installation operation and service instructions

GSR14 Series Units

GAS UNITS
502,606M
3/91
Supersedes 502,250M

RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE

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 this manual. For assistance or additional information, consult a qualified installer, service agency, or the gas supplier.

FOR YOUR SAFETY
WHAT TO DO IF YOU SMELL GAS:

- **Do not try to light any appliance.**
- **Open windows.**
- **Do not touch any electrical switch; Do not use the phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

Litho U.S.A

LENNOX Industries Inc.

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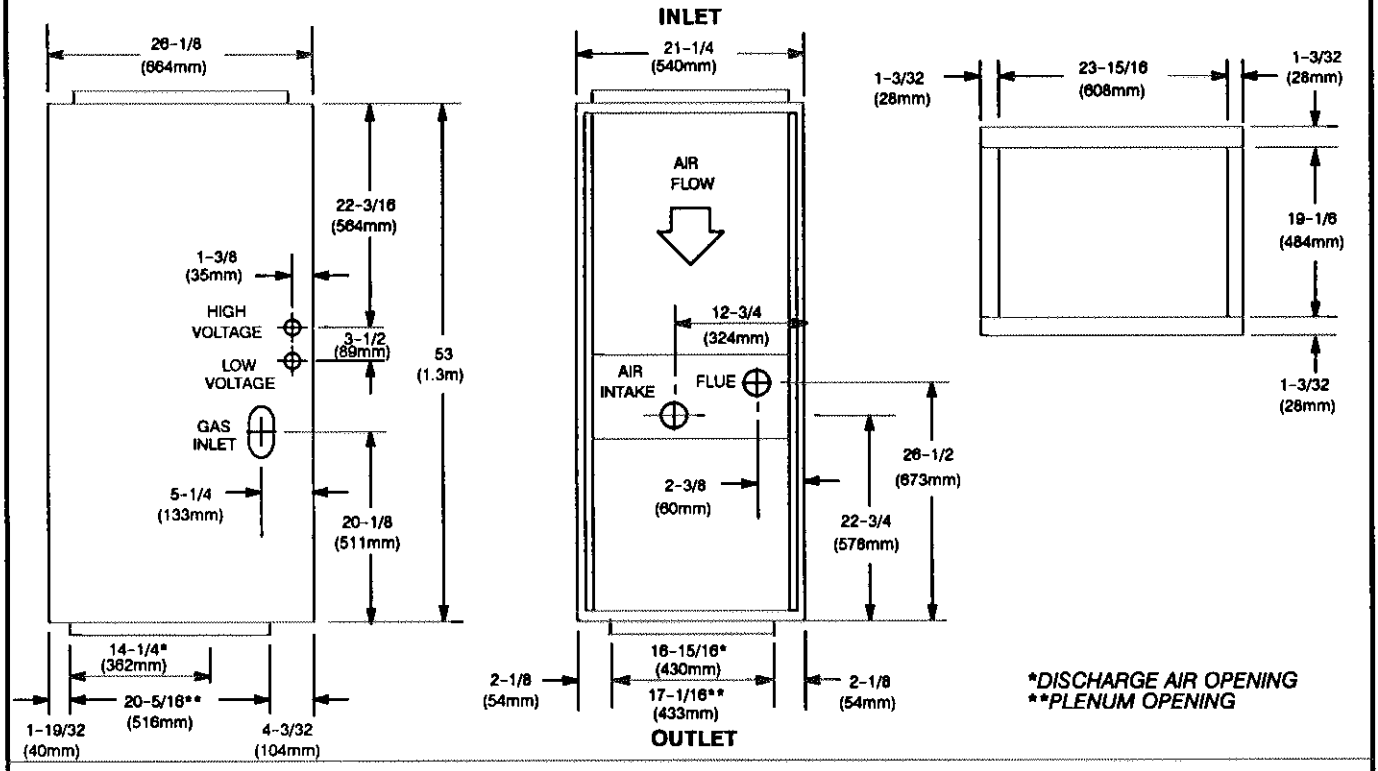
UNIT DIMENSIONS



START-UP AND PERFORMANCE CHECK LIST

Job Name _____ Job No. _____ Date _____

Job Location _____ City _____ State _____

Installer _____ City _____ State _____

Unit Model No. _____ Serial No. _____ Serviceman _____

HEATING SECTION

Electrical Connections Tight? ☐

Supply Voltage _____

Condensation Drain in Unconditioned Space (If applicable)

Heat Tape Applied? ☐ Heat Tape Electrical Supply On? ☐

Gas Piping Connections Tight & Leak-Tested? ☐

Fuel Type: Natural Gas ☐ LP Gas ☐

Furnace BTU Input _____

Line Pressure (7" (178mm) Natural Gas; 11" (279mm) LP Gas)

Regulator Pressure (Refer to unit nameplate) _____

Exhaust Connections Tight? ☐

Intake Connections Tight? ☐

Fan Control Off Setting (90°F/32.5°C factory setting) _____

Temperature Rise _____ External Static Pressure _____

Filters Clean & Secure? ☐

THERMOSTAT

Calibrated? ☐ Heat Anticipator Properly Set? ☐ Level? ☐

I-REQUIREMENTS

The installation of Lennox high efficiency central heating forced air gas furnaces must conform with the current Installation Code for Gas-Burning Appliances and Equipment CAN1-B149.1 (natural gas) or CAN1-B149.2 (propane gas), installation requirements for gas burning appliances in mobile homes C.S.A Z240.4.1, local plumbing or waste water codes and other applicable local codes.

The GSR14 furnace used as a high-static unit heater may be installed in an aircraft hangar in accordance with the requirements of the enforcing authorities. The unit heater may be installed in public garages in accordance with CAN1-B149 codes.

For unspecified requirements, the installation must conform with manufacturer's C.G.A. certified instructions contained herein. The GSR14 forced air gas furnace and high-static unit heater is certified for installation clearances to combustible material as listed on appliance rating plate and the following tables.

Only GSR14-50 and GSR14-80 units in downflow applications are approved for manufactured (mobile) home installations.

TABLE 1
(Forced Air Furnaces Only)

DOWNFLOW CLEARANCES	
Sides	1 inch (25mm)**
Rear	1 inch (25mm)**
Top	1 inch (25mm)
Front	6 inches (150mm)
*Floor	Non-Combustible
Flue Pipe	0 inches (0mm)

**Clearance for installation on combustible floor if optional additive base is installed between the furnace and the combustible floor.*

***Add one extra inch to the nameplate clearance for mobile home installation.*

NOTE-When downflow unit is installed on a combustible floor, an additive base (ordered separately) must be installed between the furnace and the floor.

TABLE 2
(Forced Air Furnaces and Unit Heaters)

HORIZONTAL CLEARANCES	
Ends	3 inches (75mm)
Rear	3 inches (75mm)
Top	3 inches (75mm)
Front	6 inches (150mm)
Floor	Combustible
Flue Pipe	0 inches (0mm)

Accessibility and service clearances must take precedence over fire protection clearances.

For installation in a residential garage, unit must be located or protected to avoid physical damage by vehicles. Unit must be adjusted to obtain a temperature rise and external static pressure within the range specified on appliance rating plate. When this furnace is used in conjunction with cooling units, it shall be installed in parallel with or on the upstream side of the cooling units to avoid condensation in the heating element. With a parallel flow arrangement, damper (or other means to control flow of air) shall be adequate to prevent chilled air from entering furnace and, if manually operated, must be equipped with means to prevent operation of either unit unless damper is in full "heat" or "cool" position. When installed, furnace must be electrically grounded in accordance with Canadian Electric Code Part 1, C.S.A. C22.1 and/or local codes.

Wiring to be done in the field, between the furnace and devices not attached to the furnace or between separate devices which are field-installed and located, shall conform with the temperature limitation for type T wire [63°F (17°C) rise] when installed in accordance with these instructions.

When a furnace is installed so that supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall also be handled by a duct(s) sealed to the furnace casing and terminating outside the space containing the furnace.

II-GENERAL

A-Shipping Damage

Check unit carefully for shipping damage. Receiving party should contact last carrier immediately if any shipping damage is found.

NOTE-Special care should be taken to check the alignment of the gas piping at the point it penetrates the vestibule panel. Inspect the rubber grommet for damage; there must be no direct contact between the gas pipe and the vestibule panel.

B-Shipping Bracket Removal and Hoisting

Remove two shipping bolts and brackets at discharge end of unit before installation. If lifting is necessary, remove shipping bolts (leaving brackets in place). Slip end links of a 2 ft. length of 3/16" diameter steel chain into open space in brackets and replace bolts. See figure 1. Remove bolts, brackets and chain after lifting. Also, remove shipping tags on bottom of furnace. Holes must be plugged with snap plugs provided.

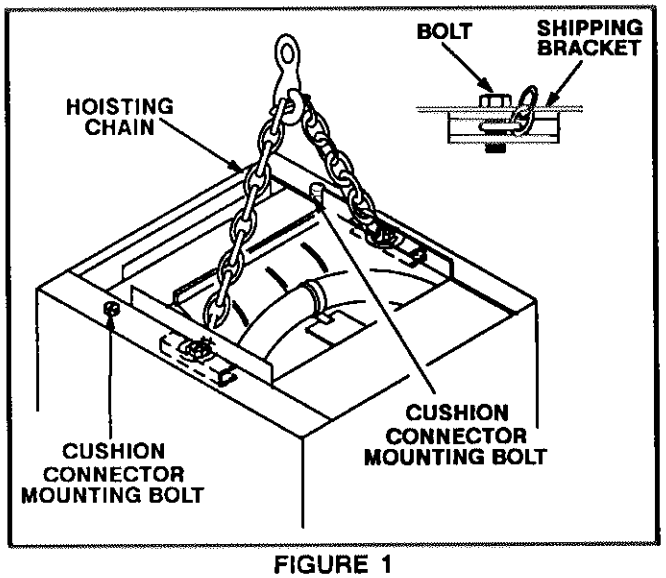


FIGURE 1

WARNING-Unit access panels provide necessary unit support. When unit is being hoisted or moved in any way, panels must be in place. The blower may be removed to reduce weight before lifting the unit. To remove the blower, remove two bolts holding blower frame in place, as well as wiring harness jackplug. Slide blower from cabinet as shown in figure 2.

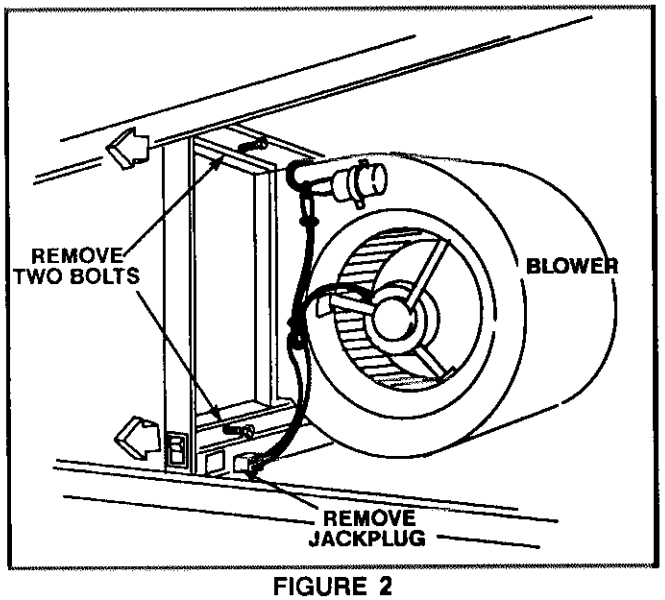


FIGURE 2

C-Setting Equipment

GSR14 series furnaces may be installed in either the downflow or horizontal position. When unit is installed where freezing temperatures are possible, condensate trap and condensate line must be protected by 3-watt, grounded and sheathed self-regulating heating cable and insulation. Heating cable installation kit is available as Lennox kit no. LB-56497CA. Heating cable is also available in 25 and 100 ft. lengths.

Condensate trap must be accessible for servicing and unit must be level to ensure proper drainage from coil.

CAUTION-Unit is designed to lock out operation when blockage occurs in condensate trap or condensate line.

Before installing unit in downflow position, cushion connector mounting bolts must be removed from bottom of unit. This will facilitate servicing heat exchanger at a later date.

NOTE – GSR14 furnaces used in manufactured (mobile) home applications must be installed in the downflow position.

D-Auxiliary Power Supply

If installation requires use of a condensate pump or heating cable, a 110V power supply must be made available near the unit.

E-Duct System

1- Insulate supply air plenum and duct system at least through the first elbow. Use 1-1/2 to 3 lb. density, matt face, 1" thick insulation. Provisions must be made to keep insulation in place and to protect edges from airflow deterioration.

2- Size and install supply and return system using industry-approved standards that result in a quiet and low-static system with uniform distribution.

F-Filters

GSR14 series units are equipped with a reusable foam filter. Filter must be in place any time unit is in operation.

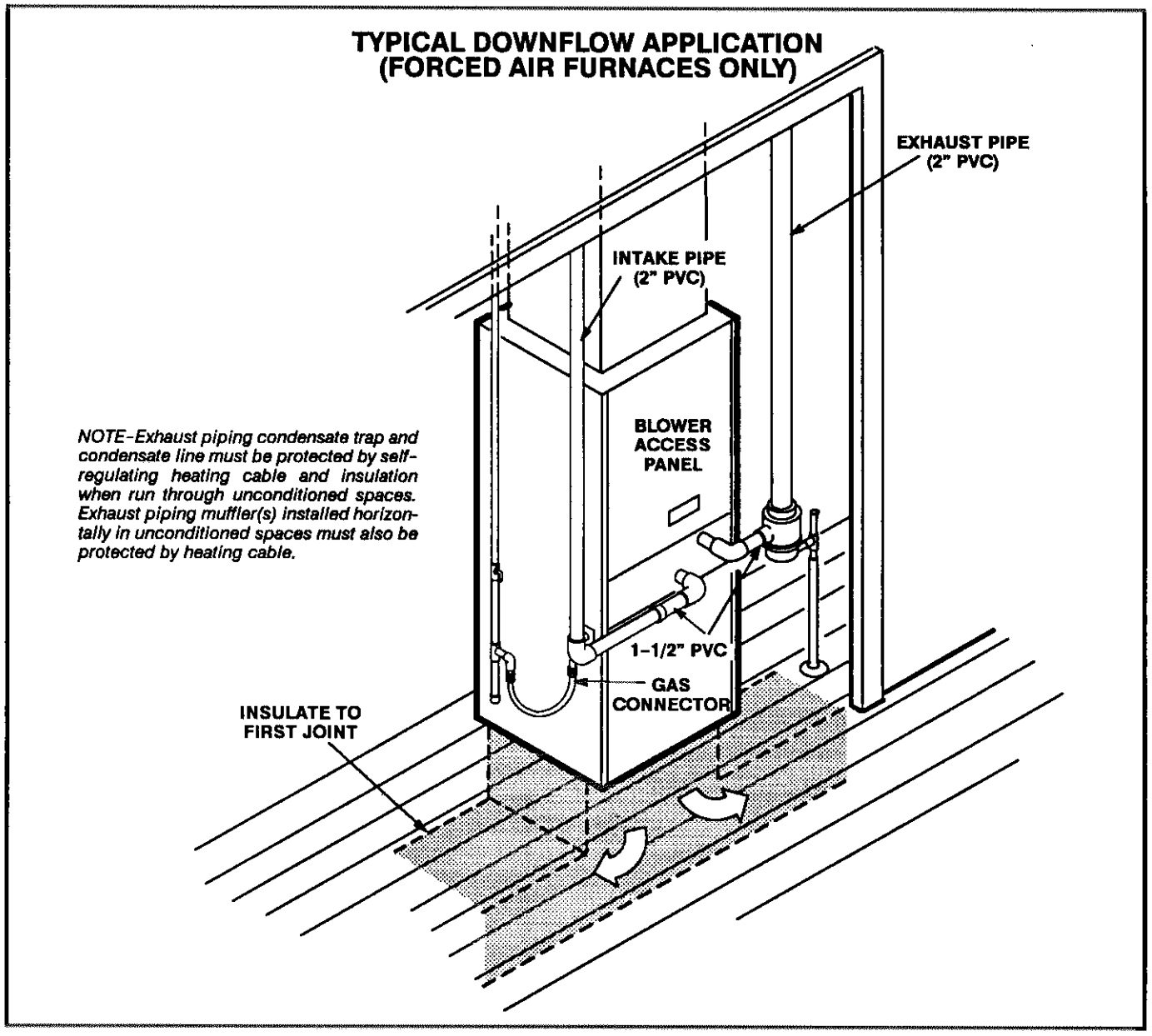


FIGURE 3

III-INSTALLATION

A-Setting Equipment -- Downflow Units - Does Not Include Manufactured (Mobile) Home Applications (Forced Air Furnaces Only)

Downflow unit installs in three ways: on non-combustible flooring, on combustible flooring using an additive base or on a reverse-flow cooling cabinet. Do not drag unit across floor.

Before installing unit in downflow position, cushion connector mounting bolts must be removed from bottom of unit. This will facilitate servicing heat exchanger at a later date. Set unit as follows:

Installation on Non-Combustible Flooring

1- Cut floor opening keeping in mind clearances listed on unit rating plate. Also keep in mind gas supply connections, electrical supply, flue and air intake connections and sufficient installation and servicing clearances. See table 3 for correct floor opening size.

2- Flange warm air plenum and lower into opening.

3- Set unit over plenum.

4- Check to see that an adequate seal is made.

TABLE 3
NON-COMBUSTIBLE FLOOR

Model No.	Front to Rear		Side to Side	
	In.	mm	In.	mm
GSR14-50/80/100	20-1/2	521	17-1/4	438

NOTE-Floor opening dimensions listed are 1/4" (5mm) larger than unit opening.

Installation on Combustible Flooring

1- When unit is installed on a combustible floor, an additive base (available separately as kit number LB-80639BB) must be installed between the furnace and the floor. See table 4 for opening size to cut in floor.

CAUTION-The furnace and additive base shall not be installed directly on carpeting, tile or other combustible material other than wood flooring.

TABLE 4
ADDITIVE BASE FLOOR OPENING

Model No.	Front to Rear		Side to Side	
	In.	mm	In.	mm
GSR14-50/80/100	22-7/8	581	19-5/8	498

NOTE-Floor opening dimensions listed are 1/4" (5mm) larger than unit opening.

2- After opening is cut, set additive base into opening.

3- Check fiberglass strips on additive base to make sure they are properly glued and positioned.

4- Lower supply air plenum into additive base until plenum flanges seal against fiberglass strips.

NOTE-Be careful not to damage fiberglass strips. Check for a tight seal.

5- Set unit on additive base so unit flanges drop into plenum. Refer to figure 4.

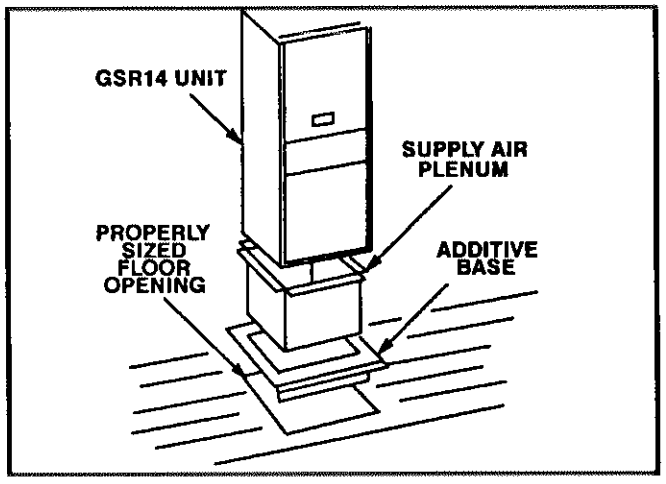


FIGURE 4

Installation on Cooling Cabinet

1- Refer to reverse-flow coil installation instructions for correctly sized opening in floor and installation of cabinet.

2- When cooling cabinet is in place, install furnace so flanges drop inside cabinet opening.

3- Seal cabinet and check for air leakage.

Return Air Opening -- Downflow Units

The following steps should be taken when installing plenum:

1- Bottom edge of plenum should be flanged with a hemmed edge. See figure 5.

2- Fiberglass sealing strips should be used.

3- In all cases, plenum should be secured to top flanges of furnace with sheet metal screws.

4- In closet installations, it may be impossible to install sheet metal screws from the outside. In this case, make plenum with a removable front and install screws from the inside. See figure 6.

5- Continue with exhaust, condensate and intake piping section.

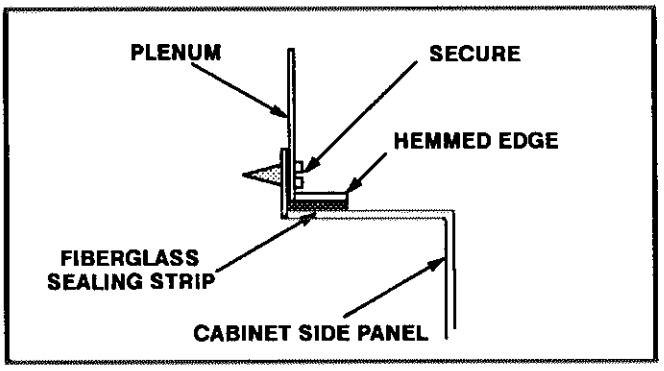


FIGURE 5

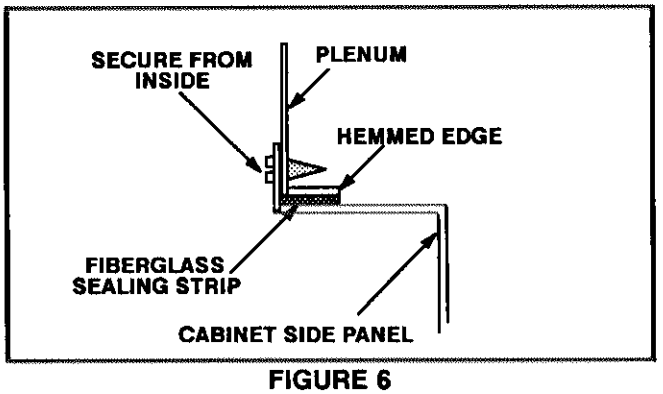


FIGURE 6

B-Setting Equipment -- Downflow Units Used in Manufactured (Mobile) Home Applications

(GSR14-50 and -80 Forced Air Furnaces Only)

Downflow units installed in manufactured (mobile) homes can be installed on combustible flooring using an additive base or on a reverse-flow cooling cabinet. When moving furnace, do not drag across floor.

Before installing unit in downflow position, cushion connector mounting bolts must be removed from bottom of unit. This will facilitate servicing heat exchanger at a later date. Set unit as follows:

Installation on Combustible Flooring

1- Cut an opening in floor as given in table 4.

2- Set additive base (available separately as Lennox kit number LB-80639BB) in opening between the furnace and the floor. See figure 7.

CAUTION – The furnace and additive base shall not be installed directly on carpeting, tile or other combustible material other than wood flooring.

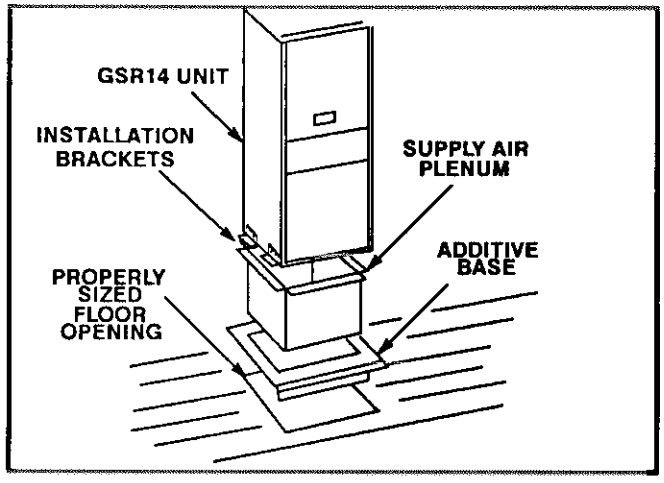


FIGURE 7

3- Check fiberglass strips on additive base to make sure they are properly glued and positioned.

NOTE -- Be careful not to damage fiberglass strips Check for a tight fit.

4- Lower supply air plenum into additive base until plenum flanges seal against fiberglass strips.

5- Set unit on additive base so unit flanges drop into plenum. Refer to figure 7.

6- Secure unit to floor with four installation brackets provided. See figure 8. Use existing screws located at the bottom of unit to secure brackets to the unit and use screws provided with kit to secure bracket to floor.

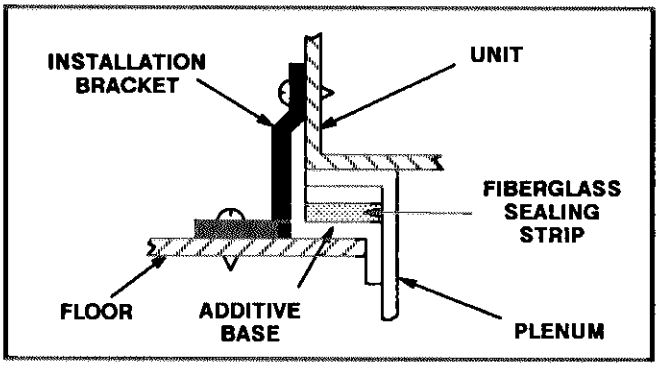


FIGURE 8

Installation on Cooling Cabinet

1- Refer to reverse-flow coil installation instructions for correctly sized opening in floor and installation of cabinet.

2- When cooling cabinet is in place, install furnace so flanges drop inside cabinet opening.

3- Seal cabinet and check for air leakage.

Return Air Opening -- Downflow Units Used in Manufactured (Mobile) Home Applications

NOTE – The furnace and its return air system must be designed and installed so that negative pressure created by the air-circulating fan cannot affect another appliance's combustion air supply or act to mix products of combustion with circulating air. When installed in an enclosure communicating with another fuel-burning appliance not of the direct vent type, the furnace air-circulating fan must be operable only when all doors or panels in the furnace fan compartment or in a return air plenum or duct are in the closed position.

The following steps should be taken when installing plenum:

1- Bottom edge of plenum should be flanged with a hemmed edge. See figure 5.

2- Fiberglass sealing strips should be used.

3- In all cases, plenum should be secured to top flanges of furnace with sheet metal screws.

4- In closet installations, it may be impossible to install sheet metal screws from the outside. In this case, make plenum with a removable front and install screws from the inside. See figure 6.

5- Continue with exhaust, condensate and intake piping section.

Additive Cooling

The following match-ups of evaporator coil and outdoor condensing units are recommended for specific mobile home applications.

TABLE 5
MOBILE HOME APPLICATION MATCH-UPS

Furnace Model No.	Evaporator Coil	Condensing Unit
GSR14Q3M-50 GSR14Q3M-80	CR16-41FF	HS14-411 HS16-411 HS19-411 HS18-411

C-Setting Equipment -- Horizontal Forced Air Furnaces Installed In Attic

Horizontal forced air furnaces may be installed in attic space either suspended with support frame kit or mounted on a platform. In either case, exhaust piping condensate trap assembly must be installed where it can be serviced at a later date.

NOTE-Control access panel is shipped in proper position for downflow application. In horizontal applications, panel should be rotated after unit is in place.

IMPORTANT-Exhaust connection must always be positioned below intake connection to ensure proper coil drainage. When viewing unit from front, circulating air blower compartment must be located to the right.

Installation of Horizontal Furnace Suspended In Attic

NOTE-If unit is suspended in attic or crawl space, horizontal support kit (ordered separately) must be used to ensure proper unit support and coil drainage.

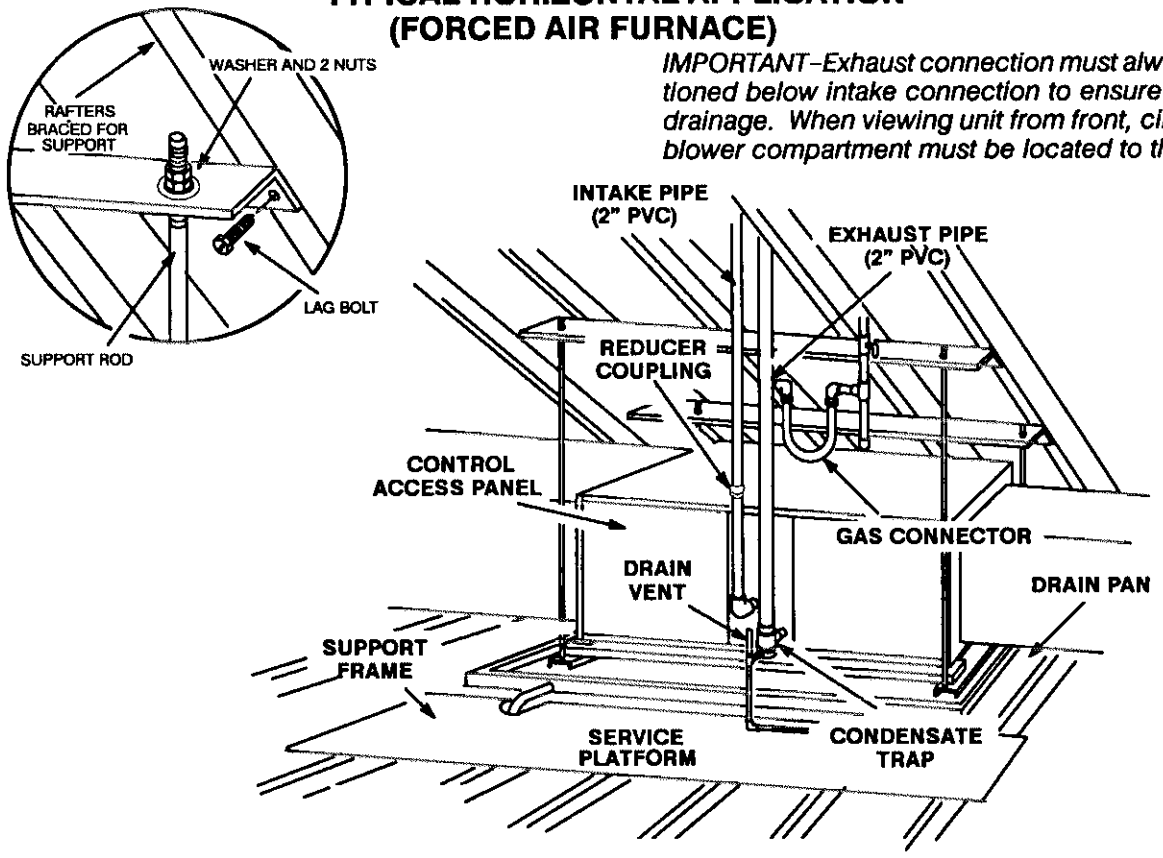
1- Select location for unit keeping in mind service and other necessary clearances.

2- Provide service platform in front of unit.

3- Fabricate a drain pan fitted with a 1/2" or 3/4" N.P.T. fitting.

4- Using 3/8" rods and support frame kit (ordered separately), fabricate suspension hangers for unit keeping in mind front service access clearances.

TYPICAL HORIZONTAL APPLICATION (FORCED AIR FURNACE)



IMPORTANT-Exhaust connection must always be positioned below intake connection to ensure proper coil drainage. When viewing unit from front, circulating air blower compartment must be located to the right.

NOTE-Exhaust piping condensate trap and condensate line must be protected by self-regulating heating cable and insulation when run through unconditioned spaces. Exhaust piping muffler(s) installed horizontally in unconditioned spaces must also be protected by heating cable.

FIGURE 9

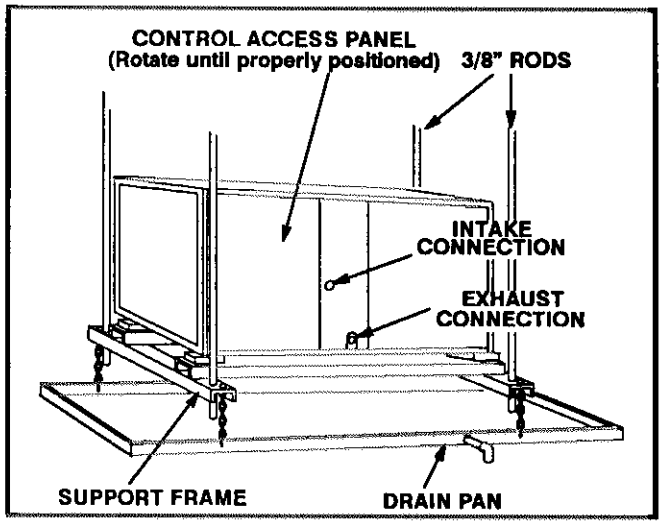


FIGURE 10

5- Mount unit on support frame and slide six isomode pads into place between cabinet and frame as shown in figure 10. Unit must be level to ensure proper coil drainage. Replace blower if it was removed during hoisting.

6- Continue with exhaust, condensate and intake line piping instructions.

7- Hang drain pan below support frame as shown in figure 10.

Platform Installation of Horizontal Unit in Attic

1- Select location for unit keeping in mind service and other necessary clearances.

2- Construct a raised wooden frame and cover frame with a plywood sheet. Provide a service platform and drain pan for unit as outlined in section "A."

NOTE-To prevent interference with unit access panels, drain pan lip must not exceed 5/8 in.

3- Set unit in drain pan, using six isomode pads (provided) as shown in figure 11. Unit must be level to ensure proper coil drainage.

4- Replace blower and reconnect jackplug if removed during hoisting.

5- Cooling coils which come in contact with rafters must be supported with isomode pads when used with GSR14 horizontal furnaces.

6- Continue with exhaust, condensate and intake piping installation according to instructions.

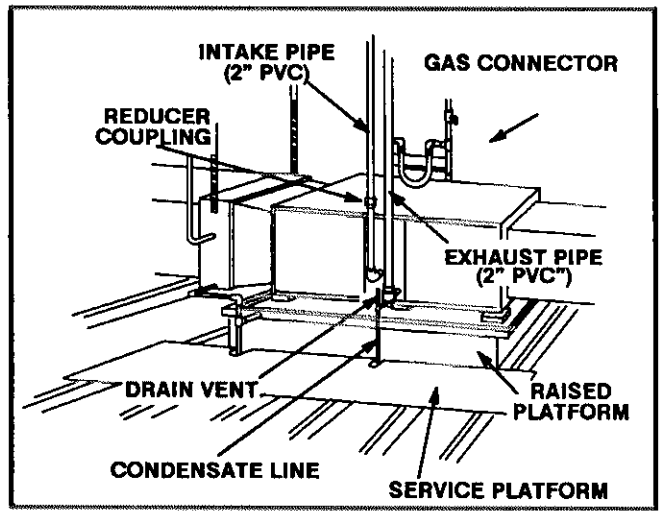


FIGURE 11

D-Setting Equipment -- Horizontal Forced Air Furnaces Installed in Crawl Space

Horizontal forced air furnaces may be installed in a crawl space either suspended with support frame or mounted on support frame on level cement blocks. In either case, exhaust piping condensate trap assembly must be installed where it can be serviced at a later date.

NOTE-Control access panel is shipped in proper position for downflow application. In horizontal applications, panel should be rotated after unit is in place.

IMPORTANT-Exhaust connection must always be below intake connection to ensure proper coil drainage. When viewing unit from front, circulating air blower compartment must be located to the right.

Installation of Horizontal Unit Suspended in Crawl Space

NOTE-If unit is suspended in attic or crawl space, support frame kit (ordered separately) must be used to ensure proper unit support and coil drainage.

1- Select location for unit keeping in mind service and other clearances.

2- Using 3/8" rods and support frame kit, fabricate suspension hangers keeping in mind service access panel clearances.

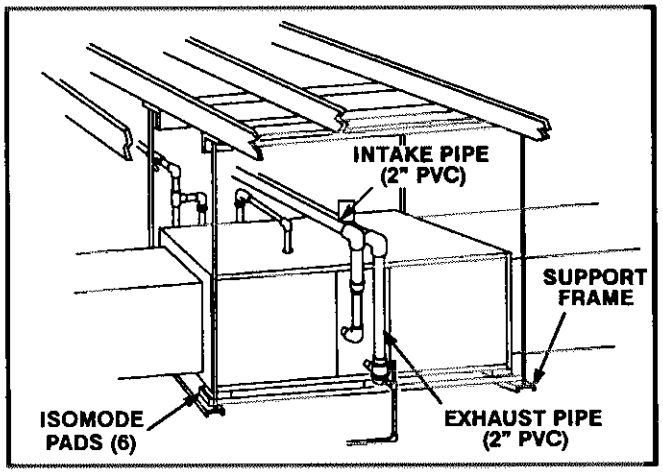


FIGURE 12

3- Install unit on support frame and slide isomode pads between cabinet and frame as shown in figure 12. Unit must be level to ensure proper coil drainage.

4- Install exhaust and intake piping according to instructions given in following section. Condensate line should be run into condensate pump if necessary to meet drain line slope requirements.

Platform Installation of Horizontal Unit in Crawl Space

1- Select location for unit, keeping in mind service and other clearances.

2- After positioning cement blocks, mount support frame kit (ordered separately) on top of blocks and install unit on frame. Slide six isomode pads between cabinet and support frame . See figure 13. Unit must be level to ensure proper coil drainage.

3- Install exhaust and intake piping according to information given in following section. Condensate line should be run into condensate pump. See figure 13.

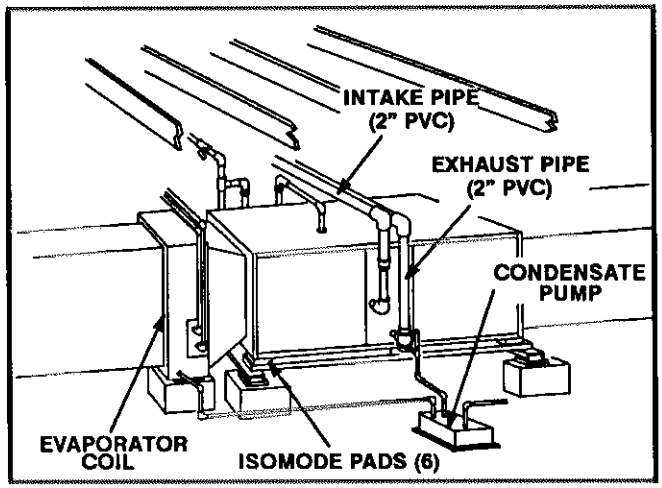


FIGURE 13

E-Setting Equipment -- Horizontal Unit Heater

Horizontal unit heaters may be installed either suspended from the ceiling using the support frame kit or mounted on a field-fabricated platform. Exhaust piping condensate trap assembly must be installed where it can be serviced at a later date.

NOTE-Control access panel is shipped in proper position for downflow application. In horizontal applications, panel should be rotated after unit is in place.

IMPORTANT-Exhaust connection must always be positioned below intake connection to ensure proper coil drainage. When viewing unit from front, circulating air blower compartment must be located to the right.

Installation of Horizontal Unit Heater Suspended from Ceiling

1- Select location for unit keeping in mind service and other clearances.

2- Fabricate a drain pan fitted with 1/2" (13mm) or 3/4" (19mm) N.P.T. fitting.

3- Using 3/8" (9mm) rods and support frame kit (ordered separately), fabricate suspension hangers, keeping in mind service access panel clearances.

4- Hang drain pan below support frame as shown in figure 14.

5- Mount unit on support frame and slide six isomode pads into place between cabinet and frame as shown in figure 14. Unit must be level to ensure proper coil drainage. Replace blower if removed during hoisting.

6- Continue with exhaust, condensate and intake line piping instructions.

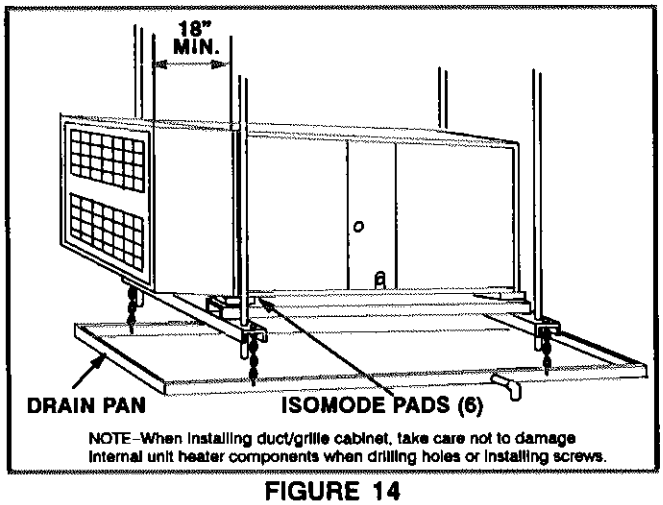


FIGURE 14

Platform Installation of Horizontal Unit Heater

1- Select location for unit keeping in mind service and other necessary clearances.

2- Construct a raised wooden frame and cover frame with a plywood sheet. Provide service platform and drain pan for unit as outlined on page 8.

NOTE-To prevent interference with unit access panels, drain pan lip must not exceed 5/8 in.

3- Set unit in drain pan, using six isomode pads (provided) as shown in figure 15. Unit must be level to ensure proper coil drainage.

4- Replace blower and reconnect jackplug if removed during hoisting.

5- Cooling coils which come in contact with rafters must be supported with isomode pads when used with GSR14 horizontal unit heaters.

6- Continue with exhaust, condensate and intake piping installation according to instructions which follow.

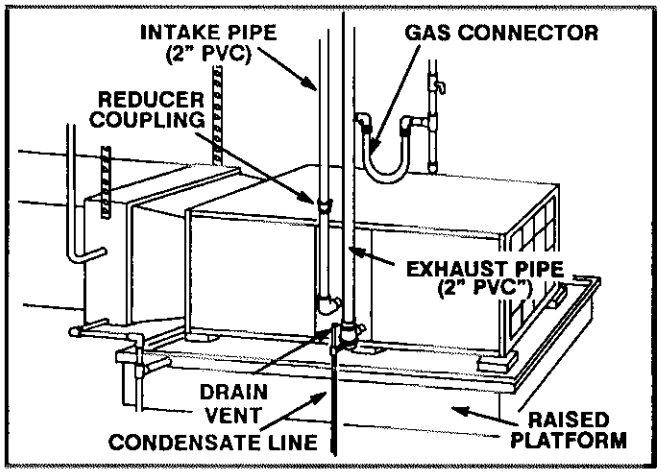


FIGURE 15

IV-EXHAUST, CONDENSATE AND INTAKE PIPING

A-Exhaust and Intake Piping Requirements

If GSR14 furnace replaces a furnace which was commonly vented with another gas appliance, the size of the existing vent pipe for that gas appliance must be checked. Without the heat of the original furnace flue products, the existing vent pipe is probably oversized for the single water heater or other appliance. The vent should be checked for proper draft with the remaining appliance. Two mufflers (one each in the exhaust and intake piping) are required and furnished for use with the GSR14-100 units. See table 6 for optional usage of mufflers with GSR14 units. Mufflers should be located and installed as directed in instructions packaged with muffler kit.

IMPORTANT-Exhaust piping muffler(s) installed horizontally in unconditioned spaces must be protected by self-regulating heating cable and insulation.

TABLE 6

MODEL NO.	EXHAUST MUFFLER	INTAKE MUFFLER
GSR14-50	1(optional)	1 (optional)
GSR14-80/100	1(required) 2(additional option)	1(required) 2(additional option)

1- GSR14 furnace is certified as a direct vent unit. It must be installed with a combustion air intake pipe and a flue exhaust pipe. Vent piping must be sized per table 7.

2- Furnace pipe connections are factory supplied. Pipe and fittings from furnace connections to outside termination are not supplied. Use Schedule 40 B137 plastic pipe.

3- Vent terminations may be field-assembled using Schedule 40 PVC plastic pipe and wall termination or roof termination kit (LB-49107C) as illustrated.

4- Vent termination kits must be installed without modification. Failure to do so may cause unsafe operation and void C.G.A. certification.

5- Install all piping per C.S.A B181.11 for PVC pipe.

Schedule 40 PVC pipe used for exhaust and intake lines should be sized per table 7. Each 90° elbow is equivalent to 5 ft. of vent pipe. Two 45° elbows are equivalent to one 90° elbow. One 45° elbow is equal to 2.5 ft. of vent pipe.

TABLE 7

MINIMUM DIAMETER FOR GSR14 VENTING					
Pipe Length (Max. Feet)	Number of 90° Elbows				
	0	2	4	6	8
5	2	2	2	2	2
10	2	2	2	2	2
20	2	2	2	2	2-1/2
30	2	2	2	2-1/2	2-1/2
40	2	2	2-1/2	2-1/2	2-1/2
50	2	2-1/2	2-1/2	2-1/2	2-1/2
60	2-1/2	2-1/2	2-1/2	2-1/2	3
70	2-1/2	2-1/2	2-1/2	3	3
80	2-1/2	2-1/2	3	3	3
90	2-1/2	3	3	3	3

If intake and exhaust piping runs are not equal in length and combination, the larger diameter pipe, as sized per table 7, must be used for both runs.

Muffler lengths should be excluded when measuring vent pipe runs for sizing. If the muffler is installed within 3 ft. of the GSR14 unit, 2" pipe should be used between the unit and the muffler. Pipe which has been sized according to

table 6 should then be used from the muffler to the termination. In cases where the muffler must be installed further than 3 ft. away from the unit, pipe sized according to table 6 must be used from the unit to the muffler and reduced to 2" to accommodate the muffler(s). PVC drain, waste and vent (DWV) type fittings may be used for intake runs. Exhaust fittings, however, must be schedule 40 PVC.

B-Exhaust and Condensate Line Piping

In horizontal applications, exhaust piping outlet must always be below intake connection. Both left and right-side exhaust piping exits are permissible in downflow applications.

WARNING-DANGER OF EXPLOSION! FUMES FROM PVC GLUE MAY IGNITE DURING SYSTEM CHECK. REMOVE SPARK PLUG WIRE FROM IGNITION CONTROL BEFORE 115V POWER IS APPLIED. RECONNECT WIRE AFTER TWO MINUTES.

1- Select proper fitting (different fittings are provided for use with horizontal or downflow applications) to run exhaust piping out of unit.

2- Glue fitting to compression coupling which is factory-installed.

CAUTION-Compression fitting must be checked to ensure a proper seal. If adjustment is necessary, center mullion can be removed. After adjustment, carefully inspect pressure switch hose to make sure it is firmly attached and check for proper positioning of barbed fitting. See figures 18 and 19.

3- Condensate trap is packaged separately and shipped inside unit. Separate housing from condensate trap assembly as shown in figure 17. In downflow applications, 1-1/2" elbow and 1-1/2" PVC nipple must be used to avoid blocking access panels. See figure 18. Cement the housing to either the 1-1/2" PVC nipple (downflow applications) or directly to the compression coupling (horizontal applications). Condensate trap housing must be installed perpendicular with bottom of unit to ensure proper operation of trap float. See figure 16.

IMPORTANT-Care must be taken to avoid using excessive amounts of cement when making connections to condensate trap housing.

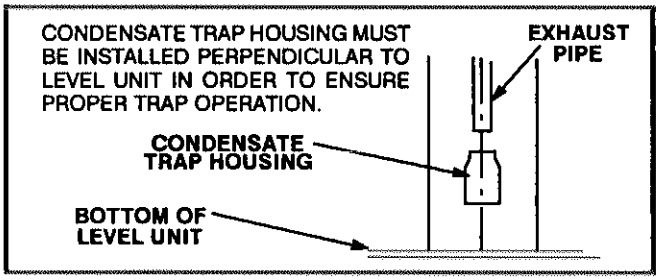


FIGURE 16

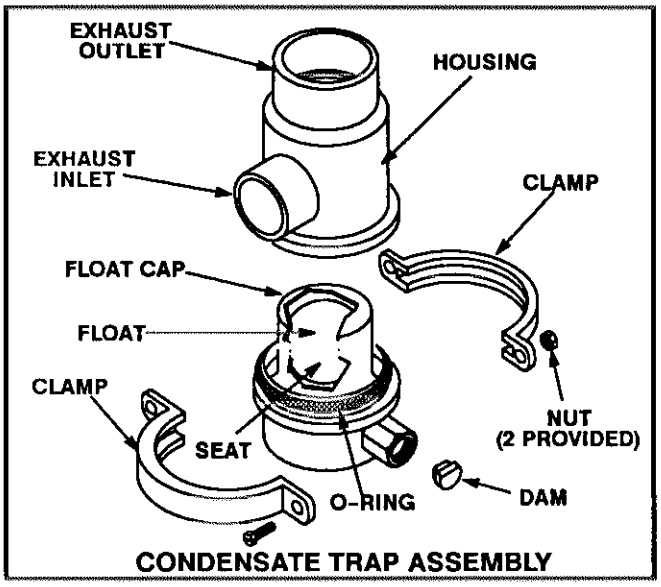


FIGURE 17

4- Cement exhaust pipe into top of housing and route to outside of structure.

CAUTION-Inside of housing must be free of primer and solvent cement before trap assembly is installed.

5- All horizontal runs of exhaust pipe must slope back toward unit. A minimum of 1/4" drop for each 12" of horizontal run is mandatory for drainage. Horizontal runs of exhaust piping must be supported every 5 feet using isolation hangers.

NOTE-Exhaust piping should be checked carefully to make sure there are no sags or low spots.

6- Install O-ring (provided) on trap assembly as shown in figure 17. Lubricate O-ring with water or silicone-based lubricant.

7- Install condensate trap assembly to housing using clamps, bolts and nuts provided. Rotate condensate connection to appropriate position.

IMPORTANT-Trap assembly must be removable to facilitate servicing. Do not use cement when installing condensate trap assembly to housing.

8- Install threaded adapter (provided) to condensate connection and cement 1/2" X 2" PVC nipple and tee to adapter in position so that condensate line may be attached in horizontal or vertical position depending upon application. See figure 18 or 19.

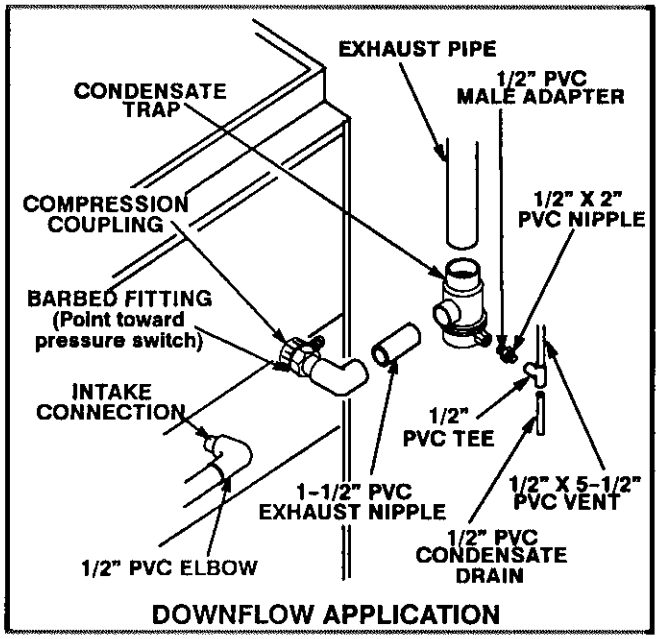


FIGURE 18

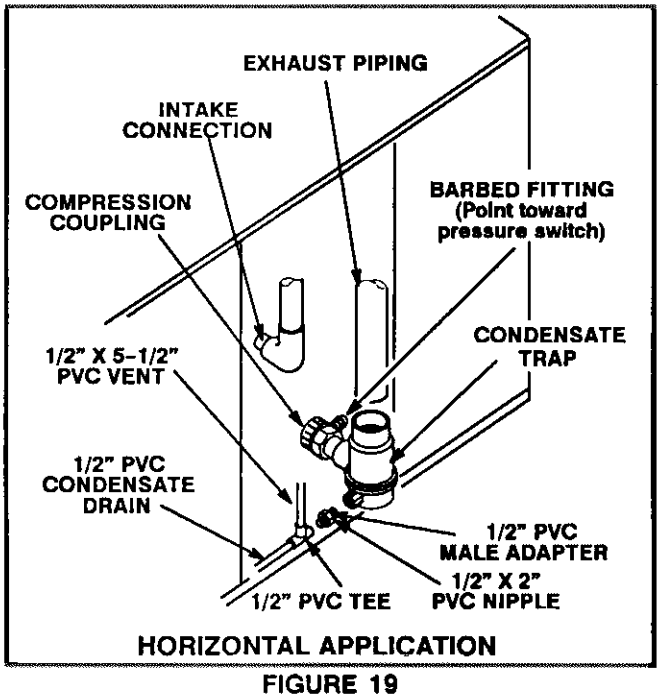


FIGURE 19

9- Cement 1/2" X 5-1/2" nipple to tee as shown in figure 18 or 19 to provide drain vent.

IMPORTANT-Drain vent must remain open at the top. Open end of pipe must not be used to connect drain hoses or other condensate hoses.

10- Connect 1/2" or 3/4" PVC condensate drain line to connection on condensate trap assembly (1/2" PVC adapter is furnished). Route condensate line to open drain. Condensate line must be sloped downward away from condensate trap to drain. If drain level is above condensate trap, condensate pump must be used in condensate line. Rigid PVC pipe must be used for condensate line. Both condensate trap and line must be protected by 3-watt, grounded and sheathed self-regulating heating cable when installed in areas where freezing might occur. Heating cable installation kit is available as Lennox part number LB-56497CA. Heating cable is packaged in 25 and 100 ft. lengths.

NOTE-When installing condensate line, keep in mind that condensate trap assembly must be removable to facilitate servicing.

CAUTION-Do not use copper tubing or existing copper condensate lines for drain line.

WARNING-The exhaust vent pipe operates under positive pressure and must be completely sealed to prevent leakage of combustion products into the living space.

11- Determine exhaust piping size using table.

12- Suspend piping at a minimum of every 5 feet using isolation hangers. A suitable hanger can be fabricated by putting a sleeve of Armaflex refrigeration piping insulation around the pipe and suspending it using metal strapping as shown in figure 20. Place a small sheet metal strip between the Armaflex and the metal strapping to prevent crimping. Do not secure piping directly to joist or flooring.

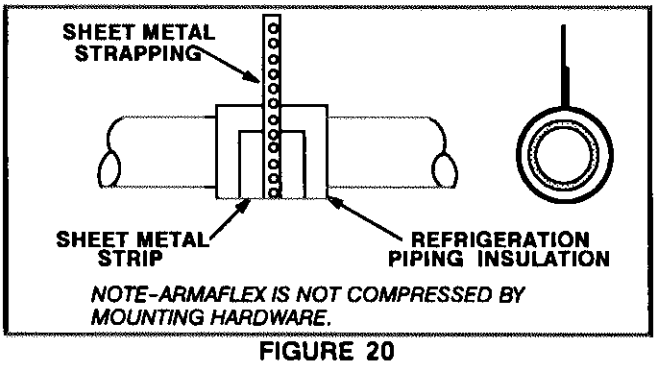


FIGURE 20

13- In areas where piping penetrates joists or interior walls, hole must be large enough to allow clearance on all sides of pipe through center of hole using an isolation hanger.

14- When furnace is installed in a residence where unit is shut down for an extended period of time (such as a vacation home), make provisions for draining condensation from trap assembly.

IMPORTANT-Exhaust piping must be insulated with 1/2" Armaflex or equivalent when run through unheated space. Do not leave any area of exhaust pipe open to outside air; exterior exhaust pipe must be insulated with 1/2" Armaflex or equivalent.

CAUTION-Do not discharge exhaust into an existing stack or stack that also serves another gas appliance. If vertical discharge through an existing unused stack is required, insert PVC pipe inside the stack until the end is even with the top or outlet end of the metal stack.

C-Intake Piping

1- Cement intake piping to intake inlet using elbow assembly, PVC pipe and reducer coupling provided. See figures 18 and 19 for typical applications.

NOTE-In downflow applications, intake piping may be run to right or left in addition to typical application shown.

2- Determine intake piping size using table.

3- Suspend piping at a minimum of every 5 feet using isolation hangers. A suitable hanger can be fabricated by putting a sleeve of Armaflex refrigeration piping insulation around the pipe and suspending it using metal strapping as shown in figure 20. Place a small sheet metal strip between the Armaflex and the metal strapping to prevent crimping. Do not secure piping directly to joist or flooring.

4- In areas where piping penetrates joists or interior walls, hole must be large enough to allow clearance on all sides of pipe through center of hole using an isolation hanger.

5- Route piping to outside of structure. Continue with installation following instructions given in exhaust and intake piping termination section.

D-Intake and Exhaust Piping Terminations

Intake and exhaust pipes may be routed either horizontally through an outside wall or vertically through the roof. In attic or closet installations, vertical termination through the roof is preferred. Figures 21 through 30 show typical terminations.

IMPORTANT-GSR14 units used in manufactured (mobile) home applications require the use of rooftop termination.

1- Locate intake piping upwind (prevailing wind) from exhaust piping. To avoid recirculation of exhaust gas on roof terminations, end of exhaust pipe must be higher than intake pipe. Exhaust and intake exits must be in same pressure zone. Do not exit one through the roof and one on the side. Also, do not exit the intake on one side and the exhaust on another side of the house or structure.

IMPORTANT-Combustion air intake inlet should not be located within 6 feet of dryer vent, condensing unit, or combustion air inlet or outlet of another appliance. Piping should not exit less than 3 feet from opening into another building.

2- Intake and exhaust pipes should be placed as close together as possible at termination end (refer to illustrations). Maximum separation is 3" on roof terminations and 6" on side wall terminations.

3- Exhaust piping must terminate straight out or up as shown. On roof terminations, the intake piping should terminate straight down using two 90° elbows. See figure 29. In rooftop applications, a 2" X 1-1/2" reducer must be used on the exhaust piping at the point where it exits the structure to improve the velocity of exhaust away from the intake piping.
If intake and exhaust piping must be run up a side wall to position above snow accumulation or other obstructions, refer to figures 28 and 30 for proper piping method. Piping must be supported every 3 ft. as shown. When exhaust and intake piping must be run up an outside wall, the exhaust piping is reduced to 1-1/2 " after the final elbow.

IMPORTANT-Care must be taken to avoid recirculation of exhaust back into intake pipe.

NOTE-If winter design temperature is below 32°F, exhaust piping must be insulated with 1/2" Armaflex or equivalent when run through unheated space. Do not leave any surface area of exhaust pipe open to outside air; exterior exhaust pipe must be insulated with 1/2" Armaflex or equivalent. In extreme cold climate areas, 3/4" Armaflex or equivalent is recommended. Insulation on outside runs of exhaust pipe must be painted or wrapped to protect insulation from deterioration.

4- Minimum separation distance between the end of the exhaust pipe and the end of the intake pipe is 8 inches.

5- Position termination ends so they are free from any obstructions and above the level of snow accumulation (where applicable). Termination ends must be a minimum of 12" above grade level. Do not point into window wells, stairwells, alcoves, courtyard areas or other recessed areas. Do not position termination ends directly below roof eaves.

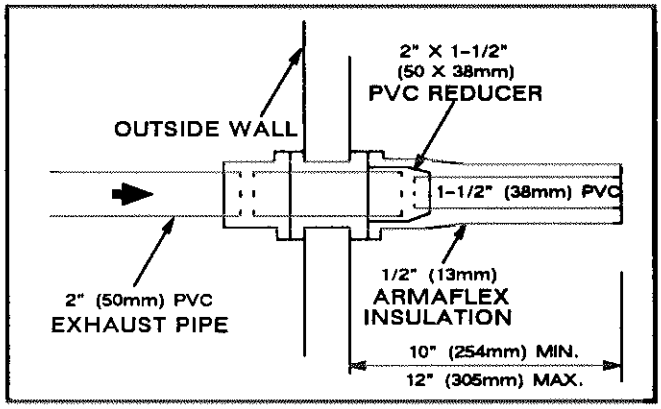


FIGURE 21

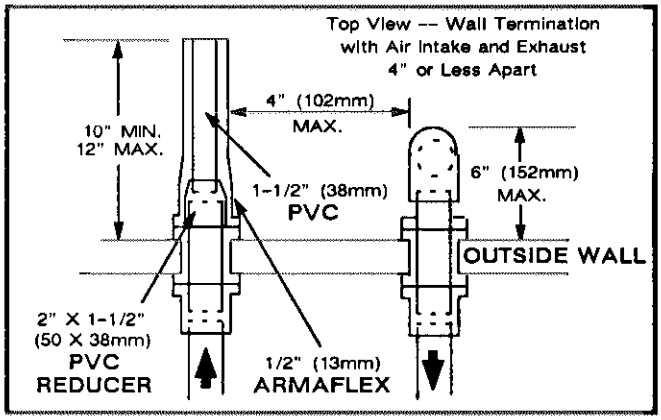


FIGURE 22

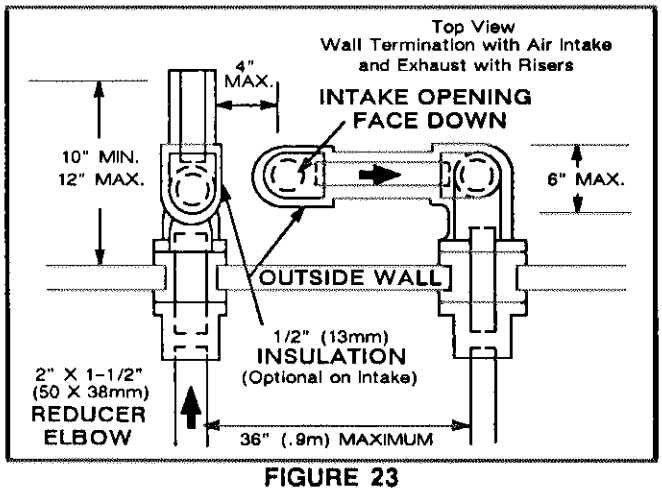


FIGURE 23

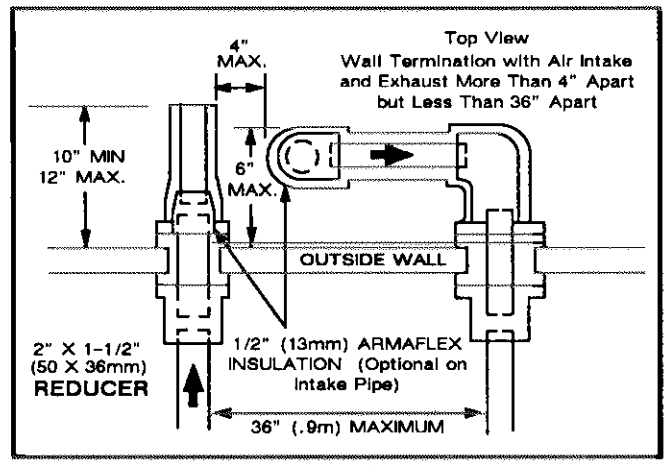


FIGURE 24

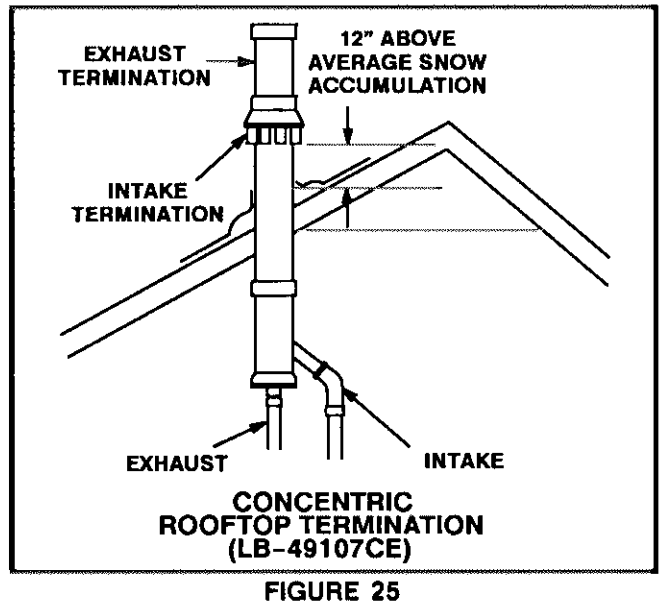


FIGURE 25

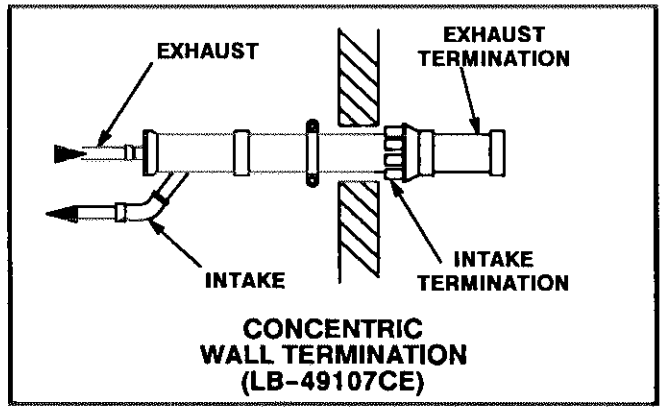


FIGURE 26

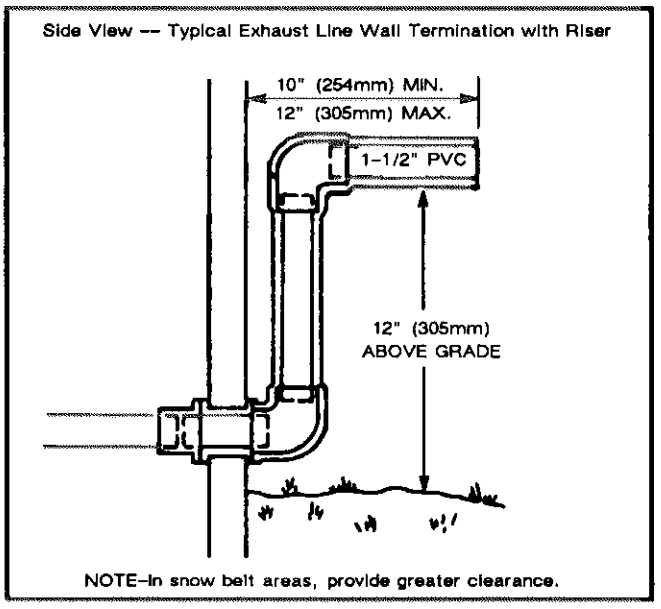


FIGURE 27

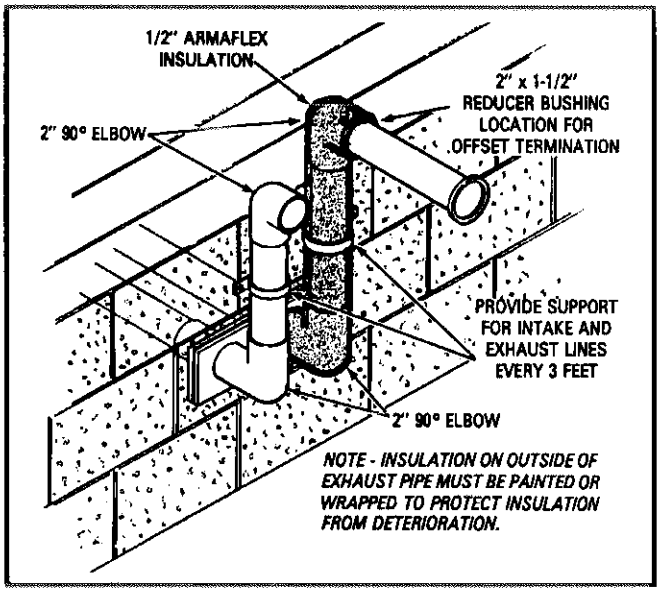


FIGURE 29

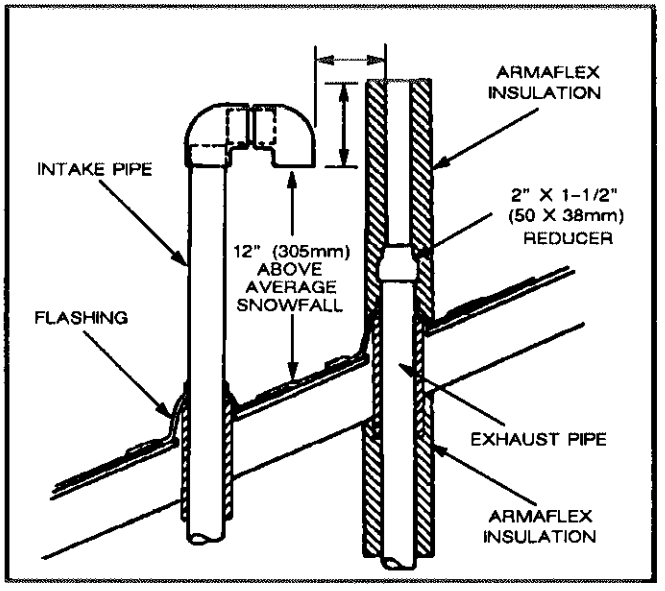


FIGURE 28

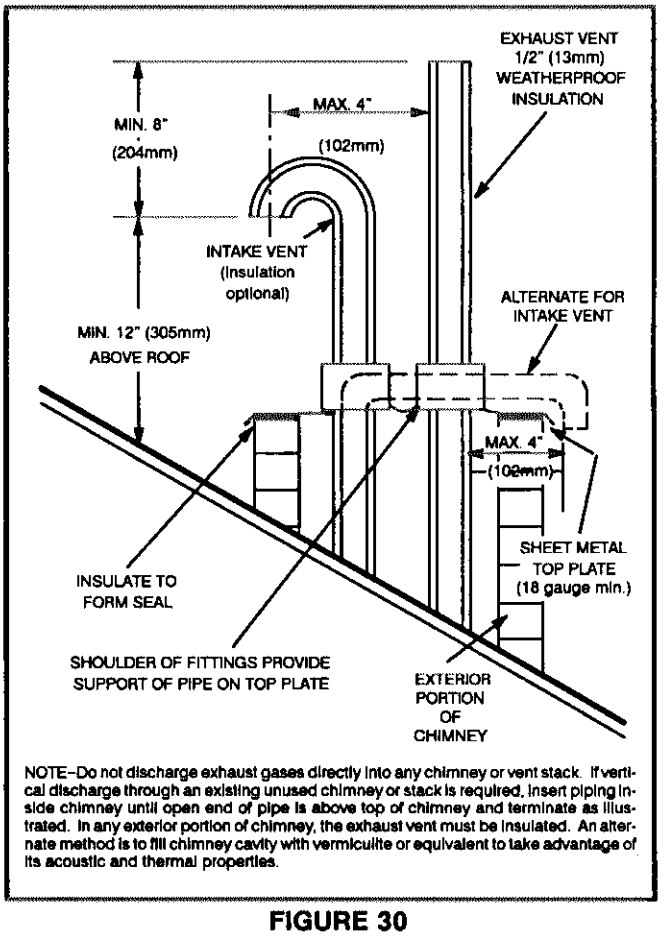


FIGURE 30

V-GAS PIPING

A-Gas Supply

The unit is shipped standard (downflow position) for right-side installation of gas piping. A piping hole is also fabricated in the left side for an alternate piping arrangement.

1- When connecting the gas supply, the length of run from the meter must be considered in determining the pipe size to avoid excessive pressure drop. For correct sizing of gas supply line, the length of run from the meter must be considered in determining the pipe size so as to avoid excessive pressure drop. For correct sizing of gas delivering piping, consult the utility having jurisdiction. A drip leg should be installed in the pipe run to the unit. In some localities, codes may require a manual main shut-off valve and union (furnished by installer) installed external to unit. Union must be of ground joint type.

NOTE-Compounds used on threaded joints of gas piping must be resistant to the actions of liquefied petroleum gases.

2- Install flexible gas connector (where permitted by local codes) in the gas supply line between the furnace and the ground joint union. See illustration for correct piping. All flexible gas connectors must be C.G.A. certified components.

NOTE-Do not secure flexible connector to unit, duct system or structure.

CAUTION-Flexible gas connector must not be used to exit the unit. Flex connector must be installed in U-shaped fashion in order to achieve its purpose. See figures 31 and 32. Do not secure to unit ducting or structure.

3- Center gas line through piping hole. Gas line should not touch side of unit. See figure 31 for downflow and figure 32 for horizontal application.

4- Connect gas supply line.

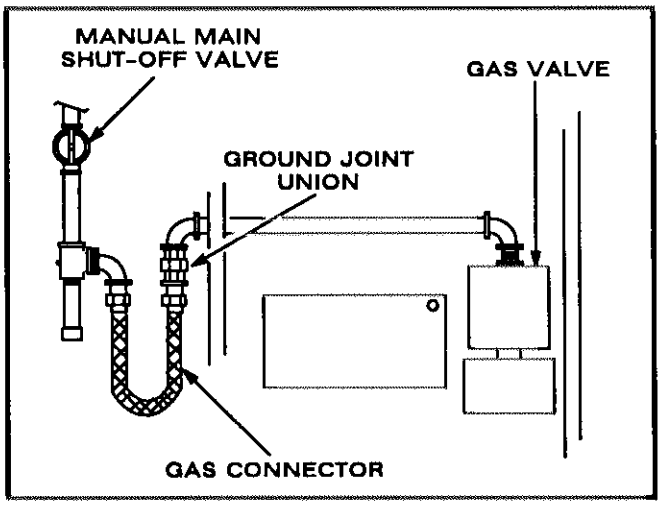


FIGURE 31

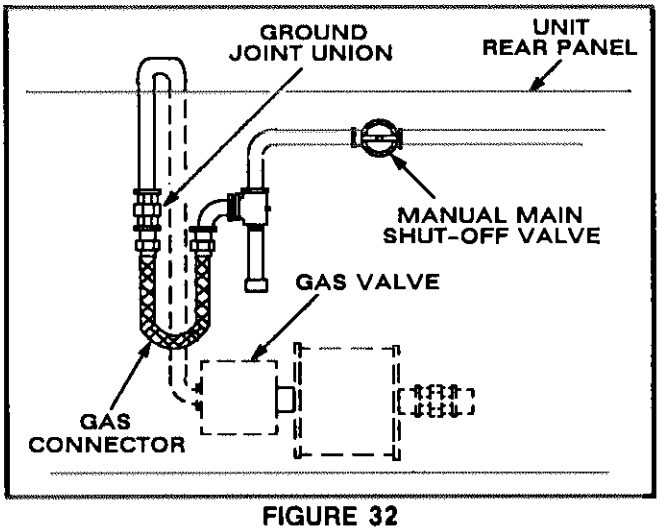


FIGURE 32

B-Leak Check

After gas piping has been completed, carefully check all piping connections (factory and field) for gas leaks. Use a leak detecting solution or other preferred means.

CAUTION

Many soaps used for leak testing are corrosive to certain metals. Use Bubble Foam Leak Detector available as Lennox part number 31B2001 or other equivalent leak detecting solution. Piping must be rinsed thoroughly with clean water after leak check has been completed. Do not use matches, candles, flame or other source of ignition to check for gas leaks.

IMPORTANT-The furnace must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psig.

The furnace and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of the system at test pressures greater than 1/2 psig.

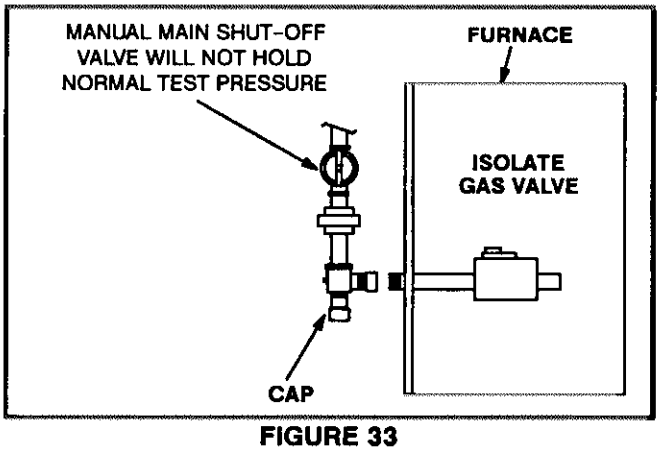


FIGURE 33

VI-ELECTRICAL

1- Install power supply to unit according to Canadian Electric Code, Part 1.

2- Access openings are provided on both sides of cabinet to facilitate wiring.

3- Install room thermostat according to instructions provided with thermostat. See figure 34 for new Lennox thermostat nomenclature versus old style nomenclature.

4- Complete wiring connections to equipment using provided wiring diagrams.

5- Electrically ground unit in accordance with local codes or, in the absence of local codes, in accordance with the Canadian Electric Code.

7- Seal unused electrical openings with snap plugs.

8- Check for correct voltage at unit with unit operating.

9- Check amperage draw on blower motor.

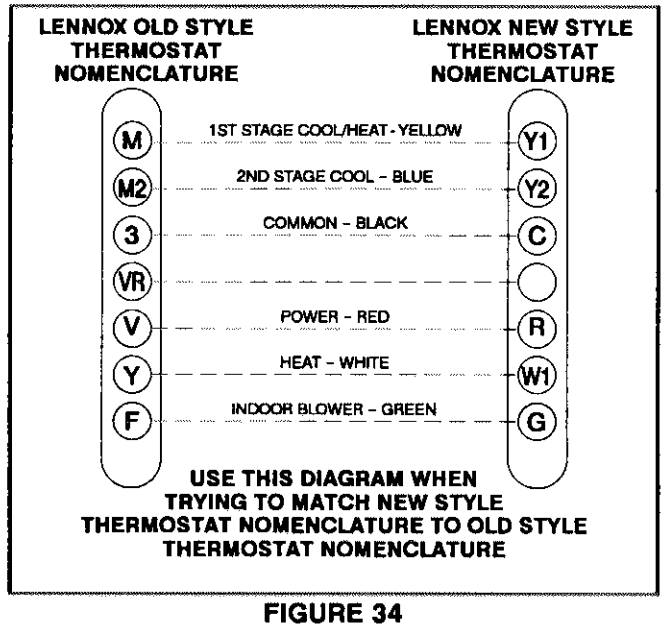


FIGURE 34

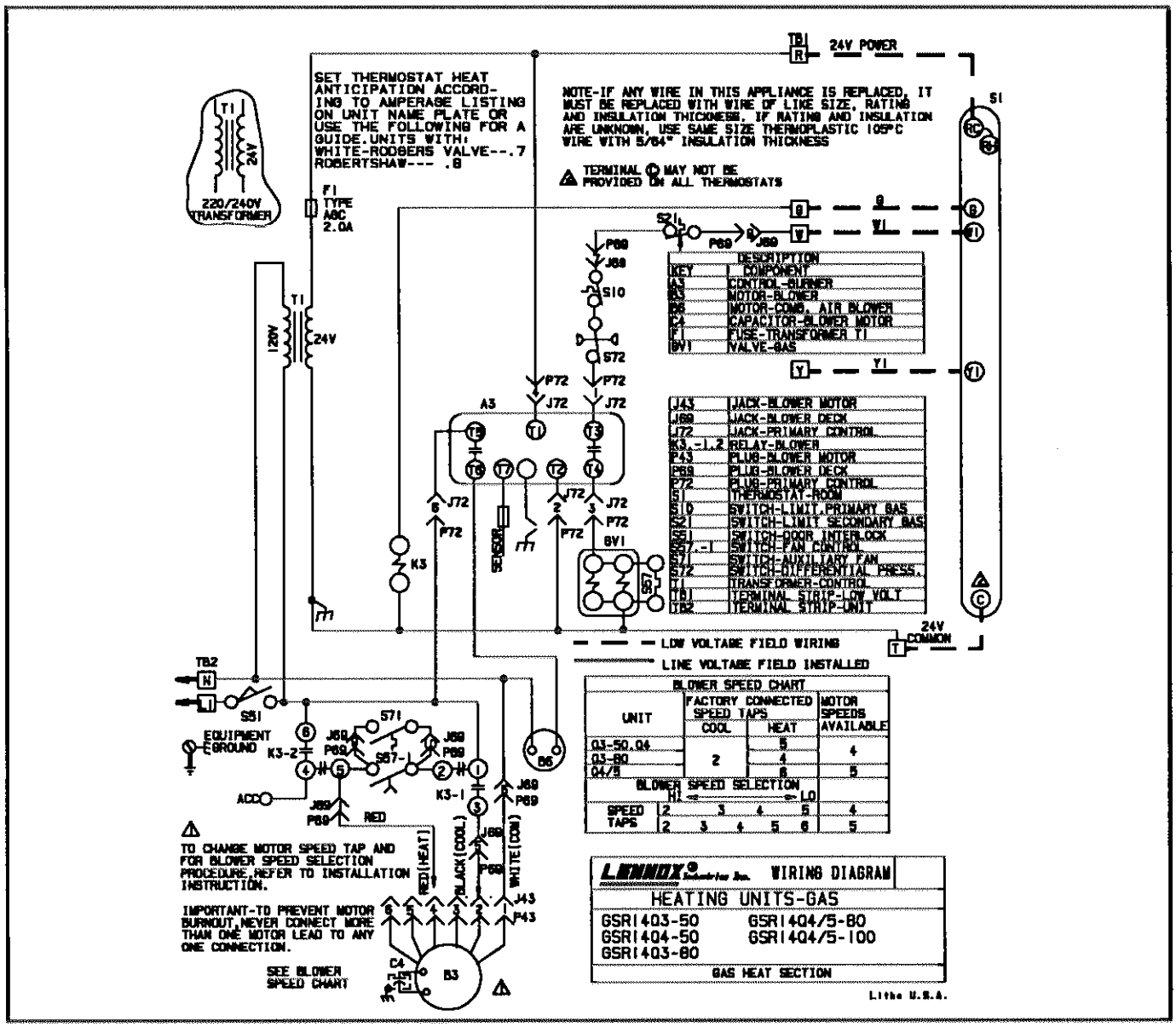


FIGURE 35

VII-START-UP/ADJUSTMENTS

FOR YOUR SAFETY READ BEFORE LIGHTING

WARNING: Do not use this furnace if any part has been under water. Immediately call a qualified service technician to inspect the furnace and to replace any part of the control system and any gas control which has been under water.

WARNING: If overheating occurs or if gas supply fails to shut off, shut off the manual gas valve to the appliance before shutting off electrical supply.

CAUTION: Before attempting to perform any service or maintenance the electrical power to unit OFF at disconnect switch.

BEFORE LIGHTING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, do not try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

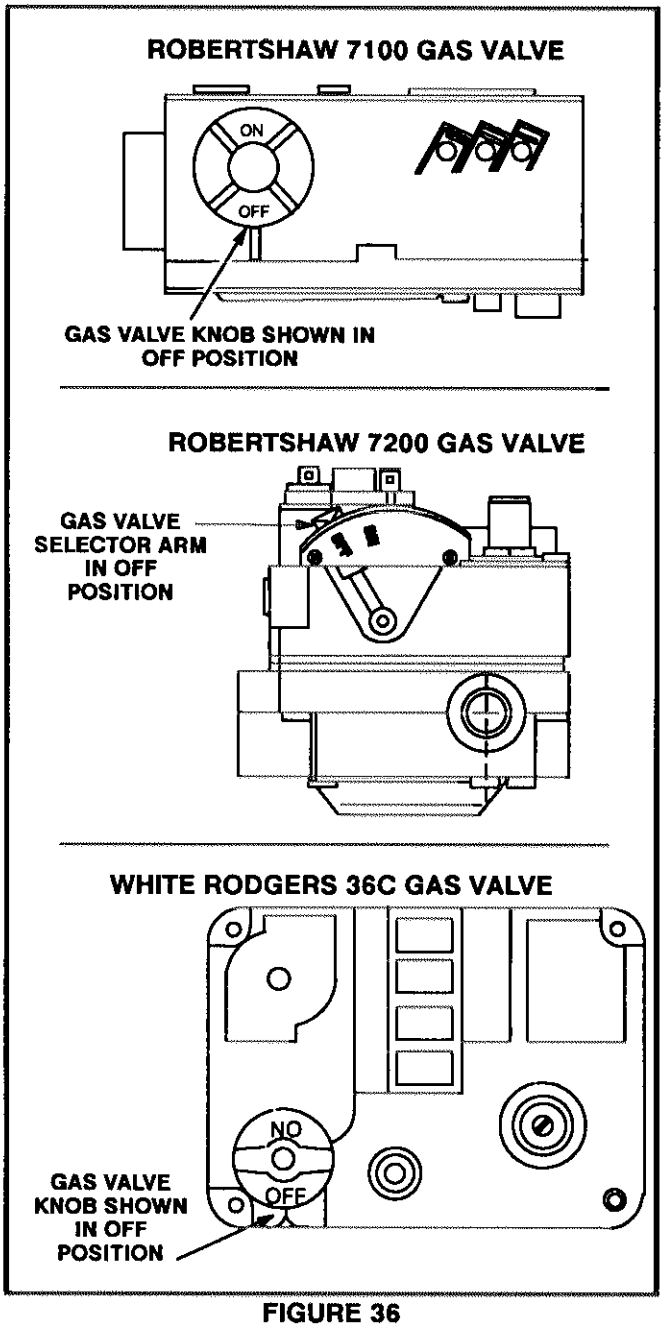


FIGURE 36

This unit is equipped with an automatic spark ignition system with flame rectification. Once combustion has started, the purge blower and spark ignitor are turned off. Do **not** try to light by hand.

A-Gas Valve Operation

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Gas Valve Operation for Robertshaw and White Rodgers Valves (Figure 36)

1- Set thermostat to lowest setting.

2- Turn off all electrical power to furnace.

3- This appliance is equipped with an ignition device which automatically lights the burner. Do **not** try to light the burner by hand.

4- Remove unit access panel.

5- Turn knob on gas valve clockwise to **OFF**. On Robertshaw 7200 gas valve, depress lever on gas control and move to **OFF** and release. Do not force.

6- Wait five (5) minutes to clear out any gas. If you then smell gas, STOP! Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. If you do not smell gas go to next step.

7- Turn knob on gas valve counterclockwise to **ON**. On Robertshaw 7200 gas valve, depress lever on gas control and move to **ON** and release.

8- Replace unit access panel.

9- Turn on all electrical power to unit.

10- Set thermostat to desired setting.

11- If the furnace will not operate, follow the instructions "To Turn Off Gas To Unit" and call your service technician or gas supplier.

B-To Turn Off Gas To Unit

1- Set thermostat to lowest setting.

2- Turn off all electrical power to unit if service is to be performed.

3- Remove heat section access panel.

4- Turn knob on gas valve clockwise to **OFF**. Do not force.

NOTE-On Robertshaw 7200 gas valve, depress lever on gas control and move to OFF and release.

5- Replace unit access panel.

Failure to Operate

If unit fails to operate, check the following:

1- Is thermostat calling for heat?

2- Is main disconnect switch closed?

3- Is there a blown fuse?

4- Is filter dirty or plugged? Dirty or plugged filters will cause unit to go off on limit control.

5- Is gas turned on at meter?

6- Is manual main shut-off valve open?

7- Is internal manual shut-off open?

8- Are intake and exhaust pipes clogged?

9- Is primary control locked out? (Turn thermostat off and then back on.)

10- Is unit locked out on secondary limit? (Secondary limit is manually reset.)

C-Gas Flow

To check proper gas flow to combustion chamber, determine Btu input from the appliance rating plate. Divide this input rating by the Btu per cubic foot of available gas. Result is the number of cubic feet per hour required. Determine the flow of gas through gas meter for 2 minutes and multiply by 30 to get the hourly flow of gas to burner.

D-Gas Pressure

1- Check gas line pressure with unit firing at maximum rate. Normal natural gas inlet line pressure should be 7.0 in. w.c. Normal line pressure for LP gas is 11.0 in. w.c.

IMPORTANT-Minimum gas supply pressure is listed on unit rating plate for normal input. Operation below minimum pressure may cause nuisance lockouts.

2- After line pressure is checked and adjusted, check regulator pressure. Correct manifold pressure (unit running) is specified on nameplate. To measure, connect gauge to pressure tap in elbow below expansion tank.

E-Heat Anticipation Settings

Units with White Rodgers gas valves -- 0.7
Units with Robertshaw gas valves -- 0.8

F-Fan/Limit Control

Limit Control -- Factory set: No adjustment necessary.
Fan Control -- Factory set: ON -- No adjustment necessary; OFF -- 90°.

G-Temperature Rise and External Static Pressure

Check temperature rise and external static pressure. If necessary, adjust blower speed to maintain temperature rise and external static pressure within range shown on unit rating plate.

H-Electrical

1- Check all wiring for loose connections.

2- Check for correct voltage at unit (unit operating).

3- Check amp-draw on blower motor.
Motor Nameplate _____ Actual _____.

NOTE-Do not secure electrical conduit directly to ducting or structure.

J-Blower Speeds

Blower speed selection is accomplished by changing the taps at the harness connector at the blower motor. See figure 37.

Refer to speed selection chart on unit wiring diagram.

NOTE-CFM readings are taken external to unit with a dry evaporator coil and without accessories.

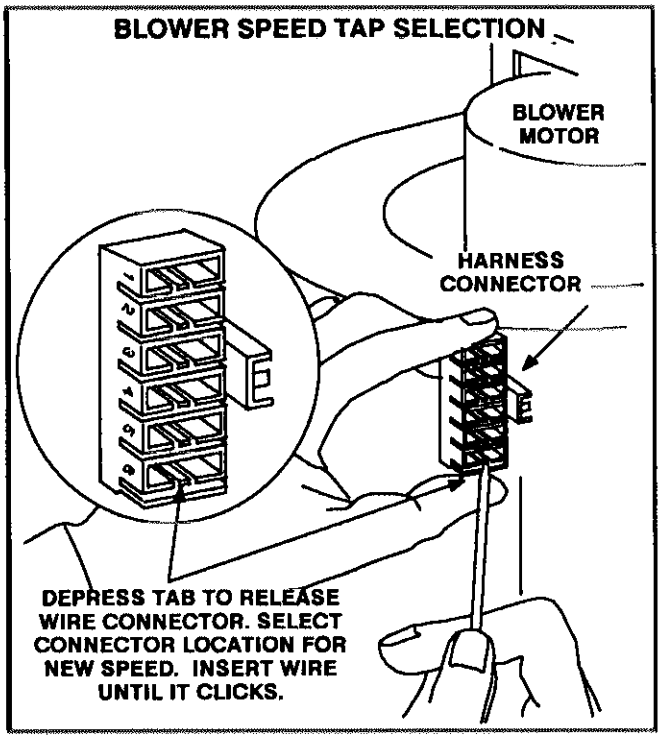


FIGURE 37

VIII-SERVICE

A-Annual Service

At the beginning of each heating season, system should be checked as follows:

Blower

1- Check and clean blower wheel.

2- Check motor lubrication. Motors are prelubricated for extended life; no further lubrication is required.

Electrical

1- Check all wiring for loose connections.

2- Check for correct voltage at unit (unit operating).

3- Check amp-draw on blower motor.
Motor Nameplate _____ Actual _____

4- Check to see that heat (if applicable) is operating.

Filters

1- Filters must be cleaned or replaced when dirty to assure proper furnace operation.

2- Reusable foam filters supplied with GSR14 can be washed with water and mild detergent. When dry, they should be sprayed with filter handicoater prior to reinstallation. Filter handicoater is RP Products coating no. 481 and is available as Lennox part no. P-8-5069.

3- If replacement is necessary, order Lennox part no. P-9-7831 for 20 X 25 inch filter.

Intake and Exhaust Lines

Check intake and exhaust PVC lines and all connections for tightness and make sure there is no blockage. Also check condensate line for free flow during operation.

Insulation

Outdoor piping insulation should be inspected yearly for deterioration. If necessary, replace with same materials.

B-Cleaning Heat Exchanger/Burner Assembly

NOTE-Use papers or protective covering in front of furnace while removing heat exchanger assembly.

CAUTION-Before removing spark plug and sensor wires after unit has been operating, unit should be allowed to cool down at least 15 minutes before placing hands into heat chamber access opening. Residual heat in combustion chamber also transfers back to air intake valve causing it to become very hot when unit is first shut down. To cool completely to room temperature, blower should be run continuously for approximately 40 minutes.

1- Turn off both electrical and gas power supplies to furnace.

2- Remove heat exchanger from unit.

3- Backflush heat exchanger with soapy water solution or steam clean.

IMPORTANT-If unit is backflushed with water, make sure all water is drained from heat train before replacing.

4- Replace heat exchanger assembly.

IX-REPAIR PARTS LIST

The following repair parts are available through independent Lennox dealers. When ordering parts, include the complete furnace model number listed on the unit rating plate. Example: GSR14Q3-50-1.

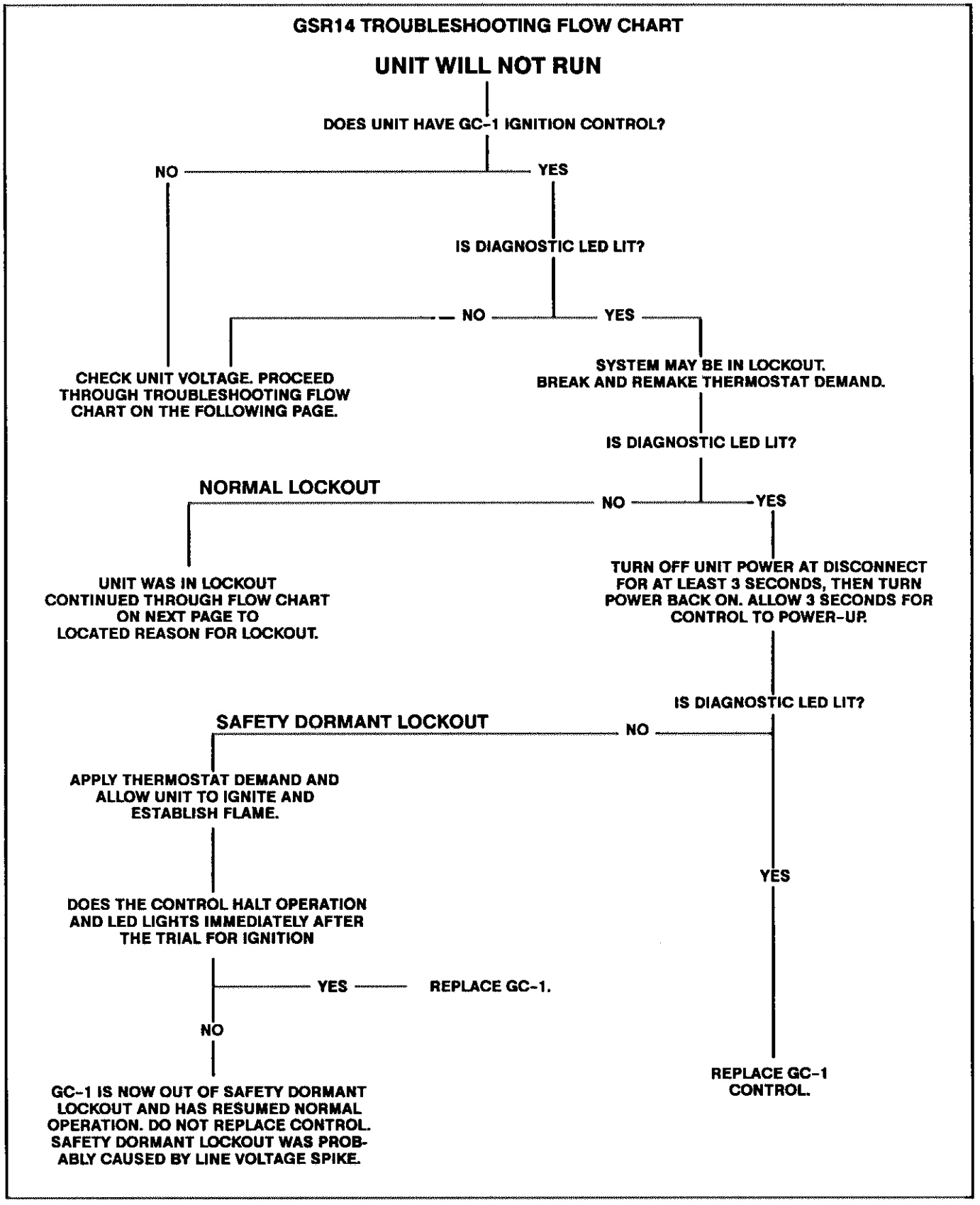
CABINET PARTS
Blower access panel
Control Access panel
Upper vestibule panel
Lower vestibule panel
Control box cover

CONTROL PANEL PARTS
Transformer
Indoor blower relay
Low voltage terminal strip
High voltage terminal strip

HEATING PARTS
Heat exchanger assembly
Gas orifice
Gas valve
Gas decoupler
Gas flapper valve
Purge blower
Air intake flapper valve
Primary control board
Ignition lead
Spark plug ignitor
Flame sensor lead
Flame sensor
Primary fan and limit control
Secondary limit control
Auxiliary fan control
Differential pressure switch
Door interlock switch
Air filter

BLOWER PARTS
Blower wheel
Motor
Motor mounting frame
Motor capacitor
Blower housing cut-off plate
Blower housing

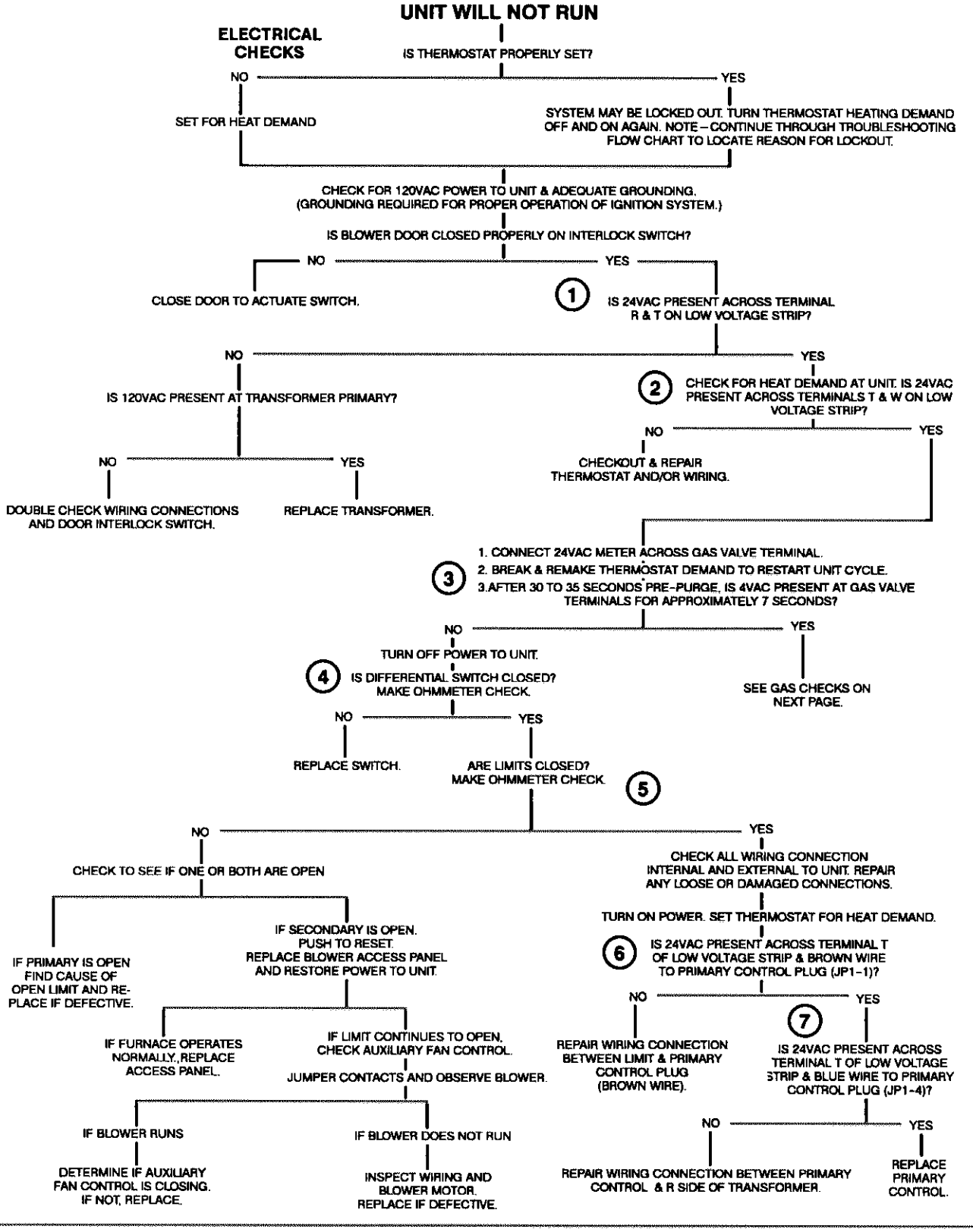
CONDENSATE TRAP PARTS
Float
Seat
O-ring
Clamps and screws
Housing
Trap assembly
Dam


GSR14 TROUBLESHOOTING FLOW CHART
UNIT WILL NOT RUN
DOES UNIT HAVE GC-1 IGNITION CONTROL?
NO
YES
IS DIAGNOSTIC LED LIT?
NO
YES
CHECK UNIT VOLTAGE. PROCEED THROUGH TROUBLESHOOTING FLOW CHART ON THE FOLLOWING PAGE.
SYSTEM MAY BE IN LOCKOUT. BREAK AND REMAKE THERMOSTAT DEMAND.
IS DIAGNOSTIC LED LIT?
NORMAL LOCKOUT
NO
YES
UNIT WAS IN LOCKOUT CONTINUED THROUGH FLOW CHART ON NEXT PAGE TO LOCATED REASON FOR LOCKOUT.
TURN OFF UNIT POWER AT DISCONNECT FOR AT LEAST 3 SECONDS, THEN TURN POWER BACK ON. ALLOW 3 SECONDS FOR CONTROL TO POWER-UP.
IS DIAGNOSTIC LED LIT?
SAFETY DORMANT LOCKOUT
NO
APPLY THERMOSTAT DEMAND AND ALLOW UNIT TO IGNITE AND ESTABLISH FLAME.
YES
DOES THE CONTROL HALT OPERATION AND LED LIGHTS IMMEDIATELY AFTER THE TRIAL FOR IGNITION
YES
REPLACE GC-1.
NO
REPLACE GC-1 CONTROL.
GC-1 IS NOW OUT OF SAFETY DORMANT LOCKOUT AND HAS RESUMED NORMAL OPERATION. DO NOT REPLACE CONTROL. SAFETY DORMANT LOCKOUT WAS PROBABLY CAUSED BY LINE VOLTAGE SPIKE.

GSR14 TROUBLESHOOTING FLOW CHART

(continued form flow chart on previous page)

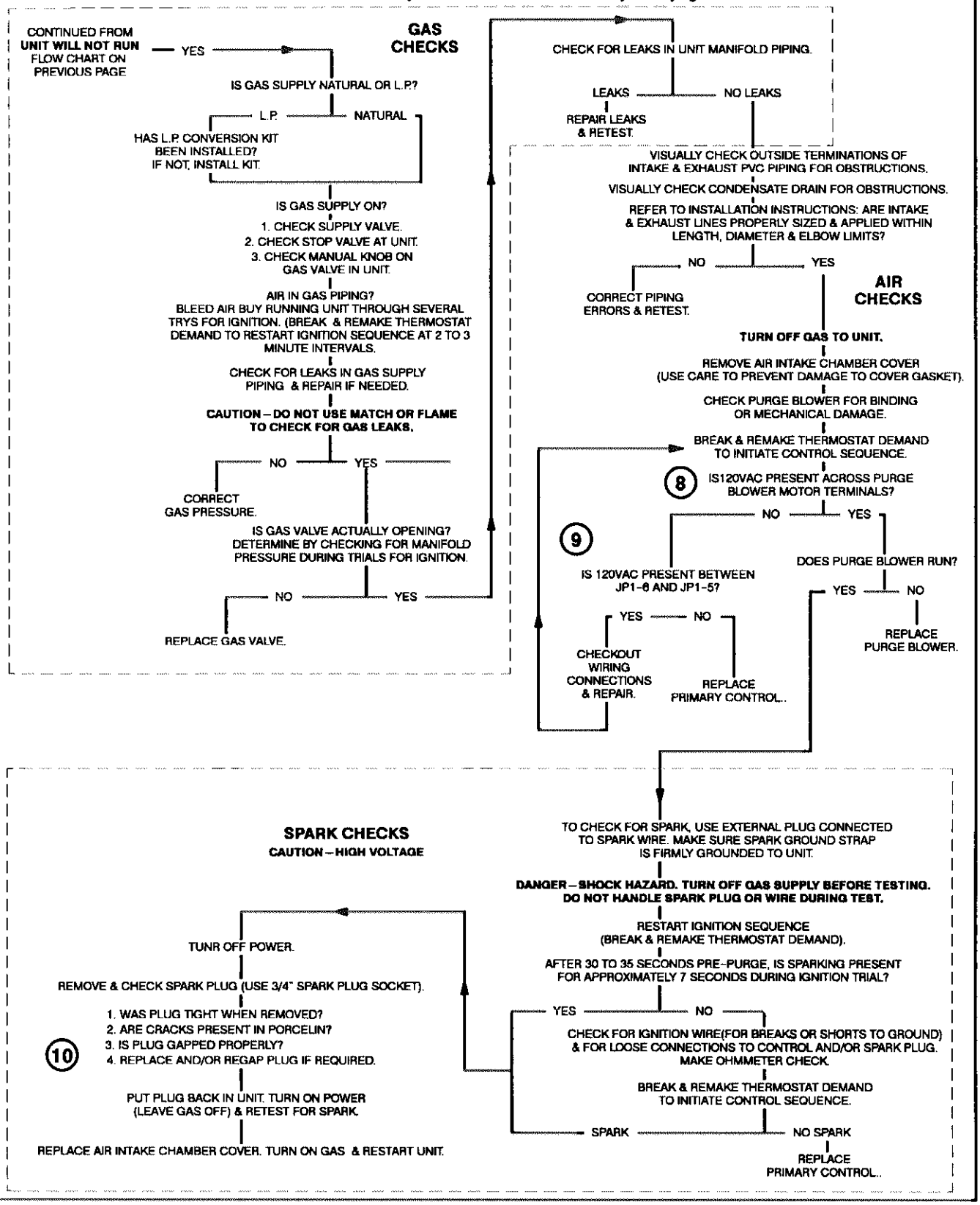
NOTE—Numbered steps refer to illustrations on last page.



GSR14 TROUBLESHOOTING FLOW CHART

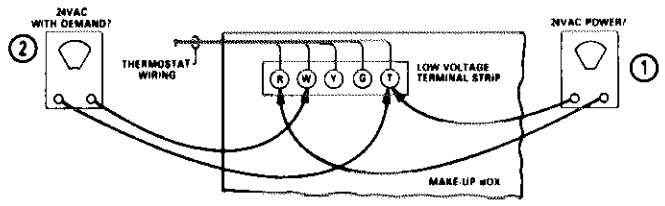
(continued from flow chart on previous page)

NOTE – Numbered steps refer to illustrations on adjacent page.

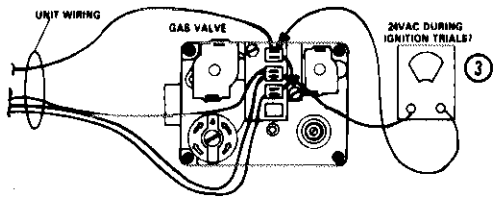


GSR14 TROUBLESHOOTING FLOW CHART – UNIT WILL NOT RUN

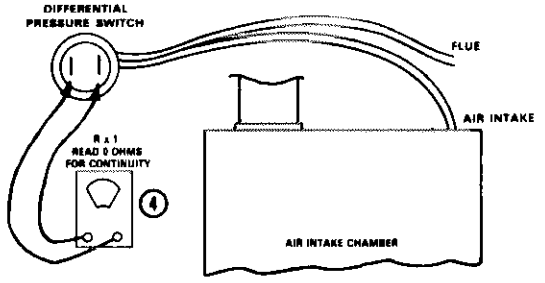
CHECK VOLTAGE AT TERMINAL AND CHECKING THERMOSTAT DEMAND



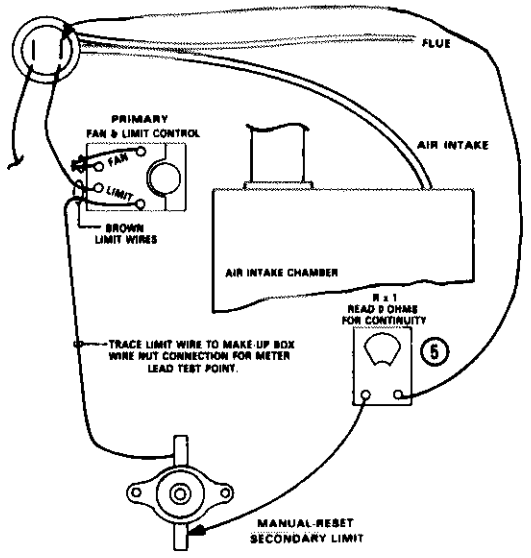
CHECKING VOLTAGE AT GAS VALVE



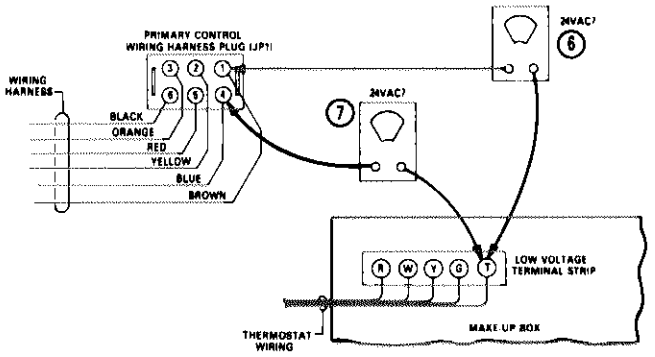
CHECKING FOR OPEN SWITCH



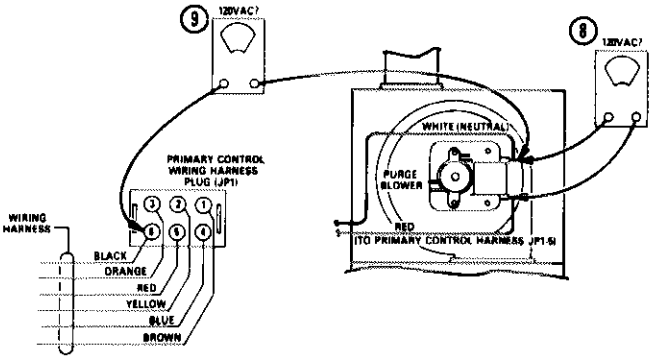
CHECKING FOR OPEN SWITCH IN LIMIT CONTROL



CHECKING VOLTAGE AT PRIMARY CONTROL

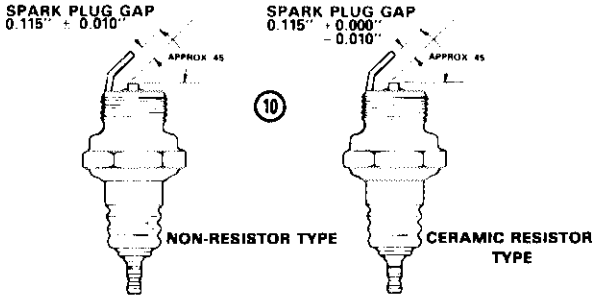


CHECKING VOLTAGE AT PURGE BLOWER



SPARK PLUG

IT IS NORMAL FOR THE ELECTRODE TO PROTRUDE AT AN UNUSUAL ANGLE



CHAMPION CJ8 (NOT FOR GC-1)

CHAMPION CH-21500

NOTE-CARBON RESISTOR TYPE PLUGS SHOULD NOT BE USED