



SUBURBAN MANUFACTURING COMPANY  
Post Office Box 399  
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# DYNATRAIL

## INSTALLATION INSTRUCTIONS FOR MODELS

NT-24S • NT-30S • NT-34S

### SUBURBAN DYNATRAIL GAS FURNACES



The design of the furnace has been certified by the American Gas Association and the Canadian Gas Association for installation in recreational vehicles only. In order for the furnace to operate in conformity with generally accepted safety regulations, the installation instructions must be followed. Failure to comply with the installation instructions will void the warranty on the furnace and any responsibility on the part of Suburban Manufacturing Company.

The furnace was inspected before it left the factory. If any parts are found to be damaged, do not install the furnace. Immediately contact the transportation company and file a claim.

## INSTALLATION INSTRUCTIONS

**WARNING!** These furnaces must be installed and vented as described in this manual so that the negative pressure created by the air circulating (return air) fan cannot affect the combustion air intake or venting of any other appliance. (See 'Installing Vent Assembly'.)

**WARNING!** These furnaces are not designed nor are they to be used in conjunction with cooling units. To do so will damage furnace and will void the warranty.

These furnaces are design certified for liquefied petroleum (LP) gas only. Do not attempt to convert to natural gas.

These furnaces are designed to operate at the following gas inlet supply pressure: minimum - 11" W.C.\*; maximum - 13" W.C.\* (W.C.\* - water column).

In the U.S.A., the installation of the furnace must be in accordance with local codes and regulations. In the absence of local codes and regulations, refer to:

1. American National Standard for Recreational Vehicles ANSI A-119.2-1982.
2. National Fuel Gas Code ANSI Z223.1 - 1984.
3. Furnace must be electrically grounded in accordance with the National Electrical Code ANSI/NFPA No. 70 - 1984.

This unit is equipped with an electric igniter device that has an energy consumption of .1 amp @ 12 volts D.C.

In Canada, the furnace must be installed in accordance with:

1. Standard CSA Z240-4 - Gas Equipped Recreational Vehicles and Mobile Housing.
2. CSA Standard Z240.6.1 and Z240.6.2 - Electrical Requirements for Recreational Vehicles.
3. Any applicable local codes and regulations.

#### RETURN AIR

There are three methods described below for installing the furnace. Regardless of the method you choose, we require that a permanent opening be provided in the interior cabinetry of the coach directly in front of the furnace. The opening must allow for free, unobstructed removal of the furnace. This opening is also used as a means of providing circulating return air to the furnace. It must contain a louvered grille totaling 55 square inches free area. It is important that adequate return air be provided to assure normal heating and operation of the furnace. Failure to provide the minimum return air opening as well as an adequate opening for furnace removal, voids the warranty.

**WARNING!** Combustion air must not be drawn from the living area of the recreational vehicle. It is also important that the circulating air openings not be blocked in order to assure adequate heating and safe operation.

#### A. INSTALLATION DIRECTLY AGAINST OUTER SKIN OF COACH (See Figure 1)

**WARNING!** Maximum wall thickness for this type installation is 3".

1-Locate the furnace near lengthwise center of the coach.

2-Choose a location for installation out of the way of wires, pipes, etc. which might interfere with the installation. Adhere to the minimum clearances from the cabinet to combustible construction as listed in Table 1.

NOTE: Side and top clearances may be 0" for through the wall installations up to a maximum wall thickness of 3". (See Figure 1.)

3-Carpet and floor coverings must be removed from under the furnace when the installation is such that the weight of the furnace rests on the floor covering. If the furnace is allowed to rest on the floor covering, it may settle into the material, thus reducing our clearances under the furnace. It will not be necessary to remove the floor covering if the furnace is not mounted directly on the material.

4-Cut an opening through the inner wall 12 7/16" x 13". This will allow the rear of the furnace to be installed against the outer skin of the coach. (See Figure 1.)

5-Cut two 2 1/4" diameter holes through the outer skin of the coach as shown in Figure 1.

6-Put furnace in place, making sure that rear of furnace cabinet is firmly against outer skin of coach.

7-Fasten furnace to floor of coach using the two holes provided in the front plenum area of furnace cabinet. (See Figure 1.)

8-Install vent assembly. (See instructions for installing vent.)

#### B. INSTALLATION DIRECTLY AGAINST INNER WALL OF COACH (See Figure 2)

**WARNING!** Maximum wall thickness for this type installation is 2 1/4".

1-Locate the furnace near lengthwise center of the coach.

2-Choose a location for installation out of the way of wires, pipes, etc. which might interfere with the installation. Adhere to the minimum clearances from the cabinet to combustible construction as listed in Table 1. Refer to Figure 3 for illustration of furnace clearances.

3-Carpet and floor coverings must be removed from under the furnace when the installation is such that the weight of the furnace rests on the floor covering. If the furnace is allowed to rest on the floor covering, it may settle into the material, thus reducing our clearance under the furnace. It will not be necessary to remove the floor covering if the furnace is not mounted directly on the material.

4-Locate center lines for exhaust and intake tubes as shown in Figure 1. Cut two 2 3/4" diameter holes through coach wall for exhaust and intake. (See Figure 2.)

5-Put furnace in place, making sure that rear of furnace cabinet is firmly against inner wall of coach.

6-Fasten furnace to floor of coach using the two holes provided in front plenum area of furnace cabinet. (See Figure 1.)

7-Install vent assembly. (See instructions for installing vent.)

#### C. INSTALLATION USING VENT EXTENSION TUBES (See Figure 4)

When it is not possible to install the furnace as described in installations A or B, extension tubes must be used to connect the exhaust and intake tube to the vent assembly on the outside of the coach.

Avoid the use of extension tubes whenever possible. If they must be used, installation must be as follows:

1-Locate center lines for exhaust and intake tubes as shown in Figure 1.

2-Cut two 2 3/4" diameter holes through coach wall for exhaust and intake. (See Figure 4.)

3-Carpet and floor coverings must be removed from under the furnace when the installation is such that the weight of the furnace rests on the floor covering. If the furnace is allowed to rest on the floor covering, it may settle into the material, thus reducing our clearances under the furnace. It will not be necessary to remove the floor covering if the furnace is not mounted directly on the material.

4-Determine what length extension tube is required for the exhaust and intake tube by positioning the furnace in its permanent location and measure the distance from the end of the exhaust and intake tube to the outer edge of the coach skin. Add 1/2" to the measured distance. This gives the minimum length extension tubes you must order. Only Suburban extension tubes are to be used.

**WARNING!** Under no circumstances are the extension tubes, as supplied by Suburban, to be cut, altered, or modified in any way. To do so could be dangerous and will void the responsibility of Suburban Manufacturing Company.



5-Attach extension tubes to furnace as shown in Figure 4. Secure each extension tube to the exhaust and intake tube on the furnace, as shown.

6-Put furnace in place, making sure that the extension tubes terminate flush with outer skin (or no less than 3/4" from outer skin) of coach, and fit tightly on the furnace exhaust and intake tubes.

7-Fasten furnace to floor of coach using the two holes provided in the front plenum area of the furnace cabinet. (See Figure 1.)

8-Install vent assembly. (See instructions for installing vent.)

Model	Front	Left Side	*Right Side	Top	Bottom	Back	Exhaust and Intake Tube
NT-24S	0"	1"	1"	0"	0"	0"	3/8"
NT-30S	0"	1"	1"	0"	0"	0"	3/8"
NT-34S	0"	2"	2"	0"	0"	0"	3/8"

— NOTE —

0" MEANS TO SPACER BUMPS  
CLEARANCE FROM DUCTS TO  
COMBUSTIBLE MATERIAL - 1" (See Figure 3)

TABLE 1

INSTALLING VENT ASSEMBLY

**WARNING!** Vent outlet must be installed so it is in the same atmospheric pressure zone as the combustion air intake.

**WARNING!** Combustion air must not be drawn from the living area; therefore, one must insure that the vent cap and tube assemblies have been properly installed, allowing a minimum of 1/2" overlap of tubes, to guarantee that adequate combustion air will be supplied from the outside atmosphere.

1-Caulk around vent assembly as shown in Figure 2.

2-Insert intake tube over intake tube on furnace. Tube must be installed from the outside of the coach. Minimum 1/2" overlap.

3-Insert vent assembly over exhaust tube. **Minimum tube overlap of 1/2" is required.**

4-Attach vent assembly to outer skin of coach with the four (4) screws provided.

**WARNING!** Do not install vent assembly upside down. The words "Suburban" and "Dayton, Tenn." must be right side up.

5-Attach vent assembly to furnace with special 3" screw provided. Insert screw through hole provided in exhaust opening of vent assembly and secure to bracket in exhaust tube of furnace. This anchors the furnace to the vent assembly and the outer skin of the coach. (See Figure 2.)

CONNECTING GAS SUPPLY

Connect the gas supply to the furnace at the manifold, following the suggestions outlined below.

**WARNING!** The compound used on threaded joints must be resistant to liquefied petroleum (LP) gas.

**WARNING!** The appliance and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressure in excess of 1/2 in. P.S.I.G.

The appliance must be isolated from the gas supply piping by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressure equal to, or less than, 1/2 in. P.S.I.G.

1-Be sure that the manual shut-off valve is outside of the furnace jacket and easily accessible. (See Figure 1.) The shut-off valve is to be connected directly to the 90° elbow at the gas inlet to the furnace. To assure an airtight seal, be sure the gasket provided with the furnace is installed between the shut-off valve and the furnace cabinet, as illustrated in Figure 1. If this gasket is omitted, it could result in overheating of component parts within the furnace.

2-A drip leg should be installed upstream of the manual shut-off valve exterior to unit casing.

3-In order to maintain a check on gas supply pressure to the furnace, Suburban advises the installer to provide a 1/8" NPT plug tap for test gauge connection immediately upstream of the gas supply connection to the furnace.

4-After the furnace has been connected to the gas supply, all joints must be checked for leaks.

**WARNING!** Never check for leaks with an open flame. Turn on the gas and apply soapy water to all joints to see if bubbles are formed.

CONNECTING ELECTRICAL SUPPLY

**WARNING!** This furnace is designed for negative ground 12 volt D.C. system only. Do not attempt to alter the furnace for a positive ground system or connect the furnace directly to 115 volts A.C. Damage to furnace component parts will occur.

Be sure all wiring to the furnace is of heavy enough gauge to keep the voltage drop through it to a minimum. No. 12 gauge wire is recommended. If any of the original wire that is supplied with the appliance must be replaced, it must be replaced with type 105°C or its equivalent.

Connect the power supply to the quick connect pigtail on the right side of the furnace. The wires are color coded, red for positive (+) and yellow for negative (-). This polarity must be observed so the furnace motor will run with the proper direction of rotation to insure correct air delivery. (See wiring diagram.)

If the furnace power supply is to be from a convertor, we recommend that the convertor system used to power the furnace be wired in parallel with the battery. This will serve two purposes:

- 1-Provide a constant voltage supply to the furnace.
- 2-Filter any A.C. spikes or volt surges.

NOTE: This furnace is not furnished with a built-in 115 volt A.C. power supply. If the optional power pack supplied by Suburban is used, it must be wired to furnace as shown in Figure 6.

**WARNING!** Under no circumstances should any other appliance or switching be connected to this power pack. To do so could result in damage to the power pack.

CONNECTING DUCTS TO FURNACE

The following duct requirements must be followed in order to assure proper operation of the furnace.

a-For Models NT-24S and NT-30S, maintain a minimum of 36 square inches open duct area from the furnace cabinet to register. (Minimum 3 ducts 4" diameter.)

For Model NT-34S, maintain a minimum of 48 square inches open duct area. (Minimum 4 ducts - 4" diameter.)

On all models, maintain a minimum of 48 square inches when under floor ducting is used.

b-Make the duct connections at the furnace cabinet tight. Loose connections will result in overheating of the component parts on the furnace and a reduction of the heated air flow through the duct system.

c-Avoid making any sharp turns in the duct system. Sharp turns will increase the static pressure in the plenum area and could cause the furnace to cycle.

d-Avoid making a lot of turns in the duct system. The straighter the duct system, the better the performance of the furnace.

e-Maintain a minimum of 1" clearance where ducts pass through any combustible construction such as coach cabinetry (see Figure 3).

f-Do not install air boosters in the duct system. Such devices will cause the furnace to cycle on limit and to have erratic sail switch operation.

NOTE: After installation of the furnace and duct system is completed, adjustments must be made to obtain a temperature rise within the range specified on the Rating Plate.

INSTALLING THERMOSTAT

Locate the room thermostat approximately 4 1/2 feet above the floor on an inside bulkhead where it is not affected by heat from any source except room air. Connect thermostat wires to the blue wires leaving power supply plug on right side of furnace. (See wiring diagram.)

!!! WARNING !!!

Young children should be carefully supervised when they are in the same room as the appliance.

Clothing or other flammable material should not be placed on or near the appliance.

Any safety screen or guard removed for servicing an appliance must be replaced prior to operating the appliance.

Children and adults should be alerted to the hazards of high surface temperature and should stay away to avoid burns or clothing ignition.

Due to high temperatures, the appliance should be located out of traffic and away from furniture and draperies.

Installation and repair should be done by a qualified service person. The appliance should be inspected before use and at least annually by a professional service person. More frequent cleaning may be required due to excessive lint from carpeting, bedding, etc. It is imperative that control compartments, burners and circulating air passageways of the appliance be kept clean.



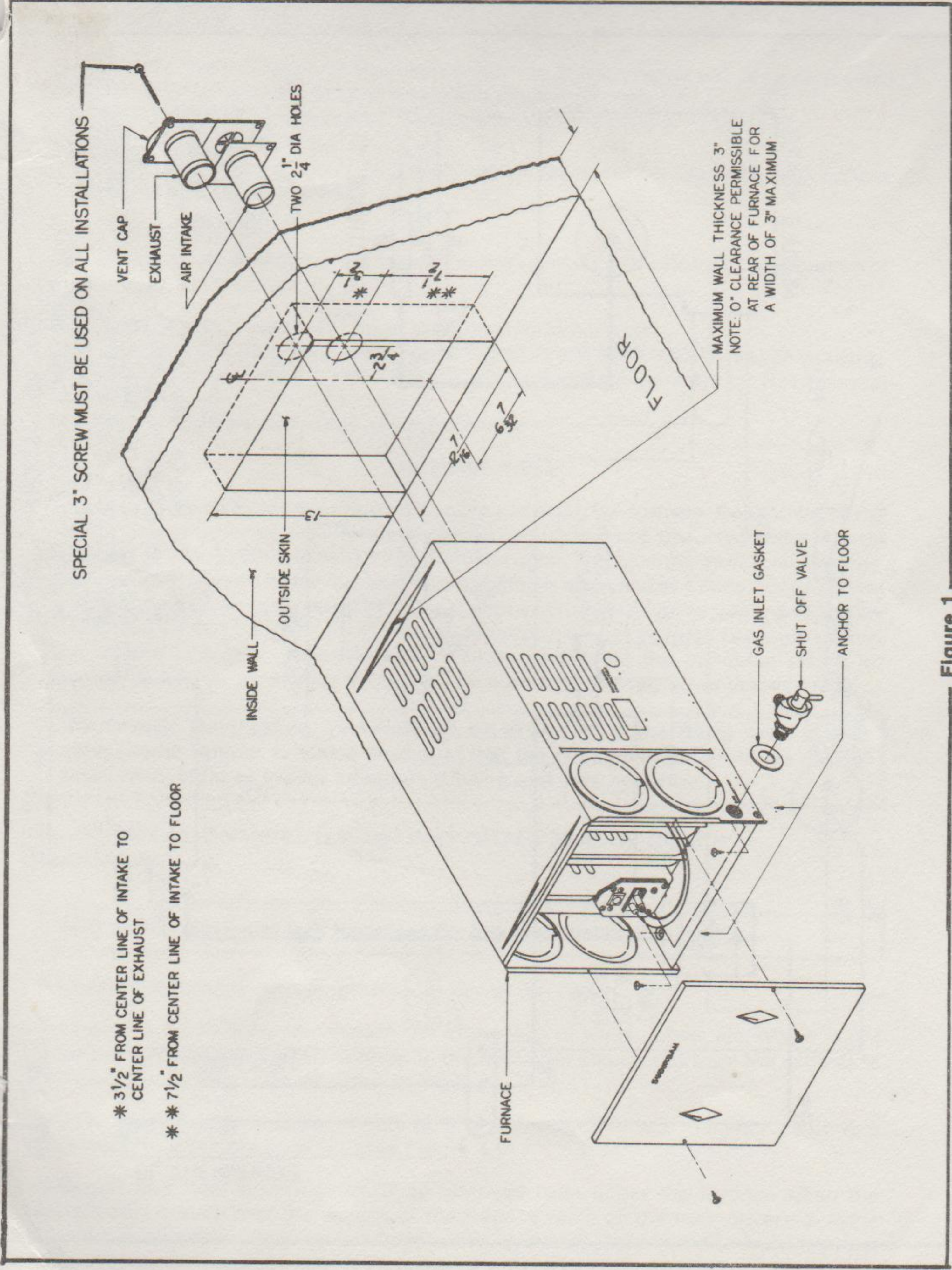


Figure 1

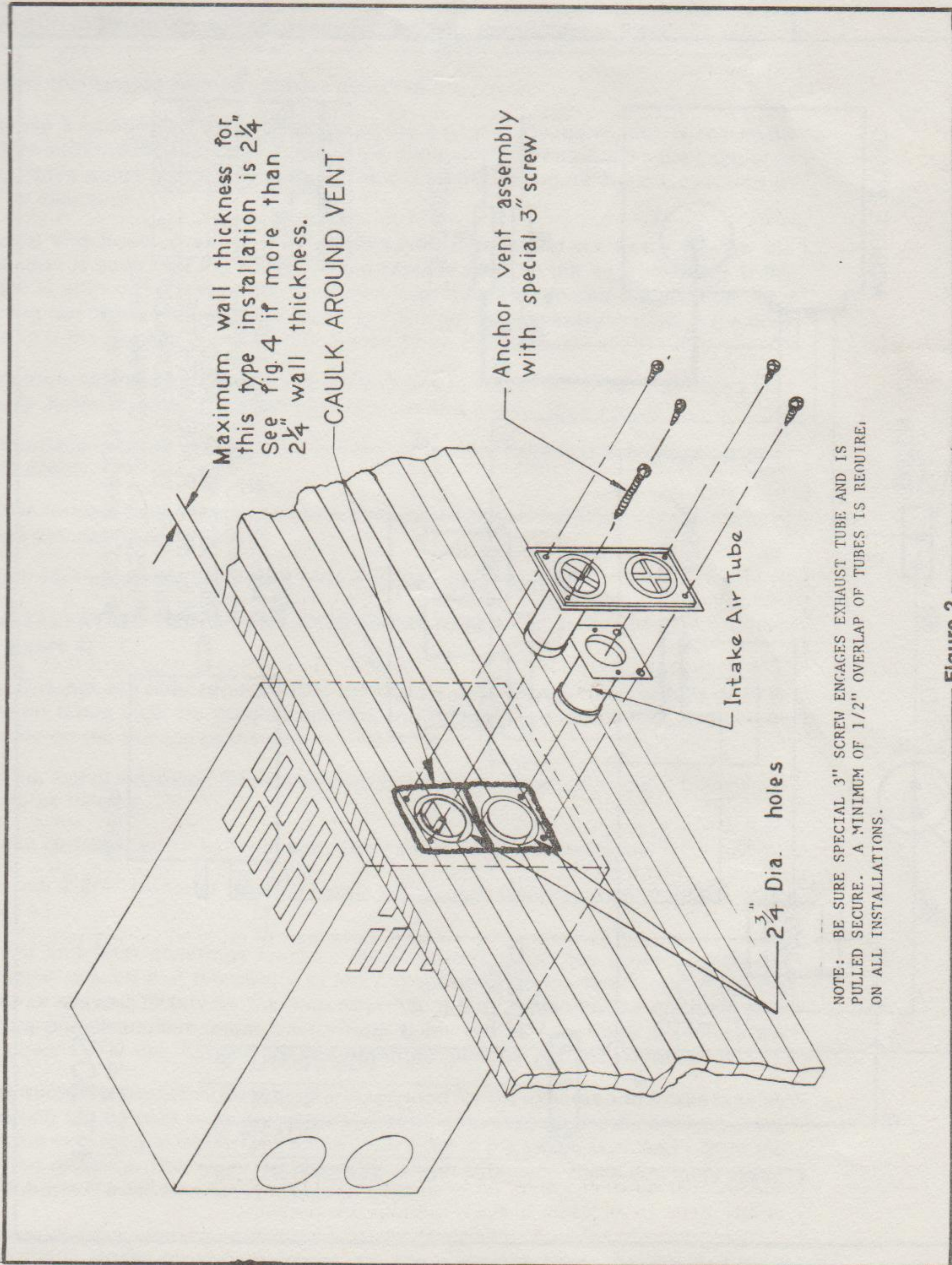


Figure 2

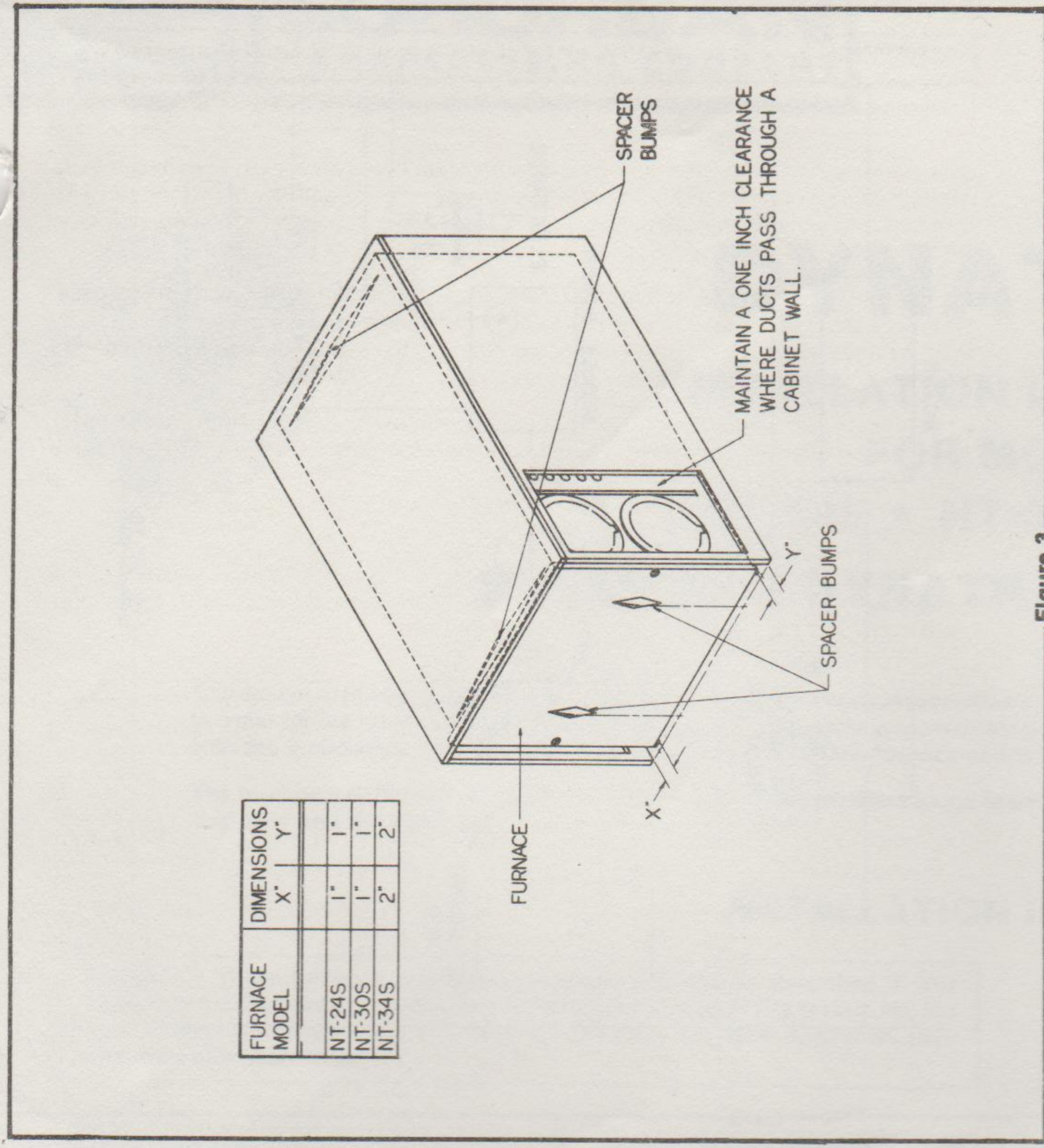


Figure 3

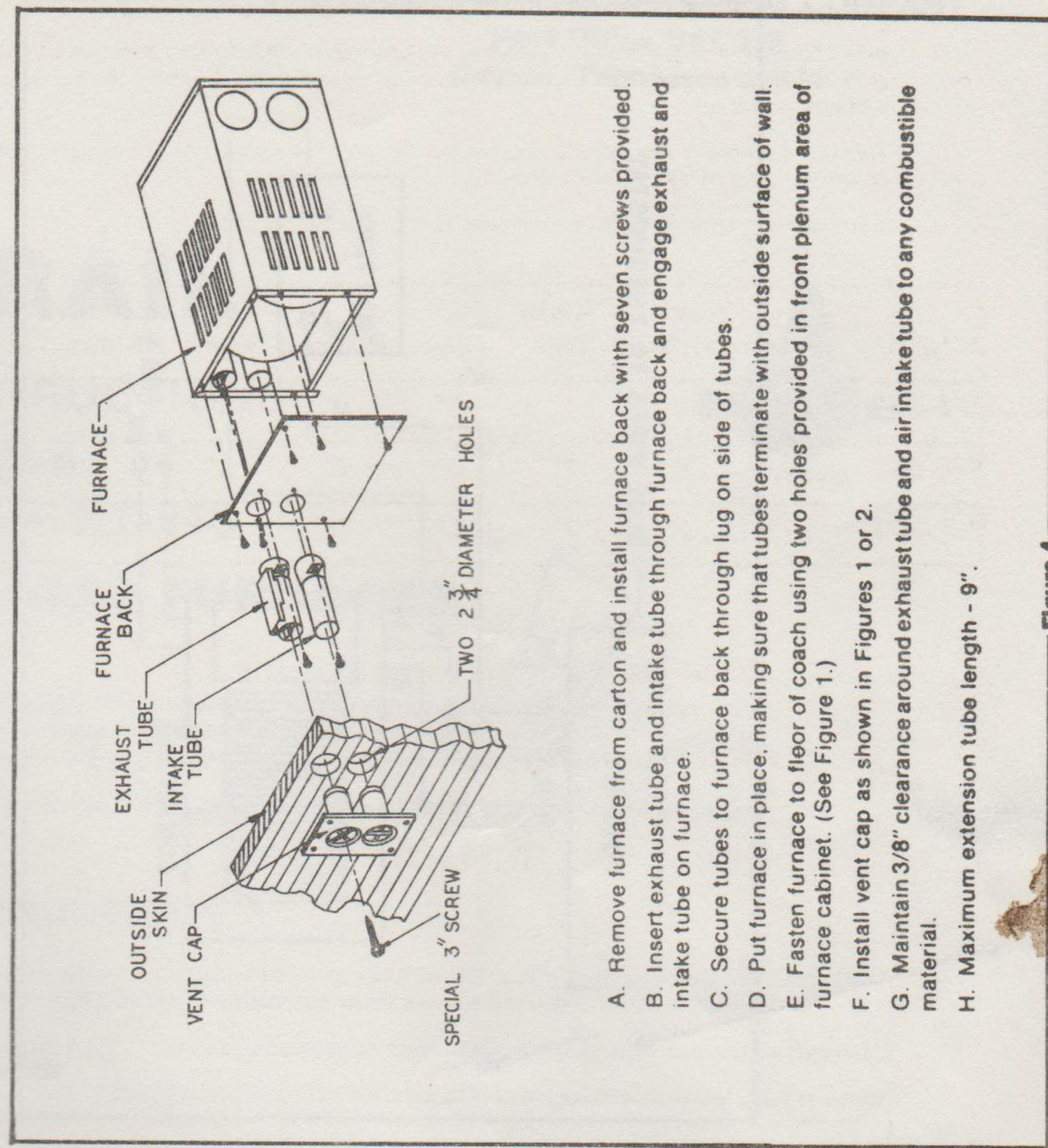


Figure 4



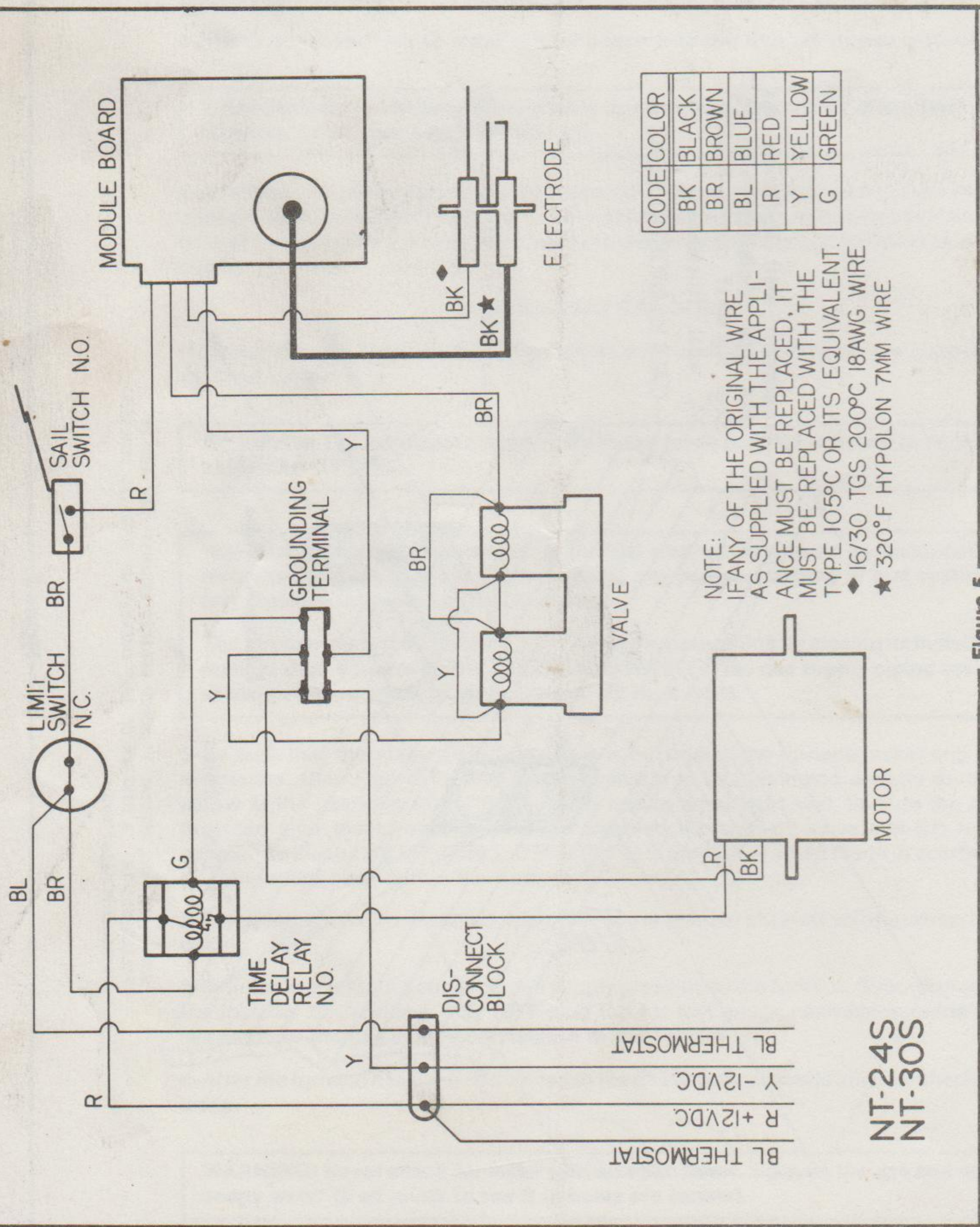


Figure 5

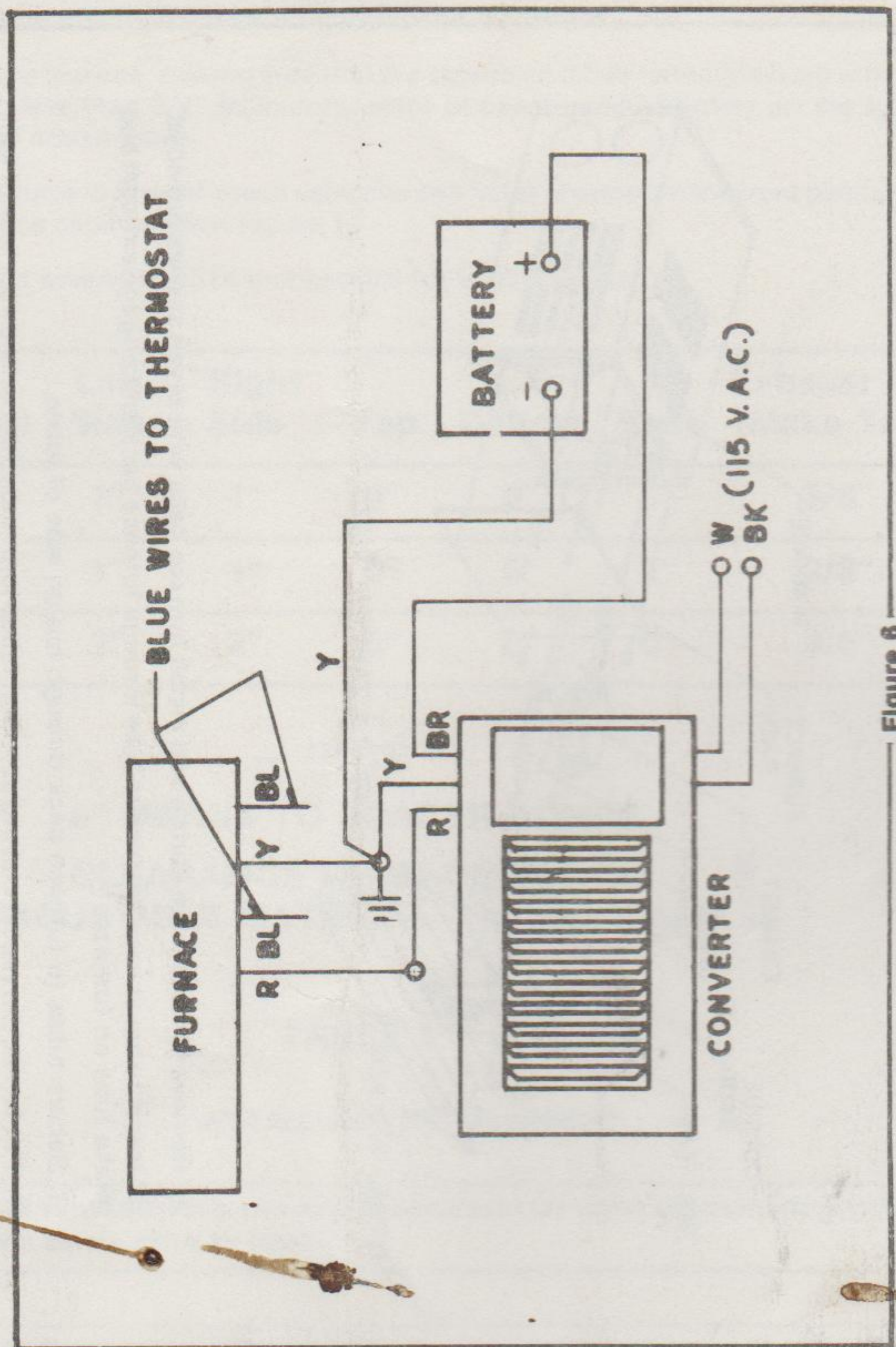


Figure 6

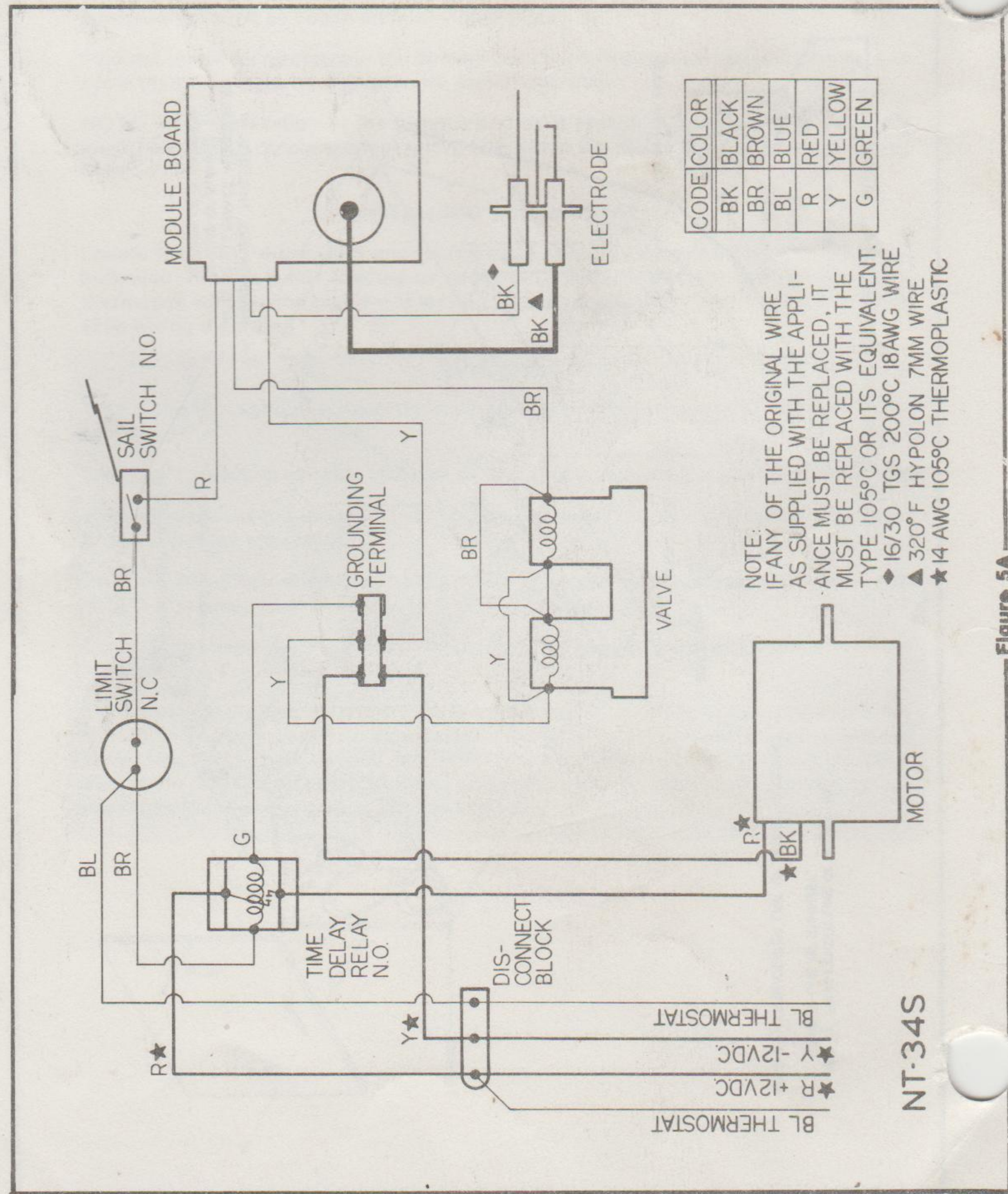


Figure 5A

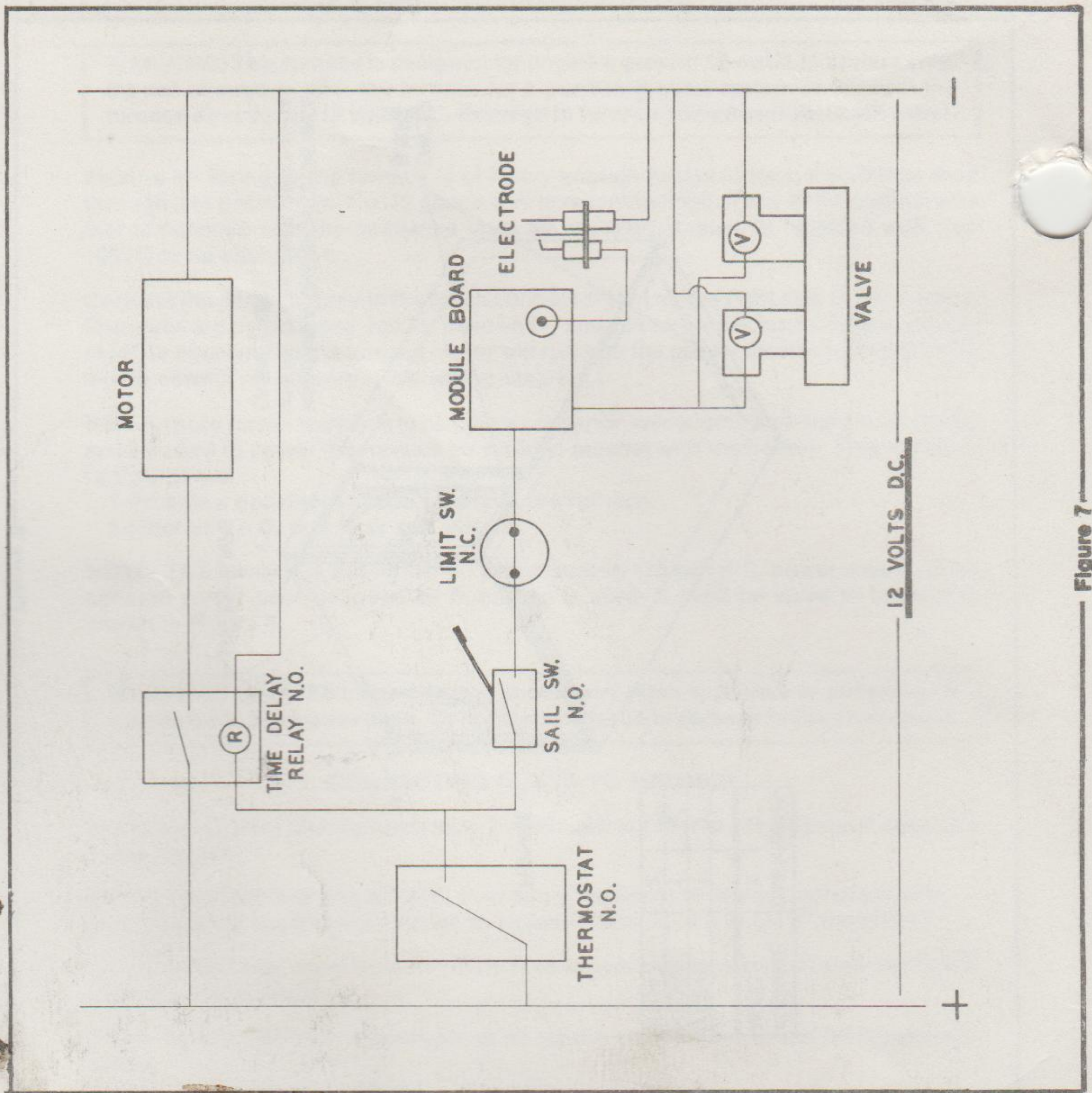


Figure 7