

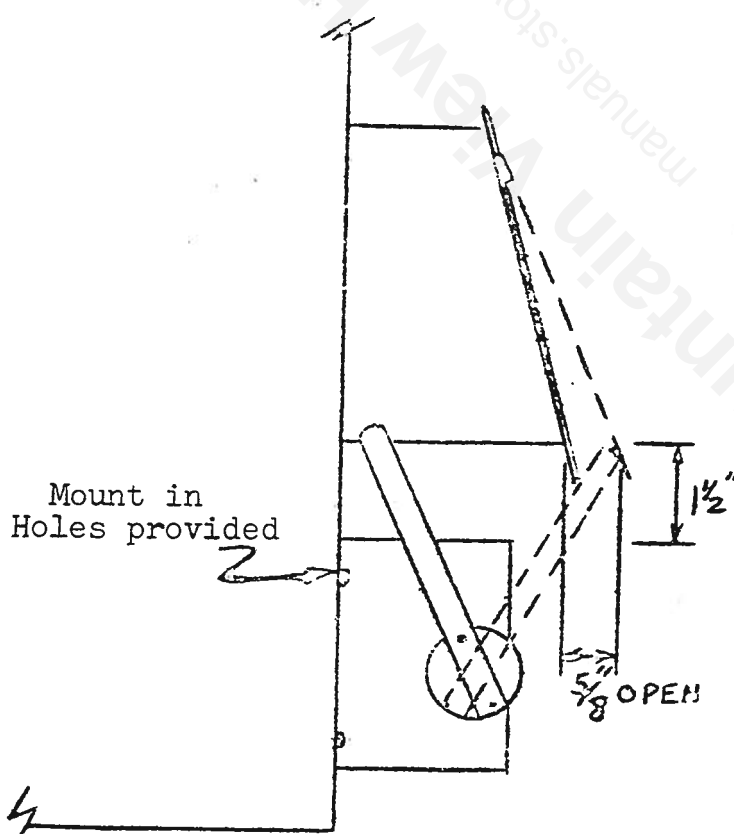
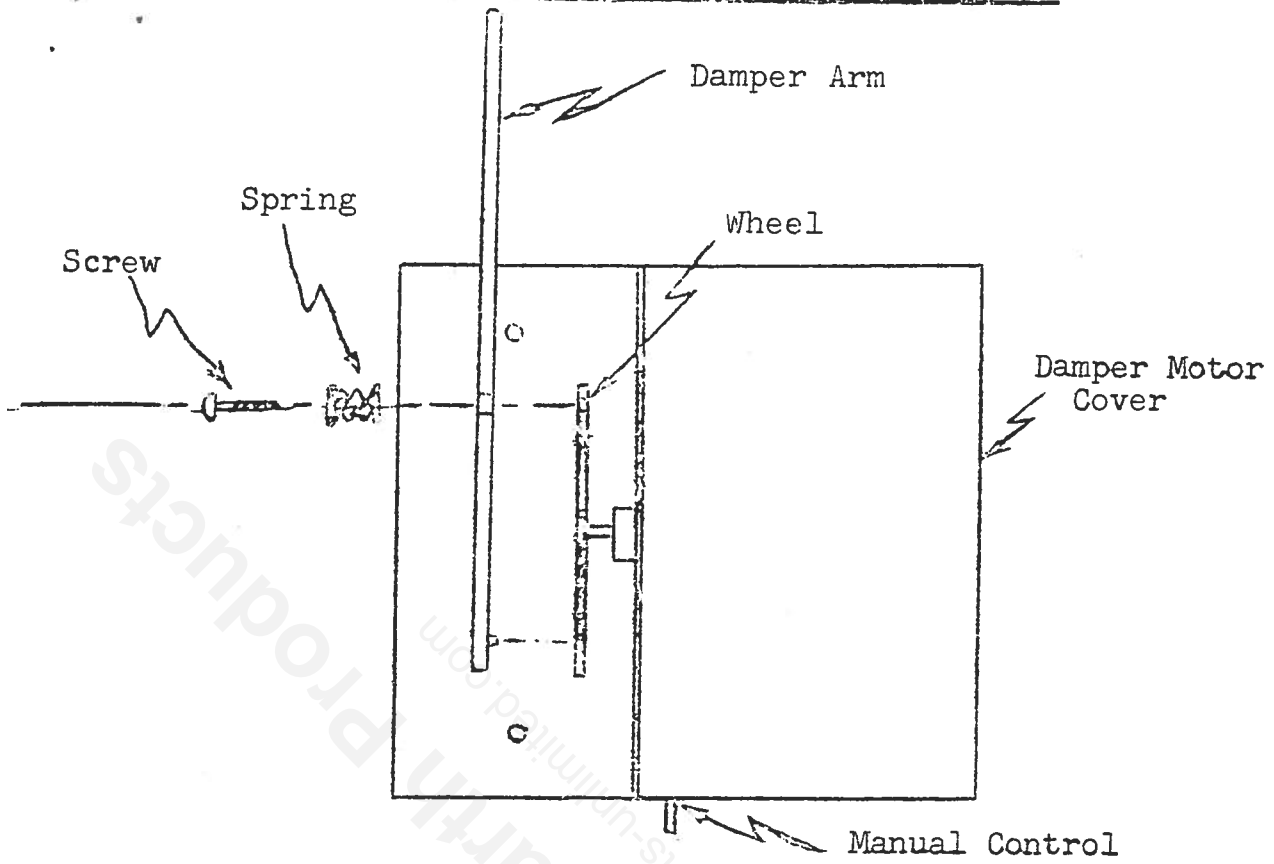
INSTALLATION, OPERATING
and
SERVICE MANUAL

NEWMAC COMBINATION FURNACE
MODELS GL 115B, 140B, 155B, 170B

NEWMAC MFG. INC.

1- 519-539-6147 *Woodstock, Ont.*
1- 902-662-3840 *Delant, N.S.*

DAMPER MOTOR ASSEMBLY & INSTALLATION



GENERAL INSTRUCTIONS

The NEWMAC COMBINATION FURNACE is shipped in three packages. It is the responsibility of the consignee of the unit to examine the packages for damage and if found, to note the same on the Carrier's Bill of Lading.

PACKAGE #1 - Heat Exchanger with end panels and one side panel installed, filters smoke baffle & draft regulator in firebox.

PACKAGE #2 - Blower Section with twin G10 blowers and centre panel installed.

PACKAGE #3 - (A) Modern flame retention oil Burner with mounted primary control and cell factory wired for easy installation
(B) Fan & Limit control
(C) Solid fuel and Oil Burner thermostats
(D) Junction Box with solid fuel control relay-transformer mounted
(E) Motor, belt & pulleys
(F) Nozzle
(G) Damper Motor
(H) Instruction Booklet

Minimum Clearances from Combustible Surfaces:

Oil Burner end - 24"
Wood door end - 48"
Flue Pipe - 18"
Top of Plenum - 6"
Extended Plenum up to 6' from furnace - 6"
Solid fuel or other combustibles must not be stored within the above clearances.

<u>MODEL</u>	<u>CL 115B</u>	<u>CL 140B</u>	<u>CL 155B</u>	<u>CL 170B</u>
BTUH INPUT	139,400	174,250	188,190	209,100
BTUH OUTPUT	114,000	142,000	150,000	167,000
NOZZLE(GHP US)	1.00(80°R)	1.25(80°)R	1.35(80°)R	1.50(80°)R
AIR FILTERS	2-20x25	2-20x25	2-20x25	2-20x25

Oil not heavier than #2 Furnace oil.

Close oil burner supply valve if unit is to be shut down for a prolonged period of time.

If unit is installed in an enclosed enclosure (furnace room) ventilation must be provided for the burner - a minimum of one square inch for every 1,000 B.T.U.

Replacement oil burner, combustion chambers and stainless steel liners (solid fuel side) are available from the manufacturer.

INSTALLATION

1. To insure the furnace is on a level foundation and above any possible dampness, a cement pad with minimum dimensions of 58" x 52" x 2" should be poured. It is important that the top be level. Install as close to the chimney as possible so that a minimum of pipes and elbows may be used.
 2. The NEWMAC COMBINATION FURNACE may be installed with the supply or return air on either side. The units leave the factory with the return or cold air on the right when viewed looking at the Oil Burner end. If it simplifies the duct installation to have the supply air on the right, remove the installed side panel and install it on the other side.
 3. After placing the heat exchanger on the proper side of the pad, assemble the blower section to the heat exchanger section by lining up the prepunched holes and metal screwing together.
 4. Install the oil burner by mounting it on the preset mounting plate on the unit.
 5. Install junction box and fan & limit as in Diagram #1. (Dec.75)
 6. Connect wiring as in Diagram #2. (Dec.75)
 7. Install the oil storage tank or tanks according to the instructions supplied by the manufacturer of the pump. They may be found attached to the pump.
 8. We recommend the unit be connected to a chimney of at least 96 sq. inches and in no circumstances less than 50 sq. inches. It must be approved for oil and wood burning appliances.
- * The installation must conform with the regulations of the local Authorities having jurisdiction and of the applicable Electrical Code.
 - * 2" of sand should be spread over the bottom of the wood heat exchanger section. (Use pit sand only)
 - * The installation must conform with the regulations in C.S.A. Standard B139 - "The Installation Code For Oil Burning Equipment."
 - * Flue pipe connections must be secured with metal screws.
 - * Wood storage should conform to local bylaws.

HUMIDIFIER

Install the humidifier in the return air plenum. This prevents possible damage due to excessive temperatures when there is a power failure. Metal connecting ducting from the warm air plenum is recommended rather than plastic ducting.

DUCT INSTALLATION

Because the unit may be used as a gravity furnace when the power is off the following is recommended:

1. Locate the furnace as centrally as possible in the home so the best warm air distribution may be enjoyed.
2. Use an extended plenum (central duct) at least one size larger than called for in National Warm Air Standards.
3. Use a minimum pipe size of six inches diameter in runs and in no case smaller than five inches diameter.
4. Slope extended plenums and runs as much as possible to facilitate the flow of gravity warm air.

1. ~~When the installation is complete set both oil burner and solid fuel thermostats to the bottom of the scale.~~
2. Close the supply switch and turn the solid fuel thermostat above room temperature. The damper motor should open the draft door.

If this fails to happen, check (a) free movement of draft door (b) power supply (c) voltage on secondary side of control relay-transformer (d) correct wiring hook up (e) correct voltage at damper motor. If a to e check OK, the damper motor is defective.

3. Open the line switch, turn the solid fuel thermostat to its lowest setting and the oil burner thermostat above room temperature. Remove the air bleed plug from the pump (refer to Diagram attached to pump) (a) open oil supply valve (b) place a container in position to catch foam. (c) close the line switch and after pure oil is emitted, open the line switch and replace bleed plug (d) close the line switch and the oil burner should run normally after a few seconds.
4. Adjust oil burner air control so that a #1 or less smoke is arrived at by means of a smoke test. The damper on the wood side and the overair adjustment must be closed during this procedure. If a smoke tester is not available, slowly close the air adjustment until the fire becomes smokey. Slowly open the air adjustment until there is a small amount of smoke on the flame tips.

If unit fails to start check (a) power supply (b) thermostat and circuit (c) correct wiring (d) motor thermal switch.

If unit starts but goes out on safety, check (a) oil supply (b) ignition (electrodes and transformer (c) cell.

If unit goes out on safety, do not push the reset button for at least ten minutes. Do not push the reset button more than once before correcting the cause.

5. By means of the barometric draft regulator - adjust to a .03 draft at the chimney. This must be done by means of a draft meter. The maximum draft is not to be more than .04 as damage can result to the furnace when used as a gravity unit. The test must be made between the flue collar on the furnace and the draft regulator. a flue-gas analysis should be made and the unit adjusted so that between a 2% and 10% CO² is registered.
6. The combination fan & limit switch is thermally operated. The limit side is connected in series in the power supply to the oil burner. If because of blower failure, dirty filters or some other cause, the preset limit will interrupt the power supply to the burner. If the limit switch shuts the unit down it may be because of a common fault, not enough return air supply or a supply air grill being covered by a rug. The load side of the limit also supplies power to the transformer-relay. If the unit goes out on limit, the draft door will close.

The fan side of the combination control is adjustable with fan on & fan off fingers. If the furnace fan has been adjusted to deliver an 85°F temperature rise (difference between return air and supply air) a setting of fan on 125° and off at 90° - 100° is comfortable. The temperature rise is accomplished by speeding up or slowing down the fan by means of the adjustable pulley on the fan motor.

The fan speed is adjusted at the factory to give an 85° temperature rise at a .2 W.C. static pressure (air resistance in duct work) Since most home duct work does not have a resistance of this value the fan speed must be adjusted by means of the following:

With a thermometer measure the internal temperature in the warm air supply (place thermometer so that it cannot see the heat exchanger) and measure the temperature after the unit has been operating for at least 5 minutes. (be sure blower door is closed) measure the return air (at return air grill). If the difference is less than 85° slow the fan speed by opening the motor pulley or if it is of a greater value, close it. In the majority of cases the fan must be slowed.

By means of the motor adjustment bracket, adjust the motor so that the belt may be deflected at least one inch. This adjustment is important as a tight belt causes excessive fan bearing wear, it uses more electricity and it is noisy.

If the above instructions are followed, continuous air circulation can be comfortably accomplished without the added expense and problems of a two speed motor, simply by using the manual fan switch on the face of combination control.

Because of the positive seal doors, the NEWMAC COMBINATION FURNACE positively checks the fire insuring long burning and close control.

The oil burner thermostat on combination furnaces is generally set about 5° lower than the solid fuel side. When the solid fuel thermostat is calling for heat, the draft damper is open. If the fuel has been depleted and cannot keep the temperature up, the oil burner thermostat brings the oil burner on. Because the damper is wide open letting in access air, the oil burner is inefficient. The NEWMAC COMBINATION FURNACE has a relay that closes the damper, making the oil fuel side efficient once more.

For safe operating procedures for wood operation, refer to the label on the furnace. Important: Do not use salt wood (wood collected from sea shore.)

OPERATING

(3 of 3)

Draft over the fire is provided through the oil burner to slow down the build up of cresote. A small intense fire is preferable to a large smouldering one to reduce cresote build up.

If more air over the fire is required, the adjustable damper on the firedoor may be opened.

The furnace room must have adequate air for combustion. If the unit is in a confined space, one square inch of free air access for every 1,000 B.T.U. must be provided.

Use a chimney suitable for solid fuel which must be kept free of accumulations of soot and ash.

Accumulations of soot and ash not only create a fire hazard but cause poor efficiency.

In case of a soot fire, move all thermostats to their lowest setting and call the fire department.

POWER FAILURE

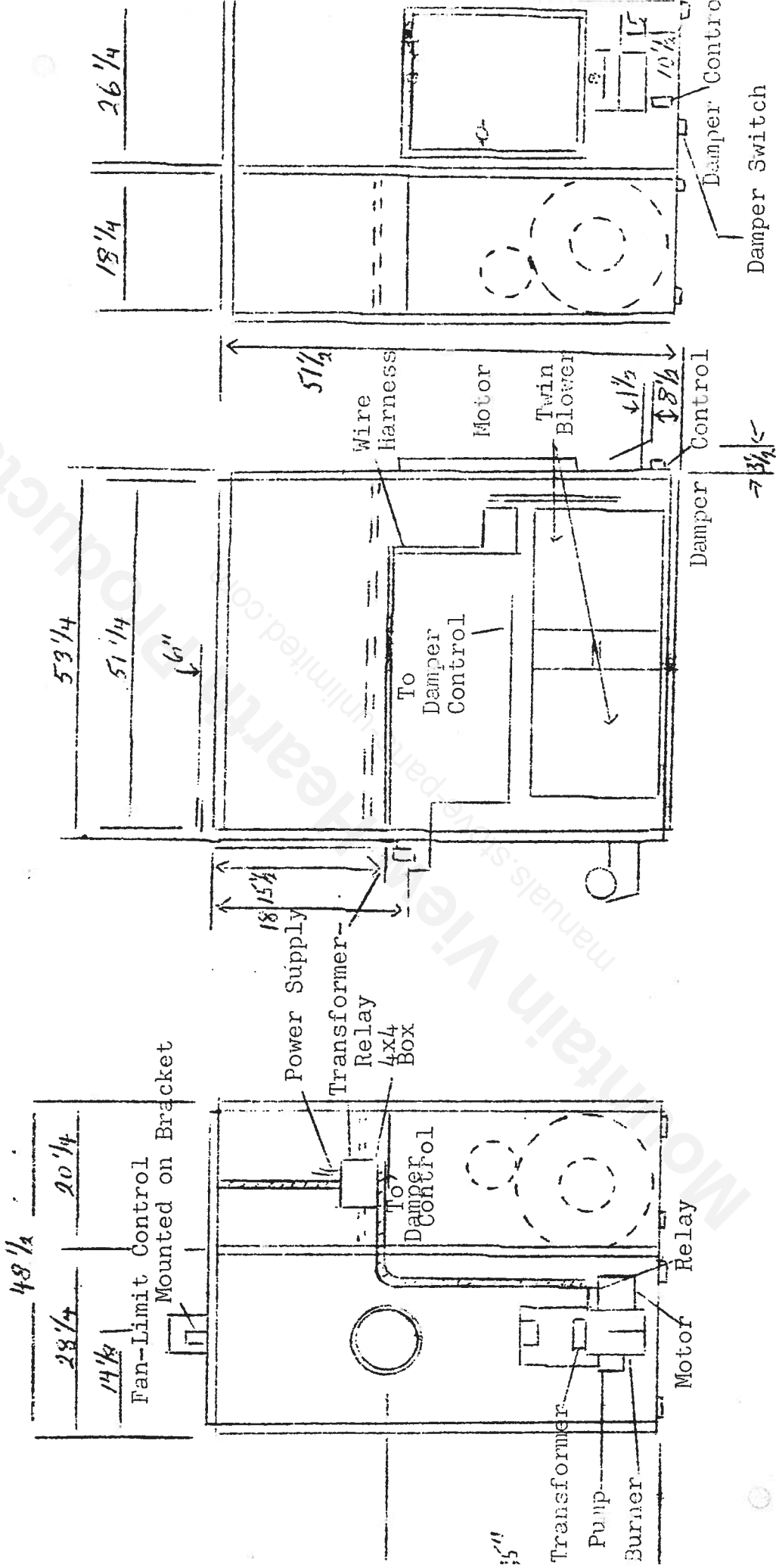
In case of a prolonged power failure, remove the blower access doors (2) so as to allow freer air movements. The draft damper will be closed. If more fire is needed, block the damper open with non-combustible material. At no time should it be more than 5/8" open.

DO NOT CHARGE the solid fuel side higher than half way up the stainless steel liner because overheating may result at the warm air outlets.

The damper must never be adjusted so that the opening is greater than 5/8".

June, 1976

(DIAGRAM #1) - Control Locations

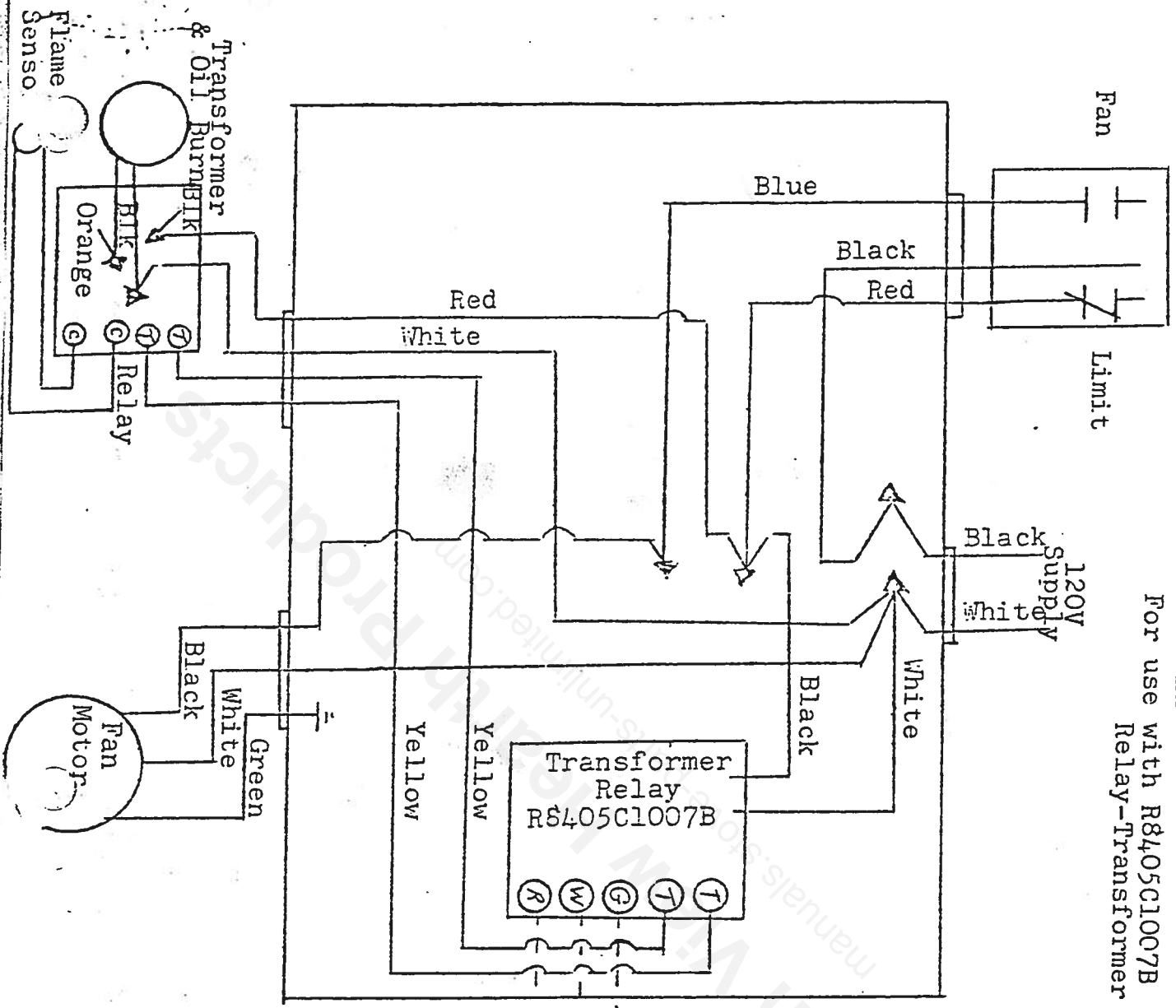


Comb. Control

DIAGRAM #2

For use with R8405C1007B
Relay-Transformer

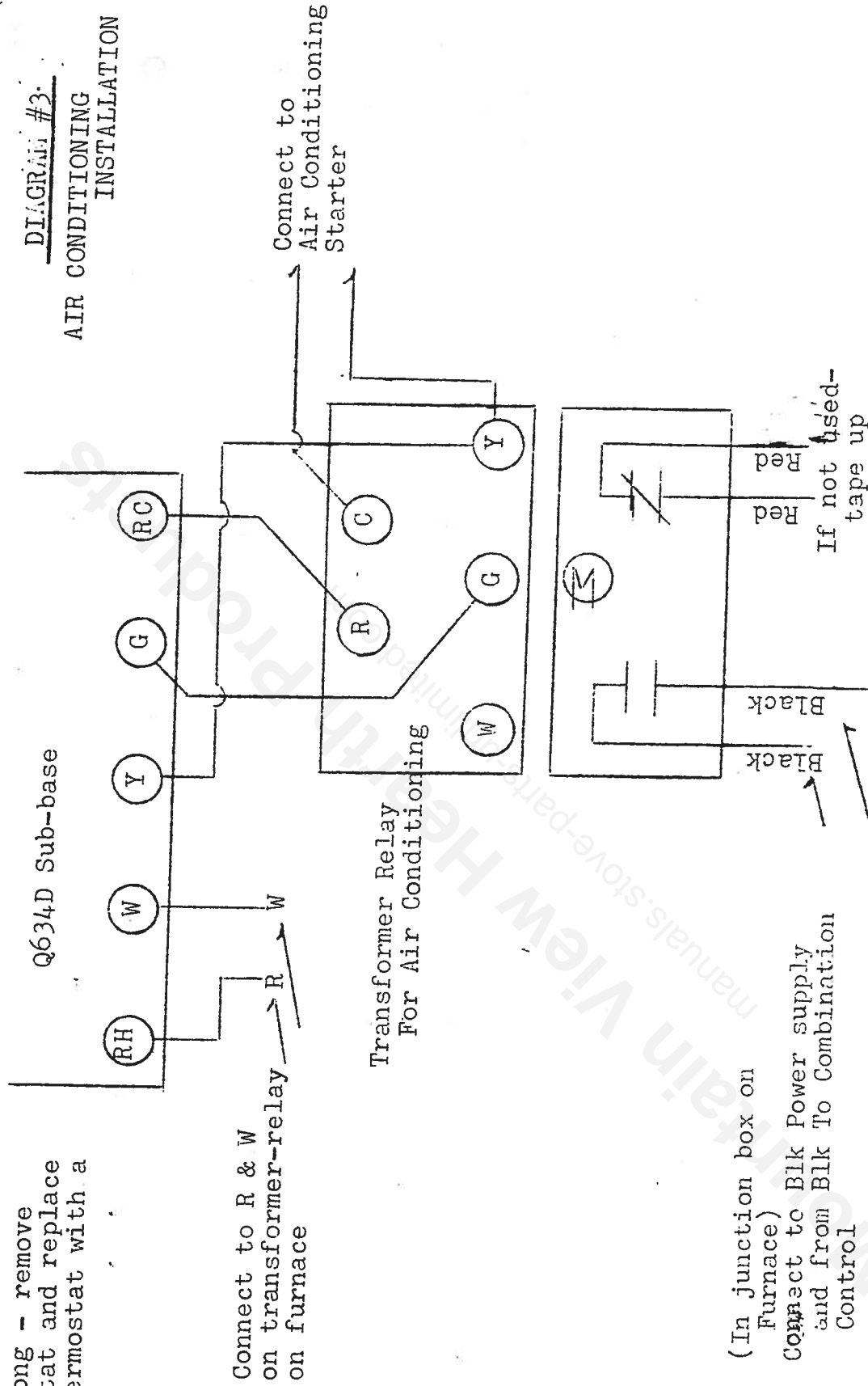
April 15th, 1977
Supersedes June, 1976



————— Factory Wired
- - - - - Field Wired

Note: Mount
Thermostats Side
by Side

For Air Conditioning - remove the oil thermostat and replace with a T834A Thermostat with a Q634D Sub-base.



BURNER OPERATING INSTRUCTIONS

GENERAL CARE:

This burner is fully automatic in operation. All adjustments have been carefully set and should not be changed. Keep burner free from excessive dirt and moisture. Any oil leaks, however small, should receive immediate attention. The oil filter should be cleaned once a year by the service man. The motor should be given a few drops of light oil two or three times a year. No other parts require lubrication.

FUEL:

The supply tank should be kept at least one-quarter full. Outside underground storage tanks if not equipped with a special gauge, are gauged by stick. Recommended grade of fuel No. 2 Furnace Oil.

CAUTION: (1) Do not use gasoline, crankcase or any oil containing gasoline. (2) Do not tamper with the unit or controls, call your serviceman. (3) Do not attempt to start burner when excess oil has accumulated, when the heating unit is full of vapour, or when the combustion chamber is very hot. (4) Do not start the burner unless the blower access door is secured in place. (5) Do not burn garbage or paper in the heating system, and never leave paper or rags around the unit.

HEATING PLANT:

Give your Heating Unit the proper care and attention. The use of the furnace as an incinerator is not recommended. Heating unit flues should be kept clean for economical operation. Dampers are set by installation men and should not be changed. Free ventilation must be permanently provided in the room where the burner installation is made.

CONTROLS:

The operation of the burner is normally controlled by room thermostat, which may be set for any temperature desired, usually 70°F. If a higher or lower temperature is desired, the indicator should be moved to the proper point on the scale. To shut down burner at any time, turn main switch to off position.

SUMMER SHUT DOWN:

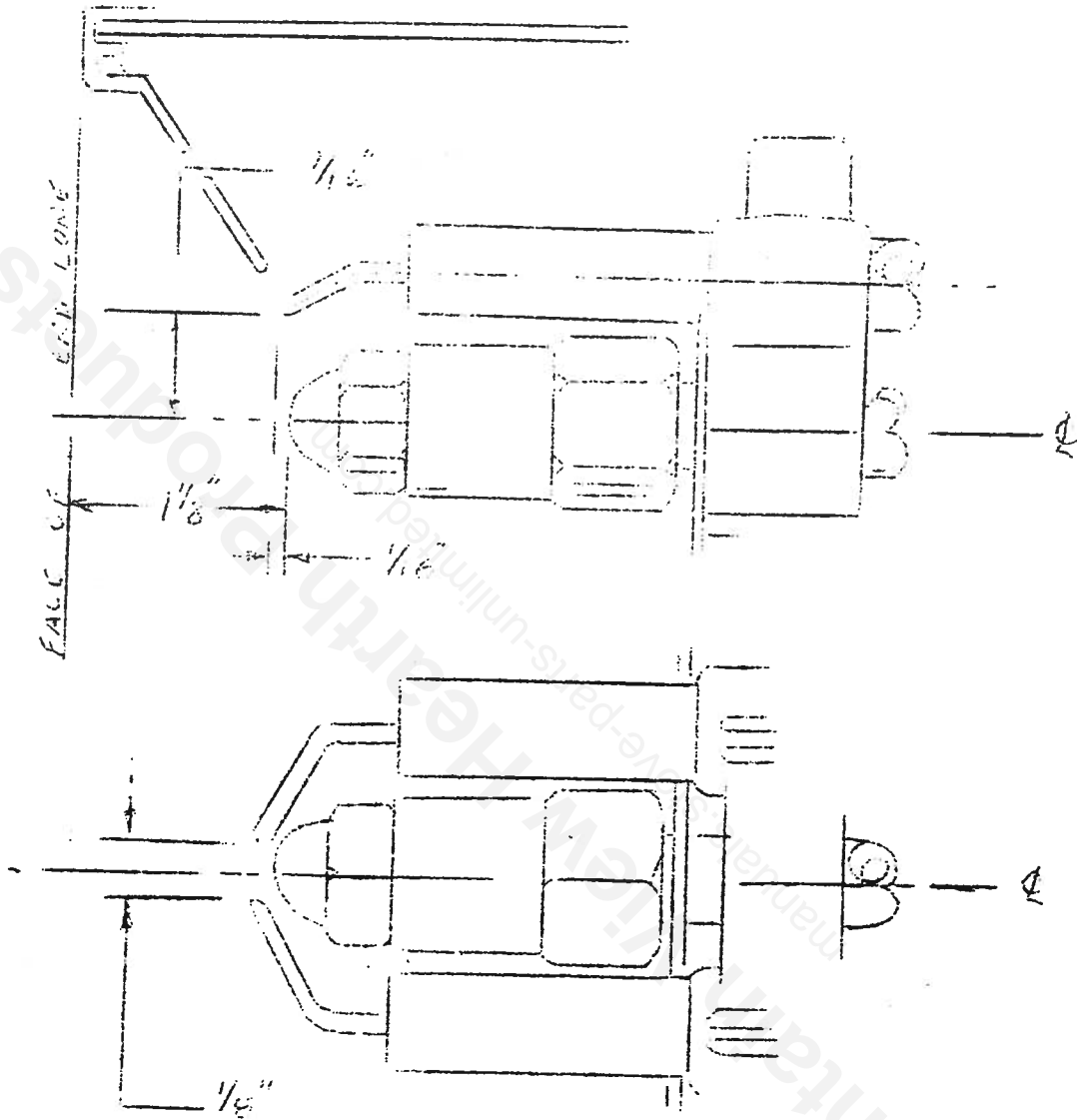
When burner is not to be used during the summer months turn off burner main switch. If the heating unit room is damp protect burner against dirt and moisture with light cover.

SAFETY SHUT-OFF:

An emergency oil shut-off valve is provided as required by local ordinance. Always keep the valve shut off if the burner is shut down for an extended period of time.

SERVICE:

If burner fails to run when the thermostat or other operating control is calling for heat, see that the main switch is turned on and that fuses are not blown. Be sure there is oil in the supply tank and that the electric service to the building has not been temporarily interrupted. Press button on burner control box and if burner still fails to start call the service. A periodical inspection of the burner is recommended.



ELECTRODE SETTING FOR AFC SERIES
 2ND OCTOBER 1972 RWS

AERO ENVIRONMENTAL LIMITED

PURCHASED PARTS

AERO Oil Burner	F-AFC-3-8 and F-AFC-4-8
White Rodgers	IF-30-301 Thermostat
White Rodgers	5D51-90 8" Combination Fan & Limit
White Rodgers	956-57 Cell
White Rodgers	651-45E7 Relay
Honeywell	R8184G1070 2 Relay
Honeywell	C554A1132 2 Cell
Honeywell	L4064B1337B - 8" Comb. Fan & Limit
Honeywell	R8239E1004 2 Transformer-Relay
Honeywell	M847A1015B Damper Motor
Honeywell	T822D1008 Thermostat
Delhi Ind.	Twin G10 Blower
Torin Mfg.	Twin BC1020-1020-1
Prestolite	1/4 1/3 1/2 HP
G.E.	1/4 1/3 1/2 HP
Ontor	RC-7 Field Draft Regulator

(STICKER ON FURNACE - WOOD END)

SPECIAL PROCEDURES

POWER FAILURE

- (1) Open the two blower access doors for better air circulation. If the furnace is in an enclosed area (furnace room) open the door to the room.
- (2) To control the wood fire operate the damper manually DO NOT CHANGE THE DAMPER STOP BRACKET SO THAT DAMPER CAN OPEN MORE THAN 5/8 INCH

SOOT FIRE

- (1) Close all sources of air that can reach the fire through the furnace and draft regulator. Insure the damper arm is disengaged.
Do not attempt to take the flue pipes down until the fire has been completely extinguished.

- RUNAWAY FIRE -- This can be caused by a wrong damper setting, too high a flue draft or excessive fuelling.
- (1) Close all sources of air to the furnace. Insure damper arm is disengaged.
 - (2) Set the barometric draft regulator wide open to reduce draft. The excessive heat caused by the runaway fire may damage the furnace safety controls. Their operation should be checked before the furnace is returned to service.

MINIMUM INSTALLATION CLEARANCES FROM COMBUSTIBLE MATERIAL

Oil burner end	24"
Wood door end	48"
One side	6"
Other side (walkway)	24"
Flue Pipe	18"
Plenum (To 6' from furnace)	6"
Floor non-combustible	

For further information refer to the installation, operating and service manual.

IMPORTANT NOTICE

The solid fuel side of this furnace is designed to burn wood only.

TO PREVENT DAMAGE: Do not load wood higher than the bottom of wood firedoor.

Do not set the flue draft above .04 W.C.

Do not open the damper more than 5/8"

FOR SAFE OPERATION: Place wood in the unit carefully to avoid damage.

Keep a minimum of 2" of sand or wood ash in bottom of the solid fuel side. (use pit sand only)

Do not use chemical or fluid fire starters.

Do not light a fire if oil vapour is present.

Do not burn garbage, manufactured fireplace logs, gasoline, naphtha or crankcase oil.

Keep the fire door closed except for charging.

When ashes come up to approximately 6" from draft louvers, remove them by:

(a) move all live ashes over to one side and remove the residue leaving a minimum of 2" in the bottom.

(b) move all live ashes over to the clean side and procede as in (a)

To maintain furnace efficiency and prevent soot fires, clean the heat exchanger flue pipes and chimney at the beginning of every heating season and after every 30 days of wood burning.

If green wood or wood with a high rosin content is used, open the overfire air opening in the firedoor to help keep the heat exchanger clean.

Do not store fuel or combustible material within the furnace clearances.

Do not use salt wood (driftwood gathered from the seashore)

FIREBRICK INSTALLATION

Place one of the T frames into the bottom of the Wood Chamber keeping a space of about 3" from the rear of the chamber to the vertical part of the T frame. The space between the T frame and the sides of the chamber should be equal.

Starting at the rear of the chamber, place the first layer of bricks on the T frame.

Place the second T frame over the bricks, locking them into position.

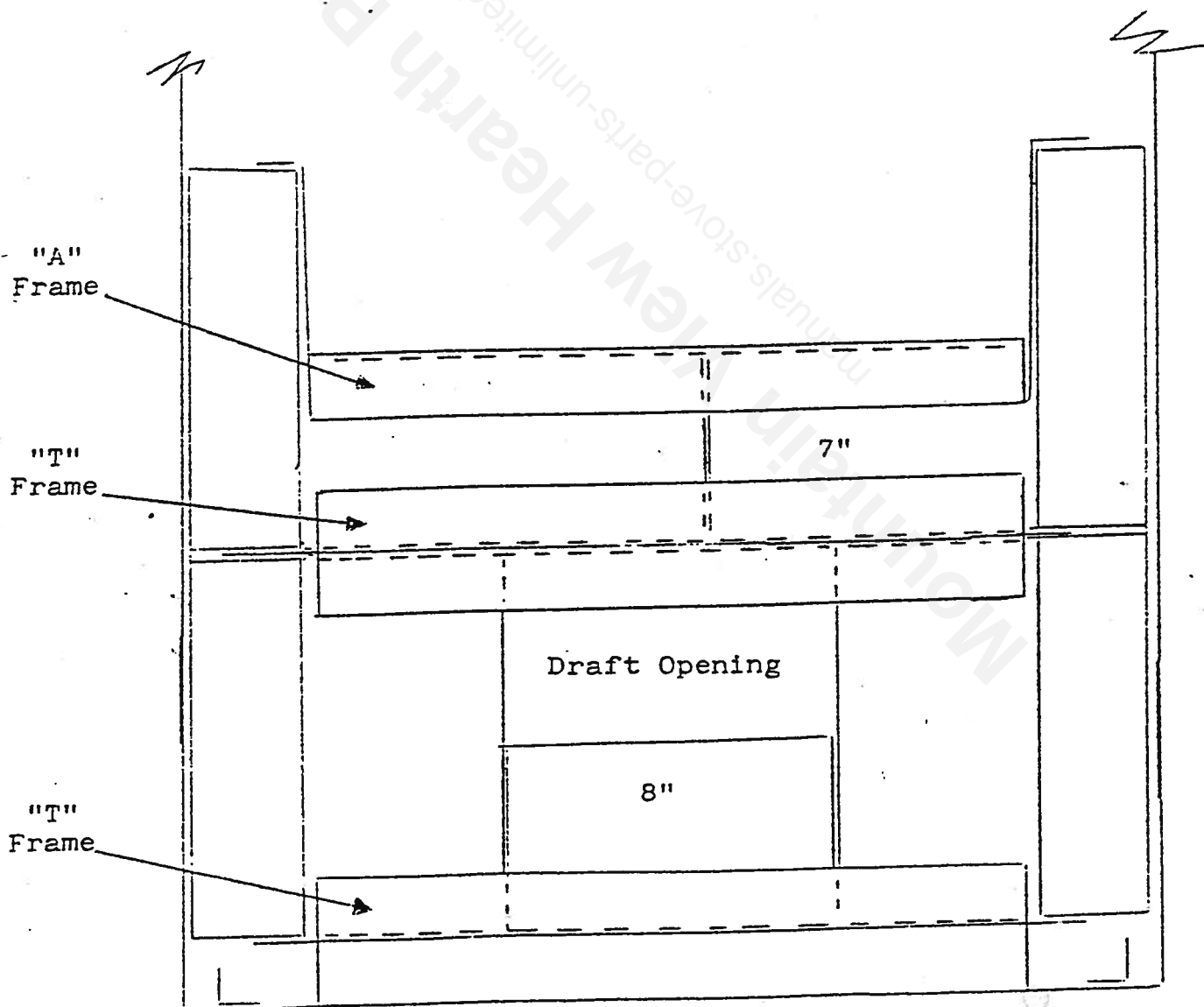
Install the second tier of bricks.

Place the top A frame into position, locking the brick in place.

Complete the installation by spreading dry sand on the chamber bottom (about 2").

<u>BRICKS</u>	
Bottom Row	14
Top Row	14
Front	<u>5</u>
Total	<u><u>33</u></u>

Top View



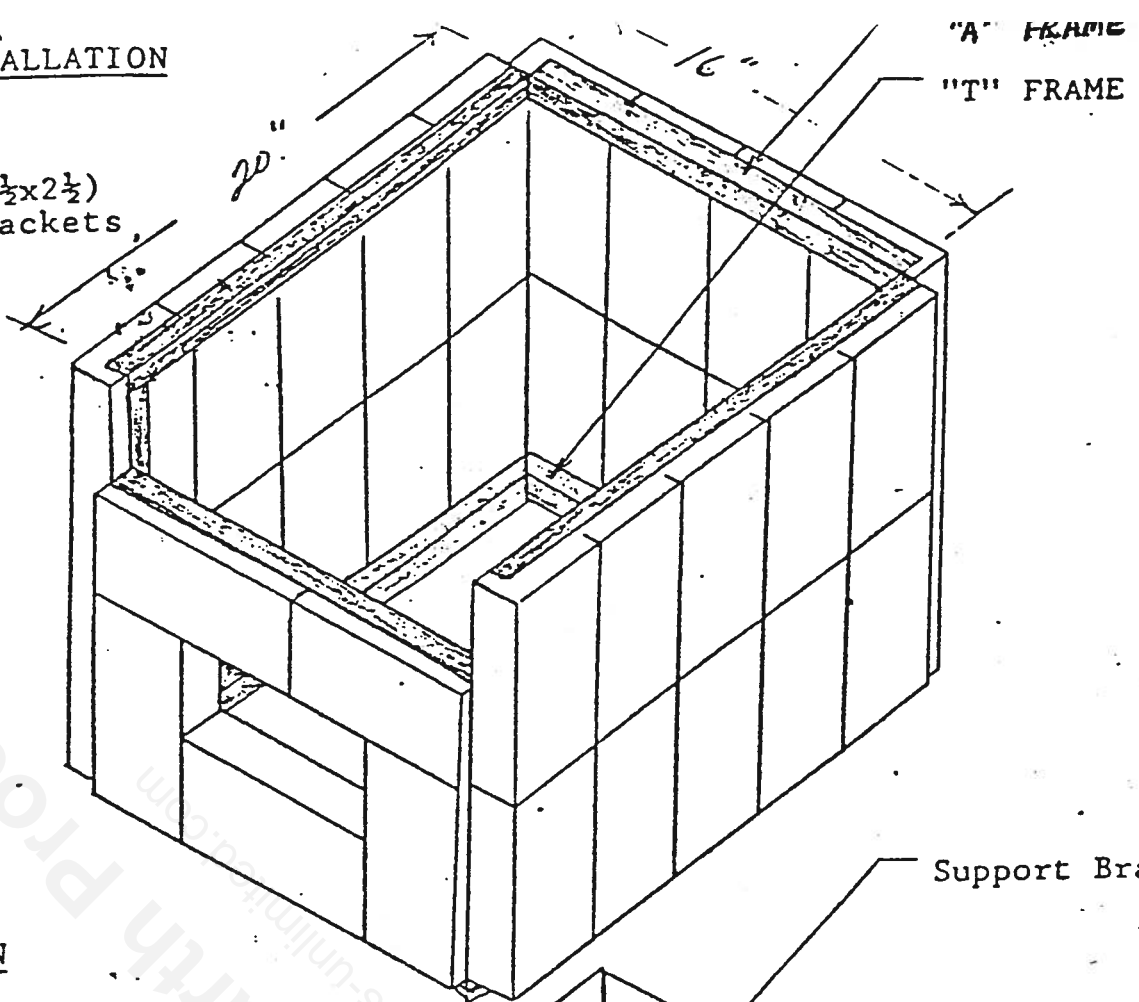
FRONT VIEW

BRIK - LOK

FIRE, BRICK INSTALLATION

PARTS REQUIRED

- 33 - Brick (9x4½x2½)
- 3 - Support Brackets
- 1 - "T" Frame
- 1 - "A" Frame



INSTALLATION

1. Centre "T" Frame in bottom of box.
2. Hook the 3 support brackets on lower retainers. (2 sides & rear)
3. Place brick in position as shown.
4. Set "A" frame on top of brick as shown.
5. Put 2" of sand or brick in bottom of fire-box to protect base.

