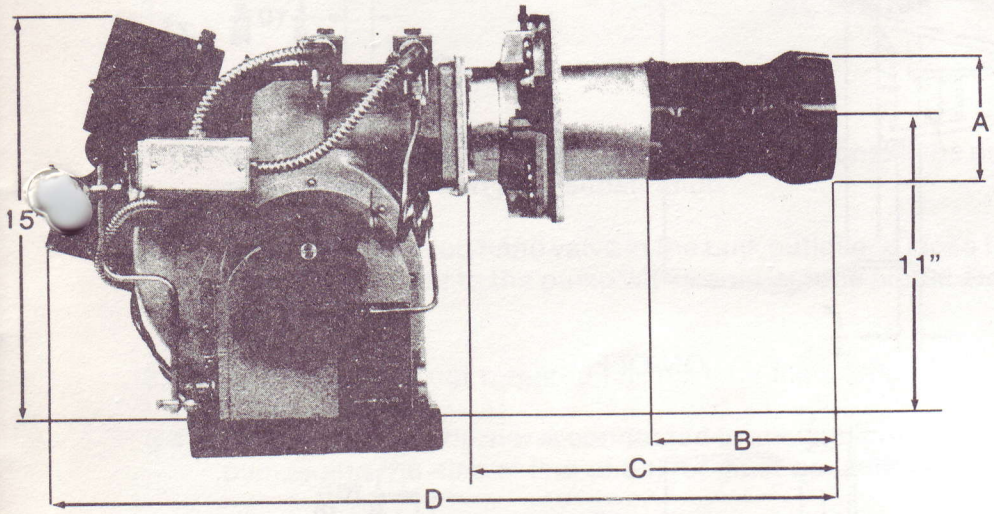
MANUAL NO. 24000-12/85-1M

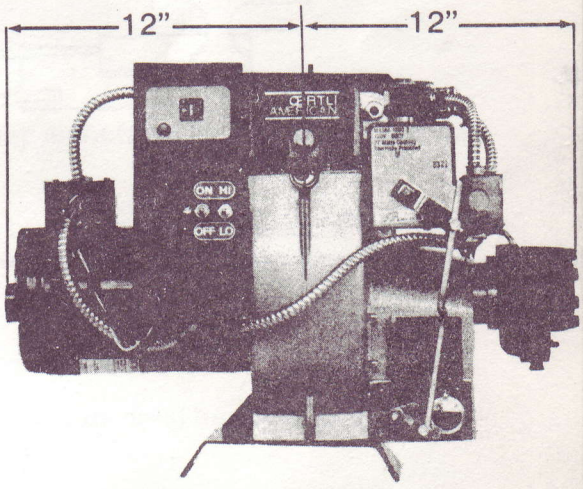
INSTALLATION SERVICE AND OPERATING MANUAL

MODEL OE-3 OIL BURNER

(4 TO 20 G.P.H.)

COMBUSTION HEAD	A	B	C	D
1	5"	$7\frac{11}{32}$"	$14\frac{5}{8}$"	$30\frac{5}{8}$"
2	$5\frac{19}{32}$"	$7\frac{19}{32}$"	$14\frac{7}{8}$"	$30\frac{7}{8}$"





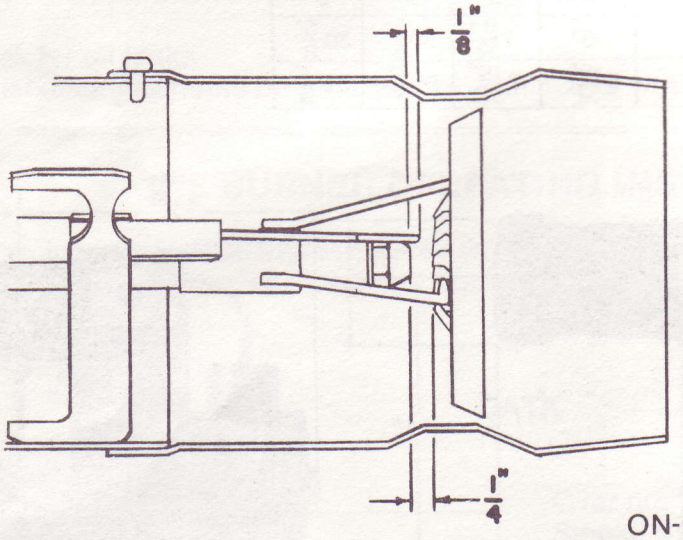
AMERICAN BURNER CORPORATION
EXCELLENCE

85 AUSTIN BLVD., COMMACK, N.Y. 11725

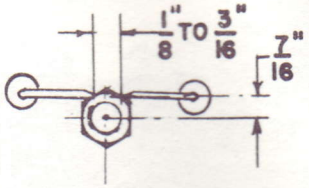
BURNER DATA:

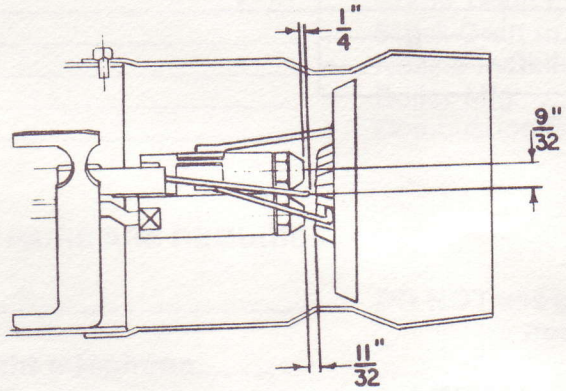
TYPE	COMBUSTION HEAD	FIRING RATE IN GPH	BASIC CONTROL	MOTOR	TRANSFORMER	PU
OE-3 ON-OFF	2	6-13	Cad Cell With Intermittent Ingition (Standard)	¾ HP, 110/220V, 60 HZ, 1 PH	12,000 V Mid Point Grounded	2-Stage 300 PSI
OE-3 Hi-Lo	1	4-12		1 HP, 110/220V, 60 HZ, 1 PH (Standard)		
	2	7-20		1 HP, 208-220/440V, 60 HZ, 3 PH (Optional)		

NOTE: Combustion Head 1. Opening 5.6"
2. Opening 5"



ON-OFF





HI-LO

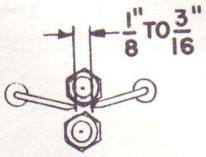


Fig. 1

NOMENCLATURE:

OE-3 — Burner Type

1 — Combustion Head

H — Type On-Off "O" Hilo "H"

Cd — Flame Monitoring CD = Cd Cell

Z — Elec. Supply To Motor
Z = 1PH, 110V, 60 HZ
Y = 1PH, 220V, 60 HZ
X = 3PH, 208V, 60 HZ
W= 3PH, 220V, 60 HZ
V = 3PH, 440V, 60 HZ

INSTALLATION INSTRUCTIONS
2 FUEL OIL BURNERS

1. UNPACKING

1.1 When unpacking the burner, be sure all loose packages are inspected for contents. Check the packing list, electrical rating (voltage, hertz) and for concealed damage.

2. FUEL TANK

2.1 All oil storage tanks must be U.L. listed and installed according to the National Board of Fire Underwriters or local ordinances, whichever has precedence.

2.2 All pipe connections on underground buried tanks must have swing joints except the sounding well (stick well).

2.3 The fill line must pitch toward ¼" per ft.

2.4 The vent pipe should not be less than 1¼" I.P.S. and equipped with an approved vent cap. Pitch the vent pipe toward tank ¼" per ft.

2.5 The tank gauge should be installed so that the float will not be under the fill line. On underground tanks, protect the bulb and gauge line inside the tank with rigid iron pipe.

3. OIL PIPING

3.A Gravity Feed

3.1 Use ½" O.D. copper tubing with flared fittings. Consult the pump manufacturer's specifications for other sizes and iron pipe substitution.

3.2 Install an approved hand valve in the tank outlet and close to burner fuel pump ahead of the filter. Connect the filter to the pump with a copper tube pigtail. Do not connect rigid pipe directly to the pump.

3.3 A return line is not required for this type installation.

3.4 If more than one burner is connected to suction line, the tank bottom must be above both burner pumps and the size of line and filter must be increased.

3.B Underground or Vaulted Tanks.

3.5 Use ½" O.D. copper tubing with flared fittings for suction and return lines to avoid underground connections. If the local regulations require rigid pipe, use black wrought iron and malleable fittings with double swing joints to prevent breakage in case the tank settles. (Consult the pump manufacturer's specifications for other sizes and iron pipe substitutions.)

3.6 Both suction and return lines should extend to within 4" of the tank bottom.

3.7 Slip fittings should be used on the tank for copper suction and return lines. Double-tapped bushings can be used with wrought-iron pipe; however, a bushing welded to the dip tube is preferred.

3.8 Install, in the suction line at an outside wall, an approved hand valve and spring loaded ball check. When the tank is vaulted and the bottom of the tank is on the same level as the burner, install a vertical check valve as close to the top of the tank as practical.

3.9 If the bottom of the tank is above the level of the burner, an anti-siphon valve is usually required at the highest point.

3.10 Install an approved hand valve close to the burner pump, ahead of the filter, and connect the filter to the pump with a copper tube pigtail.

3.11 Install a copper tube pigtail between the pump and spring-loaded ball check in the return line.

3.12 Avoid fastening suction and return lines to floor beams. If necessary to do so, use loose fitting hangers with soft rubber lining to prevent noise transmission.

3.13 A separate suction line should be used for each burner. A common return line may be used, provided a spring-loaded ball check is installed in the return pipe from each fuel unit.

4. FUEL OIL FILTER

4.1 A filter is recommended in the suction line.

4.2 Size the filter according to GPH of the nozzle on single pipe installations.

4.3 Use larger filters on 2-pipe systems

5. INSTALLATION

5.1 Use a base or flange mounting, whichever is the most practical for the installation. Follow the heating appliance manufacturer's recommendations where applicable.

5.2 Make sure the burner is level side to side.

5.3 Pitch the air tube down approximately 2° toward the nozzle end.

5.4 The end of the air tube should be ¼" back to flush with inside of the chamber wall. Improper insertion will distort the fire. See Fig. 2.

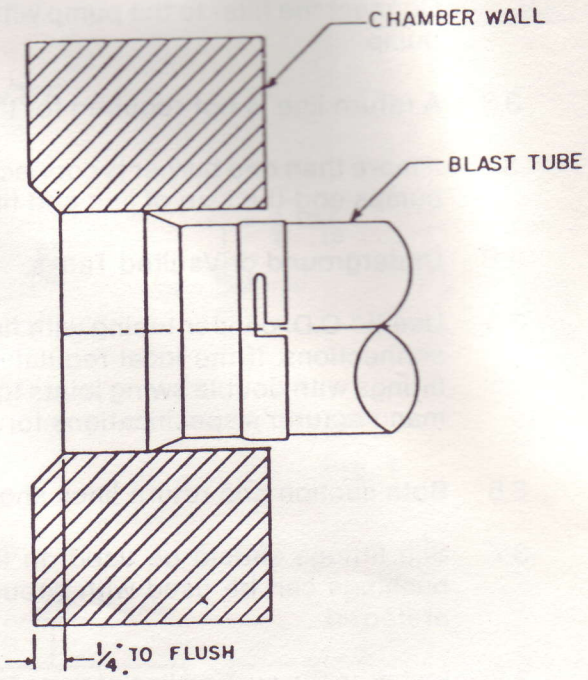


Fig. 2

6. NOZZLES

6.1 Use a nozzle of the proper size, type and spray pattern as indicated for the burner model. 45 solids are recommended; 60 solids may also be used. Refer pressure chart to select proper nozzles.

6.2 Always remove the nozzle assembly to install or replace the nozzle.

6.3 The nozzle assembly can be removed step by step as follows:

(a) Open up the cover by removing the cover screws.
(b) Disconnect the oil line to lo fire valve
(c) Remove top nut(s) on valve(s) therefore removing the coil(s) of the oil valve(s)
(d) Disconnect the cables for electrodes
(e) Slowly pull the assembly out. Do not force assembly. If assembly does not pull out easy, please move assembly side to side in order to remove assembly easy.

6.4 Flame retention cup and holder can be removed by unscrewing the bottom screw on holder.

6.5 Reverse the 6.4 for replacing the cup and holder.

7. AIR ADJUSTMENT

7. AIR ADJUSTMENT FOR LOW AND HIGH FIRE:

7.a) Right knob is for low fire and left knob is for high fire.
7.b) Set burner on low fire only (MAKE SURE the left indicator is on "Zero"). Adjust the right knob (by loosening the cap screw that holds the knob) until you get clean fire. (Please use instrument to measure smoke).
7.c) Tighten the cap screw.
7.d) Turn burner to high fire.
7.e) Adjust the high fire by moving the "ROD" that holds the shutter until you get "ZERO" smoke.
7.f) NOTE: When the burner goes to high fire, it will lock the air for low fire. Therefore, when on high fire, the air shutter for low fire should not move.
7.g) When the burner is OFF, both air shutters should be closed. (Check under air intake box). Ref: Fig. 5.

7.1 Air adjustment for on-off burner.

7.2 Set the air as in Fig. 6 for zero or trace smoke by adjusting the knob and then lock it. (Ref. 13.7)

8. CHIMNEY

8.1 Follow the recommendations of the heating appliance manufacturer.

8.2 The chimney should extend above the roof line and above or away from surrounding objects. It should be tile-lined, with no obstructions and be in a good state of repair, with no leaks.

8.3 The smoke pipe should be inserted flush with the inside of the chimney tile, and sealed in place.

8.4 All cleanout doors should be sealed.

9. DRAFT REGULATORS

9.1 The use of a draft regulator is recommended and should preferably be mounted in the smoke pipe.

9.2 Use a draft gauge to adjust to the proper opening. See "draft" 14.1.

9.3 The above may not apply to pressurized fire box boilers: Follow instructions furnished with boilers.

10. AIR FOR COMBUSTION

10.1 A separate fresh air inlet to the boiler room is required for proper combustion.

10.2 An opening of one square inch per 1,000 BTUH input is recommended.

10.3 If the opening is screened, the area should be increased by as much as 50%.

10.4 The boiler room must be closed off from any area where supply or exhaust fans are installed.

11 COMBUSTION CHAMBERS

THIS DOES NOT APPLY TO PACKAGED UNITS WHERE THE CHAMBER IS SUPPLIED

11.1 Refer to the chart for the correct chamber dimensions. Chambers may vary slightly but should maintain the floor area shown in Table 1.

TABLE 1
MINIMUM COMBUSTION AREA

G.P.H.	Length	Width	Height	Boiler Crown Sheet To Center of Nozzle	FLOOR AREA SQ. IN.	Steam Sq. Ft.	Water Sq. Ft.	Air BTU X 1000
4.00	21	16	16	8	336	1600	2560	448
4.50	24	16	16	8	384	1800	2880	504
5.00	25	17	17	8½	425	2000	3200	560
5.50	27	17	17	8½	459	2200	3520	616
6.00	27	18	18	9	486	2400	3840	672
6.50	27	19	19	9½	513	2600	4160	728
7.00	29	19	19	9½	651	2800	4480	784
8.00	32	20	20	10	640	3200	5120	896
9.00	34	21	21	10½	714	3600	5760	1008
10.00	34	24	24	12	816	4000	6400	1120
12.00	35	26	26	13	910	4800	7680	1344
14.00	40	26	26	13	1040	5600	8960	1568
16.00	43	28	28	14	1204	6400	10240	1792
18.00	48	28	28	14	1344	7200	11520	2016
20.00	47	30	30	15	1410	8000	12800	2240

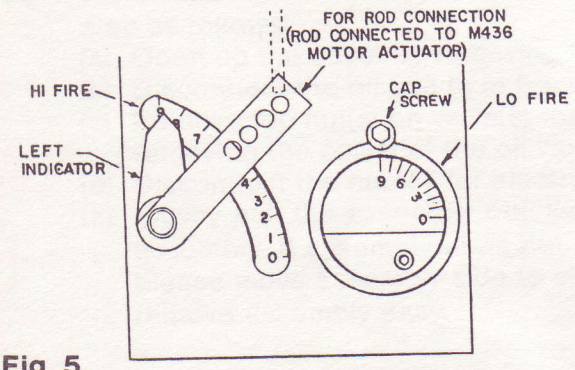


Fig. 5 OE-3 Hi-Lo

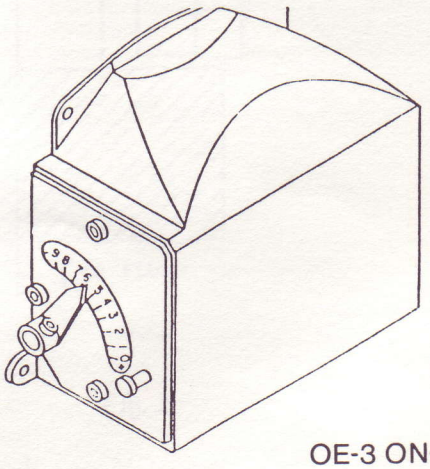
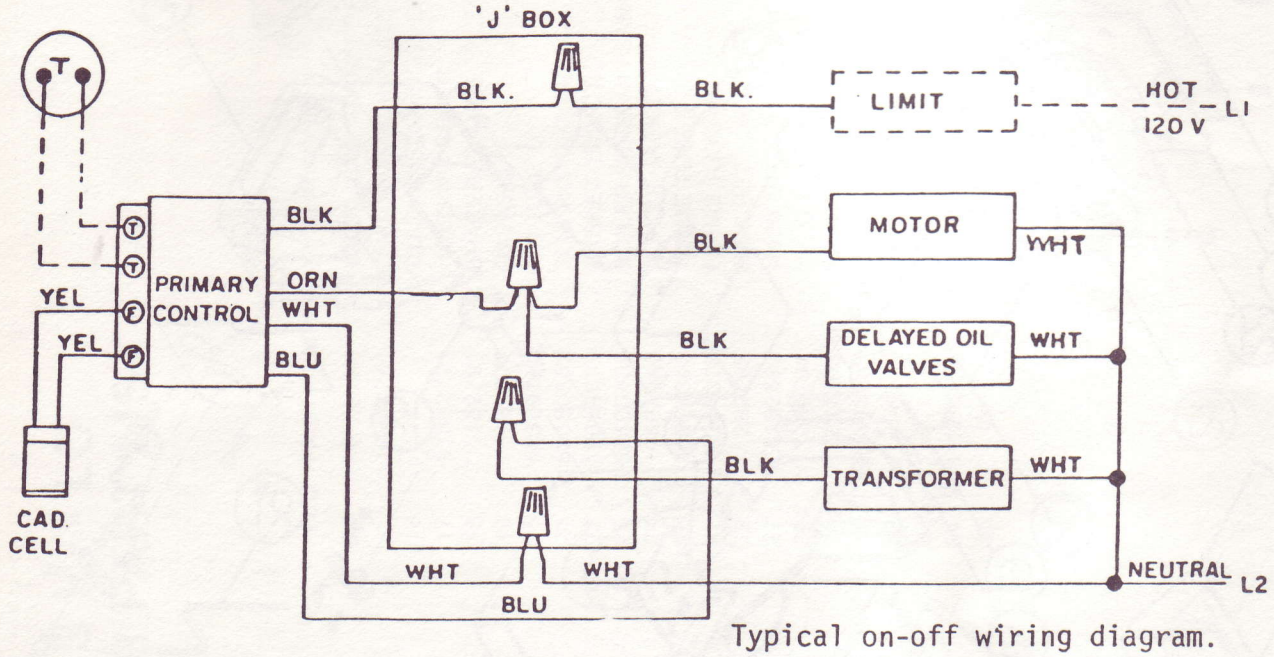


Fig. 6 OE-3 ON-OFF

WIRING

12.1 All wiring must comply with the National Electric Code and local ordinances.

12.2 Refer to the diagram supplied with the burner or controls. A typical on-off wiring schematic is enclosed for intermittent ignition on-off burner. See Fig. 7.



Typical on-off wiring diagram.

Fig. 7

NOTE:

1. Set room thermostat for 0.38 AMP. (24 volts)
2. Place jumper on T-T terminals if room thermostat is not used.
3. Factory wiring _____ Field wiring ----------

12.3 Use a 105°C thermoplastic wire — Do not use less than #14 AWG wire.

12.3 Do not fasten conduit or BX cable to hot surfaces.

13. STARTING THE BURNER

13.1 Be sure the boiler, if used, is filled with water. Be sure the oil tank is filled, all valves open and controls set to allow burner operation. Be sure the nozzle assembly is correctly positioned for the input (nozzle size) used (Ref. Table 2).

13.2 Open the burner air adjustment partially, (Ref. Fig 5 and 6) open the fire or inspection door and turn on the service switch. Adjust draft regulator for maximum chimney draft.

13.3 Prime the fuel pump according to the manufacturer's recommendations and check the pump pressure. Set pump pressure at 180 psi. (Recommended pressures are 160 through 180 psi.) See Table 2.

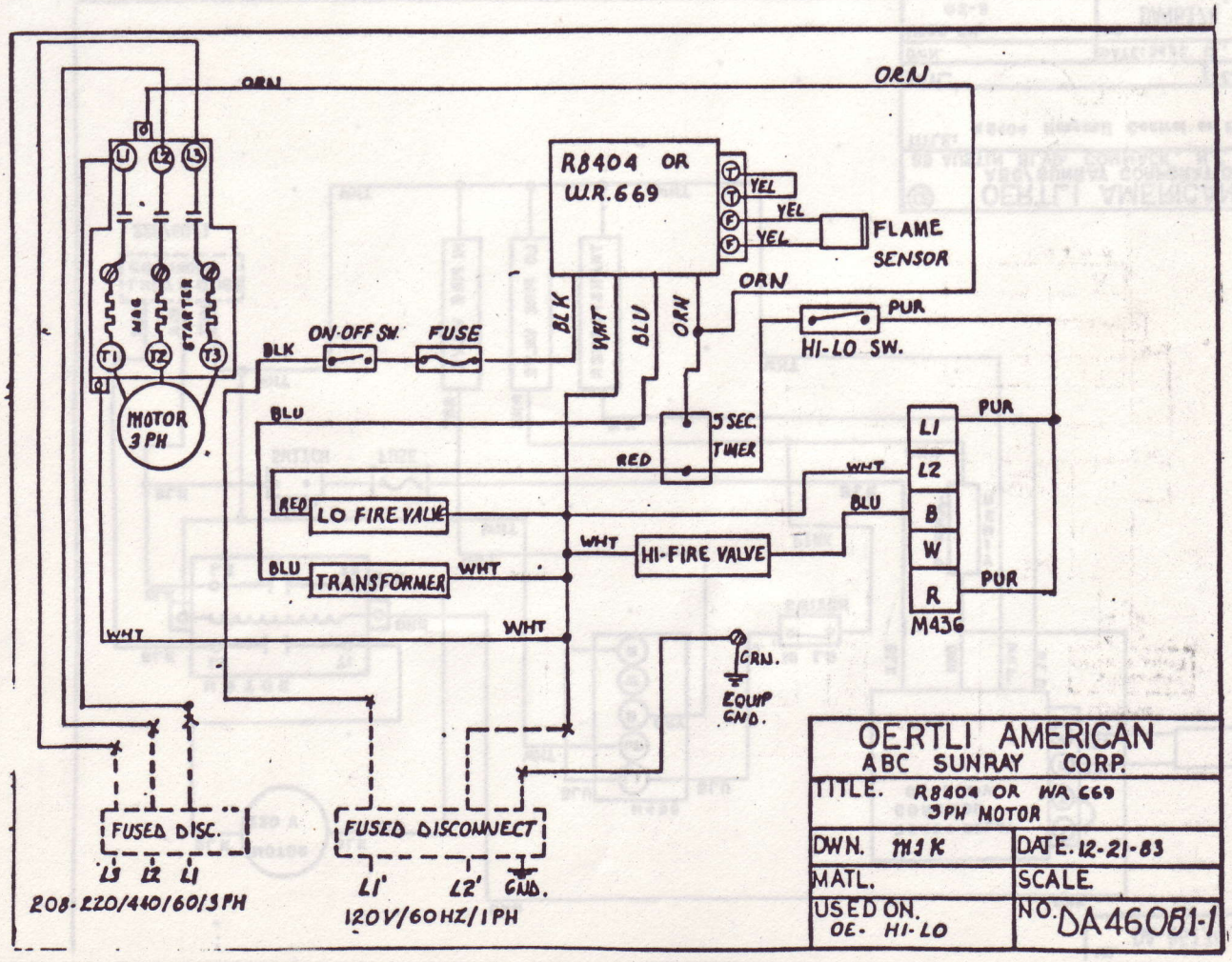
L O H I

OE-3

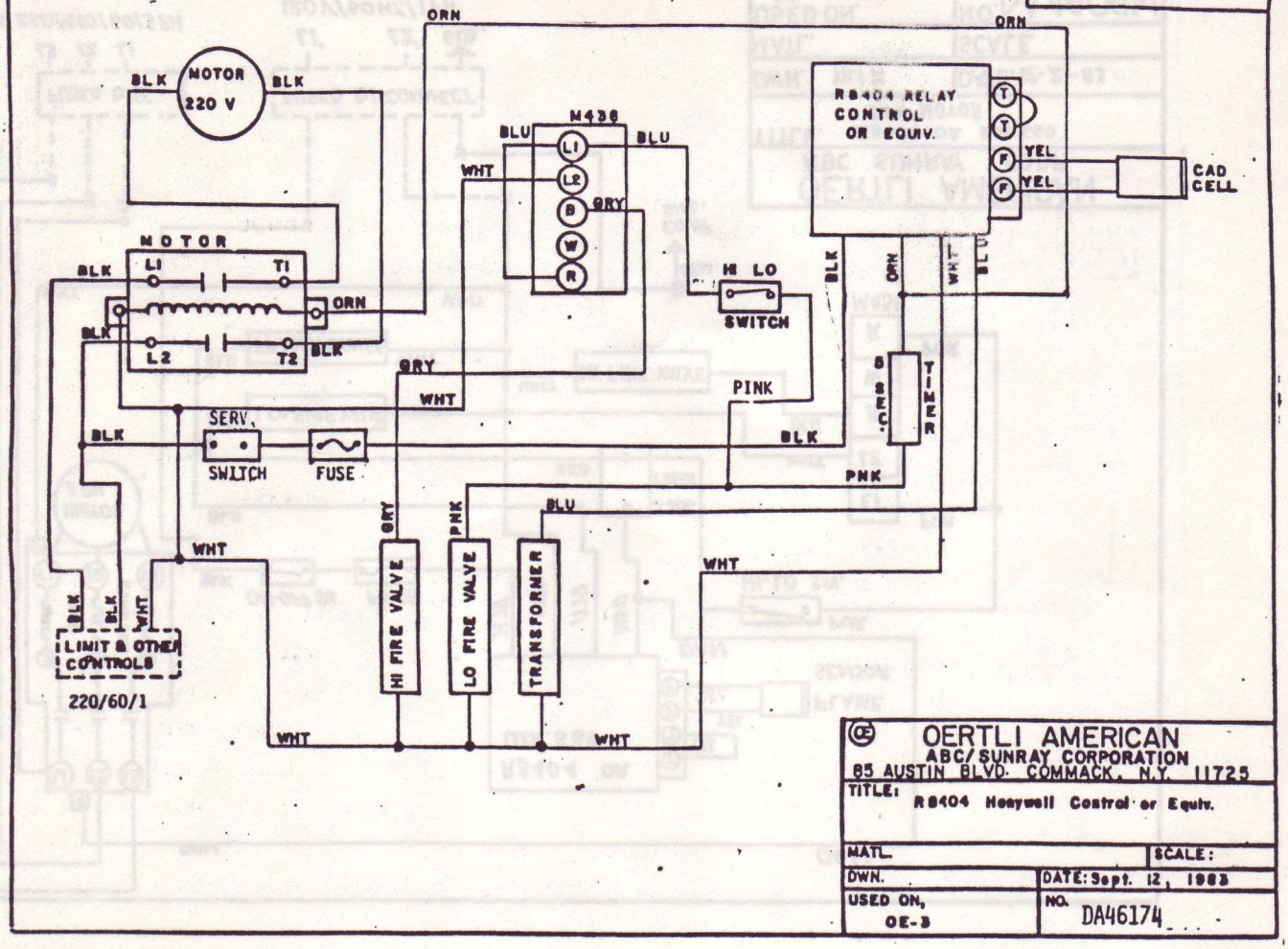
SEQUENCE OF OPERATION

WITH W.R.669 OR R 8404

THROUGH THE LIMIT WHEN CONTROL IS POWERED, THE BURNER MOTOR STARTS: DUE TO POWERED DRAFT NOW THE AIR SHUTTER OPENS UP WHICH CAN BE ADJUSTED TO DESIRED OPENING. <FIG.5 REF.7 A TO C> WITH 5 SECOND DELAY TIMER FIRST STAGE OIL VALVE OPENS AND LOW FIRE IS ESTABLISHED. AFTER THIS DELAY SIMULTANEOUSLY DAMPER MOTOR IS POWERED THROUGH HILO SWITCH WHICH IN TURN OPENS SECOND STAGE AIR SHUTTER. <REF.7 D TO G> THE LINKAGE ROD IS USED TO PROPER DESIRED OPENING. AT DESIRED OPENING OF THE AIR SHUTTER SECOND STAGE OIL VALVE CAN BE POWERED WHICH IN TURN ESTABLISHES SECOND STAGE FLAME. <HI-FIRE>.



NO. DA 46174.

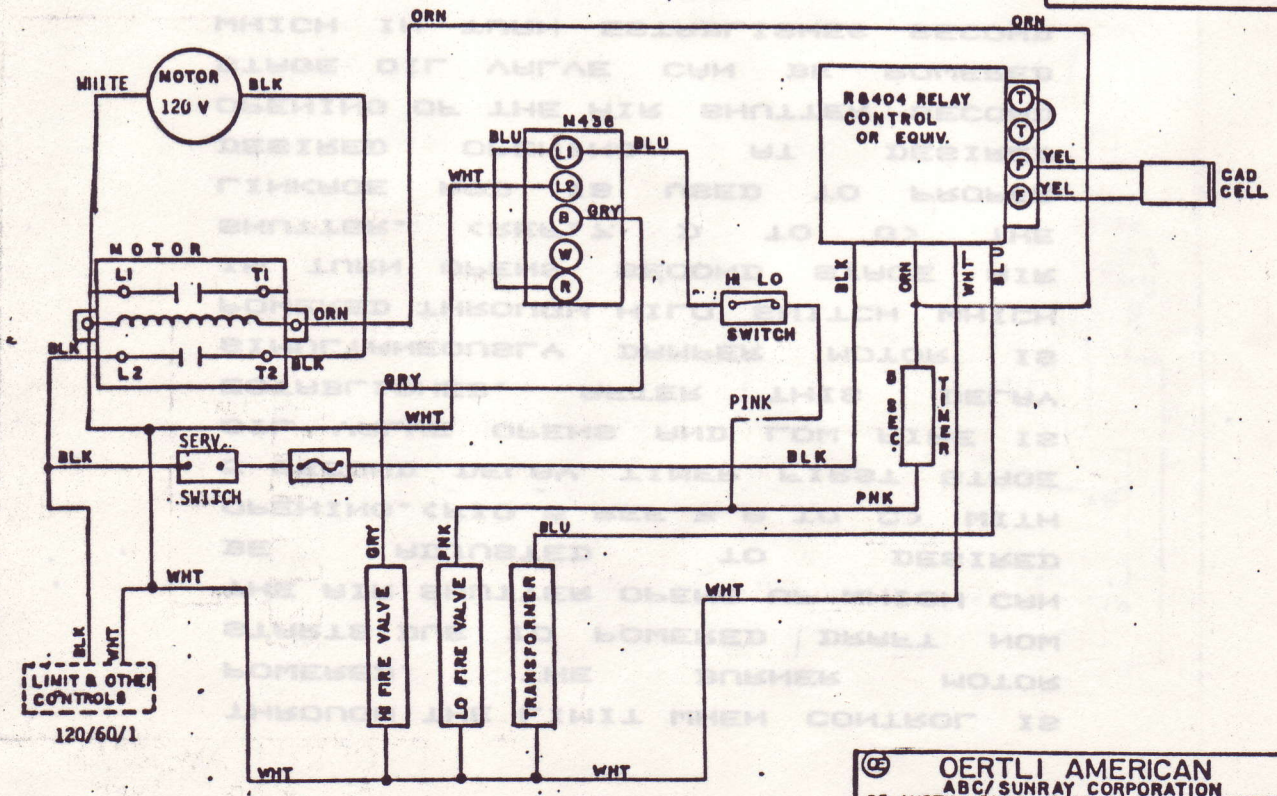


OERTLI AMERICAN
ABC/SUNRAY CORPORATION
85 AUSTIN BLVD. COMMACK, N.Y. 11725

TITLE: R8404 Honeywell Control or Equiv.

MATL.	SCALE:
DWN.	DATE: Sept. 12, 1983
USED ON, OE-3	NO. DA46174

NO. DA46174-1



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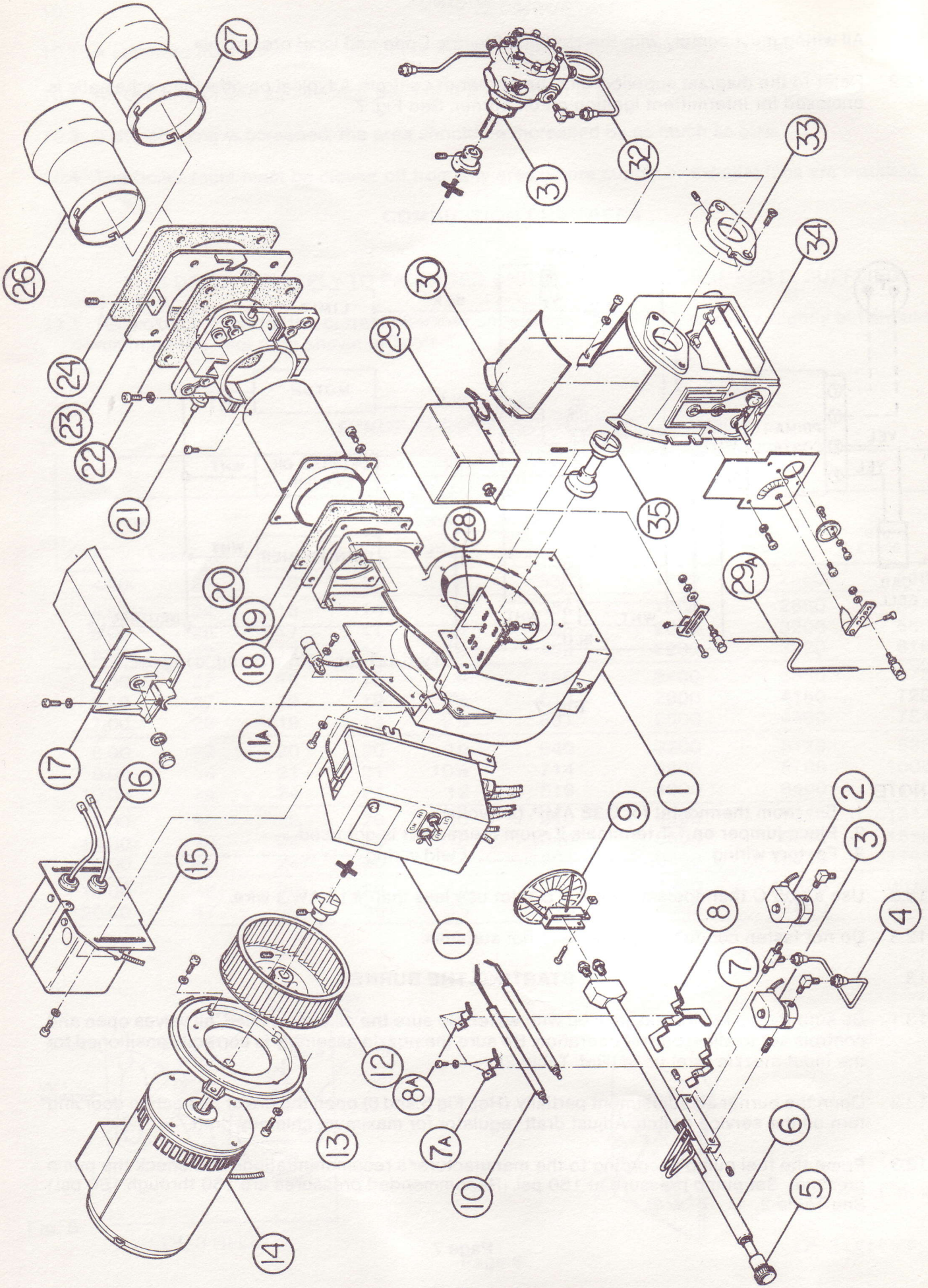
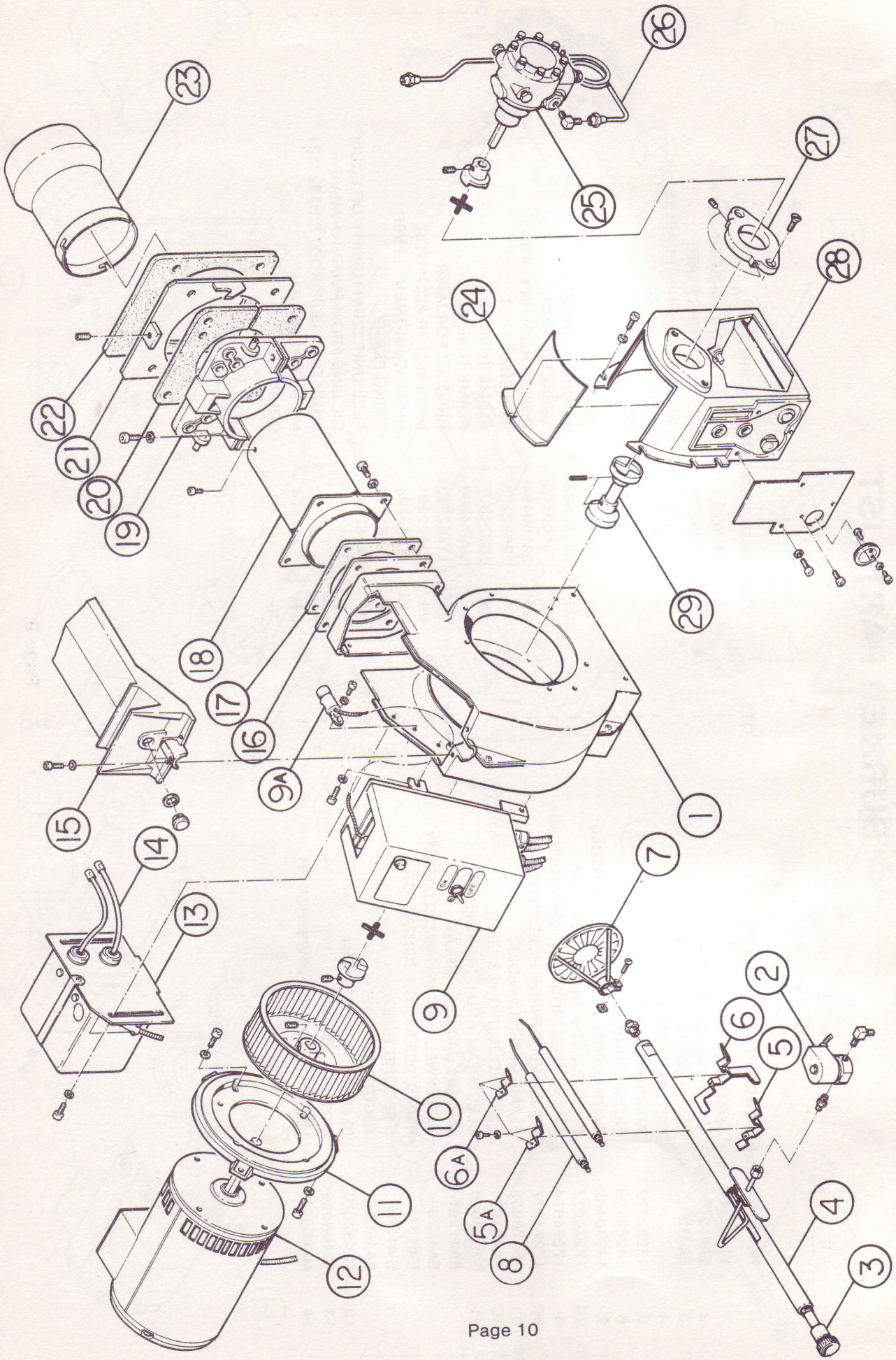

Hi-Lo

OE - 3 HI - LO
BURNER PART LIST

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	11182768	OE-3 HOUSING	!
2	EA41222	OIL VALVE (LO FIRE VALVE)	!
3	EA41222	OIL VALVE (HI FIRE VALVE)	1
4		OIL LINE ASSY. (HI-LO)	1
5	16282772	ADJUSTING KNOW	1
6	14282799	NOZZLE ROD ASSY. (HI-LO)	1
7	17270132	BACK ELECTRODE HOLDER (BOTTOM)	1
7A	17274577	BACK ELECTRODE HOLDER (TOP)	1
8	17274574	FRONT ELECTRODE HOLDER (BOTTOM)	1
8A	17274577	FRONT ELECTRODE HOLDER (TOP)	1
9	16178855	FLAME RETENTION DISC	1
10	EA46167	ELECTRODE (RIGHT & LEFT)	2
11	17583020	ELECTRICAL AND COMPONENT BOX	1
	EA41291-1	W.R. 669 CAD CELL RELAY	1 OR
	EA4128-1	HONEYWELL R8404 CAD CELL RELAY	1
	E 41311	R424B1005 MOTOR CONTACTOR	1
	E 41364	5 SECOND TIMER	1
	EA46086	TOGGLE SWITCHS	2
12	12482810	BLOWER WHEEL 180MM	1
13	12183026	MOTOR FLANGE	1
14	MA46831	MOTOR: 1H.P. 115/220V/60HZ/1PH	1

ITEM	PART NUMBER	DESCRIPTION	QTY.
15	MA10054	12000 VOLT TRANSFORMER	1
	17382781	TRANSFORMER PLATE	1
16		QUICK DISCONNECT CABLES	2
17	11382795	HOUSING COVER	1
18	11182797	SPACER FLANGE	1
19	19669677	GASKET	1
20	16369680	AIR TUBE	1
21	53180582	SLIDING FLANGE	!
22	19669678	GASKET (BISECT)	1
23	53180494	BOILER HOOK IN FLANGE	1
24	19682455	BOILER GASKET	1
26	16374307	FLAME TUBE #2	1 OR
27	16374306	FLAME TUBE #1	1
28	11282793	BRACKET FOR M436	1
29	EA10259	M436 MOTOR ACTUATOR	1
29A	11282794	HI-LO ADJUSTMENT LEVER	1
30	11281793	FIXING PLATE	1
31	PA46764	FUEL UNIT 22R411C-5A14 OR EQUIV.	1
32		OIL LINE FROM PUMP TO VALVE 1	1
33		PUMP FLANGE (IF RQD.) P/N1327521	1
34	11282774	AIR BOX HOUSING	1
35		COUPLING	1


On-Off

13.4 If a safety lockout occurs, reset after 1 to 2 minutes.

13.5 Do not run the fuel unit dry for more than 5 minutes.

TABLE 2

CALCULATED DELIVERY RATES OF NOZZLES AT VARIOUS PRESSURES

NOMINAL NOZZLE SIZE	100	125	150	175	200	225	250	275	300
2.00	2.24	2.45	2.63	2.87	3.00	3.16	3.30	3.46
2.50	2.78	3.05	3.30	3.53	3.75	3.96	4.12	4.32
3.00	3.34	3.65	3.94	4.23	4.50	4.73	4.95	5.18
3.50	3.90	4.26	4.60	4.95	5.25	5.51	5.78	6.01
4.00	4.46	4.88	5.27	5.64	6.00	6.32	6.61	6.92
4.50	5.02	5.48	5.92	6.32	6.75	7.10	7.42	7.78
5.00	5.58	6.10	6.60	7.06	7.50	7.92	8.28	8.65
5.50	6.15	6.72	7.25	7.80	8.25	8.70	9.11	9.50
6.00	6.68	7.30	7.88	8.46	9.00	9.46	9.90	10.36
7.00	7.80	8.52	9.20	9.90	10.50	11.02	11.56	12.02
8.00	8.92	9.76	10.54	11.28	12.00	12.64	13.22	13.84
9.00	10.04	10.96	11.84	12.64	13.50	14.20	14.84	15.56
10.00	11.16	12.20	13.20	14.12	15.00	15.84	16.56	17.30
11.00	12.30	13.44	14.50	15.60	16.50	17.40	18.22	19.00
12.00	13.36	14.60	15.76	16.92	18.00	18.92	19.80	20.72
13.00	14.53	15.98	17.20	18.40	19.54	20.60	21.50	22.50
14.00	15.60	17.04	18.40	19.80	21.00	22.04	23.12	24.04
15.00	16.78	18.38	19.82	21.30	22.50	23.60	24.80	25.90
16.00	17.84	19.52	21.08	22.56	24.00	25.28	26.44	27.68
17.00	19.00	20.70	22.50	24.05	25.50	26.90	28.00	29.30

13.6 Prime the pump with oil on long suction lines.

13.7 When the fire is established, make a temporary air adjustment to clear any smoke. Leave the fire door open until the combustion chamber is dry. Modern chambers contain organic binder which must be baked out before final burner adjustments can be made. Allow at least 15 minutes firing to "dry" the chamber. When normal temperatures are reached, close the inspection (fire) door, adjust the draft and the air shutter for a clean fire. Ref. 7 and 7.1 and 7.2. Extra fine tuning can be achieved by dialing the knob (See Fig. 8).

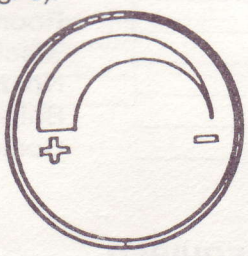


Fig. 8

ON-OFF
PARTS OTHER THAN HILO

ITEM	PART NUMBER	DESCRIPTION
4	142 82798	Nozzle Rod Assembly (On-Off)
7	161 82796	Flame Retention Disc
12	MA40451	Motor, ¾ HP, 115V/60HZ/1PH
28	112 82773	Air Box Housing

14. **DRAFT**

14.1 After the appliance and chamber are up to normal operating temperature, set the draft regulator to get — .02" W.C. over the fire. Use a draft gauge.

15. **FINAL CHECKOUT**

15.1 Use a smoke tester and set the burner air adjustment for not more than a #1 smoke (Bacharach scale).

15.2 Recheck the draft and take a CO_2 reading over the fire and in the breeching. The CO_2 reading should be between 11% and 13%.

15.2 If #1 smoke is measured, and CO_2 is less than 11%, while firing into a suitable firebox, check for air leaks into the firebox and flues. Seal all leaks found, using non-asbestos furnace cement, and recheck CO_2.

15.4 Open the fire door, turn off the oil valve and check out the safety timing of the combustion control.

15.5 Check the operation of the limit controls and the thermostat.

15.6 Check for oil leaks.
All installations should be reinspected after 1 to 2 weeks of normal operation.

OIL BURNER OPERATING INSTRUCTIONS

This Burner is listed by UNDERWRITERS' LABORATORIES INC., and other agencies for fuel oil not heavier than No. 2 commercial standard CS-12-48.

Date_____

DATA

Stack CO_2%_____
Air Shutter Setting _____
Stack Temp. F° _____
Net Stack Temp. F° _____
Overfire Draft In. W.C._____
Spray Angle ° _____
Chamber Size _____

Over fire CO_2% _____
Smoke Spot No. _____
Room Temp F° _____
Stack Draft In. W.C. _____
Nozzle Installed gal./hr._____
Boiler Mfg. _____
Combustion Efficiency _____

WHEN SERVICE OR REPAIRS ARE REQUIRED

Call_____

Day telephone_____Night telephone_____

Always give the following information;

Burner Model _____Serial No. _____

Date installed _____

CAUTION

DO NOT use gasoline, crankcase oil or any oil containing gasoline.

DO NOT incinerate garbage or refuse in this unit.

DO NOT tamper with burner or controls–CALL YOUR SERVICEMAN.

HANG NEAR BURNER