

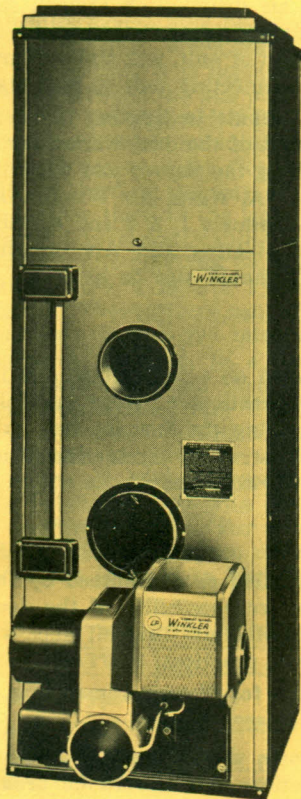
HANG THIS MANUAL IN THE VICINITY OF THE FURNACE

MANUAL INSTALLATION AND SERVICE

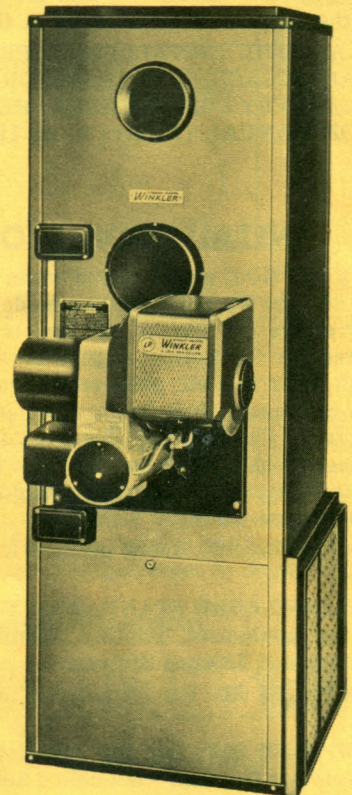


GO SERIES "C" *Oil-Fired* FURNACES

VERTICAL AND COUNTERFLOW



COUNTERFLOW



VERTICAL

Underwriters' Laboratories, Inc.
INSPECTED

STEWART-WARNER CORPORATION
HEATING AND AIR CONDITIONING DIVISION
LEBANON, INDIANA

IMPORTANT

SHIPMENT CONSISTS OF THE FOLLOWING:

- 1—Carton containing a completely assembled furnace, consisting of Heat Exchanger, Casing, Controls, Blower Motor, Furnace Wiring and Air Filter.
- 1—Carton containing one MA-85-C or MA-110-C Oil Burner with stainless steel combustion chamber and draft control

OR

- 1—Carton containing one LA-85-C or LA-110-C Oil Burner only with stainless steel combustion chamber and draft control packed in one additional carton.
- 1—Carton containing the Flue Connector.
- 1—Carton containing Primary Control, Thermostat and misc. parts.
- 1—Carton containing Humidifier (if ordered as optional equipment).
- 1—Carton containing Oil Filter (if ordered as optional equipment).

UNPACK SHIPMENT CAREFULLY AND INSPECT FOR DAMAGE. Any damage or shortage should be reported immediately to transportation company. Material in this shipment has been inspected at the factory.

For easy, fast installation and for best operating results follow the order of detailed steps in this manual.

TO AID THE INSTALLER IN PROPERLY IDENTIFYING PARTS, EACH PART IS PICTORIALLY SHOWN AND IDENTIFIED BY CODE NUMBER. REFER TO PARTS SECTION OF MANUAL (Figures 9, 10, 11, 12, 17, 22 and parts list).

INSTALLATION PROCEDURE

GO-V and GO-C model forced warm air furnaces, oil fired, use the Stewart-Warner—Winkler Models MA-85-C or MA-110-C High Pressure Oil Burner, or Models LA-85-C or LA-110-C Low Pressure Oil Burner. These burners are approved for use with No. 2 fuel oil, commercial grade CS-12.

The equipment shall be installed in accordance with the standards of the National Board of Fire Underwriters for the class, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

Existing National Board of Fire Underwriters Standards include:

BUILDING CODE STANDARDS: For Installation of Heat Producing Appliances, Heating, Ventilating, Air Conditioning, Blower and Exhaust Systems.

PAMPHLET 31: For Installation of Oil Burning Equipment.

PAMPHLET 90B: For the Installation of Air Conditioning, Warm Air Heating, Air Cooling and Ventilating Systems.

For correct heating load and air distribution systems, reference is made to the following manuals published by National Warm Air Heating and Air Conditioning Association, Cleveland 14, Ohio.

Manual No. 1—How to make a Comfort Survey—How to Make Floor Plans

Manual No. 2—How to Check Frame House Construction

Manual No. 3—Calculating Heat Losses

Manual No. 4—Warm Air Perimeter Heating

Manual No. 6—Continuous Air Circulation

Manual No. 7—Warm Air Winter Air Conditioning Systems

MAKING THE SURVEY AND PLANNING THE INSTALLATION

A survey must be made on every job before installation of the furnace. Read the manual through carefully and make notes on the following items while surveying the job so that you can plan your installation thoroughly.

1. Get a copy of any local heating codes covering furnace installation, piping, and wiring, which are based on regulations of the National Board of Fire Underwriters and National Electrical Code.

2. A floor plan of the house to be heated should be obtained or the house should be measured and a floor plan sketched to scale. Refer to National Warm Air Manuals listed above.

3. Decide on type of warm air distribution best suited for the installation, and whether any parts of the existing system can be used in the new installation.

4. Get all available data on kind and amount of fuel used in past seasons and whether all the rooms were heated adequately.

5. Check on electric wiring. Note location of fuse box, voltage, phase and cycle.

6. Check chimney for needed repairs or replacement.

7. Estimate heat loss of building.

8. Make a layout of the air distribution system, showing location and size of all supply and return registers, all supply and return wall stacks, location of unit, and size and arrangement of trunk duct system connecting unit to wall stacks.

Heat Loss and Heating Layout: In figuring the heat loss and in making a heating layout of the duct work refer to the section in this manual, "Making the Survey and Planning the Installation." Manuals 7 and 7A, Warm Air Winter Air Conditioning Systems, and also Manuals 1, 2, 3 and 6, published by the National Warm Air Heating and Air Conditioning Association, Cleveland, Ohio, should also be helpful.

LOCATE FURNACE

Furnace should be installed on a level floor, and located as close to the chimney as practicable. Read carefully the instructions for wiring, adjusting the furnace fan, chimney, flue pipe and final check. Refer to burner section of manual for installing and adjusting the oil burner.

DUCT WORK

The duct work is not supplied or guaranteed by the furnace manufacturer. It is the responsibility of the dealer to make certain, for his own protection, that all duct work is installed according to approved practices.

Refer to Specification Table for Plenum Dimensions.

AIR IS NEEDED FOR COMBUSTION.

Ventilation to furnace room should provide sufficient air to properly support combustion. Air should be brought to the furnace room from outdoors or from a ventilated attic or crawl space. A total free area of not less than one square inch for each 1000 B.T.U. per hour input (105 sq. in. is recommended).

GO-C

The Model GO-C Furnace and Burner unit constitute a complete furnace. See specification table and drawings in this manual for additional information on dimensions, etc.

INSTALLATION CLEARANCES (Approved by Underwriters Laboratories, Inc.): Model GO-C Furnace may be installed on combustible flooring ONLY if Counterflow Base Assembly 6C-181815 is used. It may be installed in closet, alcove or corner of utility room. See Chart 1 for clearances.

When unit is installed in closet two ventilating openings 9 x 18 shall be provided 6" from ceiling and 6" from floor. See drawing showing closet installation Fig. 1.

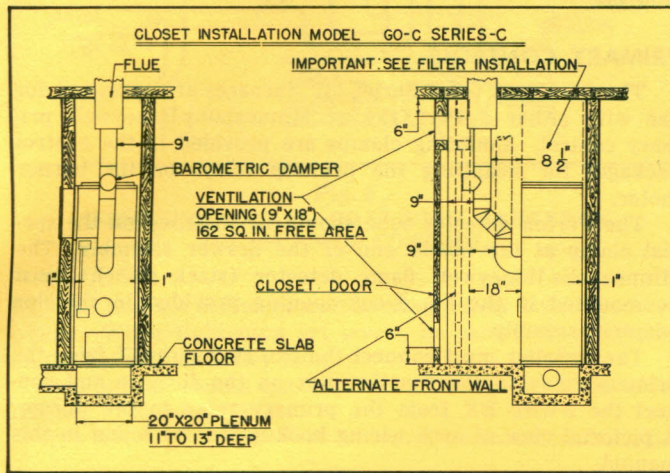


Fig. 1

FILTER INSTALLATION

The filter frame may be installed on either side, rear or top of fan housing. When the filter frame is installed on top of the fan housing it is necessary to maintain a clearance of 8½ inches between the flue pipe and filter frame, for removal of the filter. See Figure No. 1.

When the filter is mounted on top of the fan housing, the filter can be removed for cleaning or replacement by pulling the filter a third of the way out, bending it upward, pulling it out another third of the way, then bending it upward.

Where it is impracticable to maintain the 8½" dimension between the flue pipe and the filter frame, a set of three narrow filters (6½ x 22¼ x 1) can be furnished as optional equipment. These filters can be installed along the side of the flue pipe then moved into position.

Method of Heating: In a counterflow installation, warm air is forced downward through furnace into a warm air plenum underneath, from which it is distributed through ducts in or under the floor to floor registers at the outside walls. Return air is drawn off the ceiling, through one or more return air ducts of adequate capacity. This method of heating is usually used with concrete slab floors, having the ducts cast in the slab. For wood floors, the ducts can be installed in the crawl space under the floor.

Reference is made to Manual 4, Perimeter Heating, pub-

lished by the National Warm Air Heating and Air Conditioning Association, Cleveland, Ohio.

Slab Floor Installation: On a concrete slab floor the furnace should be centered over a 20" x 20" x 11" to 13" deep plenum opening cast in the floor. Warm air runs from the plenum to registers are also cast in the floor in accordance with the heating plan. See Fig. 1.

The floor surface around the opening shall be smooth and level. An air tight seal shall be provided between the floor opening and the furnace, by the use of a caulking compound or cement grout. The sealing material should be placed on the floor or base before the furnace is walked into position.

Combustible Flooring Installation: Counterflow Base Assembly number 6C-181815 shall be used when installing counterflow furnace on combustible flooring. A framed opening 22" x 22" shall be provided in the floor where the furnace is to be located. The floor should be smooth and level.

The plenum should be deep enough so that the top of the warm air take-offs will clear the bottom of floor joists by 1" within 6 ft. of the furnace. The Furnace Frame insures 1" clearance between bottom of furnace and the floor, and 1" clearance between the framed opening and the plenum on all four sides. See Fig. 2.

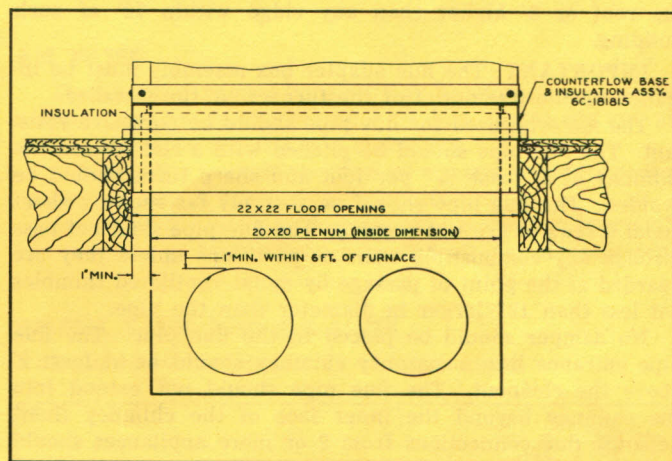


Fig. 2

GO-V

The Model GO-V Furnace and Burner Unit constitute a complete furnace. See specification table and drawings in this manual for additional information on dimensions, etc.

INSTALLATION CLEARANCES: Approved by Underwriters Laboratories, Inc. The Model GO-V furnace may be installed on combustible flooring, in a closet or alcove, or in a corner of a utility room with clearances as shown in Chart 1.

NOTICE: Service clearance will always take precedence over minimum clearances to combustible material.

INSTALLATION	CLEARANCES									
	Model—Type	Top	Side	Rear	Front	Side of Plenum	Warm Air Duct	Flue Vert.	Flue Horiz.	Ventilation Openings
GO-V Alcove		1	1	1	48	1	1" (Note 1)	9	9	
GO-V Closet		2	2	2	18	3	2" (Note 1)	10	18	2—13 x 26 (Note 2)
*GO-C Alcove		1	1	1	48	*6	*6" (Note 1)	9	9	
*GO-C Closet		1	1	1	18	*6	*6" (Note 1)	9	9	2—11 x 22 (Note 2)

Chart I

*The Model GO-C must not be installed on combustible flooring. Except when counterflow base 6C-181815 is used, the flooring may be combustible and the clearances from the sides of the plenum and warm air duct may be reduced to 1". See Chart 1 for other clearances.

Note 1: Clearances to any side of warm air duct shall be maintained within 6' of furnace.

Note 2: Two vent openings are required. One is located 6" from ceiling and the other 6" from floor.

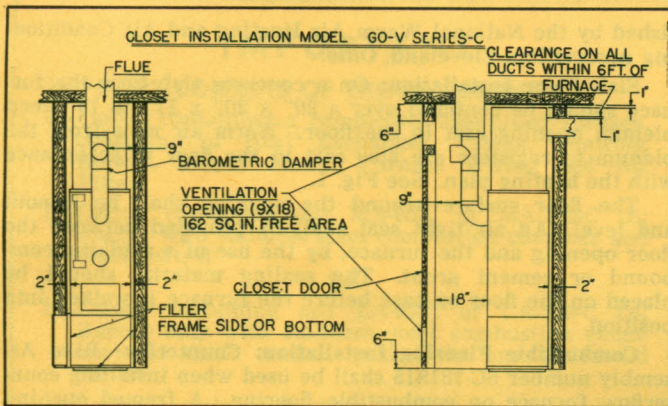


Fig. 3

CHIMNEY AND FLUE PIPE

The chimney should be clean and smoke tight and preferably lined. Type A, masonry or pre-fab chimneys are suitable for oil firing. Outside metal stacks are unsatisfactory. The chimney should be 8" x 8" or equivalent.

To avoid down drafts, the chimney must be 3' higher than the roof or 2' higher than any ridge within 10' of such building.

IMPORTANT: The flue adapter box assembly must be installed on the flue outlet of the furnace by the installer.

The material used for flue pipe should be corrosive resistant. The flue pipe should be pitched with a rise toward the chimney of at least 1/4" per foot and sharp turns should be avoided. The flue pipe should be securely fastened by sheet metal screws to prevent sagging. The flue pipe shall not pass through any combustible walls or partitions unless they are guarded at the point of passage by metal ventilated thimbles not less than 12" larger in diameter than the pipe.

No damper should be placed in the flue pipe. The flue pipe entrance into a masonry chimney should be at least 2' above the cleanout. The flue pipe should not extend into the chimney beyond the inner face of the chimney liner. Separate flue connections from 2 or more appliances should not enter the chimney at the same level.

Install barometric draft control in accordance with instructions supplied with control.

INSTALL BURNER IN FURNACE

The MA-85-C, and MA-110-C oil burners are shipped with combustion chamber mounted on the burner. (Refer to burner section of manual.) The combustion chambers are packaged separately for the LA-85-C and LA-110-C and must be field assembled to the burner.

ELECTRIC WIRING

All electrical wiring shall be done in accordance with the National Electric code and the code legally authorized in the locality where the installation is made.

The power supply should be connected directly from the meter, through a fused disconnect switch to the furnace, using not less than No. 14 wire. Connect power supply in the junction box located on the front panel assembly of furnace. Refer to wiring diagrams.

FAN AND LIMIT CONTROLS

The counterflow furnace is equipped with a secondary fan and limit control located on the blower housing.

The secondary fan switch will operate only when the burner first comes on, or when the burner shuts down. The heat rises from the heat exchanger, actuating the switch to

start the blower motor. This protects the blower motor and filter from the rising heat. The blower motor may cycle twice on the secondary fan control until the lower or main fan switch cuts in.

The secondary or upper limit switch will shut down the burner in case of a blower motor or fan belt failure.

The limit controls are wired in series and the fan controls are wired in parallel. Refer to wiring diagram Figures 4, 5, 6, and 7, and also refer to instructions furnished with controls.

PRIMARY CONTROLS

The GO-V and GO-C Series "C" furnaces are approved for use with either a PerfXray or Minneapolis-Honeywell primary control. Mounting clamps are provided in the control packages for installing the primary relays on the burner motor.

The Perfex detector tube should be installed on the special clamp at the nozzle end of the drawer assembly. The Minneapolis-Honeywell flame detector (stack switch) must be mounted in the knock-out opening provided in the flue adapter assembly.

The installer must connect the No. 14 2-wire BX from the primary relay to the junction box on the furnace and connect the 3-wire BX from the primary relay to the burner. A pictorial view of each wiring hookup will be found in this manual.

Refer to the control manufacturer's instructions for placing the primary controls "In Step".

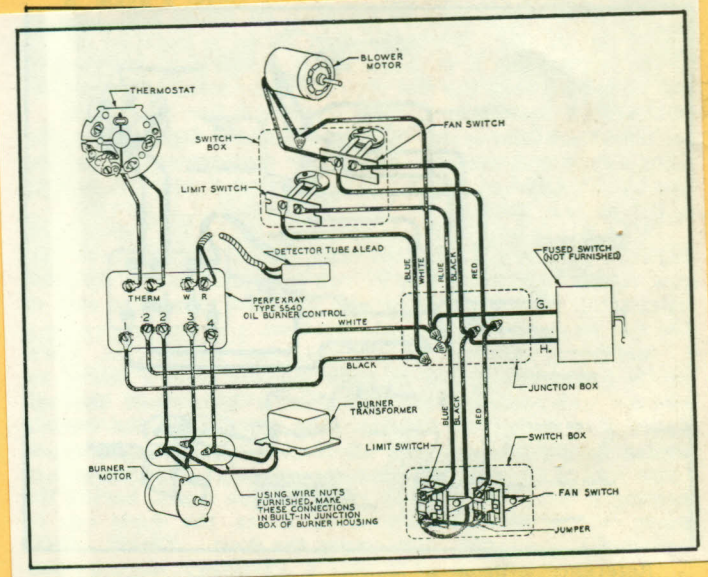


Fig. 4
WIRING DIAGRAM—GO-C WITH PERFXRAY
OIL BURNER CONTROL

INSTALL ROOM THERMOSTAT

Locate thermostat in accordance with instruction packaged with it.

ADJUST BLOWER (GO-C AND V)

With furnace in steady operation, the fan speed should be adjusted so that the warm air discharge is about 100°F. higher than the return air, which can be determined by thermometers in the return air and warm air ducts at a point unaffected by radiant heat. When the variable pitch pulley on the motor shaft is opened, the fan speed is reduced. To open variable pitch pulley, first remove fan belt then insert an Allen wrench into the outside set screw, turn

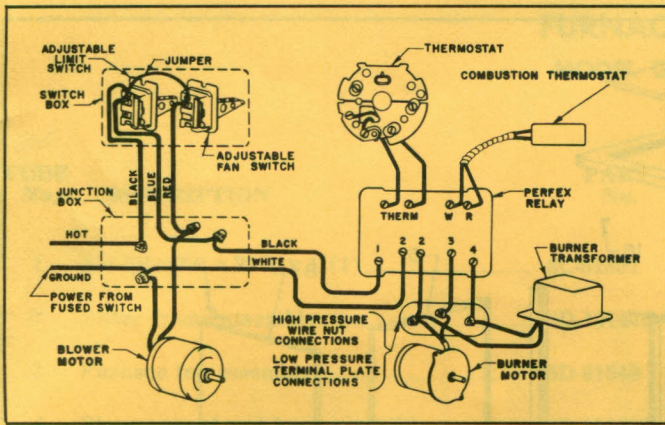


Fig. 5
WIRING DIAGRAM—GO-V WITH PERFXRAY
OIL BURNER CONTROL

CCW so that set screw clears threaded pulley hub, then turn pulley. When tightening set screw, be certain it is located on the flat side of pulley hub.

Set the fan switch cut-in point as low as practicable for comfort (110° to 130°F.).

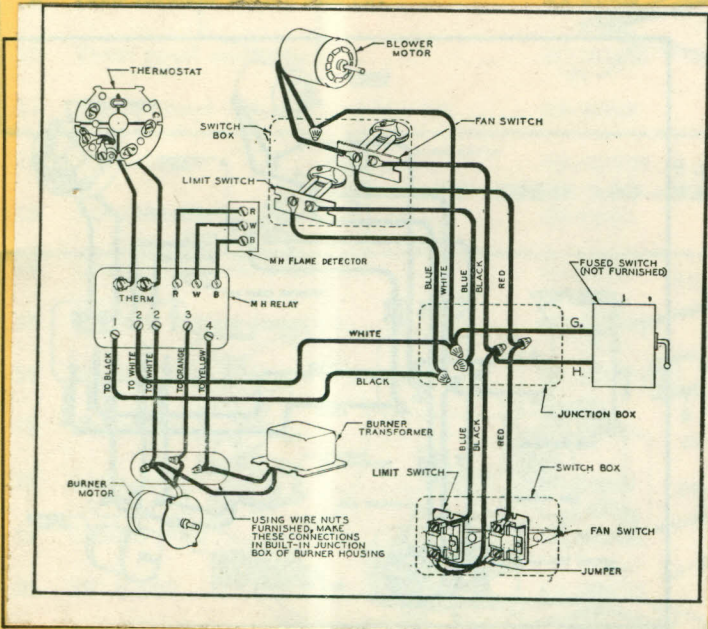


Fig. 6
WIRING DIAGRAM—GO-C WITH STACK MOUNTED
OIL BURNER CONTROL

BLOWER BELT SETTING EXTREMELY IMPORTANT

Proper belt tension and alignment will contribute to quieter blower operation and longer bearing and belt life.

Fig. 8 indicates the recommended tension, determined by grasping the belt as shown and when a normal pressure is applied, a deflection of approximately 1" in the belt will occur.

If the deflection is much in excess of that indicated, belt slippage may occur and excessive belt wear can result.

If the deflection is somewhat less than indicated, the belt is too tight and will greatly shorten the life of the bearing. Excessive tension will actually pull the shaft through the oil film in the bearing and allow metal to metal contact. In addition to greatly decreasing the bearing life, it will contribute to noisy blower operation.

Fig. 8 also indicates a recommended method for checking correct alignment. Excessive misalignment produces increased belt wear and can produce lateral motion of the wheel and shaft to the point that considerable noise can develop.

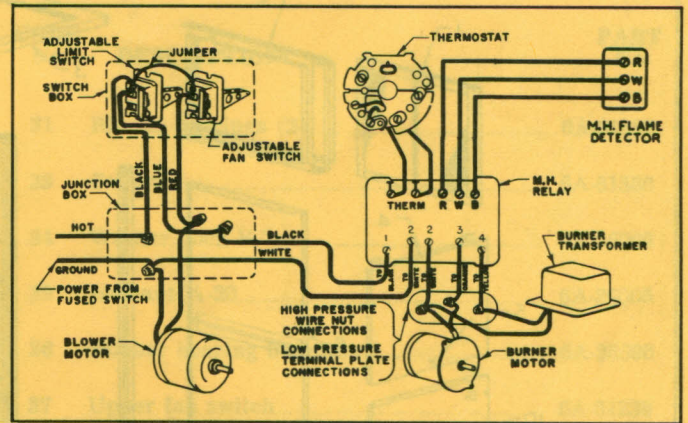


Fig. 7
WIRING DIAGRAM—GO-V WITH STACK MOUNTED
OIL BURNER CONTROL

AIR FILTER

The air filter in new housing may become clogged within a short time due to the presence of dust, in the air and air ducts, created by construction operations.

A dirty filter retards the flow of air and prevents proper heating as well as increasing fuel costs.

The 20 x 22 1/4 x 1 air filter should be checked frequently and replaced at least once a year and oftener if necessary.

INSTALL TANK AND OIL LINES

Refer to oil burner section of this manual.

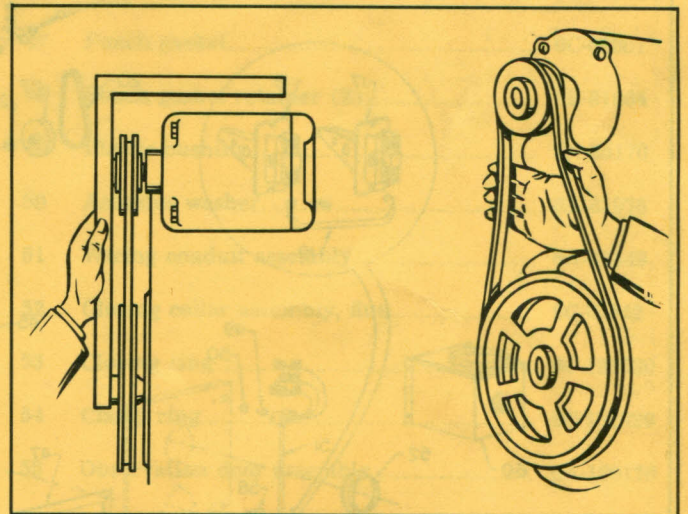


Fig. 8

LUBRICATION

Lubricate burner motor and blower motor before placing in operation and annually thereafter with SAE No. 20 oil. Light machine oil should never be used.

HANG instructions in a prominent location near furnace for future service reference.

(Continued on page 10)

SAE no. 20 oil

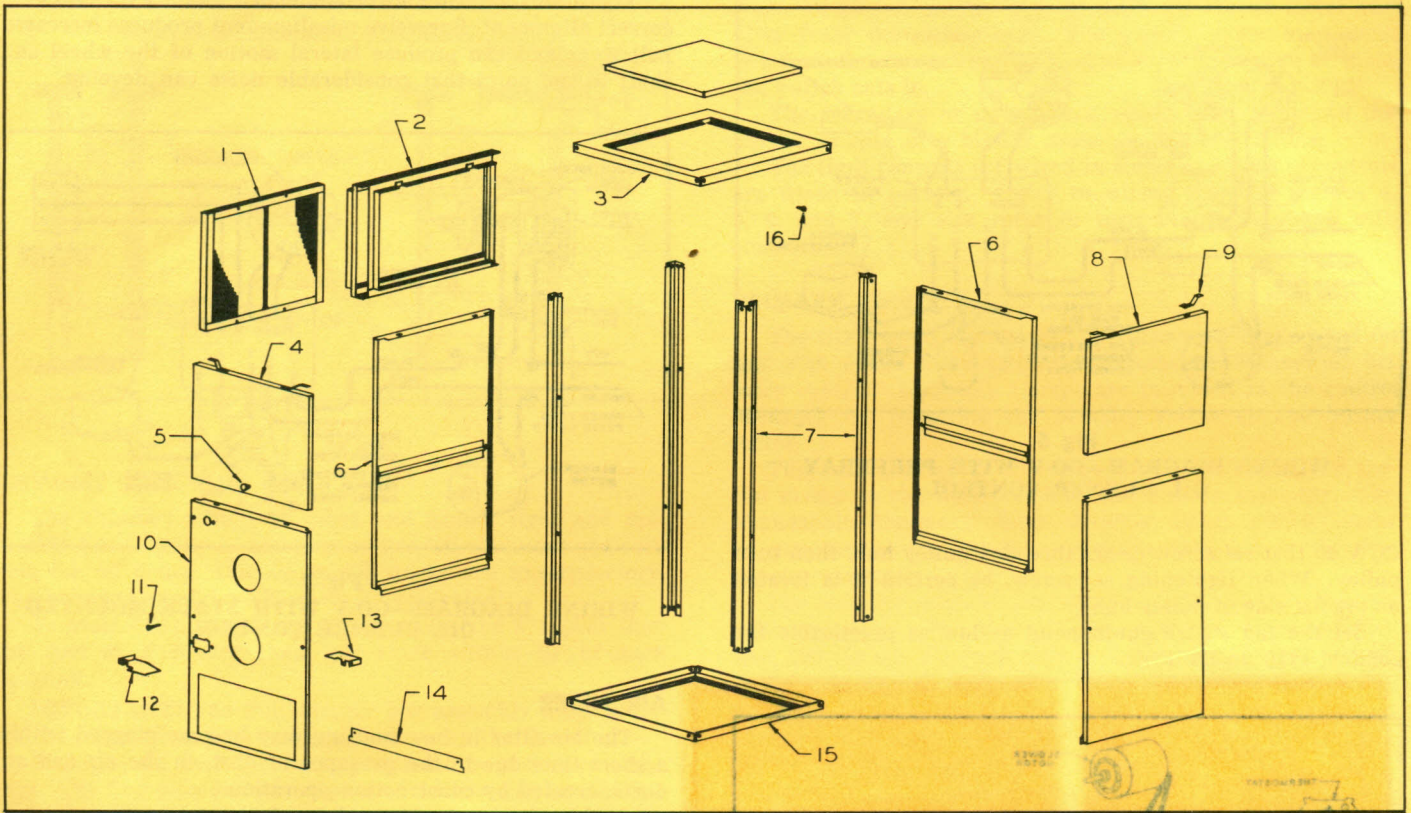


Fig. 9
EXPLODED PARTS VIEW—GO-C SERIES "C"

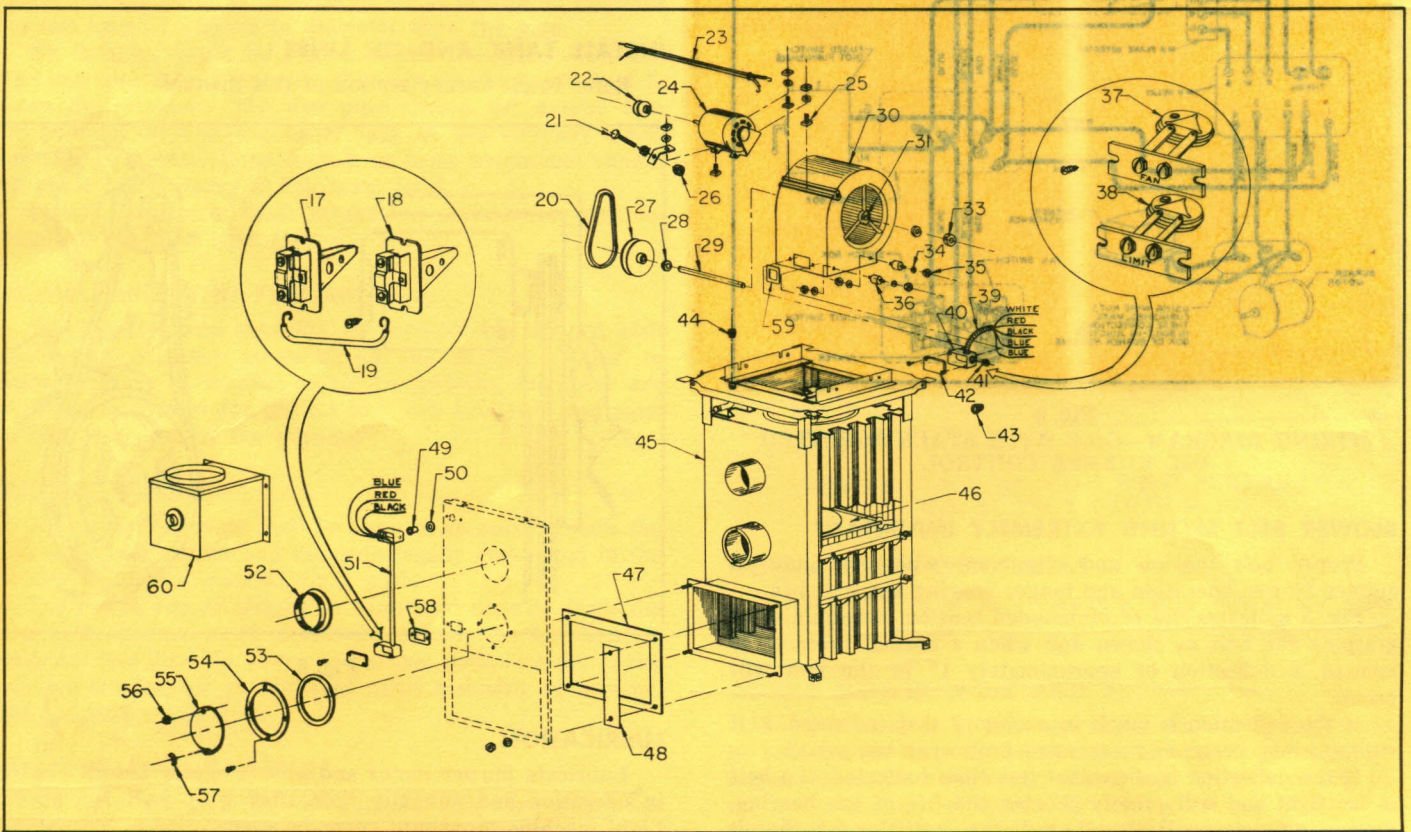


Fig. 10
EXPLODED PARTS VIEW—GO-C SERIES "C"

FURNACE PARTS LIST

MODEL GO-C SERIES "C"

CODE No.	DESCRIPTION	PART No.	CODE No.	DESCRIPTION	PART No.
1	Air filter 20 x 22¼ x 1 (1).....	6C-81851	31	Blower bearings (2).....	6A-81387
2	Filter frame assembly.....	6D-181475	33	Collar.....	6A-81386
3	Furnace top assembly.....	6D-81549	34	Washer, lock ¼".....	6A-26009
4	Blower panel and knob assembly.....	6D-181932	35	Hex nut ¼-20.....	6A-26005
5	Door knob and screw.....	6A-125023	36	Rubber bearing bumpers.....	6A-26690
6	Panel assemblies, side and rear (3).....	6D-181890	37	Upper fan switch.....	6A-81230
7	Corner rail (4).....	6D-81545-2	38	Upper limit switch.....	6A-81229
8	Blower panel assembly (3).....	6D-81801	39	Wiring assembly.....	6B-181015
9	Door retainer spring clip (8).....	6A-81798	40	Counterflow switch box.....	6B-81909
10	Front panel assembly.....	6C-181858	41	Strain relief bushing.....	6A-26720
11	Phillips head S.M. screw, #10 x 1¼.....	6A-26709	42	Junction box cover.....	6B-81908
12	Air deflector.....	6B-181339	43	Wire nut.....	6A-25596
13	Air deflector.....	6B-81991	44	BX connector.....	6A-25177
14	Counterflow base baffle.....	6C-81910	45	Heat exchanger assembly complete.....	6C-181824
15	Furnace bottom assembly.....	6D-81860	46	Heat exchanger baffle.....	6C-81971
16	Phillips head S.M. screw, #10 x ¾.....	6A-26717	47	Pouch gasket.....	6C-81861
17	Fan switch.....	6A-20930	48	Pouch gasket retainer (2).....	6B-81864
18	Limit switch.....	6A-20929	49	Plastic bushing.....	6A-25170
19	Jumper wire.....	6A-181491	50	Asbestos washer.....	6A-81976
20	38" V belt.....	6A-125185	51	Wiring conduit assembly.....	6A-81849
21	Belt adjustment screw.....	6A-26558	52	Closing collar assembly, flue.....	6C-81542
22	Motor pulley.....	6A-125120	53	Closing ring.....	6C-181030
23	Wire lead assembly.....	6A-180045-8	54	Clamp ring.....	6C-181029
24	Motor, 1/3 H.P.....	6C-22164	55	Observation door assembly.....	6A-180170
25	Square head mounting bolt.....	6A-26916	56	Lock nut.....	6A-26661
26	Adjustment support button.....	6A-180059	57	Wing nut.....	6A-26616
27	Blower pulley.....	6A-81988	58	Switch box gasket.....	6A-181010
28	Spacer (2).....	6A-81385	59	Gasket.....	6A-81250
29	Blower shaft.....	6A-180066	60	Flue adapter assembly.....	6C-181761
30	Blower kit A-10 complete— specify upflow or counterflow.....	6A-180055		Counterflow base.....	6C-181815

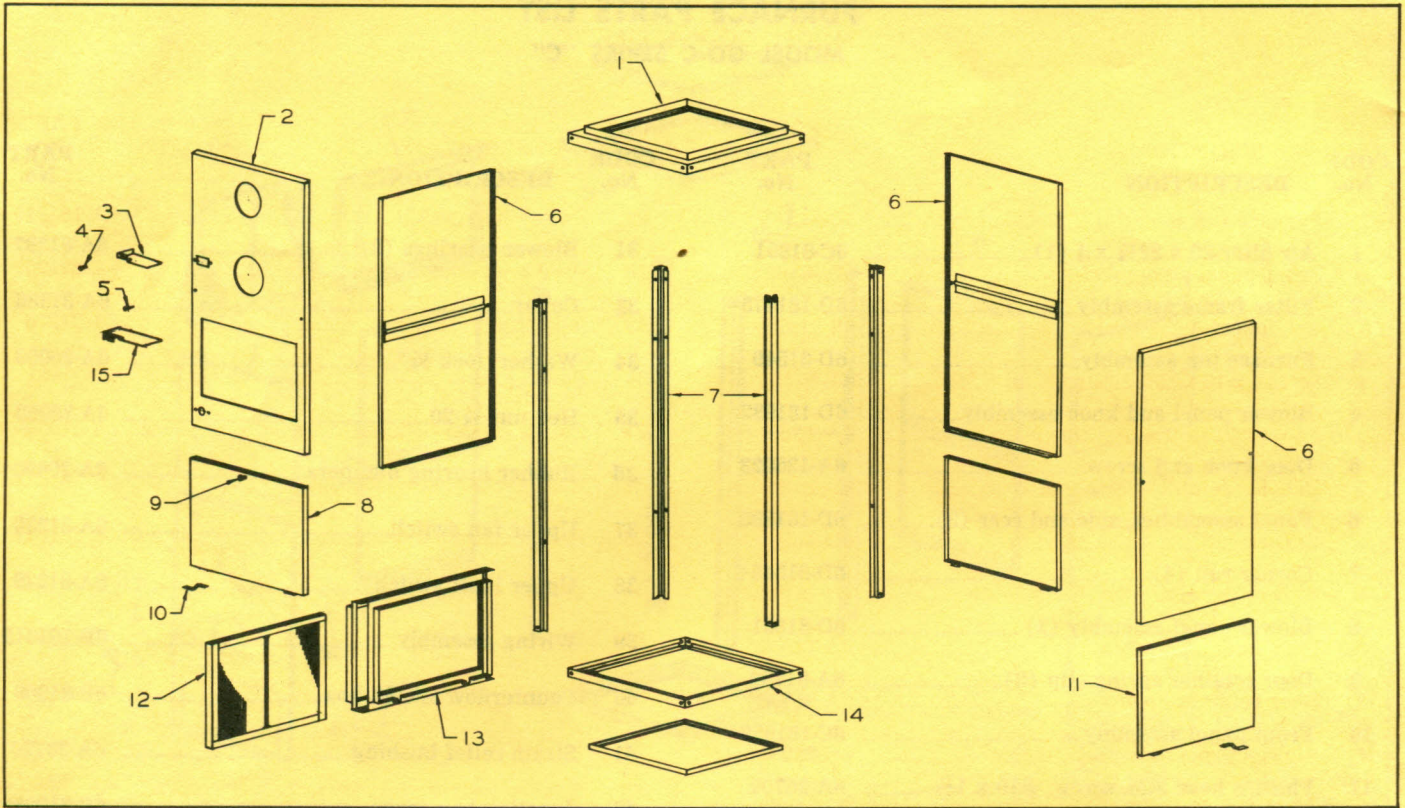


Fig. 11
EXPLODED PARTS VIEW—GO-V SERIES "C"

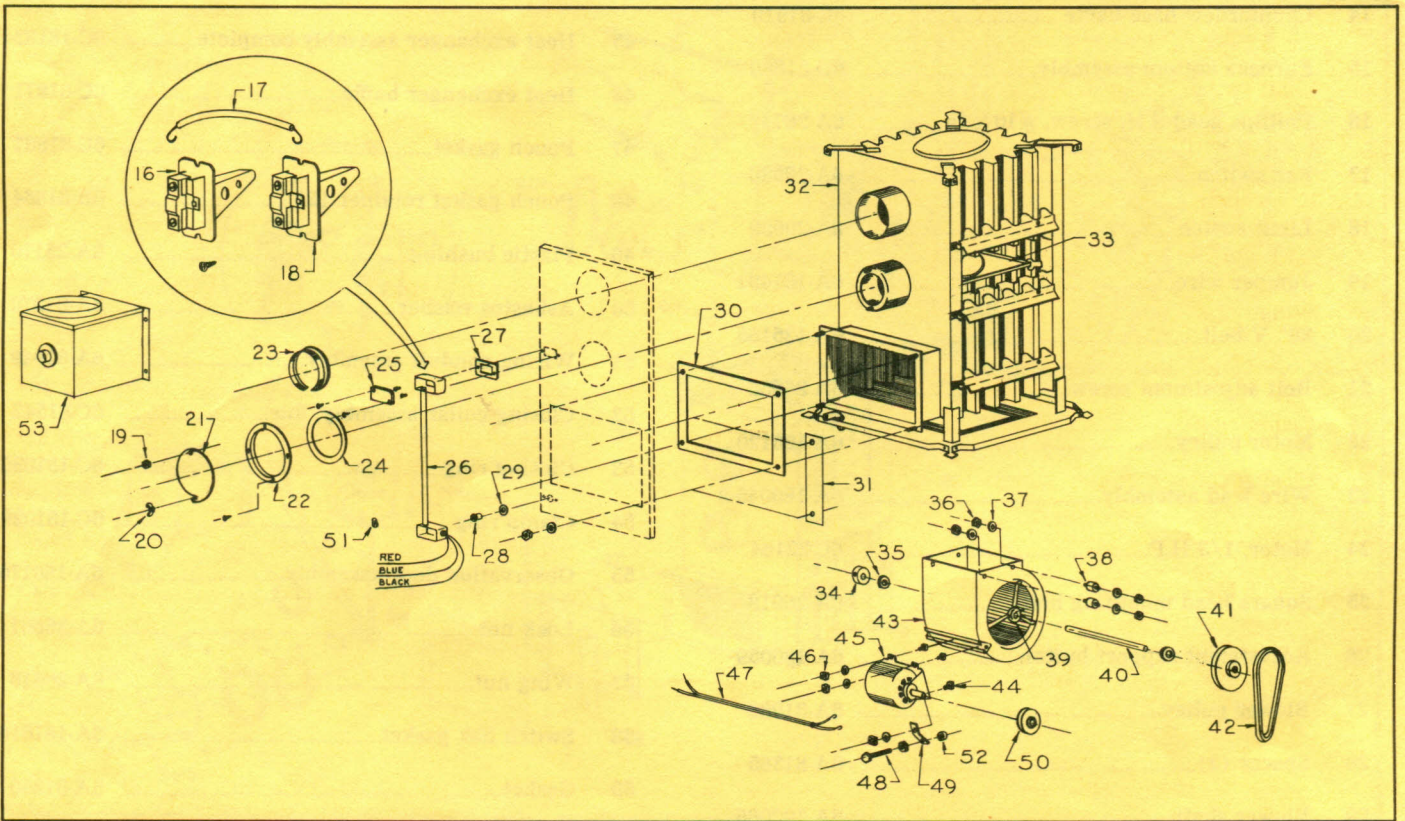


Fig. 12
EXPLODED PARTS VIEW—GO-V SERIES "C"

FURNACE PARTS LIST

MODEL GO-V SERIES "C"

CODE No.	DESCRIPTION	PART No.	CODE No.	DESCRIPTION	PART No.
1	Furnace top assembly.....	6D-81549	27	Switch box gasket.....	6A-181010
2	Front panel assembly.....	6C-181934	28	Plastic bushing.....	6A-25170
3	Air deflector.....	6B-81991	29	Asbestos washer.....	6A-81976
4	Screw, #10 x 3/8 Phillips head S.M.....	6A-26717	30	Pouch gasket.....	6C-81861
5	Screw, #10 x 1 1/4 Phillips head S.M.....	6A-26709	31	Pouch gasket retainer.....	6B-81864
6	Panel assemblies, side and rear.....	6D-181891	32	Heat exchanger assembly.....	6C-181823
7	Corner rail.....	6D-81545-2	33	Heat exchanger baffle.....	6C-181817
8	Blower panel and knob assembly.....	6D-181932	34	Collar.....	6A-81386
9	Door knob and screw.....	6A-125023	35	Spacer.....	6A-81385
10	Door retainer spring.....	6A-81798	36	Hex nut 1/4-20.....	6A-26005
11	Blower panel assembly.....	6D-81801	37	Lock washer.....	6A-26009
12	Air filter, 20 x 22 1/4 x 1.....	6C-81854	38	Rubber bearing bumpers.....	6A-26690
13	Filter frame assembly.....	6D-181475	39	Blower bearings (2).....	6A-81387
14	Furnace bottom assembly.....	6D-181474	40	Shaft.....	6A-180066
15	Air baffle.....	6B-81201	41	Blower pulley.....	6A-81988
16	Limit switch.....	6A-20929	42	37" V belt.....	6A-81989
17	Jumper wire.....	6A-181491	43	Blower kit, A-10 complete— specify upflow or counterflow.....	6A-180055
18	Fan switch.....	6B-20930	44	Square head mounting bolts 5/16-18 x 3/4..	6A-26916
19	Lock nut.....	6A-26661	45	Motor 1/3 H.P.....	6C-22164
20	Wing nut.....	6A-26616	46	Nut, square 5/16-18.....	6A-26175
21	Observation door assembly.....	6A-180170	47	Wiring assembly.....	6A-180045-8
22	Clamp ring.....	6C-181029	48	Belt adjustment screw.....	6A-26558
23	Closing collar assembly, flue.....	6C-81542	49	Tail piece strap.....	6A-180060
24	Closing ring.....	6C-181030	50	Motor pulley.....	6A-125180
25	Switch box cover.....	6B-81908	51	Wire nut.....	6A-25596
26	Wiring conduit assembly.....	6B-81849	52	Adjustment support button.....	6A-180059
			53	Flue adapter assembly.....	6C-181761

SPECIFICATIONS FOR THE GO-C AND GO-V SERIES "C" FURNACES

(GO-C COUNTERFLOW — GO-V VERTICAL)

DESCRIPTION OF FURNACE

Flue Outlet Diameter (from flue adapter assembly).....	6"
Warm Air Plenum.....	20" x 20"
Return Air Opening (Filter Frame Inlet).....	18" x 22"
Filter Size.....	20" x 22 1/4" x 1"
Belt Driven Blower, Size.....	10 5/8" x 10 5/8" (A-10)
Blower Wheel Pulley.....	5" diameter, 3/4" bore
Motor Pulley.....	3 1/4" VS. x 5/8" bore
Blower Motor.....	1/3 H.P.
V-Belt GO-C.....	38"
V-Belt GO-V.....	37"
Limit Control.....	Adjustable
Fan Control.....	Adjustable
Approximate Shipping Weight (Less Burner).....	290 lbs.
C.F.M. @ .2" W.C. Ext. S.P.***.....	1220
Max. Air Conditioning H.P.....	3
Burner Protrudes in front of Furnace.....	12"
Evaporator Casing (optional—Less Coil).....	C-UD-1-A

Complete Model No.	Type of Burner	Fuel Input G.P.H.	BTU Output at Bonnet	Furnace Dimensions L x W x H
GO-C, MA-85-C	High Pressure	.75	85,000	22 x 22 x 65*
GO-C, LA-85-C	Low Pressure	.75	85,000	22 x 22 x 65*
GO-C, MA-110-C	High Pressure	1.00	110,000	22 x 22 x 65*
GO-C, LA-110-C	Low Pressure	1.00	110,000	22 x 22 x 65*
GO-V, MA-85-C	High Pressure	.75	85,000	22 x 22 x 65
GO-V, LA-85-C	Low Pressure	.75	85,000	22 x 22 x 65
GO-V, MA-110-C	High Pressure	1.00	110,000	22 x 22 x 65
GO-V, LA-110-C	Low Pressure	1.00	110,000	22 x 22 x 65

*6C-181815 Counterflow Base shall be used when installing GO-C on combustible floor. This base adds 2" to overall height of furnace.

***The air volume ratings are taken externally of the largest evaporator coil approved for the furnace.

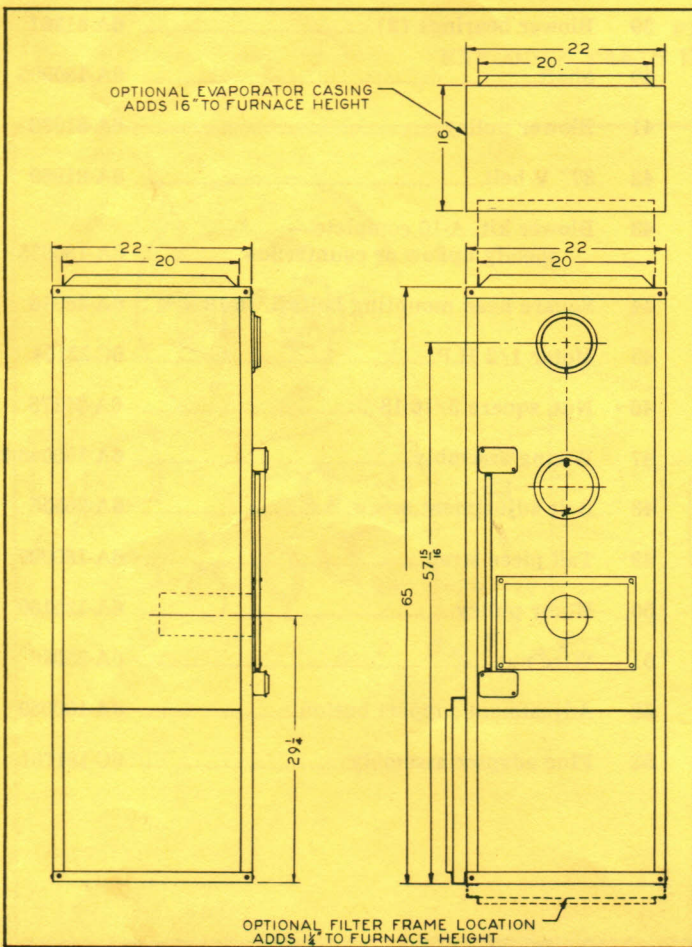


Fig. 13
GO-V

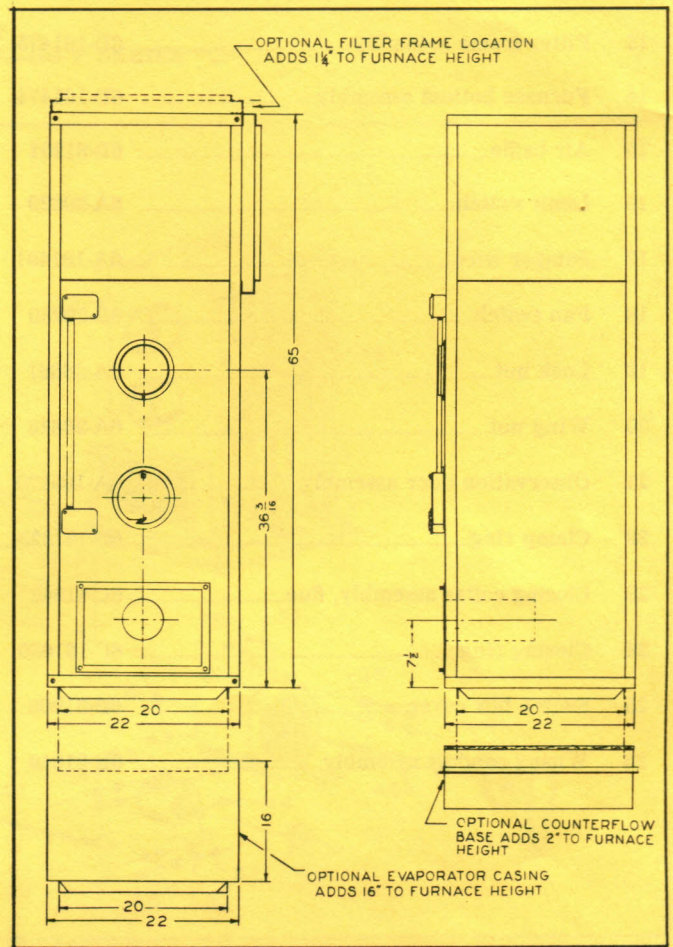


Fig. 14
GO-C

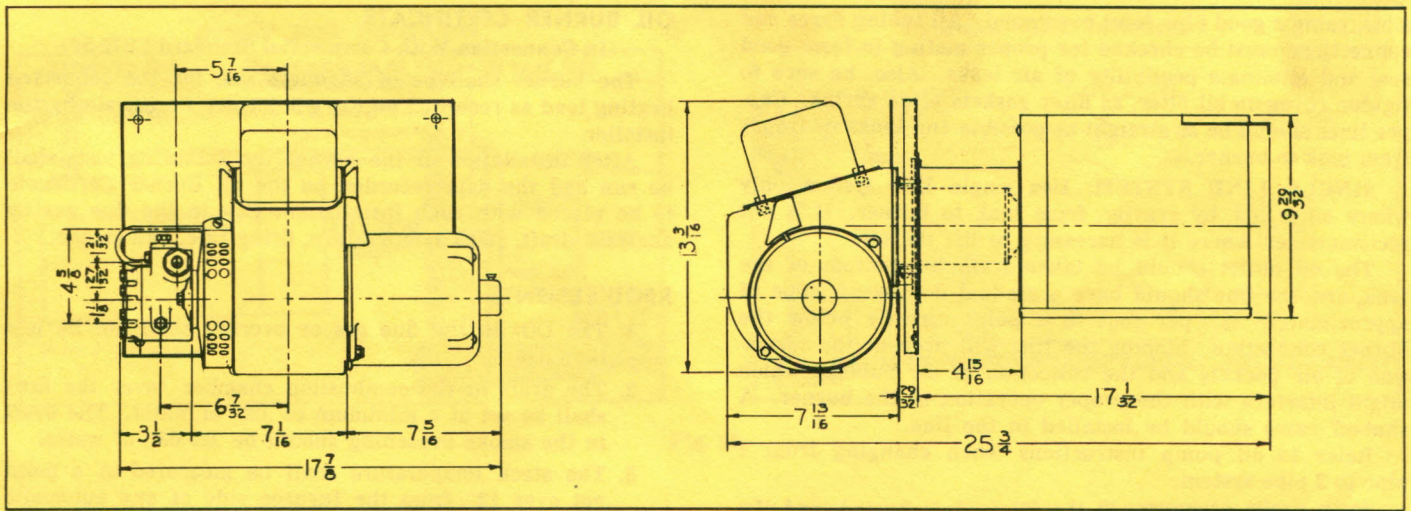


Fig. 15

Models MA-85-C and MA-110-C High Pressure Oil Burners for GO-V and GO-C Furnaces

- Capacity—MA-85-C75 G.P.H.
 MA-110-C1.00 G.P.H.
- Motor— $\frac{1}{8}$ HP, 115 Volt, 60 Cycle, 1 Phase.
 Blower Wheel—4" Wide x 5 $\frac{23}{32}$ " Dia.
 Fuel Unit—Single Stage.
 Transformer—115 Volt, 60 Cycle, 10,000 Volt Sec.
 Filter—General 2A-700 or Purolator Type
 PF-2002 (optional).
 Controls—Primary Safety Control, thermostat,
 and barometric draft control.

GENERAL NOTES

Familiarize yourself with any local codes covering oil burner and tank installations and get a copy of Pamphlet 31, Standards for the Installation of Oil Burning Equipment published by National Board of Fire Underwriters, New York, New York.

Decide on whether to use an inside or outside tank (275 gal. max. inside), and location of tank fill and vent pipe. Get the owner's approval.

The MA-85-C and MA-110-C high pressure burners are designed for use with fuel oil not heavier than No. 2 Commercial Standard CS-12.

BURNER INSTALLATION AND ADJUSTMENT

To install burner and chamber assembly, remove $\frac{5}{16}$ " brass nuts from mounting studs of furnace mounting flange. Slip combustion chamber into pouch opening until 4 mounting studs project through burner mounting plate. Replace nuts, pulling burner mounting plate tightly against flange.

The oil supplied to the fire is regulated by the nozzle size and also, to a small extent, by the pressure developed by the pump. It is recommended that an oil pressure of 100 lbs. be used but not less than 95 lbs. See instructions on the care and adjustment of the fuel pump packed with the burner.

The air supplied to the burner is controlled by the air inlet band and can be adjusted by loosening the screw clamping it to the burner housing. Rotate the air inlet band to the required opening and tighten the screw again. The proper setting is that which will deliver the smallest amount of air and still maintain a clean fire.

NOTE: The adjustable port in the burner mounting plate may be opened, as required, to tune out flame noise.

REMOVING ELECTRODE, NOZZLE AND STABILIZER ASSEMBLY

Disconnect the oil line at the fan housing and remove jam nut on copper tubing fitting. Remove transformer hold-down screw in upper right hand corner and swing transformer to left on hinge clips. Remove assembly through this opening.

BURNER NOZZLE

All MA-85-C and MA-110-C burners are shipped with 80° spray angle nozzles. Remove nozzle, for cleaning purposes, by screwing it from the adapter. When cleaning, do not touch the rotor slots or orifice with any material which will scratch or damage the surfaces. Clean screen with a solvent or hot water.

The nozzle should be $\frac{1}{4}$ " to $\frac{3}{8}$ " back of the end of blast tube when in position.

SPACING ELECTRODES LOCATING FLAME STABILIZER

The ignition points should be $\frac{5}{32}$ " apart, with $\frac{1}{4}$ " clearance maintained between ignition points and nozzle. They should extend forward to flush with the face of the nozzle, but not ahead of the nozzle. They should be dry and free from carbon at all times.

The flame stabilizer, which gives the air a rotating motion, is set-screwed securely to the nozzle tube $3\frac{1}{4}$ " back of the face of the nozzle.

OIL TANK AND PIPING

Oil tanks must be installed in accordance with requirements of National Board of Fire Underwriters, and local ordinances. On outside buried tanks separate supply and return lines should be connected to top of tank with the suction line extending down to within a few inches of the bottom (refer Fig. 16). This type installation requires a two line system. Where tank is installed above the level of the burner, so that oil is fed by gravity to the burner, no return line is necessary.

If suction and return lines are under 30' in length, $\frac{3}{8}$ " OD copper tubing may be used, but never smaller; however, when the oil line is 30' or over, $\frac{1}{2}$ " tubing is recommended.

Avoid as many connections as possible in the suction line and make up all pipe thread connections as tightly as possible.

sible, using a good pipe joint compound. All tubing flares and connections must be checked for proper mating to form good seal and eliminate possibility of air leaks. Also, be sure to tighten cover on oil filter, as filter gaskets often shrink. Copper lines should be as straight as possible (no kinks or traps) from tank to burner.

SINGLE LINE SYSTEM: Use single line system only where oil is fed, by gravity, from tank to burner. It is not recommended where it is necessary to lift the oil.

The oil outlet should be taken from the bottom of the tank, and the line should have a gradual downward slope of approximately $\frac{1}{2}$ " per foot to a point directly below the burner connection. Sloping the line will prevent the formation of air pockets and the collection of air bubbles which might interfere with the proper operation of the burner. A shut-off valve should be installed in the line.

Refer to oil pump instructions when changing from 1 pipe to 2 pipe system.

TWO LINE SYSTEM: If the oil tank is buried, and the tank below the level of the burner, a 2 line system must be used. High points or air pockets in the suction line must be avoided.

Do not run suction or return line overhead as this greatly increases the possibility of air traps, oil leaks, syphoning, and transmission noises.

A readily accessible manual shut-off valve shall be installed at each point where required to avoid oil spillage during servicing.

PRESSURE TEST FOR BURIED OIL LINES

After installation and before being covered, tanks and piping should be tested for leaks. Test by closing all tank and oil line openings, then pressurizing with not less than 5 lbs. per sq. in., or more than 10 lbs. per sq. in. of air pressure. Instead of a pressure test, suction lines may be tested under a vacuum of not less than 20" of mercury.

Tests should continue for at least 60 minutes without a noticeable drop in pressure or vacuum.

FILL AND VENT CONNECTIONS

All oil tanks must be provided with a filling connection at top, extending to the surface and provided with a water-tight cap. A $\frac{1}{4}$ " minimum vent connection at top of tank and carefully separate from any other pipe must be provided. It must extend outdoors and have an approved vent fitting. (Refer Fig. 16.)

FUEL UNIT

See separate instruction sheet packaged with burner.

STARTING BURNER

After testing all oil lines for leaks and checking wiring for possible mistakes, see fuel pump instruction sheet for bleeding the fuel pump.

To start the burner make sure the room thermostat is calling for heat and that the reset button on the primary control has been reset. The main switch to the oil burner service should then be closed to start the burner. Visual or instrument tests should then be taken to determine if the secondary air setting is correct. There should be no smoke or soot.

Make sure that the primary control and limit controls are operating properly. The primary control can be tested by removing the motor lead from the burner and allowing the ignition circuit to be energized. Not over 2 minutes time should elapse between the time the switch is closed and the safety device shuts off the ignition.

OIL BURNER CERTIFICATE

(In Connection With Commercial Standard CS75-56)

The burner shall be of adequate size for the connected heating load as recorded on the Oil Burner Certificate by the installer.

After installation of the burner the following tests shall be run and the data recorded on the oil Burner Certificate to be placed with each installation: CO₂ in the flue gas by analysis, draft, stack temperature, firing rate, and smoke.

REQUIREMENTS

1. The CO₂ in the flue gas or overfire shall not be less than 8%.
2. The draft in the combustion chamber (over the fire) shall be set at a minimum of .02" of water. The draft in the smoke breeching should be .02-.03" of water.
3. The stack temperature shall be measured at a point not over 12" from the furnace side of any automatic draft control.
4. The firing rate shall be the burner manufacturer's recommendation.
5. During the test there shall be no visible smoke in the furnace.
6. The burner shall be installed in accordance with the manufacturer's installation manual.

TEST PROCEDURE

In order to conduct these tests the following equipment shall be available at the installation:

- (a) A suitable flue gas analyzer to determine the percentage of CO₂.
- (b) A suitable draft gauge graduated in hundredths of an inch of water.
- (c) A suitable thermometer to indicate the flue gas temperature.
- (d) A Shell Bacharach smoke tester.
- (e) Some provisions for inserting the thermometer into the flue pipe shall be made. It should not be over $\frac{1}{4}$ " in diameter, not over 12" from the furnace outlet, and located on the center line of the pipe. Insert the thermometer $\frac{1}{4}$ the diameter of the flue pipe and seal it to prevent air leakage. This same opening may be used to check the draft.
- (f) A hole not over $\frac{1}{4}$ " in diameter shall be made in the furnace observation door for measuring the draft in the combustion chamber.

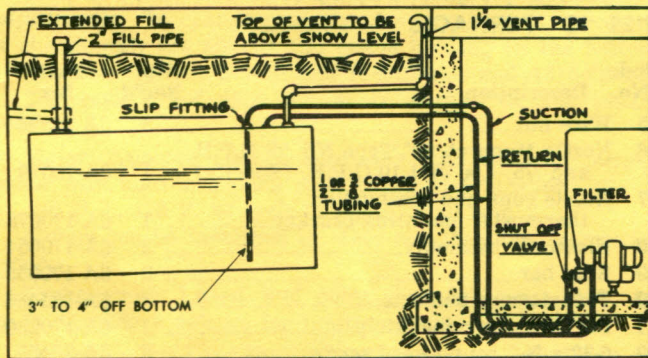
Proceed with the test as follows:

1. The burner shall be operated and the fuel rate selected to that required for the particular installation.
2. The draft shall be adjusted to meet the burner manufacturer's specifications, both over the fire and at the breeching.
3. The air supply to the burner shall be adjusted to give the highest CO₂ reading without exceeding a number 5 smoke on a Shell-Bacharach smoke tester; however, we recommend a smoke reading no darker than a No. 2. A No. 2 reading will produce cleaner fire and little, if any, increase in flue gas temperature.

If the minimum required percentage of CO₂ cannot be obtained in the breeching, it will be permissible to take CO₂ readings over the fire. In that event both CO₂ readings shall be recorded on the certificate.

4. Stack temperature shall be recorded after 10 minutes of operation after reaching 125°F. bonnet temperature. During the period of operation to permit flue-gas tem-

Outside Tank Installation



Inside Tank Installation

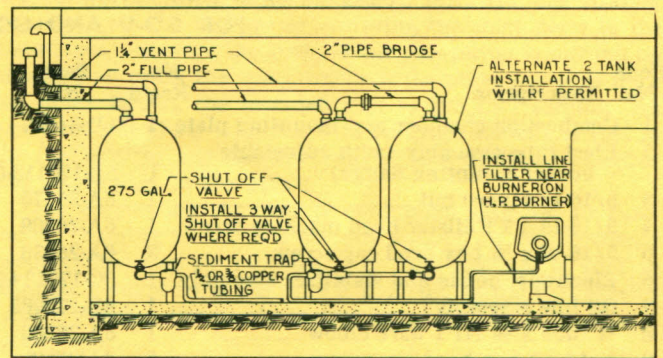


Fig. 16

peratures to reach maximum, periodic readings of draft and CO₂ shall be taken and the average recorded on the certificate. All controls and limiting devices shall be checked for proper operation.

GUARANTEE REGISTER CARD

After installation fill out the Guarantee Register Card and mail to Stewart-Warner Corporation, Heating and Air Conditioning Division, Lebanon, Indiana.

FOLLOW-UP SERVICE

After the burner has been installed a careful check-up

should be made within three days and another check-up within three weeks. The controls should be rechecked to see that they are functioning properly. The burner operation should be checked, to see that the original efficiency setting is maintained, and that all parts are working properly. Recheck the air bleed to be sure no air remains in the fuel meter or pump. Chimney draft should be rechecked to see that .02-.03" of draft is maintained. All pipes should be carefully checked to see that no oil leaks have developed.

The installation should receive a careful yearly check-up at which time the fuel strainer should be cleaned and the oil filter cartridge changed.

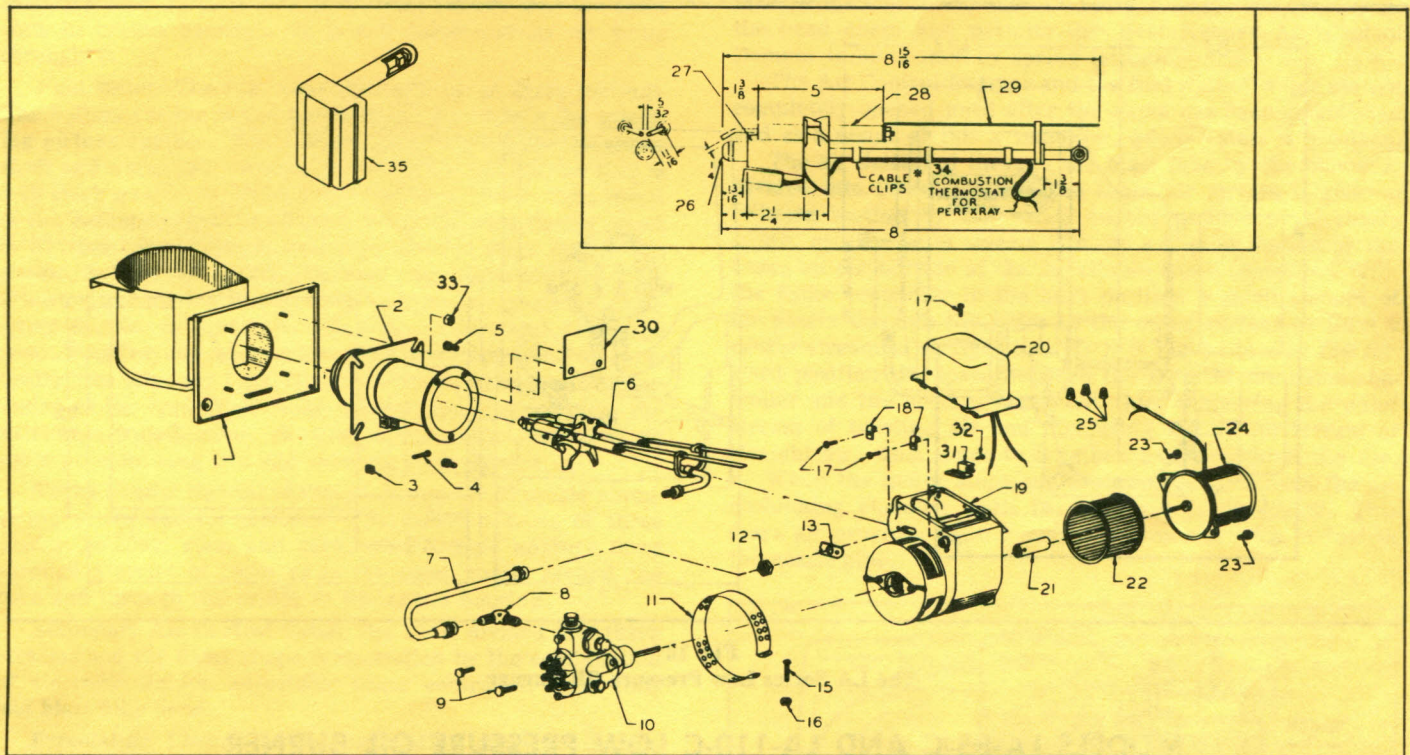


Fig. 17

Exploded Parts View—MA-85C and MA-110C High Pressure Oil Burner
Perff Primary Control Illustrated

MA-85-C AND MA-110-C OIL BURNER PARTS LIST FOR GO-V AND GO-C SERIES "C" FURNACES

Code No.	Description	No. Req'd	Part No.	Code No.	Description	No. Req'd	Part No.
1	Combustion chamber and mounting plate	1	6D-81962	25	Wire nut	3	6A-25596
2	Blast tube assembly (with adjustable burner mounting flange)	1	6B-170113-6	26	Nozzle Monarch 80° Type NS .75 G.P.H. and .75, 1.00 or 1.10 G.P.H. (Specify)	1	6A-70019
3	5/16-18 square nut	1	6A-26175	27	Nozzle cone and combustion thermostat mounting bracket	1	6A-170075
4	5/16-18 x 1 Fillister head machine screw	1	6A-26869	28	Electrode assembly	2	6A-170054
5	5/16-18 x 5/8 hex head cap screw	3	6A-26036	29	Buss bar	2	6A-170055
6	Electrode, nozzle and stabilizer assembly	1	6C-170124-6	30	Transformer baffle	1	6A-181488
7	Oil line assembly	1	6B-170083	31	PerfXray terminal strip	1	6A-170220
8	1/4 tube x 1/2 NPT flare elbow	1	6A-26860	32	6-32 x 5/8" round head screw	2	6A-26485
9	3/8-16 x 1 hex head cap screw	2	6A26045	33	5/16-18 brass nut	4	6A-26631
10	Fuel unit	1	6A-170082	34	*Burner mounted combustion thermostat for PerfXray (CT-99A101-48)	1	6A-20764
11	Air inlet band	1	6C-170098	35	M-H (C-550A) stack mounted flame detector	1	6A-20647
12	7/16 x 20 jam nut	1	6A-26843		*Cable clips for PerfXray lead	3	6A-265117
13	Nozzle tube locating plate, M-2	1	6A-170130		Oil filter—General 2A-700 or Purolator type PF-2002. Specify. Optional		6A-70029
15	1/4-20 x 1 round head machine screw	1	6A-26541		Oil filter cartridge—General 2A-710, or Purolator type PF-200. Specify. Optional.		6A-70102
16	1/4-20 hex nut	1	6A-26005		Mounting flange gasket		6B-70670
17	8-32 x 1/2 self-tapping screw	3	6A-26844		PerfXray primary relay		6A-20763
18	Transformer hinge	2	6A-170091		M-H primary relay		6A-20646
19	Burner housing	1	6D-170063		Relay mounting brackets		6C-170203
20	Transformer	1	6C-170050				
21	Flexible coupling	1	6A-170238				
22	Blower wheel (5 23/32 dia. x 4" wide)	1	6B-170237				
23	5/16-18 x 7/8 hex head cap screw	2	6A-26477				
24	Oil burner motor 1/8 HP 115/60/1	1	6B-22161				

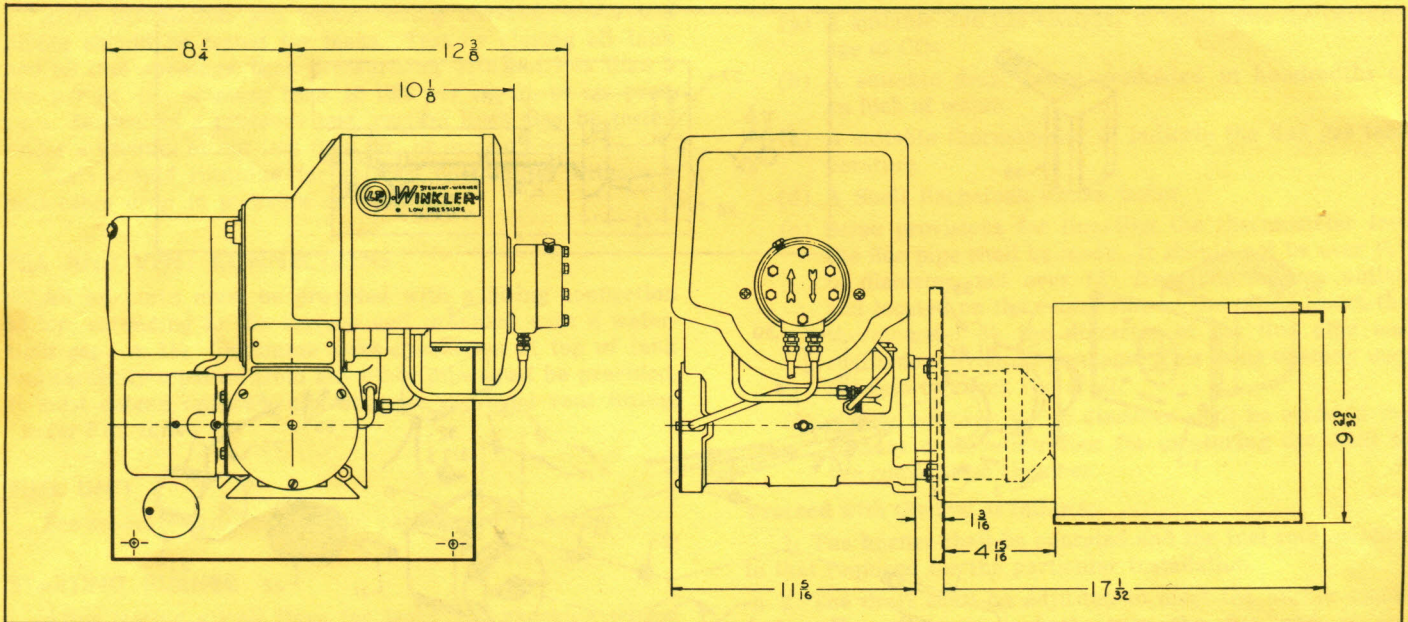


Fig. 18
The LA Series Low Pressure Oil Burner

MODELS LA-85-C AND LA-110-C LOW PRESSURE OIL BURNER FOR GO-V AND GO-C SERIES "C" FURNACES

GENERAL NOTES

Familiarize yourself with any local codes covering oil burner and tank installations and get a copy of Pamphlet 31, Standards for the Installation of Oil Burning Equipment published by National Board of Fire Underwriters, New York, New York.

Decide on whether to use an inside or outside tank (275

gal. max. inside), location, and location of fill pipe. Get the owner's approval.

Low Pressure Burners were designed for use with fuel not heavier than No. 2 Commercial Standard Grade CS-12.

DESCRIPTION OF BURNER

Capacity—LA-85-C75 G.P.H.
LA-110-C 1.00 G.P.H.

Each size is a fixed capacity, eliminating any troublesome adjustments. To change capacity of a burner it is necessary to change only the pistons and piston housing on the bottom of the metering unit. See Burner Installation and Adjustment.

The capacity of each burner is marked on the piston housing.

Motor: Approved flange type long hour duty oil burner motor with built-in manual reset overload protection.

1/6 H.P., 115 V, 60 cycle, 1 phase, 1740 rpm.

Motors can be furnished to other specifications on special order.

Transformer: Listed, mid point grounded type, 115V, 60 cycle, secondary voltage for ignition 10,000.

Secondary Air Fan: Squirrel cage type, mounted direct on motor shaft and having a flexible coupling for driving the metering assembly.

Metering Assembly: The complete metering assembly is a unit attached to the burner housing by two cap screws through the secondary air regulator. This unit consists of the secondary air regulator, the fuel aerator and the fuel meter all on the same shaft and driven at motor speed through a flexible coupling to fan and motor.

Air Regulator: The Heat Keeper secondary air control is made up of a cast iron housing and damper. It operates in conjunction with the fuel shut-off valve.

Aerator: The fuel aerator consists of a spring loaded single vane riding an eccentric impeller of meehanite. It is a non-adjustable, fool-proof, positive metering and mixing means for the air that is pre-mixed with the fuel. Flexible face type seals are used on each side of the fuel aerator and the shaft runs in bronze bearings. It is self lubricated by oil going through it.

Fuel Meter: The fuel meter is made up of three castings. The bottom casting is the piston housing in which the metering pistons operate. The middle casting houses the eccentric shaft and worm gear reduction. In one end of this housing is a 20 mesh strainer to remove the coarse sediment. The speed of the eccentric shaft is reduced from 1740 rpm motor speed to 51 rpm. Twice the eccentricity of this shaft equals the stroke ($\frac{1}{8}$ ") of the metering pistons. By means of the wobble action of the fork and clevis the pistons are given an oscillating motion to open and close the intake and discharge ports. Positive, low speed fuel metering is obtained at practically zero pressure regardless of viscosity changes. The top casing of the fuel meter houses the piston that operates the automatic shutoff valve. The slow action of the fuel metering parts promote long life and freedom from service.

Turba Nozzle: Special advanced design for complete atomization of the fuel-air mixture. The nozzle consists of three pieces: housing, stem and core. The fuel-air mixture flows through a series of passages in the stem, swirls around the core and through the orifice in the nozzle housing.

Secondary Air Control Parts: The air is divided into three streams and the flame shape is controlled by the combination of electrode holder, adjustable flame controller, blast tube and blast tube hood.

Percolating Chamber: The percolating chamber in conjunction with the air cushioning chamber is an oil flow leveling device located between the aerator and the nozzle. This casting is connected to the blower housing and is open to the air cushioning chamber.

DESCRIPTION OF OPERATION

When the motor starts the fuel aerator builds up a pressure of approximately $3\frac{1}{2}$ lbs. per sq. in. in the air cushioning chamber. This pressure acts on one side of a piston to overcome spring pressure and thus opens the automatic fuel

shut-off valve. Fuel flows by gravity through the strainer chamber into the fuel meter, covering the inlet ports to the pistons that measure the fuel. While one piston is moving up allowing oil to fill the space under it the other piston is moving down forcing the metered fuel to the fuel aerator. An exact amount of air is mixed with an exact amount of fuel in the fuel aerator and forced through the percolating chamber and nozzle pipe to the nozzle.

The percolating chamber in conjunction with the air cushioning chamber provides a smooth flow of air and correctly proportioned fuel-air mixture. The fuel and air is kept in intimate contact from the time it is mixed in the fuel aerator until it reaches the nozzle in the form of foam and oil saturated vapor.

In the nozzle this mixture is dashed against a series of passage walls by several abrupt changes in direction of flow, breaking the mixture into four separate streams. These streams are hurled inwardly through tangentially drilled holes against and around the nozzle core, giving the thoroughly atomized fuel-air mixture a swirling action as it passes through the $\frac{5}{32}$ " diameter nozzle orifice to be mixed with secondary air from the fan.

The secondary air supplied by the fan is controlled by the Heat Keeper Secondary Air Control. Air pressure, which is built up in the air cushioning chamber by the aerator, is slowly bled through an orifice, to the air piston chamber assembly of the fuel shut-off valve. As the piston is forced upward by the air pressure the fuel shut-off valve is opened. The Heat Keeper Air Control Damper is connected to the beam of the fuel shut-off valve with a bead chain and the upward motion of the shut-off valve releases the tension on the bead chain and permits the Heat Keeper Air Control Damper to be opened by spring tension.

The Air Control Damper and the fuel shut-off valve are not completely opened until after the flame has been established and as a result of this a smoother, quieter start is obtained.

The air delivered through the blast tube by the blower is divided into three streams. The inner air stream is given a twisting motion by the vanes on the outside of electrode holder and the outer stream is given a similar motion by the vanes on the outside of the adjustable flame controller. With the flame controller in the back position a small amount of air passes through the holes in the outer surface to form a center stream of straight air. As it is moved toward the forward position the space between the front of the flame controller and the hood is restricted, thus decreasing the outer stream of twisting air and increasing the center stream of straight air. This tends to lengthen and straighten the fire.

When the motor stops, air continues to flow from the air cushioning chamber until the pressure is dissipated. This extra air provides clean burning for any remnants of fuel in the nozzle pipe.

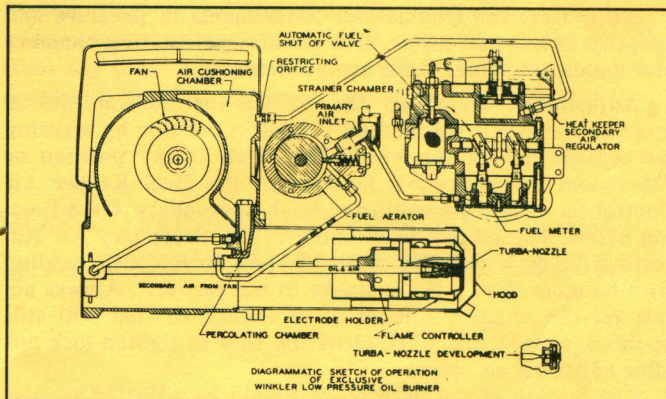


Fig. 19

BURNER INSTALLATION AND ADJUSTMENT

Before installing burner in furnace check to be sure that nozzle is in the center of the hole in the blast tube hood and that the end of the nozzle is not less than $\frac{7}{8}$ " or more than 1" back from the face of the hood. Also check electrode setting. (See figure 22.)

To install burner, remove nuts on 4 screws in furnace mounting flange. Slip burner blast tube into hole until 4 screws project through burner flange, replace nuts and pull up tight.

The end of the blast tube hood should be flush to $\frac{1}{4}$ in. back from the inside surface of the combustion chamber.

It is very important that the blast tube is level after being installed in the furnace. Level the burner by placing a level on top of the fuel shut-off valve casting. The difference in level between this position and the blast tube should be compared before the burner is installed and the obvious difference allowed for because the **BLAST TUBE MUST BE LEVEL**.

If, after the installation is finished, the fire is heavier on one side, remove the nozzle assembly and turn the top very slightly toward the lean side. This will balance the fire.

NOTE: The adjustable port in the burner mounting plate may be opened, as required, to tune out flame noise.

POSITIVELY do not use line filter. Always use sediment trap.

Check the number .75 or 1.00 (indicates burning rate in gallons per hour) on the side of the fuel meter piston housing for correct capacity. If it is required to change capacity it is only necessary to change the pistons and piston housing on the bottom of the fuel meter. This is accomplished by removing six cap screws in piston housing, disconnecting fuel discharge line, dropping the piston housing off so that coters and pins holding the pistons may be removed, and then replacing with pistons and housing of desired capacity. See Fig. 22.

Caution: When changing capacity it is important that the two gaskets be placed in the proper location. The gasket with the six holes for the cap screws and the open center is placed between the fuel drive housing and the top of the piston housing. The other gasket is the cover gasket and is placed between the cover and the bottom of the piston housing. These gaskets are kidney shaped to conform to the contour of the piston housing and are designated in this manner to prevent error in assembling. If the gaskets are placed otherwise the capacity of the burner will be increased and the burner will not operate properly.

By disconnecting fuel and air lines and removing two cap screws holding air regulator to the burner housing the complete metering assembly comprising air regulator, fuel aerator and fuel meter may be removed and replaced by a similar unit of desired capacity.

All critical and troublesome adjustments of pressure and capacity in the fuel meter, fuel aerator, percolating chamber and nozzle feed lines have been eliminated.

Adjustment: To adjust the burner the Control Shroud must be removed. The Shroud is held in position by a spring for convenience in servicing. The "Full Open" position or "Maximum Secondary Air Setting" of the Heat Keeper Air Control Damper can be adjusted by the Secondary Air Adjusting Screw. The correct positioning of the Secondary Air Adjusting Screw is one that gives at least an 8% CO₂ reading with no more than a No. 2 smoke in the furnace. Always adjust for the smallest amount of secondary air that will still maintain a clean fire. CAUTION: Be sure to tighten lock nut after adjusting air screw.

The tension of the bead chain should be adjusted snugly; however, **under no circumstances should it be adjusted so**

tight that the chain will not allow the fuel shut-off valve to close completely. Improper starting operation will occur if the bead chain tension is too tight.

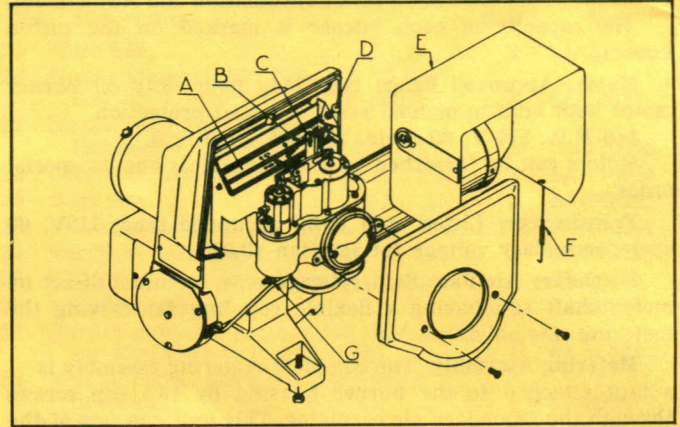


Fig. 20

Code	Part	Code	Part
A	Secondary Air Damper	D	Secondary Air Adjusting Screw
B	Bead Chain	E	Control Shroud
C	Bead Chain Tension Adjustment	F	Shroud Spring
		G	Flame Controller Adjusting Screw

The flame shape may be controlled from the outside of the burner by merely loosening the adjusting rod clamp screw located on the right side of the main housing under the fuel meter and pushing the screw head forward or back in the adjusting slot. The flame controller position is determined by flame pattern. The flame should fit the firebox so that it lightly touches the target wall of the combustion chamber.

The ignition points should be set as indicated on the illustration in this manual (see Fig. 22).

After the burner is started the fuel meter must be bled. Back off the bleed screw near the top of the fuel meter with a screwdriver and wait until the air is expelled and an ounce or two of oil free from bubbles flows out. The oil can be caught in a small glass or can and kept from being spilled on the floor or burner. Then tighten screw so that it doesn't drip.

On installations where the oil is fed by gravity from the oil tank to the burner, the following procedure gives the fastest and most complete venting possible. Remove the pipe plug from the tee fitting located on top of the sediment trap (inside tank installation). Open the shutoff valve and allow the oil to flow into the sediment trap and oil lines. As the oil fills the trap and the oil lines, air is displayed and is vented through the tee fitting on the sediment trap. Keep a close watch on the oil level in the tee fitting and, as soon as the lines are filled, close the oil shutoff valve and insert the plug in the tee fitting.

Whenever an outside underground tank is used, or when the bottom of the tank is lower than the inlet to the burner, the burner must be equipped with a suction pump. A suction pump can be added to existing equipment. (See Fig. 21.)

When a suction pump is used, it is required that a return line pressure of from 1½ to 2½ p.s.i. be obtained. Return line pressures can be read by inserting a low pressure gauge at the bleeder port. The above mentioned return line pressure is required to prevent a syphoning effect. If insufficient return line pressure is present, then utilize the small spring in the envelope attached to the suction pump. Complete directions are printed on the envelope.

If the outside underground tank is above the level of the burner, the valve assembly installed in the Eliminair may

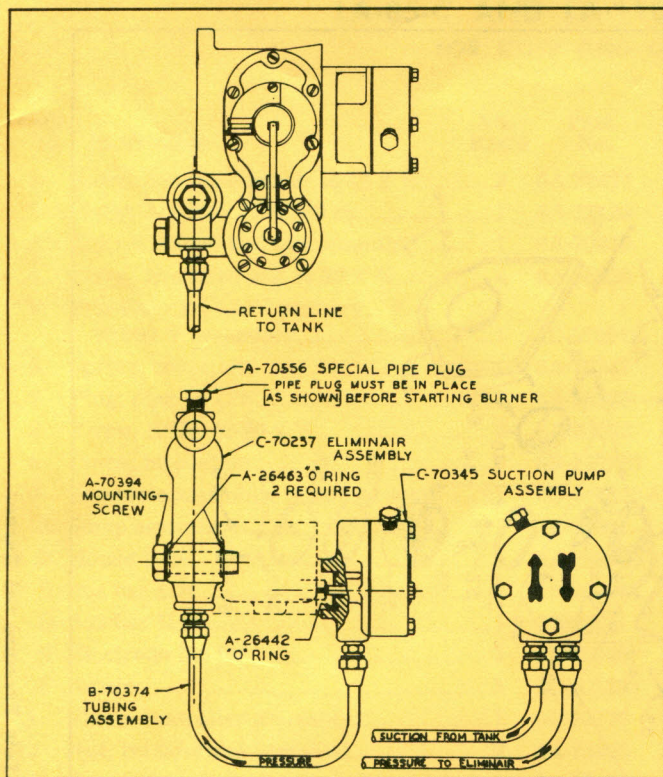


Fig. 21
Suction Pump and Eliminair Assembly
for LA-85-C and LA-110-C Burners

have to be partially cut off or completely removed to reduce the return line pressure to the 1½ to 2½ p.s.i.

It is advisable to clean the fuel strainer about once each season. Shut off the oil supply valve and remove the drain plug in the bottom of the strainer chamber after placing a pan or pail underneath. Open the oil supply valve and flush a quart of fuel oil through drain plug hole. This washes the strainer or screen. Replace drain plug and bleed air as above.

If the fuel tank should run empty the burner will have to be bled when restarting.

Installation Instructions for Suction Pump and Eliminair

The Suction Pump is shipped with an "O" ring and two mounting bolts and copper washers. For shipping purposes a wire is used to retain the mounting bolts and to prevent the "O" ring from dropping out of the Suction Pump.

The following procedure is outlined for installation of the Suction Pump.

1. Remove the two cap screws which hold the pump mounting cap pad to the fuel metering drive housing. This will expose the pinion shaft. The pinion shaft has a slotted end to receive the Suction Pump shaft.

2. Check to determine that the "O" ring is in position in the Suction Pump (one is supplied with the Suction Pump and another will be found in the pump mounting pad cap). Only one is required. This acts as a seal between the fuel metering drive housing and Suction Pump.

3. Check the surfaces of the fuel metering drive housing and the Suction Pump to ascertain that the surfaces are clean.

4. Place the Suction Pump shaft so the shaft will go into the slotted end of the pinion shaft. This should easily go into position and should not be forced.

5. The Suction Pump will go to within approximately 1/16" of the fuel metering drive housing, because of the "O" ring seals. This 1/16" will be taken up when the mounting bolts are inserted through the Suction Pump housing and tightened firmly. The copper washers must be used with these mounting bolts.

The ELIMINAIR (air eliminator assembly) is shipped with the Suction Pump. Also included is a section of tubing with a flare nut on each end. The air eliminator is assembled as outlined in Fig. 21. All pipe joints must be doped to prevent oil leaks.

Note: The return line tubing from the Eliminair Assembly must be off-set to miss the Control Shroud.

The long end of the tubing is connected to the bottom of the air eliminator assembly.

The other end of this tubing is connected to the "port" located on the bottom of the Suction Pump. The proper port is indicated by an arrow pointing downward. This port is the one located to the right looking at the cover plate of the Suction Pump. A ¼" pipe to ⅜" flare fitting is furnished for this connection.

The suction line is installed from the tank and is connected to the other "port" located on the bottom of the Suction Pump. This port is indicated by an arrow pointing upward. This port is the one located to the left looking at the cover plate of the Suction Pump.

The return line is connected to the side outlet near the top of the air eliminator and runs to the tank.

This Suction Pump should only be used as a two line system.

OIL TANK AND PIPING

On outside tanks separate supply and return lines should be connected to the top of the tank with the lines extending down to within three to four inches of the bottom. Install lines of ⅜" copper on runs up to forty feet and ½" copper on longer runs. Run line in as straight as possible from the tank to the burner, being careful not to kink or trap. A Suction Pump must be used with outside tank in single or two tank installation as shown in Fig. 16.

All oil tanks must be provided with a full connection extending outdoors and provided with a watertight cap. A 1¼" minimum vent connection at top of tank and entirely separate from any other pipe must be provided. It must extend outdoors and have an approved vent fitting.

REFER TO PAGES 12 AND 13 FOR INFORMATION COVERING TEST PROCEDURES, OIL BURNER CERTIFICATE, FOLLOW-UP SERVICE, AND GUARANTEE REGISTER CARDS.

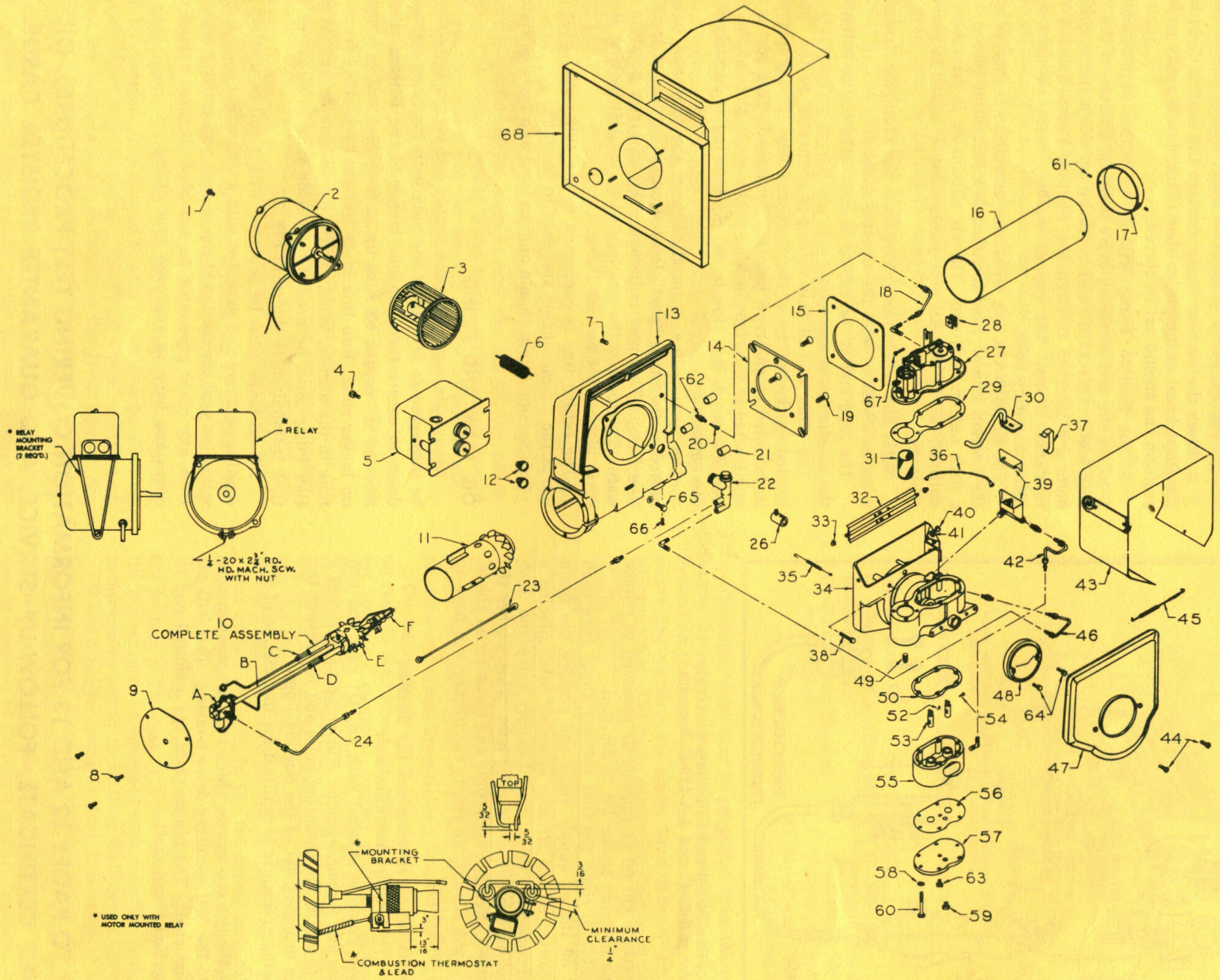


Fig. 22
Exploded Parts View—LA-85-C and LA-110-C Low Pressure Oil Burner

LA-85-C AND LA-110-C OIL BURNER PARTS LIST
FOR GO-V AND GO-C SERIES "C" FURNACES

Code No.	Description	No. Req'd	Part No.	Code No.	Description	No. Req'd	Part No.
1	Screw, hex head cap 5/16-18 x 7/8	2	6A-26477	41	Nut, lock 1/4-20	1	6A-26005
2	Motor, 1/6 HP, 110V, 60 cy	1	6A-22125	42	Tube, piston housing to reservoir	1	6A-70891
3	Blower Wheel and hub assembly	1	6A-70810	43	Shroud assembly	1	6C-170262
4	Screw, hex head cap 1/4-20 x 1/2	4	6A-26025	44	Screw, oval head 1/4-20 x 1/2	2	6A-26966
5	Transformer, 110V primary, 10,000 V secondary	1	6C-170249	45	Spring, shroud	1	6A-170282
6	Spring, coupling	1	6A-70387	46	Tube, aerator to percolating chamber	1	6B-70320
7	Plug, pipe 1/8 IPS	1	6A-26096	47	Plate, cover retaining	1	6D-170276
8	Screw, RHM, 1/4-20 x 1/2	3	6A-26002	48	Cap, pump mounting pad	1	6B-170277
9	Cover, inspection	1	6B-170283	49	Plug, 1/8 pipe	1	6A-26466
10	Complete assembly, nozzle to sump	1	6D-170270-6	50	Gasket, piston housing	1	6B-70170
A	Sump assembly	1	6A-70557	52	Pin, I.H. cotter	4	6A-26446
B	Nozzle tube	1	6A-70268-12 ³ / ₄	53	Piston	2	6A-70196
C	Bus bar L.H.	1	170267-6	54	Pin, clevis	4	6A-70254
D	Bus bar R.H.	1	170266-6	55	Piston housing	1	6B-70300
E	Electrode holder	1	6B-70240		Cap. change kit. Specify burner & G.P.H.	1	6B-70445
F	Nozzle	1	6C-70325	56	Gasket, cover plate	1	6A-70301
11	Flame controller assembly	1	6C-70377	57	Cover plate	1	6A-70302
12	Nut, transformer terminal	2	6A-26903	58	Washer, copper 1/4"	14	6A-26429
13	Burner housing	1	6A-170257	59	Plug, hex head pipe 1/8	1	6A-26466
14	Flange, mounting	1	6B-70379	60	Screw, hex head cap 1/4-20 x 2 ³ / ₈	6	6A-26459
15	Gasket, flange	1	6A-70670	61	Pin, blast tube to hood	2	6A-70634
16	Blast tube and hood assembly	1	6B-70829-6	62	Fitting, air cushion chamber	1	170309
17	Hood assembly	1	6C-70614	63	Screw, hex head cap, 1/4-20 x 5/8	1	6A-26026
18	Tube, air chamber to shut-off valve	1	6A-70321	64	Screw, hex head cap. 1/4-20 x 1	2	6A-26029
19	Screw, F.H.M., 5/16-18 x 1 ³ / ₄ "	3	6A-26471	65	Screw, hex head cap. 1/4-20 x 7/8	1	6A-26028
20	Orifice, restricting	1	170311	66	Screw, cone point set	1	6A-26444
21	Spacer	3	6A-70395-1	67	Screw, 8-32 x 5/8	1	6A-26965
22	Percolating chamber assembly	1	6B-70561	68	Combustion chamber and mtg. plate assembly	1	6D-81962
23	Adjusting rod, flame controller	1	6B-70232	69	M-H (C-550A) stack mtg. flame detector	1	6A-20647
24	Tubing, percolating to nozzle tube	1	6B-170263	70	General control (CT-99A101-48) combustion thermostat	1	6A-20764
26	Hub, coupling	1	6A-70398		Cable clips (detector tube lead to nozzle tube)	3	6A-26517
27	Valve, fuel shut-off assembly	1	6D-170261		Suction pump, Eliminair and tube assembly complete	1	6C-70550
28	Shoe, bead chain	1	6A-170245		Suction pump assembly	1	6C-70345
29	Gasket, valve housing to drive housing	1	6B-70171		Eliminair assembly	1	6C-70237
30	Reservoir cover & silencer tube assembly	1	6B-170280		Eliminair mounting screw	1	6A-70394
31	Fuel strainer	1	6A-70164		"O" ring (11/16 ID x 7/8 OD)	2	6A-26463
32	Blade assembly, damper	1	6B-170247		"O" ring (15/16 ID x 1 3/16 OD)	1	6A-26442
33	Bearing, Nylon	2	6A-26938		Tubing assembly	1	6B-70374
34	Air regulator and fuel metering assembly (specify capacity)	1	6A-170260		Special pipe plug 3/8"	1	6A-70556
35	Spring, damper	1	6A-170326		PerfXray primary relay		6A-20763
36	Chain, bead	1	6A-170251-6		M-H primary relay		6A-20646
37	Retainer clip, cover	1	6A-70892		Relay mounting brackets		6C-170203
38	Screw, hex head cap 5/16-18 x 2 ¹ / ₄	1	6A-26969				
39	Reservoir housing assembly (complete)	1	6C-70872				
40	Screw, air adjustment 1/4-20 x 1 ¹ / ₄	1	6A-26541				

STEWART-WARNER CORPORATION
HEATING AND AIR CONDITIONING DIVISION
LEBANON, INDIANA