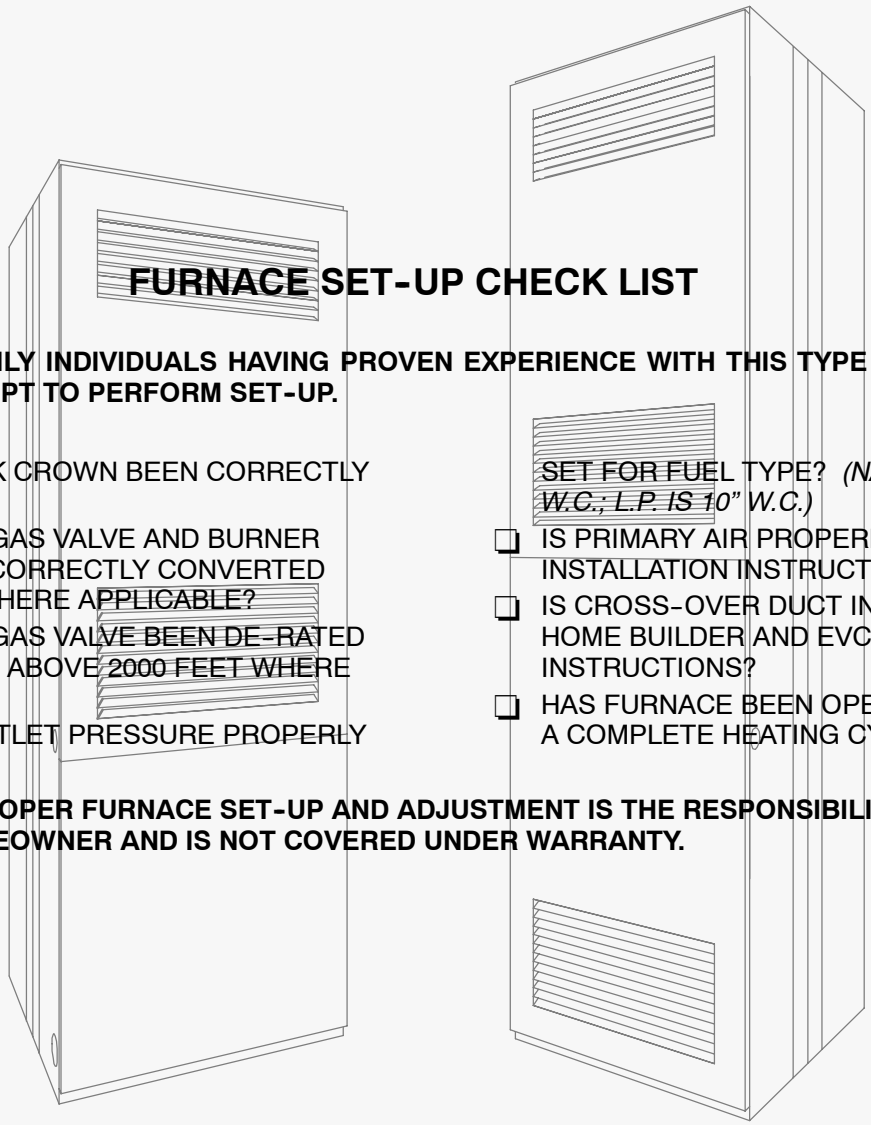
INSTALLATION INSTRUCTIONS

SEALED COMBUSTION DOWNFLOW GAS FURNACES

Forced Draft with Direct Ignition (Hot Surface)



FURNACE SET-UP CHECK LIST

IMPORTANT: ONLY INDIVIDUALS HAVING PROVEN EXPERIENCE WITH THIS TYPE OF EQUIPMENT SHOULD ATTEMPT TO PERFORM SET-UP.

- ❑ HAS ROOF JACK CROWN BEEN CORRECTLY INSTALLED?
- ❑ HAS FURNACE GAS VALVE AND BURNER ORIFICE BEEN CORRECTLY CONVERTED FOR L.P. GAS WHERE APPLICABLE?
- ❑ HAS FURNACE GAS VALVE BEEN DE-RATED FOR ALTITUDES ABOVE 2000 FEET WHERE APPLICABLE?
- ❑ IS GAS LINE OUTLET PRESSURE PROPERLY SET FOR FUEL TYPE? *(NATURAL GAS IS 3.5" W.C.; L.P. IS 10" W.C.)*
- ❑ IS PRIMARY AIR PROPERLY ADJUSTED PER INSTALLATION INSTRUCTIONS?
- ❑ IS CROSS-OVER DUCT INSTALLED PER HOME BUILDER AND EVCON INSTALLATION INSTRUCTIONS?
- ❑ HAS FURNACE BEEN OPERATED THROUGH A COMPLETE HEATING CYCLE?

IMPORTANT: PROPER FURNACE SET-UP AND ADJUSTMENT IS THE RESPONSIBILITY OF THE RETAILER/HOMEOWNER AND IS NOT COVERED UNDER WARRANTY.

DLAS MODELS
(No Coil Cabinet)

DGAT & DGAM MODELS
(With Built-In Coil Cabinet)

For Installation In:
1. Manufactured (Mobile) Homes
2. Recreational Vehicles & Park Models
3. Modular Homes & Buildings

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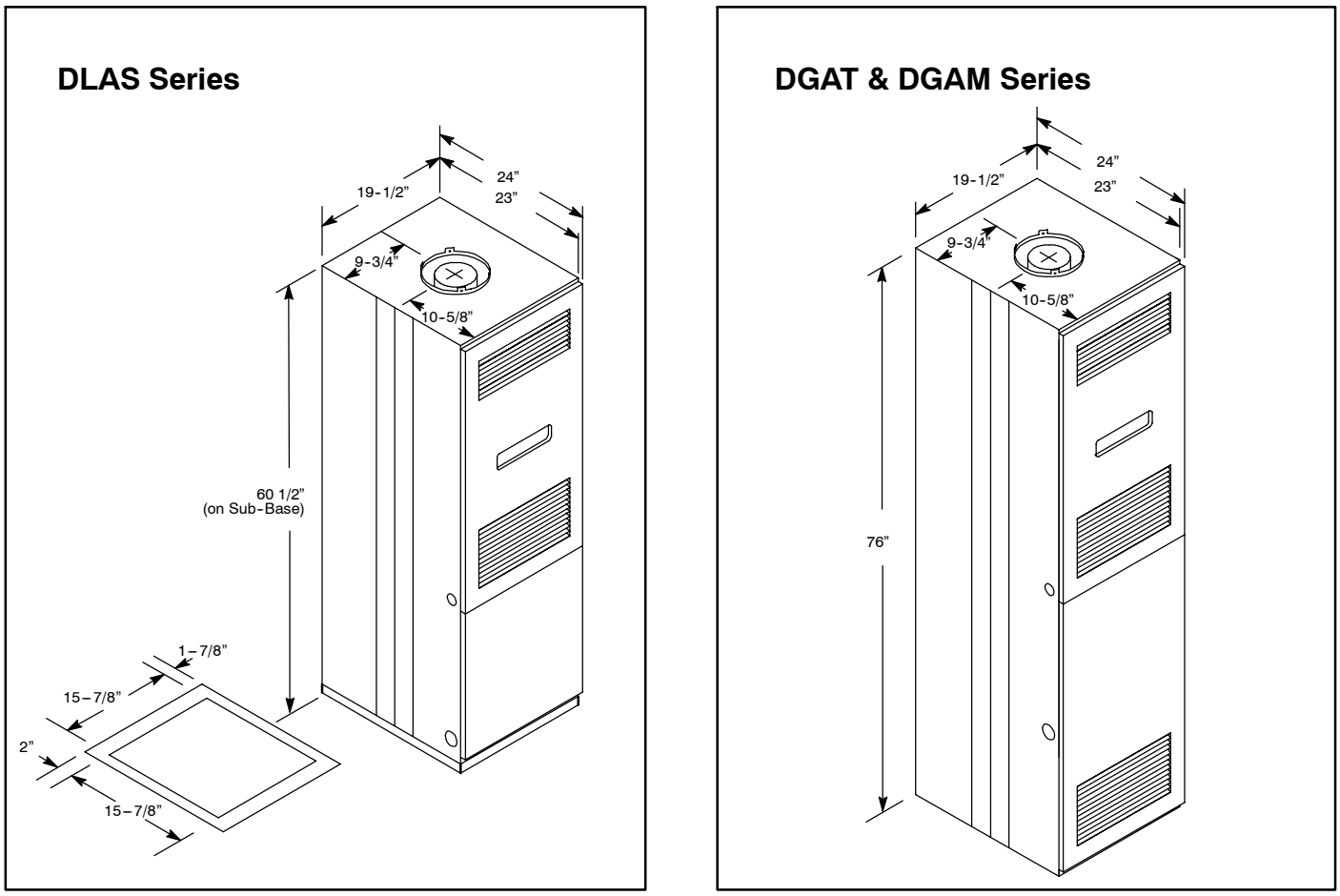


Figure 1 – DLAS, DGAT, and DGAM Series Furnace Dimensions

⚠ WARNING

IMPROPER INSTALLATION, ADJUSTMENT, SERVICE OR MAINTENANCE CAN CAUSE INJURY OR PROPERTY DAMAGE.

PLEASE REFER TO ALL THE INSTRUCTIONS OF THIS MANUAL FOR PROPER INSTALLATION PROCEDURES. IMPROPER INSTALLATION WILL VOID THE WARRANTY.

THE FURNACE SHALL BE INSTALLED SO THE ELECTRICAL COMPONENTS ARE PROTECTED FROM WATER.

DO NOT TEST THE FUEL SYSTEM AT MORE THAN 14 INCHES WATER COLUMN AFTER FURNACE HAS BEEN CONNECTED TO THE FUEL LINE. SUCH TESTING MAY VOID THE WARRANTY. ANY TEST RUN ABOVE 14 INCHES WATER COLUMN MAY DAMAGE THE FURNACE CONTROL VALVE WHICH COULD CAUSE AN EXPLOSION, FIRE, OR ASPHYXIATION.

IMPORTANT

These instructions are intended for the use of qualified individuals specially trained and experienced in installation of this type of equipment and related system components.

Installation and service personnel are required by some states to be licensed.

Persons not qualified shall not install this equipment or interpret these instructions.

NOTE

The words *"Shall"* or *"Must"* indicate a requirement which is essential to satisfactory and safe product performance.

The words *"Should"* or *"May"* indicate a recommendation or advice which is not essential and not required but which may be useful or helpful.

FURNACE SPECIFICATIONS

TABLE 1 — Furnace Specifications

DGAM — Automatic ignition — with Built-in Coil Cabinet — 4 Ton - A/C Ready			
Model No.	Factory Equipped for use with:	Input/BTUH	Output/BTUH
DGAM056BDE	NATURAL GAS	56,000	46,000
DGAM075BDE	NATURAL GAS	75,000	61,000

DGAT — Automatic Ignition — with Built-in Coil Cabinet — 3 Ton - A/C Ready			
Model No.	Factory Equipped for use with:	Input/BTUH	Output/BTUH
DGAT056BDE	NATURAL GAS	56,000	46,000
DGAT070BDE	NATURAL GAS	70,000	57,000
DGAT075BDE	NATURAL GAS	75,000	61,000
DGAT090BDE	NATURAL GAS	90,000	72,000

DLAS — Automatic Ignition — Heating Only — No Coil Cabinet			
Model No.	Factory Equipped for use with:	Input/BTUH	Output/BTUH
DLAS056BDE	PROPANE	56,000	47,000
DLAS075BDE	PROPANE	75,000	62,000

TABLE 2 — Electrical Specifications	
Electrical Power Supply —	**120 Volts — 60 Hz — 1 Phase**
Breaker or Fuse —	**15 Amp**
Thermostat Circuit —	**24 Volt — 60 Hz — 40 VA**
Nominal Anticipator Setting —	**.50**
Gas Valve Inlet —	**$^1/_2$" NFPT**

Comply with Local Codes

The installer shall familiarize himself with and comply with all local codes and regulations which govern the installation of this appliance. Local codes and regulations shall take precedent over these regulations where applicable. In lieu of local codes, the appliance shall be installed in accordance with:

In the U.S.A.:

the National Electrical Code, in accordance with recommendations made by the National Board of Fire Underwriters, in accordance with the the American National Standard Institute National Fuel Gas Code (Ansi Z223.1/NFPA-54).

The installation must conform with:

local building codes,
Federal Manufactured Home Construction & Safety Standard (H.U.D. Title 24, Part 3280),
or in the absence of local codes with:
American National Standard Mobile Homes A225.1 for installation in mobile homes, and American National Standard (ANSI-C1/NFPA-70) for all electrical wiring, and American National Standard (A119.2/ NFPA-501C) for installation in recreational vehicles.

In Canada:

Manufactured (Mobile) Homes:
Unit installation shall comply with current CSA standard CAN/CSA-Z240.4.1 - Installation Requirement for Gas Burning Appliances in Mobile Homes.

Unit electrical wiring and grounding shall comply with current standard CSA C22.1 - Canadian Electrical Code Part 1.

Recreational Vehicles:
Unit installation shall comply with current CSA standard CAN/CGA-Z240.4.2 - Installation Requirements for Propane Appliances and Equipment in Recreational Vehicles.

Unit electrical wiring and grounding shall comply with current CSA standard C22.2 No.148/CAN/CSA-Z240.6.2 - Electrical Requirements for recreational vehicles.

HIGH ALTITUDE INSTALLATION

For elevation above 2,000 feet, derate furnace orifice 4% for each 1,000 feet of elevation above sea level. Derating is accomplished by reducing the orifice size.
See Derating Chart for orifice size.

MINIMUM FURNACE CLEARANCES

Access for servicing is an important factor in the location of any furnace. A minimum of 24 inches should be provided in front of the furnace for access to the heating elements and controls. This access may be provided by a closet door or by locating the furnace 24 inches from a facing wall or partition.

These furnaces are design certified for the following minimum clearances from combustible material in alcove or closet installation:

TABLE 3 — Minimum Clearances

	CLOSET	ALCOVE
BACK	0”	0”
SIDES	0”	0”
FRONT	6”	24”
TOP	2”	2”
ROOF JACK	0”	0”
DUCT	0”	0”

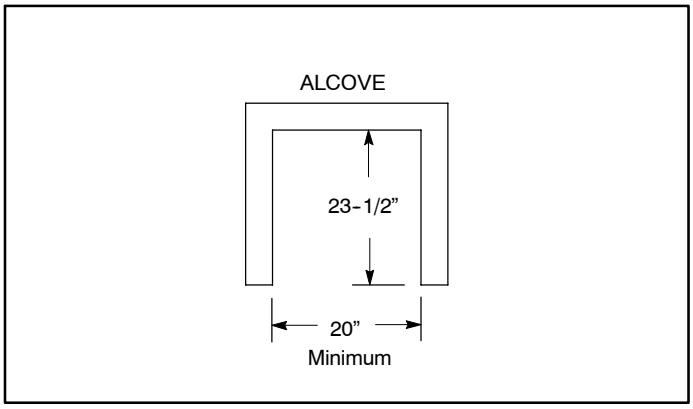
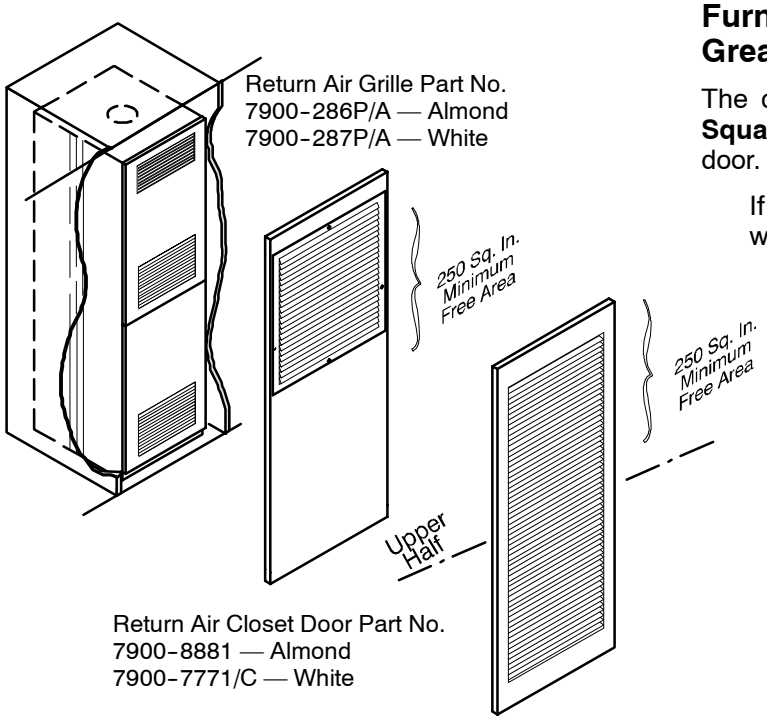


Figure 2 — Alcove Installation

RETURN AIR REQUIREMENTS
CLOSET INSTALLATIONS



Furnace to Closet Door Clearance — Greater than 6 Inches

The closet door **MUST** have a minimum of **250 Square Inches** of free area in the upper half of the door.

If the opening for return air is located in the sidewall and below the top of the furnace casing:

a. total side return must equal or exceed 350 sq. in. free area
b. 6" min. clearance must be provided on the side where the return is located
c. 6" min. clearance must be maintained in front of the furnace.

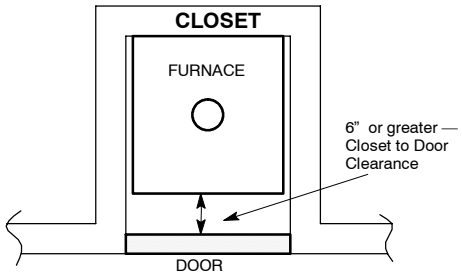


Figure 3 — Closet to Door Clearance — 6" or greater

Additional Requirements

Additional requirements for floor and ceiling return system for closet installed sealed combustion heating appliance are given in the next paragraph.

Floor or Ceiling Return Air System

Floor or ceiling return air system for closet installed direct vent forced air heating appliance.

Listed in the next paragraph are the conditions to be met by Mobile Home Manufacturers to have U.L. acceptance of in-floor or ceiling return air systems of closet installed direct vent forced air heating appliances for Mobile Homes to be sold in the United States.

A. The return-air opening into the closet, regardless of location, is to be sized not less than specified on the appliance's rating plate.

B. If the return-air opening is located in the floor of the closet (versus the vertical front or side wall), the opening is to be provided with means to prevent its inadvertent closure by a flat object placed over the opening.

C. The cross-sectional area of the return duct system (when located in the floor or ceiling of the mobile home) leading into the closet is to be not less than that of the opening specified on the appliance's rating plate.

D. The total free area of openings in the floor or ceiling registers serving the return-air duct system is to be not less than 150% of the size of the opening specified on the appliance's rating plate. At least one such register is to be located where likelihood of its being covered by carpeting, boxes, and other objects is minimized.

E. Materials located in the return duct system have a flame spread classification of 200 or less.

F. Non-combustible pans having one-inch upturned flanges are located beneath openings in the floor return duct system.

G. Wiring materials located in the return duct system conform to Article 300-22 (b&c) of the National Electric Code (ANSI C1 / NFPA-70).

H. Gas piping is not run in or through the return duct system.

I. The negative pressure in the closet as determined by test with the air-circulating fan operating at high heating speed and the closet door closed is to be not more negative than minus 0.05-inch water column.

J. For floor return systems, the mobile home manufacturer or installer shall affix a prominent marking on or near the appliance where it is easily read when the closet door is open. The marking shall read:

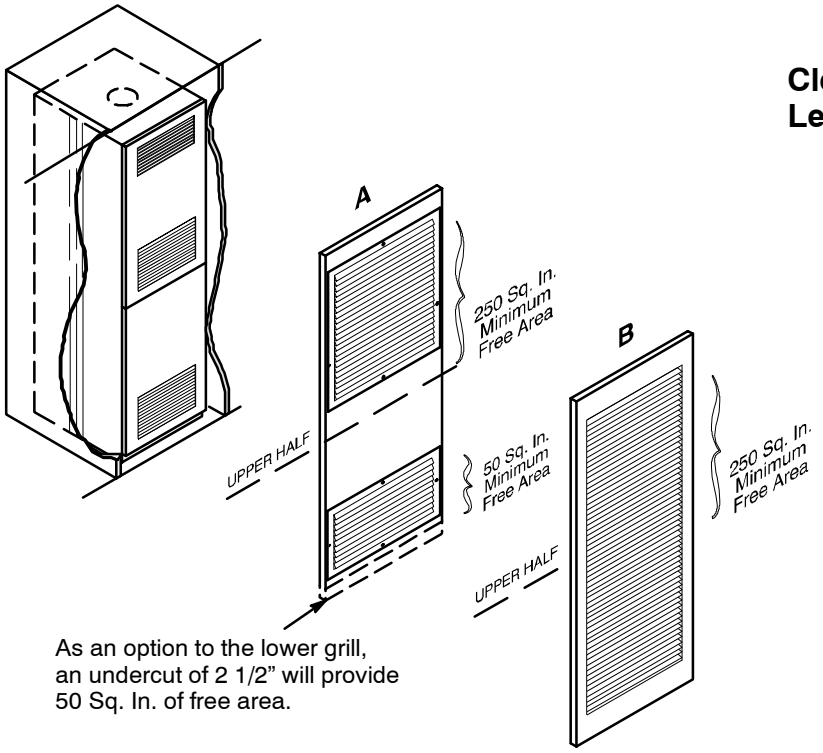
⚠ WARNING

HAZARD OF ASPHYXIATION
DO NOT COVER OR RESTRICT FLOOR OPENING

or equivalent.

SPECIAL CLOSET INSTALLATIONS

Furnace to Closet Door Clearance — Greater than 1 Inch and Less than 6 Inches



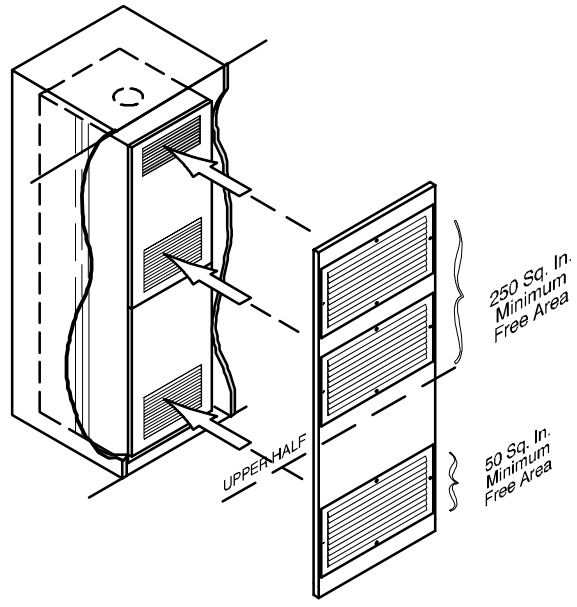
Clearance — Greater than 1 Inch and Less than 6 Inches

A. The closet door **MUST** have a minimum of **250 Square Inches** of free area in the upper half of the door and a minimum of **50 Square Inches** of free area in the lower area of the door.
The lower closet door grille may be omitted if an undercut of 2 1/2 Inches is provided in the door.

B. A fully louvered closet door **MUST** have a minimum of **250 Square Inches** of free area in the upper half of the door.

Figure 4 — Furnace to Closet Door Clearance — 1" to 6"

Furnace to Closet Door Clearance — Less than 1 Inch



Clearance — Less than 1"

The closet door **MUST** have three return air grilles. The total free area of the two **upper** grilles must be a minimum of **250 Square Inches.** The total free area of the **lower** grille **MUST** be a minimum of **50 Sq. In.**

NOTE: Each grille MUST BE ALIGNED directly opposite the corresponding return air grille of the furnace door.

Figure 5 — Furnace to Closet Door Clearance — Less than 1"

AIR DISTRIBUTION SYSTEMS

For proper air distribution, the supply duct system shall be designed so that the static pressure does not exceed the listed static pressure rating on the furnace rating plate.

Three typical distribution systems are illustrated in Figure 6.

Location, size and number of registers should be selected on the basis of best air distribution and floor plan of the home.

The Air Temperature Rise is to be adjusted to obtain a temperature rise within the range(s) specified on the furnace rating plate.

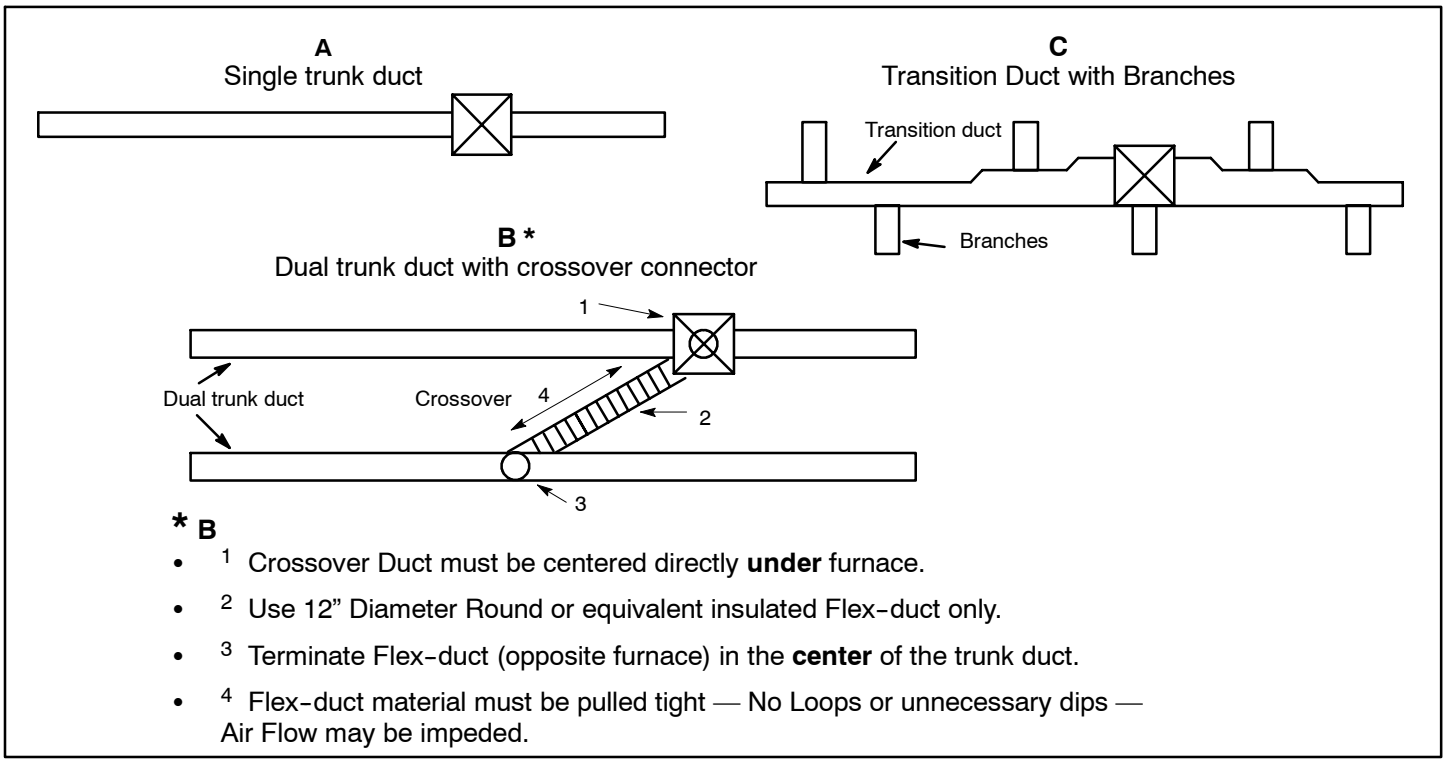


Figure 6 — Air Distribution Systems

⚠ CAUTION

Only use the appropriate roof jack.
See TABLE 4 & TABLE 5 for correct application.

Do not exceed the maximum height as determined from TABLE 4 & TABLE 5. Installer should allow an additional 1-$^1/_2$" travel before the flue pipe assembly is fully extended against the built-in stop. This provides an additional safeguard against the flue assembly being pulled from the roof jack during transportation or other stress conditions.

Improper installation may damage the equipment, can create a hazard, and will void the warranty.

Carefully follow all instructions and warnings to avoid Fire, Explosion, Or Asphyxiation.

Locating and Cutting Roof Jack Opening

To facilitate the proper installation of the roof jack, it is very important that the roof jack opening in the ceiling and roof be on the same vertical center line as the furnace flue collar. See Figure 7.

The dimensions shown in Figure 7 may be used if the furnace is flush with the walls or adjusted to allow for any spacing away from either wall.

Mark this location on ceiling and scribe a circle with a 5" radius (10" diameter) around this mark. Cut opening for roof jack through ceiling and roof. **(If furnace was installed during construction, cover furnace and flue opening to prevent debris from entering flue and combustion air when hole is cut for roof jack.)**

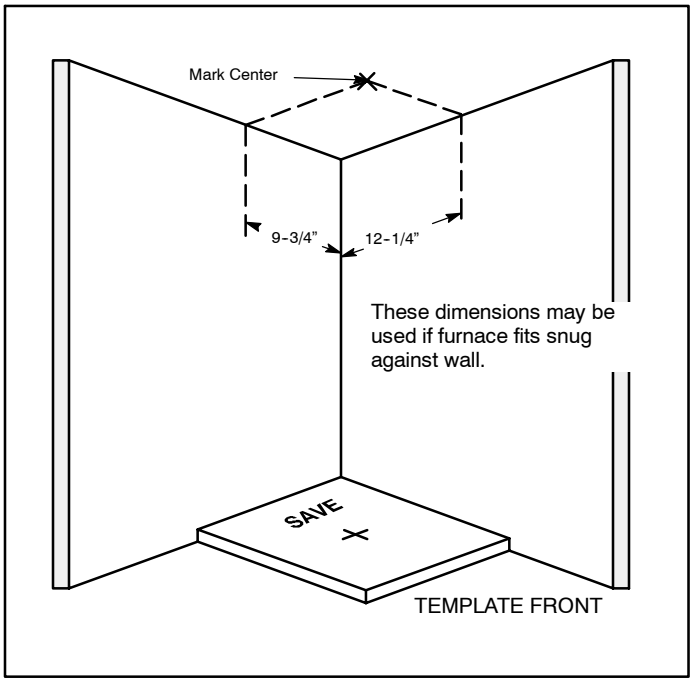


Figure 7 — Location of Roof Jack Opening

Installing Roof Jack in Roof

(See Figure 8 & Figure 9 for Dimensional requirements.)

Insert roof jack into opening in the roof.

The roof jack should be secured to the furnace before roof flange (flashing) is secured to the roof. This will insure a better alignment of the flue pipe and furnace flue collar. Caulk completely around the underside of the roof jack flashing to provide a rain tight seal, before securing roof jack flashing to roof. After roof jack flashing has been secured to the roof, caulk carefully all around swivel joint with sealant supplied by furnace manufacturer.

TABLE 4 — DLAS Roof Jacks

Roof Jack Model Number	Installation Dimensions	
	[1] Adjustable Height	
4000-7121/C	75" to 86"	These dimensions are from the floor to the top side of the roof. (See Figure 8.)
4000-7141/C **	83" to 104"	
4000-7151/C **	90" to 116"	
4000-7171/C	127" to 157"	
4000-8161/C *+	85" to 101"	
4000-8181/C *+	99" to 129"	

* These jacks have removable crowns.

Note: It is recommended that the 7900-6171 (17") Interior extension be used with these models. If used refer to TABLE 5 for sizing of roof jack.

** Available with 3-1/2, 12 Pitch Fixed Flashing.
Models 4000-6141 and 4000-6151
+ Available with 3-1/2, 12 Pitch Fixed Flashing.
Models 4000-9161 and 4000-9181

TABLE 5 — DGAT & DGAM Roof Jacks

Roof Jack Model Number	Installation Dimensions	
	[1] Adjustable Height	
4000-7101/C	86" to 95"	These dimensions are from the floor to the top side of the roof. See Figure 9.
4000-7121/C	91" to 102"	
4000-7141/C **	99" to 120"	
4000-7151/C **	106" to 132"	
4000-7171/C	143" to 173"	
4000-8161/C *+	101" to 117"	
4000-8181/C *+	115" to 145"	

* These jacks have removable crowns.

** Available with 3-1/2, 12 Pitch Fixed Flashing.
Models 4000-6141 and 4000-6151
+ Available with 3-1/2, 12 Pitch Fixed Flashing.
Models 4000-9161 and 4000-9181

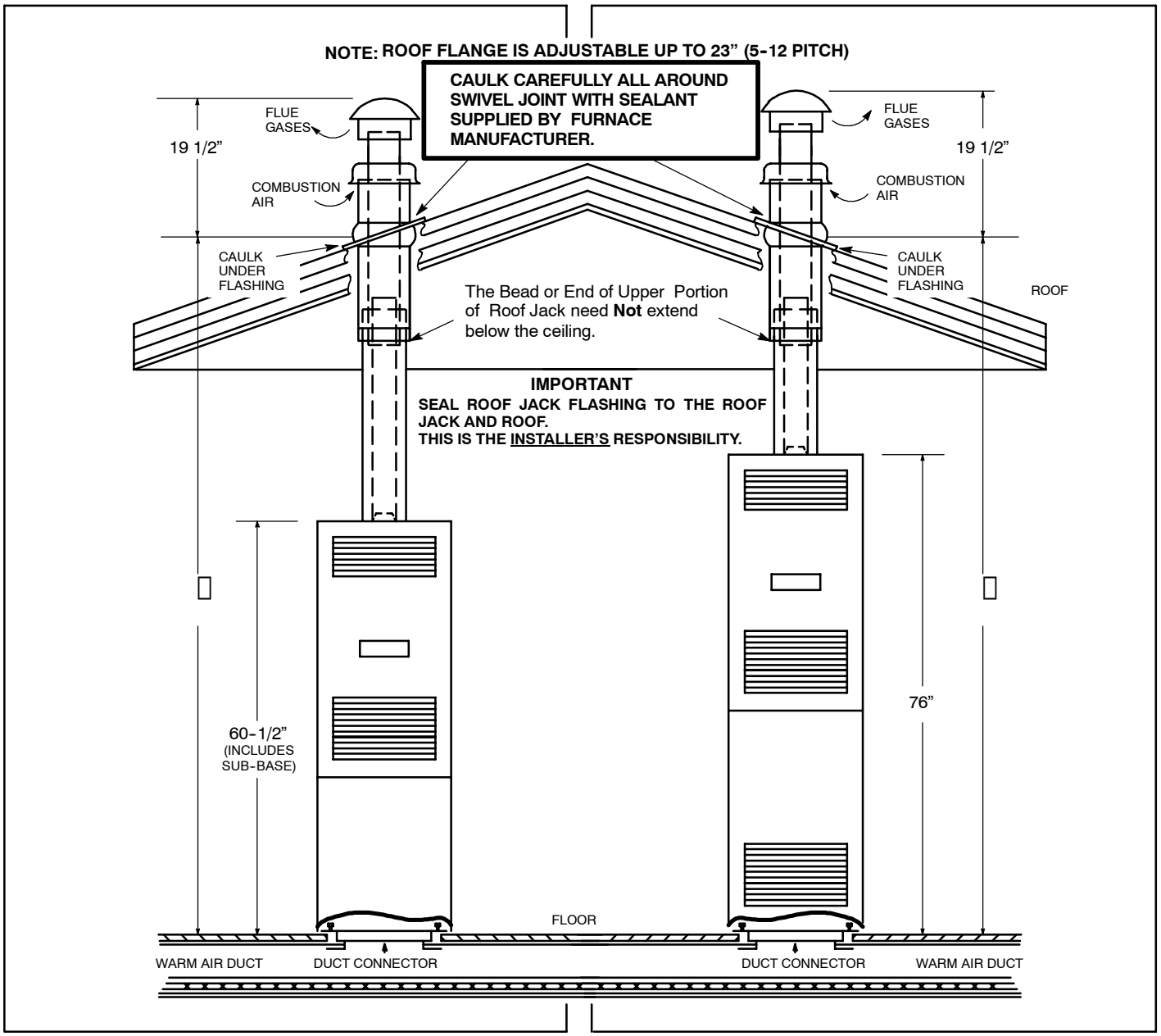


Figure 8 — DLAS Models

Figure 9 — DGAT & DGAM Models

CEILING RINGS

The ceiling ring is to meet fire stop requirements. Accessory Ceiling Ring (P/N 7660–2841) may be used, (see Figure 10) or the mobile home manufacturer or the installer may use other approved methods to stop fire.

If required, three (3) sections of Accessory Ring may be used as shown in Figure 10B to provide closer clearance around roof jack.

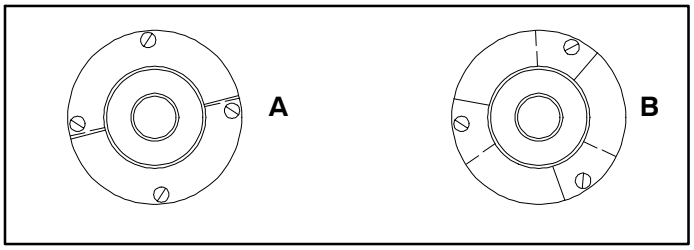


Figure 10 — Ceiling Rings

DUCT CONNECTORS

The duct connector is designed for use on ducts down to 12" in width. When using the connector on smaller width ducts, there will not be sufficient clearance to bend the tabs on two sides of the duct connector.

In such cases the tabs may be attached to the sides of the duct by using sheet metal screws or other suitable fasteners. Holes for sheet metal screws are provided in three (3) tabs on each side of the duct connector. If more than 3 tabs need to be used to provide a more secure and air tight connection, the remaining tabs can also be fastened to the duct with screws after drilling the required screw holes.

If tape is used to provide a better air seal, it should be a type approved by the applicable national or local codes.

TABLE 6 — Duct Connectors

Sales Package	Part Number	Depth
7681-6621	7681-602	2" Duct Connector — For Ducts 1-1/8" below top of floor surface
7681-6631	7681-603	3" Duct Connector — For Ducts 2-1/8" below top of floor surface
7681-6651	7681-605	5" Duct Connector — For Ducts 4-1/8" below top of floor surface
7681-6661	7681-606	6" Duct Connector — For Ducts 5-1/8" below top of floor surface
7681-6671	7681-607	7" Duct Connector — For Ducts 6-1/8" below top of floor surface
7681-6681	7681-608	8" Duct Connector — For Ducts 7-1/8" below top of floor surface
7681-6691	7681-609	9" Duct Connector — For Ducts 8-1/8" below top of floor surface
7681-6611	7681-611	11" Duct Connector — For Ducts 10-1/8" below top of floor surface
7681-6711	7681-612	12" Duct Connector — For Ducts 11-1/8" below top of floor surface

TEMPLATE & CUTOUT DIMENSIONS

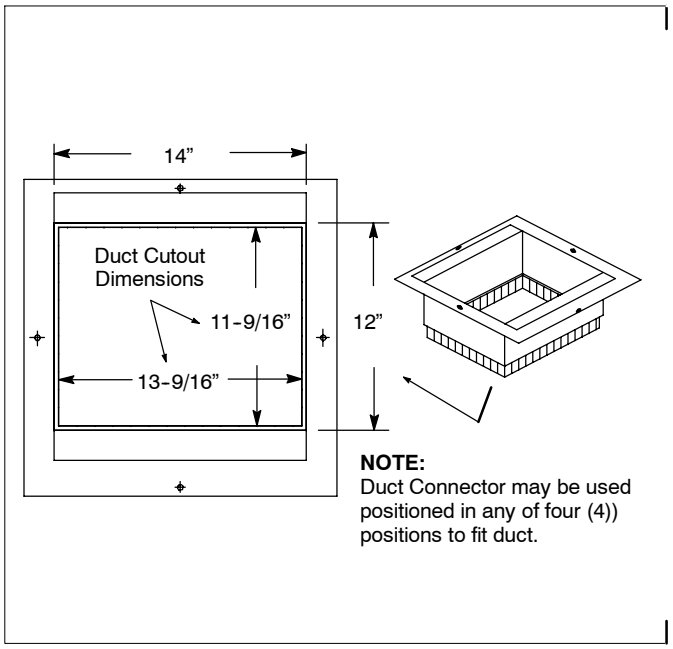


Figure 11 — Duct Connector Dimensions

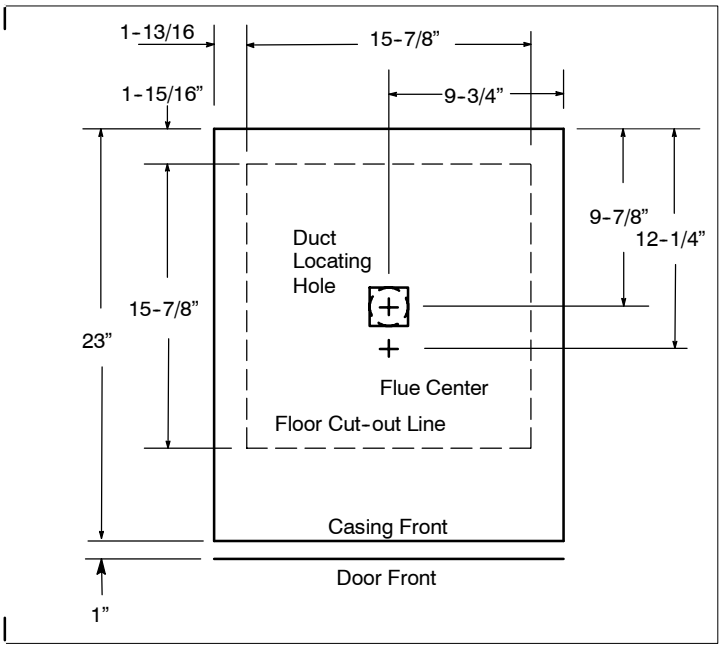


Figure 12 — Template

Installation Procedure for DLAS Furnace

The following steps are listed for installation of furnace and need not be performed in the exact order as listed.

Follow this procedure to avoid serious misalignment of furnace duct connector opening and supply duct.

A. This Furnace requires a SUB-BASE (Included)

For convenience, a template is provided on the furnace shipping carton. This may be cut out and used to accurately locate furnace, floor and vent openings. See Figure 12.

Locate template on floor to provide proper clearances to the walls and the front. Cut 2" diameter hole or small square hole as indicated on template.

Locate template so that furnace opening outline is centered over under-floor supply duct as accurately as possible. This is important because of the limited adjustment from side to side, and from front to rear of the duct connector.

Locate under-floor duct through hole and center "floor cut-out opening" on template over duct.

Accurately cut "floor cut-out opening" from template, mark floor opening, remove template and cut floor on outside edge of marked line.

Position sub-base over hole.

Duct connectors will fit openings of sub-base in any one of four (4) positions. Place proper duct connector in the opening in the best position, (duct connector may be shifted in either direction for best location).

Mark duct opening with a scribe or marking pen, then remove duct connector. Cut hole in duct to correct size according to dimensions shown in Figure 11. Cut duct accurately to prevent air leakage.

Reinstall duct connector with tabs inside of hole in the duct and bend tabs up firmly against underneath side of duct.

Secure duct connector with four (4) sheet metal screws using holes provided in the connector, and the sub-base. See Figure 13.

Secure sub-base to floor with 2 or more screws or nails.

B. Install Furnace

Check to make sure roof jack is not extending too far down into furnace location. Slide furnace into location and align over floor opening.

Pre-cut openings and knock-outs are provided in furnace base to install a front fuel line and/or front refrigerant lines. **If rear entrance lines are to be used, they must be installed before the duct connector is installed and secured in place.**

For air conditioning lines, remove the knock-out.

C. Securing Furnace

Make any minor adjustments in the furnace location necessary to insure that the opening in the furnace bottom is centered over the opening in the duct. Secure furnace to sub-base, as required, through holes at front and rear of furnace. Holes for screws are located in bottom flange front corners and rear flanges.

Secure furnace to wall at top by using metal strap provided. (See Figure 13.)

Manufacturers may add straps equivalent to provided straps, if required, for securing furnace to structural member.

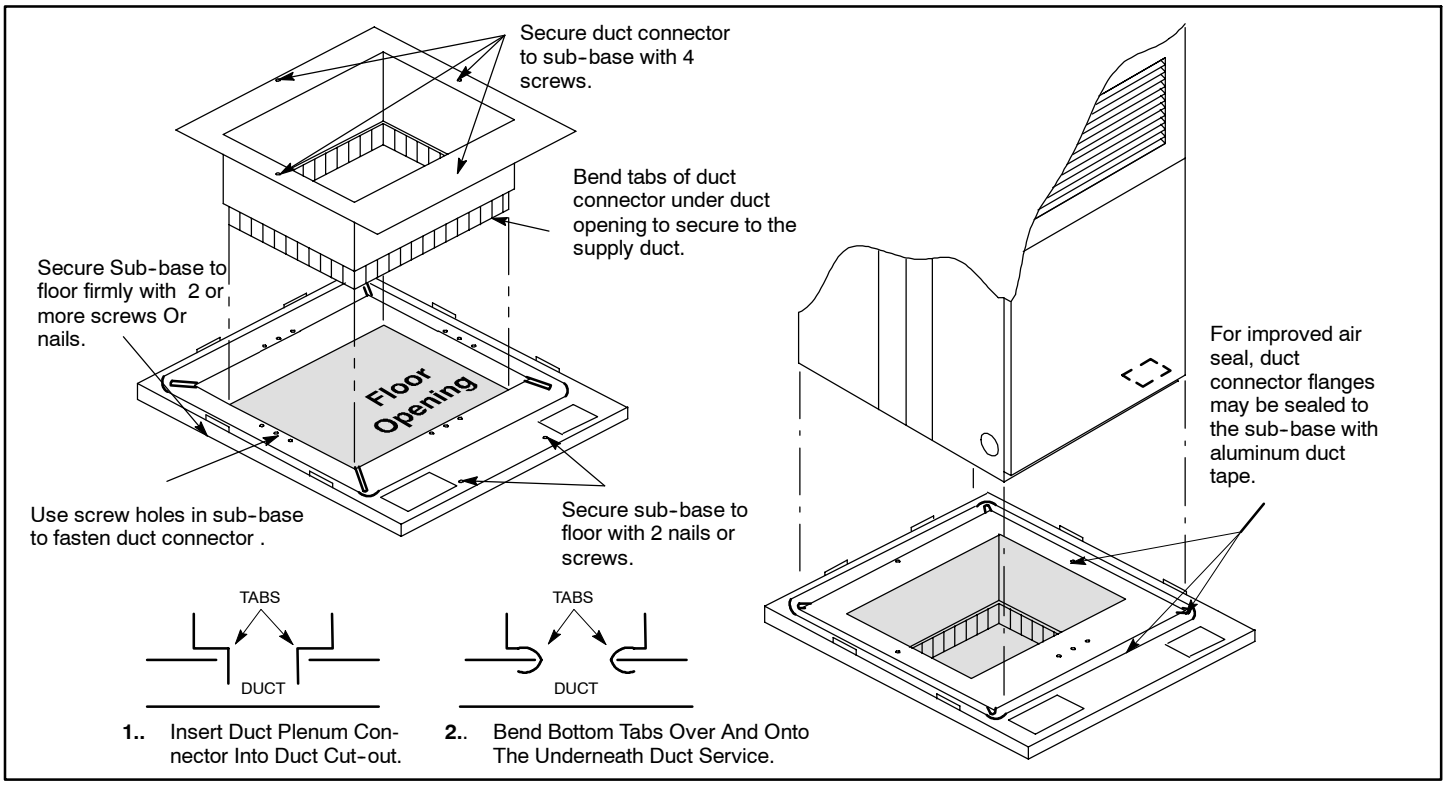


Figure 13 — Sub-base / Duct Connector

Installation Procedure for DGAT & DGAM Furnaces

The following steps are listed for installation of furnace and need not be performed in the exact order as listed:

Follow this procedure to avoid serious misalignment of furnace duct connector opening and supply duct.

A. This Furnace requires NO sub-base

For convenience, a template is provided on the furnace shipping carton. This may be cut out and used to accurately locate furnace, floor and vent openings. See Figure 12.

Locate template on floor to provide proper clearances to the walls and the front. Cut 2" diameter hole or small square hole as indicated on template.

Locate template so that furnace opening outline is centered over under-floor supply duct as accurately as possible. This is important because of the limited adjustment from side to side, and from front to rear of the duct connector.

Locate under-floor duct through hole and center "floor cut-out opening" on template over duct.

Accurately cut "floor cut-out opening" from template, mark floor opening, remove template and cut floor on outside edge of marked line.

Duct connectors will fit opening in any one of four (4) positions. Place proper duct connector in the opening in the best position, (duct connector may be shifted in either direction for best location).

Mark duct opening with a scribe or marking pen, then remove duct connector. Cut hole in duct to correct size according to dimensions shown in Figure 11. Cut duct accurately to prevent air leakage.

Reinstall duct connector with tabs inside of hole in the duct and bend tabs up firmly against underneath side of duct.

Secure duct connector to floor with four (4) sheet metal screws using holes provided in the connector. See Figure 14.

B. Install Furnace

Remove panel from air conditioning compartment. Check to make sure roof jack is not extending too far down into furnace location. Slide furnace into location and align over floor opening.

Pre-cut openings and knock-outs are provided in furnace base to install a front fuel line and/or front refrigerant lines. **If rear entrance lines are to be used, they must be installed before the duct connector is installed and secured in place.**

For air conditioning lines, remove the knock-out.

C. Securing Furnace

Make any minor adjustments in the furnace location necessary to insure that the opening in the furnace bottom is centered over the opening in the duct. Secure furnace to floor, as required, through holes at front and rear of furnace. Holes for screws are located in bottom flange front corners and rear flanges.

Secure furnace to wall at top by using metal strap provided. (See Figure 14.)

Manufacturers may add straps equivalent to provided straps, if required, for securing furnace to structural member.

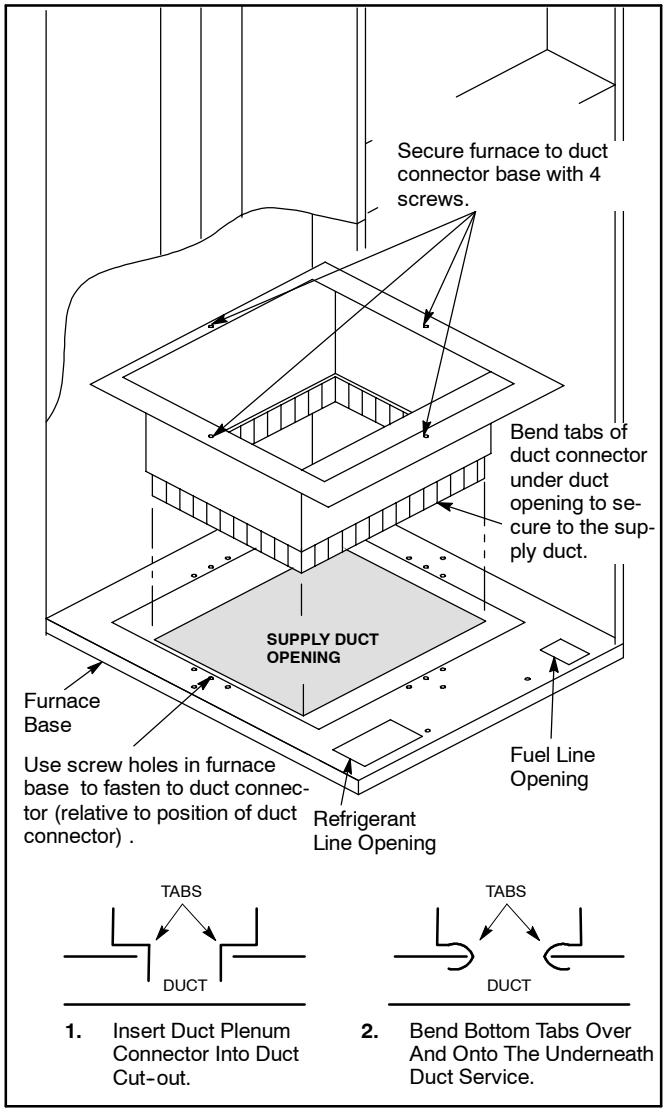


Figure 14 — Duct Connector

CONNECTING ROOF JACK TO FURNACE

⚠ CAUTION

The inner flue pipe must be present.

It is mandatory that the combustion air pipe and flue pipe assembly be fully engaged. The combustion air pipe MUST be securely fastened to the furnace with sheet metal screws in the holes provided.

Use $^1/_2$" blunt or sharp end sheet metal screws to fasten roof jack combustion air pipe to furnace combustion air collar. Screw holes are provided in the pipe and collar. Excessively long screws may extend to flue pipe and puncture it. Screws are not to exceed 1 $^1/_2$" in length.

NOTE

Combustion air tube and flue pipe are part of the same assembly. Only the combustion air tube need be fastened to the furnace.

1. Check to be certain that the flue pipe and combustion air tube are present.
2. Pull the telescoping flue tube and combustion air tube assembly down from the roof jack. Slide the flue tube/ combustion air tube assembly down firmly over the furnace flue outlet and combustion air collar. Insure that the back, side and front of combustion air tube collar is fully engaged and is in contact with gasket. Fasten the combustion air tube to the furnace combustion air collar using two (2) $^1/_2$ inch sheet metal screws. (Screw holes are provided in combustion air tube and furnace combustion air collar. (See Figure 15.)

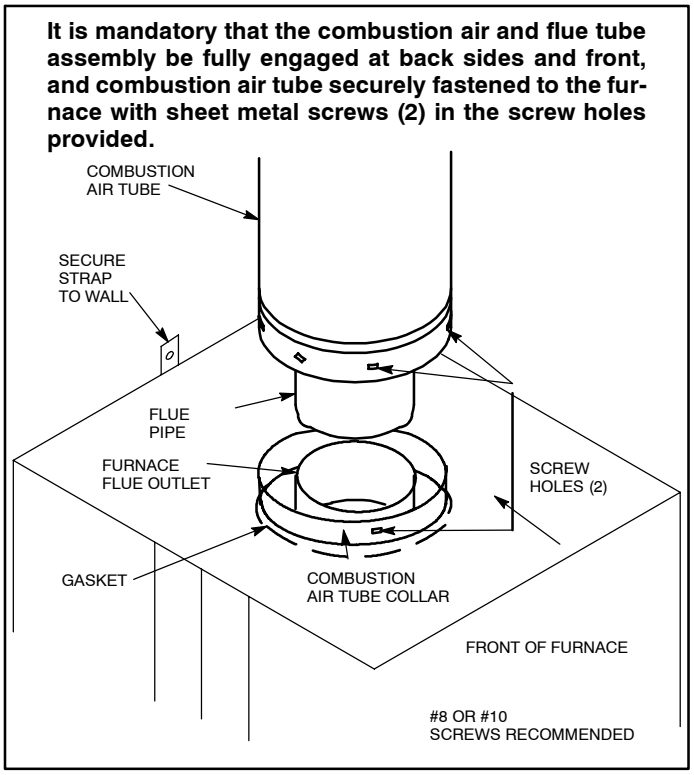


Figure 15 — Connecting Roof Jack to Furnace

IMPORTANT

VENT SYSTEM INSTALLATION INSTRUCTIONS

⚠ WARNING

FAILURE TO FOLLOW ALL VENTING INSTRUCTIONS CAN RESULT IN FIRE, ASPHYXIATION, OR EXPLOSION.

The vent system is an important part of your furnace installation. Carefully read and observe the following basic instructions, as well as those packed with the vent system.

EXISTING FURNACE REPLACEMENT

IF THIS FURNACE REPLACES AN **EXISTING FURNACE**, DO THE FOLLOWING.

1. If a 2nd roof, roof cap or addition has been made to the existing roof of the home, **remove the old vent system completely!... to avoid the possibility of an improperly installed pipe or gaps in the old vent system, INSTALL A NEW VENT SYSTEM. Your ceiling and roof height will determine the correct vent system to use. Refer to the vent selection table, of the furnace installation instructions.**
2. After unpacking the vent system, check the rain caps. Insure they are not damaged, tilted or crooked. **Do not twist, crush or sit on the roof caps during installation.** Damaged roof caps will cause improper furnace operation. The furnace will not heat properly and could result in explosion.
3. Before inserting the vent pipe into the furnace top, inspect the furnace flue and combustion air opening for debris or insulation which might have fallen in during pre-installation steps. Do not proceed unless all debris have been cleaned out or removed.
4. After installing vent pipe on furnace top collar, check to make sure there is no gap in back or side between the pipe collar and the furnace casing top.
5. Use only the pipes provided with the roof jack assembly. Do not add to or adapt other sheet metal pipes. **Do not cut, insert or add other pipes to this assembly.**
6. In no case should there be a gap between sections of the flue pipe or the combustion air pipe. If necessary to prevent excessive air leakage, the installer should seal joints in the combustion air tube with aluminum type or other suitable sealant.

NEW HOME INSTALLATION

IF THIS FURNACE IS INSTALLED ON A **NEW HOME** DO THE FOLLOWING

1. Inspect the furnace top collars for signs of insulation or ceiling debris which might have fallen in during cutting of the ceiling and roof holes. Remove all debris before continuing.
2. After unpacking the vent system, check the rain caps. Insure they are not damaged, tilted or crooked. **Do not twist, crush or sit on the roof caps during installation.** Damaged roof caps will cause improper furnace operation. The furnace will not heat properly and could result in explosion.
3. Before inserting the vent pipe into the furnace top, inspect the furnace flue and combustion air opening for debris or insulation which might have fallen in during pre-installation steps. Do not proceed unless all debris have been cleaned out or removed.
4. After installing vent pipe on furnace top collar, check to make sure there is no gap in back or side between the pipe collar and the furnace casing top. If necessary to prevent excessive air leakage, the installer should seal joints in the combustion air tube with aluminum type or other suitable sealant.

INSTALLATION IN SNOW REGIONS

When the combustion air pipe inlet is covered or blocked with snow, the furnace will not operate properly due to the depleted combustion air supply.

Therefore, if the furnace will be located in regions where snow accumulation on the roof exceeds 7" or in H.U.D. Snow Load Zones, a # 7680B6541 roof jack extension is recommended.

ELECTRICAL WIRING

⚠ CAUTION

TO INSTALLER: INCOMING POWER MUST BE POLARIZED. OBSERVE COLOR CODING.

DANGER

- SHOCK HAZARD -

DISCONNECT ELECTRICAL POWER SUPPLY TO THE UNIT BEFORE SERVICING TO AVOID THE POSSIBILITY OF SHOCK INJURY OR DAMAGE TO THE EQUIPMENT.

CONNECT POWER SUPPLY WIRES

a. Remove the field wiring cover.

b. Insert 115 volt wires through the large plastic bushing on the left side of the furnace (See Figure 16). If conduit is used it should be secured to the control box.

c. Connect the “hot” wire to the BLACK pigtail lead, and the “neutral” wire to the WHITE pigtail lead. Secure all connections with suitable wire nuts and wrap with electrical tape.

d. Connect the “ground” wire to the grounding screw.

e. Reinstall the control panel cover and secure mounting screw.

CONNECT THERMOSTAT WIRES

a. Insert 24 volt wires through the small plastic bushing just above the control panel.

b. Connect the thermostat wires to the furnace low voltage pigtails (See Figure16).

c. Connect low–voltage circuit to the wall thermostat pigtails.

A separate 120 V.A.C. supply circuit must be used for the furnace. The circuit should be protected by a 15 amp fuse or circuit breaker.

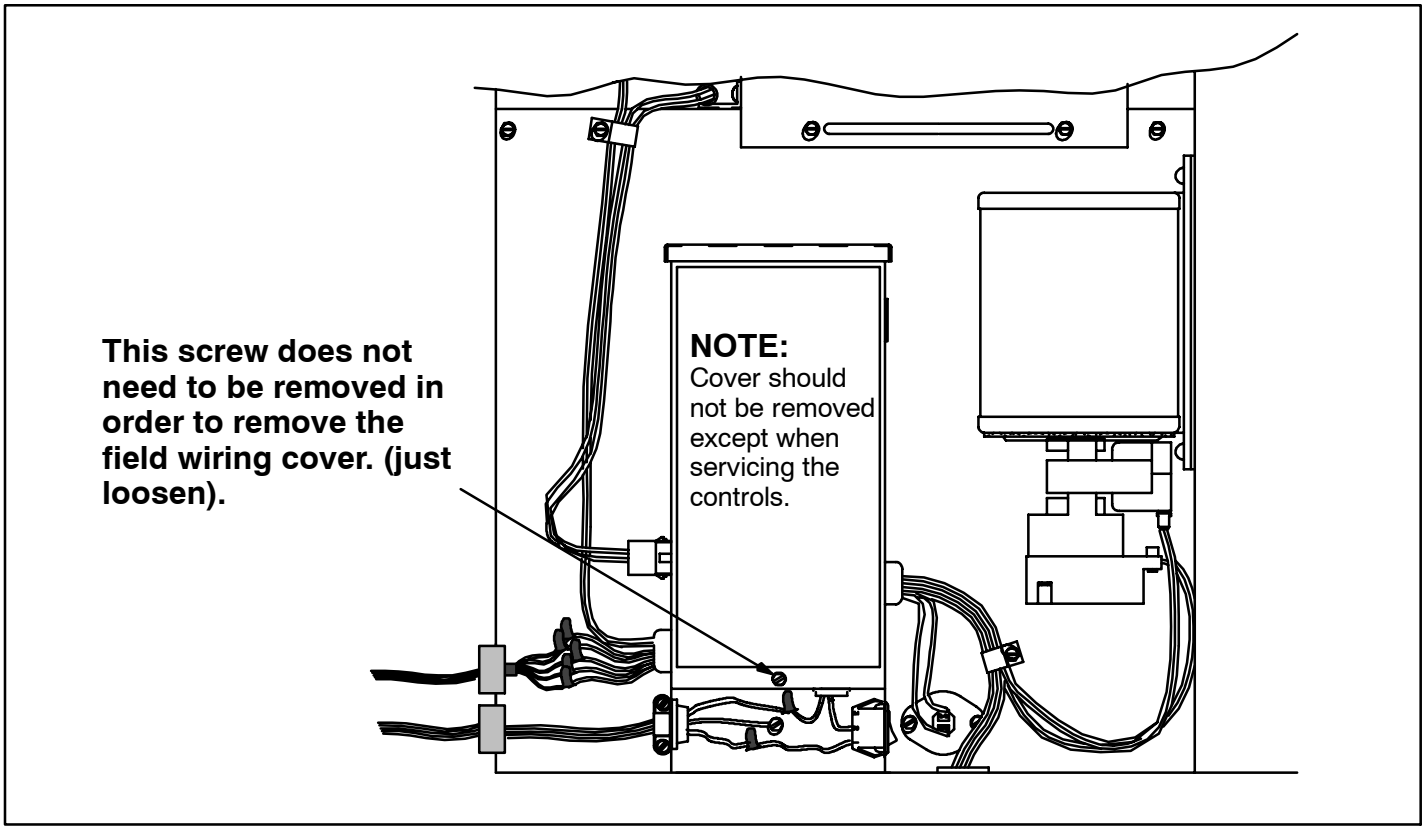


Figure 16

WALL THERMOSTAT

Avoid locations where the thermostat could be subject to drafts from outside, or exposed to direct light from lamps, sun, fireplaces, etc., or affected by air from a duct register blowing directly on the thermostat.

The wall thermostat should be located 52 to 66 inches above the floor. The preferred location is on an inside wall situated in an area with good air circulation, and where the temperature will be reasonably representative of other living areas the thermostat is controlling.

THERMOSTAT WIRING FOR DGAT AND DGAM SERIES

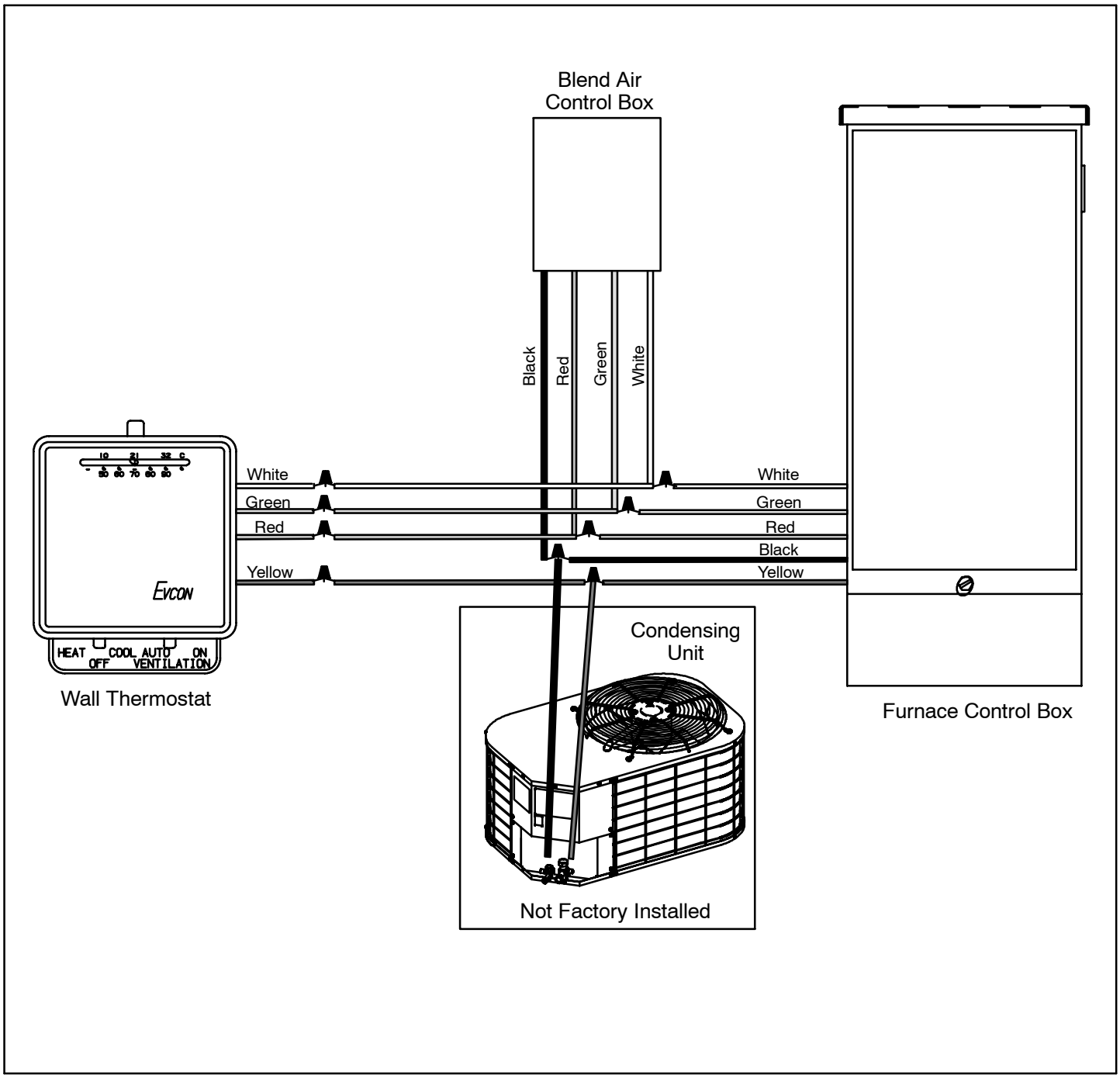


Figure17 - Thermostat Wiring

THERMOSTAT WIRING FOR DLAS (HEAT ONLY) SERIES

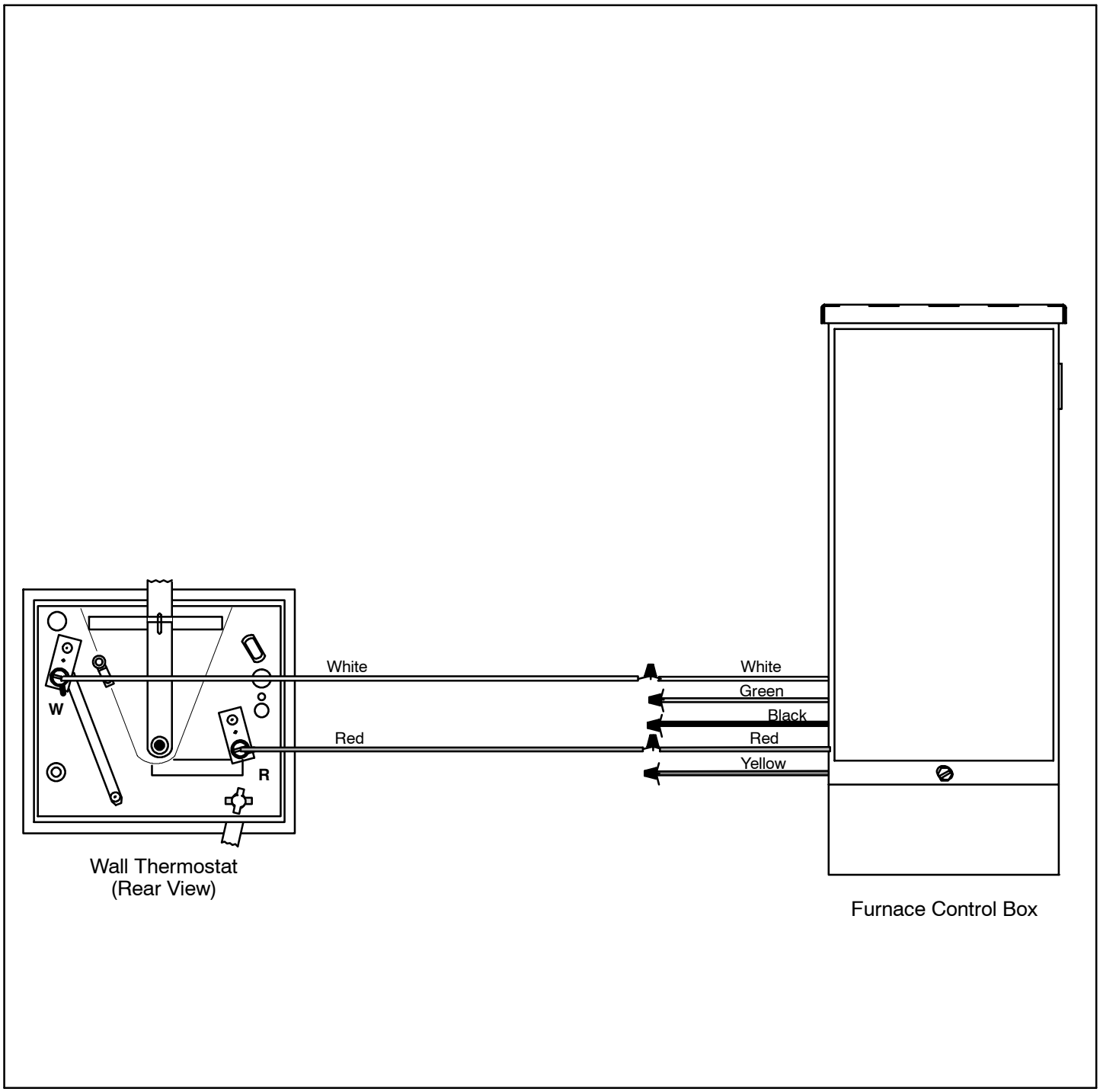


Figure17a - Thermostat Wiring for DLAS Series

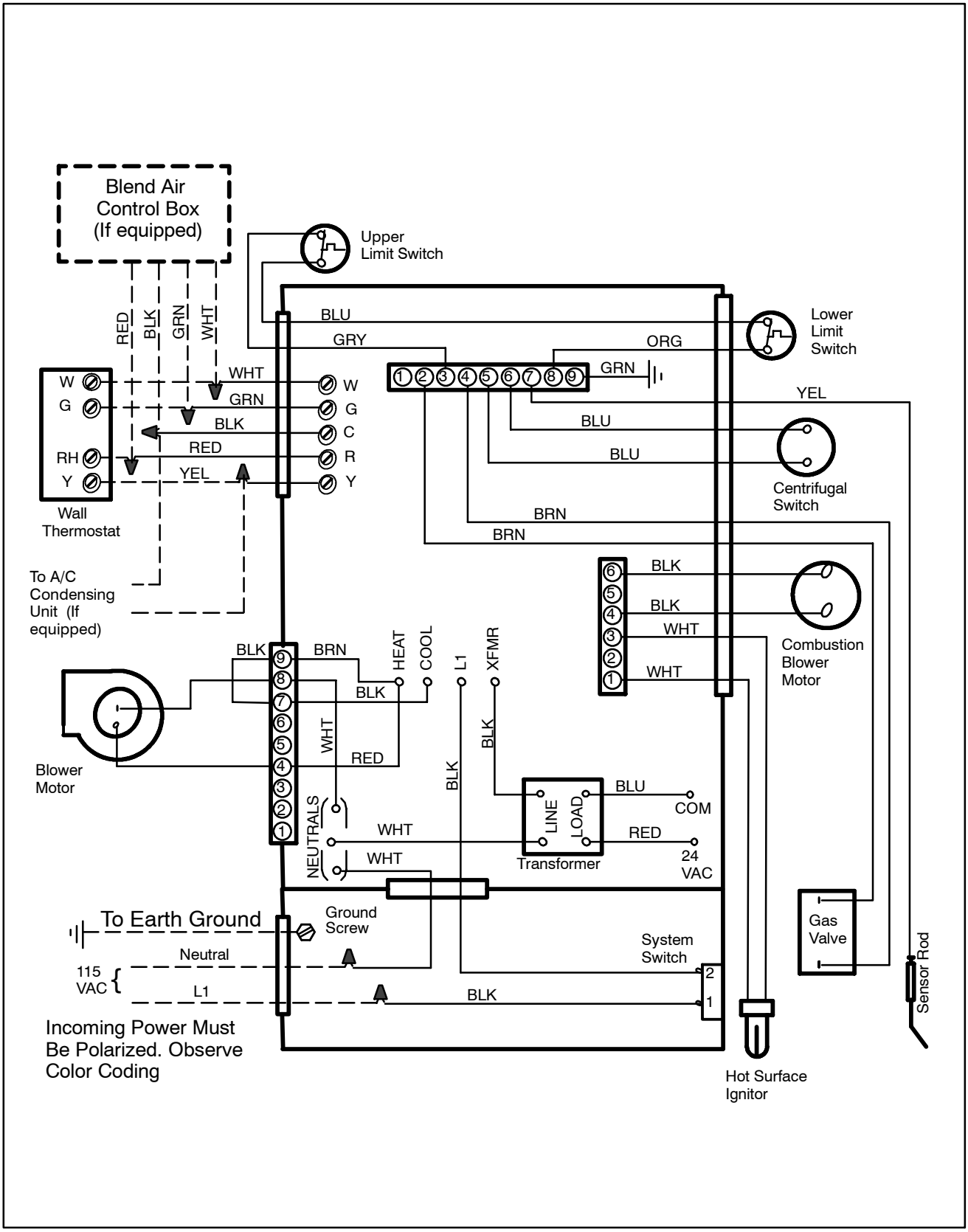


Figure 18 – DGAT Series Wiring Diagram

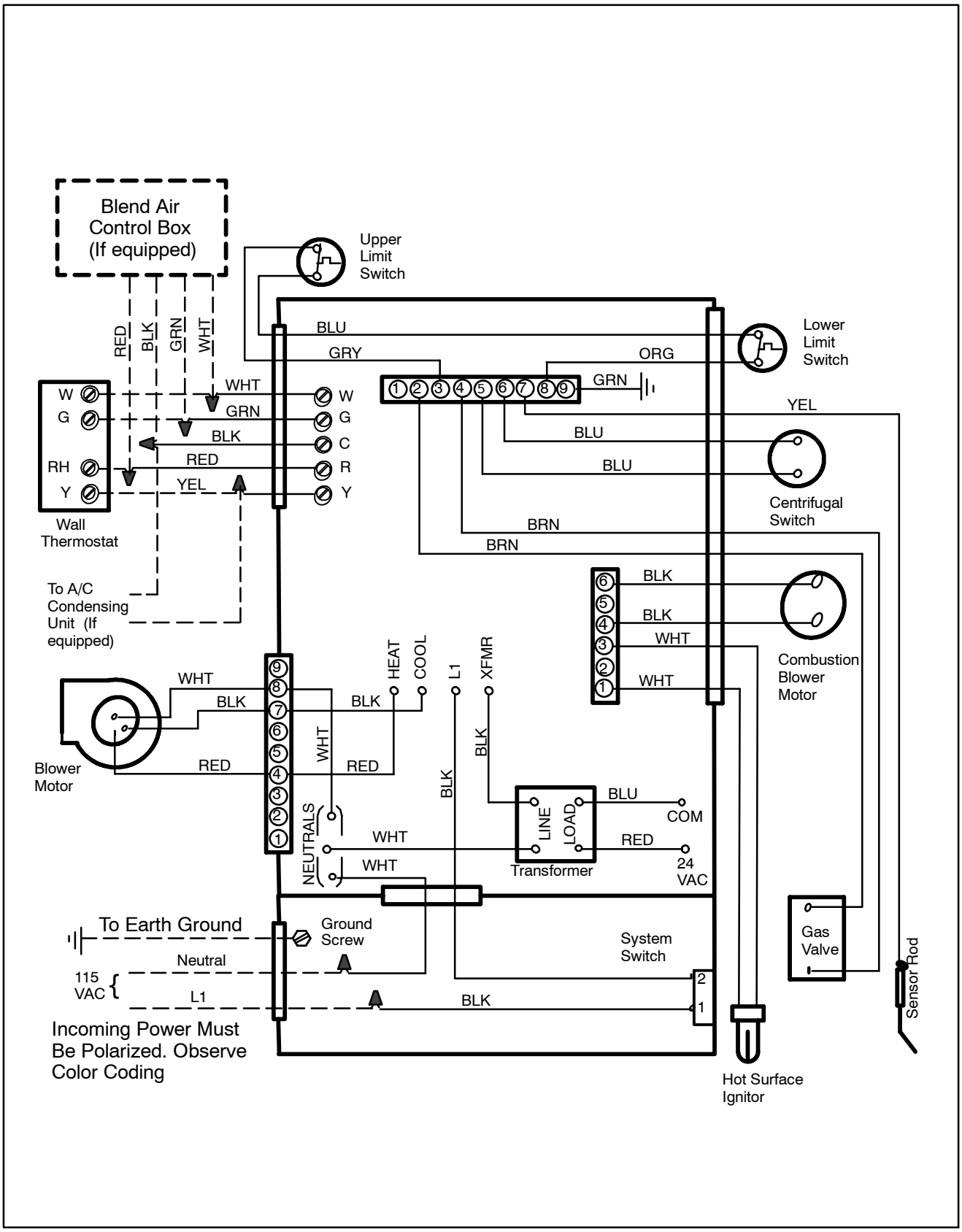


Figure 19 – DGAM Series Wiring Diagram

INSTALLATION AND CHECKING OF GAS LINE

Gas Supply piping must be sized in accordance with the recommendations contained in "American National Standard Institute Installation of Gas Piping" ANSI 223.1 unless local codes or regulations state otherwise.

Materials used and pipe sizing for U.S. mobile homes must comply with requirements contained in Mobile Homes A119.1, Recreational Vehicles A119.2 and H.U.D. Title 24, Section 280.705 and any local or state codes.

NOTE

The gas line inlet on the gas valve is $^1/_2$-14 N.P.T. The gas line may be installed through the furnace floor or furnace side to the gas valve.

⚠ CAUTION

To install gas line and to connect it to the gas valve, care must be taken to hold gas valve firmly to prevent misalignment of the burner orifice, or to damage gas valve which could result in improper heating, explosion, fire or asphyxiation.

DO NOT USE EXCESSIVE PIPE SEALANT ON PIPE JOINTS. Pipe sealant, metal chips or other foreign material that could be deposited in the inlet of the gas valve, when gas pipe is installed or carried through the gas piping into the gas valve inlet after installation, may cause the gas valve to malfunction and could result in possible improper heating, explosion, fire or asphyxiation. Also, pipe sealant must be resistant to Propane gas.

Where regulations require, a main shut-off valve shall be installed externally of furnace casing. After piping has been installed, turn gas on and check all connections with a leak detector or soap solution.
NEVER USE OPEN FLAME. FIRE OR EXPLOSION COULD OCCUR.

Do not test the fuel system at more than 14" W.C. after furnace has been connected to fuel line. Such testing could void the warranty. Any test run above 14" W.C. may damage furnace control valve which could cause an explosion, fire or asphyxiation.

A dirt leg may be required by some local codes to trap moisture and contaminations.

For NAT. gas operation, the furnace is designed for 7" W.C. inlet gas pressure. Pressure to main burner is then reduced to 3 $^1/_2$" W.C.

For Propane gas operation, the furnace is designed for 11" W.C. inlet gas pressure. Pressure to main burner is then reduced to 10" W.C.

IMPORTANT

When converting valve from or to Propane gas, it will be necessary to change main burner orifice to prevent an underfired or overfired condition. See furnace nameplate for complete instructions.

⚠ CAUTION

If the gas input to the furnace is too great because of excessive gas pressure, wrong size orifice, high altitude, etc., the burner flame will be sooty and may produce carbon monoxide, which could result in unsafe operation, explosion, and/or fire or asphyxiation.

Observing Burner Operation

1. Observe burner to make sure it ignites. Observe color of flame. On natural gas the flame will burn blue with appreciably yellow tips. On Propane gas a yellow flame may be expected. If flame is not the proper color call a qualified serviceman for service.
2. Let furnace heat until blower cycles on.
3. Turn thermostat down.
4. Observe burner to make sure it shuts off.
5. Let the furnace cool and blower cycle off.

⚠ WARNING

Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the furnace and allow burner to run until furnace cools down and blower shuts off before shutting off the electrical supply.

If any abnormalities are observed when checking for correct operation, such as burner failing to ignite or to turn off, sooty flame, etc., call your nearest authorized service technician as shown in the Service Center List included in the home owner envelope with the furnace.

Combustion Air

In order for the burner flame to burn efficiently, it must receive adequate combustion air.

The amount of combustion air can be changed by operating the combustion air adjustment rod located beneath the gas valve. (See Figures 19 and 20.)

The adjustment rod is set at an "average" position at the factory and may be properly set for many applications.

However, the amount of combustion air required will vary depending on altitude, actual BTU. content of the gas being used, gas pressure, conversion to another gas, and other variable factors.

Therefore, it is essential that the burner flame be observed and any necessary adjustments are made before the furnace is put into service at the final home site. Adjusting the burner air is considered part of the normal home set–up procedure and is the responsibility of either the home seller or buyer, depending on their agreement. Adjustments of this type are not covered by the warranty.

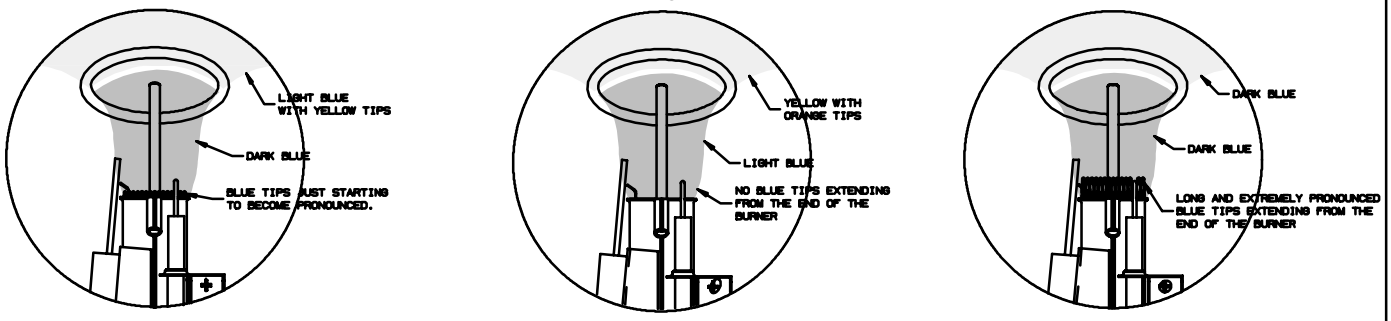
⚠ CAUTION

Combustion air adjustments must be made only by a qualified technician. Improper air adjustment may cause unsafe operation, explosion or asphyxiation.

To adjust the combustion air:

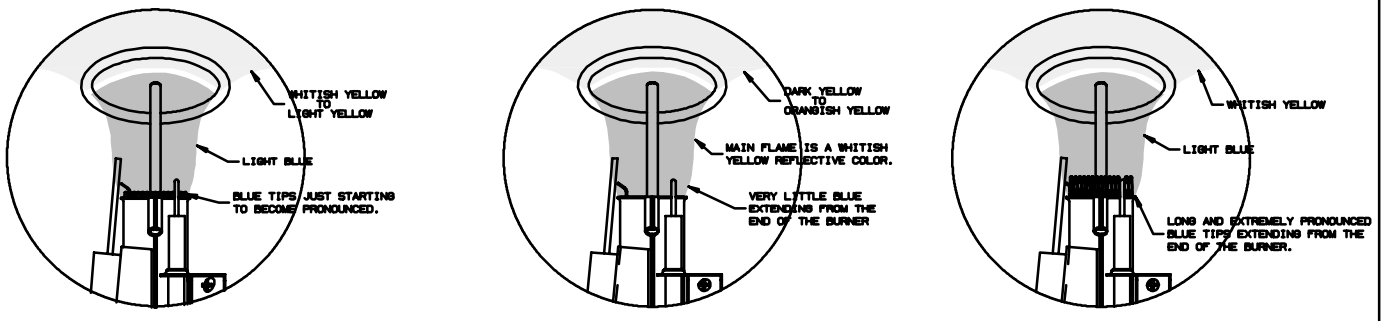
1. To light and operate furnace see label inside lower furnace door.
2. Allow the burner to burn for about 1 MINUTE.
3. Look through the observation window and observe the appearance of the flame.
4. On natural gas, the base of the flame should be blue but the tips of the flame will be yellow. (See Figure 20.)
5. On Propane gas, almost all of the flame will be yellow although some blue should still be present at the base of the flame next to the end of the burner. (See Figure 21.)
6. If the flame is too yellow, the combustion air should be increased. If the flame is excessively blue (no yellow) the combustion air should be decreased.
7. To adjust the combustion air, loosen the lock screw holding the combustion air rod in place. Push in on the rod to increase the combustion air. Pull out on the combustion air rod to decrease the combustion air. Tighten lock screw after adjustment is made. Do not completely close air damper at any time. Complete closure of air damper to burner will result in improper operation. See caution above.

View of Burner Through the Observation Window



Correct Amount of Primary Air | Too Little Primary Air Push Shutter Rod In | Too Much Primary Air Pull Shutter Rod Out

Figure 20 – Natural Gas Flame Appearance



Correct Amount of Primary Air | Too Little Primary Air Push Shutter Rod In | Too Much Primary Air Pull Shutter Rod Out

Figure 21 – Propane Gas Flame Appearance

If Furnace Fails to Operate Properly

1. Check setting of thermostat – and position of HEAT/COOL switch if air conditioning is installed. If a set–back type thermostat is employed be sure that the thermostat is in the correct operating mode.
2. Check to see that electrical power is ON.
3. Check to see that the knob on the gas control valve is in the full ON position.
4. Make sure filters are clean, return grilles are not obstructed, and supply registers are open.
5. Be sure that furnace flue piping is open and unobstructed.

If the cause for the failure to operate is not obvious, do not attempt to service the furnace yourself. Call a qualified service agency or your gas supplier.

FINAL PROCEDURE

Install Furnace Doors

Install the bottom door first by holding the door flush against the casing and sliding the door down until the door top and bottom flanges rest in the casing channels. Then install the upper door in the same manner.

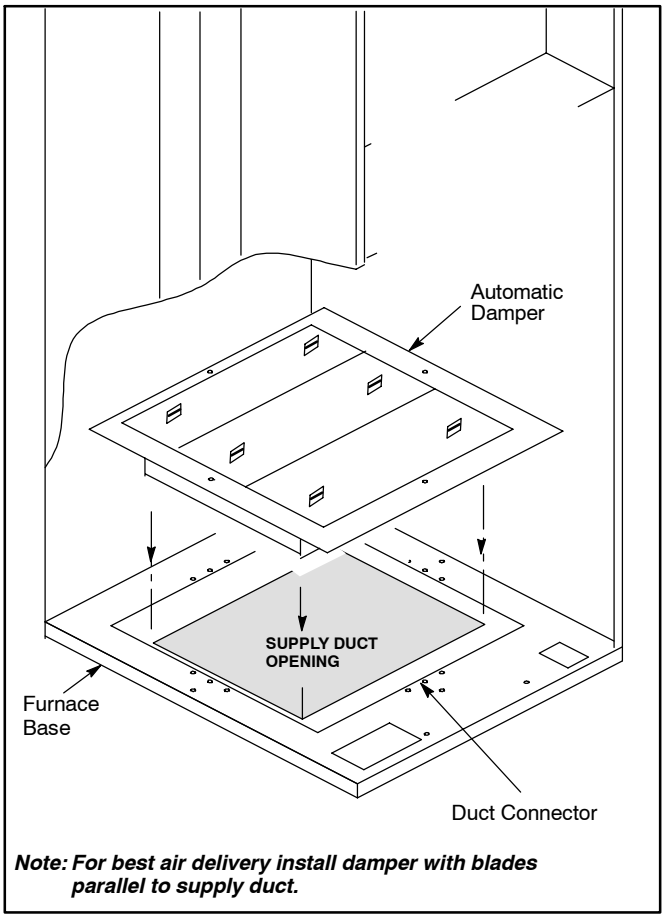
Finish and Trim

Alcove and Closet Installations may now be finished and trimmed as necessary.

Leave enough gap above upper furnace door to allow it to be lifted and removed.

NOTE

See nameplate for conversion and lighting instructions. Obtain a temperature rise within the ranges specified on the name plate.



Note: For best air delivery install damper with blades parallel to supply duct.

Figure 22 – Anti–Backflow Damper

Furnace and Air Conditioner Installations

In an air conditioner is installed which does not use the blower for air distribution and operates completely independent of the furnace, the thermostat system must have an interlock to prevent the furnace and air conditioner form operating at the same time. This interlock system usually contains a heat–cool switch which must be turned to either HEAT or COOL to activate either heating or cooling operation, or a positive OFF switch on the cooling thermostat.

When used in connection with a cooling unit the furnace shall be installed parallel with or on the upstream side of the cooling unit to avoid condensation in the heat exchanger.

For installations with a parallel flow arrangement, the furnace must be equipped with a damper to prevent cold air from being discharged up around the heat exchanger. Cold air causes condensation inside the exchanger and can cause it to rust out which can allow products of combustion to be circulated into the living area by the furnace blower resulting in possible asphyxiation. An air flow activated automatic damper, P/N 7900–6771, is available from furnace manufacturer.

HIGH ALTITUDE DERATION CHART — DGAM, DGAT, DLAS Series

NATURAL GAS

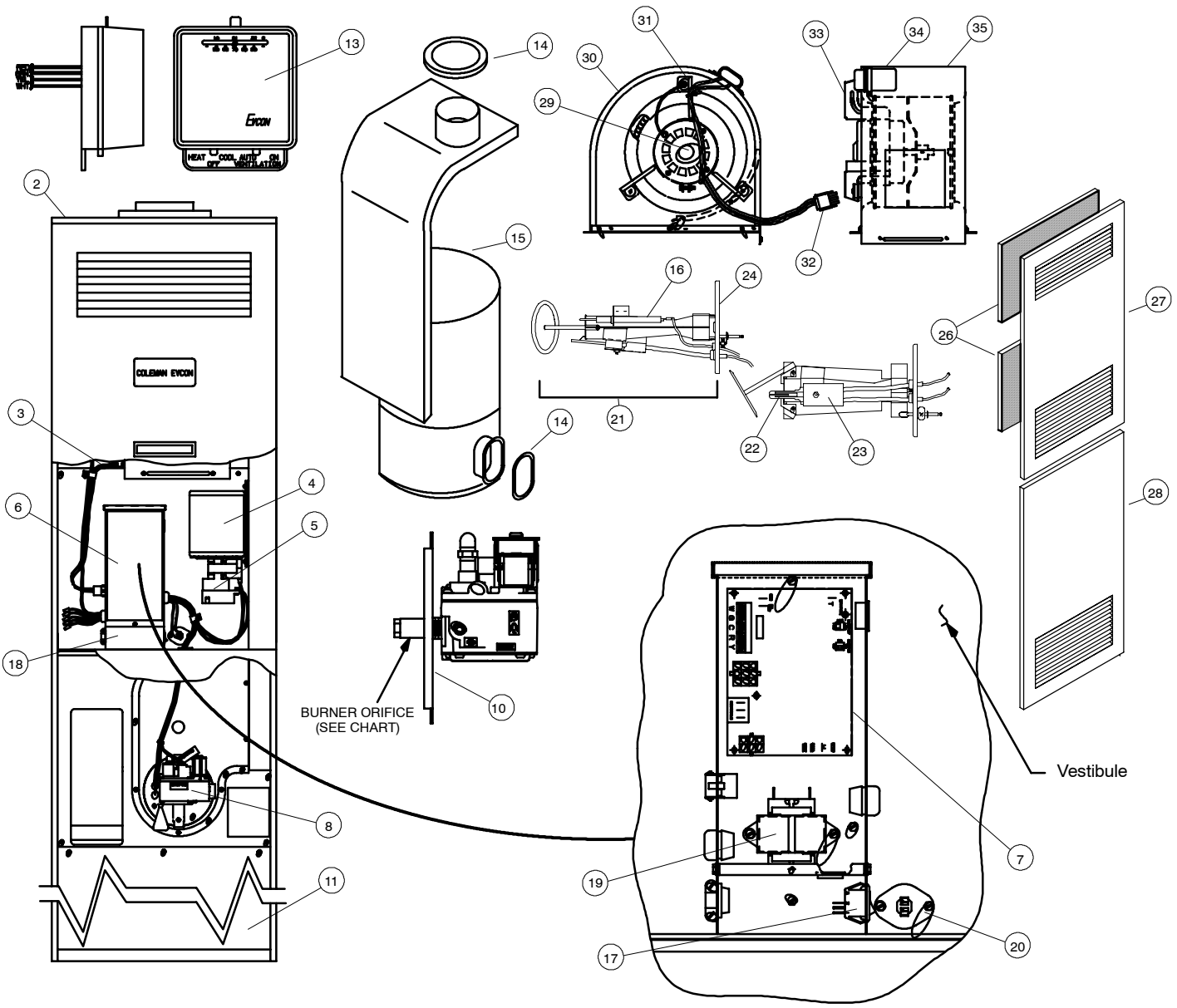
Elevation	56,000 — Input			70,000 — Input			75,000 — Input			90,000 — Input		
	Orifice Dia.	Drill Size	Part #	Orifice Dia.	Drill Size	Part #	Orifice Dia.	Drill Size	Part #	Orifice Dia.	Drill Size	Part #
Sea Level	0.136	29	9951-1361	0.154	23	9951-1541	0.161	20	9951-1611	0.18	15	9951-1801
2,000	0.136	29	9951-1361	0.149	25	9951-1491	0.157	22	9951-1571	0.177	16	9951-1771
3,000	0.128	30	9951-1281	0.149	25	9951-1491	0.157	22	9951-1571	0.173	17	9951-1731
4,000	0.128	30	9951-1281	0.147	26	9951-1471	0.154	23	9951-1541	0.173	17	9951-1731
5,000	0.128	30	9951-1281	0.144	27	9951-1441	0.152	24	9951-1521	0.169	18	9951-1691
6,000	0.128	30	9951-1281	0.144	27	9951-1441	0.149	25	9951-1491	0.166	19	9951-1661
7,000	0.12	31	9951-1201	0.14	28	9951-1401	0.147	26	9951-1471	0.161	20	9951-1611
8,000	0.12	31	9951-1201	0.136	29	9951-1361	0.144	27	9951-1441	0.161	20	9951-1611
9,000	0.12	31	9951-1201	0.136	29	9951-1361	0.14	28	9951-1401	0.157	22	9951-1571
10,000	0.116	32	9951-1161	0.128	30	9951-1281	0.136	29	9951-1361	0.152	24	9951-1521

PROPANE GAS

Elevation	56,000 — Input			70,000 — Input			75,000 — Input			90,000 — Input		
	Orifice Dia.	Drill Size	Part #	Orifice Dia.	Drill Size	Part #	Orifice Dia.	Drill Size	Part #	Orifice Dia.	Drill Size	Part #
Sea Level	0.082	45	9951-0821	0.093	42	9951-0931	0.098	40	9951-0981	0.106	36	9951-1061
2,000	0.081	46	9951-0821	0.093	42	9951-0931	0.096	41	9951-0961	0.104	37	9951-1041
3,000	0.078	47	9951-0781	0.089	43	9951-0891	0.093	42	9951-0931	0.101	38	9951-1011
4,000	0.078	47	9951-0781	0.089	43	9951-0891	0.093	42	9951-0931	0.101	38	9951-1011
5,000	0.078	47	9951-0781	0.089	43	9951-0891	0.093	42	9951-0931	0.099	39	9951-0991
6,000	0.076	48	9951-0761	0.086	44	9951-0861	0.089	43	9951-0891	0.098	40	9951-0981
7,000	0.076	48	9951-0761	0.086	44	9951-0861	0.089	43	9951-0891	0.096	41	9951-0961
8,000	0.073	49	9951-0731	0.082	45	9951-0821	0.086	44	9951-0861	0.096	41	9951-0961
9,000	0.073	49	9951-0731	0.081	46	9951-0811	0.086	44	9951-0861	0.093	42	9951-0931
10,000	0.073	50	9951-0731	0.078	47	9951-0781	0.082	45	9951-0821	0.089	43	9951-0891

Adjust air shutter for correct flame appearance.
Table shows 4% Input Reduction per 1,000 feet Elevation.
Reference Source: NFPA No. 54, ANSI Z 223.1 1996 Edition.

Repair Parts List for:							
DGAM056BDE	DGAT056BDE	DLAS056BDE	DGAT070BDE	DGAM075BDE	DGAT075BDE	DLAS075BDE	DGAT090BDE



	CODE	USED ON MODEL	NO. REQ.	PART NUMBER	DESCRIPTION
	__	ALL	X	8B247P	Enamel (Spray 15 oz. White)
	2	--	-	------	----------
*	3	ALL	1	7990-3591 ▼	Limit Switch (Upper)
	4	ALL	1	7990-6451	Booster Assembly (Includes Motor)
*	5	ALL	1	7990-317P	Booster Motor - 3000 RPM

▼ **NOTE:** The 7624A3591 (180□ Manual Reset) is a designed approved alternate for this limit switch.

	CODE	USED ON MODEL	NO. REQ.	PART NUMBER	DESCRIPTION
	6	ALL	1	7990-401	Cover (Control Box)
*	7	ALL	1	7990-319P	Integrated Control
*	8	ALL	1	7990-328P▼▼	Gas Valve (24V .5 Amp $^{1}/_{2}$" x $^{3}/_{8}$")
	9	--	-	-------	----------
	10	ALL	1	7945-5151/C	Valve Bracket
	11	DGAM,DGAT	1	7956A5201	Panel (Coil Cavity 19 $^{13}/_{16}$")
	12	--	-	-------	----------
*	13	ALL	1	7990-368P	Thermostat (Adj. Ant.)
	14	ALL	1	7945-3011	Gasket Pkg. (Heat Exchanger)
	15	ALL	1	7995-5751	Heat Exchanger (with Gaskets)
*	16	ALL	1	7975-3881	Remote Sensor
	17	ALL	1	7681-3301	System Switch
	18	ALL	1	7990-402	Field Wiring Cover
*	19	ALL	1	2940A3541	Transformer (115-24V 40VA)
*	20	056 070,075 090	1	7945-3281/A 7970-3281/A 7995-3281/A	Limit Switch (OPEN-140º CLOSE-110º) Limit Switch (OPEN-145º CLOSE-115º Limit Switch (OPEN-150° CLOSE-120°)
	21	ALL	1	7970-5851/A	Burner Assembly (Less Gas Valve)
*	22	ALL	1	1474-0521	Hot Surface Ignitor
	23	ALL	1	7970-179	Ignitor Shield
	24	ALL	1	7945-1631/A	Mounting Plate (Burner)
	25	--	-	------	----------
*	26	ALL	1	1214-2511	Filter (16 x 20 x 1 Disposable) (2 Required)
	27	DGAM	1	7975-1561/B	Panel (Upper)(White)
		DLAS, DGAT	1 1	7990-1561/A	Panel (Upper)(White)
	28	DGAM,DGAT	1	7956-1571/A	Panel (Lower)(White)
		DLAS	1	7956-1631/A	Panel (Lower)(White)

BLOWER PARTS

*	29	DGAM	1	1468-220P	Motor
		DGAT, DLAS (057, 070, 075)	1	7966-311P	Motor
		090	1	1468-212P	Motor
	30	All	1	7966A530	Scroll
	31	All	1	2702-4091	Motor Mount(3/Pkg.)
	32	All	1	7680-348	Connector Plug
	33	All	1	7670-6391	Motor Clamp
*	34	090 DGAM	1 1	1499-4461 1499-4471	Run Capacitor Run Capacitor
	35	All	1	1472-2751	Blower Wheel (10 5/8 Dia. x 7 1/8 x 1/2)

BURNER ORIFICE CHART

MODEL	056	070	075	090
Nat.	9951-1361	9951-1541	9951-1611	9951-1801
LP	9951-0821	9951-0931	9951-0981	9951-1061

▼▼ **NOTE:** The 7990-326P is a designed approved alternate for this valve.

NOTE: All parts with three digit suffix numbers are "Special Order" Parts. These parts are subject to factory availability and require extra time for delivery.

***** Suggested Parts Inventory (2% of Units Installed-Minimum 1 each)