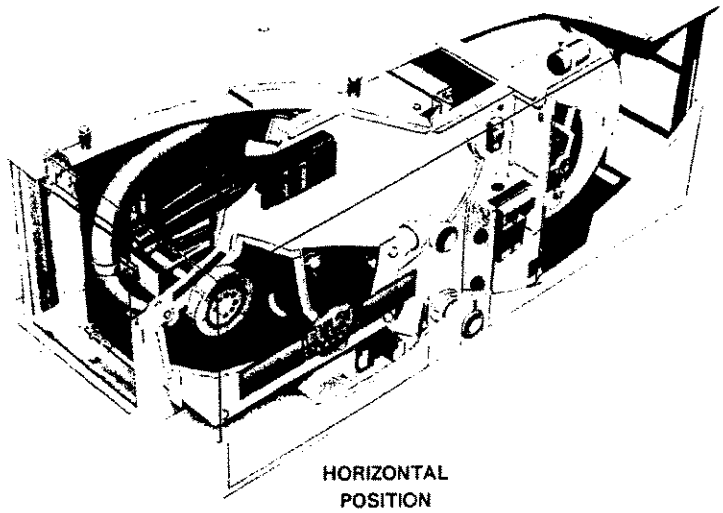
EXHIBIT 12

DATE 1/8/24 INSPECTOR

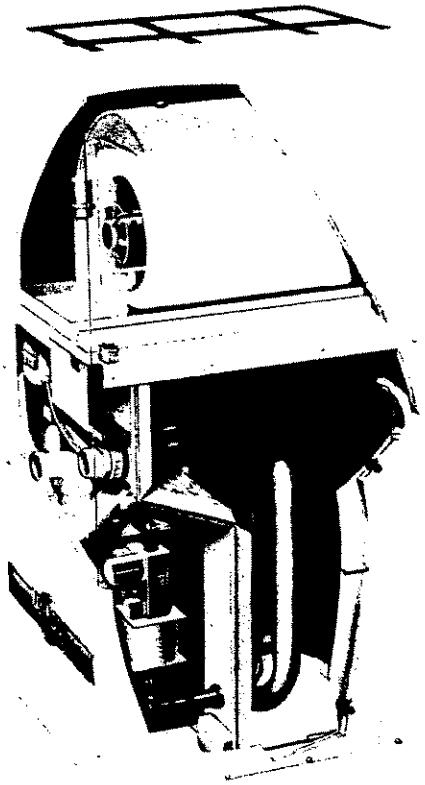
LENNOX®

GSR14 SERIES PULSE™
HORIZONTAL/DOWN-FLO GAS FURNACES
50,000 to 100,000 Btuh Input
Add-on Cooling 1-1/2 thru 5 Nominal Tons

ENGINEERING DATA
HEATING UNITS
GAS
Page 33
April 1986
Supersedes
November 1985

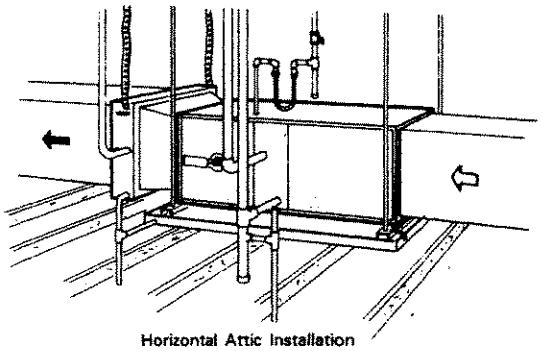


HORIZONTAL POSITION

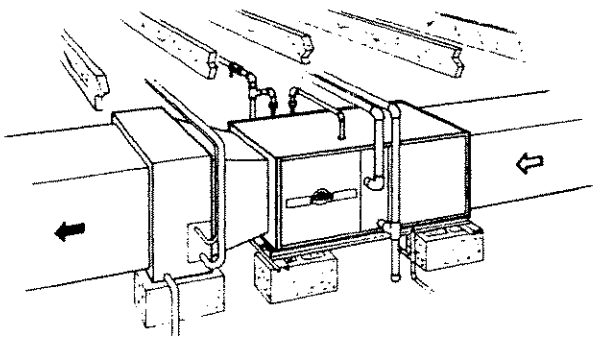


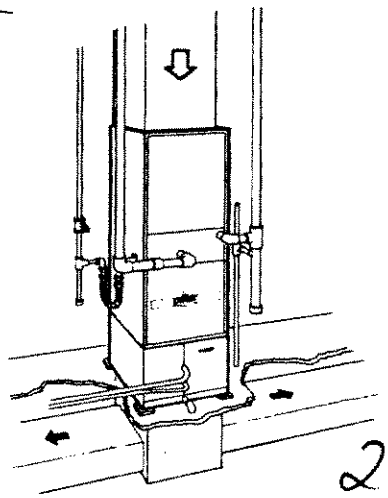
DOWN-FLO POSITION

Typical Applications



Horizontal Attic Installation





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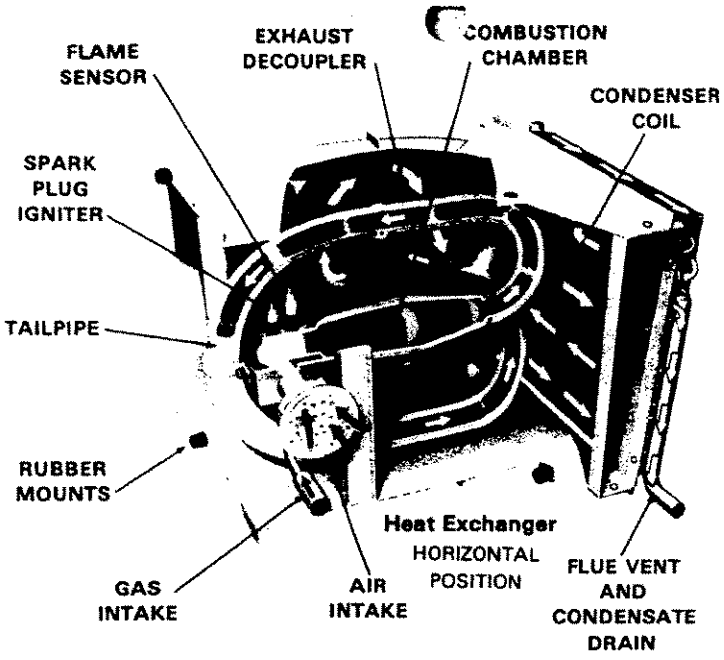

PROCESS OF COMBUSTION

The process of pulse combustion begins as gas and air are introduced into the sealed combustion chamber with the spark plug igniter. Spark from the plug ignites the gas/air mixture, which in turn causes a positive pressure buildup that closes the gas and air inlets. This pressure relieves itself by forcing the products of combustion out of the combustion chamber through the tailpipe into the heat exchanger exhaust decoupler and on into the heat exchanger coil. As the combustion chamber empties, its pressure becomes negative, drawing in air and gas for ignition of the next pulse of combustion. At the same instant, part of the pressure pulse is reflected back from the tailpipe at the top of combustion chamber. The flame remnants of the previous pulse of combustion ignites the new gas/air mixture in the chamber, continuing the cycle. Once combustion is started, it feeds upon itself allowing the purge blower and spark plug igniter to be turned off. Each pulse of gas/air mixture is ignited at a rate of 60 to 70 times per second producing from one-fourth to one-half of a Btu per pulse of combustion. Almost complete combustion occurs with each pulse. The force of these series of ignitions creates great turbulence which forces the products of combustion through the entire heat exchanger assembly resulting in maximum heat transfer.

FEATURES

Application — The GSR14 series pulse furnaces are designed to be installed in either the horizontal or down-flo discharge air position. Horizontal air flow will be left hand only. These combination horizontal/down-flo units will provide heating efficiencies (AFUE) of up to 95.5%. Five models (natural gas or LPG) are available with input capacities at 50,000, 80,000 and 100,000 Btuh. The units operate on the pulse principle and do not require a pilot burner, main burners, conventional flue or chimney. Units can be installed in a utility room, alcove, closet, crawl space or attic. Lennox evaporator coils, electronic air cleaners and power humidifiers can easily be added to the furnaces for Total Comfort all season systems. Units are shipped completely factory assembled with all controls installed and wired. In addition, the units are fire tested at the factory and require no field adjustments on start up.

The high efficiency of the GSR14 line of furnaces is achieved through a unique heat exchanger design which features a finned cast iron combustion chamber, temperature resistant steel tailpipe, aluminized steel exhaust decoupler section and a finned stainless steel tube condenser coil similar to an air conditioner coil. Moisture, in the products of combustion, is condensed in the coil, thus wringing almost every usable Btu out of the gas. Since most of the combustion heat is utilized in the heat transfer from the coil, flue vent temperatures are as low as 100°F to 130°F allowing the use of 2 inch diameter PVC (polyvinyl chloride) pipe for venting. The furnace can be vented through a side wall, roof or to the top of an existing chimney with up to 35 ft. of PVC pipe and five 90 degree elbows. Condensate created in the coil may be disposed of in an indoor drain. The condensate (PH ranges from 4.0 to 6) is not harmful to standard household plumbing and can be drained into city sewers and septic tanks without damage.

The GSR14 furnace has no pilot light or burners. An automotive type spark plug is used for ignition on the initial cycle only, saving gas and electrical energy. Due to the pulse combustion principle the use of atmospheric gas burners is eliminated with the combustion process confined to the heat exchanger combustion chamber. The sealed combustion system virtually eliminates the loss of conditioned air due to combustion and stack dilution. Combustion air is piped to the furnace with same type PVC pipe as used for exhaust gases.

Approvals — The GSR14 series furnaces are design certified by A.G.A. Laboratories and ratings are certified by GAMA. Units meet the California Nitrogen Oxides (NO_X) standards and California Seasonal Efficiency requirements. In addition, units have been rated and tested in the Lennox Research Laboratory according to Department of Energy (DOE) test procedures. Blower data is from unit tests conducted in the Lennox Laboratory air test chamber.

Sequence of Operation — The room thermostat on a demand for heat will initiate purge blower operation for a prepurge cycle (34 seconds) followed by energizing of ignition and opening of the gas valve. As ignition occurs the flame sensor senses proof of ignition and de-energizes the spark igniter and purge blower. Furnace blower operation is initiated 30 to 45 seconds after combustion ignition. When thermostat is satisfied, gas valve closes and purge blower is re-energized for a post purge cycle (34 seconds). Furnace blower will remain in operation until preset temperature setting (90°F) of fan control is reached. Should loss of flame occur before thermostat is satisfied flame sensor controls will initiate 3 to 5 attempts at re-ignition before locking out unit operation. Loss of either combustion intake air or flue exhaust will automatically shut the system down.

Heat Exchanger Assembly — Lennox developed heat exchanger assembly consists of combustion chamber, tailpipe, exhaust decoupler section and condenser coil. Combustion chamber contains the spark plug igniter, flame sensor, combustion air and gas intake manifolds. Cast iron construction provides excellent radiation of heat over entire surface area. Finned, "tear drop" shape design permits total air coverage of all surfaces with low resistance. Tailpipe connects the combustion chamber to the exhaust decoupler section. Precisely sized and shaped tailpipe is constructed of combination stainless and aluminized steel for superior resistance to high temperatures. Aluminized steel resonator on tailpipe minimizes combustion sound. Heavy gauge aluminized steel exhaust decoupler section has large surface area for maximum heat transfer. Air foil shape design results in complete air coverage with minimum resistance. Condenser coil intake header connects to bottom of exhaust decoupler section. Large face area and circuiting of coil provides high heat transfer, minimum air resistance and proper moisture drainage. Coil is constructed of exactly spaced ripple-edged aluminum fins fitted to stainless steel tubes. Flared collars on fins grip tubes for maximum contact area. Flared tubing connections and high temperature soldering provide tight, leakproof joints. Combined flue vent and condensate drain outlet is located on the coil. Coil is factory tested for leaks. All components are mounted in a heavy gauge steel frame and installed in the cabinet on resilient rubber mounts assuring vibration free operation. Heat exchanger has been Laboratory life cycle tested.

FEATURES

Rugged Cabinet — Constructed of heavy gauge cold roll steel. Cabinet is subject to a five station metal wash process resulting in a perfect bonding surface for a paint finish of baked-on enamel. The paint solution and metal are given opposite electrical charges resulting in positive adhesion and even coverage of the paint to the metal surfaces. Heat exchanger section is completely lined with thick (1-1/2 lb. density) foil faced fiberglass insulation. This results in quiet and efficient operation due to the excellent acoustical and insulating qualities of fiberglass. Complete service access is accomplished by removing heating section and blower access panels. Removable panel is provided in vestibule panel for access to the spark plug and flame sensor. Safety interlock switch automatically shuts power off to unit when blower access panel is removed. Electrical inlets, gas line inlets and flue vent outlets are provided in the cabinet.

Powerful Blowers — Units are equipped with quiet variable speed direct drive blowers. Each blower assembly is statically and dynamically balanced. Multiple-speed motor is resiliently mounted. A choice of blower speeds is available on each blower. See blower performance charts. Change in blower speed is easily accomplished by simple wiring change.

Cleanable Air Filter — Washable or vacuum cleanable frame type filter is furnished as standard. Polyurethane media is coated with oil for maximum efficiency. Filter is readily accessible in unit for quick and easy removal for servicing.

Combustion Air Intake Box — Contains the purge blower and air intake flapper valve. Box is located on vestibule panel. Purge blower is equipped with a permanently lubricated motor. Blower operates only during pre-purge and post purge cycles. Air is drawn through the blower during the combustion cycle by negative pressure in the combustion chamber. Flapper valve section of the box is completely lined with 1 inch thick (6 lb. density) duct liner board, black neoprene coated fiberglass. Valve opening and closing is actuated by back pressure and negative pressure in combustion chamber during the heating cycle. Differential pressure switch, mounted on the vestibule panel, terminates unit operation in case of air intake or flue exhaust blockage.

Automatic Gas Valve, Expansion Tank and Gas Intake Flapper Valve — 24 volt redundant dual gas control valve combines gas pressure regulation and manual main shut-off valve into a compact combination control. Dual valve design provides double assurance of 100% close off of gas on each heating cycle. Expansion tank is located downstream from the gas valve and absorbs any pressure pulsations. Gas intake flapper valve is installed in the combustion chamber intake manifold between the orifice and expansion tank. Valve is opened by entering gas pressure and closed off by back pressure from combustion pulse during the heating cycle.

Wiring Junction Box — Power supply and thermostat wiring connections are made at the wiring junction box conveniently located on vestibule panel for easy access. Box contains 30 VA transformer, high and low voltage terminal strips and blower cooling relay. Terminal strip permits easy connections for optional power humidifier and electronic air cleaner accessories. Blower cooling relay activates blower operation for add-on air conditioning cooling cycles.

Dual Fan and Limit Controls — Factory installed and accurately located upstream and downstream of the heat exchanger. Primary and secondary limit controls provide protection from abnormal operating conditions. Primary fan control brings blower on 30 to 45 seconds after combustion ignition and shuts blower off at factory temperature setting of 90°F. Upstream auxiliary fan control prevents nuisance cutout of secondary limit control (manual reset).

In-Line Mufflers — Two mufflers are furnished as standard equipment with the GSR14Q4/5-100 model. Mufflers field install, vertical or horizontal, one in the intake line and one in the exhaust line. The two mufflers (LB-52057CA) are available as optional equipment with all other models and must be ordered extra.

Vent/Intake Air Roof Termination Kit (Optional) — Facilitates installation of combustion air intake pipe and flue exhaust pipe. Kit contains 2 neoprene rubber roof flashings and 18 inch insulation sleeve for sealing and isolating intake and exhaust piping penetration in roof. Kit LB-49107CC is optional and must be ordered extra.

Vent/Intake Air Wall Termination Kit (Optional) — Facilitates installation of combustion air intake pipe and flue exhaust pipe. Kit is not furnished and must be ordered extra. Select one of the following.

1 — Kit (LB-49107CB) contains 2 stainless steel outside seal caps, 2 galvanized steel inside seal caps, 4 seal rings for the caps and 18 inch insulation sleeve for sealing and isolating intake and exhaust piping penetration of wall. Maintain a maximum of 6 inches between the inlet and outlet openings in the installation of the pipes.

2 — Kit (LB-49107CD) contains factory assembled close-couple side-by-side PVC piping with galvanized steel wall cover plate for sealing and isolating piping penetration of the wall. Piping spacing and length is sized for proper wall installations A.G.A. certified.

LPG Conversion Kits (Optional) — For LPG models a conversion kit is required for field changeover from natural gas. Kit is not furnished and must be ordered extra. See Specification table.

Thermostat (Not Furnished) — Heating thermostat is optional equipment and must be ordered extra. For all-season applications, heating-cooling thermostat is available with the condensing unit. See Lennox Price Book.

Down-Flo Additive Base (Optional) — Additive base is required for heating only models installed on combustible floors. Base is not furnished and must be ordered extra for field installation. See specification table. Not required in add-on cooling coil applications.

Horizontal Support Frame Kit (Optional) — Kit provides support of the unit in horizontal applications. Kit consists of 2 — 1" x 1-1/2" x 32-5/8" and 2 — 1" x 3" x 53-7/8" painted, heavy gauge cold rolled steel support channels with assembly and suspending holes. Bolts and nuts are furnished for field assembly of channels. Suspending rods must be furnished by installer. Kit is not furnished and must be ordered extra. See specification table.

Condensate Drain Heat Cable Kits (Optional) — Self-limiting wattage heat cable prevents condensate drain from freezing when unit is installed in unconditioned space. 3 kits are available and must be ordered extra. Kit (LB-56539DA) has 100 ft. of heat cable, Kit (LB-56496DA) contains 25 ft. of heat cable and Kit (LB-56497CA) contains the necessary installing hardware.

Installation Recommendations — Lennox recommends the following installation procedures to minimize any vibration transmitted from furnace during operation. Place (6) neoprene rubber isolation mounting pads (furnished) and/or insulation pad, 1 inch thick, 1-1/2 lb. density fiberglass (furnished), under the unit. Insulate (1 inch thick, 1-1/2 to 3 lb. density, matt faced fiberglass) supply air plenum through take-off or duct elbow. Use flexible connector (furnished) in gas supply piping where allowed by local codes. Insulate (refrigerant piping insulation or equivalent) all straps and hangers used in suspending ducts, electrical conduit, gas piping, combustion air intake piping and flue exhaust piping. In addition, use rigid (PVC) plastic pipe for drain line from the heat coil condensate drain leg (furnished) to the drain. Do not use copper tubing.

SPECIFICATIONS

Model No.		GSR14Q3-50	GSR14Q4-50	GSR14Q3-80	GSR14Q4/5-80	GSR14Q4/5-1
Input Btuh		50,000	50,000	80,000	80,000	100,000
Output Btuh	Indoor	48,000	48,000	72,000	72,000	93,000
	Non-Weatherized	47,000	47,000	71,000	72,000	92,000
†A.F.U.E.	Indoor	95.4%	95.5%	92.4%	93.4%	91.0%
	Non-Weatherized	94.8%	95.0%	91.7%	92.9%	90.2%
High static Certified by A.G.A. (in. wg.)		.50	.50	.50	.50	.50
California Seasonal Efficiency		89.5%	89.2%	87.6%	87.6%	86.0%
Temperature rise range		30 – 60°F	25 – 55°F	40 – 70°F	30 – 60°F	45 – 75°F
Vent/Intake air pipe size (in.)		2"	2"	2"	2"	2"
Gas piping size I.P.S. (in.)	Natural	1/2	1/2	1/2	1/2	1/2
	*LPG	1/2	1/2	1/2	1/2	1/2
Condensate drain connection (SDR11)		1/2	1/2	1/2	1/2	1/2
Blower wheel nominal diameter x width (in.)		10 x 8	10 x 10	10 x 10	12 x 12	12 x 12
Blower motor hp		1/3	1/2	1/3	3/4	3/4
Number and size of filters (in.)		(1) 20 x 25 x 1	(1) 20 x 25 x 1	(1) 20 x 25 x 1	(1) 20 x 25 x 1	(1) 20 x 25 x
Tons of cooling that can be added		1-1/2 – 3	3-1/2 – 4	2 – 3	3-1/2 – 5	3-1/2 – 5
Shipping weight (lbs.)		311	316	317	329	335
Number of packages in shipment		1	1	1	1	**2
Electrical characteristics		120 volts – 60 hertz – 1 phase (less than 12 amps)				
*LPG Kit (optional)		LB-51702CJ	LB-51702CJ	LB-51702CK	LB-51702CK	LB-51702CL
Optional Horizontal Support Frame Kit – Shipping Wt.		LB-56495CA (All Models) – 18 lbs.				
Optional Down-Flo Additive Base – Shipping Weight		LB-80639BB (All Models) – 6 lbs.				

† Annual Fuel Utilization Efficiency based on DOE test procedures.
* For LPG units a field changeover kit is required and must be ordered extra.
** Packages consist of assembled unit and in-line mufflers.

HIGH ALTITUDE DERATE

If the heating value of the gas does not exceed values listed in the table, derating of the unit is not required. Should the heating value of the gas exceed the table values, or if the elevation is greater than 6,000 feet above sea level it will be necessary to derate the unit. Lennox requires that derate conditions be 4% per thousand feet above sea level. Thus at an altitude of 4000 feet, if the heating value of the gas exceeds 1000 Btu/ft³, unit will require a 16% derate.

Elevation Above Sea Level (feet)	Maximum Heating Value (Btu/ft³)
5001 – 6000	900
4001 – 5000	950
3001 – 4000	1000
2001 – 3000	1050
Sea Level – 2000	1100

A.G.A. INSTALLATION CLEARANCES

DOWN-FLO

Sides	1 inch
Rear	1 inch
Top	1 inch
Front	6 inches
*Floor	Combustible
Flue Pipe	0 Inches

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

HORIZONTAL

Ends	3 inches
Rear	3 inches
*Top	3 inches
Front	6 inches
Floor	Combustible
Flue Pipe	0 inches

*Line contact installation permissible between jacket top or sides and building joists

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BLOWER DATA

GSR14Q3-50 BLOWER PERFORMANCE

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds			
	High	Med-High	Med-Low	Low
0	1640	1405	1070	875
.05	1620	1390	1065	870
.10	1595	1375	1060	865
.15	1570	1360	1055	860
.20	1545	1345	1045	855
.25	1520	1325	1035	850
.30	1490	1305	1025	840
.40	1430	1260	995	810
.50	1365	1200	960	775
.60	1285	1135	910	735

NOTE – All cfm is measured external to the unit with the air filter in place.

GSR14Q4-50 BLOWER PERFORMANCE

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds			
	High	Med-High	Med-Low	Low
0	1915	1765	1660	1375
.05	1875	1735	1635	1355
.10	1840	1700	1610	1335
.15	1805	1665	1585	1315
.20	1765	1630	1560	1290
.25	1730	1595	1535	1270
.30	1690	1555	1505	1245
.40	1605	1480	1440	1190
.50	1510	1390	1360	1125
.60	1390	1280	1255	1035

NOTE – All cfm is measured external to the unit with the air filter in place.

GSR14Q3-80 BLOWER PERFORMANCE

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds		
	High	Med-High	Med-Low
0	1735	1455	1095
.05	1720	1445	1090
.10	1700	1435	1085
.15	1675	1420	1080
.20	1640	1405	1070
.25	1615	1385	1060
.30	1585	1355	1045
.40	1520	1290	995
.50	1440	1210	930
.60	1330	1120	870

NOTE – All cfm is measured external to the unit with the air filter in place.

GSR14Q4/5-80 PERFORMANCE

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2355	2205	1965	1740	152
.05	2325	2175	1940	1715	149
.10	2290	2150	1920	1695	147
.15	2255	2115	1890	1670	145
.20	2220	2085	1860	1645	142
.25	2185	2050	1830	1620	140
.30	2150	2020	1800	1595	137
.40	2080	1950	1745	1540	132
.50	2000	1880	1680	1475	126
.60	1915	1805	1615	1410	119

NOTE – All cfm is measured external to the unit with the air filter in place.

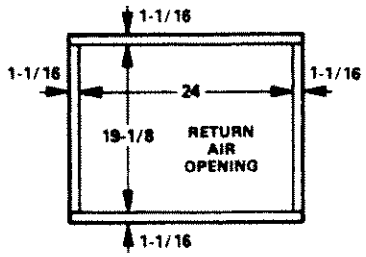
GSR14Q4/5-100 BLOWER PERFORMANCE

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2275	2140	1940	1725	1520
.05	2245	2110	1915	1700	1490
.10	2215	2075	1885	1675	1465
.15	2185	2040	1860	1645	1435
.20	2150	2005	1830	1620	1410
.25	2115	1970	1805	1590	1380
.30	2075	1935	1775	1560	1350
.40	1990	1870	1710	1500	1290
.50	1925	1800	1645	1435	1235
.60	1835	1730	1570	1370	1175

NOTE – All cfm is measured external to the unit with the air filter in place.

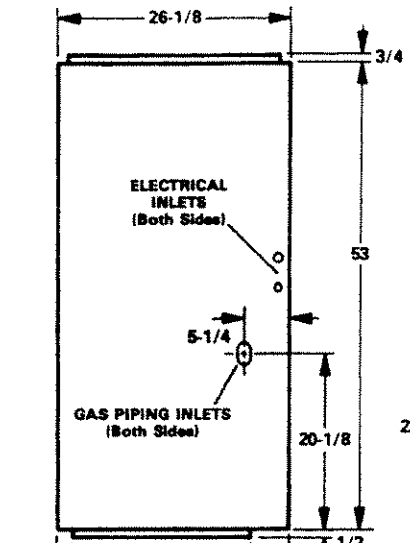
DIMENSIONS (inches)

DOWN-FLO MODELS

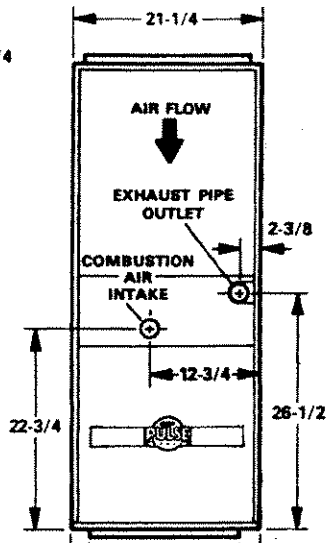


TOP VIEW

NOTE — When heating only unit is installed on a combustible floor an additive base is required. This is optional equipment and must be ordered extra. When using additive base make opening in floor 2-5/8 inches larger (front to rear and side to side) than furnace supply air opening.

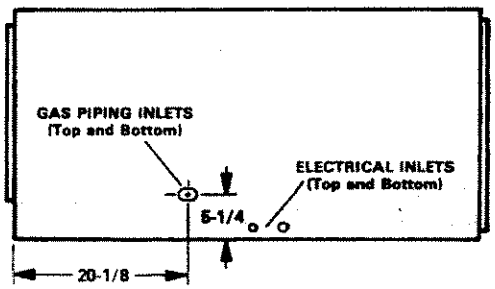


SIDE VIEW

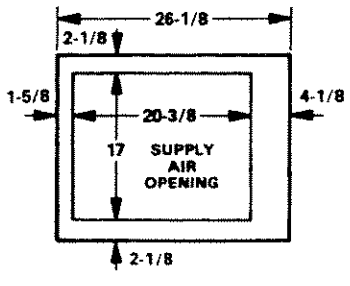


FRONT VIEW

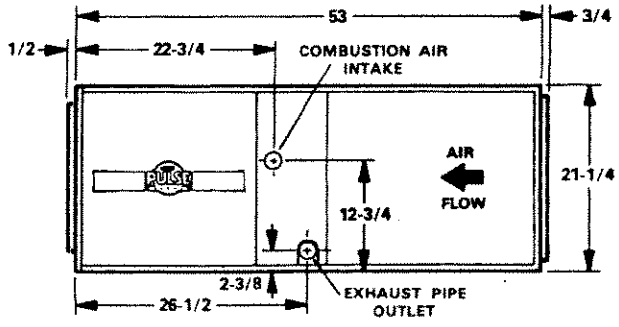
HORIZONTAL MODELS



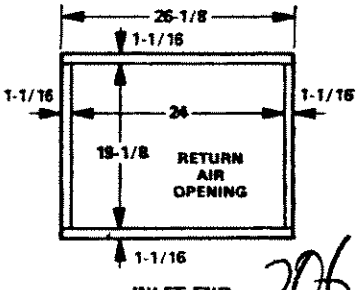
TOP VIEW



DISCHARGE END



FRONT VIEW



INLET END

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E.P.A. EXHIBIT 13

installation - operation - maintenance instruction

GSR14 SERIES UNITS

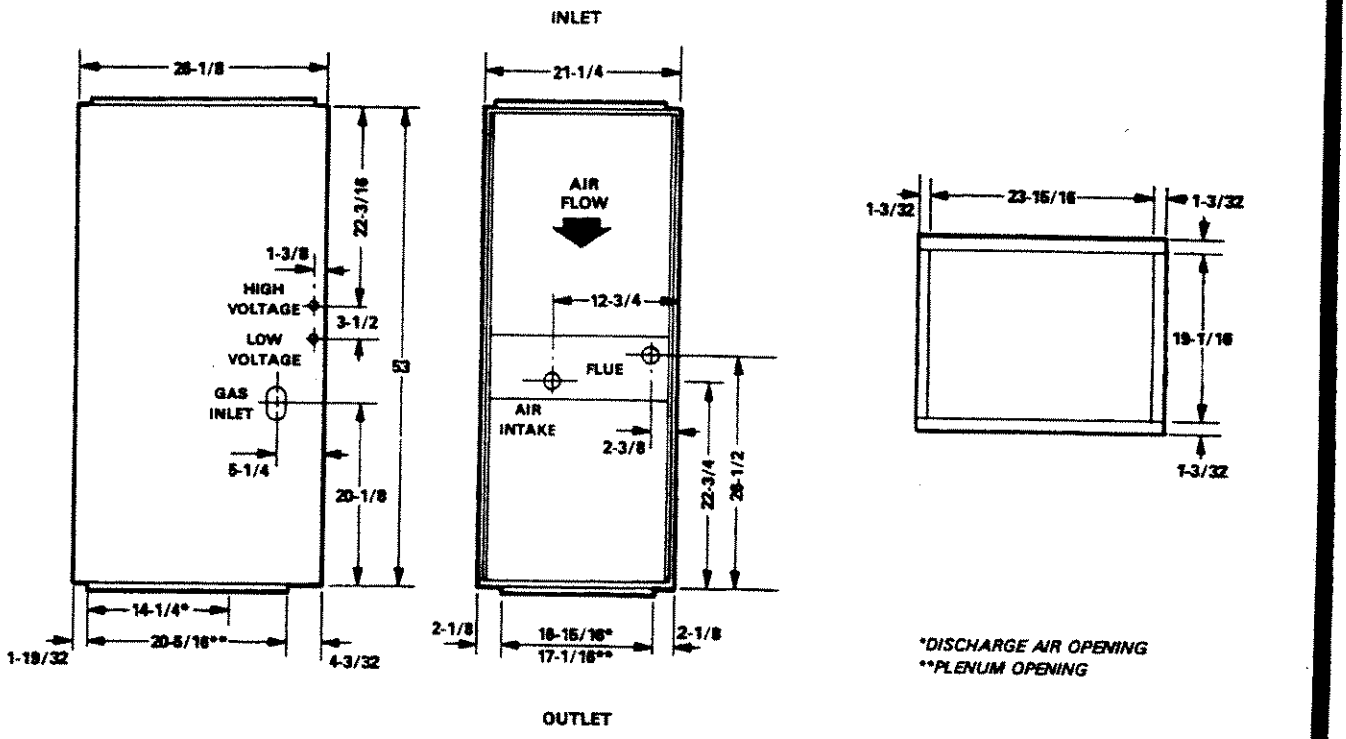
LENNOX Industries Inc.

GAS UNITS
502,100M
7/86
Supersedes 502,060M

Horizontal

Litho U.S.A.

UNIT DIMENSIONS



*DISCHARGE AIR OPENING
**PLENUM OPENING

CHECK POINTS

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" Natural Gas; 11" LP Gas)
Regulator Pressure (Refer to unit nameplate) _____
Exhaust Connections Tight? ☐
Intake Connections Tight? ☐
Fan Control Off Setting (90° factory setting) _____
Temperature Rise _____. External Static Pressure _____.
Filters Clean & Secure? ☐

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

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CONTENTS

REQUIREMENTS

Installation of Lennox gas central furnaces must conform with local building codes or, in the absence of local codes, with the National Fuel Gas Code (ANSI-Z223.1-1984). The National Fuel Gas Code is available from:

American National Standards Institute, Inc.
1430 Broadway
New York, NY 10018

The GSR14 furnace used as a high-static unit heater may be installed in an aircraft hangar in accordance with Standard for Aircraft Hangars ANSI/NFPA No. 409-1979.

Installation in parking structures must be in accordance with the Standard for Parking Structures (NFPA No. 88A-1979).

Installation in repair garages must be in accordance with the Standard for Repair Garages (NFPA No. 88B-1979).

The GSR14 forced air gas furnace and high-static unit heater is design-certified for installation clearances to combustible material as listed on appliance rating plate and the following tables. Unit heater installation is for horizontal applications only.

DOWNFLOW CLEARANCES
(Forced Air Furnaces Only)

Sides	1 inch
Rear	1 inch
Top	1 inch
Front	6 inches
*Floor	Combustible
Flue Pipe	0 inches

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

HORIZONTAL CLEARANCES
(Forced Air Furnaces and Unit Heaters)

Ends	3 inches
Rear	3 inches
*Top	3 inches
Front	**Alcove
Floor	Combustible
Flue Pipe	0 inches

**Line contact installation permissible between jacket top or sides and building joists.*

***Horizontal units are for alcove installations only.*

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

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 National Electric Code, ANSI/NFPA No. 70-1984, if an external electrical source is utilized. The National Electric Code is available from:

National Fire Protection Association
470 Atlantic Ave.
Boston, MA 02210

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 be handled by a duct(s) sealed to the furnace casing and terminating outside the space containing the furnace.

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GENERAL

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.

SHIPPING BRACKET REMOVAL AND UNIT 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.

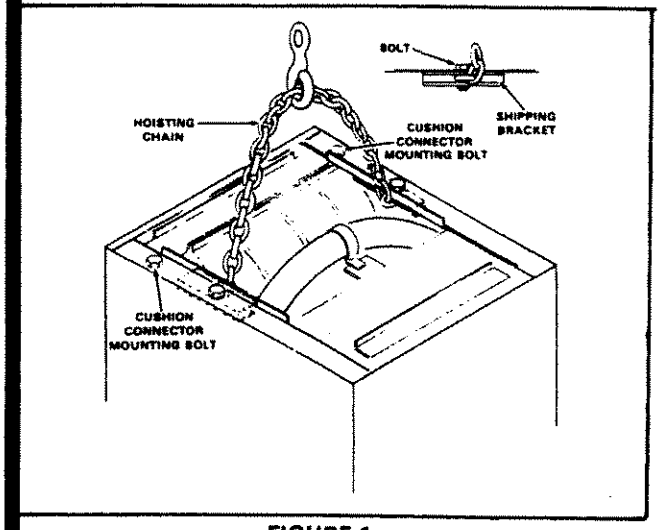

FIGURE 1

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.

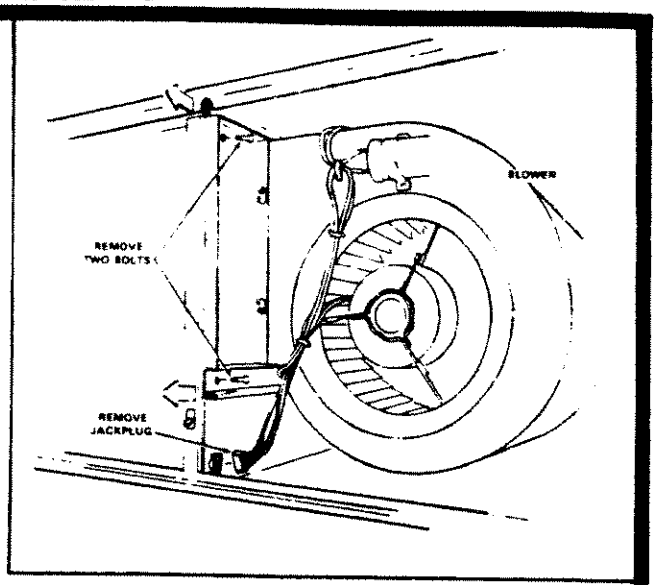

FIGURE 2

SETTING EQUIPMENT

GSR14 series furnaces may be installed in either the downflow or horizontal position. Special consideration must be given to exhaust piping drip leg and condensate line when unit is installed where freezing temperatures are possible. Drip leg and condensate line should be installed in a remote, conditioned location to avoid freezing. If this is not possible, drip leg 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.

Drip leg 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 drip leg or condensate line.

AUXILIARY POWER SUPPLY

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

DUCT SYSTEM

1 - Insulate supply air plenum and ductwork at least through the first elbow. 1-1/2 to 3 lb. density, matt face, 1" thick insulation should be used. 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.

FILTERS

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

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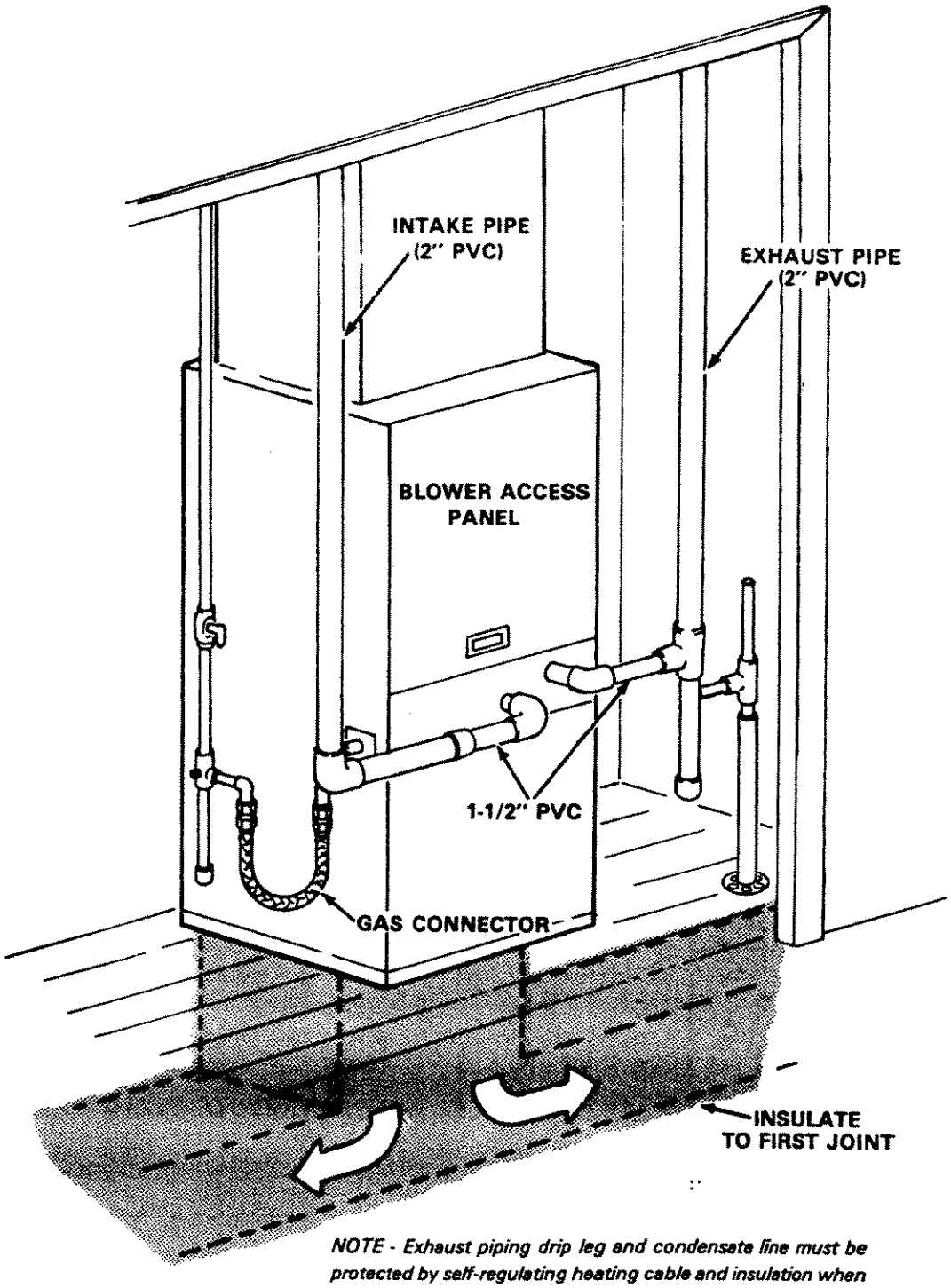
INSTALLATION – DOWNFLOW APPLICATION

TYPICAL DOWNFLOW APPLICATION
(FORCED AIR FURNACES ONLY)



NOTE - Exhaust piping drip leg 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 3

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INSTALLATION — DOWNFLOW APPLICATION (CONT.)

SETTING EQUIPMENT — DOWNFLOW UNITS
(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:

A - 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 1 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 1
NON-COMBUSTIBLE FLOOR

Unit	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 3/16" (5 mm) larger than unit opening.

B - 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 2 for opening size to cut in floor.

TABLE 2
ADDITIVE BASE FLOOR OPENING

Unit	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" (6mm) larger than additive base 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.
5 - Set unit on additive base so unit flanges drop into plenum. Refer to figure 4.

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

C - 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.

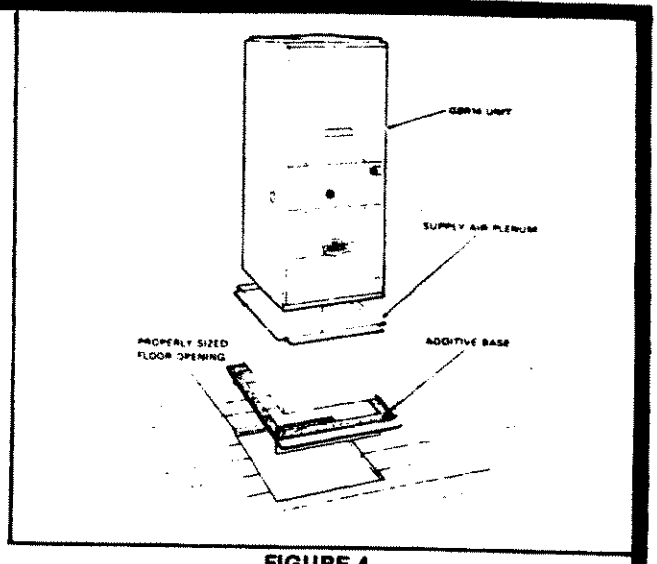

FIGURE 4

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).

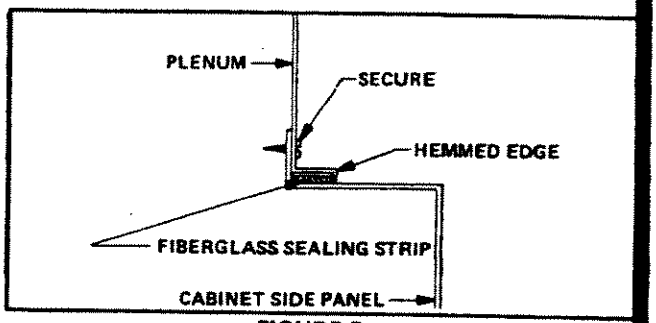

FIGURE 5

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 which begins on page 10.

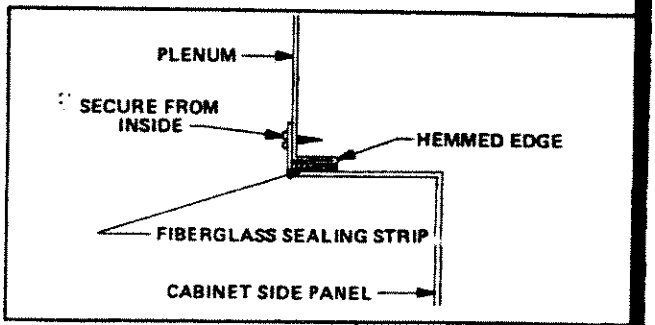

FIGURE 6

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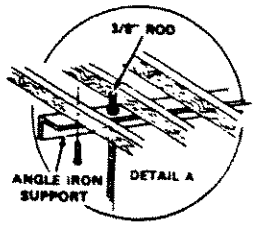
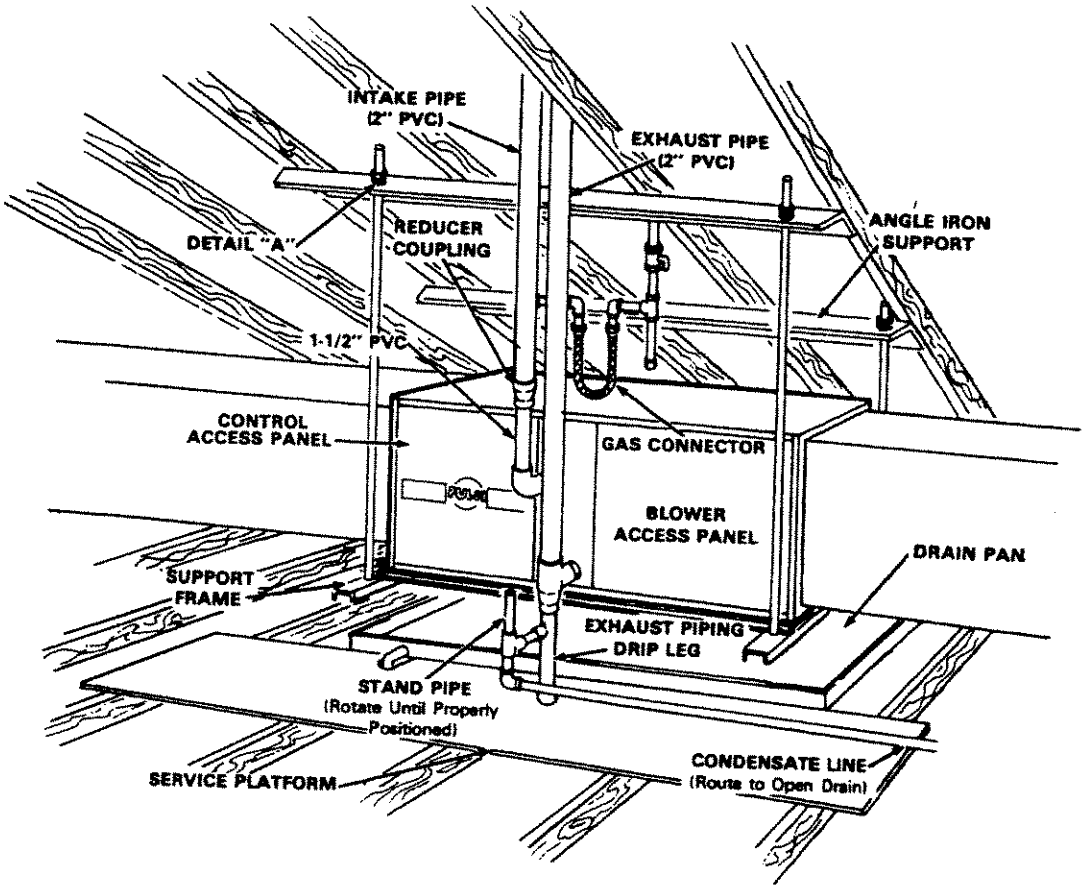
INSTALLATION — HORIZONTAL APPLICATIONS



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 drip leg 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.

TYPICAL HORIZONTAL APPLICATION (FORCED AIR FURNACE)

FIGURE 7

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INSTALLATION — HORIZONTAL APPLICATIONS (CONT.

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 drip leg assembly can be installed at unit or in a remote location where drip leg can be serviced.

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.

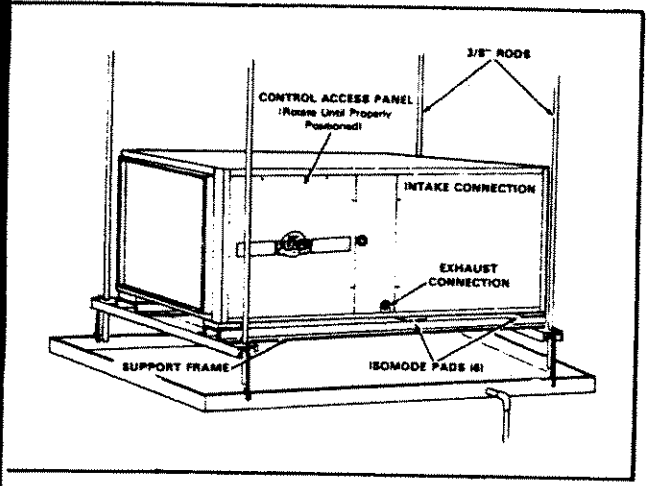

FIGURE 8

A - 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.
IMPORTANT - If drip leg is to be installed near unit, an 18-inch installation clearance must be considered when locating unit. Refer to figure 16 for remote drip leg installation.

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. If exhaust piping drip leg must be installed in attic, an 18-inch clearance must be provided between support frame and service platform or rafters.

5 - Mount unit on support frame and slide six Isomode pads into place between cabinet and frame as shown in figure 8. 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 on page 10.

7 - Hang drain pan below support frame as shown in figure 8.

B - Platform Installation of Horizontal Unit in Attic

1 - Select location for unit keeping in mind service and other necessary clearances.
IMPORTANT - If drip leg is to be installed near unit, an 18-inch installation clearance must be considered when locating unit. Refer to figure 16 for remote drip leg installation.

2 - Construct a raised wooden frame and cover frame with a plywood sheet. Provide 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 9. 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 which begin on page 10.

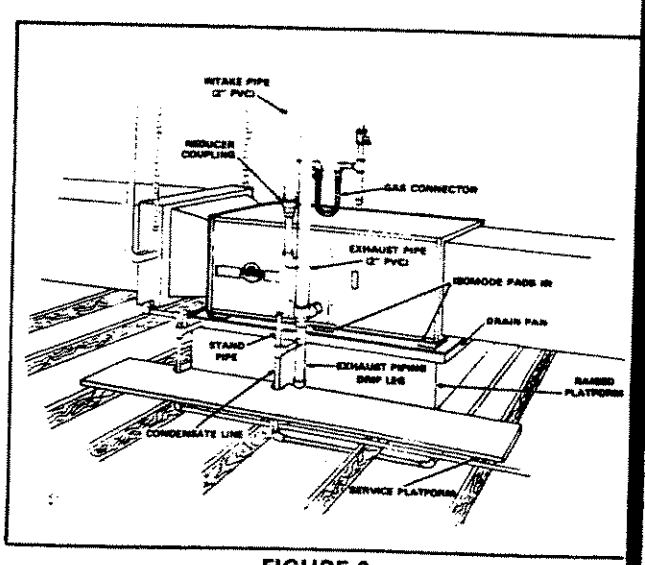

FIGURE 9

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NSTALLATION — HORIZONTAL APPLICATIONS (CONT.)

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 drip leg assembly can be installed at unit or in a remote location where drip leg can be serviced.

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.

A - 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.

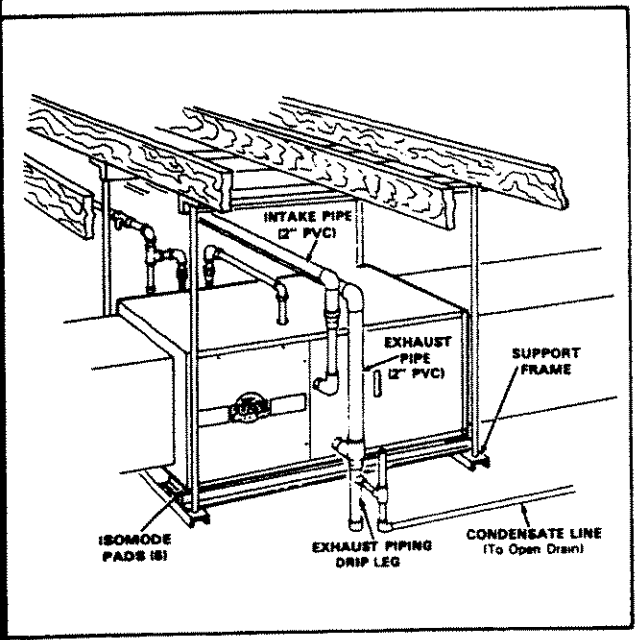

FIGURE 10

1 - Select location for unit keeping in mind service and other clearances.
IMPORTANT - If drip leg is to be installed near unit, an 18-inch installation clearance must be considered when locating unit. Refer to figure 16 for remote drip leg installation.

2 - Using 3/8" rods and support frame kit, fabricate suspension hangers keeping in mind service access panel clearances. Provide an 18-inch distance from exhaust outlet to flooring to furnish clearance for exhaust piping drip leg.

3 - Install unit on support frame and slide isomode pads between cabinet and frame as shown in figure 10. 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.

5 - Continue with exhaust, condensate and intake line piping instructions on page 10.

B - Supported Installation of Horizontal Unit in Crawl Space

1 - Select location for unit, keeping in mind service and other clearances.
IMPORTANT - If drip leg is to be installed near unit, an 18-inch installation clearance must be considered when locating unit. Refer to figure 16 for remote drip leg installation.

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 8). Unit must be level to ensure proper coil drainage.

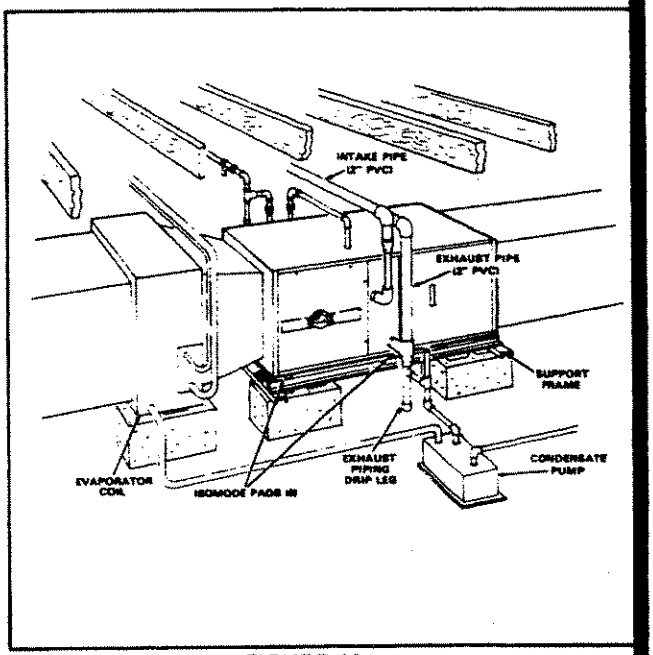

FIGURE 11

3 - Install exhaust and intake piping according to information given in following section. Condensate line should be run into condensate pump as shown in figure 11.

4 - Continue with exhaust, condensate and intake line piping instructions on page 10.

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INSTALLATION — UNIT HEATER APPLICATION

SETTING EQUIPMENT — HORIZONTAL UNIT HEATER SUSPENDED FROM CEILING

Horizontal unit heaters may be suspended from the ceiling using the support frame kit. Exhaust piping drip leg assembly can be installed either at the unit or in a remote location where drip leg can be serviced.

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.

A - Installation of Horizontal Unit Heater Suspended from Ceiling

1 - Select location for unit keeping in mind service and other clearances.
IMPORTANT - If drip leg is to be installed near unit, an 18-inch installation clearance must be considered when locating unit. Refer to figure 16 for remote drip leg installation.

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

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

4 - Hang drain pan below support frame as shown in figure 12.

TYPICAL INSTALLATION
Unit Heater Suspended from Ceiling

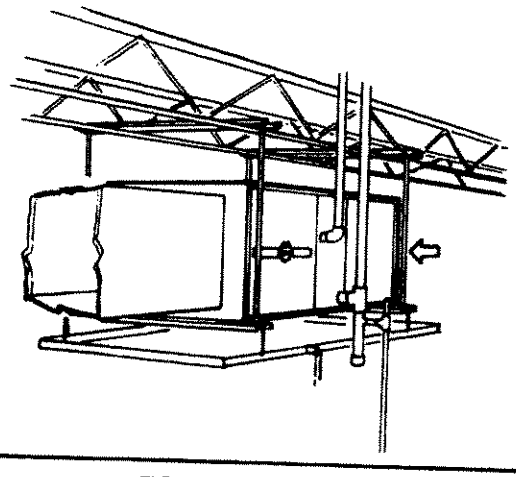

FIGURE 12

5 - Mount unit on support frame and slide six Isomode pads into place between cabinet and frame as shown in figure 12. 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.

B - Platform Installation of Horizontal Unit Heater

1 - Select location for unit keeping in mind service and other necessary clearances.
IMPORTANT - If drip leg is to be installed near unit, an 18-inch installation clearance must be considered when locating unit. Refer to figure 16 for remote drip leg installation.

2 - Construct a raised wooden frame and cover frame with a plywood sheet. Provide service platform and drain pan for unit as outlined in section "A" on page 7.
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 13. Unit must be level to ensure proper coil drainage.

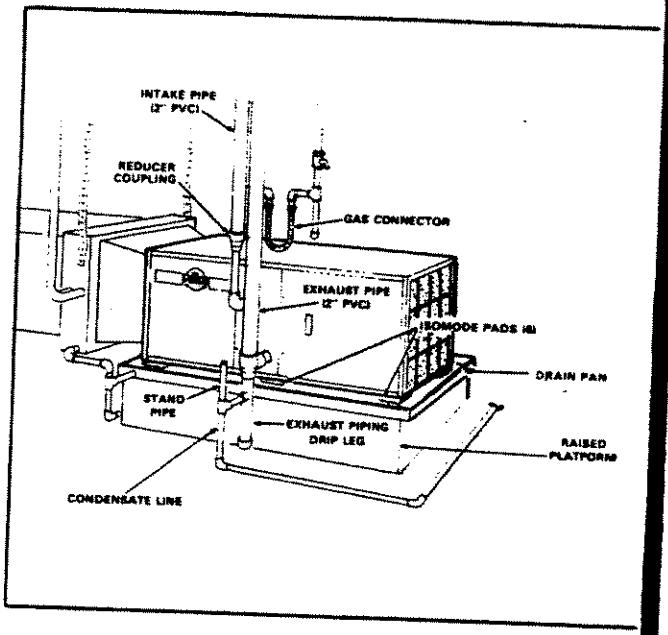

FIGURE 13

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 begin on page 10.

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EXHAUST, CONDENSATE AND INTAKE PIPING (CONT.)

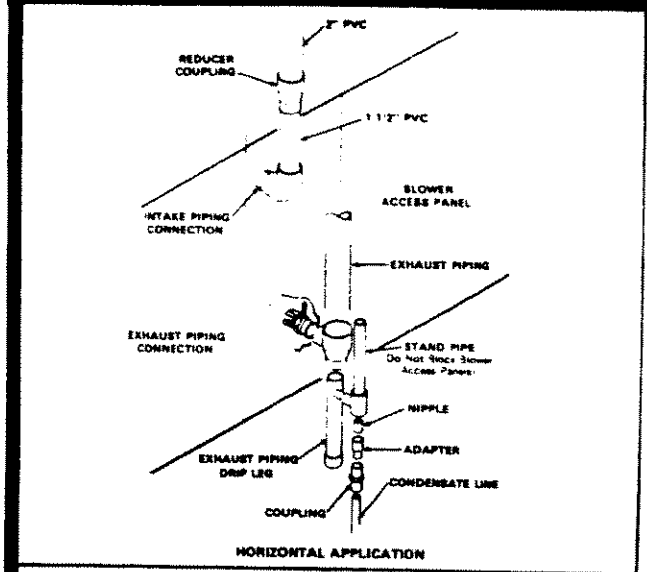

FIGURE 15

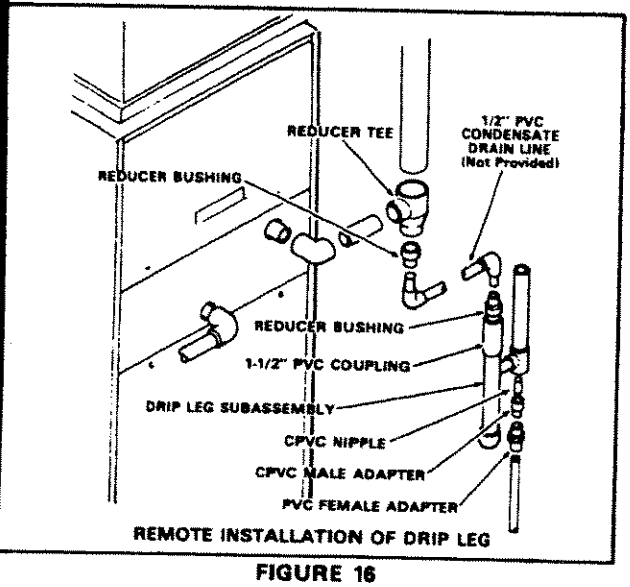

FIGURE 16

IMPORTANT - Bottom of drip leg assembly with condensate connection is not cemented to tee. Make sure condensate connection is in a suitable drain position and cement in place. Do not block blower access panel with drip leg assembly.

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

4 - Cement exhaust pipe into top of drip leg assembly and route to outside of structure. 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.

5 - Maximum of 35 ft. per run with no more than five 90° elbows. For runs less than 35 ft., an additional 90° elbow may be added for each 10 ft. decrease in length.

6 - 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 a metal strapping as shown in figure 17. 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.

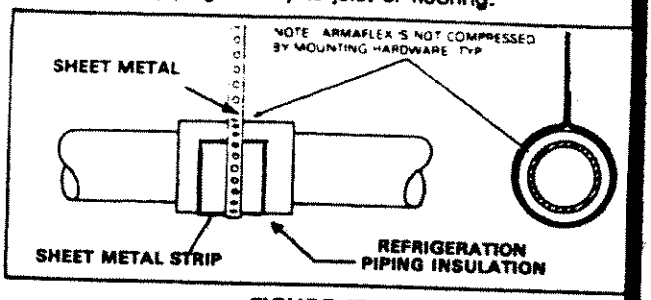

FIGURE 17

7 - 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.

8 - 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 drip leg on exhaust line.

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 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.

9 - Connect 1/2" or 3/4" PVC condensate drain line to condensate connection on drip leg assembly (1/2" PVC adapter is furnished). Route condensate line to open drain. Condensate line must be sloped downward away from drip leg to drain. If drain level is above drip leg, condensate pump must be used in condensate line. Condensate line should be remotely mounted in conditioned space if possible to avoid freezing and blockage of line. Rigid PVC pipe must be used for condensate line and line must be protected by 3-watt, grounded and sheathed self-regulating heating cable (heating cable installation kit is available as Lennox part number LB-56497CA). Heating cable is also available in 25 and 100 ft. lengths.

CAUTION - DO NOT USE COPPER TUBING OR EXISTING COPPER CONDENSATE LINES FOR DRAIN LINE.

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

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INTAKE PIPING

1 - Cement intake piping to intake inlet using elbow assembly, PVC pipe and reducer coupling provided (See figures 13 and 14 for typical applications).
NOTE - In downflow applications, intake piping may be run to right or left in addition to typical application shown.

2 - Maximum of 35 ft. per run with no more than five 90° elbows. For runs less than 35 ft., an additional 90° elbow may be added for each 10 ft. decrease in length.

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 a metal strapping as shown in figure 17. 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.

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.

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.

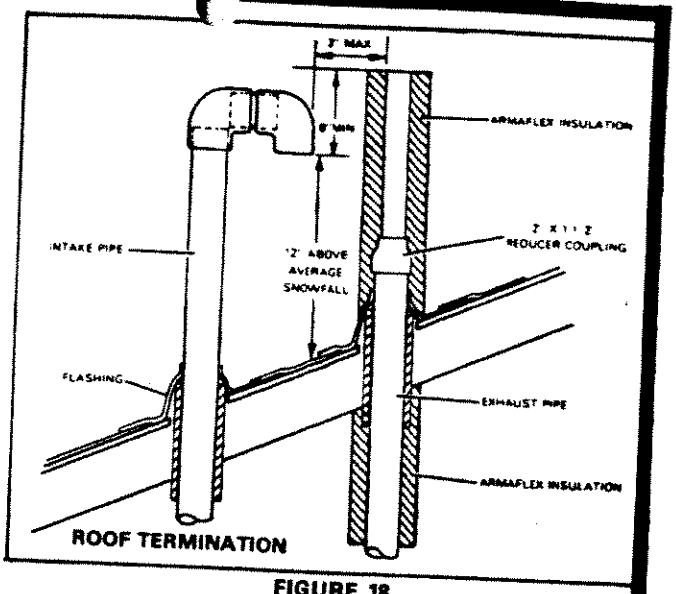

FIGURE 18

2 - Intake and exhaust pipes should be placed as close together as possible at termination end (refer to illustrations). Maximum separation is 3 in. on roof terminations and 6 in. 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 18). In rooftop applications, a 2" X 1-1/2" reducer must be used on the exhaust piping at the point 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 figure 20 for proper piping method. Piping must be supported every 3 ft. as shown (See figure 20). When exhaust and intake piping must be run up an outside wall, the exhaust piping is reduced to 1-1/2 inches after the final elbow.
IMPORTANT - Care must be taken to avoid recirculation of exhaust back into intake pipe.

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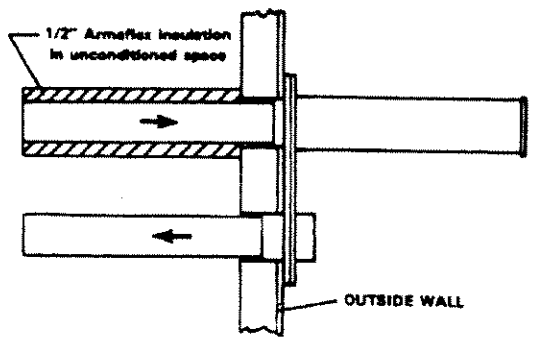
EXHAUST, CONDENSATE AND INTAKE PIPING (CONT.



TOP VIEW
WALL TERMINATION

FIGURE 19

IMPORTANT - 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 in.

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 in. 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.

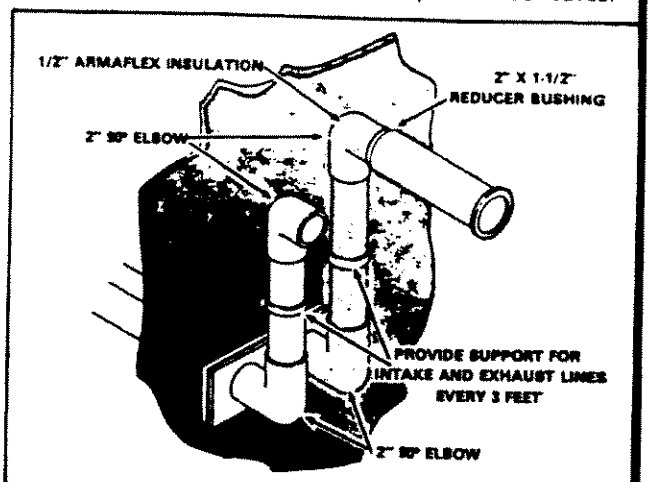


FIGURE 20

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GAS PIPING

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.

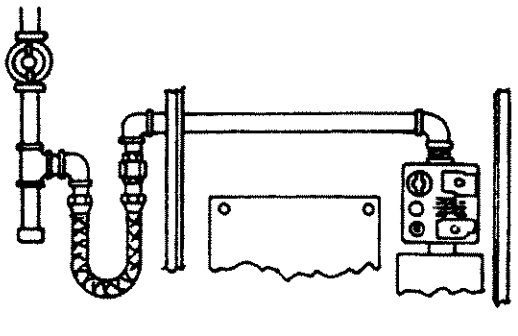
1 - When connecting the gas supply, the length of run from the meter must be considered in determining the pipe size to avoid excessive pressure drop. For correct sizing of gas delivering piping, consult the utility having jurisdiction. A drip leg should be installed in the pipe run to the unit. In some localities, codes may require a manual main shut-off valve and union (furnished by installer) be 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 - The use of one of the following gas connectors is recommended:

- ANS Z21.24 Appliance Connectors of Corrugated Metal Tubing and Fittings.
- ANS Z21.45 Assembled Flexible Appliance Connectors of Other Than All-Metal Construction.

The above connectors may be used if acceptable by the authority having jurisdiction. A gas connector is provided and, if used, should be installed between the manual main shut-off valve and ground joint union. See figure 21 for downflow application and figure 22 for horizontal application



DOWNFLOW APPLICATION

FIGURE 21

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 21 and 22). Do not secure to unit ducting or structure.

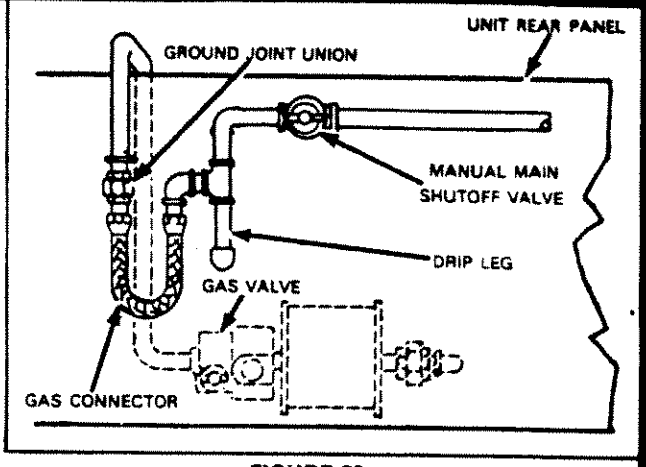


FIGURE 22

3 - Center gas line through piping hole. Gas line should not touch side or unit. See figure 21 for downflow application and figure 22 for horizontal application.

4 - Connect gas supply line.

LEAK CHECK

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

CAUTION

Many soaps used for leak testing are corrosive to certain metals. 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 - When pressure testing gas lines, the gas valve must be disconnected and isolated. Gas valves can be damaged if subjected to more than 1/2 psig.

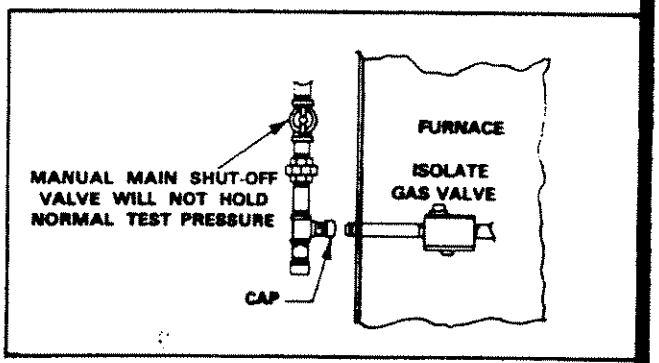


FIGURE 23

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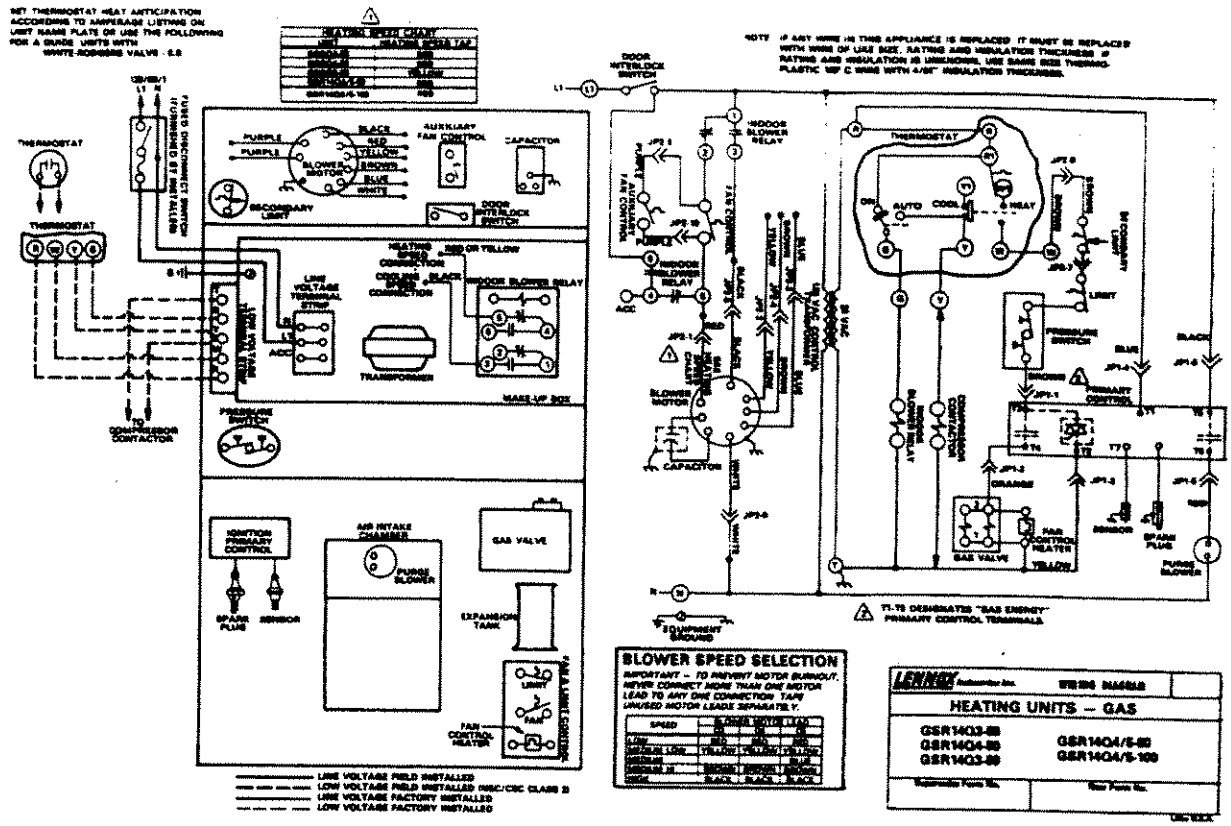
ELECTRICAL

1 - Select fuse and wire size according to blower motor amps.
2 - Access openings are provided on both sides of cabinet to facilitate wiring.
3 - Install room thermostat according to instructions provided with thermostat.
4 - Install a separate fused disconnect switch near the unit so the power can be turned off for servicing.
5 - Complete wiring connections to equipment using provided wiring diagrams.
6 - Electrically ground unit in accordance with local codes or, in the absence of local codes, in accordance with the National Electric Code.
7 - Install an auxiliary receptacle near unit.



START-UP/ADJUSTMENTS

START-UP

This unit is equipped with a direct spark ignition system with flame rectification. Once combustion has started, the purge blower and spark ignitor are turned off. To place furnace in operation:

1 - With thermostat set below room temperature make sure gas valve knob is in off position and wait 5 minutes.
2 - Turn manual knob of gas valve counterclockwise to ON position. Turn power on and set thermostat above room temperature. Unit will go into prepurge for approximately 30 seconds and then ignite.
3 - If the unit does not light on the first attempt, it will attempt four more ignitions before locking out.
4 - If lockout occurs, turn thermostat off and then back on.

To shut off furnace:

1 - Set thermostat to lowest temperature and turn power supply to furnace off.
2 - Turn manual knob of gas valve off.

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.)

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ADJUSTMENTS (CONT.)

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.

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 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.

HEAT ANTICIPATOR SETTINGS

Units with White Rodgers gas valves — 0.9

FAN/LIMIT CONTROL

Limit Control — Factory set: No adjustment necessary

Fan Control — Factory set: ON — No adjustment necessary

OFF — 90°

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.

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 duct work or structure.

BLOWER SPEEDS

Multi-tap drive motors are wired for different heating and cooling speeds. Speed may be changed by simply interchanging motor connections at indoor blower relay and fan control. Refer to speed selection chart on unit wiring diagram.

CAUTION - To prevent motor burnout, never connect more than one (1) motor lead to any one connection. Tape unused motor leads separately.

MAINTENANCE

ANNUAL MAINTENANCE

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

A - Blower

1 - Check and clean blower wheel.

2 - Check motor lubrication.

Always relubricate motor according to manufacturer's lubrication instructions on each motor. If no instructions are provided, use the following as a guide:

a - Motors Without Oiling Ports — Prelubricated and sealed. No further lubrication required.

b - Direct Drive Motors with Oiling Ports — Prelubricated for an extended period of operation. For extended bearing life, relubricate with a few drops of SAE No. 10 non-detergent oil once every two years. It may be necessary to remove blower assembly for access to oiling ports.

B - 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 tape (if applicable) is operating.

C - 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. They should be sprayed with filter handicoater when dry 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-8-7831 for 20 X 25 inch filter.

D - 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.

E - Insulation

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

MAINTENANCE (CONT.)

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 a 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.

REPAIR PARTS LIST

The following repair parts are available through independent Lennox dealers. When ordering parts, include the complete furnace model number listed on 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

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

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
Flame sensor lead
Flame sensor
Primary fan and limit control
Secondary limit control
Auxiliary fan control
Differential pressure switch
Door interlock switch
Air filter

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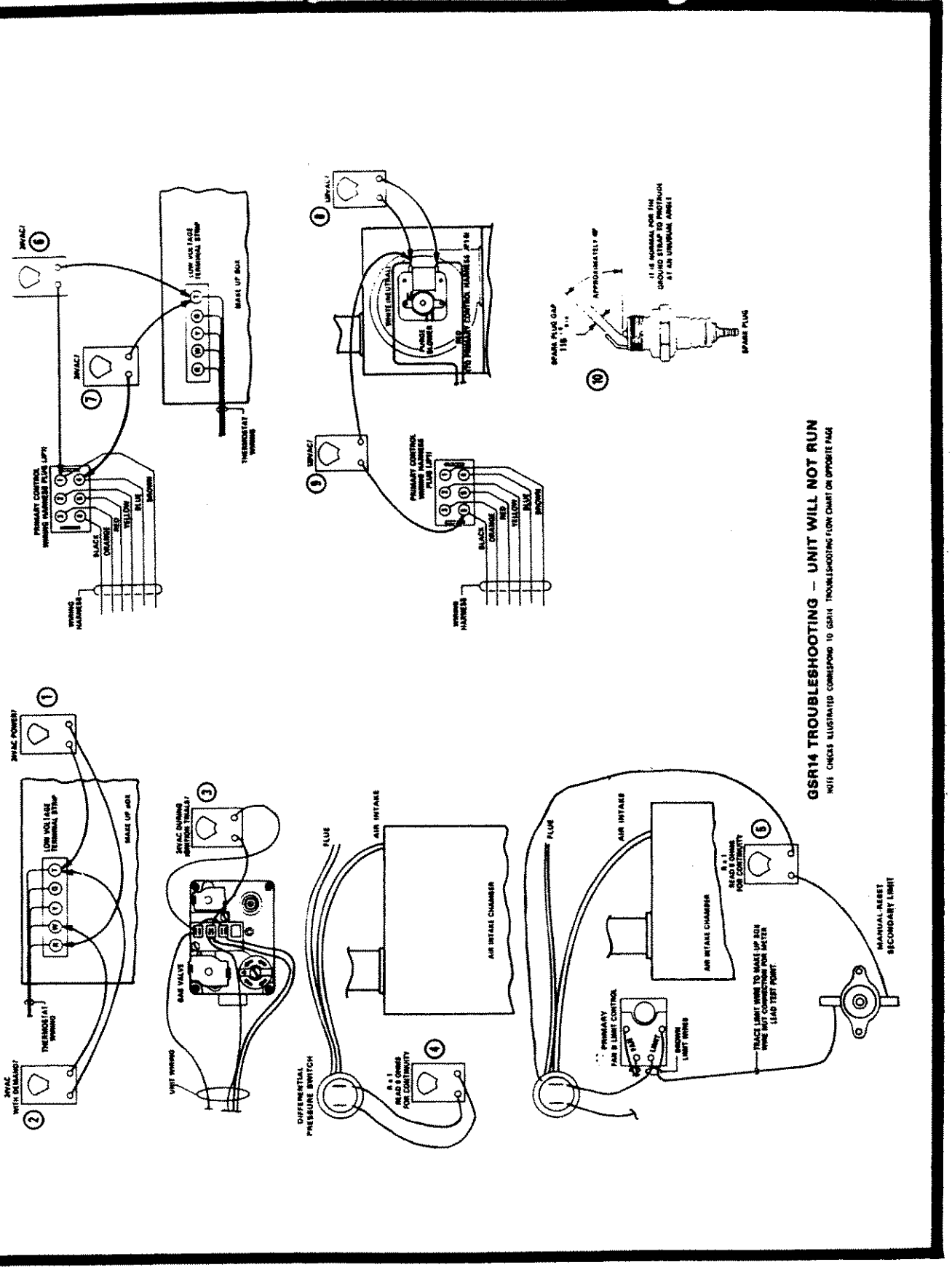
TROUBLESHOOTING



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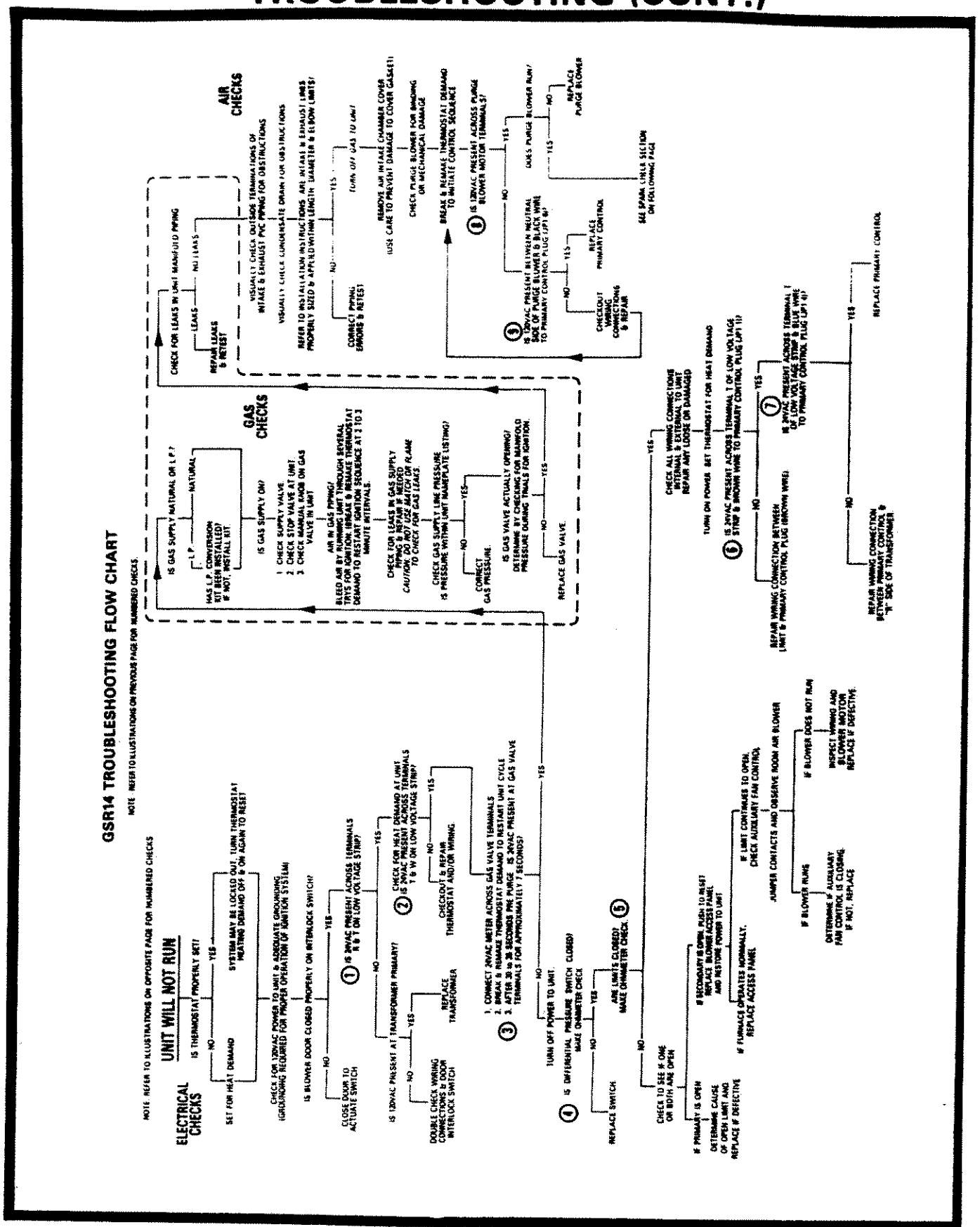
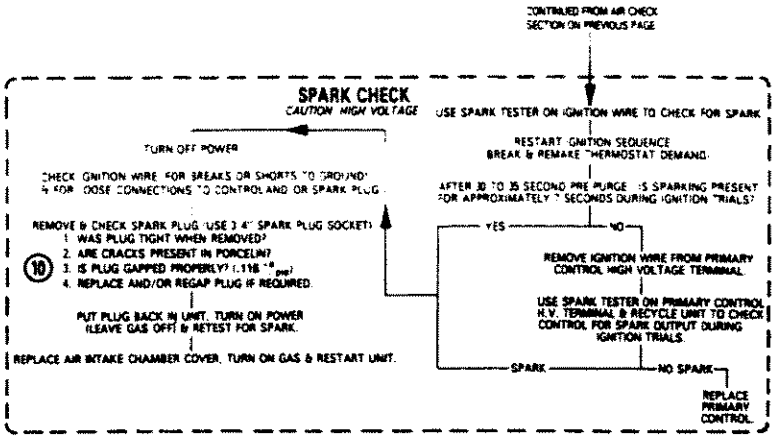
TROUBLESHOOTING (CONT.)



TROUBLESHOOTING (CONT.)



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S.C.R. EXHIBIT 14

installation - operation - maintenance instruction

G14 SERIES UNITS

V Dow-flow

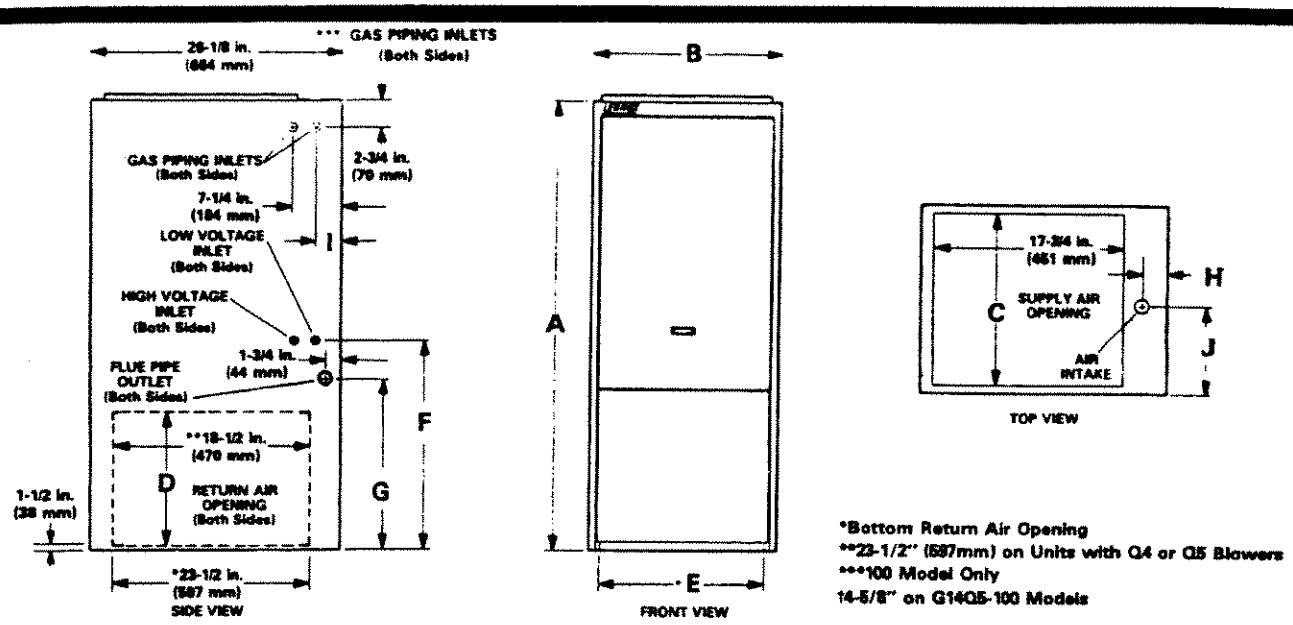
Gas Units

501,972M
7/86
Supersedes 9/85

LENNOX Industries Inc.

Litho U.S.A.

UNIT DIMENSIONS



Model Number	A	B	C	D	E	F	G	H†	I	J
G14Q3 or Q4 40, 60, and 80 series	49 in. (1245 mm)	21-1/4 in. (540 mm)	19-1/8 in. (486 mm)	14-1/2 in. (368 mm)	14-1/2 in. (368 mm)	23-5/8 in. (600 mm)	20-1/4 in. (514 mm)	4-1/8 in. (105 mm)	5-1/4 in. (133 mm)	8-1/2 in. (216 mm)
G14Q5-80 and G14Q3 or Q5-100	53 in. (1346 mm)	26-1/4 in. (667 mm)	24-1/8 in. (613 mm)	18-1/2 in. (470 mm)	18-1/2 in. (470 mm)	27-5/8 in. (702 mm)	24-1/4 in. (616 mm)	1-15/16 in. (49 mm)	4-1/2 in. (114 mm)	11 in. (279 mm)

CHECK POINTS

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 _____ Blower Motor Amps _____

Gas Piping Connections Tight & Leak-Tested ☐

Fuel Type: Natural Gas? ☐ LP Gas? ☐

Furnace BTU Input _____

Line Pressure (7" Natural Gas; 11" LP Gas) _____

Regulator Pressure (Refer to unit nameplate) _____

Exhaust Connections Tight? ☐

Intake Connections Tight? ☐

Fan Control Off Setting (90° Factory Setting) _____

Temperature Rise _____ External Static Pressure _____

Filters Clean & Secure? ☐

THERMOSTAT

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

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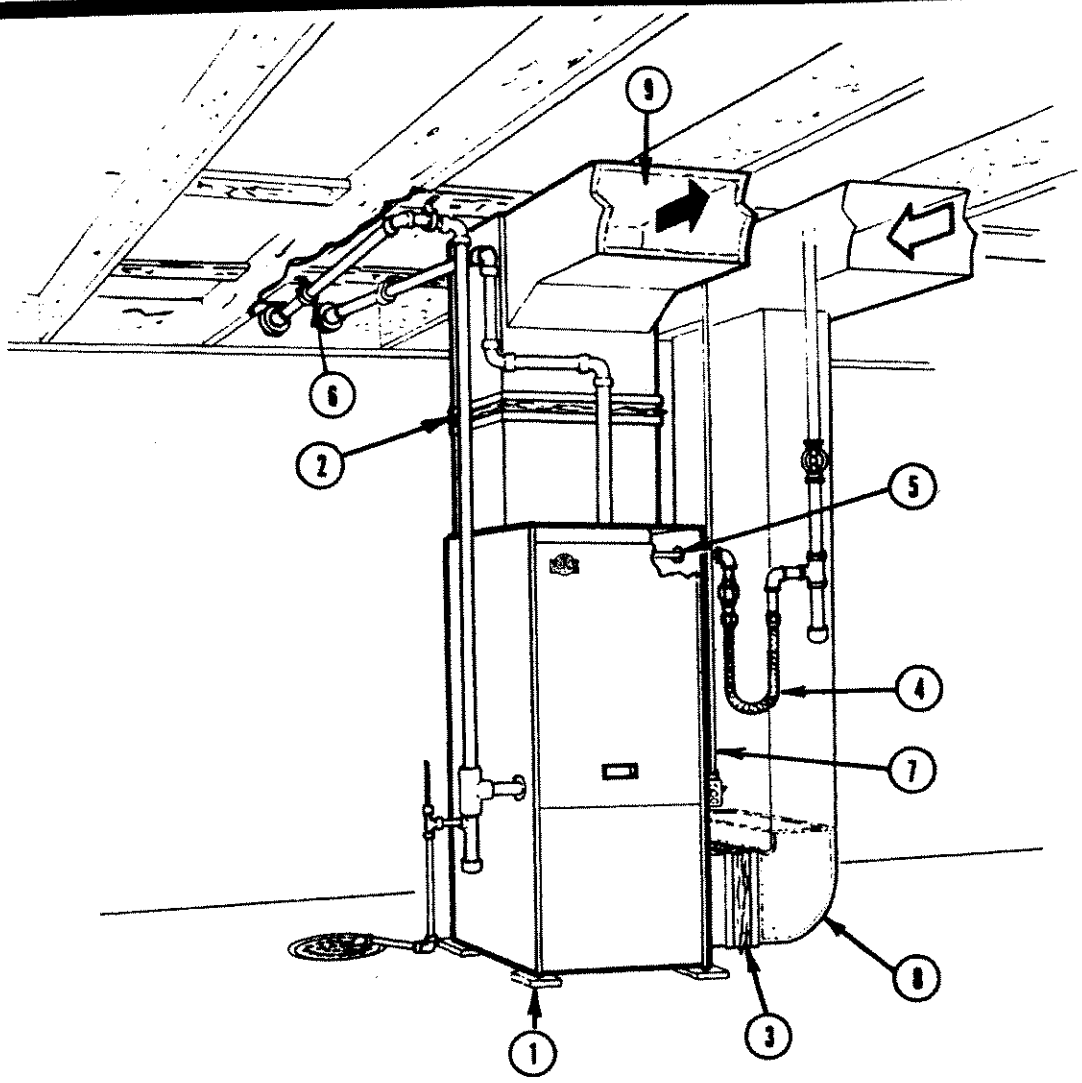

MAJOR INSTALLATION REQUIREMENTS

1. ISOLATION MOUNTING PADS
2. FLEXIBLE BOOT - SUPPLY AIR PLENUM
3. FLEXIBLE BOOT - RETURN AIR PLENUM
4. GAS CONNECTOR
5. GAS SUPPLY PIPING CENTERED IN INLET HOLE
6. ISOLATION HANGERS
7. ELECTRICAL CONDUIT ISOLATED FROM UNIT AND DUCT WORK
8. RETURN AIR PLENUM AND DUCT INSULATED PAST FIRST ELBOW
9. SUPPLY AIR PLENUM AND DUCT INSULATED PAST FIRST ELBOW

THE ABOVE REQUIREMENTS ARE ESSENTIAL TO THE INSTALLATION IN ORDER TO ISOLATE THE UNIT.

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REQUIREMENTS

Installation of Lennox gas central furnaces must conform with local building codes or, in the absence of local codes, with the National Fuel Gas Code (ANSI-Z223.1-1984).

The National Fuel Gas Code is available from:

American National Standards Institute, Inc.
1430 Broadway
New York, NY 10018

Furnace is design-certified for installation clearances to combustible material as listed on appliance rating plate and the following table.

Clearances	Location	Inches (mm)
Service access	Front	36 in. (914 mm)
	Exhaust Side	6 in. (152 mm) (from side of unit)
To combustible materials	Top, Side, Rear and Front	1 in. (25 mm)
	Exhaust	0

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 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 local codes or, in the absence of local codes, with the National Electric Code, ANSI/NFPA No. 70-1984, if an external electrical source is utilized. The National Electric Code (ANSI/NFPA No. 70-1984) is available from:

National Fire Protection Association
470 Atlantic Ave.
Boston, MA 02210

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 be handled by a duct(s) sealed to the furnace casing and terminating outside the space containing the furnace.

INSTALLATION

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 intake piping at the point it penetrates the vestibule panel. Inspect the rubber grommet for damage; there must be no direct contact between the intake pipe and the vestibule panel.

SHIPPING BOLT REMOVAL

Remove all shipping bolts and blocks before starting unit.

1 - Bolt and shipping block behind air decoupler box.
2 - Four (4) heat section shipping bolts from bottom side of blower deck—access through blower compartment.

RETURN AIR OPENING

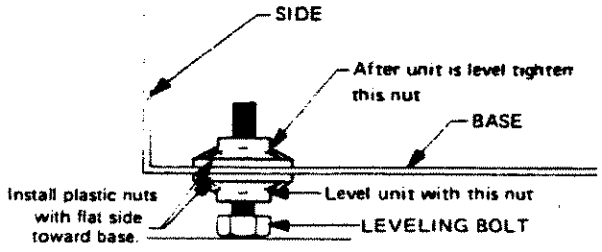
Return air can be brought in either side or at bottom of unit. Scribe lines show outline of each opening.

NOTE - Larger opening is for units with Q4 or Q5 blowers.

SETTING AND LEVELING UNIT

1 - Holes are provided in the corners of the base for leveling the unit. Install leveling bolts (if desired) as shown or shim under unit. If unit is shimmed, use isolation pads (such as Isomode) for shims. Unit should not sit directly on flooring.

CAUTION - If leveling bolts are used, be sure to install plastic nuts as shown and tighten down snug before setting unit.



2 - Set unit in desired location keeping in mind clearances listed on appliance rating plate. Also keep in mind gas supply connections, electrical supply, intake and exhaust runs, condensate drainage, and sufficient clearances for installing and servicing unit.

Bottom Return

1 - Cut opening in floor or platform.
2 - Flange return air plenum and lower into opening.
3 - Place fiberglass insulation strips around opening. Position isolation mounting pads at corners of insulation. Insulation should not overlap the mounting pads. Trim away any excess insulation from insulation strips.

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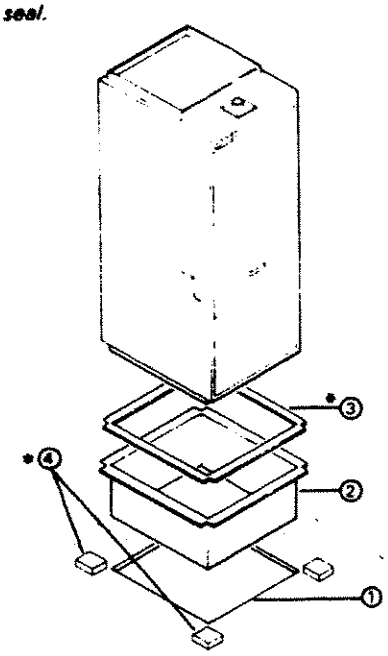
INSTALLATION CONT.

4 - Set unit. Make sure unit is sitting on isolation pads.
NOTE - Be careful not to damage fiberglass. Check for tight seal.



*Provided in Installation Kit

FILTERS

G14 series units are equipped with a reusable foam filter. Filter must be in place any time unit is in operation. Install filter mounting clips provided and secure with sheet metal screws.

DUCT SYSTEM

1 - Install flexible canvas boots or equivalent on both supply and return air plenums. Boots should be placed as close as possible to unit.
2 - Insulate supply and return air plenums and ductwork at least through the first elbow. 1-1/2 to 3 lb. density, matt face, 1" thick insulation should be used. Provisions must be taken to keep insulation in place and to protect edges from airflow deterioration.
3 - Size and install supply and return system using industry-approved standards that result in a quiet and low-static system with uniform distribution.

INTAKE AND EXHAUST PIPING REQUIREMENTS

I - REQUIREMENTS

All schedule 40 PVC pipe, fittings, primer and solvent cement must conform with American National Standard Institute and the American Society for Testing and Materials (ANSI/ASTM) standards. The solvent shall be free flowing and contain no lumps, undissolved particles or any foreign matter that adversely affects the joint strength or chemical resistance of the cement. The cement shall show no gelation, stratification, or separation that cannot be removed by stirring.

CAUTION—Solvent cements for plastic pipe are flammable liquids and should be kept away from all sources of ignition. Good ventilation should be maintained to reduce fire hazard and to minimize breathing of solvent vapors. Avoid contact of cement with skin and eyes.

A - Materials

-2" schedule 40 PVC, (type 1120 or 1220) pipe and (PVCI or PVC12) fittings for intake and exhaust piping (not provided) per ASTM D1785, D2466 and D2665.
-PVC primer (not provided) per ASTM D2564.
-PVC solvent cement (not provided) per ASTM D2564.
NOTE – Low temperature solvent cement is recommended.
-Exhaust termination isolation material (provided in installation kit LB-49107C).
-Material for isolation hangers—Armaflex refrigeration insulation and sheet metal strapping (not provided).

B - Procedure for Cementing Joints Per ASTM D2855

1 - Measure and cut PVC pipe to desired length.
2 - Debur and chamfer end of pipe, removing any ridges or rough edges. If end is not chamfered, edge of pipe may remove cement from fitting socket and result in a leaking joint.
3 - Clean and dry surfaces to be joined.
4 - Test fit joint and mark depth of fitting on outside of pipe.
5 - Uniformly apply liberal coat of primer to inside socket surface of fitting and male end of pipe to depth of fitting socket.
6 - Promptly apply solvent cement to end of pipe and inside socket surface of fitting. Cement should be applied lightly but uniformly to inside of socket. Take care to keep excess cement out of socket. Apply second coat to end of pipe. *IMPORTANT - Time is critical at this stage. Do not allow primer to dry before applying cement.*
7 - Immediately after applying last coat of cement to pipe, and while both inside socket surface and end of pipe are wet with cement, forcefully insert end of pipe into socket until it bottoms out. Turn pipe 1/4 turn during assembly (but not after pipe is fully inserted) to distribute cement evenly. *NOTE - Assembly should be completed within 20 seconds after last application of cement. Hammer blows should not be used when inserting pipe.*
8 - After assembly, wipe excess cement from pipe at end of fitting socket. A properly made joint will show a bead around its entire perimeter. Any gaps may indicate a defective assembly due to insufficient solvent.
9 - Handle joints carefully until completely set.

II - INTAKE AND EXHAUST PIPING

If a G14 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 draw with the remaining appliance.

Intake and exhaust pipes may be routed either horizontally through an outside wall or vertically through the roof. Vertical termination through the roof is preferred.

1 - Use 2" schedule 40 PVC pipe for both intake and exhaust piping.
2 - Secure all joints, including drain leg, gas tight using approved PVC solvent.

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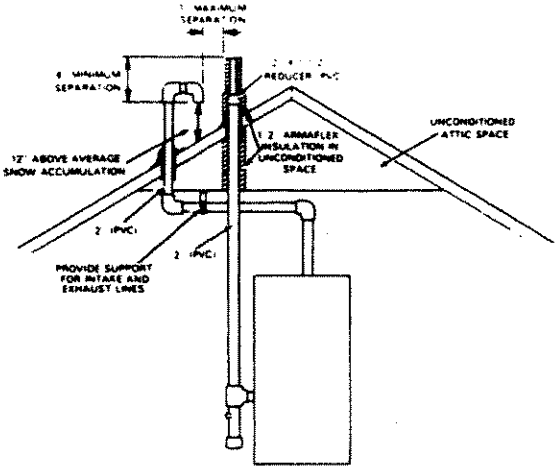
INSTALLATION CONT.

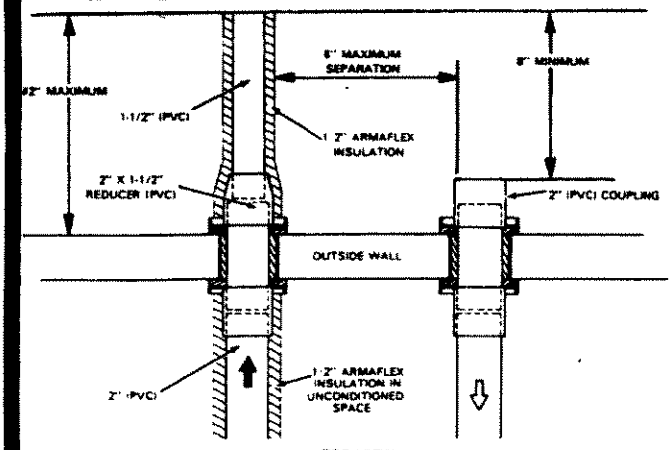
3 - Maximum of 35 ft. per run with no more than four 90° elbows. For runs less than 35 ft. an additional 90° elbow may be added for each 10 ft. decrease in length. Locate intake piping upwind (prevailing wind) from exhaust piping. To avoid recirculation of exhaust gas on roof terminations, end of exhaust 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.



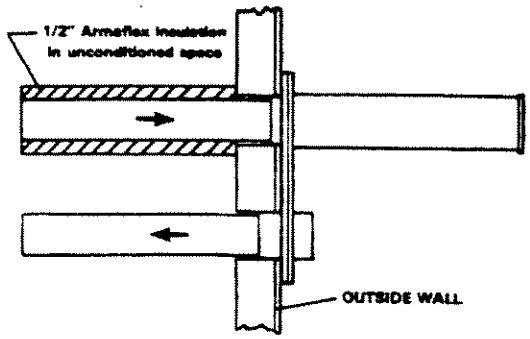
ROOF TERMINATION

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

5 - Exhaust piping must terminate straight out or up as shown. On roof terminations, the intake piping should terminate straight down using two 90° elbows. Intake piping on side wall terminations should point straight out. A 2" X 1-1/2" reducer must be used on the exhaust piping at the point it exits the structure to improve velocity of exhaust away from intake piping. When exhaust and intake piping must be run up an outside wall, the exhaust piping is reduced to 1-1/2 inches after the final elbow.



TOP VIEW
WALL TERMINATION



TOP VIEW
ALTERNATE WALL TERMINATION

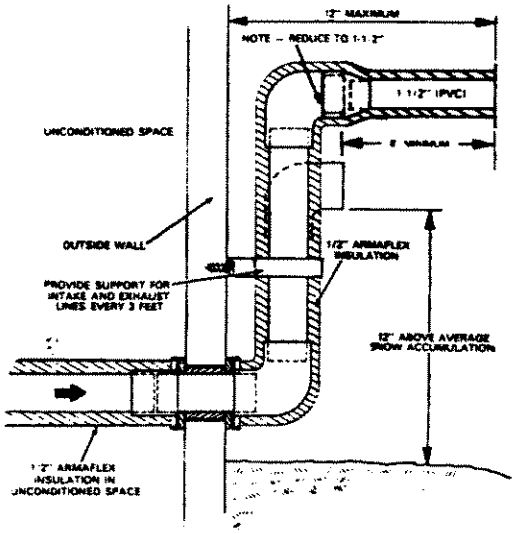
IMPORTANT - If winter design temperature is below 32°F, exhaust piping must be insulated with 1/2" Armaflex or equivalent when run through unheated space. Do not leave any surface area of exhaust pipe open to outside air; exterior exhaust pipe must be insulated with 1/2" Armaflex or equivalent. In extreme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

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

If intake and exhaust piping must be run up a side wall to a position above snow accumulation or other obstructions, refer to illustrations for proper piping method. Piping must be supported every 3 feet as shown. Alternate wall termination kit must be modified for use in this application.

6 - On side wall exits, exhaust piping should extend a maximum of 12 in. beyond the outside wall. Intake piping should be as short as possible.

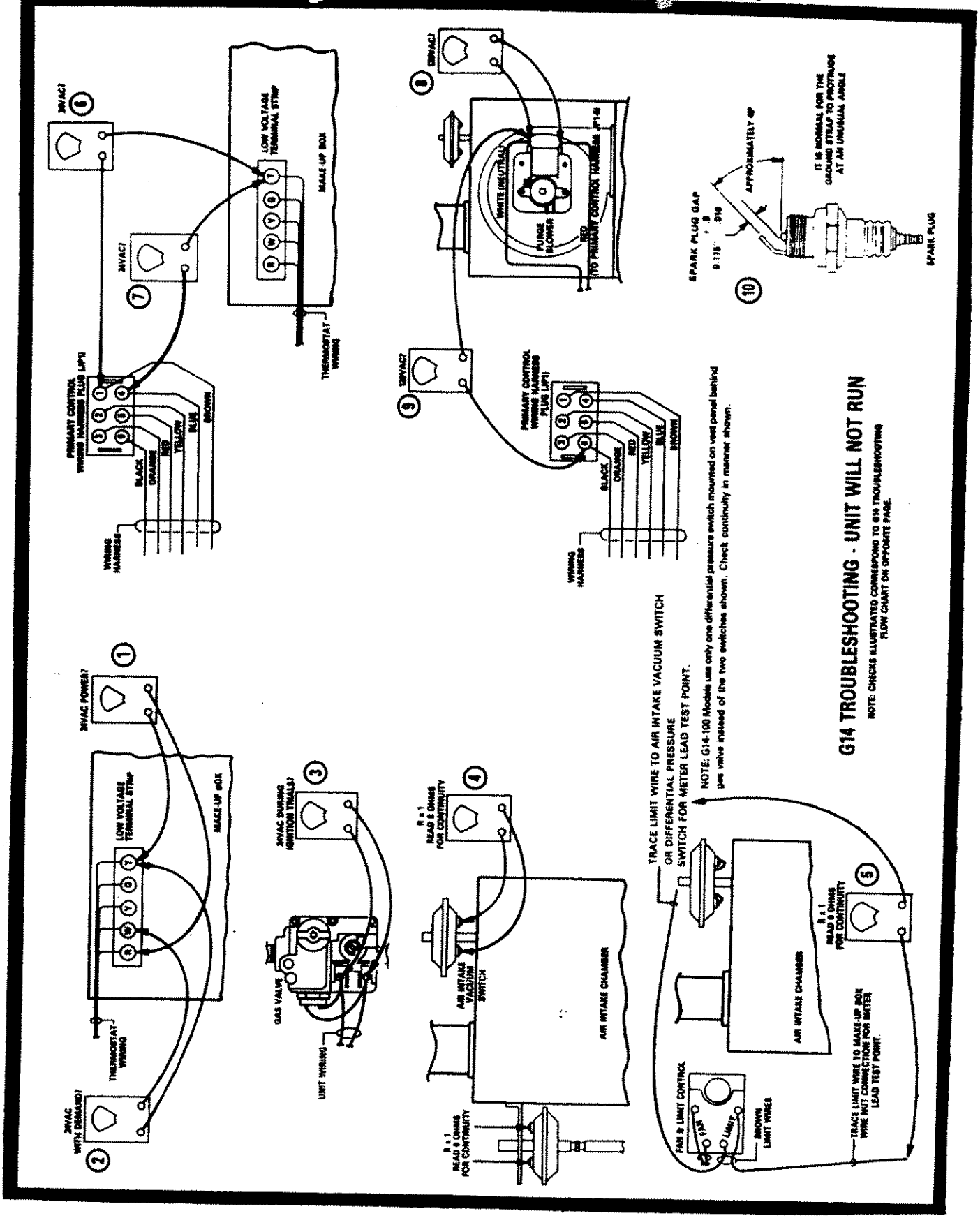
7 - Minimum separation distance between the end of the exhaust pipe and the end of the intake pipe is 8 in.



EXHAUST LINE
WALL TERMINATION

230

TROUBLESHOOTING CONT.



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Fc-21 EPDS

CONSUMER PRODUCT INCIDENT REPORT

1. Name of Respondent	2. Telephone No. (Home)	(Work)
Arthur L. Aamot	(507) 345-5756	
3. Street Address	4. City, State, Zip Code	
317 Haynes St.	Mankato, MN 56001	

5. Give details of accident, injury, or illness. Describe how incident occurred. (Use reverse side if necessary.)

The respondent reported that since they had a new furnace installed in their home in March, 1988, they are experiencing a hot metallic and chemical odor throughout their home. The respondent said she and her husband are senior citizens and spend most of their time at home due to her husbands health problems. They both have been experiencing burning eyes, nausea and dry throats.

A repreaentative from the company inspected the furnace and made a comment about a mold or mildew problem.

(15) LH FYI

The odor problem continues even though the furnace has not been used for several weeks.

6. If injury or illness: Victim's Name _____ Relationship _____

Age _____ Sex _____ Date _____ Type Injury _____

Body Part Involved _____ Treatment _____

7. Description of Product	8. Was the product:
High efficiency gas furnace	Damaged before incident? Yes ☐ No ☒ Repaired before incident? Yes ☐ No ☐ Repaired after incident? Yes ☐ No ☐
9. Brand Name	10. Identifying Numbers, Letters, etc.
Lennox Pulse Furnace	Mod.#G14Q36019 ,Ser.#5887-K13819 Nov.1987
11. Manufacturer's Name and Address	12. Dealer's Name and Address
Lennox Industries P.O. Box 809000 Dallas, Tx 75380	

13. How product acquired?	14. Age of Product
Purchased New ☒ Second Hand ☐ Other _____	3 months
15. Is product available for inspection? Yes ☒ No ☐ Other _____	16. Does product have warning labels or instructions? Yes ☒ No ☐ Are they available? Yes ☒ No ☐
17. Have you contacted the manufacturer? Yes ☒ No ☐ If not, do you plan to contact them? Yes ☐ No ☐	18. Do you object to the use of your name? Yes ☐ No ☒

FOR ADMINISTRATIVE USE ONLY

19. Receiving Office	20. Date Received	21. Received by	22. Reporting Office
MSP ~~MSP~~	6-19-88	Carolyn A. Schultz	FOCR

23. Source of Report Letter ☐ Phone ☒ Visit ☐ Other _____

24. Document No. 086 0156

25. Follow-Up Action

Home RO

EPDS JUL 1 1988

26. Product Code(s) A. 0310 B.

27.

28. Distribution

EPDS, FOCR, FOWR

29. Endorser's Name/Title

Regional Director

CPSC Form 175A (Revised 6/15/84) COPY 2 EP 239

tc 2f

CONSUMER PRODUCT COMPLAINT REPORT

1. NAME OF COMPLAINANT	2. TELEPHONE NO.	3. DATE OF INCIDENT
Clarence Schmorenberg	414-673-4024	1/87
4. STREET ADDRESS	**5. CITY, STATE, ZIP CODE**	
15 Mill St.	Hartford, WI 53027	

6a. DESCRIPTION OF PRODUCT(S)
Lennox gas furnace

☐ Objects to release of name.
☒ Does not object to release of name.

6b. DATE ACQUIRED 1/87

7. BRAND NAME	8. MODEL/STYLE NO.
Lennox	Pulse
9. SERIAL NO.	10. LOT/BATCH NO.
11. MANUFACTURER, IMPORTER OR DISTRIBUTOR NAME AND ADDRESS: Lennox	12. DEALER NAME AND ADDRESS: John Thidman & Son, Inc. 501 W. Sumner St. Hartford, WI 53027

13. HOW PRODUCT ACQUIRED
Purchased New ☒ Second Hand ☐ Other ☐ Specify _____

14. SAMPLE AVAILABLE	15. WARNING LABEL	16. INSTRUCTIONS
Yes ☒ No ☐	Yes ☒ No ☐	Yes ☒ No ☐

17. PRODUCT DAMAGED BEFORE INCIDENT	18. PRODUCT REPAIRED	19. AGE OF PRODUCT (ESTIMATE IF NECESSARY)
Yes ☒ No ☐ 2nd replacement Lennox furnace	BEFORE INCIDENT Yes ☒ No ☐ AFTER Yes ☒ No ☐	One Yr.

IF INJURY OR ILLNESS COMPLETE ITEMS 20 - 24 EPDS

20. VICTIM'S AGE	21. VICTIM'S SEX	22. BODY PART(S) INVOLVED
	Male ☐ Female ☐	MAR 3

23. TYPE OF INJURY OR ILLNESS
Burn ☐ Fracture ☐ Cut ☐ Other ☐ Specify _____

24. MEDICAL TREATMENT RECEIVED
Physician's Office ☐ Emergency Room ☐ Other Hospital ☐ Other ☐ Specify _____

25. GIVE DETAILS OF COMPLAINT, INJURY, OR ILLNESS. DESCRIBE HOW INCIDENT OCCURRED. USE REVERSE SIDE IF NECESSARY.

Sooting started immediately – odorless dark film everywhere – He has 2 roof furnaces w/ air for combustion from outside. His 1st 2 Lennox furnaces purchased in 1969 had same problem – They were replaced in 1980 with 2 more Lennox furnaces that experienced same problem, so he replaced them with the Pulse furnaces in 1987.
Furnaces are in a floor covering store. (Adhesives are not in store.
Furnaces are in garage.

FOR COMMISSION USE ONLY SOURCE:

26. RECEIVING OFFICE	27. DATE RECEIVED	28. RECEIVED BY
CPSC	2/29/88	L. Hershman

29. SOURCE OF REPORT	30. DOCUMENT NO.
Letter ☐ Phone ☒ Visit ☐ Other ☐ Specify _____	X830193AO
31. FOLLOW-UP ACTION: (15) L. Hershman copy per request	32. PRODUCT CODE(S): 0340
33. DISTRIBUTION	34. ENDORSER'S NAME AND TITLE: 240

FORM [illegible] Revised 4-77

COPY 1 - FILE

FIELD ACTIVITY COVERSHEET

CACA

1. REGION/STATE	2. OPERATION (Check One)	3. DATE
FOER	( ) Inspection ( ) Establishment Visit ( ) Telephone Contact (X) Investigation ( ) Other	3/29/88
		4. NUMBER (For RO Use) 880314NYC5043

5. ESTABLISHMENT
Name Lennox Industries, Inc.
Address
City Dallas State TX Zip Telephone No.

6. RELATED FIRM ( ) Parent ( ) Headquarters ( ) Subsidiary ( ) Other
Name City State

7. PRODUCTS COVERED	8. OTHER CONSUMER PRODUCTS
Lennox Pulse Furnace Mod. #G14Q5-130-2	

9. ESTABLISHMENT TYPE	10. ANNUAL PRODUCTION
( ) Manufacturer ( ) Importer ( ) Wholesaler ( ) Own Label Distributor ( ) Retailer ( ) Repackager ( ) Other	Product Covered $ Units Other Products $ Units

11. I.S. BUSINESS	12. SAMPLES COLLECTED	13. MIS CODE	14. HOURS
% Received % Shipped	None	32626	Activity 12 Travel 1.5

15. REASON FOR ACTIVITY (Assignment Reference)
IDI 880314NYC5043

16. ANNOUNCED ( ) Rationale for Announced Inspection
UNANNOUNCED ( )

17. EMPLOYEE'S NAME	TITLE	SIGNATURE
Benedict C. Fink	Investigator	Benedict C. Fink

18. (X) ENDORSEMENT ( ) REMARKS ( ) SUMMARY ( ) OTHER

Two ruptures in the heat exchange system of a high efficiency natural gas, forced air furnace allowed combustion products to enter the air circulation system in a single family home occupied by a man and wife and their eight children. There were no injuries although family members suffered from fatigue. The furnace was removed and the purchase price refunded by the manufacturer, whose assistant service manager advised the complainant that "Continuously subjected to high temperatures, heat exchangers can fail .....".

Refer to CACA and FOCR.

19. REVIEWER'S NAME	TITLE	SIGNATURE
Anthony J. Merolla	Supervisory Investigator	Anthony J. Merolla

20. REVIEW DATE	21. DISTRIBUTION
4/29/88	O: EPDS; cc; RD; CACA; FOCR; PIT RP; Reading

CPSC FORM NO. 167 (Revised 8/86)

241

elyn—GPO404
5-581-1F
O. 18

EPIDEMIOLOGIC INVESTIGATION REPORT

1. CASE NO.: 880314NYC5043

2. INVESTIGATOR'S ID: 8173

3. OFFICE CODE: 805

4. DATE OF ACCIDENT: YR 87 MO 12 DAY 12

5. DATE INVESTIGATION INITIATED: YR 88 MO 03 DAY 18

6. SYNOPSIS OF ACCIDENT OR COMPLAINT: Two ruptures in the heat exchange system of a high efficiency natural gas forced air furnace allowed combustion products to enter the air circulation system. The furnace was installed in a single family home occupied by a family with 8 children. No one was injured as a result of the failure. For approximately two months prior to the discovery of the failure, the family noticed a strange odor in the home and family members suffered from fatigue. The furnace was removed from the home and the purchase price was refunded by the manufacturer.

7. LOCATION (Home, school, etc.): Home — 10

8. CITY: Pittsburgh

9. STATE: PA

10A. FIRST PRODUCT: Nat. Gas Furnace — 0310

11A. TRADE/BRAND NAME, MODEL NUMBER, MANUFACTURER & ADDRESS: Mod #G14Q5-130-2 Lennox Industries, Inc. Dallas, TX

10B. SECOND PRODUCT: N/A

11A. TRADE/BRAND NAME, MODEL NUMBER, MANUFACTURER & ADDRESS:

12. AGE OF VICTIM: 999

13. SEX (Use numerical code) — MALE - 1, FEMALE - 2, UNKNOWN - 3: 9

14. DISPOSITION: No Injury — 0

15. INJURY DIAGNOSIS: No Injury — 70

16. BODY PART: 99

17. RESPONDENT(S) (Mother, Friend): Complainant — 1

18. TYPE INVESTIGATION — ON SITE 1, TELEPHONE 2, OTHER 3: 1

19. TIME SPENT: 120

20. ATTACHMENTS: Multi — 9

21. CASE SOURCE: Complaint — 07

22. REVIEWED BY: 8211 YR 88 MO 04 DAY 29

23. PERMISSION TO DISCLOSE NAMES (NON-NEISS CASES ONLY) — CPSC MAY DISCLOSE MY NAME: [ ] CPSC MAY NOT DISCLOSE MY NAME: [X]

24. NARRATIVE (See Instructions on Other Side)

PRE-INCIDENT

The family involved in this incident consist of a middle-aged husband and wife and their 8 children. The children are 6 boys ages 19, 17, 16, 14, 11, and 11. The girls' ages are 14, and 8. According to the complainant, father, they are a normal, healthy family. No one in the family suffers from any physical disabilities or allergies.

25. REGIONAL OFFICE DIRECTOR REVIEW: Raymond Benson DATE: 4/29/88

(USE OTHER SIDE AND ADDITIONAL SHEETS IF NECESSARY)

PRE-INCIDENT (CON'T)

The family purchased the house involved in this incident in April 1983. The house is a 2½ story, Georgian Colonial style house with a basement. The house is of brick and tile construction. There is no insulation in the exterior walls of the house. The complainant said the only insulation is behind the knee walls on the third floor. The house's original single pane windows are equipped with storm windows. The ground floor and second floor of the house are each approximately 1200 sq. ft. in area. The third floor of the house is approximately 700 sq. ft. in area.

The complainant said it became apparent during the family's first winter in the house (1983-1984) that the heating system was not adequate. The system could not maintain the house at a comfortable temperature on cold days. There was no duct work to the third floor and areas on the ground and second floors of the house did not have sufficient heat outlets. The third floor bedrooms of the complainant's two oldest sons were heated with electric space heaters. The complainant decided that a new heating system was required to heat the house.

The complainant contracted with a heating contractor in February 1984 for the installation of a new furnace and other related equipment. The installation was completed during March 1984. The installation included a new 130,000 BTU output natural gas fired forced air furnace. The furnace was the largest of its type available made by the manufacturer. The heating contractor determined that the heat output of the furnace was sufficient to heat the house. The installation included addition and modification of duct work to the ground and second floors of the house. Duct work from the heating system was not extended to the third floor because it was not practical to extend the duct work into that area. Electric space heaters were continued as the heat source for the third floor bedroom.

The furnace was installed in the basement of the home in the same location as the previous furnace. The furnace was located along the left side of the house. It was not located in a central location. The furnace did not require a conventional chimney. It was vented directly to the foundation wall with the plastic vent pipe provided with the furnace.

PRE-INCIDENT (CON'T)

The complainant said he immediately was dissatisfied with the noise level of the furnace. He said he was aware that that type of furnace generated noise due to its combustion process. He said although he suspected noise as a potential problem, he assumed that the noise level of the installed furnace would be acceptable. He said the contractor installed insulation in the duct work and in the furnace cabinet to dampen the noise level. He said the contractor completed his efforts to reduce the noise level but the noise level was still not acceptable.

The complainant said except for the noise level, he was satisfied with the operation of the furnace and the efficiency of the heating system. He said the contractor returned in the summer or early fall of 1985 with two representatives of the manufacturer to examine the installation because of the noise complaint. He said he was told by the factory representatives that no further reduction of the noise level was possible. He said he was not satisfied with the noise but he decided to accept the noise level because he was otherwise satisfied with the operation of the furnace.

The complainant said he did not have any problems with the heating system during the following 1985-1986 and 1986-1987 heating seasons. He said he noticed a strange odor in the house when he turned the furnace on in October 1987. He said the odor was present throughout the house. He described it as an electrical burning type odor. The odor was present whenever the furnace was in operation. Outside temperatures did not require the furnace to operate every day or for extended periods during October and November and the odor did not cause any concern. The complainant said he thought the odor was due to dirty ducts or some other minor problem in the house.

The complainant said beginning in December when the outside temperatures got colder and the furnace operated more frequently, the odor became more noticeable. He said he still did not suspect any serious problem in the house.

The complainant said beginning in October and until the problem was discovered, he felt tired and listless. His wife was more tired than usual. The wife is not employed outside the home and normally spends her days in the house.

PRE-INCIDENT (CON'T)

The complainant said except for his 11 year old son, he is not certain whether the children were unusually tired or missed more school days than normal. He said the 11 year old son was noticeably more tired and missed more school than normal. The 11 year old son's bedroom is located on the second floor directly above the furnace. A heating duct runs directly upward from the furnace and exits in the 11 year old son's bedroom near the headboard of his bed.

INCIDENT

The complainant said on 12/15/87, the furnace operated erratically and the odor was stronger throughout the house. Late that evening the furnace would not operate. The complainant called the contractor and the contractor said he could not come to the house until the next morning. The complainant said he left the thermostat set at 70°F and the furnace operated intermittently throughout the night. The furnace was able to maintain a temperature of 58°F on the ground floor of the house with an outdoor temperature in the 30's.

The contractor examined the furnace on 12/16/87. The contractor thought the intermittent operation of the furnace was caused by a problem with the ignition system's primary control The contractor did not have the part in stock and said he would obtain the part and repair the furnace the next day. The furnace operated intermittently during the night of 12/16/87 and maintained a temperature of 58°F on the ground floor with the thermostat set at 70°F.

The contractor returned on 12/17/87 and installed a new primary control. The furnace operated for a short period and stopped. The contractor could not restart the furnace. The contractor then replaced the air flapper valve which controls the air to the combustion chamber. The furnace would not operate. The contractor then telephoned the manufacturer's area field service consultant who suggested that the contractor cover four holes on the air flapper valve to enrich the air/fuel mixture. The consultant said he would arrive at the home the next day to examine the furnace.

The contractor modified the air flapper valve as suggested by the service consultant. The furnace would not start and the contractor decided to stop work on the furnace until the manufacturer's field service consultant arrived the next day.

INCIDENT (CON'T)

The complainant said the furnace was not operating and the temperature inside the house was 48°F. The children were sent to their grandmother's house for the night. The thermostat was left set at 70°F in the event that it would begin operating. The complainant said the furnace began operating at approximately 2130 hours. He said over a 10 minute period the furnace operated for 45 seconds, 50 seconds and 2½ minutes. The house became filled with the odor but the odor was very strong. The complainant experienced irritation of his respiratory system and turned the furnace off. The complainant telephoned the contractor and informed him of the incident.

The complainant said the contractor and the manufacturer's field service consultant arrived at the house at 0830 hours on 12/18/87. The complainant left work and went home. He said he was advised by the service consultant that there were holes in the furnace's heat exchanger. He said the heat exchanger was not visible but the service consultant reached through an access panel and felt the holes with his hand. The furnace was then disassembled and the heat exchanger was removed.

Removal of the heat exchanger/combustion chamber system from the furnace revealed two holes in the heat exchanger. The holes were located in the approximate two inch diameter stainless steel tubing which connects the combustion chamber to the heat exchanger. The holes were in the "U" bend section of the pipe attached to the top of the combustion chamber. The complainant described the holes as ruptures and said the metal around the holes was bulged outward. The complainant photographed the heat exchanger and the holes. Copies of these photographs were obtained from the complainant and are attached to this report as Exhibit #1.

The complainant said the manufacturer's service consultant ordered a new heat exchanger/combustion chamber unit from the manufacturer. The new unit was expected to arrive three days later. The complainant said after an argument, the service consultant agreed to have the unit shipped air freight for arrival the next day.

The complainant said in a subsequent conversation with the service consultant, he learned that the large size furnace which was in his home was no longer manufactured by the firm. The furnace was discontinued due to the noise problems. They then discussed the noise reduction kit offered by the firm. The kit

INCIDENT (CON'T)

primarily consisted of a new air flapper valve and a smaller gas orifice. The complainant was told that the kit would reduce the noise level but would also reduce the BTU output of the furnace by at least 15%. The complainant agreed to have the kit installed when the new heat exchanger was installed in the furnace.

The new heat exchanger/combustion chamber unit was installed by the constractor on 12/19/87. The noise reduction kit was also installed.

The complainant said after the completion of the repairs on 12/19/87, the furnace operated satisfactorily and without any problems until 12/29/87. The complainant noticed a natural gas odor near the furnace on 12/29/87 and notified the contractor. The contractor discovered a loose gas connection in the furnace. The contractor did not sufficiently tighten the connection during the installation on 12/19/87 because he feared damaging the connection. He tightened the connection and fixed the leak on 12/29/87. The complainant said while the contractor was at the house on 12/29/87, he requested that the contractor set the blower to a higher speed. This was accomplished by changing some electrical connections in a control box.

The complainant said approximately two weeks later the furnace stopped operating and he discovered a blown fuse in the power supply to the furnace. He said he replaced the fuse and the fuse blew when he turned the furnace on. He replaced and blew three fuses before he telephoned the contractor. The contractor came to the house and discovered a wire inside the control box which became detached from its screw connection and was in contact with the grounded metal of the control box. The complainant said the contractor worked inside this box when he changed the fan speed on 12/29/87 and apparently did not tighten a wire connection at that time. The complainant said he did not have any further problems with the furnace until it was removed from the house.

POST INCIDENT

The complainant said he decided he wanted the furnace removed from his house after the holes were discovered in the heat exchanger. He said he realized the danger that the carbon monoxide in the home presented to the family. He said he was concerned because there was apparently no safety device and the furnace was

POST INCIDENT (CON'T)

able to operate with the leaking heat exchanger. He said he was concerned because the contractor (dealer) was not able to diagnose and discover the problem.

The complainant said he wrote a letter, dated 12/29/87, to Robert Burgess, the manufacturer's manager of customer relations located in Columbus, OH. In the letter, the complainant detailed his problems with the furnace and safety concerns. The complainant indicated he expected the firm to remove the furnace and related products from his house and issue a refund. A copy of that letter is attached to this report as Exhibit #2.

The complainant received a response from Mr. Burgess dated 1/8/88. The letter stated that the firm would remove its products from the complainant's home and refund the cost. The letter recommended that the complainant purchase another brand of equipment. A copy of that letter is attached to this report as Exhibit #3.

The complainant said he did not receive a timely response to his 12/29/87 letter to Mr. Burgess. He said while waiting for a response from Mr. Burgess he telephoned the manufacturer's local sales branch and spoke to Thomas Plocki, the branch manager. He spoke to Mr. Plocki on 1/12/88. He received the 1/8/88 letter from Mr. Burgess that next day on 1/13/88. After receiving that letter, he wrote response letters dated 1/16/88 to Mr. Burgess (Exhibit #4) and Mr. Plocki (Exhibit #5).

The complainant spoke to Mr. Plocki by telephone on 2/9/88 and reached a settlement for removal of the firm's equipment and a refund. Details of the conversation were confirmed by a memo from Mr. Plocki to the complainant dated 2/9/88. A copy of that memo is attached to this report as Exhibit #6.

A new furnace was installed in the complainant's home by another heating contractor on 2/22/88. The furnace involved in this incident was disconnected at that time.

The furnace involved in this incident and other Lennox brand equipment was picked up at the complainant's home by the manufacturer on 2/25/88. The complainant received a check in payment for the equipment at that time. A copy of the check stub is attached to this report as Exhibit #7.

VOLUNTARY STANDARDS -

Unknown. The furnace was not available for examination.

PRODUCT IDENTIFICATION

The furnace involved in this incident is a high efficiency type natural gas fired, hot air furnace. The furnace was purchased new from and installed by a heating contractor in the complainant's home in March 1984.

The complainant identified the furnace as a Lennox brand, manufactured by Lennox Industries, Inc., Dallas, TX. The furnace is a Lennox Pulse Model. The model number is G14Q5-130-2. The serial number of the furnace is 5884A04645.

The manufacturer removed the furnace from the complainant's home on 2/22/88.

EXHIBITS

Exhibit #1 - Photographs of the heat exchanger/combustion chamber assembly. These photographs were provided by the complainant.
Exhibit #2 - A copy of the complainant's letter dated 12/29/87 to the manager of customer relations of the manufacturer's eastern division headquarters (Columbus, OH).
Exhibit #3 - A letter dated 1/8/88 to the complainant from Robert Burgess of Lennox Industries, Inc., Columbus, OH. This letter identifies Mr. Burgess as the assistant service manager.
Exhibit #4 - The complainant's response to Mr. Burgess dated 1/16/88.
Exhibit #5 - The complainant's letter to Thomas Plocki, Branch Manager, Lennox, Industries, Oakmont, PA dated 1/16/88.
Exhibit #6 - A memo from Thomas Plocki to the complainant dated 2/9/88.
Exhibit #7 - A check stub from the firm dated 2/23/88. This covers the payment to the complainant for the cost of the furnace and related equipment removed from the complainant's home on 2/22/88.
Exhibit #8 - A copy of the installation/operation/maintenance instructions provided with the furnace.

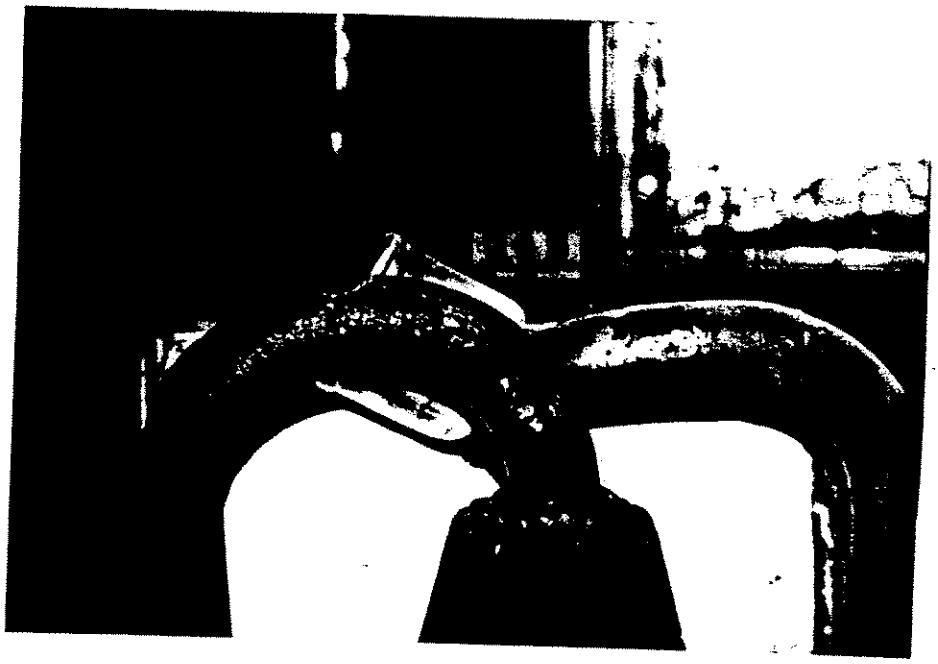

PHOTO #3: The rupture closest to the top of the combustion chamber.

PHOTO #4: Close-up of the rupture closest to the combustion chamber.

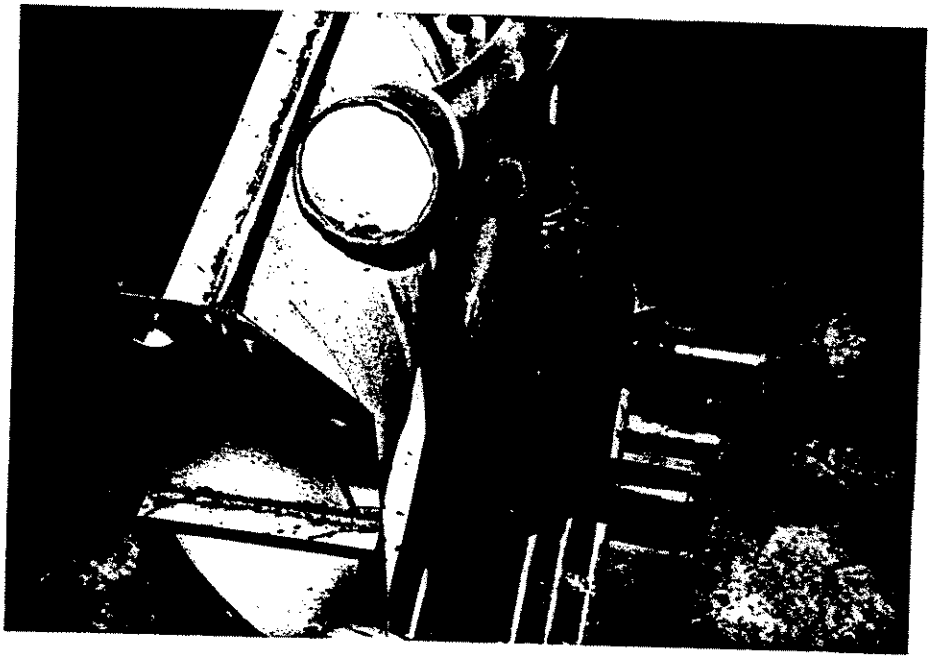

PHOTO #5: The location of the "2nd" rupture. Note the lifted metal around the edges of the "1st" rupture in the background.

PHOTO #6: Close-up of the "2nd" rupture.

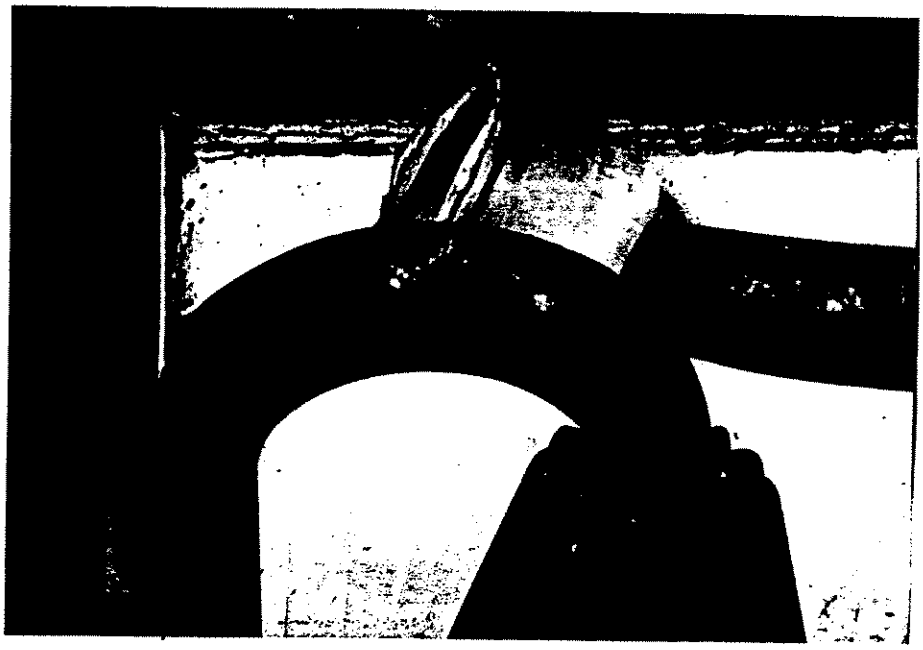

PHOTO #7: A view showing both ruptures and the lifted metal around the edges of the "2nd" rupture (rupture on left).

Wednesday, December 16, 1987

Mr. [redacted] spent about four hours checking the gas pressure, cleaning the air flapper valve and generally troubleshooting the entire system. He was still there when I arrived home from work. We studied the troubleshooting chart together. He eventually checked the spark from the primary control. Instead of a strong spark lasting 6 to 7 seconds, a weak spark was generated that lasted no more than 1 second. This surely seemed to be the answer. He returned to his shop and found he had none in stock. He called immediately and said he would obtain one from another dealer the next day.

In the meantime, we still left the thermostat at 70. The furnace did operate occassionally throughout the night, and raised the temperature to 58 on the first floor...and the odor was still there.

Thursday, December 17, 1987

Mr. [redacted] was again at our home when I returned from work. He installed a new primary control and it produced a much stronger spark for a longer period than the original control. He said the furnace did run for several minutes, but would not start again.

My wife had also mentioned the odor, but he again noted it may be due to dirty ducts, dirty filters, a dead animal in the intake PVC pipe or incomplete combustion leaking back through a faulty air flapper valve.

He replaced the air flapper valve, blew out the air intake pipe - which netted only a few dead bees, cleaned the gas flapper valve, and checked the gas pressure again and again. All with negative results.

Mr. [redacted] then placed a long distance call to Mr. Horner, Field Service Consultant, from our home. I was on the other phone. Mr. [redacted] expressed his complete bafflement at the problem. Mr. Horner suggested covering four holes on the air flapper valve to enrich the air/fuel mixture - suggesting a possibly faulty pressure regulator. In any event he agreed to arrive at our home by 8:00 A.M. the next day - Friday, December 18.

Mr. [redacted] covered the four holes as suggested, but to no avail. Nothing more could be done but wait until Mr. Horner's arrival.

The temperature was down to 48. The house was simply too uncomfortable - particularly for our three younger children. We had to send them to the home of my wife's mother for the night.

I left the thermostat on 70, thinking the furnace might operate for awhile and produce some heat. At 9:30 P.M., it did come on. During a 10 minute period it ran continuously for periods of 45 seconds, 50 seconds and 2-1/2 minutes. We began to feel some relief. But then that same strange odor was extraordinarily strong! My nose became irritated and I experienced a slight burning sensation in my lungs!! Now I became quite alarmed! I turned the furnace off and immediately called Mr. [redacted] to inform him. I said I believed we no longer had a simple problem and asked him to tell Mr. Horner the following morning.

Needless to say, the thermostat was left off after that.

880314 NYC5043 Ex#2 3/4 254

Friday, December 18, 1987

At 8:30 A.M. my wife called me at my office. Messrs. [redacted] and Horner had just arrived. I spoke with Mr. Horner and told him I now believed we had an unsafe product in the house, and it must be corrected immediately. He assured me it would be resolved.

I decided to go home. I simply had to know what was going on. When I arrived, I learned the heat exchanger had failed. Mr. Horner then said a new one was ordered and would be placed on a truck in Detroit that same day.

This news sapped my last reserve of patience! The heat exchanger would not arrive before Monday, 12/21! We would have to experience at least three more days without heat in the house! I insisted the heat exchanger be shipped via air freight. The response was puzzlement, "...don't know if that can be done....sounds expensive....customer would have to pay for the difference if it could be done...". This was too much. Ten people living in the house without heat for up to a week was completely unacceptable, not to mention the damper it placed on our preparation for Christmas!!!

I could only raise their sensitivity to the situation by utterly exploding, and demanding the heat exchanger be shipped air freight at Lennox's expense! Mr. Horner then called his branch office. Mr. Plocki authorized the shipment.

Mr. [redacted] and Mr. Horner then proceeded to dismantle the furnace in preparation for the replacement heat exchanger. I observed the entire procedure. While working, Mr. [redacted] asked if I wanted the original primary control reinstalled. I told him to leave the new primary control installed.

During our subsequent conversation I learned the G14-130 is no longer offered by Lennox, ostensibly due to the noise factor. When I asked about units already installed, Mr. Horner said he brought an update kit with him from his home, and that it was the last one he had. He and Mr. [redacted] then explained the kit consisted of some additional insulation plus a new air flapper valve and smaller gas orifice. I was also told this would reduce the BTU output of the furnace by at least 15%.

I then asked when this kit was made available. The response was "...about three years ago". I then asked how Lennox informed its customers about the kit's availability, only to learn Lennox depended on its dealers.

By 11:00 A.M. the furnace was completely dismantled.

We again made arrangements to send some of the kids to stay with my wife's mother. Also, we brought mattresses to the living room and brought in two electric heaters to take the chill out for the night.

Saturday, December 19, 1987

Burlington Northern Air Express (Air Bill # 918 034 574) delivered the heat exchanger to our home by 11:00 A.M. Mr. [redacted] arrived at 1:00 P.M. and left at 8:00 P.M. I again observed the entire procedure. He installed the new heat exchanger, plus the update kit to reduce the noise.

Now what should be done given the following conclusions?

1. The quality of Lennox training must be questioned.

   It took three days to diagnose the problem. There is nothing in the troubleshooting guide to suggest inspecting the heat exchanger. Mr. [redacted] made numerous calls to fellow dealers. It took a consultant to find the problem.

   Also, when Messrs. [redacted] and Horner were removing the panel in front of the heat exchanger on Friday, they neglected to remove the heat sensor wires and spark plug wires that ran to the new primary control. These were ripped from the connectors. Wires and connectors had to be taken from the old primary control and installed on the new one on Saturday. In addition, again on Friday, Mr. Horner disconnected the wires in the terminal box on this same panel without giving Mr. [redacted] the opportunity to take notes. "You have a wiring diagram," was the casual response to Mr. [redacted]s objection. Both "wiring incidents" cost at least 3 hours of time the next day.

   It was obvious Mr. [redacted] had no training or experience troubleshooting and replacing a heat exchanger.

2. More timely installation of the noise reduction kit would probably have prevented the heat exchanger from failing.

   It obviously reduces the pressure in the combustion chamber by burning less fuel during each combustion cycle. I wonder how many G130 heat exchangers failed after 3 to 5 years.

3. My furnace no longer has the original capacity of 130,000 BTU output.

   I now have one with no more than 85% of that capacity with the installation of the update kit.

4. A key safety feature of the Lennox Pulse Furnace failed to perform as designed.

   This is evidenced by the persistent odor since October, and the absence of this odor since the heat exchanger was replaced. The furnace operated for two months despite two ruptures in the heat exchanger. I took the enclosed photographs on Saturday, 12/19, before the replacement part arrived.

880314 NYC5043 Ex#2 5/7 256

5. My family's health was placed at risk.

Our childrens' excessive absences from school the past two months are now understandable. I was especially distressed to think of my son [redacted] (now 11 years old). He persistently complained of being so terribly tired all the time. The wall register is right next to the head of his bed!!!

My wife does not work outside our home. She was living in this foul environment throughout the entire day, every day!!!

I happen to be an avid long distance runner, having completed a marathon last spring. I was puzzled as to why I was getting more sleep these past two months, yet waking up tired, and finding my running times were getting slower.

The linkage to the failed heat exchanger that continued to operate is obvious. It allowed the blower to pump carbon monoxide throughout our home. The odor, according to Messrs. Horner and [redacted], was from incomplete carbon combustion.

Simply put, the entire experience leaves me outraged. Once again, what is to be done? When I received Mr. [redacted]s enclosed bill (# 1174), I decided to send it to you along following expectations of Lennox.

1. Compensate Mr. [redacted] for the amount of his enclosed bill - $232.08.
2. Arrange, and pay for, the removal of all Lennox products from my home at the end of the current heating season.
3. Reimburse me for the cost of all Lennox products installed in our home. Furnace $2700, Electronic Air Cleaner $600, and Lennox Day/Night Chronatherm $100.

   The remaining $988 of the original contract was for the humidifier and additional ductwork Mr. Gibson installed.

My expectations were reasonable when I contracted for the work in the first place.

My wife and I sought to make our home a comfortable and safe haven.

We wanted the best and were willing to pay for it!

I was confident of the reputation of the Lennox name!

I was sold on the engineering principles of the pulse furnace technology!

I was certain we would have a reliable unit, and that any problem would be diagnosed promptly!

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As of now I have no confidence in the Lennox name in terms of reliability, service, and - most importantly - SAFETY!!!

Many associates of mine have been urging me to seek legal redress given the clear absurdity and injustice we have suffered. I chose to first take this direct route.

By purging our home of the Lennox name, you will get rid of a dissatisfied customer, and we will use the funds to replace the system with non-Lennox products!

Most sincerely!!!

Phone: Home
Office

880314 NYC5043 Ex#2 7L 258

Mr. Robert T. Burgess, Assistant Manager
Customer Relations
Lennox Industries, Inc.
1711 Olentangy River Road
P. O. BOX 1319
Columbus, OH 43216

Dear Mr. Burgess,

I received your letter of January 8 just a few days ago - January 13.

In your letter you stated that, "...heat exchangers should always be checked no matter how trivial the service call may seem to be." This certainly sounds reasonable. I just wonder why it is not mentioned in the Troubleshooting Guide for the Lennox Pulse Furnace. I happen to have a copy.

Concerning Lennox training courses, you noted that "... dealers and contractors are independent business men...We cannot make them attend." I find this unreasonable. Lennox products are represented to the ultimate customer by these business men. It certainly would be in the best interests of the consumer and Lennox that these representatives have thorough training in the installation and servicing of your products. If you do not require them to participate in the training - and prove their competence - you risk much in terms of customer satisfaction and saftey.

By the way, we were more than merely "discomfited". I encourage you to read my letter again. The health and safety of my family was placed at serious risk because your product continued to operate since October with a ruptured heat exchanger. It pumped noxious fumes throughout our home. I will probably always wonder about the possible long term effects on the health of my family.

You also failed to note that I no longer have the furnace I originally paid for. Remember - the installation of the noise reduction kit also lowered the capacity of the unit by at least 15%.

The only solace I find is that Lennox agrees to remove its products and refund my cost; however, I need more specifics on this matter. I spent considerable time researching modern heating technology before deciding on the Lennox Pulse. This research must now be repeated. Furthermore, the selection of a contractor and scheduling of the installation will take more time. That is why I stated the furnace may be removed after the end of the current heating season. Furthermore, I do not plan to release the furnace and contract with another dealer without the refund in hand. I suppose this will be handled by Mr. Plocki.

Finally, you need not have recommended I seek another brand of equipment. A careful reading of my letter of December 29, 1987 - especially the last sentence - should have clearly informed you that I am quite anxious to have a non-Lennox heating system.

Sincerely,

880314 NYC5043 Exhibit

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Mr. Thomas Plocki, Branch Manager
Lennox Industries, Inc.
One Allegheny Plaza
Oakmont, PA 15139

Dear Mr. Plocki,

Thanks for returning my call last Tuesday - January 12. It had been two weeks since I sent my letter to Mr. Burgess, and I found it frustrating in not being able to have a call returned - Thursday, January 7 - and receiving either no answer or busy signals on succeeding days.

Enclosed is my letter to Mr. Burgess of December 29, 1987. You also will find Mr. Burgess' reply dated January 8, 1988 and my response to his letter.

I trust you remember your comment to me, "Frankly, I don't think you were very fair to us." Please do take the time to carefully read my first letter. The SAFETY issue continues to be the main source of my dissatisfaction.

With my letter to Mr. Burgess, I enclosed color photographs of the heat exchanger. I have not yet obtained additional prints, but the heat exchanger is still in our basement. I invite you to visit us to inspect it. It is incredible that it still functioned with two major ruptures.

Please call soon so we can work out the details of the agreement.

Sincerely,

880314 NYC5043 Exh 5

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Memo FROM THE DESK OF ...

TOM PLOCKI

2-9-82

Mr.

Per our phone conversation
today - We will refund you
$3400.00 - for your Lennox Equipment
consigned by you in Sale No. [illegible]
In addition we will pay
for your efforts in changing
Please advise when [illegible]
1/ equipment will be made
pick up the equipment & refund
Money to you. We plan to do that
at a date we mutually set up
within a reasonable time of the change.

Tom Plocki

8803/4N4C5043 Ex #6

INVOICE NUMBER	INVOICE DATE	VOUCHER NO.	GROSS AMOUNT	DISCOUNT AMOUNT	NET AMOUNT PAID
[redacted] Kelly Lee	02 15 88	002589	3,633.00		3,633.00

CHECK NO.	CHECK DATE	VENDOR NUMBER	VENDOR NAME	TOTAL AMOUNT OF CHECK
49358	02 23 88	000252230	[redacted]	3,633.00

880314 NYC 5043 Ex #7

CONSUMER PRODUCT INCIDENT REPORT

5. Give details of accident, injury, or illness. Describe how incident occurred. (Use reverse side if necessary.)
The furnace was installed in the complts home during 3/87. The home is occupied by complnt, wife and 5 children. The complnt noticed a strange odor in the home during 10/87 and family members experienced headaches. During the week of 12/14/87, the furnace began to operate intermittently. Examination by a Lennox representative revealed that the heat exchanger was ruptured and combustion products were entering the home. The heat exchanger was replaced. The complnt was not satisfied because he feared the problem would reoccur. The furnace was replaced with a different brand on 2/22/88 and the complnt received a full refund from Lennox. The complnt is satisfied with Lennox

6. If injury or illness: Victim's Name NO TREATMENT Relationship
Age Sex Date Type Injury
Body Part Involved Treatment

7. Description of Product
GAS FURNACE

8. Was the product:
Damaged before incident? Yes ☐ No ☒
Repaired before incident? Yes ☐ No ☒
Repaired after incident? Yes ☒ No ☐

9. Brand Name
LENNOX

10. Identifying Numbers, Letters, etc.
MOD# G14Q5-130-2

11. Manufacturer's Name and Address
LENNOX INDUSTRIES
1711 Olentangy River RD.
COLUMBUS, OH 43212

12. Dealer's Name and Address
REQUESTED NAME WITHHELD

13. How product acquired?
Purchased New ☒ Second Hand ☐ Other

14. Age of Product
4 yrs

15. Is product available for inspection?
Yes ☐ No ☒
Other

16. Does product have warning labels or instructions? N/A Yes ☐ No ☐
Are they available? Yes ☐ No ☐

17. Have you contacted the manufacturer? Yes ☒ No ☐
If not, do you plan to contact them? Yes ☐ No ☐

18. Do you object to the use of your name? Yes ☒ No ☐

FOR ADMINISTRATIVE USE ONLY

19. Receiving Office ~~NYC~~ PIT
20. Date Received 3/9/88
21. Received by BCF 3/14/88
22. Reporting Office IN83 00148
23. Source of Report
Letter ☐ Phone ☒ Visit ☐ Other
24. Document No.
25. Follow-Up Action
IDI 580314NYC 5043 - GP III
26. Product Code(s)
A. 0310
B.
27.
28. Distribution
E. FDS/FOCR/GP III/FOFCF
29. Endorser's Name/Title
Raymond Lisson Program Officer

CPSC Form 175A (Revised 6/15/84)

COPY 1 FILE 263

U. S. CONSUMER PRODUCT SAFETY COMMISSION

AUTHORIZATION FOR RELEASE OF NAME

Thank you for assisting us in collecting information on a potential product safety problem. The Consumer Product Safety Commission depends on concerned people to share product safety information with us. We maintain a record of this information, and use it to assist us in identifying and resolving product safety problems.

We routinely forward this information to manufacturers and private labelers to inform them of the involvement of their product in an accident situation. We also give the information to others requesting information about specific products. Manufacturers need the individual's name so that they can obtain additional information on the product or accident situation.

Would you please indicate on the bottom of this page whether you will allow us to disclose your name. If you request that your name remain confidential, we will of course, honor that request. After you have indicated your preference, please sign your name and date the document on the lines provided.

☐ You are hereby authorized to disclose my name and address with the information collected on this case.

☒ My identity is to remain confidential.

[redacted] 3/29/88

(Signature) (Date)

880314NYC5043

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installation - operation - maintenance instruction

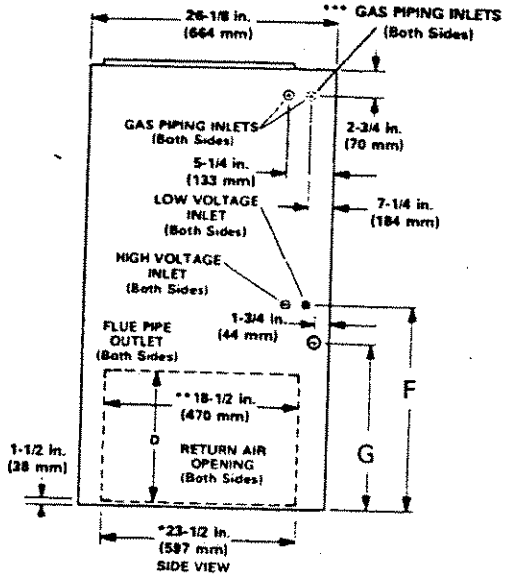
G14 SERIES UNITS

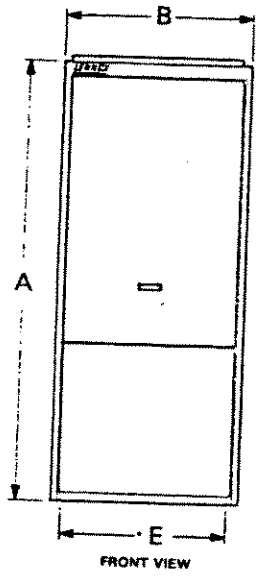
Gas Units
501,743M
6/83
Supersedes 4/83

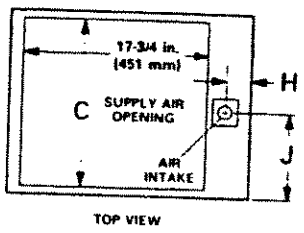
LENNOX Industries Inc.

Litho U.S.A.

UNIT DIMENSIONS







*Bottom Return Air Knockout
**23-1/2" (597mm) On Units With Q4 Blowers
***Models 100 & 130 only

Model No.	A	B	C	D	E	F	G	H	J
40, 60 and 80 Series	49 in. (1245mm)	21-1/4 in. (540 mm)	19-1/16 in. (484 mm)	14-1/2 in. (368 mm)	14-1/2 in. (368 mm)	23-5/8 in. (600 mm)	20-1/4 in. (514 mm)	4-1/8 in. (105 mm)	8-1/2 in. (216 mm)
100 and 130 Series	53 in. (1346mm)	26-1/4 in. (667mm)	24-1/8 in. (613mm)	20 in. (508mm)	21 in. (533mm)	27-5/8 in. (702 mm)	24-1/2 in. (622 mm)	1-7/8 in. (48 mm)	11 in. (280 mm)

CHECK POINTS

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 _____ Blower Motor Amps _____
Blower Motor Lubrication O.K.? ☐
Gas Piping Connections Tight & Leak-Tested ☐
Fuel Type: Natural Gas? ☐ LP Gas? ☐
Furnace BTU Input _____
Line Pressure (7" Natural Gas) _____

Regulator Pressure (Refer to unit nameplate) _____
Exhaust Connections Tight? ☐
Intake Connections Tight? ☐
Fan Control Setting (90° Factory Setting) _____
Temperature Rise _____
Filters Clean & Secure? ☐

THERMOSTAT

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

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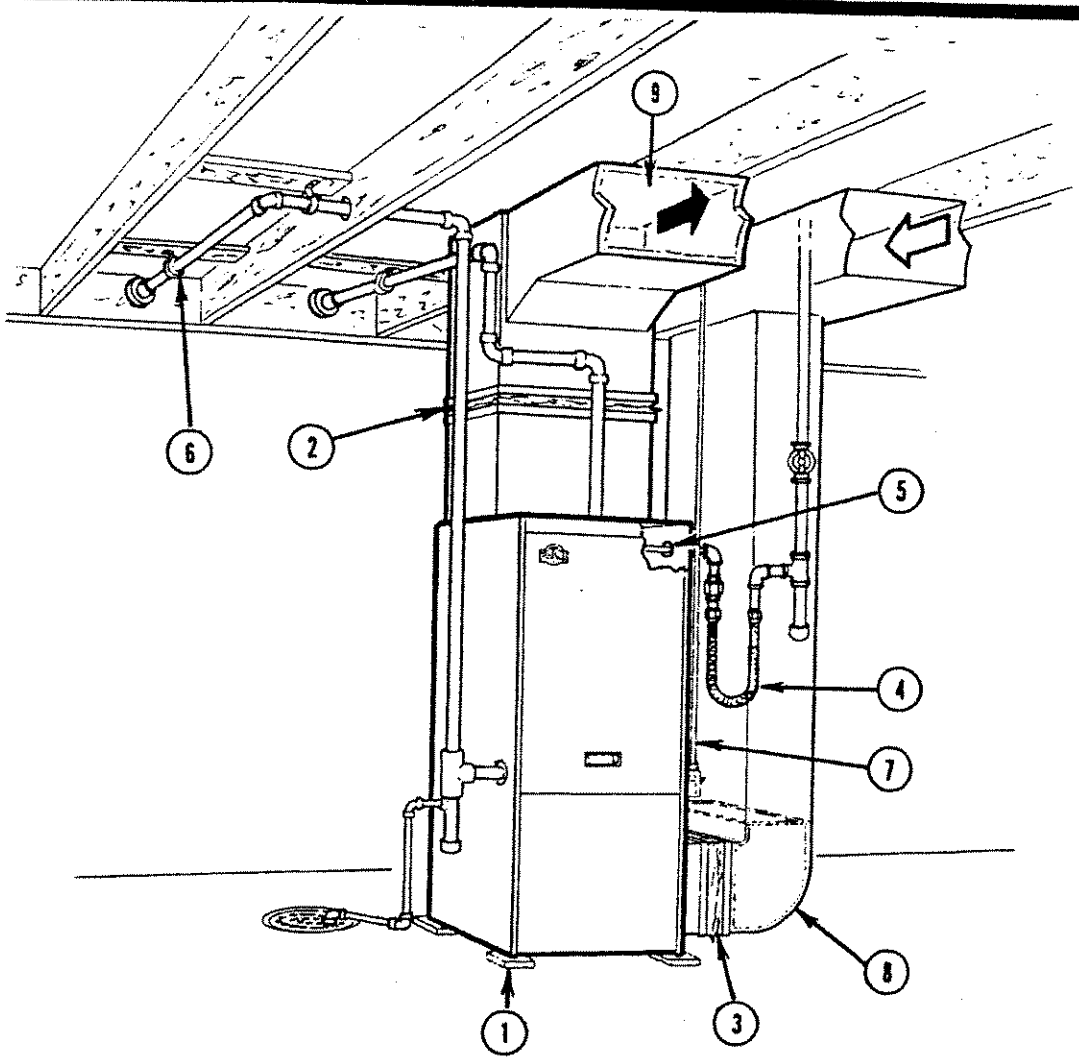
880314N4C5043 Ex#8 1/13



MAJOR INSTALLATION REQUIREMENTS

1. ISOLATION MOUNTING PADS
2. FLEXIBLE BOOT - SUPPLY AIR PLENUM
3. FLEXIBLE BOOT - RETURN AIR PLENUM
4. GAS CONNECTOR
5. GAS SUPPLY PIPING CENTERED IN INLET HOLE
6. ISOLATION HANGERS
7. ELECTRICAL CONDUIT ISOLATED FROM UNIT AND DUCT WORK
8. RETURN AIR PLENUM AND DUCT INSULATED PAST FIRST ELBOW
9. SUPPLY AIR PLENUM AND DUCT INSULATED PAST FIRST ELBOW

THE ABOVE REQUIREMENTS ARE ESSENTIAL TO THE INSTALLATION IN ORDER TO ISOLATE THE UNIT.

880314N4C5043 EXPT 266 2/-

REQUIREMENTS

Installation of Lennox gas central furnaces must conform with local building codes or in the absence of local codes, with the National Fuel Gas Code (ANSI-Z223.1-1980).

Code is available from:

American National Standards Institute, Inc.
1430 Broadway
New York, NY 10018

Furnace is design certified for installation clearances to combustable material as listed on appliance rating plate and the following table.

Clearances	Location	inches (mm)
Service access	Front	36 in. (914 mm)
	Exhaust Side	6 in. (152 mm) (from side of unit)
To combustable materials	Top, Side, Rear and Front	1 in. (25 mm)
	Exhaust	0

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 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 cooling units to avoid condensation in the heating element. With a parallel flow arrangement, damper (or other means to control the flow of air) shall be adequate to prevent chilled air from entering the furnace and, if manually operated, must be equipped with means to prevent operation of either unit, unless damper is in the full "heat" or "cool" position.

When installed, the furnace must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electric Code, ANSI/NFPA No. 70-1978, if an external electrical source is utilized. The National Electric Code (ANSI/NFPA No. 70-1978) is available from:

National Fire Protection Association
470 Atlantic Ave. Boston, MA 02210

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 (35°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 be handled by a duct(s) sealed to the furnace casing and terminating outside the space containing the furnace.

INSTALLATION

SHIPPING DAMAGE

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

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

SHIPPING BOLT REMOVAL

Remove all shipping bolts and blocks before starting unit.

a - Bolt and shipping block behind air decoupler box.
b - (4) Heat section shipping bolts from bottom side of blower deck — Access thru blower compartment.

RETURN AIR OPENING

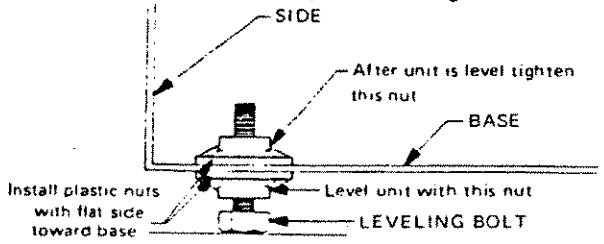
Return air can be brought in either side or at the bottom of the unit. Scribe lines show outline of each opening.

NOTE - Larger opening is for units with Q4 blowers.

SETTING AND LEVELING UNIT

1 - Holes are provided in the corners of the base for leveling the unit. Install leveling bolts (if desired) as shown or shim under unit. If unit is shimmed, use isolation pads (such as isomode) for shims. Unit should not sit directly on flooring.

CAUTION – If leveling bolts are used be sure to install plastic nuts as shown and tighten down snug before setting unit.

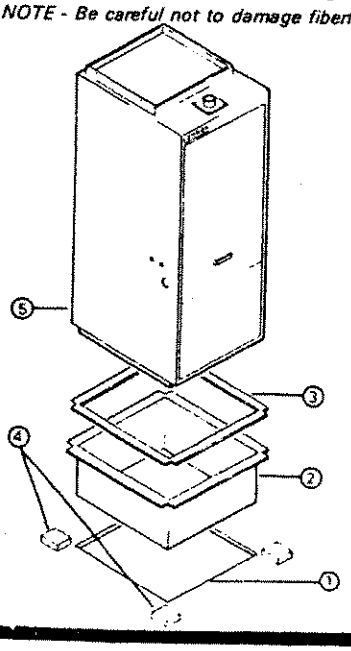


2 - Set unit in desired location keeping in mind clearance listed on appliance rating plate. Also keep in mind gas supply connections, electrical supply, intake and exhaust runs, condensate drainage, and sufficient clearances for installing and servicing unit.

Bottom return

1 - Cut opening in floor or platform.
2 - Flange return air plenum and lower into opening.
* 3 - Place fiberglass insulation strips around opening. Position isolation mounting pads at the corners of the insulation. Insulation should not overlap the mounting pads. Trim away any excess insulation from insulation strips.
* 4 - Set unit. Make sure unit is setting on isolation pads.

NOTE - Be careful not to damage fiberflass. Check for tight seal.



*Provided in Installation Kit LB-49107CA

26F
880314N4C5043 Ext 3/13

INSTALLATION CONT.

FILTERS

G14 series units are equipped with scotfoam reusable filters. Filter must be in place any time unit is in operation. Install filter mounting clips provided and secure with sheet metal screws.

DUCT SYSTEM

1 - Install flexible canvas boots or the equivalent on both supply and return air plenums. Boots should be placed as close as possible to the unit.

2 - Insulate supply and return air plenums and ductwork at least through the first elbow. 1-1/2 to 3 lb density, matt face, 1" thick insulation should be used. Provisions must be taken to keep the insulation in place and to protect the edges from airflow deterioration.

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

INTAKE AND EXHAUST PIPING REQUIREMENTS

I - REQUIREMENTS

All schedule 40 PVC pipe, fittings, primer and solvent cement must conform to American National Standard Institute and the American Society for Testing and Materials (ANSI/ASTM) standards. The solvent shall be free flowing and contain no lumps, undisolved particles, or any foreign matter that adversely affect the joint strength or chemical resistance of the cement. The cement shall show no gelation, stratification, or separation that cannot be removed by stirring.

CAUTION – SOLVENT CEMENTS FOR PLASTIC PIPE ARE FLAMMABLE LIQUIDS AND SHOULD BE KEPT AWAY FROM ALL SOURCES OF IGNITION. GOOD VENTILATION SHOULD BE MAINTAINED TO REDUCE FIRE HAZARD AND TO MINIMIZE BREATHING OF SOLVENT VAPORS. AVOID CONTACT OF CEMENT WITH SKIN AND EYES.

A - Materials

- 2" schedule 40 PVC, (type 1120 or 1220) pipe and (PVCI or PVC12) fittings for intake and exhaust piping (not provided) per ASTM D1785, D2466 & D2665.
- PVC primer (not provided) per ASTM D2564.
- PVC solvent cement (not provided) per ASTM D2564.
- Exhaust termination isolation material (provided in installation kit LB-49107C)
- Material for isolation hangers - Armaflex refrigeration insulation (provided in installation kit LB-49107C) and sheet metal strapping (not provided).

B - Procedure For Cementing Joints Per ASTM D2855

1 - Measure and cut PVC pipe to desired length.

2 - Debur and chamfer the end of the pipe removing any ridges or rough edges. If the end is not chamfered, the edge of the pipe may remove the cement from the fitting socket and result in a leaking joint.

3 - Clean and dry the surfaces to be joined.

4 - Test fit the joint and mark the depth of the fitting on the outside of the pipe.

5 - Uniformly apply a liberal coat of primer to inside socket surface of the fitting and the male end of the pipe to the depth of the fitting socket.

6 - Promptly apply solvent cement to end of pipe and inside socket surface of fitting. Cement should be applied lightly but uniformly to inside of socket, take care to keep excess cement out of socket. Apply a second coat to the end of the pipe.

IMPORTANT – Time is critical at this stage. Do not allow primer to dry before applying cement.

7 - Immediately after applying the last coat of cement to the pipe, and while both inside socket surface and the end of the pipe are wet with cement, forcefully insert the end of the pipe into the socket until it bottoms out. Turn the pipe 1/4 turn during assembly (but not after the pipe is fully inserted) to distribute the cement evenly.

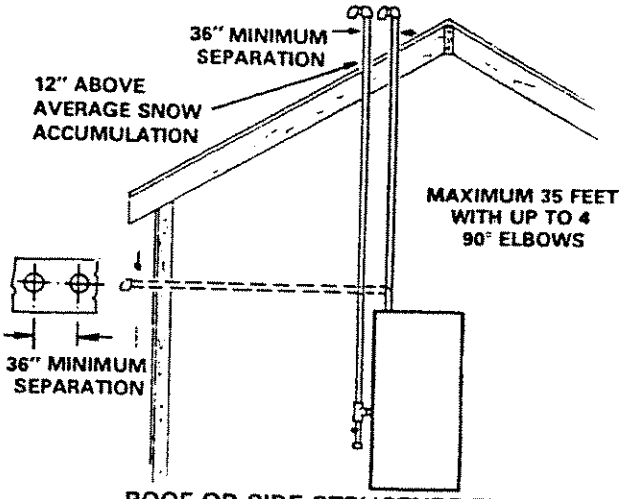
NOTE – Assembly should be completed within 20 seconds after the last application of cement. Hammer blows should not be used when inserting pipe.

8 - After assembly, wipe excess cement from the pipe at the end of the fitting socket. A properly made joint will show a bead around its entire perimeter. Any gaps may indicate a defective assembly due to insufficient solvent.

9 - Handle joints carefully until completely set.

II INTAKE AND EXHAUST PIPING

Intake and exhaust pipes may be routed either horizontally through an outside wall or vertically through the roof as shown.



ROOF OR SIDE STRUCTURE EXITS

1 - Use 2" schedule 40 PVC pipe for both intake and exhaust piping.

2 - Secure all joints, including drain leg, gas tight using approved PVC solvent.

3 - Maximum of 35 feet per run with no more than four 90° elbows. For runs less than 35 feet, an additional 90° elbow may be added for each 10 foot decrease in length. Locate intake piping upwind (prevailing wind) from exhaust piping. Exhaust and intake exits must be in the 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.

4 - Provide as much separation distance as possible between intake and exhaust pipes at termination end. Minimum separation is 36 inches.

5 - Terminate pipes downward using either one or two 90° elbows. Care must be taken to avoid recirculation of exhaust back into the intake pipe.

6 - On side wall exits, extend both intake and exhaust piping 12" beyond outside wall. If intake and exhaust piping exits beneath an overhanging surface, piping should extend 12" beyond outside edge of overhang.

7 - Position the termination ends so they are free from any obstructions and above the level of snow accumulation (where applicable). Do not point into window wells, stairwells, alcoves, courtyard areas or other recessed areas.

8 - 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

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16 - Remove remaining gas piping from the fitting at the vestibule panel.

IMPORTANT - The hex head fitting contains the gas diaphram valve so care must be taken when handling this portion of the piping assembly.

17 - Disconnect blower motor wires from the control box.

18 - Disconnect spark plug and sensor wires from plugs in combustion chamber. (Access plate is located to the left of the air decoupler box)

19 - Remove vest panel.

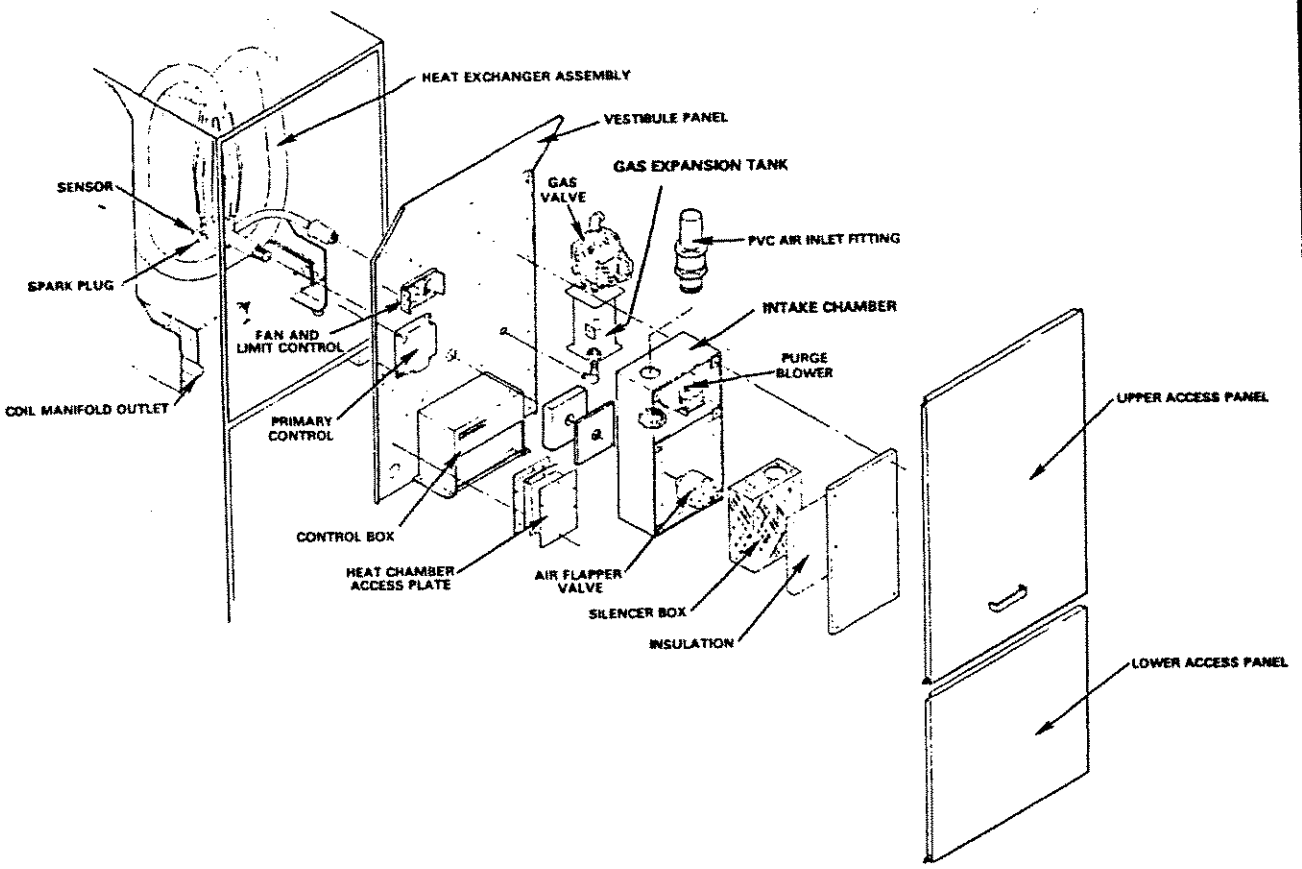
20 - From underside of blower deck, remove the nuts (4) holding the rubber heat train mounts.

21 - Lift heat train from unit.

22 - Back flush heat train with a soapy water solution or steam clean.

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

23 - Reverse the above steps to replace heat exchanger assembly. Be sure the rubber seal pad is in place on the air pipe, and that the ground wire on the gas valve is put back on the upper right air decoupler box mounting stud.



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 rating Plate - Example G14-80-1

CABINET PARTS
Top access panel
Blower panel
Vestibule panel
Control box cover

HEATING PARTS
Heat exchange ass'y
Gas orifice
Gas valve
Gas decoupler
Gas flapper valve
Purge blower
Air intake flapper valve
Primary Control Board
Ignition lead
Flame sensor lead
Flame sensor
Fan and limit control

CONTROL PANEL PARTS
Transformer
Indoor blower relay

BLOWER PARTS
Blower wheel
Motor
Motor mounting frame
Motor capacitor
Blower housing cutoff plate
Blower housing

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G14 TROUBLE SHOOTING FLOW CHART

NOTE: REFER TO ILLUSTRATIONS ON OPPOSITE PAGE FOR NUMBERED CHECKS.

UNIT WILL NOT RUN

ELECTRICAL CHECKS

IS THERMOSTAT PROPERLY SET?

NO → SET FOR HEAT DEMAND.

YES → SYSTEM MAY BE LOCKED OUT, TURN THERMOSTAT HEATING DEMAND OFF & ON AGAIN TO RESET.

CHECK FOR 120VAC POWER TO UNIT & ADEQUATE GROUNDING. (GROUNDING REQUIRED FOR PROPER OPERATION OF IGNITION SYSTEM).

IS BLOWER DOOR CLOSED PROPERLY ON INTERLOCK SWITCH?

NO → CLOSE DOOR TO ACTUATE SWITCH.

YES → (1) IS 24VAC PRESENT ACROSS TERMINALS R & T ON LOW VOLTAGE STRIP?

NO → IS 120VAC PRESENT AT TRANSFORMER PRIMARY?

NO → DOUBLE CHECK WIRING CONNECTIONS & DOOR INTERLOCK SWITCH.

YES → REPLACE TRANSFORMER.

YES → (2) CHECK FOR HEAT DEMAND AT UNIT. IS 24VAC PRESENT ACROSS TERMINALS T & W ON LOW VOLTAGE STRIP?

NO → CHECKOUT & REPAIR THERMOSTAT AND/OR WIRING.

YES →

(3)
1. CONNECT 24VAC METER ACROSS GAS VALVE TERMINALS.
2. BREAK & REMAKE THERMOSTAT DEMAND TO RESTART UNIT CYCLE.
3. AFTER 30 to 35 SECONDS PRE-PURGE - IS 24VAC PRESENT AT GAS VALVE TERMINALS FOR APPROXIMATELY 7 SECONDS?

NO → TURN OFF POWER TO UNIT.

(4) IS AIR INTAKE VACUUM SWITCH CLOSED? MAKE OHMMETER CHECK.

NO → REPLACE SWITCH.

YES → IS LIMIT CLOSED? MAKE OHMMETER CHECK. (5)

NO → DETERMINE CAUSE OF OPEN LIMIT AND/OR REPLACE IF DEFECTIVE.

YES → CHECK ALL WIRING CONNECTIONS - INTERNAL & EXTERNAL TO UNIT. REPAIR ANY LOOSE OR DAMAGED.

TURN ON POWER, SET THERMOSTAT FOR HEAT DEMAND.

(6) IS 24VAC PRESENT ACROSS TERMINAL T OF LOW VOLTAGE STRIP & BROWN WIRE TO PRIMARY CONTROL PLUG (JP1-1)?

NO → REPAIR WIRING CONNECTION BETWEEN LIMIT & PRIMARY CONTROL PLUG (BROWN WIRE).

YES → (7) IS 24VAC PRESENT ACROSS TERMINAL T OF LOW VOLTAGE STRIP & BLUE WIRE TO PRIMARY CONTROL PLUG (JP1-4)?

NO → REPAIR WIRING CONNECTION BETWEEN PRIMARY CONTROL & R SIDE OF TRANSFORMER

YES → REPLACE PRIMARY CONTROL.

GAS CHECKS

IS GAS SUPPLY NATURAL OR L.P.?

L.P. → HAS L.P. CONVERSION KIT BEEN INSTALLED? IF NOT, INSTALL KIT.

NATURAL →

IS GAS SUPPLY ON?

1. CHECK SUPPLY VALVE.
2. CHECK STOP VALVE AT UNIT.
3. CHECK MANUAL KNOB ON GAS VALVE IN UNIT.

AIR IN GAS PIPING? BLEED AIR BY RUNNING UNIT THROUGH SEVERAL TRYS FOR IGNITION. (BREAK & REMAKE THERMOSTAT DEMAND TO RESTART IGNITION SEQUENCE AT 2 TO 3 MINUTE INTERVALS.

CHECK FOR LEAKS IN GAS SUPPLY PIPING & REPAIR IF NEEDED. *CAUTION: DO NOT USE MATCH OR FLAME TO CHECK FOR GAS LEAKS.*

CHECK GAS SUPPLY LINE PRESSURE. IS PRESSURE WITHIN UNIT NAMEPLATE LISTING?

NO → CORRECT GAS PRESSURE.

YES → IS GAS VALVE ACTUALLY OPENING? DETERMINE BY CHECKING FOR MANIFOLD PRESSURE DURING TRIALS FOR IGNITION. (GAS VALVE IS SLOW OPENING & WILL BE FULL OPEN FOR ONLY A FEW SECONDS OF EACH APPROXIMATE 7 SECOND IGNITION TRIAL FOLLOWING EACH PRE-PURGE CYCLE.)

NO → REPLACE GAS VALVE.

YES → CHECK FOR LEAKS IN UNIT MANIFOLD PIPING.

LEAKS → REPAIR LEAKS & RETEST.

NO LEAKS →

AIR CHECKS

VISUALLY CHECK OUTSIDE TERMINATIONS OF INTAKE & EXHAUST PVC PIPING FOR OBSTRUCTIONS

VISUALLY CHECK CONDENSATE DRAIN FOR OBSTRUCTIONS.

REFER TO INSTALLATION INSTRUCTIONS. ARE INTAKE & EXHAUST LINES PROPERLY SIZED & APPLIED WITHIN LENGTH, DIAMETER & ELBOW LIMITS?

NO → CORRECT PIPING ERRORS & RETEST.

YES → *TURN OFF GAS TO UNIT*

REMOVE AIR INTAKE CHAMBER COVER (USE CARE TO PREVENT DAMAGE TO COVER GASKET).

CHECK PURGE BLOWER FOR BINDING OR MECHANICAL DAMAGE.

BREAK & REMAKE THERMOSTAT DEMAND TO INITIATE CONTROL SEQUENCE.

(8) IS 120VAC PRESENT ACROSS PURGE BLOWER MOTOR TERMINALS?

NO → (9) IS 120VAC PRESENT BETWEEN NEUTRAL SIDE OF PURGE BLOWER & BLACK WIRE TO PRIMARY CONTROL PLUG (JP1-8)?

NO → CHECKOUT WIRING CONNECTIONS & REPAIR.

YES → REPLACE PRIMARY CONTROL.

YES → DOES PURGE BLOWER RUN?

NO → REPLACE PURGE BLOWER.

YES →

SPARK CHECK

CAUTION: HIGH VOLTAGE

USE SPARK TESTER ON IGNITION WIRE TO CHECK FOR SPARK.

RESTART IGNITION SEQUENCE (BREAK & REMAKE THERMOSTAT DEMAND).

AFTER 30 TO 35 SECOND PRE PURGE - IS SPARKING PRESENT FOR APPROXIMATELY 7 SECONDS DURING IGNITION TRIALS?

YES → USE SPARK TESTER ON PRIMARY CONTROL H.V. TERMINAL & RECYCLE UNIT TO CHECK CONTROL FOR SPARK OUTPUT DURING IGNITION TRIALS.

SPARK → IF UNIT DOES NOT RUN, REFER TO G14 SERVICE MANUAL FOR FURTHER CHECKS.

NO SPARK → REPLACE PRIMARY CONTROL.

NO → REMOVE IGNITION WIRE FROM PRIMARY CONTROL HIGH VOLTAGE TERMINAL.

TURN OFF POWER.

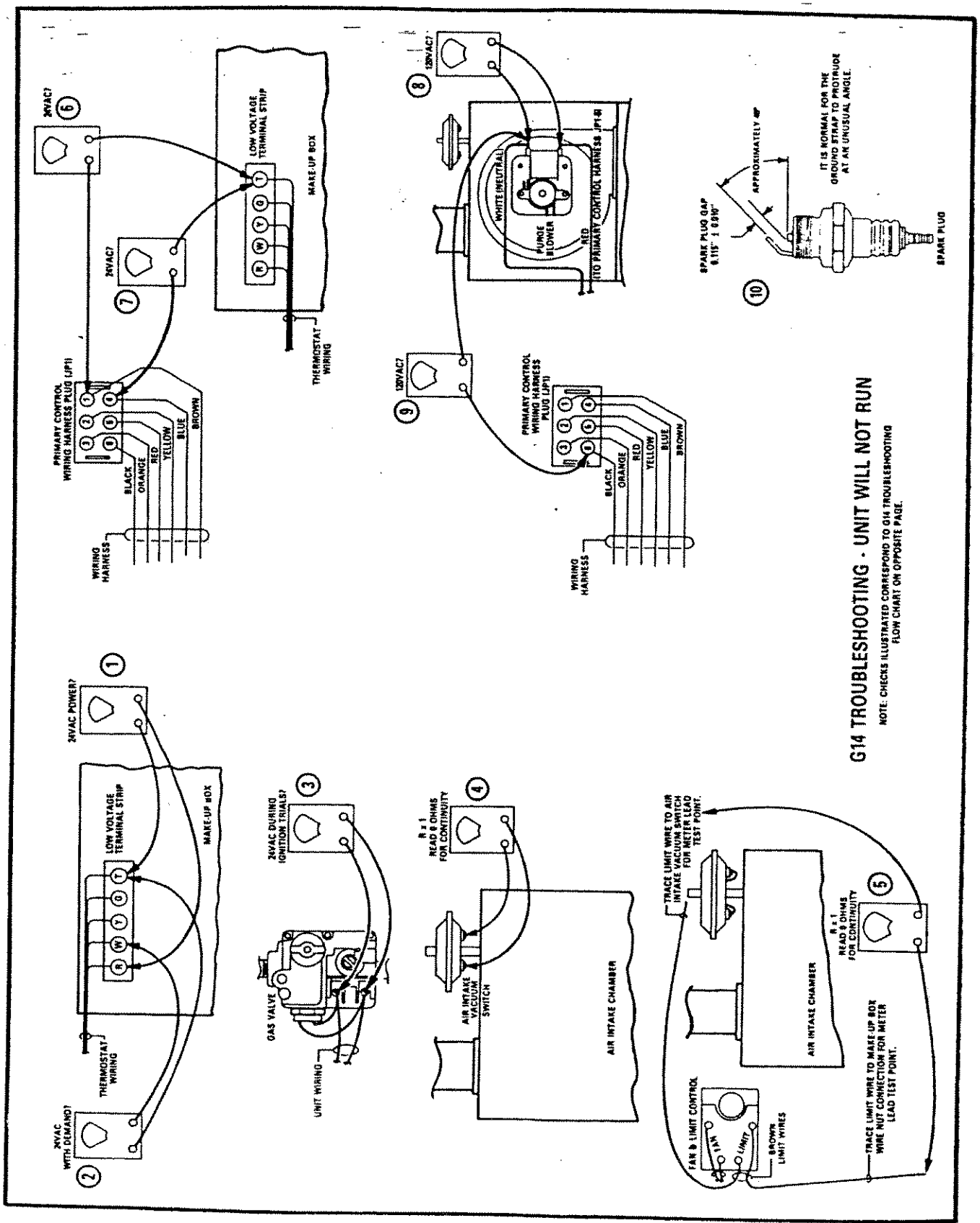
CHECK IGNITION WIRE (FOR BREAKS OR SHORTS TO GROUND) & FOR LOOSE CONNECTIONS TO CONTROL AND/OR SPARK PLUG.

(10) REMOVE & CHECK SPARK PLUG (USE 3/4" SPARK PLUG SOCKET).
1. WAS PLUG TIGHT WHEN REMOVED?
2. ARE CRACKS PRESENT IN PORCELIN?
3. IS PLUG GAPPED PROPERLY? 0.125" ± 0.010" (1/8")
4. REPLACE AND/OR REGAP PLUG IF REQUIRED.

PUT PLUG BACK IN UNIT, TURN ON POWER (LEAVE GAS OFF) & RETEST FOR SPARK.

REPLACE AIR INTAKE CHAMBER COVER, TURN ON GAS & RESTART UNIT.

TROUBLESHOOTING CONT.



IMPORTANT INFORMATION ON YOUR NEW LENNOX EQUIPMENT

I - Use and Care of Your New Lennox Equipment

A - In order to maintain high efficiency in operation and conserve limited energy resources, we would suggest a good maintenance program on your new Lennox equipment.

Service contracts and extended protection programs covering parts and labor are available from many Lennox dealers.

Such contracts provide a regular maintenance program and will help increase the equipment service life and protect your investment. Consult your local dealer or contractor.

B - Make sure that your dealer or installing contractor fills out completely the equipment description, including model number, serial number and date of installation.

C - Ask your dealer or contractor to explain the system to you, its function and operation and how to clean or replace dirty filters.

D - Clean or replace filters regularly. Dirty filters reduce air flow, system efficiency and can cause coil freeze-ups during the cooling cycle or high temperature operation during the heating cycle.

E - Keep all registers and grilles open. Closing registers or blocking return air grilles, reduces air flow and causes the same problems as described in Item D above.

F - Have your dealer inspect your unit at least at the beginning of each cooling season and again at the beginning of each heating season. Planned Service is excellent insurance against unnecessary wear and damage. Ask him to explain the benefits of an annual P.S. contract.

II - The following are the responsibility of the user and are not considered as manufacturing defects:

A - Filter cleaning and replacement.

B - Failure of unit to operate satisfactorily due to restricted air flow over the outdoor coil or the indoor unit.

C - Cleaning of the condensate drain to prevent overflow.

D - Damage to the equipment or finish due to use of corrosive materials or corrosive atmosphere.

E - Damage due to failure to properly maintain, tampering with or altering equipment.

In addition for solar equipment:

F - Cleaning of exterior collector plates.

G - [illegible] proper mixture of the Lennox specified solar transfer fluid and pH factor of 8 or higher in transfer fluid. (Prevents freezing and corrosion in collection and transfer system.

[illegible]

III - If equipment will not operate—before calling for service:

A - Check thermostat setting.

B - Check for blown fuses, tripped circuit breakers, or open disconnect switches.

C - Restricted air flow: See Item I (D and E)

D - Are fuel valves turned on?

E - Some models are equipped with manual reset. Reset if necessary.
CAUTION: Do not reset more than once. If unit does not continue to operate, call dealer for service.

WARRANTY PROCEDURE

When warranty parts are required:

1 - Be prepared to furnish the following information:
  a - Complete model and serial number, and date of installation.
  b - An accurate description of the problem.

2 - Call your local independent installing contractor or dealer.

3 - If the installing dealer is unable to provide warranty parts, check the yellow pages for another Lennox dealer near you. If you are unable to secure assistance from a Lennox dealer, call the Lennox Industries Inc., Division Headquarters in your area. You will be referred to a Lennox dealer in your area.

NOTE TO CUSTOMER

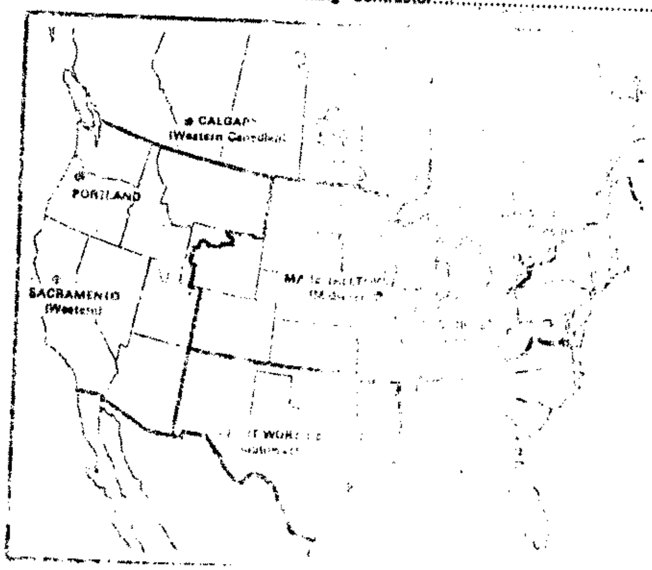
Please fill information below and retain warranty for your records and future reference

EQUIPMENT IDENTIFICATION

Unit Model Number..

Serial Number.................................... Date of Installation....................

Installing Contractor.................................... Phone....................



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LENNOX EQUIPMENT LIMITED WARRANTY

DOES NOT APPLY OUTSIDE U.S.A. AND CANADA

BASIC ONE-YEAR WARRANTY

Lennox Industries Inc. ("Lennox") equipment will deliver its rated heating and cooling capacity, when used under normal conditions, and when installed, operated and serviced in strict accordance with Lennox recommendations.

If, within one (1) year from the date of original installation, any part of your new Lennox cooling, heating, solar or accessory equipment fails because of a manufacturing defect, Lennox will supply a replacement part, F.O.B. point of shipment.

You must pay all other costs of warranty service. Lennox will not pay the cost of labor involved in diagnostic calls or in removing, servicing or replacing parts, or the cost of refrigerant, driers, filters, belts, solar transfer fluid, glass or freight charges.

EXTENDED WARRANTY PERIOD FOR CERTAIN COMPONENTS

For certain components in Lennox equipment, the warranty period is extended beyond the basic one year, providing the unit has not been moved from its original installation, as outlined below:

1 - **Cooling Compressor** - an additional four (4) years, beyond the basic one year, except as stated below.
2 - **Gas and Oil Furnace Heat Exchanger** - an additional nine (9) years, beyond the basic one year, except as stated below.
3 - **Duracurve® Heat Exchangers coated with Lennox Duraglass II®** , Used in Up-flo and Down-flo Residential Type Furnaces - an additional fourteen (14) years, beyond the basic one year, except as stated below.
4 - **Pulse Combustion Heat Exchangers used in Residential Type Furnaces** - an additional nineteen (19) years, beyond the basic one year warranty, except as stated below.
5 - **Solar Collector Absorber Plate** - an additional four (4) years, beyond the basic one year.
6 - **LSM Series Solar Hot Water Tank/Heat Exchanger** - an additional four (4) years, beyond the basic one year.

EXCEPTIONS TO EXTENDED WARRANTY PERIOD

1 - The extended warranty period on gas and oil fired heat exchangers, as stated above, DOES NOT APPLY:
   a - When Lennox furnaces have been operated in atmospheres contaminated by compounds of chlorine, flourine, or other damaging chemicals;
   b - When conditioning air supplied to Lennox furnaces is 100% air from out of doors; or
   c - When Lennox furnaces are field installed downstream from a cooling coil.
2 - The extended warranty periods listed above DO NOT APPLY to the following:
   a - Gas or oil duct heaters, unit heaters, industrial heaters;
   b - LHF, LMU and LHV rooftop series; and
   c - Cooling compressors used in HPWH and HPWV closed loop heat pumps.

REPLACEMENT FURNACE HEAT EXCHANGERS

Lennox, at its option, will furnish a replacement Heat Exchanger or allow a credit (in the amount of the then current suggested selling price) of an equivalent Heat Exchanger toward the purchase of a Lennox gas or oil furnace (at the then current suggested selling price).

LIMITATIONS ON WARRANTY

Lennox makes no express warranties other than the warranty set forth above. All implied warranties, including the implied warranties of merchantability and fitness for a particular purpose, are limited to the duration of the express warranty, set forth above. Liability for incidental and consequential damages is excluded.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the limitations or exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

CONDITIONS OF WARRANTY

The furnishing of replacement parts under the terms of this warranty will apply to the original warranty period (including any extended warranty period) and will not serve to extend such period.

This warranty does not apply to damage or defect resulting from:

1 - Accident, or negligent or unreasonable use or operation of the equipment, including operation beyond rated capacity and operation of electrical components at voltages other than the range specified in the nameplate;
2 - Failure to protect water source equipment against freezing or corrosion;
3 - Modification, change or alteration of the equipment, except as directed by Lennox; and
4 - Operation of heat pump or air conditioning compressors with system components (indoor unit, outdoor unit and refrigerant control devices) which do not match or meet the specifications recommended by Lennox.

Lennox shall not be liable for any default or delay in performance under this warranty, caused by any contingency beyond its control, including without limitation, war, government restrictions or restraints, strikes, fire, floods or a short or reduced supply of energy or raw material.

LENNOX Industries Inc.

Form W-772-L8 (8-15-82) Supersedes (10-15-81)

880314NYC5043 EXHIBIT #1

SEVEN PHOTOGRAPHS OF THE HEAT EXCHANGER/COMBUSTION CHAMBER ASSEMBLY INVOLVED IN THIS INCIDENT. THESE PHOTOGRAPHS WERE PROVIDED BY THE COMPLAINANT.

PHOTO #1: The subject unit with the furnace in the background.

PHOTO #2: Close-up view of the subject unit. Note the two "ruptures" in the U bend section of the manifold ata. to the top of the combustion chamber.

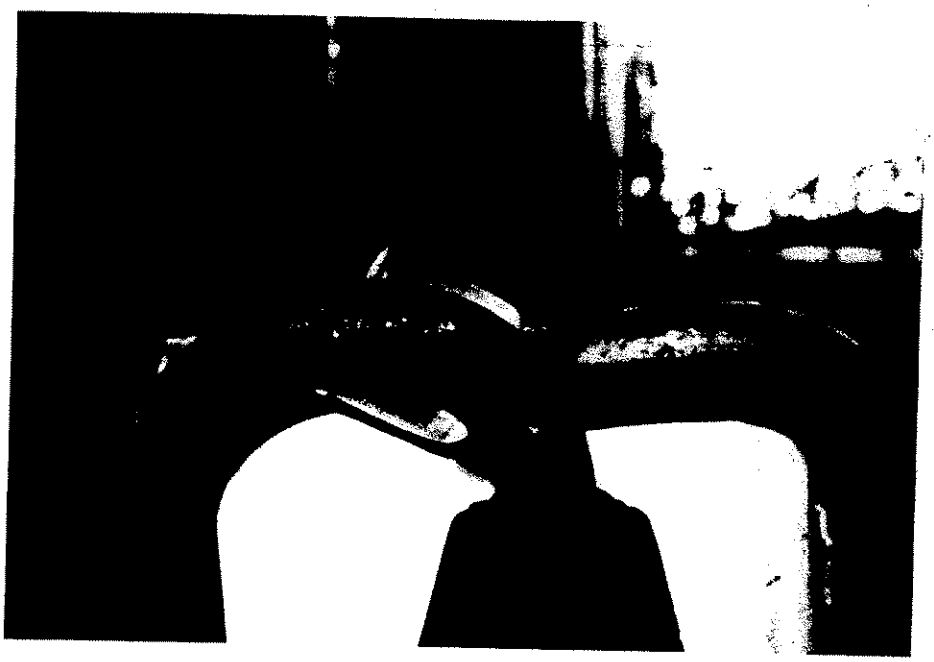

PHOTO #3: The rupture closest to the top of the combustion chamber.

PHOTO #4: Close-up of the rupture closest to the combustion chamber.

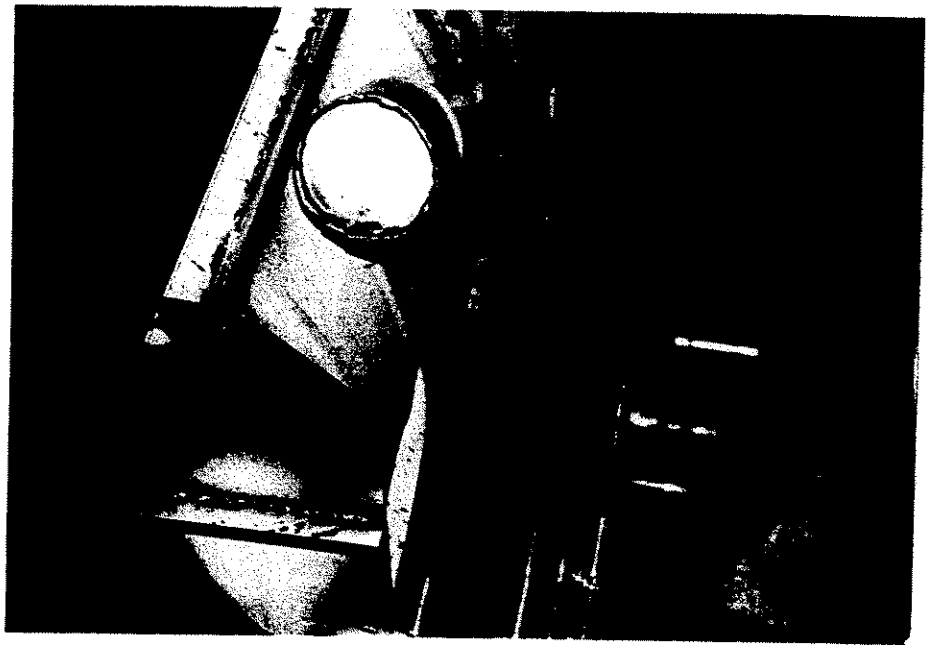

PHOTO #5: The location of the "2nd" rupture. Note the lifted metal around the edges of the "1st" rupture in the background.

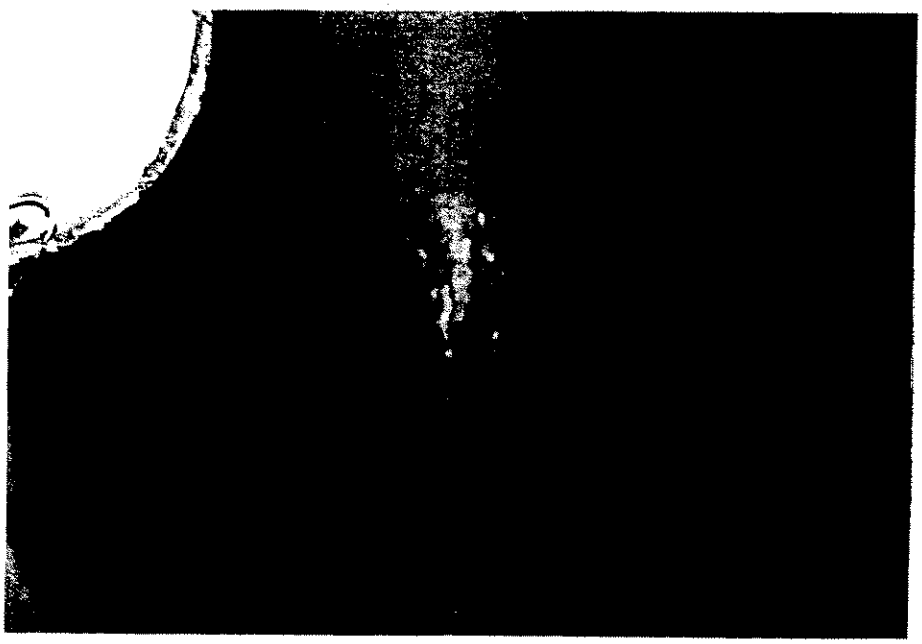

PHOTO #6: Close-up of the "2nd" rupture.

880314NYC5043 EXHIBIT #1

PHOTO #7: A view showing both ruptures and the lifted metal around the edges of the "2nd" rupture (rupture on left).