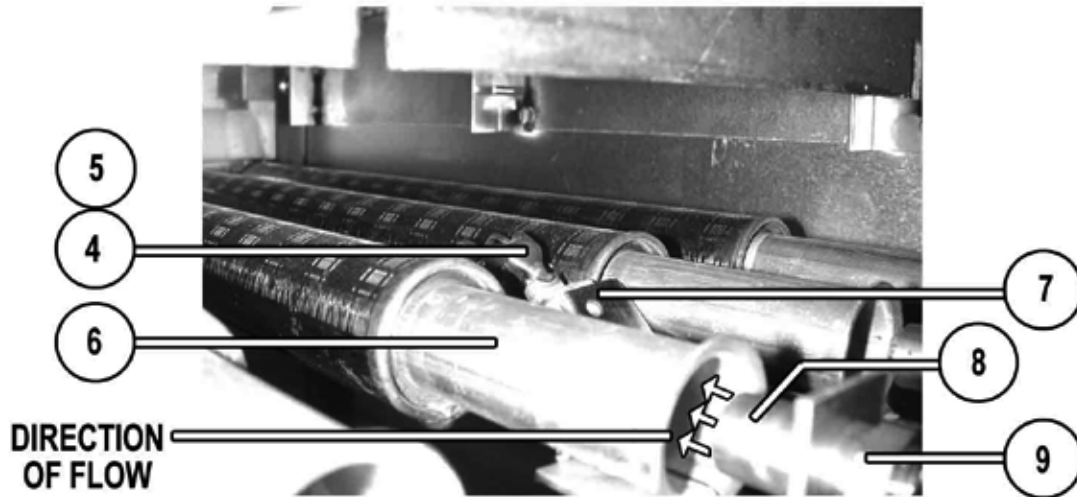
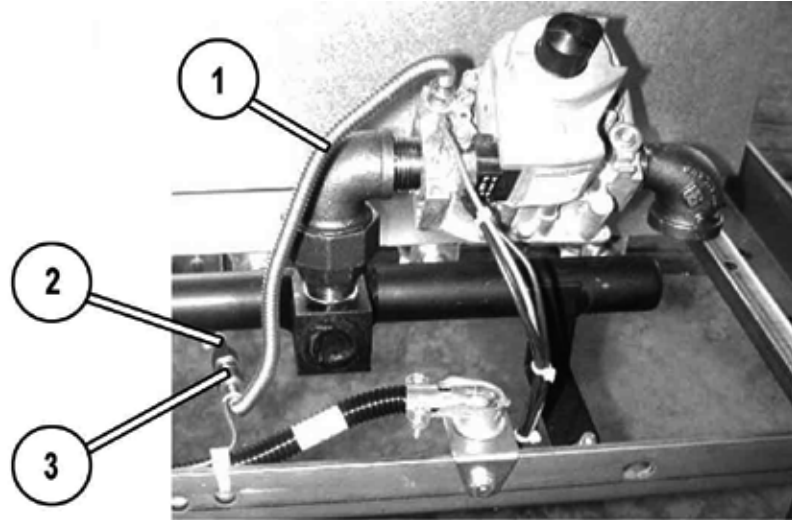
ITEM	PART NO.	DESCRIPTION
1	08-4900	Water Inlet, Manual Valve
2	94-5023	Gas Valve
3	94-5033	Gas Manifold, 100K & 200K Boilers
3	94-5034	Gas Manifold, 300K Boilers
4	10-3661	Drain Valve, Manual
5	10-1311	Drain Valve, Automatic
6	91-5112	Probe Plate Assy
7	10-7955	Safety Valve
8	10-4556	Air Vent
9	08-4991	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