

OWNER'S MANUAL

Tilting Self-Contained Gas Steam Jacketed Kettles

MODELS:

• FT-20GL • FT-40GL • FT-60GL • FT-80GL • FT-100GL



MARKET FORGE
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Form No. S-1922A • 02/08

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INSTALLATION

Uncrate carefully. Report any hidden freight damage to the freight company immediately.

Set unit in place. Be certain to maintain the following minimum clearances to combustible construction. Side "0" inches, back "4" inches at flue box. Level the unit using a spirit level in all directions on the top of the kettle (lid up). Adjust the bottom foot on each leg to overcome an uneven floor. Be certain to leave adequate clearances for cleaning, maintenance and service. If unit is also equipped with an optional water fill valve it too must be connected with a flexible water supply tube, quick disconnect and strain relief.

Appliance location should have an exhaust system provided directly above the appliance to exhaust combustion generated by the gas burner. For use on noncombustible floors. Minimum clearance from combustible and noncombustible constructions, sides "0" inches, back "4" inches at flue box.

Clearance must be adequate in aisle and at the side and back. Adequate clearances for air openings into combustion chamber must be provided, as well as for serviceability. All units must be installed in such a manner that the flow of combustion and ventilation are not obstructed. Provisions for an adequate air supply must also be provided. Do not obstruct the lower front or left side of the unit, as combustible air enters through these areas.

DESCRIPTION: The kettle has double-wall construction of 300 series stainless steel forming a steam jacket around the lower 2/3 of the kettle. The jacket enclosure contains factory sealed water and antifreeze. The kettle exterior is fully insulated. The bottom of the kettle is a hemispherical design for superior heat circulation. The recessed control panel is located on the front right side of the unit in full view of the operator. Standard controls include direct immersion thermostat, water sight glass, cooking light, pressure gauge and electronic ignition with ignition indicator light. Safety features include low water cutoff with indicator light, pressure switch, pressure relief valve and a 100% safety gas shut off valve.

The kettle pivots on trunnions connected to the gear and control consoles. The worm and gear tilting mechanism allows the kettle to tilt forward to a full 90° for complete draining. The tilt mechanism is self locking for positive stop action. The consoles are drip proof, stainless steel clad and are supported on all welded 1 5/8" (41mm) diameter stainless steel legs with flanged feet.

OPERATION SHALL BE BY: Natural or L.P. gas utilizing a high efficiency power burner system. The steam

kettle is A.S.M.E. code stamped for operation to 50 PSI. Temperature range from 150° F to 285° F.

120 VAC, 1pH, 50/60 Hz

OPTIONAL AT EXTRA COST:

- Spring assist cover, HSC
- 2" tangent draw off, FDOR-2
- 3" tangent draw off, FDOR-3
- Tri-Basket assembly
- Single pantry faucet with swing spout, SP-12
- Double pantry faucet with swing spout, DP-12
- Graduated measuring strip, MS-1
- Perforated strainer
- Solid disk strainer DOS-2
- 316 stainless steel liner for high acid content

SERVICE CONNECTIONS: GAS INSTALLATION TO CONFORM TO LOCAL CODES OR IN THE ABSENCE OF LOCAL CODES TO NATIONAL FUEL GAS' CODE - ANSI Z223.1.- LATEST EDITION IN CANADA INSTALLATION IN ACCORDANCE WITH CAN/CGA-B149.1 OR 0.2 OR CURRENT CODE.

1. The appliance and it's individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at .test pressures in excess of 1/2 PSI (0.1 kg/cm²).
2. The appliance must be isolated from' the gas supply piping system by closing it's individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 PSI (0.1 kg/cm²).

ELECTRICAL GROUNDING MUST BE PROVIDED IN ACCORDANCE WITH LOCAL CODES, OR IN THE ABSENCE OF LOCAL CODES, WITH THE NATIONAL ELECTRIC CODE, ANSI/NFPA 70 - LATEST EDITION' IN CANADA INSTALLATION IN ACCORDANCE WITH C.S.A. C22.1 CANADIAN ELECTRIC CODE PART 1.

WARNING: ELECTRICAL GROUNDING INSTRUCTIONS UNITS EQUIPPED WITH A THREE-PRONG (GROUNDING) PLUG FOR YOUR PROTECTION AGAINST SHOCK HAZARD AND SHOULD BE PLUGGED DIRECTLY INTO A PROPERLY GROUNDED THREE-PRONG RECEPTACLE. DO NOT CUT OR REMOVE THE GROUNDING PRONG FROM THIS PLUG. (120 VOLT UNITS ONLY).

Units with these electrical rating are factory equipped with a transformer.. To connect supply wire remove top right cover and route supply wires and ground wire through the hole in the back of console with strain relief fitting supplied. Connect wires to terminal block and ground lug. Replace cover.

Wiring diagram for unit is located in side panel of the left hand console facing the front of the unit..

INSTALLATION

NOTE: Allow 6" (152mm) Min. spacing on left and right sides and 2" (51mm) spacing from flue.

MODEL	CAPACITY		A	B	C	D	E	F	G	H	J	K	L	M
FT-20GL	20 Gallons 76 liters	inches mm	20 508	48.125 1222	40.375 1032	19 483	40.5 1020	76.5 1943	16.5 419	24 610	11 280	10 254	32 813	30.5 775
FT-30GL	30 Gallons 114 liters	inches mm	26 660	54.25 1378	43.375 1108	16.5 419	37.25 946	73.75 1874	15.5 394	22.25 565	7.5 190	11 280	34 864	29.5 749
FT-40GL	40 Gallons 152 liters	inches mm	26 660	54.25 1378	43.375 1108	16.5 419	41.5 1054	76 1930	15.5 394	22.25 565	7.5 190	12 305	35 889	30.5 775
FT-60GL	60 Gallons 227 liters	inches mm	30 762	58.125 1378	43.375 1108	17.875 454	45.5 1156	82 2083	19.5 496	22.25 565	5.5 140	15 381	38 965	30.375 772

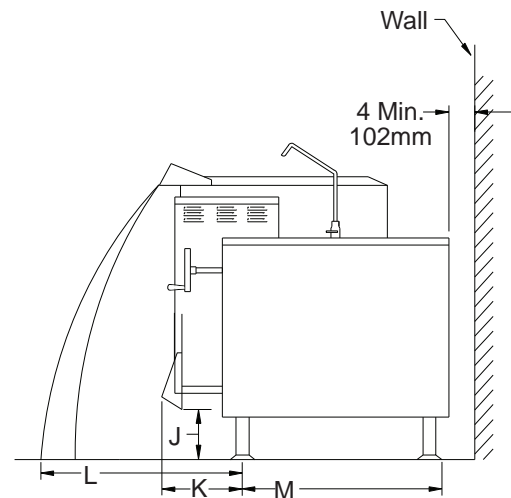
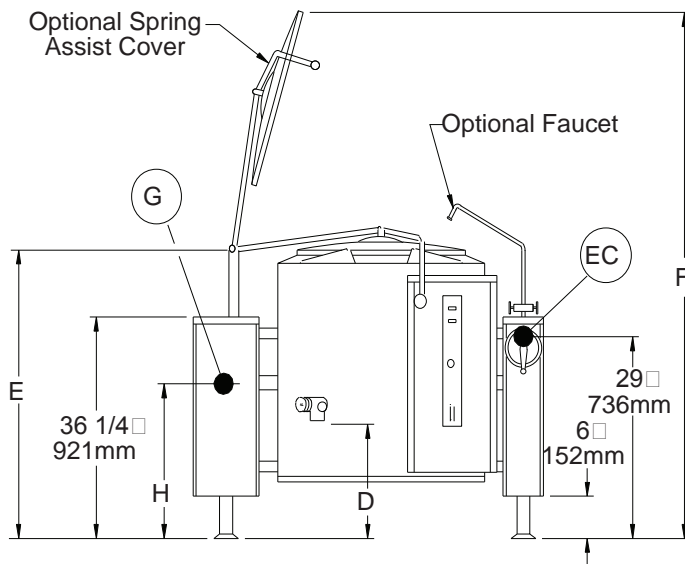
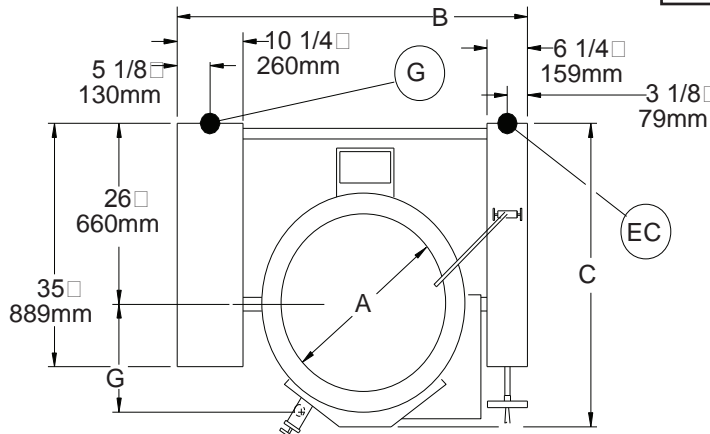
SERVICE CONNECTIONS

Gas Operated

EC	Electrical Connection - 115 Volt, 60Hz, 1Ph, furnished with 6 ft. cord with 3 pronged plug. Total Max. Amps 2.0.
G	Gas Connection - 3/4" (19mm) N.P.T.

ELECTRICAL OPTIONS:

- 208 Volts, 60Hz, 1Ph or for use on 190 to 219 Volts supply unit. Total Max. Amps 1.0.
- 236 Volts, 60Hz, 1Ph or for use on 220 to 240 Volts supply unit. Total Max. Amps 1.0.
- 220 Volts, 50Hz, 1Ph or for use on 220 to 240 Volts supply unit. Total Max. Amps 1.0.



OPERATION

IMPORTANT NOTE: Unit is shipped with gas combination valve turned “ON”

1. OPEN MANUAL GAS SHUT OFF VALVE.
2. WITH THERMOSTAT SET AT OFF.
3. TURN POWER SWITCH ON.
4. SET THERMOSTAT TO MAXIMUM, INITIATING A 30 SECOND PRE-PURGE.

NOTE: If after 36 seconds the burner fails to ignite or burner lights then goes out the system goes into safety lockout; de-energize the system by setting the thermostat to OFF for 5 minutes and try again.

5. SET THERMOSTAT TO DESIRED TEMPERATURE SETTING.

DAILY SHUTDOWN

1. TURN POWER SWITCH OFF.
2. TURN THERMOSTAT OFF.

COMPLETE SHUTDOWN

1. TURN POWER SWITCH OFF.
2. TURN THERMOSTAT OFF.
3. TURN POWER SUPPLY TO UNIT OFF.
4. REMOVE FRONT ACCESS PANEL ON LEFT SIDE AND TURN DIAL ON COMBINATION VALVE TO OFF.
5. CLOSE MANUAL GAS SHUT OFF VALVE.

FRONT PANEL CONTROLS

1. **POWER SWITCH** - This switch turns the main power to the unit on and off. It must be turned on to heat the kettle. It should be turned off when kettle will not be in use for long periods of time.
2. **(RED) COOKING LIGHT** - This light is on whenever the main burner gas is on.
3. **(AMBER) LOW WATER LIGHT** - All kettles are supplied with sufficient distilled water in pressurized jacket. If at any time the water level falls below that required for proper operation, the kettle will not heat and this light will come on. See “Adding Water” Section.

4. **THERMOSTAT** - The thermostat selects are desired internal kettle operating temperatures.
5. **PRESSURE GAUGE** - The pressure gauge indicates that internal operating pressure of the kettle. When cold, the gauge should indicate 25 to 30 inches mercury column vacuum. If it does not, refer to “Re-establishing Vacuum” above this section. Under normal operation with the kettle empty (*thermostat set at 285°F*) the pressure shall reach 38 PSI. When loaded the pressure may be considerably less.
6. **SIGHT GLASS** - The sight glass indicates the minimum and maximum water level within the kettle. If water level falls below minimum level more distilled water should be added. See “Adding Water” section.
7. **PRESSURE RELIEF VALVE** - A safety device which prevents the internal kettle pressure from ever exceeding 50 PSI. It should never be tampered with.

LOW WATER LIGHT COMES ON - ADD WATER

1. Unit should be completely cold and off.
2. Lift handle of pressure relief valve to release vacuum in kettle.
3. Remove relief valve and attach a 3/4” NPT elbow pointing upward.
4. Using pure distilled water only, pour the water into the open end of the elbow (*a funnel will be helpful*). Water will enter kettle slowly, as air must escape through the same hole. Water should be added until water level is at the sight glass half way between the minimum and maximum levels.
5. When sufficient water has been added, remove elbow and replace pressure relief for steam at 50 PSI.
6. Vacuum must be re-established.

The total amount of distilled water in each kettle is:

- FT-20GL - 6 Gallons of water
- FT-30GL - 9 Gallons of water
- FT-40GL - 9 Gallons of water
- FT-60GL - 12 Gallons of water

MAINTENANCE

PERIODIC MAINTENANCE

NOTICE: As a safety precaution, disconnect the power supply during cleaning or servicing.

CLEANING

For easier cleaning add cold water to the kettle immediately after removing contents and let soak.

Wash exposed cleanable areas daily. To remove normal dirt, grease or product residue from stainless steel, use ordinary soap and water applied with a sponge or cloth. Dry thoroughly with a clean cloth. Never use vinegar or any corrosion cleaner. Never, use ordinary steel wool, wire brush or steel scouring pads. Never use cleaning solvents with a hydrocarbon base on control panel. Blower wheel inlet screen and motor air vent should be cleansed if an accumulation of dust or lint is obvious.

At least twice a year the unit venting system should be examined and cleaned. At least twice a year have an authorized Service Person clean and adjust the unit for maximum performance.

RE-ESTABLISHING VACUUM

With the kettle completely cold a vacuum of 25 to 30 inches mercury column should be maintained as indicated by the pressure gauge on the front control panel. If at any time the vacuum is less than 25 inches M.C. the vacuum should be re-established. With the kettle empty turn the thermostat knob to the highest temperature. When the pressure gauge reaches 2.0 PSI turn thermostat off, open the pressure relief valve until manometer reads 1 PSI then sharply release it. This should remove the air and any loss in performance should return. Should the kettle fail to maintain a vacuum after repeated attempts to establish it further checks should be made to see if the pressure relief valve is leaking or if there are any leaks in the pressure relief valve piping, copper lines going to the pressure switch, pressure gauge or thermostat fitting.

ADJUSTMENTS

THERMOSTAT: The thermostat adjustment should not be changed. Check the following before changing the thermostat.

1. With kettle cold, the pressure on the pressure gauge should read 25 to 30 inches mercury column vacuum. If not, see "Re-establishing Vacuum" above.
2. The pressure switch is .not set too high or too low and causing the out of adjustment condition. A voltmeter should be used by a properly trained servicemen to determine if the pressure switch or thermostat is actually cycling the burners. If the

pressure switch is found to be the problem. See "Pressure Switch" below.

PRESSURE SWITCH: The pressure switch should not be adjusted until it is determined to be the cause of an operating pressure difficulty. See "thermostat" section to determine if the source of difficulty is the pressure switch or thermostat, The major difficulties caused by pressure switch miss-adjustment are:

1. Pressure relief valve opening, especially on pre-heat from a cold start to 285°F (*pressure switch set too high*).
2. Pressure in kettle is too low and burners are being shut down by pressure switch (*not thermostat*).

The pressure switch is preset for proper operation from the factory. It is adjusted to the maximum pressure which will prevent the pressure relief valve from opening. This setting will be slightly different on different kettles due to variations in the pressure relief valves. During preheat to the maximum thermostat setting (285°F), from either a cold condition or a lower temperature setting, the temperature may overshoot the thermostat setting and be shut down by the pressure switch. This is normal, however, after the kettle has cycled several times (*empty*) the thermostat will begin cycling the unit. .

TO ADJUST PRESSURE SWITCH:

1. With the kettle empty and completely cold, turn kettle on and set thermostat to maximum setting (285°F).
2. Pressure in kettle (*read pressure gauge on front panel*) should reach a maximum pressure of 40 PSI and pressure relief valve should not open. Kettle pressure may rise 3 or 4 PSI even after burners shut down.
3. Relief valve should not open when kettle pressure is 40 PSI pressure switch setting is satisfactory.
4. If relief valve opens, reduce setting on pressure switch, cool kettle completely by running cold water through it and repeat this procedure.
5. If pressure in kettle is below 40 psi increase setting of pressure switch, cool kettle completely by running cold water through it and repeat this procedure.
6. To obtain access to the pressure switch the front panel must be removed. Remove the screws on either side of the panel. Be sure to support the panel to avoid excessive strain on the wiring.
7. To increase the pressure switch setting turn the white ribbed knob clockwise; to decrease turn it counterclockwise. Use the centre of the black ring as an indicator.

TROUBLE-SHOOTING

MOTOR WILL NOT RUN!

1. No Current.
2. Defective Thermostat.
3. Defective Motor.
4. Motor Overload Out.
5. Blown Fuse.

MOTOR RUNS, NO SPARK!

1. Defective Transformer.
2. Defective Spark Ignition.
3. Defective Spark Electrode (Cracked Insulator).
4. Defective High Tension Wire.
5. Defective Centrifugal Switch on Motor.

MOTOR RUNS, SPARK PRESENT ON GAS IGNITION!

1. Manual Main Valve Off.
2. Miss-located Spark or Ground Rods.
3. Defective Valve.
4. Defective Primary Safety Control.
5. Air Shutter Open Too Far.

FLAME BURNS ONLY ABOUT 6 SECONDS & SHUTS OFF!

1. Flame Rod or Flame Ground Miss-located.
2. Defective Flame Rod Wire.
3. Defective Primary Control.

SHORT FLAME!

1. Wrong Main Orifice.
2. Low Gas Pressure.
3. Air Shutter Adjustment.
4. Main Manual Valve Partially Closed.
5. Inoperative Step Regulator Portion of Main Valve.

LONG HAZY FLAME!

1. Wrong Main Orifice.
2. High Gas Pressure.
3. Dirty Blower Wheel.
4. Air Shutter Adjustment.
5. Main Regulator Adjustment.

NOTE: Loose, broken or grounded wiring may cause many of the symptoms listed, Check all wiring make sure it is intact.

GAS FAILS TO SHUT OFF!

1. Dirt on Valve Seat.
2. Defective Main Valve.

ILLUSTRATED PARTS

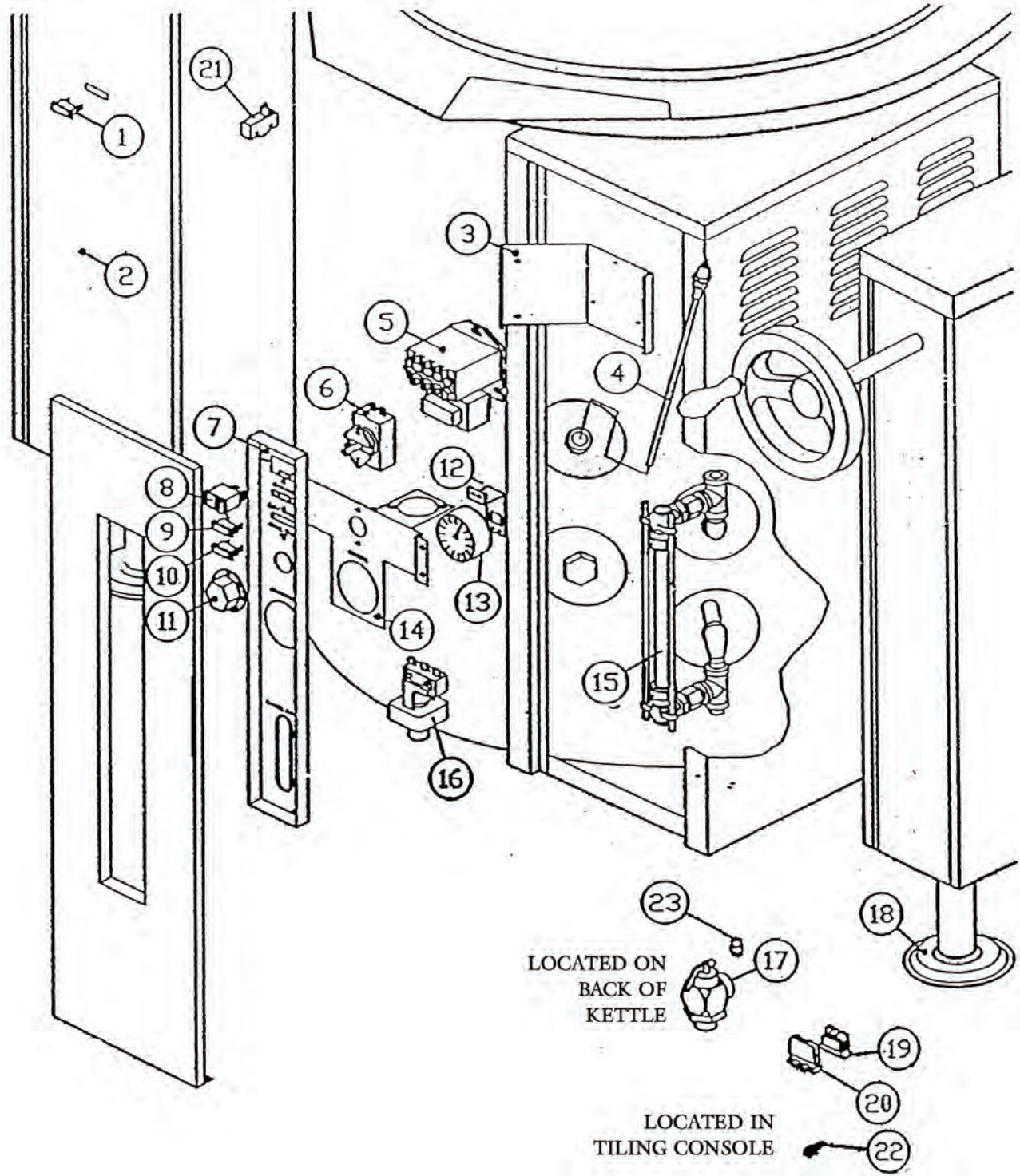
FIGURE 1.

ITEM	PART NO.	DESCRIPTION	QTY.
1	97-5725	PILOT LIGHT - GREEN 24V	1
2	97-5423	INSTRUCTION LABEL	1
3	97-5424	L.W. MTG. BRACKET	1
4	97-5554	PROBE	1
5	97-5426	L.W. CUT OFF	1
6	97-5427	THERMOSTAT	1
7	97-5357	POLY PANEL	1
8	97-5429	POWER SWITCH	1
9	97-5430	PILOT LIGHT - RED	1
10	97-5431	PILOT LIGHT - AMBER	1
11	97-5559	DIAL	1
12	97-5433	PRESSURE GAUGE BRACKET	1
13	97-5002	PRESSURE GAUGE	1
*14	97-5434	MTNG. BRKT (20, 30 & 40 GALLON ONLY)	1
*	97-3435	MTNG. BRKT (60 GALLON ONLY)	1
15	97-5436	SIHT GLASS	1
16	97-5437	PRESSURE SWITCH	1
17	97-5997	RELIEF VALVE	1
18	97-5032	FLANGE FOOT	4
19	10-6963	TERMINAL BLOCK	2
20	10-6962	END SECTION	1
21	97-5414	INTERLOCK SWITCH	1
22	97-5441	GROUND LUG	1
23	97-5415	VENT	1

* SELECT AS REQUIRED.

ILLUSTRATED PARTS

FIGURE 1.



ILLUSTRATED PARTS

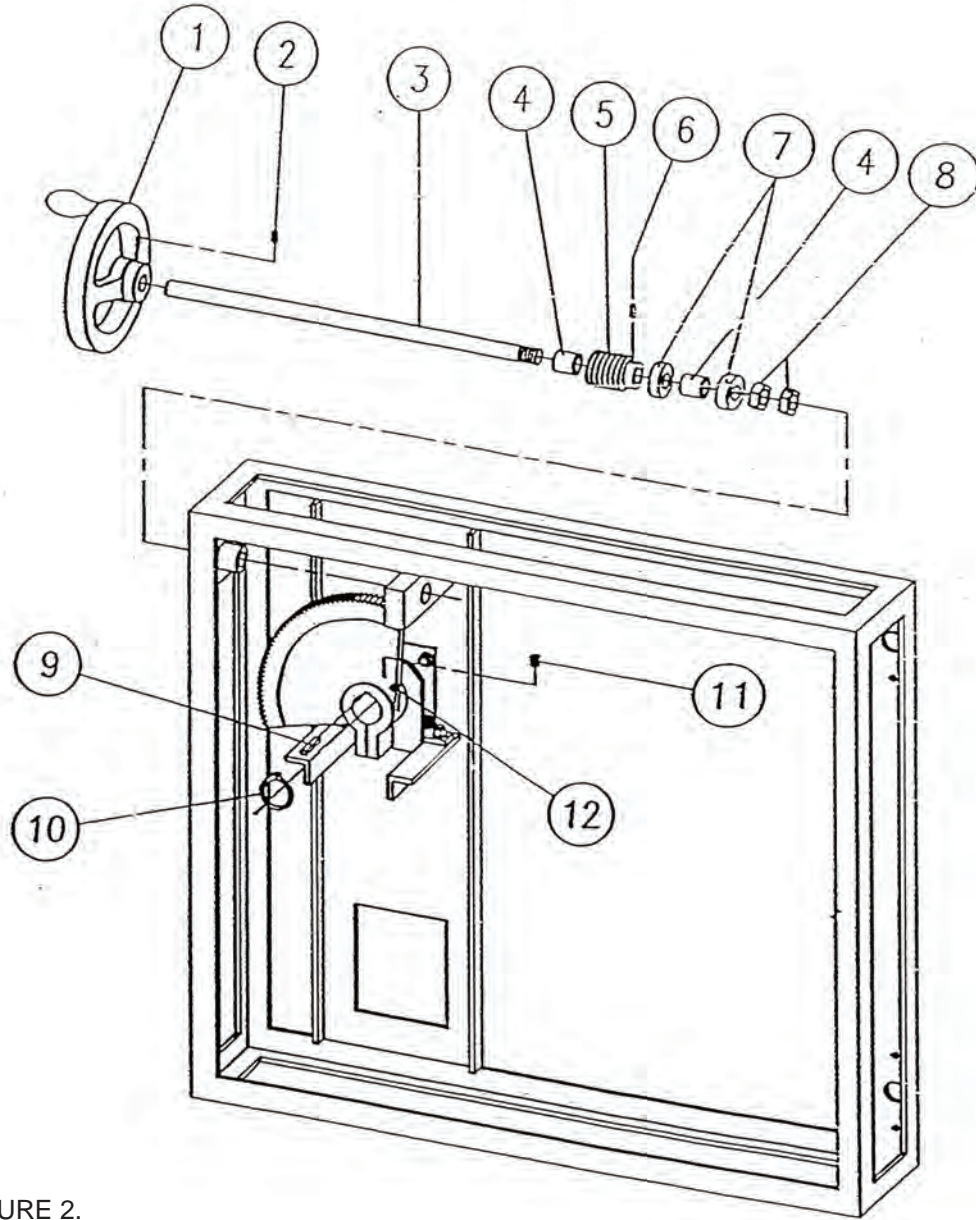


FIGURE 2.

ITEM	PART NO.	DESCRIPTION	QTY.
1	97-5090	HANDWHEEL	1
2	97-5091	SET SCREW	1
3	97-5092	TILT SHAFT	1
4	97-5420	BUSHING	2
5	97-5094	WORM GEAR	1
6	97-5093	TENSION PIN	1
7	97-5095	THRUST BEARING	2
8	97-5096	JAM NUT	2
9	97-5845	KEY	1
10	97-5546	RETAINING RING	1
11	97-5416	SET SCREW	1
12	97-5098	SEGMENT GEAR	1

ILLUSTRATED PARTS

FIGURE 3.

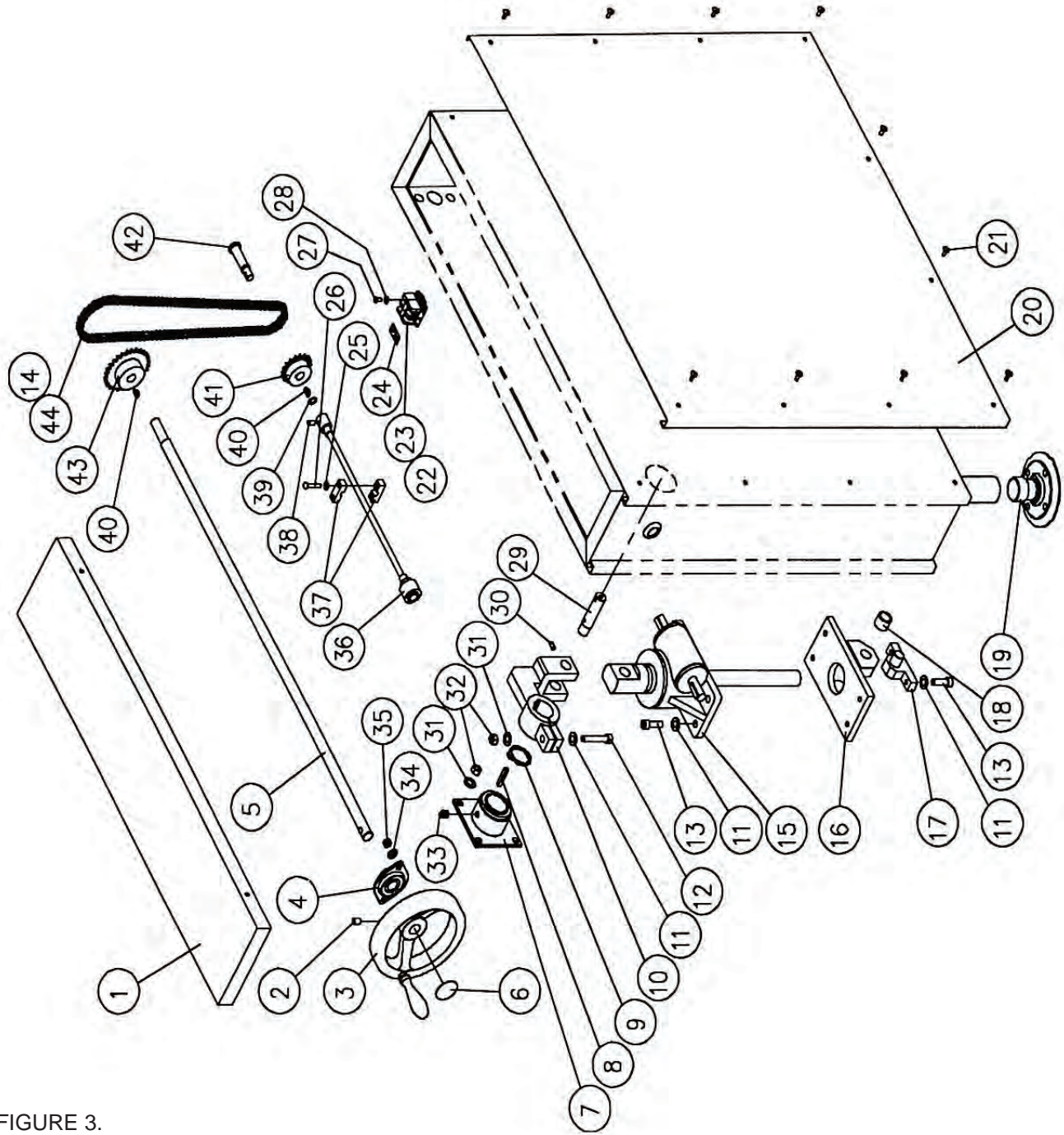


FIGURE 3.

ITEM	PART NO.	DESCRIPTION	QTY.
**1	97-5829	CONSOLE COVER	1
*	98-6196	CONSOLE COVER ASSY., FAUCET MOUNT (OPTIONAL)	1
*	97-5902	SPACER, FAUCET MOUNT (OPTIONAL)	1
2	97-5091	SET SCREW	1
3	97-5090	HAND WHEEL	1
4	97-5814	FRONT BEARING	1
5	97-5832	TILT SHAFT	1

ILLUSTRATED PARTS

FIGURE 3.

ITEM	PART NO.	DESCRIPTION	QTY.
6	97-6494	TILT LABEL	1
7	97-5712	TRUNNION HOUSING ASSEMBLY	1
8	97-5845	KEY	1
9	97-5546	RETAINING RING	1
10	97-5737	ARM	1
**11	97-5868	FLAT WASHER 3/8	**
12	97-5870	HEX SOCKET CAP SCREW, 3/8 -16 x 2- 1/8	1
13	97-5869	HEX SOCKET CAP SCREW, 3/8 -16x1- 1/4	8
14	97-5818	CHAIN LINK	1
15	97-5830	SCREW JACK	1
16	97-5735	BASE ASSEMBLY	1
17	97-5831	BASE BRACKET ASSEMBLY	1
18	97-5813	BEARING	2
19	97-5032	ADJUSTABLE FOOT	2
20	97-5732	SIDE PANEL	1
21	97-5738	TRUSS HEAD SLOT SCREW, 10-32 x 1/2	10
22	10-6963	TERMINAL BLOCK SECTION	2
23	10-6962	END SECTION	1
24	97-5848	EARTH ID TAG	1
25	97-5866	FLAT WASHER #10	2
26	97-5751	TRUSS HEAD PHILLIPS DRIVE, 10-32 x 1 1/4	2
27	97-5733	RD HEAD SLOT DRIVE SCREWS 8-32 x 1/4	3
28	97-5865	EXTERNAL TOOTH WASHER #8	3
29	97-5811	PIN	1
**30	97-5872	HEX SOCKET SET SCREW 1/4 -20 x 1/2	1
31	97-5871	LOCK WASHER 3/8	**
32	97-5584	HEX NUT 3/8 - 16	7
33	97-5790	GREASE NIPPLE, 1/8 NPT	1
34	97-5652	FLAT WASHER 5/16	2
35	97-5739	HEX NUT 5/16 -18	2
36	97-5833	FLEXIBLE SHAFT GUIDE	1
37	97-5819	NYLON SHAFT GUIDE	2
38	97-5873	SET SCREW 1/4 -20 x 3/8	1
39	97-5741	EXTERNAL RETAINING RING	1
40	97-5815	KEY	2
41	97-6569	SPROCKET	1
42	97-5812	OUTPUT SHAFT	1
43	97-5816	SPROCKET	1
44	97-5817	CHAIN	1

* NOT SHOWN.

** SELECT AS REQUIRED.

ILLUSTRATED PARTS

FIGURE 4.

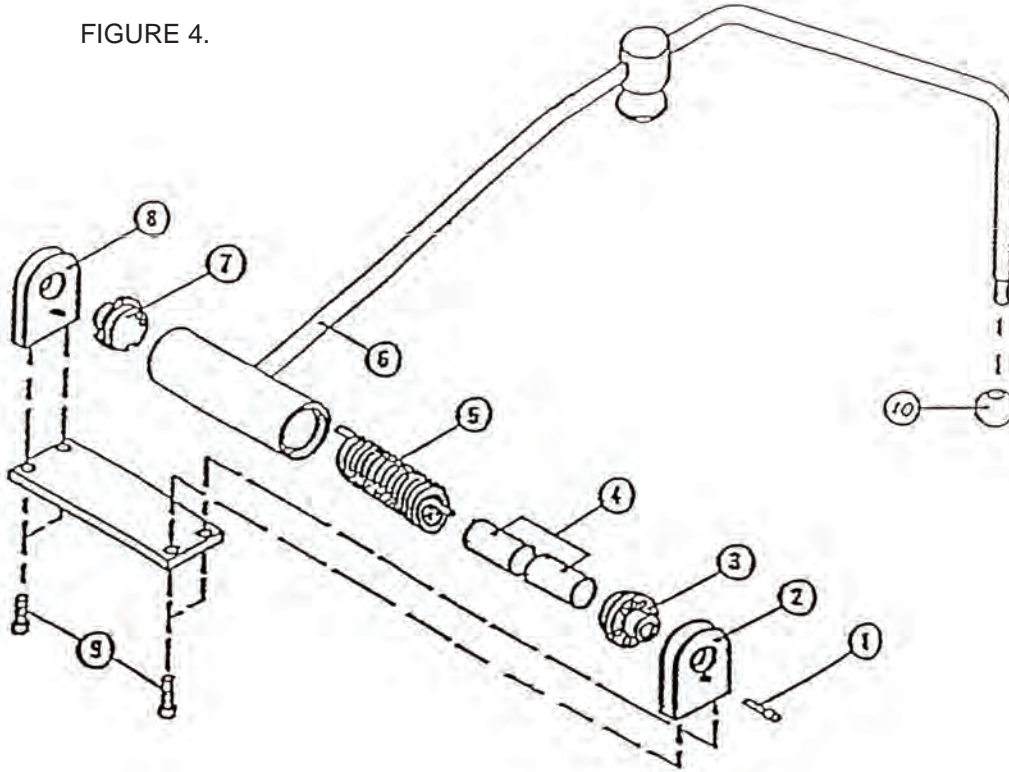
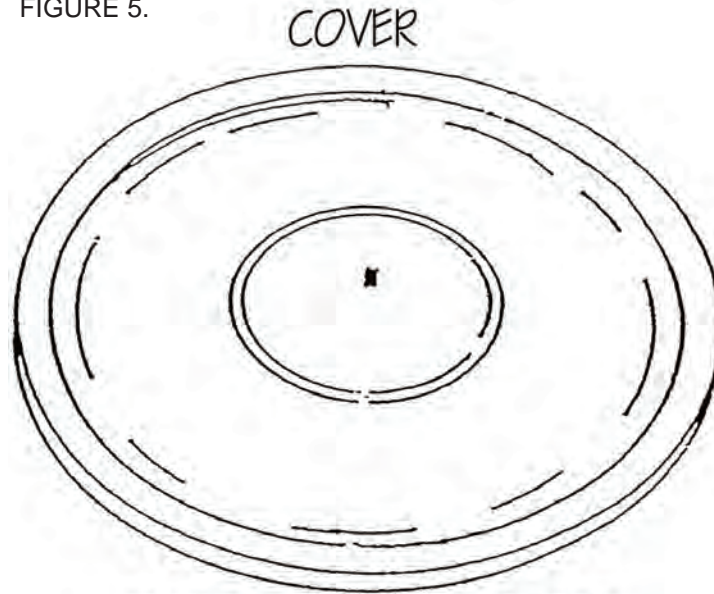


FIGURE 4.

ITEM	PART NO.	DESCRIPTION	QTY.
	97-5530	HINGE ASSY - 20-40 GALLON KETTLE	
1	97-5352	LOCK PIN	1
2	97-5343	END LOCK PLATE	1
3	97-5344	STATIONARY DISC	1
4	97-5698	CORES	2
5	97-5699	SPRING	1
6	97-5335	HANDLE ASSY- 20 GALLON KETTLE	1
6	97-5336	HANDLE ASSY - 30/40 GALLON KETTLE	1
7	97-5347	ROTARY DISC	1
8	97-5348	END STOP PLATE	1
9	97-5349	CAP SCREW	4
10	97-5337	KNOB	1
	97-5464	HINGE ASSY - 60 GALLON KETTLE	
1	97-5352	LOCK PIN	1
2	97-5343	END LOCK PLATE	1
3	97-5354	STATIONARY DISC	1
4	97-5345	CORES	2
5	97-5160	SPRING	1
6	97-5842	HANDLE ASSY	1
7	97-5352	ROTARY DISC	1
8	97-5356	END STOP PLATE	1
9	97-5545	CAP SCREWS	4
10	97-5337	KNOB	1

ILLUSTRATED PARTS

FIGURE 5.



20 GALLON KETTLE COVER - P/ N: 97-5742
 30/ 40 GALLON KETTLE COVER - P/ N: 97-5053
 60 GALLON KETTLE COVER - P/ N: 97-5054

FIGURE 6.

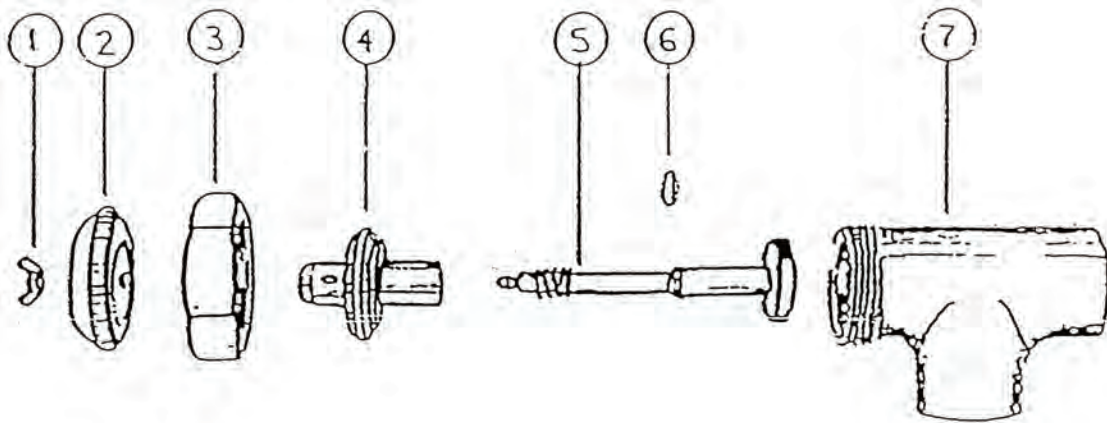
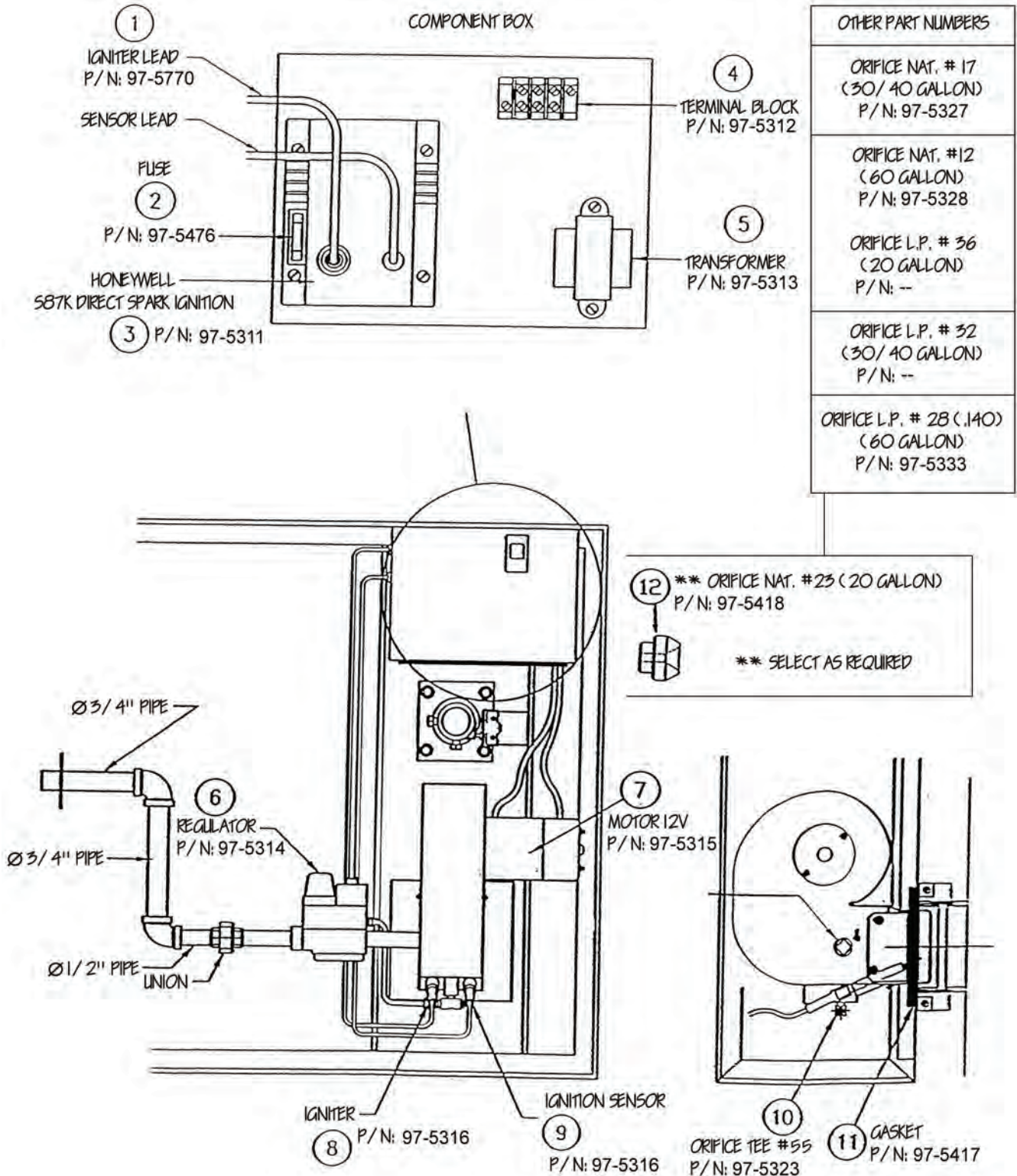


FIGURE 6.

ITEM	PART NO.			DESCRIPTION	QTY.
	1.5" VALVE	2" VALVE	3" VALVE		
1	98-6155	98-6155	98-6155	NUT	1
2	--	--	--	HANDLE	1
3	97-5068	97-5069	97-5070	HEX ASSY NUT	1
4	97-5074	97-5072	97-5073	BONNET	1
5	97-5074	97-5074	97-5074	DISC & STEM ASSY	1
6	97-5077	97-5078	97-5079	O-RING	1
7	97-6496	97-6159	97-6497	VALVE BODY	1

ILLUSTRATED PARTS

FIGURE 7.



WIRING

FIGURE 8.

ITEM	PART NO.	DESCRIPTION
1A	10-6962	TERMINAL BLOCK END SECTION
1B	10-6963	TERMINAL BLOCK SECTION
2	97-5360	FUSE, 3 AMP 600V
3	97-5359	FUSE HOLDER
4	97-5358	TRANSFORMER 240/120, 200VA
5	97-5429	POWER SWITCH
6	97-5414	TILT SWITCH
7	97-5426	LEVEL CONTROL
8	97-5710	PILOT LIGHT, LOW WATER AMB
9	97-5430	PILOT LIGHT, COOKING RED
10	97-5437	PRESSURE SWITCH
11	97-5427	THERMOSTAT
12	--	TRANSFORMER 120/24, 30VA
13	--	BLOWER MOTOR W/INTERLOCK
14	97-5475	FUSE 3 AMP 205V BUSS
15	--	GAS VALVE
16	--	DSIMODUAL
17	--	FLAME SENSOR
18	--	SPARK ELECTRODE
19	97-5554	LEVEL PROBE
20	97-5422	PILOT LIGHT, IGNITION

