

**Instructions for the Installation
and Adjustment of**

WEIL-McLAIN

Types J and CO-800

Pressure Atomizing Oil Burners

These burners are approved under the provisions of Commercial Standard CS-75 for burning fuel oil not heavier than Commercial Standard No. 2.

DO NOT USE GASOLINE, CRANKCASE OIL, OR ANY OIL CONTAINING GASOLINE

Oil Burners should be installed in accordance with the regulations of the National Board of Fire Underwriters for the class of installation, which regulations should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installation is made.

WEIL McLAIN MODEL J BURNER SPECIFICATIONS AND RATINGS

BOILER NUMBER	BURNER RATING	CHOKE	STATIC DISC	FIRING RATE GPH	NOZZLE DATA				
					NO.	SIZE	ANGLE	TYPE	MFG.
B482	No. 2*	4 $\frac{1}{4}$ "	None	4.30	2	2.25	80°	B	Delavan
B582	No. 2*	4 $\frac{1}{4}$ "	None	5.15	2	2.50	80°	B	Delavan
B682	No. 2*	4 $\frac{1}{4}$ "	None	5.95	2	3.00	70°	B	Delavan
B782	No. 2A*	4-3/8"	None	6.75	2	3.50	60°	B	Delavan

* Standard equipment: MH-V4001A Delayed Valve and Two Stage Pump

WEIL McLAIN MODEL CO-800 BURNER SPECIFICATIONS AND RATINGS*

BOILER NUMBER	CHOKE	FIRING RATE G.P.H.	NOZZLE DATA				
			NO	SIZE	ANGLE	TYPE	MFG.
∇ B882	4-3/8"	7.55	2	4.00	70°	B	Delavan
‡ B982	4-3/8"	8.30	2	4.00	70°	B	Delavan
B1082	4-3/8"	9.10	2	4.50	70°	B	Delavan
B1182	4-3/8"	9.80	2	5.00	70°	B	Delavan

*Standard equipment: MH Electronic Safety Control consisting of RA890E, C7013A Photo Cell, and Q270 Mounting Base; Two Stage Pump, and Delayed Oil Valve.

∇ For correct firing rate, set oil pump pressure at 90 P.S.I.

‡ For correct firing rate, set oil pump pressure at 110 P.S.I.

TANK INSTALLATION

1. The oil tank should be installed in accordance with local regulations and those of the National Board of Fire Underwriters. Galvanized tanks and piping are not recommended.

2. Gravity supply tanks located inside buildings shall not exceed 275 gallons individual capacity, or 550 gallons aggregate capacity (in one building). Inside tanks larger than the above must be installed in an enclosure or casing constructed of reinforced concrete at least 6" thick, or of brick at least 8" thick, bonded to the floor. The space between the enclosure and the tank shall be completely filled with well-tamped earth or sand. Instead of an enclosure, the tank may be encased in reinforced concrete at least 6" thick applied directly to the tank.

3. Underground oil supply tanks should be located so that the top of the tank is below the level of all piping to which the tank is connected, so that oil cannot be discharged through a broken pipe or connection by syphoning. The tank shall be buried so as to be covered by not less than two feet of earth, or one foot of earth on top of which is placed a slab of reinforced concrete not less than 4 inches thick. A well-tamped earth foundation shall be provided beneath the concrete slab, which shall extend at least one foot beyond the tank in all directions. The tank shall be set on a firm foundation and soft earth or sand shall be packed around it. When necessary, to prevent floating, it shall be securely anchored or weighted.

OIL PIPING

1. Proper allowance shall be made for expansion, contraction, jarring and vibration. With the exception of fill lines and test wells, pipe lines shall be provided with double swing joints, which will permit the tank to settle without straining the pipe connections. Tanks shall be equipped with an open vent or an approved automatically operated vent, which will permit discharge to the open air. Vent pipe and vent opening shall be large enough to prevent abnormal pressure in the tank during filling, 1¼" pipe size being the minimum. The vent and fill pipes should drain to the tank, and the lower end of the vent pipe shall not be cross-connected with the fill pipe. The outer end of vent pipe shall be provided with a weather-proof hood which should be high enough above the ground to prevent its being obstructed with snow or ice. The vent pipe shall not be closer than two feet, either vertically or horizontally, from any window or other building opening.

2. The storage tank shall be filled only through a 2" fill pipe terminating outside of the building, no closer than five feet from any building opening at the same or lower level. A metal cover designed to prevent tampering shall be provided.

3. All piping shall be standard full weight wrought iron, steel or brass pipe, with standard fittings, or approved brass or copper tubing, with U.L. Listed fittings. At least ¼" iron pipe or ⅜" O.D. copper tubing (½" O.D. copper tub-

ing is preferred) having a wall thickness not less than 0.049" shall be used in connecting the burner to the tank. The piping shall be protected from possible injury, and shall be rigidly fastened in place in a workmanlike manner. Where practicable, it should be buried underground, or in a concrete floor, or placed in a metal-covered pipe trench. Do not cover the piping until the burner has been installed and operated so that any leaks may be corrected. Pipe joints and connections shall be made tight, and unions and tubing fittings of an approved type only shall be used. Use only pipe thread compound resistant to oil. A U.L. Listed strainer shall be installed in the oil supply line to the burner.

To determine the proper fuel line size, refer to the fuel unit instructions shipped with the oil burner.

4. U.L. Listed shut-off valves shall be installed in the oil supply line in an accessible location close to the tank and to the burner.

CHIMNEY INSPECTION

1. A chimney extending through the center of a peak roof should extend at least 2 feet above the peak. If the chimney does not extend through the center of a peak roof, it should extend at least 2½ feet above the peak. The top of the chimney should extend at least 3 feet above a flat roof.

2. The chimney cap should not extend over the flue, and the flue should not be obstructed by a ventilator.

3. Any accumulation of soot or debris in chimney offsets should be removed.

4. Any obstructions such as a protruding joint or a piece of broken tile wedged in the chimney should be removed.

5. No other heater or ventilator connection should be made to the chimney.

6. The flue pipe should have an upward pitch toward the chimney of at least 1 inch per foot of length. It should fit tightly and should not project into the chimney.

7. Any leakage between tiles, around cleanout doors, or around the vent pipe should be sealed.

8. The cross-sectional area of the chimney should be at least equal to the sum of the flues venting into it.

9. All hand dampers in converted units must be removed, or secured in the open position.

AIR SUPPLY

The furnace or boiler should be provided with adequate fresh air for combustion. If the furnace or boiler is installed in a utility room or closet, grilles should be placed near the ceiling and the floor to provide ventilation as well as air for combustion. One square inch minimum free area per 1,000 B.T.U. per hour input or 135 square inches for each gallon per hour input are required in each grille. Outdoor connections should be screened and provided with louvers.

INSTALLING BURNER

1. Check to see that the asbestos gasket is attached to the burner mounting plate.
2. CHECK TO SEE THAT THE FIRING ASSEMBLY IS ADJUSTED AS SHOWN BELOW.
3. Install burner in flange and secure in place.
4. After referring to the instructions attached to the oil pump, connect the oil line(s) to the oil pump.

ADJUSTING INSTRUCTIONS

I. Set the room thermostat 10 degrees higher than the temperature on the thermometer. Adjust the limit control to 200°. See that the manual reset button of the integral thermal overload switch on the oil burner motor is pushed in. Open all valves and oil lines. Open the fire door or observation door of the furnace or boiler. To purge the air from the oil line and oil pump, loosen the plug in the gauge port of the pump (see oil pump instructions). Close the burner switch and allow the burner to run until there are no air bubbles in the oil issuing from the gauge port of the pump. Then tighten the plug in the pump.

II. To obtain best efficiency and performance, adjust the draft balancer alternately with the burner air adjustment until a 10% CO₂ flue gas analysis (as measured with a gas analyzer) is obtained with .02-.03" W.C. over-

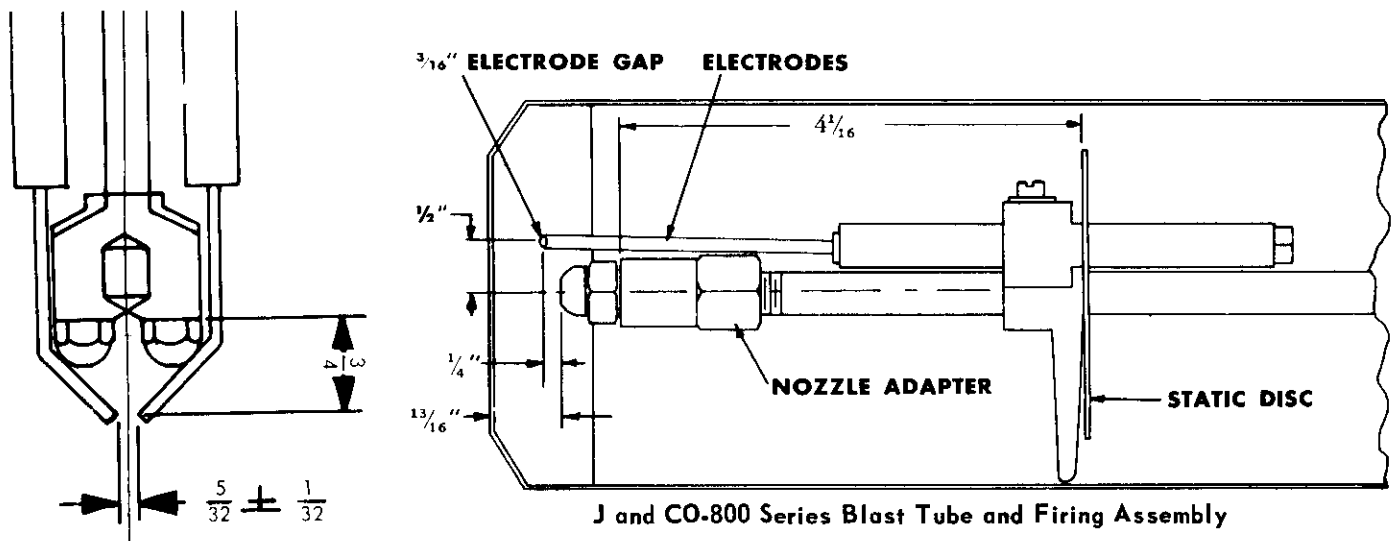
fire draft (as measured with a draft gauge). To approach this CO₂ reading, close the burner air supply adjustment until a smoky flame is obtained, and then open it only enough so that a clean flame is apparent immediately after the fire door or observation door is opened. Final air adjustment should be made with a gas analyzer.

III. Check the safety controls for proper operation as described in the control manufacturer's instructions.

IV. Be sure to leave the installation in a clean and tidy condition.

V. Advise the home owner how to start and stop the oil burner.

VI. Return in two or three weeks and recheck burner adjustment and operation.



OIL BURNER TROUBLE SHOOTING

1. BURNER MOTOR DOES NOT START:

CAUSE	REMEDY
a. Incomplete electrical circuit.	Check switches, fuses, stack control, thermostat contacts and main disconnect.
b. Stack control off on "safety."	Wait five minutes and depress the red button on the protectorelay.
c. Stack control out of step.	Draw re-set lever back and slowly allow it to move forward to put contacts in cold start position.
d. Motor bearings frozen.	Free shaft and lubricate.
e. Motor off on thermo-protector.	Allow motor to cool and push red re-set button. If motor cuts out again check wiring to locate cause.

2. BURNER MOTOR OPERATES BUT NO OIL IS DELIVERED AT THE NOZZLE:

CAUSE	REMEDY
a. Oil level below intake line inside supply tank.	Fill tank with oil and bleed air from the line.
b. Clogged strainer.	Remove and clean strainer.
c. Clogged nozzle.	Remove and clean or replace nozzle.
d. Air leak in the intake line.	Tighten all fittings in the intake line. Tighten unused intake port plug in the fuel unit. If there are valves in the line, be sure the valve stems are packed solid and tightened securely.
e. Restricted intake lines.	Replace any kinked tubing and check all valves in the intake line.
f. A two pipe system that becomes air bound.	Check and insert by-pass plug if not in place.
g. A single pipe system that becomes air bound.	Loosen gauge port plug and drain oil until burner ignites.
h. Slipping or broken coupling.	Tighten or replace coupling.
i. Frozen pump shaft.	Return unit to approved fuel unit service station.
j. Excessive vacuum.	Use two stage pump or next larger tubing size.
k. Suction line oil filter cartridge dirty.	Replace cartridge.

3. BURNER MOTOR OPERATES AND DELIVERS OIL BUT THERE IS NO FLAME:

CAUSE	REMEDY
a. No spark.	Check the ignition transformer.
b. Poor atomization due to low oil pressure.	Adjust oil pressure to 100 p.s.i. and check for oil line restriction.
c. Improper electrode setting.	Remove firing assembly and adjust per instructions.
d. Excessive combustion air.	Adjust combustion air for 9% CO ₂ .

4. BURNER STARTS BUT FLAME BLOWS AWAY FROM NOZZLE:

CAUSE	REMEDY
a. Excessive combustion air.	Adjust combustion air for 9% CO ₂ .
b. Excessive draft.	Adjust draft regulator for .03 to .04" water column over-fire draft.
c. Poor atomization of oil.	Check pump pressure and nozzle.
d. Uneven flame.	Change or clean nozzle.

5. PULSATION ON IGNITION AND SHUT DOWN RESULTING IN CARBON DEPOSITS ON THE NOZZLE:

CAUSE	REMEDY
a. Air pocket between cut-off valve and nozzle.	Run burner stopping and starting occasionally until pulsation, smoke and after flame disappears.
b. Poor nozzle spray pattern or angle.	Check the oil pressure and set at 100 p.s.i. Check that the nozzle is the proper size and type.
c. Poor draft on ignition.	Check for excessive stack length with insufficient pitch or excessive number of elbows in vent pipe.

6. MECHANICAL OIL BURNER NOISES:

CAUSE

REMEDY

- a. Bad coupling alignment.
- b. Tank hum.
- c. Clogged strainer.
- d. Burner vibrations transmitted through rigid electrical conduit or oil lines.
- e. Vibrations transmitted through oil line from burner to the oil tank.

Loosen fuel unit mounting screws slightly and shift fuel unit in different position until noise is eliminated.

Add anti-hum device.

Remove and clean the strainer.

Tubing or conduit should not be fastened to joist studs, or beams so securely that vibration can be transmitted to floor or ceiling.

Check diaphragm in pump. This diaphragm should have an air pocket behind it to absorb any pulse or beat set up by pumping members.

7. OIL ODORS IN HOUSE:

- a. Oil leaks.
- b. Poor burner shut-off.
- c. Smoky flame.
- d. Oil spray on the burner end cone.
- e. Downdraft causing smoke to enter the basement through the barometric regulator.
- f. Ventilator fans.

Check fittings and valve seals.

Check oil cut-off.

Check CO₂ setting.

Adjust firing assembly.

Correct chimney condition by extending height, or by adding a ventilating cap, induced draft fan, or draft generator.

Provide dampers to prevent ventilator fans from drawing air out of the furnace room.

INSTRUCTIONS FOR REMOVING AND REPLACING BURNER PARTS

IMPORTANT: BEFORE MAKING ANY ADJUSTMENT TURN OFF THE OIL BURNER ELECTRIC SWITCH

MODEL J

FIRING ASSEMBLIES

Disconnect the tubing at the top of the blower housing adjacent to the ignition transformer. Remove the two screws at the front of the ignition transformer and rotate the transformer on its hinges. Loosen the screws which fasten the top cover to the blower housing and withdraw the firing assembly. Check the firing assembly setting against the sketch on page 3. Reinstall the firing assembly carefully to prevent mis-alignment. Make sure the buss bars are in position so that they will contact the transformer terminals when the transformer is in its normal position.

its shaft. To remove the coupling, loosen the Allen set screw. To remove the fan from the motor shaft, loosen the set screw. Reassemble and reinstall in reverse procedure.

IGNITION TRANSFORMER

Remove the two screws at the front of the ignition transformer and rotate the transformer at its hinges. Disconnect the electrical leads from the power supply and motor leads. Remove the screws from the transformer hinge and withdraw the transformer. Reinstall in reverse procedure.

MOTOR, FAN AND FLEXIBLE COUPLING

Remove the two screws at the front of the ignition transformer and rotate the transformer on its hinges. Disconnect the electrical leads from the motor in the junction box in the rear of the blower housing. Unfasten the wireway from the fan housing, place an Allen wrench through the top of the air collar and loosen the set screw in the flexible coupling. Remove the two screws which attach the motor to the blower housing. Withdraw the motor with fan and flexible coupling attached to

FUEL PUMP

Close the valve(s) in the oil lines between the burner and the tank. Disconnect the oil line(s) between the oil tank and the fuel pump at the pump and disconnect the oil line leading to the blast tube. Place an Allen wrench through the top of the air collar and loosen the set screw which attaches the fuel pump to the flexible connector. Remove the two screws holding the fuel pump to the blower housing. Withdraw the fuel pump. On reassembly, be sure that the pump shaft inserts into the rubber coupling. Tighten the set screw.

MODEL CO-800

FIRING ASSEMBLIES

Disconnect tubing at the left side of the blower housing adjacent to the fuel pipe. Remove the four screws that hold the service cover to the back of the burner. Disconnect the burner side plate. Reach inside of blower housing and remove the transformer terminal nuts. Pull the buss bars free and out the back of the burner. Carefully slide the complete firing assembly out toward the rear of the burner, being careful to disconnect the photocell lead wire when it is in reach. Check the firing assembly against the sketch shown on page 3. Reinstall the firing assembly carefully to prevent mis-alignment. Make sure the buss bars are in their proper position.

to its shaft. To remove the coupling, loosen the Allen set screw. To remove the fan from the motor shaft, loosen the set screw. Reassemble and reinstall in the reverse procedure.

IGNITION TRANSFORMER

Remove the four screws which secure the rear service cover. Disconnect the electrical wiring and remove the high tension terminal nuts pulling the buss bars free. From inside the blower housing remove the two nuts which secure the transformer to the side of the blower housing. Reinstall in the reverse procedure.

MOTOR, FAN AND FLEXIBLE COUPLINGS

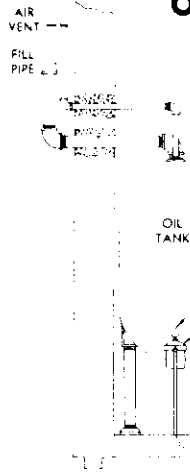
On the rear side of the motor, remove the junction box cover plate and disconnect the electrical leads from the motor. Unfasten the flexible conduit connection from the junction box. Place an Allen wrench through the top of the air inlet and loosen the set screw in the flexible coupling. Remove the two screws which attach the motor to the blower housing. Withdraw the motor with the fan and flexible coupling attached

FUEL PUMP

Close the valve(s) in the oil lines between the burner and the tank. Disconnect the oil line(s) between the oil tank and the fuel pump at the pump and disconnect the oil line leading to the blast tube. Place an Allen wrench through the top of the air collar and loosen the set screw which attaches the fuel pump to the flexible connector. Remove the two screws holding the fuel pump to the blower housing. Withdraw the fuel pump. On reassembly, be sure that the pump shaft inserts into the rubber coupling. Tighten the set screw.

HOW TO DETERMINE THE CORRECT LINE SIZE FOR SUNDSTRAND FUEL UNITS

ONE-PIPE INSTALLATION



NOTE: Use this system only with inside tank where Fuel Unit is below bottom of tank.

INSTALL IN ACCORDANCE WITH UNDERWRITERS & LOCAL REGULATIONS

Total Length of INTAKE LINE in feet
(Including horizontal and vertical run)

MAX. LENGTH OF 3/8" LINE

MAX. LENGTH OF 1/2" LINE

Dimension "A"	J2	J3	J4	J5	J6
0'	60	29	19	13	9
1'	75	39	26	17	12
2'	98	49	36	22	15
3'	122	61	40	27	19
4'	140	70	47	31	22
5'	150	84	54	36	24

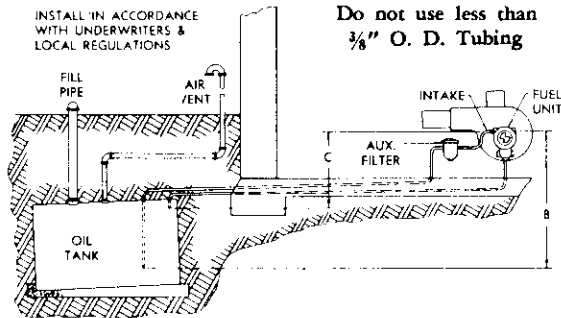
J2	J3	J4	J5	J6
	131	88	57	39
		115	76	54
		146	94	66
	150'		119	85
			136	96
				109

Do not use less than 3/8" O. D. Tubing

If no oil is available at nozzle or sharp cut-off is not obtained, and shaft is rotating in direction indicated by arrow on body, there may be an air leak in the suction line causing the unit to be air bound. To correct this, tighten all fittings and bleed air from the system through the gage port.

TWO-PIPE INSTALLATION

Inside or outside tank Fuel Unit above tank



Do not use less than 3/8" O. D. Tubing

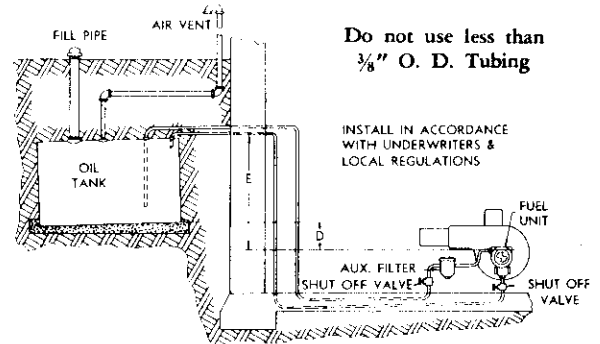
Total length of INTAKE LINE in feet
(Including horizontal and vertical run)

Dimension "B" Intake	MAX. LENGTH 3/8" Tubing					MAX. LENGTH 1/2" Tubing				
	J2	J3	J4	J5	J6	J2	J3	J4	J5	J6
0'	48	48	40	30	24				132	100
1'	46	46	37	28	21		150'		128	94
2'	42	42	34	26	19				115	87
3'	39	39	31	24	17			139	110	78
4'	36	36	28	22	16			127	98	72
5'	32	32	26	19	14	140	140	115	84	65
6'	28	28	22	17	13	128	128	100	75	57
7'	24	24	19	15	11	110	110	87	65	50
8'	21	21	17	12	9	91	91	74	55	42
9'	19	19	14	10		76	76	62	46	36
10'	13	13				60	60	47	36	27
11'						42	42	35	25	19
12'						25	25	20	15	

Total length of RETURN LINE in feet
(Including horizontal and vertical run)

Dimension "C" Return	MAX. LENGTH 3/8" Tubing					MAX. LENGTH 1/2" Tubing				
	J2	J3	J4	J5	J6	J2	J3	J4	J5	J6
0'	48	48	40	30	23				132	100
1'	52	52	43	32	27				145	115
2'	54	54	45	34	28				150	125
3'	57	57	48	36	29					130
4'	60	60	50	38	31			150'		140
5'	65	65	54	40	32					145

Inside or outside tank Fuel Unit below tank



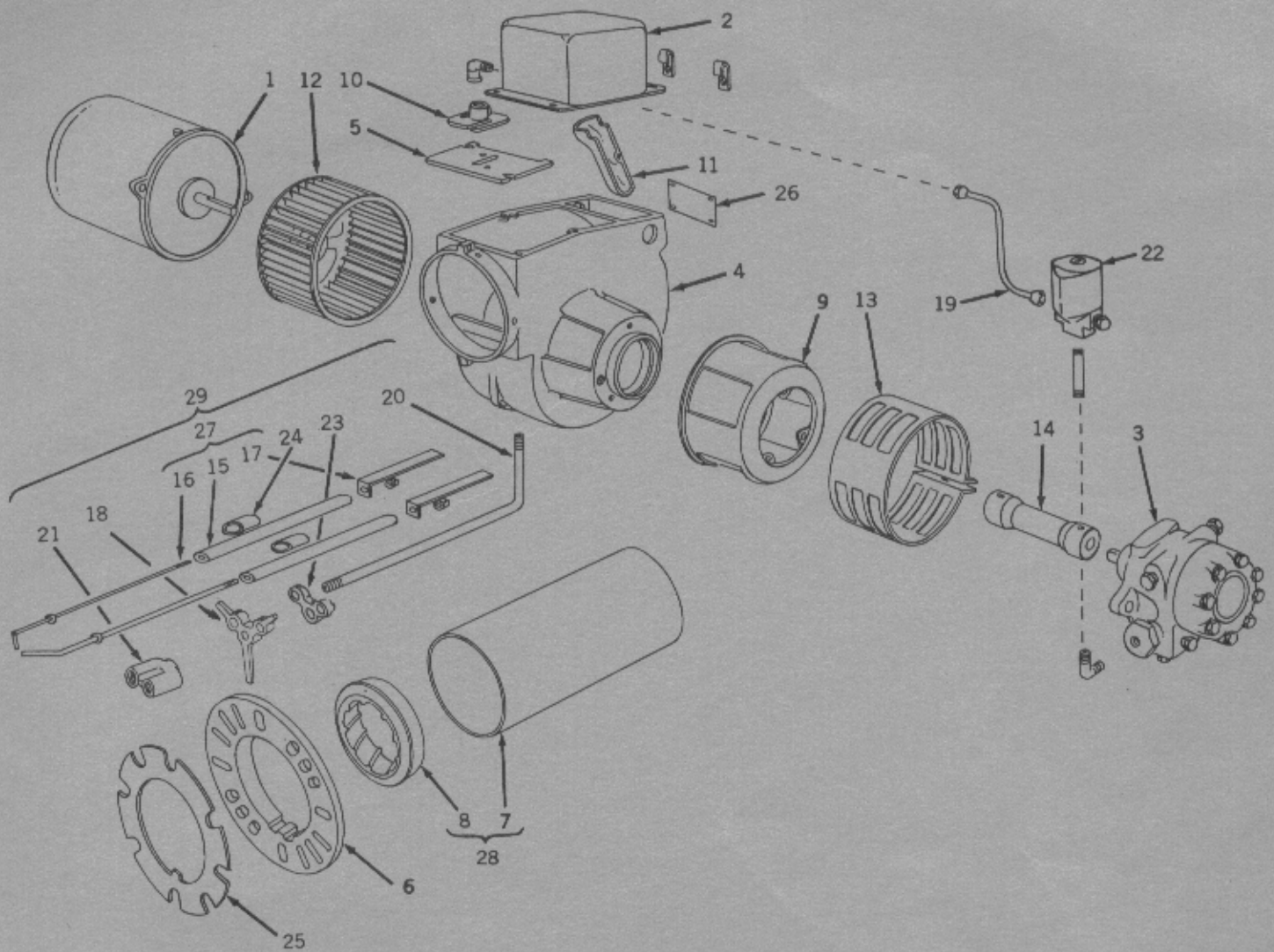
Do not use less than 3/8" O. D. Tubing

Total length of INTAKE LINE in feet
(Including horizontal and vertical run)

Dimension "D" Intake	MAX. LENGTH 3/8" Tubing					MAX. LENGTH 1/2" Tubing				
	J2	J3	J4	J5	J6	J2	J3	J4	J5	J6
5'	65	65	55	40	31					140
4'	61	61	52	38	30					132
3'	58	58	49	36	28			150'		125
2'	56	56	48	35	27					120
1'	52	52	44	32	25					145
-	-	-	-	-	-					-
-	-	-	-	-	-					-
-	-	-	-	-	-					-
-	-	-	-	-	-					-

Total length of RETURN LINE in feet
(Including horizontal and vertical run)

Dimension "E" Return	MAX. LENGTH 3/8" Tubing					MAX. LENGTH 1/2" Tubing				
	J2	J3	J4	J5	J6	J2	J3	J4	J5	J6
0'	48	48	40	30	23				135	105
1'	45	45	38	28	22				125	96
2'	42	42	36	26	21			150'		115
3'	39	39	33	24	19				145	110
4'	35	35	29	21	17				130	95
5'	32	32	28	19	15				115	85



MODEL J2 PARTS LIST No. 570
 MODEL J2A PARTS LIST No. 752

Item	Description	Item	Description
1	Motor	16	Electrode
2	Transformer - Ignition	17	Buss Bar
3	Fuel Pump	18	Deflector
4	Blower Housing	19	Fuel Line
5	Top Cover	20	Fuel Pipe
6	Mounting Flange	21	Nozzle Adaptor - Dual
7	Draft Tube	22	Oil Valve
8	Fire Ring (677 on J2A) (638 on J2)	23	Insulator Support
9	Air Can	24	Insulator Clip
10	Adjusting Bracket	25	Gasket
11	Wireway		
12	Blower Wheel		Assembled Components
13	Air Band	27	Electrode Assembly (2 required)
14	Flexible Coupling	28	Draft Tube Assembly (items 7 and 8)
15	Insulator	29	Firing Assembly (items 18, 20, 21, 23, 24 and 27)

When ordering parts please specify item numbers and the following: For J2A specify Parts List No. 752
 For J2 specify Parts List No. 570