



SUBURBAN MANUFACTURING COMPANY
Post Office Box 399
Dayton, Tennessee 37321

DYNATRAIL

INSTALLATION AND OPERATING INSTRUCTIONS FOR MODEL P-40

SUBURBAN DYNATRAIL FURNACE

LISTED



This design is UL listed and meets UL 307B Standard for installation in recreational vehicles and mobile homes 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.

FOR YOUR SAFETY

IF YOU SMELL GAS:

1. OPEN ALL WINDOWS.
2. DON'T TOUCH ANY ELECTRICAL SWITCHES.
3. EXTINGUISH ANY OPEN FLAMES.
4. IMMEDIATELY CALL YOUR GAS SUPPLIER.

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

WARNING! Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to the installation instructions provided with the furnace and this manual. For assistance or additional information, consult a qualified installer, service agency or the gas supplier.

This book contains instructions covering the operation and maintenance of your furnace. Keep with unit at all times.
Should you require further information, contact your dealer or nearest Suburban Service Center.

INSTALLATION INSTRUCTIONS

CAUTION: If possible, do not install the furnace to where the vent can be covered or obstructed when any door on the trailer is opened. If this is not possible, then the travel of the door must be restricted in order to provide a 6" minimum clearance between the furnace vent and any door whenever the door is open.

NOTE: 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".)

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

These furnaces are design certified for liquefied petroleum (LP) gas or conversion to natural gas.

Gas supply pressure for purposes of input adjustment:
minimum - 11" W.C.*; maximum - 13" W.C.* for LP
minimum - 5" W.C.*; maximum - 7" W.C.* for natural gas
(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. Standard for Recreational Vehicles ANSI A-119.2-1987.
2. National Fuel Gas Code ANSI Z223.1-1988.
3. Furnace must be electrically grounded in accordance with the National Electrical Code ANSI/NFPA No. 70-1987.

This unit is equipped with an electric igniter device that has an energy consumption of .1 amp @24 volts A.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 two 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 64 square inches. Also, a return air opening of 49 square inches must be provided on left side of coach cabinetry and centered by room air blower opening on furnace. The return air to the furnace must total 113 square inches. (See Figure 3.)

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.

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

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.

NOTE: Side and top clearances may be 0" for through the wall installations up to a maximum wall thickness of 2-1/4". (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 13-1/8". This will allow the rear of the furnace to be installed against the outer skin of the coach. (See Figure 1.)

5-Cut two 3" 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 as close to the outer skin of coach as possible and still assure proper vent tube overlap. (See Installing Vent Assembly.)

7-Fasten furnace to floor of coach using the two (2) 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)

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 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-Locate center lines for exhaust and intake tubes as shown in Figure 2. Cut two 3" 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 as close to inner wall of coach as possible and still assure proper vent tube overlap. (See Installing Vent Assembly.)

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.)

| Model | Front | Left Side | Right Side | Top | Bottom | Back | Exhaust and Intake Tube |
|-------|-------|-----------|------------|-----|--------|------|-------------------------|
| P-40 | 1" | 2" | 2" | 1" | 0" | 0" | 3/8" |

—NOTE—
CLEARANCE FROM DUCTS TO COMBUSTIBLE MATERIAL WITHIN FIRST 3 FEET FROM FURNACE-1/4"
(See Figure 3)

TABLE 1

INSTALLING VENT ASSEMBLY

NOTE: Vent outlet must be installed so it is in the same atmospheric pressure zone as the combustion air intake.

CAUTION: Combustion air must not be drawn from the living area. The combustion air must be supplied from the outside atmosphere; therefore, one must insure that the vent cap and tube assemblies are properly installed. A minimum of 1/2" overlap on intake tube and a minimum of 1-1/4" on the exhaust tube is required.

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 as illustrated in Figure 2. Minimum 1/2" is required.

3-Insert vent assembly over exhaust tube. Tube must be installed from the outside of the coach as illustrated in Figure 2. Minimum tube overlap of 1-1/4" is required.

4-Attach vent assembly to outer skin of coach with the four (4) screws provided. Do not install vent assembly upside down. The words "Suburban" and "Dayton, Tenn." must be right side up.

CONNECTING GAS SUPPLY

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

NOTE: The compound used on threaded joints must be resistant to liquefied petroleum (LP) and natural gas.

NOTE: 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.

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 supplied pressure to the furnace, a 1/8" NPT plug tap must be installed and accessible 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

This furnace is wired for 120 volts A.C. only. Connect the 120 volt A.C. wire leads in the junction box located on the right side of the furnace cabinet.

All wiring and wire connections must conform to local codes and the National Electrical Code ANSI/NFPA No. 70-1987.

CONNECTING DUCTS TO FURNACE

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

1-Maintain a minimum of 48 square inches open duct area from the furnace cabinet to register. (Minimum 4 ducts - 4" diameter.)

Maintain a minimum of 48 square inches when under floor ducting is used.

2-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.

3-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.

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

5-Maintain a minimum of 1/4" clearance where ducts pass through any combustible construction; such as, coach cabinetry. (See Figure 3.)

6-Do not install air boosters in the duct system. Such devices will cause the furnace to cycle on limit and cause 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.

PREVENTIVE MAINTENANCE

Your furnace should be inspected before use at least annually by a qualified service agency. Particular attention should be given to the following items:

1-Inspect combustion chamber for restrictions in exhaust or intake. It is imperative that the flow of intake combustion air and the flow of exhaust gases being expelled to the outside atmosphere not be obstructed. Any soot or loose debris should be blown out using compressed air. (See Figure 9.)

2-Inspect all gaskets. If any gaskets show signs of leakage or deterioration, replace them. Safe operation of the furnace depends on all gaskets being tight.

3-Inspect return air inlet openings to the furnace. Remove any restrictions to assure adequate air flow.

4-Inspect main burner by removing the four (4) screws (A, B, C and D) securing the burner access door to the combustion chamber (see Figure 7). If excessive rust and corrosion are present on burner surface, the burner must be thoroughly cleaned or replaced. The burner may be cleaned using a steel wire brush and blown clean using compressed air.

5-The motor is permanently lubricated and requires no oiling.

You, as the owner/user, should inspect the furnace monthly during heating season for presence of soot on vent. Operating the furnace under this condition could lead to serious property damage, personal injury or loss of life. If soot is observed on the vent, immediately shut the furnace down and contact a qualified service agency.

Listed below are several safety related items that you should follow to assure continued safe operation of furnace.

1-Keep the furnace area clear of any combustible materials, gasoline or other flammable vapor and liquids.

2-Before operating furnace, check the location of the furnace vent to make sure it will not be blocked by the opening of any door on the trailer. If it can be blocked, do not operate the furnace with the door open.

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 wiring to the white wires on right side of furnace marked "Thermostat Wires". (See wiring diagram.)

WARNING! Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the appliance before shutting off the electrical supply.

6-Always follow the lighting instructions. Do not deviate from step-by-step procedures.

7-Never attempt to repair damaged parts. Always have them replaced by a qualified service agency.

8-Never attempt to repair the furnace yourself. Seek the help of a qualified service person.

9-Periodically observe the main burner flame to assure it is burning with a hard blue flame with well defined burner ports. (See Figure 3.) If flame appears yellow or burner has a lazy flame, shut furnace down and contact a qualified service person.

NOTE: To observe flame, cabinet front must be removed. Operation of burner can then be observed through the viewing window on front of chamber. (See Figure 2.)

10-Periodically inspect the vent for obstructions or presence of soot. If soot is present, immediately shut the furnace down and contact your dealer or a qualified service person. Do not operate the furnace if soot is present on vent. To do so could result in personal injury and/or death.

11-Never restrict the ducting installed by your trailer manufacturer. To do so could cause improper furnace operation.

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

OPERATING INSTRUCTIONS

1-Turn the manual valve to the "OFF" position. (See Figure 1.)

2-Move "OFF" lever located at bottom of thermostat to the right if set on "OFF" position.

3-Set thermostat above room temperature to begin blower operation. A slight delay will occur before the blower comes on. Allow blower to run for 5 minutes for combustion chamber purge cycle.

4-After 5 minutes, move thermostat lever below room temperature. Blower should go off.

5-Open manual shut-off valve. Correct operating characteristics depend on this valve being positioned fully open. Never attempt to operate with valve partially closed.

6-Set thermostat lever above room temperature.

7-Allow 30 seconds for main burner to light after blower comes on.

8-If burner does not light, repeat Steps 1 through 5.

9-If after three (3) attempts with no ignition, go to Shut Down and contact your dealer or a local recreational vehicle service agency. Do not continue to cycle furnace through thermostat in an attempt to get ignition.

TO SHUT DOWN

1-Set thermostat to positive off position.

2-Turn manual shut off valve to the "OFF" position.

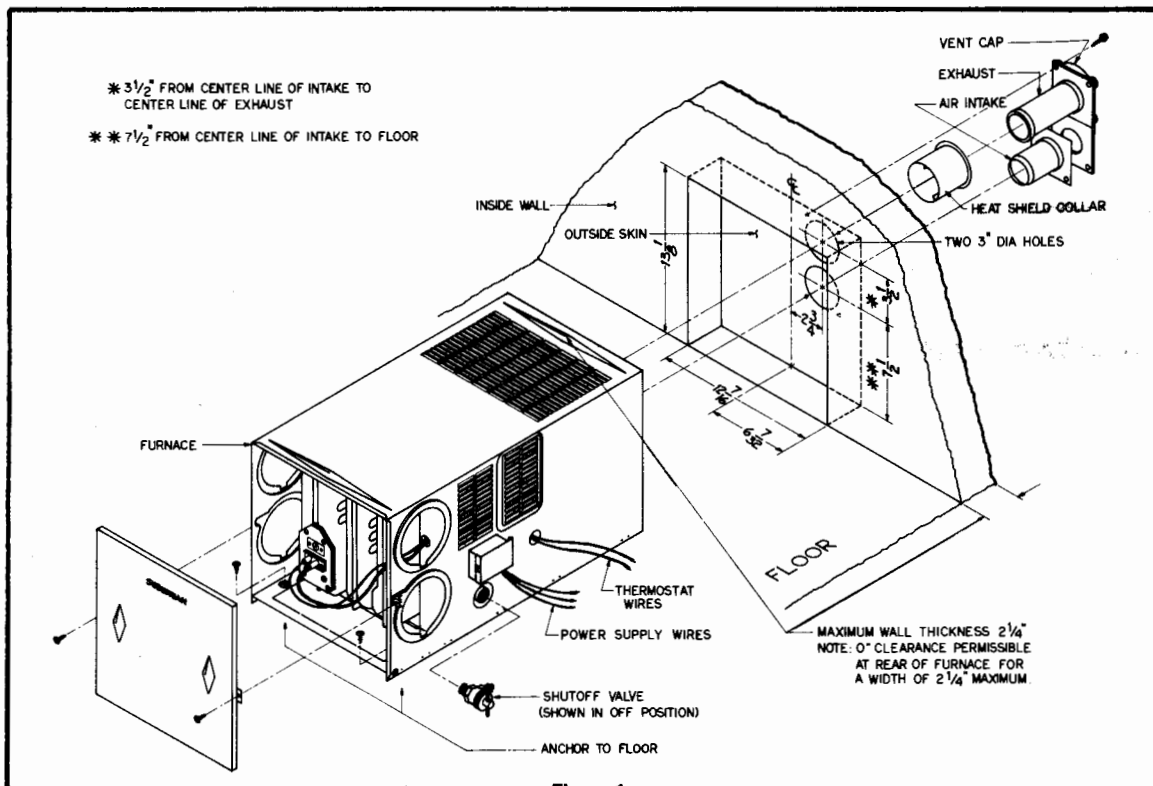
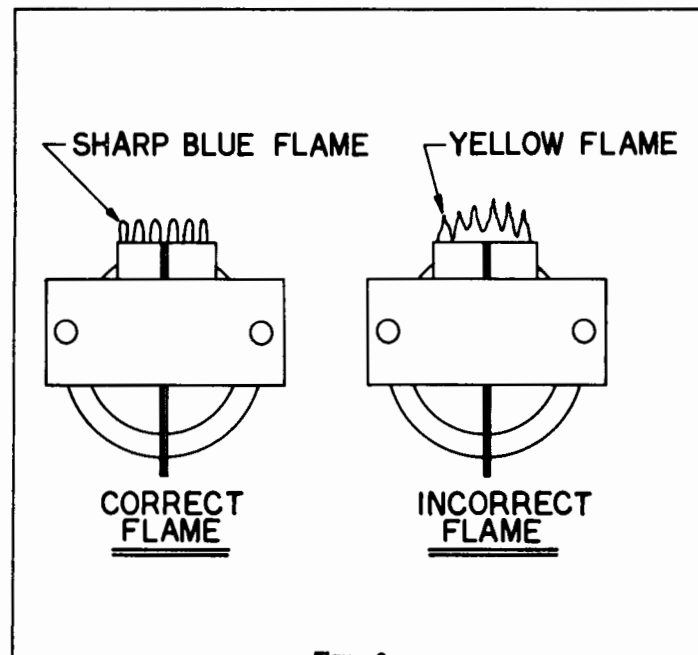
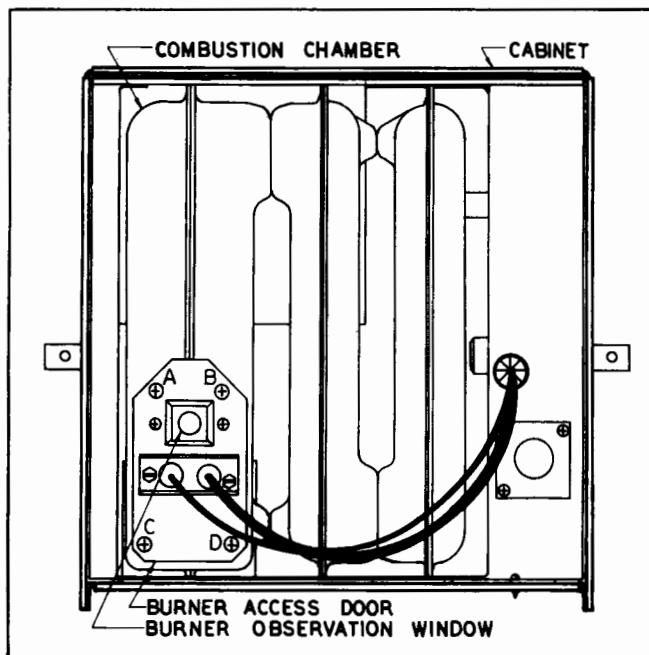
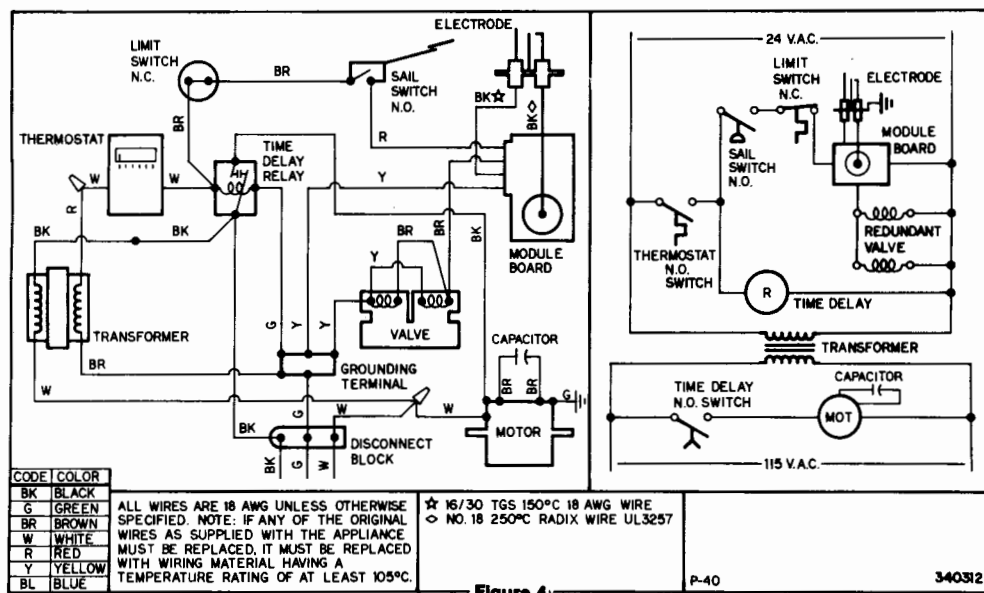
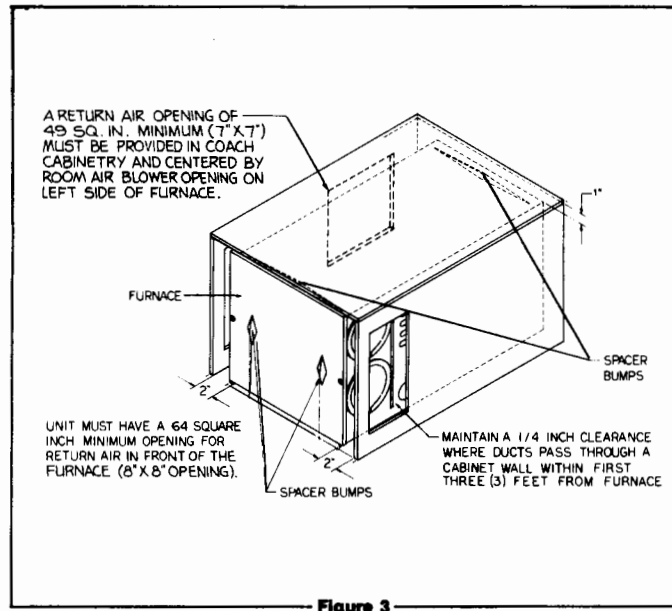
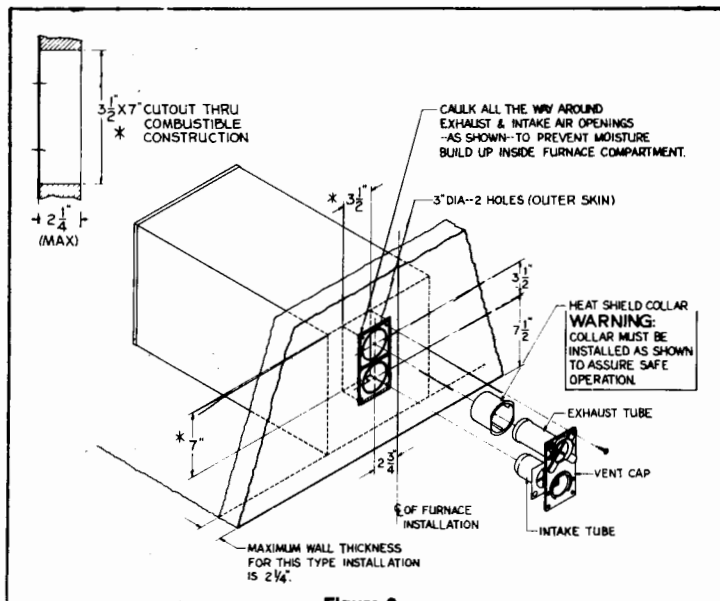


Figure 1



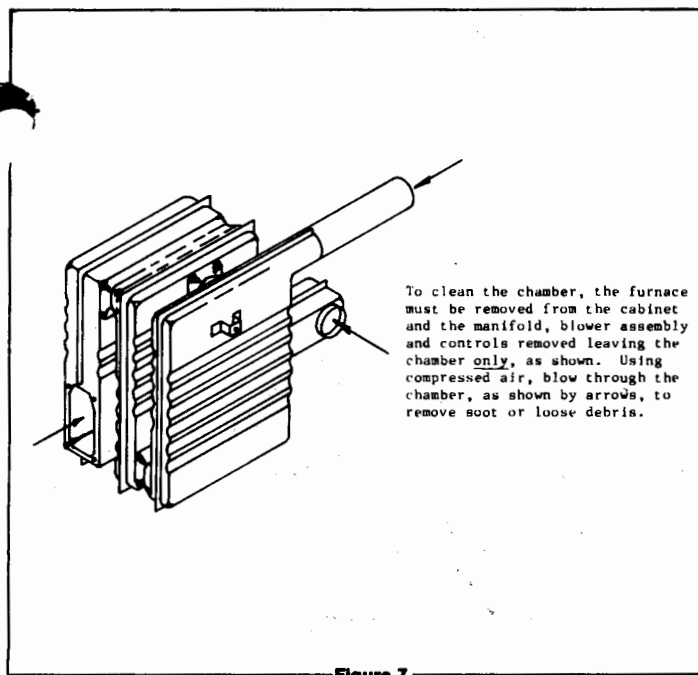


Figure 7

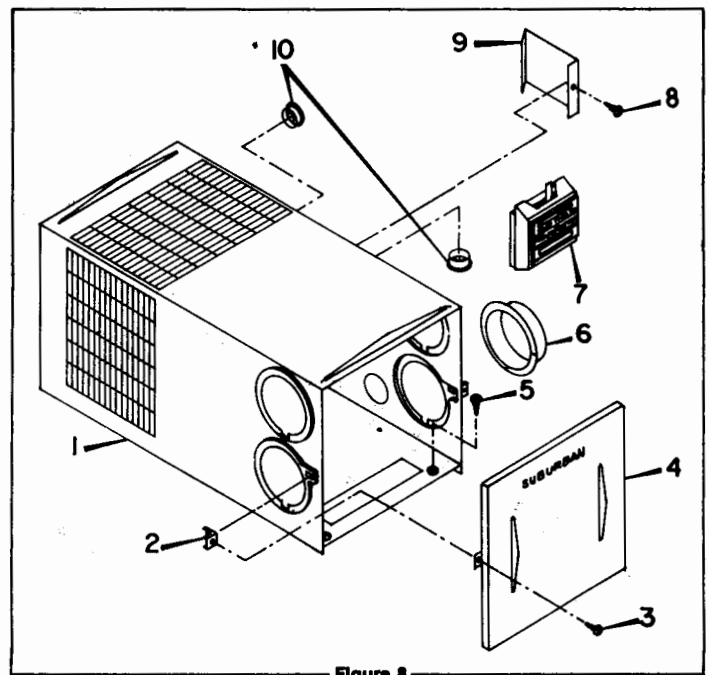


Figure 8

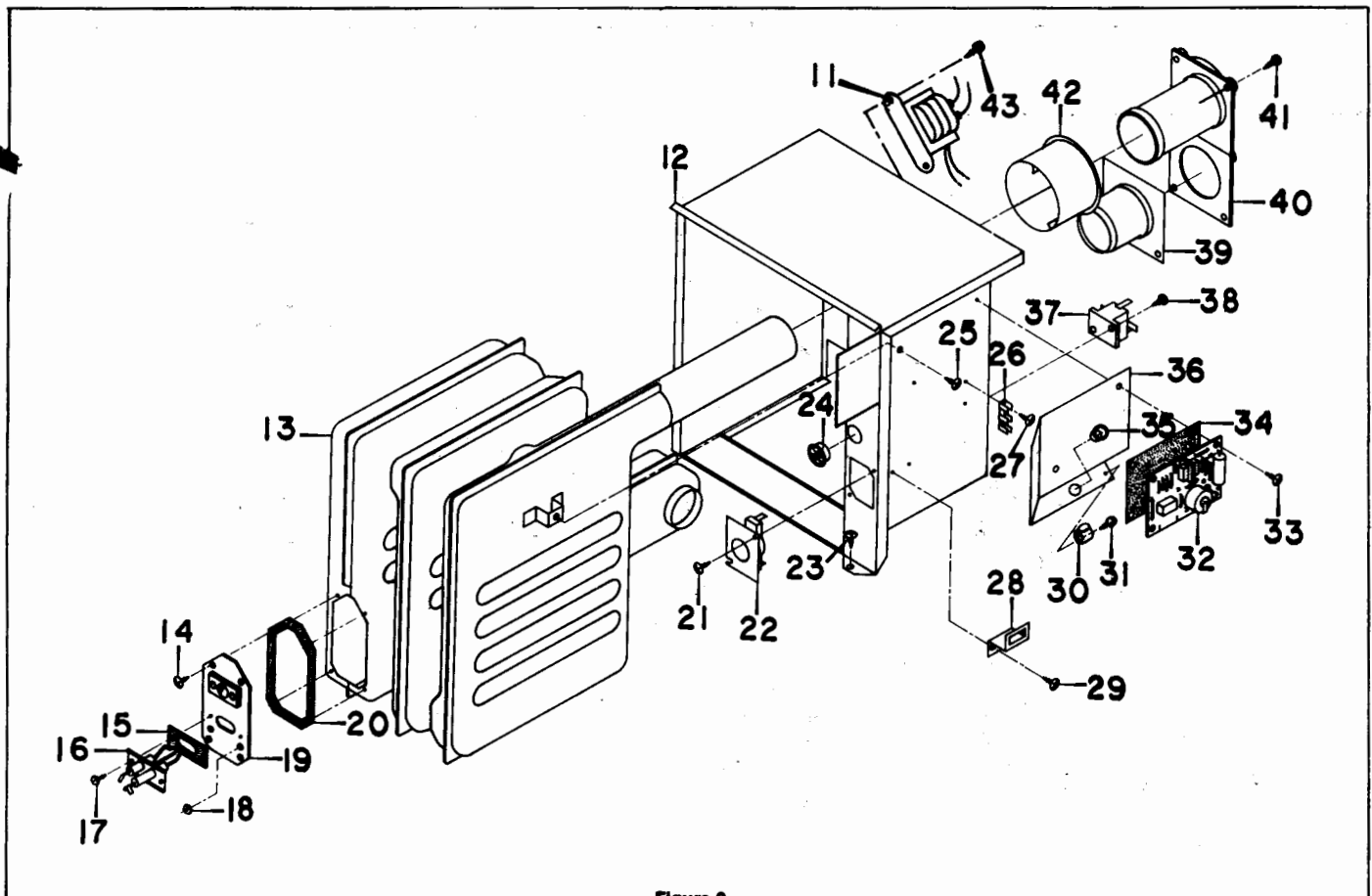


Figure 9