



MODELS:

NATURAL GAS ONLY

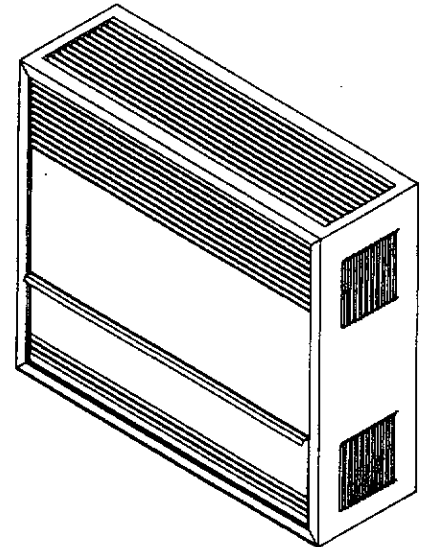
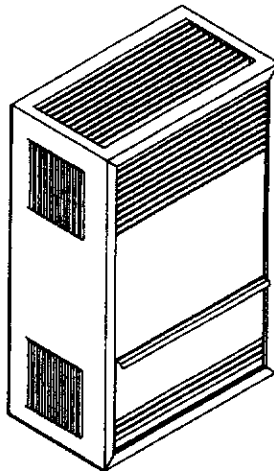
1403622; 1433622; 1453622
2203622; 2233622; 2253622
3003622; 3033622; 3053622



MODELS:

PROPANE GAS ONLY

1403621; 1433621; 1453621
2203621; 2233621; 2253621
3003621; 3033621; 3053621
1403621.5; 3003621.5



INSTALLATION & OPERATING INSTRUCTION MANUAL
Gravity Direct-Vent Wall Furnace

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

WARNING: Installation and repair must be done by a qualified service person. The appliance should be inspected before use and at least annually by a professional service person.

WARNING: Do not install this furnace (Natural or L.P. Gas) in trailers or recreational vehicles.

Version disponible
en Español
llame al
(909) 825-0993, ext. 237

WARNING: If the information in this manual is not followed exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
 - Open all windows.
 - Do not try to light any appliance.
 - Do not touch any electrical switch.
 - Do not use any phone in your building.
 - Extinguish any open flame.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instruction.
 - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Basic Description

Your direct-vent wall furnace is shipped ready to install against an exterior wall up to 9 inches thick. For walls greater than 9 inches, and up to 24 inches thick, use an optional Vent Extension Kit.

The furnace may burn either Natural or L.P. Gas, depending on the model you have purchased.

No electric power is required unless furnace is equipped with an optional blower accessory.

Always consult your local heating or plumbing inspector, building department or gas utility company regarding regulations, codes or ordinances which apply to the installation of a direct-vent furnace.

The sealed combustion system draws combustion air directly from outdoors into the combustion chamber and combustion gases are discharged directly outdoors through tubes on the rear of the furnace.

The furnace cabinet is also constructed of heavy-gauge steel and has a powder paint finish.

The furnace controls are located behind an access door on the lower front of the furnace. All models are equipped with American Gas Association and Canadian Gas Association (AGA/CGA) listed gas valves and pilots.

Helpful Installation Information

The following booklets will help you in making the installation:

ANSI/NFPA 70, or current edition "National Electrical Code". In Canada: CSA C22.1 Canadian Electrical Code.

American National Standard Z223.1 or current edition "National Fuel Gas Code".

Obtained from: American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018. In Canada: CAN/CGA B149.

Unpacking Your Furnace

This direct-vent furnace is packed complete including the vent cap, vent tube and air inlet tube ready for installation on an exterior wall with a total thickness from 5 inches minimum to a maximum of 9 inches.

Examine all packing material carefully. Look for loose parts discarding them. Store all parts where they cannot be lost or damaged before you need them.

Note: Check the furnace rating plate, located in burner compartment, to make sure your furnace is equipped to operate on the type of gas available (either natural or L.P. gas). Do not convert unit from natural gas to L.P. Gas or from L.P. Gas to natural gas without the proper manufacturer's gas conversion kit.

Basic Tools Needed

Hand drill or properly grounded electric drill
6 foot folding ruler or tape measure
Screwdriver (Phillips Head)
Pliers (Wire Cutting)
Hammer
Stud locator or small finishing nails

Tin Snips
8 and 12 inch adjustable wrenches
Keyhole saw or saber saw
(2) 10 inch or 12 inch pipe wrenches
Gloves and safety glasses

Basic Materials

Pipe joint compound resistant to L.P. gases.
Caulking compound-silicone rubber with a temperature rating of 500°F. DO NOT use types advertised as paintable or for bathtub use as most contain fillers and will not withstand high temperatures.

Pipe and fittings to make connections to heater.
Electrical wiring supplied as needed for optional blower.
Minimum wire size is #14 gauge copper.

Installing Your Furnace

The following steps are needed for proper installation and safe operation of your furnace. If you have any doubts as to any requirements, check with local authorities for local and state codes affecting the installation.

Obtain professional help where needed.

DO NOT install this heater in a travel trailer or recreational vehicle.

For satisfactory and trouble-free operation be sure to:

1. Properly locate the furnace within the space to be heated.
2. Provide for adequate combustion air around vent cap on outside and provide adequate air circulation around cabinet inside the open room.
3. Maintain all minimum clearances.

Optional Accessories

Vent Extensions:

For walls greater than 9 inches thick and up to 24 inches thick, use one of the following Vent Extension Kits:

Kit Number	Wall Thickness	Models
9301	9 inches to 15 inches	22036 and 30036 Series
9302	15 inches to 24 inches	22036 Series
9303	15 inches to 24 inches	14036 and 30036 Series
9304	9 inches to 15 inches	14036 Series

Blower

To increase circulation of warmed air within the heated space, you may use Blower Accessory Kit 2302, for models 22036 series 30036 series or kit 2303 for models 14036 series. Both are equipped with a two-speed fan and automatic fan switch.

Thin Wall Collar Kit, 9307:

For walls less than 4-1/2 inches thick, a Thin Wall Collar Kit may be used to increase wall thickness.

Vent-Cap Guard, 9308:

This mounts to the outside of the exterior wall over the vent cap, to protect pedestrian traffic from heat.

Vent Shield Deflector, 4318:

Insulated, galvanized sheet for all direct-vent models.

Gas Conversion Kits:

Used to convert your furnace from Natural Gas to L.P. Gas and from L.P. Gas to Natural Gas.

Description	Models
Natural Gas to L.P. Gas for 14036 Series	8925
Natural Gas to L.P. Gas for 22036 Series	8926
Natural Gas to L.P. Gas for 30036 Series	8927
L.P. Gas to Natural Gas for 14036 Series	8928
L.P. Gas to Natural Gas for 22036 Series	8929
L.P. Gas to Natural Gas for 30036 Series	8930

Safety Rules

Warning

Read these rules and the instructions carefully. Failure to follow these rules and instructions could cause a malfunction of the furnace. This could result in death, serious bodily injury, and/or property damage.

Installation must conform to local codes. In the absence of local codes, installation must conform with the National Fuel Gas Code, ANSI Z223.1. The appliance, when installed, must be electrically connected and grounded in accordance with local codes or, in the absence of local codes, with the current National Electrical Code ANSI/NFPA NO. 70.

In Canada

1. Installation must conform to local codes or, in the absence of local codes, the current CAN/CGA B149 installation code.
2. The appliance, when installed, must be electrically connected and grounded in accordance with local codes or, in the absence of local codes, with the current CSA C22.1 Canadian Electrical code.
3. Field conversions for high altitude are not permitted in Canada.
4. Reference is made in this manual regarding gas type as L.P.G. Be advised that L.P.G. is not available in Canada, refer to propane / L.P. gas.

1. Use only manufacturer's replacement parts. Use of any other parts could cause injury or death.
2. Do not install this furnace in an alcove.
3. Do not install this furnace in a travel trailer or recreational vehicle.
4. Maintain all clearances specified in section "Locating Wall Furnace and Thermostat" and "Vent Installation".
5. Be sure this furnace is for type of gas to be used. Check the rating plate by the gas valve in the lower cabinet. Do not change it to use other gases. Unsafe operation could result and could cause bodily injury and death.
6. For natural gas, the minimum inlet gas supply pressure for the purpose of input adjustment is 5" water column. The maximum inlet gas supply pressure is 7" water column.

For L.P. gas, the minimum inlet gas supply pressure for the purpose of input adjustment is 11" water column. The maximum inlet gas supply pressure is 13" water column.
7. Any safety screen, guard or parts removed for servicing this appliance must be replaced prior to operating the appliance to avoid property damage, bodily injury or death.

8. Install the furnace vent directly to the outdoors so that harmful combustible flue gases will not collect inside the building. Follow the venting instructions for your type of installation exactly. Use only the type and size of vent pipe and fittings specified.

9. Be sure to provide for adequate combustion and ventilation air. The flow of this air to the furnace must not be blocked.

10. Never vent flue gases into another room, a fireplace or any space inside a building. This could cause property damage, bodily injury or death.

11. Never test for gas leaks with an open flame. Use soap suds to check all gas connections. This will avoid the possibility of fire or explosion.

12. Allow furnace to cool before servicing. Always shut off electricity and gas to furnace when working on it. This will prevent any electrical shocks or burns.

13. Due to high temperatures, locate the furnace out of traffic and away from furniture and draperies.

14. Alert children and adults to the hazards of high surface temperatures and warn to keep away to avoid burns or clothing ignition.

15. Carefully supervise young children when they are in the same room with the furnace.

16. Do not place clothing or other flammable material on or near furnace.

17. Installation and repair must be done by a qualified service person. The appliance should be inspected before use and at least annually by a professional service person. More frequent cleaning may be required due to excessive lint from carpeting, bedding material, etc. It is imperative that control compartments, burners and circulating air passages be kept clean. Failure to keep burner-control compartment and other parts of heater clean can cause dangerous conditions to develop which can cause injury and even death.

18. Before installing: To avoid electrical shock, turn off electrical circuits that pass through the wall where you are going to install the furnace.

19. Be aware of good safety practices by wearing personal protective equipment such as gloves and safety glasses to avoid being injured by sharp metal edges in or around furnace and while cutting or drilling holes in wood and/or sheet metal.

20. CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

Warning

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

Locating Wall Furnace

Consider the following points before attempting to install the furnace.

All Models

1. This is a direct-vent wall furnace. It must be installed on an outside wall for proper venting of flue gases (Figure 1).
2. Wall furnace must be surface-mounted on an outside wall up to 24 inches thick when using an optional Vent Extension Kit.
3. Check the clearances needed from the furnace and vent (Figure 1 and 2). You must place the furnace where you will have no less than the clearances shown.
4. The outside vent must be at least 18 inches away from any window or other building opening.
5. The furnace will not work if anything stops free entry of fresh air into the vent, or free flow of flue gases from it. Be sure the center of the vent cap is at least 12 inches above ground level or shrubs (Figure 1). Make sure shrubs are kept trimmed. It must also be at least 18 inches from any wall or other blockage and 30 inches below any overhang.
6. Place the furnace near the center of the space to be heated for good air circulation. Do not put it behind a door or draperies. Do not put it in a closet, alcove, hallway or other confined space.
7. Be sure that gas piping and electrical wiring (optional blower only) can be brought to the furnace.
8. To provide adequate clearance and service access, the front of the furnace must face the open room.

After selecting a location that meets the requirements, inspect the wall, floor and outside areas. Make sure there are no pipes, wiring, or anything else that would interfere with furnace, vent or thermostat installation. If required, move or pick a new location.

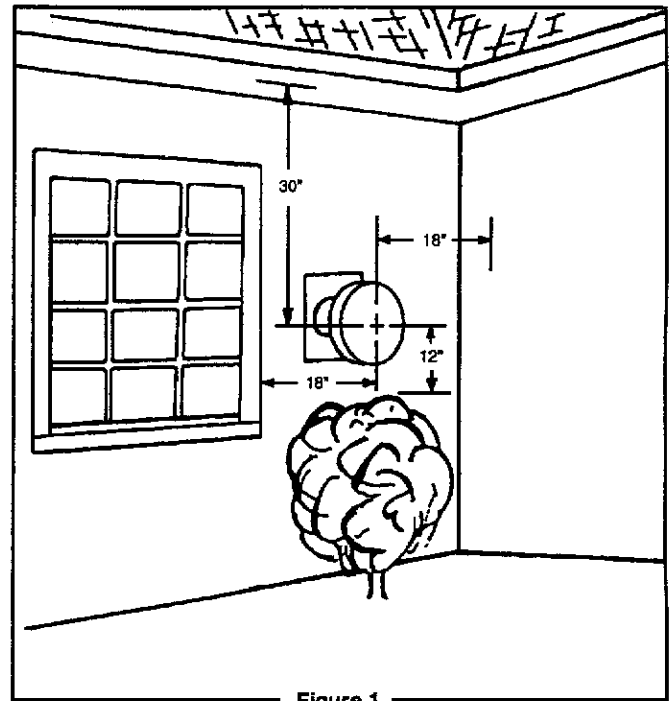


Figure 1

Interior Clearances (Figure 2)

14036 Series:

1. There must be at least 1-3/16 inches of space between the floor (top of floor covering) and the bottom of cabinet.
2. The top of the furnace must be at least 18 inches from the ceiling or other projecting overhang.
3. The side of the furnace must not be closer than 2 inches to an adjacent wall.

22036/30036 Series:

1. There must be at least 5-1/2 inches of space between the floor (top of floor covering) and the bottom of cabinet.
2. The top of the furnace must be at least 24 inches from the ceiling or other projecting overhang.
3. The side of the furnace must not be closer than 2 inches to an adjacent wall.

Choose a location for the thermostat about 5 feet above floor on an inside wall. The thermostat wire supplied with your furnace is 20 feet long, which should be enough to run up through the attic so the thermostat can be a maximum of 16 feet from furnace measured in a straight line, or approximately 12 feet from the furnace if the wire is run under the floor. The thermostat should be sensing an average room temperature, avoid the following:

Hot Spots

Concealed pipes/ducts
Fireplaces
Registers
TV sets
Radios
Lamps
Direct sunlight
Kitchen

Cold Spots

Concealed pipes/ducts
Stairwells (drafts)
Doors (drafts)
Unheated rooms on other side of wall

Dead Spots

Behind doors
Corners/alcoves

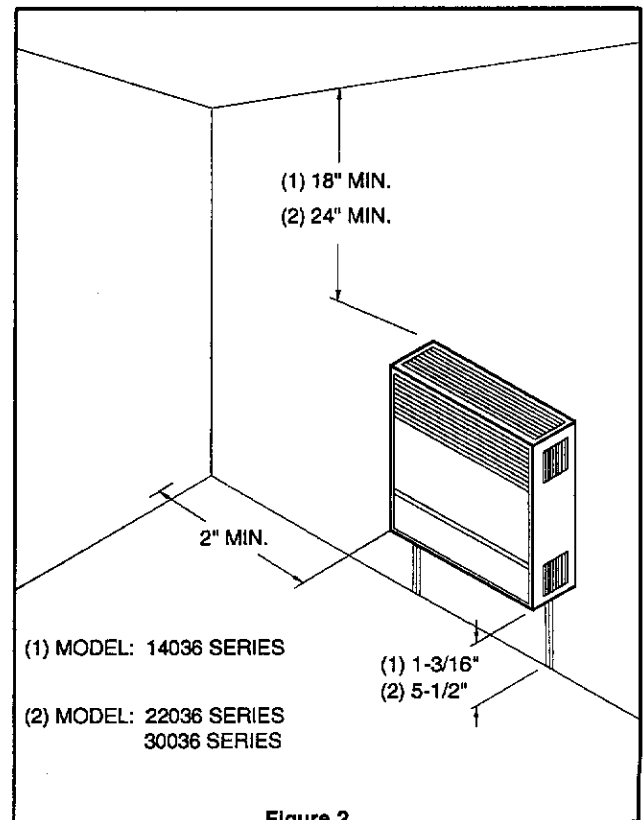


Figure 2

Installation

To avoid electrical shock, turn off electrical circuits that pass through the wall where you are going to install the furnace.

This furnace must be installed using only the vent tube, air inlet tube and vent cap assembly supplied by the manufacturer.

Before the furnace is installed, an opening must be cut through the wall for the vent cap.

Find the Stud

Find the studs where the furnace is to be placed. Use a stud locator or small finishing nails. Drive nail just on the other side of the same stud.

The inside edge of the other stud should be about 14-1/2 inches from the one found. Drive a finishing nail on the inside edge of this stud, then another nail on the outside edge.

Using a level, draw vertical lines that will represent the two stud center lines.

Cut Vent Opening

After locating studs, use the cardboard template (Figure 4). Line up the center of stud lines on the template with the center lines you have drawn on the wall. Use the template to draw the 9-1/4 inch diameter circle on the wall. Then mark the location of the gas supply line.

Using a window, door or wall corner for reference, measure to find where the vent will be on the outside wall. Check to be sure of proper clearances (Figures 1 and 2). If necessary, relocate for proper clearances.

Drill a 1/4 inch hole in the wall at the vent opening center mark all the way through to the outside. Cut the 9-1/4 inch diameter hole through the inside wall. Using the 1/4 inch hole as center, cut a matching hole in the outside wall. It may be better to work from the outside when breaking through brick, stone or tile.

Make sure the inside wall openings are aligned so tubes and vent will fit properly.

In new construction, frame in 9-1/4 inch x 9-1/4 inch opening centered between studs spaced 16 inches on-center, and center point located as noted in Figure 3.

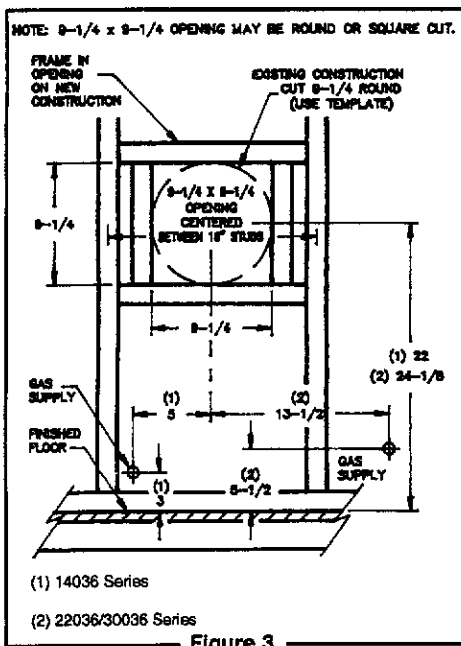


Figure 3

Gas and Electrical Supply Openings

Holes must be drilled for the gas line (and electrical supply if you use an optional blower kit). Drill a 1-1/2 inch hole in the wall for gas line where indicated on cardboard template (Figure 4). You will have to determine whether the gas line will enter the home through the outside wall or floor plate. These instructions can only guide you to where the gas line will enter the furnace.

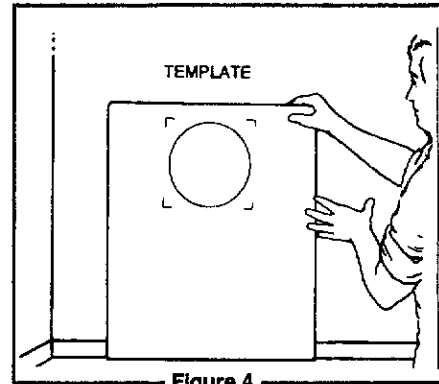


Figure 4

The gas line can be run at this time or done after the furnace is mounted. See "Gas Supply and Piping" section.

No electrical power is required unless furnace is equipped with an optional blower kit.

Do not connect 115V service line to the gas valve or wall thermostat.

Install Spacer Plate (Figure 5)

Install the mounting spacer plate with spacers entering and centered within the 9-1/4 inch vent opening in wall. Level top of spacer plate (embossed top) and fasten to interior wall using six (6) #8 roundheaded (long) screws provided.

Important: The vent tubes are factory equipped for walls 5 to 9 inches thick only. For wall thicknesses up to 24 inches, follow the instructions packed with the appropriate factory Vent Extension Kits.

Furnace Mounting (Figure 5)

Set the furnace body against the wall, legs on the floor, with the vent tubes extending through the spacer plate.

Fasten the furnace to the wall through holes at the top and bottom of the support legs using four (4) #3 roundheaded (long) screws provided.

Push the air inlet shield on from the exterior side of wall. Rotate the air inlet shield until notches on the end of the tube are straddling the standoff tabs on the mounting spacer plate. Trim the air inlet shield flush with the exterior of the wall. Never crimp the vent tubes to force them to fit.

Install Vent Cap

Outside, place a single strip of sealing gum (provided) around the back flange of the vent cap (Figure 5). Install the vent cap by inserting it into the air inlet tube and over the vent tube.

Important: The top of the vent cap is embossed "TOP". Install it in the correct position to prevent water from entering the wall. Level the vent cap and attach it to the outside wall with four (4) #8 roundheaded (long) screws (Figure 6).

If the wall surface is not flat (shiplapped siding, etc.) or less than 5 inches thick, use a Thin Wall Collar Kit (9307) or, build up a flat surface with wood strips. Do not tilt or bend cap to fit uneven surfaces. The vent cap flange must be tight against the wall to prevent rain or wind penetration. Use standard caulking compound if required (not provided).

Installation

For brick, masonry or plaster walls, it may be necessary to use lag screws or expanding anchor bolts, which are not furnished with the furnace.

When the vent cap is to be installed on vinyl siding, or a projection within 6" of any side could block the air inlet, the entire vent should be supported away from the wall at least the distance of the projection. A 2" x 4" frame, with outside dimensions that match the overall dimensions of the mounting plate, is recommended. The 2" x 4" frame protects vinyl siding from possible damage. Seal and paint all joints. The wall depth plus the additional 2" x 4" frame depth should not exceed a total depth of 13".

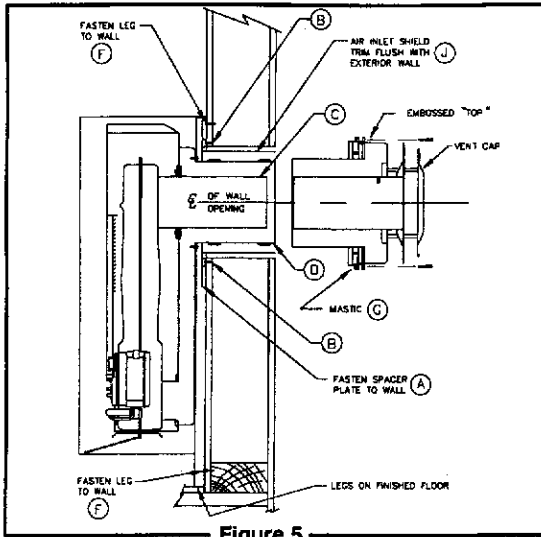


Figure 5

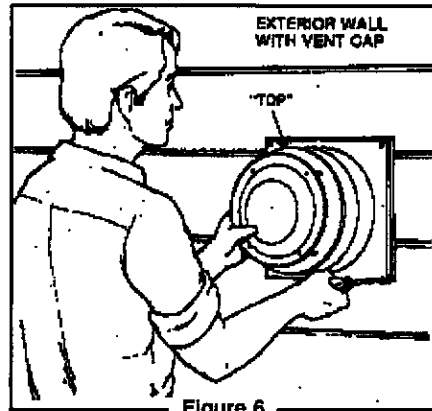


Figure 6

Thermostat Installation

Wall Mounting

1. If an existing thermostat is being replaced, is in a satisfactory location and the wiring is in good condition, use existing wiring. If in doubt, use new wiring.
2. If a new location is chosen or if this is a new installation, thermostat wire must first be run to the location selected. All wiring must agree with local codes and ordinances. These instructions cover bringing the wire down from the attic, but it can be run from a basement or crawl space using similar methods.
3. Before drilling a hole in wall at selected location, drive a small finishing nail through the ceiling in the corner of the wall and ceiling above the thermostat location. Pull the nail out and push a small stiff wire through the hole so it can be found in the attic. Drill a 1/2-inch hole through the ceiling wall plate.
4. Probe for obstructions in the partition. Then, drill a 1/2-inch hole through wall at selected location for thermostat.
5. From the attic, feed the thermostat wire or a stiff wire through the wall until even with thermostat location.
6. Snag thermostat wire through the wall so that 6 inches of wire protrudes.
7. Route wire to furnace leaving enough excess wire to make the connections at the gas valve.

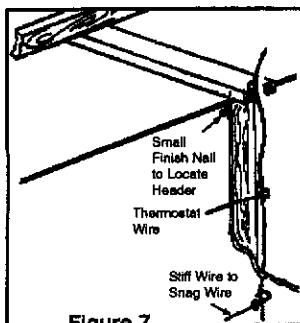
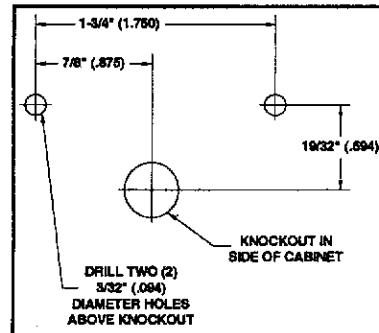


Figure 7

Cabinet Mounting

1. Locate the knockout on the right side of furnace to mount the thermostat. Remove knockout by tapping lightly with a screwdriver.



2. Cut the thermostat wire to the required length below.

Model Number	Length
14036 Series	31 inches
22036 Series	45 inches
30036 Series	47 inches

3. Connect thermostat wires to thermal screws on the back of the thermostat base. See instructions packaged with thermostat.
4. Feed the thermostat wires through the knockout and to the gas valve. **Important:** Keep thermostat wire away from combustion chamber.
5. Mount the thermostat to the side of cabinet with screws provided. Replace thermostat cover.
6. Connect thermostat wire to the gas valve. (Figure 8)

IMPORTANT:
BEFORE REMOVING THE FACE PANEL DISCONNECT THERMOSTAT WIRES AT THE GAS VALVE.

Thermostat Installation

Mounting Thermostat

1. To remove the thermostat cover, grasp cover and pull straight outward. Carefully remove and discard the packing tab protecting the switch contacts.
2. Connect thermostat wires to the terminal screws on the back of thermostat base.
3. Push any excess wire back through hole in wall and plug hole with insulation to prevent drafts from affecting thermostat operation.
4. Being sure to level thermostat for best appearance, fasten thermostat base to wall through mounting holes with screws provided.
5. Replace the thermostat cover.

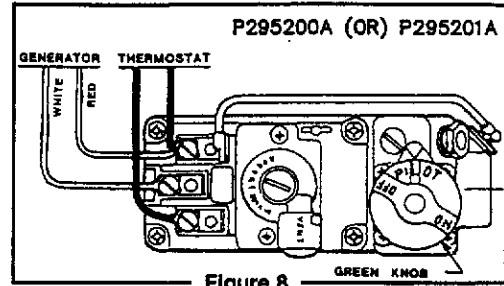
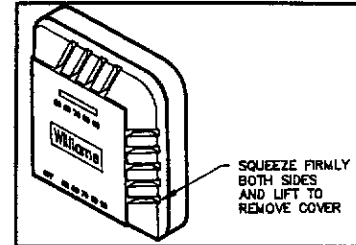


Figure 8



Note: Refer to the installation instructions packed in the thermostat carton if you have any doubt about the above procedures.

Capacity and Orifice Sizing

MODEL NUMBER	GAS TYPE	INPUT * RATING BTU/HR	HEATING CAPACITY RATING BTU/HR	Main Burner Orifice		
				DRILL	DECIMAL	QUANTITY
14036 Series	NAT	14,000	10,039	#51	.0670	1
14036 Series	LPG	14,000	10,039	#58	.0420	1
22036 Series	NAT	22,000	16,462	#45	.0820	1
22036 Series	LPG	22,000	16,462	#55	.0520	1
30036 Series	NAT	30,000	21,849	#42	.0935	1
30036 Series	LPG	30,000	21,849	#53	.0595	1

For elevations above 4,500 feet, reduce ratings 4% for each 1,000 feet above sea level. Btu/Hr = British Thermal Units per hour.

The efficiency rating of this appliance is a product of thermal efficiency rating system determined under continuous operating conditions and was determined independently of any installed system.

Cabinet Installation

14036 Series:

Set cabinet over furnace body, dropping rear top flange between support legs and wall. Open cabinet door and attach cabinet to inner casing with two (2) sheet metal screws (Figure 9).

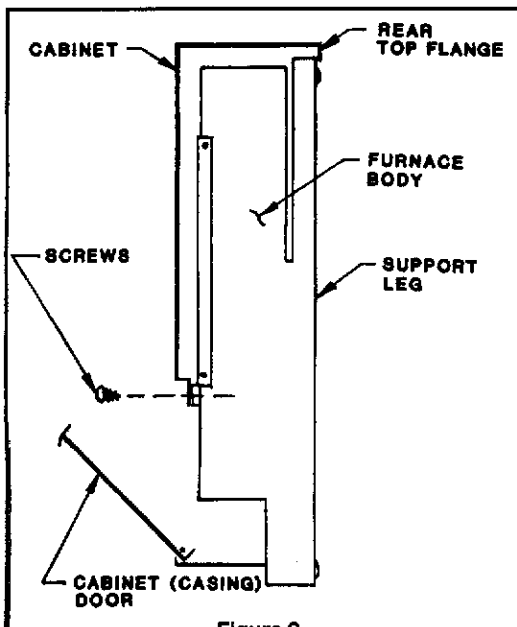


Figure 9

22036/30036 Series:

Set cabinet over furnace body, dropping rear top flange into slot in top of spacer plate and into slots between support legs and wall. When correctly positioned side-to-side, a dimple on the rear top flange will slide against the inside of each support leg. Attach two (2) tension springs through the bottom flange of combustion chamber and bottom of cabinet. Fasten trim strip to bottom of support legs using two (2) sheet metal (short) screws (Figure 10).

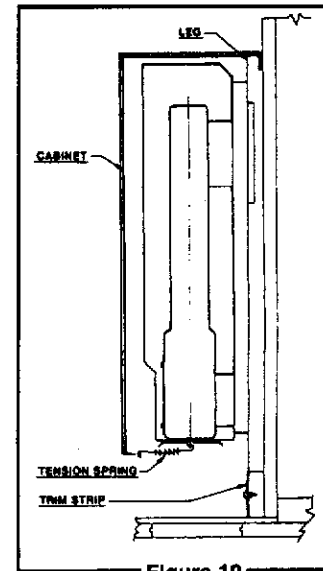


Figure 10

Gas Supply and Piping

The gas control valve, is shipped with a sealed cover over the gas inlet tapping. Do not remove seal until ready to connect piping.

Warning

Danger of property damage, bodily injury or death. Make sure the furnace is equipped to operate on the type of gas available. Models designated as natural gas are to be used with natural gas only. Furnaces designated for use with liquefied petroleum (L.P.) gas have orifices sized for commercially pure propane gas. They cannot be used with butane or a mixture of butane and propane.

Gas Supply

Minimum gas supply pressure for natural gas to the furnace control valve is 5 inches water column and must not be more than 7 inches.

Minimum gas supply pressure for L.P. gas to the furnace control valve must be at least 11 inches water column and must not exceed 13 inches.

Gas pressures and pressures to the burners must not exceed the rated input and pressure shown on the rating plate. On natural gas, the manifold pressure should be 4 inches water column. The manifold pressure should be 10.5 inches water column for L.P. gas. An orifice change may be required to suit gas supplied.

Orifice Sizes

The efficiency rating of these appliances is a product thermal efficiency rating determined under continuous operating conditions and was determined independently of any installed system. For elevations above 4,500 feet reduce ratings 4% for each 1,000 feet above sea level.

The correct orifice sizes for the different input ratings when using natural or L.P. gas are:

Model Number	Gas Type	Input Rating Btu/hr	Heating Capacity Rating Btu/hr	Main Burner Orifice		
				Drill	Dec.	Qty.
14036 Series	Nat.	14,000	10,039	#51	0.067	1
14036 Series	L.P.	14,000	10,039	#58	0.042	1
22036 Series	Nat.	22,000	16,462	#45	0.082	1
22036 Series	L.P.	22,000	16,462	#55	0.052	1
30036 Series	Nat.	30,000	21,849	#42	0.0935	1
30036 Series	L.P.	30,000	21,849	#53	0.0595	1

Btu/hr = British Thermal Units per hour.

Gas Piping

The gas supply line must be of an adequate size to handle the Btu/Hr requirements and length of the run for the unit being installed.

Determine the minimum pipe size from Figure 13, basing the length of the run from the gas meter or source to the unit.

All piping must comply with local codes and ordinances or with the National Fuel Gas Code (ANSI Z223.1 NFPA No. 54), whichever applies. (In Canada: CAN/C.G.A B149). Refer to Figure 11 for the general layout of the unit. It shows the basic fittings needed.

1. Use new, properly reamed pipe free from chips such as steel or black iron pipe and fittings or other approved by local codes.
2. Do not thread pipe too far. Distortion or malfunction may result from excess pipe within the control valve. Apply a moderate amount of good quality dope to the pipe only. Leave the two end threads bare. (Figure 12). If L.P. gas installation, use a compound resistant to action of liquefied petroleum gases.
3. Use ground joint unions.

4. Install a drip leg (sediment trap) to trap dirt and moisture before it can enter the gas valve. Nipple must be a minimum of 3 inches long.
5. Install a manual shutoff valve.
6. Provide a 1/8 NPT test gauge connection immediately before the gas supply connection to the furnace.

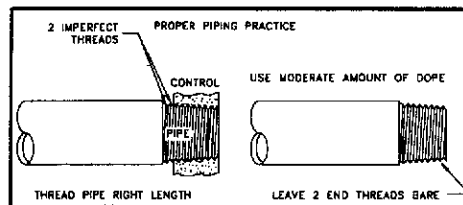
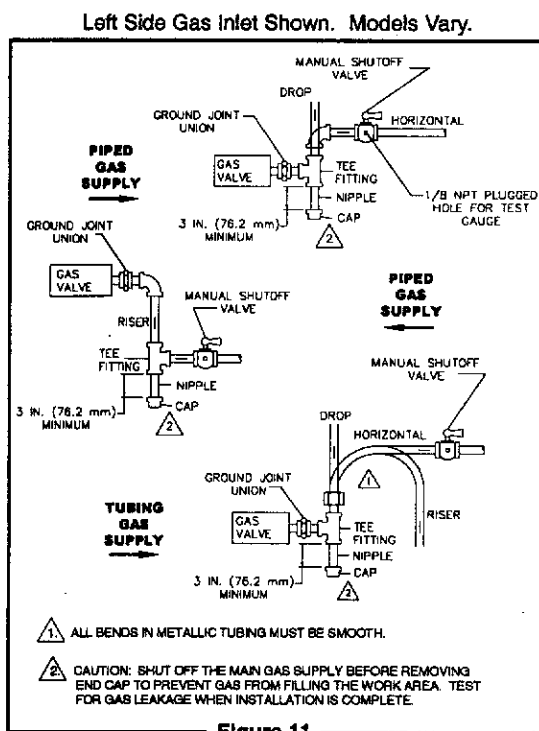
Gas Connection

If installation is for L.P. gas, use a two-stage regulator and make all connections from storage tank to furnace.

Use two pipe wrenches when making the connection to the valve to prevent turning of, or damage to gas valve.

Connection between shutoff valve and burner control assembly can be made with an A.G.A./C.G.A. design certified flexible connector if allowed by local codes.

Tighten all joints securely.



Checking the Gas Piping

Test all piping for leaks. When checking gas piping to the furnace, with gas pressure at less than 1/2 PSI, shut off manual gas valve for the furnace. If gas piping is to be checked with the pressure at or above 1/2 PSI, the furnace and manual shutoff valve must be disconnected during testing. Apply soapsuds (or a liquid detergent) to each joint. Bubbles forming indicates a leak. Correct even the slightest leak at once.

Gas Supply and Piping

Warning

Danger of property damage, bodily injury or death. Never use a match or open flame to test for leaks. Never exceed specified pressures for testing. Higher pressures may damage the gas valve and cause over-firing which may result in combustion chamber failure. Liquid petroleum (L.P.) gas is heavier than air and it will settle in any low area, including open depressions and it will remain there unless area is ventilated. Never attempt start-up of unit before thoroughly ventilating area and smelling near the floor for gas odor.

Gas Pipe Sizes			
Natural Gas			
Pipe Capacity - Btu Per Hour (Includes Fittings)			
Pipe Size			
Length of Pipe - Ft.	1/2"	3/4"	1"
20	92,000	190,000	350,000
40	63,000	130,000	245,000
60	50,000	105,000	185,000
L.P. Gas			
Pipe Capacity - Btu Per Hour (Includes Fittings)			
Pipe Size			
Length of Pipe - Ft.	1/2"	3/4"	1"
20	189,000	393,000	732,000
40	129,000	267,000	504,000
60	103,000	217,000	409,000

Figure 13

Gas Conversion (Mobile Home Models Only)

Note: All models are factory set for L.P. Gas usage. If conversion is required to natural gas follow instructions below exactly.

Warning

Conversion must be done by a qualified service technician. Failure to comply with instructions could result in personal injury, property damage and/or death.

Conversion parts are in a cloth bag attached to the gas controls.

1. Be sure gas to appliance is off.
2. The control valve is factory set for L.P. gas.
3. To change to natural gas remove the black plastic thread protector. Unscrew the protector cam. Flip it over and reinstall it into the valve. The red stripe should now be further away from the valve. Reinstall the black plastic thread protector.

To change to L.P. gas remove the black plastic thread protector. Unscrew the protector cam. Flip it over and reinstall it into the valve. The red stripe should now be closer to the valve. Reinstall the black plastic thread protector.

4. Remove six (6) screws securing the control door to the combustion chamber. **Caution:** Be careful not to damage the gasket.
5. Remove two (2) screws holding main burner.
6. Remove main burner L.P. gas orifice stamped #53 or #58 and replace with natural gas orifice stamped #42 for model 3003621.5 or #51 for model 1403621.5 (depending on model) located in a cloth bag attached to the pilot tube.
7. When changing from L.P. gas to natural gas, disconnect the pilot tube from the pilot assembly. Remove L.P. gas pilot orifice marked TV .010. Replace it with the natural gas orifice marked TV .013. Reconnect the pilot tube to the pilot assembly. Be sure all connections are tight.

When changing from natural gas to L.P. gas, disconnect the pilot tube from the pilot assembly. Remove natural gas pilot orifice marked TV .013. Replace it with the L.P. gas orifice marked TV .010. Reconnect the pilot tube to the pilot assembly. Be sure all connections are tight.

8. Reinstall main burner to control door by installing two (2) screws.
9. Reinstall control door to combustion chamber by reinstalling the six (6) screws previously removed. Check the gasket to be sure there are no holes or gaps. Replace gaskets if necessary.
10. Turn on the gas and check for leaks using soap/water solution. Correct even the slightest leak at once.
11. If necessary, turn pilot adjustment screw to readjust the pilot flame.

Operating Your Furnace

The furnace operates in the following sequence:

1. Thermostat turns on the main burner.
2. Heat builds up in the furnace and starts the fan (if equipped). The heated air comes out the panel louvers.
3. When the thermostat setting is reached, it shuts off the main burner.
4. The fan runs until the heat is removed from the furnace, then it turns off.

Your furnace is equipped with a built-in pressure regulator. L.P. gas models also have a regulator at the supply tank. If you have a question regarding the amount of fuel consumed, call your local gas utility or gas supplier. **DO NOT TAMPER WITH THE REGULATOR OR BURNER ORIFICES, AS PROBLEMS RESULTING THERE FROM MAY CAUSE PRODUCT FAILURE NOT COVERED BY WARRANTY.** Input and output shown on the rating plate, located in burner compartment, must not be exceeded. **Important:** KEEP BURNER AND CONTROL COMPARTMENT CLEAN.

Warning

Do not store or use gasoline or other flammable liquids or vapors near the furnace.

Warning

Danger of bodily injury or death. Do not operate the furnace with a broken or missing pilot observation door.

Lighting the Pilot FOR YOUR SAFETY, READ BEFORE LIGHTING

This furnace is equipped with a manually operated piezo spark ignition device to ignite the pilot gas. Follow the steps below and use the manual spark igniter to light the pilot in place of a match. Press spark igniter button repeatedly. If the spark igniter fails to provide spark to light the pilot, loosen the wing nut holding the pilot cover. This will open to the combustion chamber. The pilot may be ignited with a match.

1. Follow the instructions below and use a match to light the pilot as instructed.
2. After lighting the pilot, carefully replace the pilot observation door and tighten wing nut down.

On new installations, the gas lines will be filled with air and it may take several tries to establish the pilot flame. Check the manual shutoff valve in the gas line. It must be in the open position (handle parallel to gas line) before you can light your furnace. Your furnace is equipped with a 100% safety pilot, which will shut off the gas valve in case the pilot is not burning or functioning properly. Make sure the pilot is adjusted properly and that the generator connection at the control valve is tight. If furnace will not stay lit, call your local gas utility company.

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

A. This appliance has a pilot which must be lit by hand. When lighting the pilot, follow these instructions exactly.

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

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

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

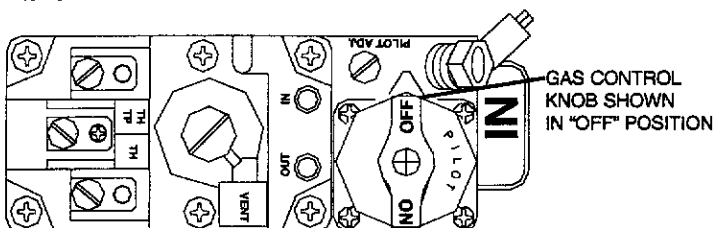
WHAT TO DO IF YOU SMELL GAS

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

IMPORTANT: KEEP BURNER AND CONTROL COMPARTMENT CLEAN.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above.
2. Set the thermostat to lowest setting.
3. If applicable, turn off all electric power to the appliance.
4. Open control access panel.
5. Push in gas control knob slightly and turn clockwise to "OFF".



NOTE: Knob cannot be turned from "PILOT" to "OFF" unless knob is pushed in slightly. Do not use force.

6. Wait five (5) minutes to clear out any gas, then smell for gas, including near the floor. If you then smell gas, **STOP!** Follow "B" in the safety information above. If you do not smell gas, go to the next step.
7. Loosen wing nut and open the pilot observation door.

8. To find the pilot, follow metal tube from gas control. The pilot is mounted on the side of the burner.
9. Turn knob on gas control counterclockwise to "PILOT".

GENERATOR



10. Push in control knob all the way and hold in. Immediately light the pilot. Continue to hold the control knob in for about one (1) minute after the pilot is lit. Release knob and it will pop back up. Pilot should remain lit. If it goes out, repeat Steps 5 through 10. If knob does not pop up when released, stop and immediately call your service technician or gas supplier. If the pilot will not stay lit after several tries, turn the gas control knob "OFF" and call your service technician or gas supplier.
11. Close pilot observation door, tighten wing nut (if equipped).
12. Turn gas control knob counterclockwise to "ON".
13. Close control access panel.
14. Turn on all electric power to the appliance (if applicable).
15. Set thermostat to desired setting.

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. If servicing is to be performed, turn off all electric power to the appliance.
3. Open control access panel.
4. Push in gas control knob slightly and turn clockwise to "OFF" position. Do not use force.
5. Close control access panel.

WARNING: DUE TO HIGH SURFACE TEMPERATURES, KEEP CHILDREN, CLOTHING, FURNITURE OR ANY COMBUSTIBLE MATERIAL AWAY FROM FURNACE.

WARNING: Danger of ignition flash and eye injury or blindness. Protect your eyes. Never attempt to light pilot with gas control valve knob in "ON" position. Flashback could occur.

Start-Up Procedure

Start the furnace using the procedures in section Operating Your Furnace.

Warning

Danger of bodily injury or death. Liquid petroleum (L.P.) gas is heavier than air and it will settle in any low area, including open depressions, and it will remain there unless area is ventilated. Never attempt to start-up the unit before thoroughly ventilating area.

Check the furnace operation as outlined in the following instructions. If any sparking, odors or unusual noises are encountered, shut off electrical power immediately. Recheck for wiring errors, or obstructions in or near optional blower motor.

Notice: During the initial firing of this unit, some smoke and odor may occur. We recommend ventilating the area during this initial "break-in period".

Check Gas Input and Pressures

For furnaces located at altitudes between sea level and 4,500 feet, the measured input must not be greater than the input shown on the rating plate of the furnace. For elevations above 4,500 feet, the measured input must not exceed the input of the rating plate reduced by 4% for each 1,000 feet that the furnace is above sea level.

Gas supply pressure and manifold pressure with the burners operating must also be as specified on the rating plate.

Type of Gas	Manifold Pressure, in W.C.
Natural	4
L.P.	10.5

Rated input will be obtained on 2,500 Btu of propane at 10.5 inches manifold pressure with factory-sized orifices. If L.P. Gas having a different value is supplied, orifices must be changed by a qualified installer before the furnace is operated.

Check the Manifold Gas Pressure

A tapped opening is provided in the gas valve to facilitate measuring the manifold gas pressure. A "U Tube" manometer having a scale range from 0 to 12 inches water should be used for this measurement. The manifold pressure must be measured with the burner and pilot operating. Any major changes in the flow must be made by changing the size of the burner orifice. Check with your local gas company for proper orifice size.

Check the Gas Input (Natural Gas Only)

Under-firing could cause inadequate heat, excessive condensation or ignition problems. Over-firing could cause shooting flame impingement or overheating of the combustion chamber. Before starting natural gas input check, obtain heating valve of gas (BTU per cubic foot) at standard conditions from your local supplier. This factor is used in "Check the Gas Input" section and procedure.

To measure the input using the gas meter, proceed as follows:

1. Turn off the gas supply to all other appliances except the furnace.
2. With the furnace operating, time the smallest dial on the meter for one complete revolution. If this is a 2 cubic foot dial, divide the seconds by 2; if it is a 1 cubic foot dial, use the time in seconds as is. (3,600 = Sec. Per Hr.) This gives the seconds per cubic foot of gas being delivered to the furnace.
3. Assuming natural gas with a heating valve of 1,000 Btu per cubic foot and 34 seconds per cubic foot as determined by step 2 above, then:

$$\text{Input: } 1,000 \times 3,600 \div 34 = 106,000 \text{ Btu Per Hour}$$

This measured input must not be greater than the input indicated on the rating plate of the furnace.

4. Relight all other appliances turned off in step 1 above. Be sure all pilot burners are operating.

Warning

Natural gas heating valve (Btu per cubic foot) can vary significantly; therefore, it is the installer's responsibility to see that Btu input to the furnace is adjusted properly. Failure to do so could cause combustion chamber failure, asphyxiation, fire or explosion, resulting in damage, bodily injury or death. Refer to the Natural Fuel Gas Code (NFFA-54) to be sure the furnace is burning fuel at the proper rate.

Check Pilot Burner

The pilot flame should surround 3/8 inch to 1/2 inch of the generator tip. Pilot gas may need adjustment depending on the inlet pressure. Increase or decrease to obtain proper setting. To adjust, remove pilot adjustment cap (do not lose gasket).

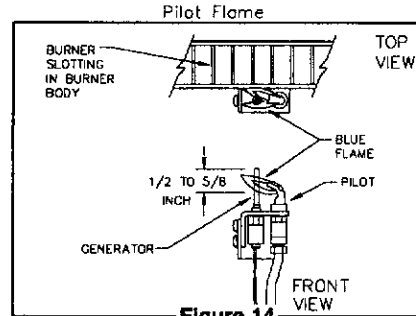


Figure 14

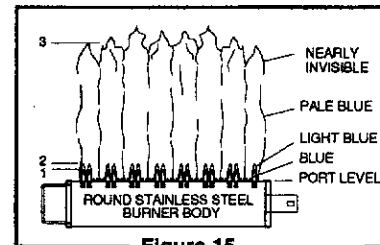


Figure 15

Burner Flame Characteristics

Start the furnace and let it operate at least 10 minutes. Open the access door to view the burner flame. Limit your movements near the furnace a few more minutes before making your final observation. The flame may look yellow due to dust particles in the room air. The flame should change to a nice blue color with firm inner and secondary cones. An occasional flash of orange might be seen as dust particles burn in the flame. This is normal. No burner adjustment is provided, or is necessary. (Figure 15).

Normal Appearance

Natural Gas:

1. Inner cone - blue color - 1/2 to 3/4 inch above ports.
2. Secondary inner cone - light blue - 1 to 2 inches above ports.
3. Total flame - from blue to nearly invisible - approximately 6 inches above ports.

L.P. Gas:

1. Inner cone - blue color - 1/2 to 3/4 inch above ports.
2. Secondary inner cone - light blue - 1 to 2 inches above ports.
3. Total flame - from blue to nearly invisible - approximately 6 inches above ports.

Abnormal Appearance

Lazy Flame

Long soft yellow cones moving around in the combustion chamber lifting from ports (insufficient air).

Extremely Fast Flame

Will not hold to ports - entire cone sections blow off from noisy ports (too much pressure).

Warning

If flame appears abnormal, contact the gas company or a qualified service technician immediately.

On new installations, the gas lines will be filled with air and may take several minutes to establish a pilot flame.

How to Care for Your Furnace

Annual Upkeep Needed

It is recommended that a qualified service technician perform these checks at the beginning of each heating season:

Burner Cleaning

Keep clean at all times. Clean all foreign materials from top of burner. For access to burner:

1. Shut off gas supply to furnace.
2. Remove cabinet.
3. Disconnect gas line inside cabinet at ground joint union fitting.
4. Remove six (6) #10-24 screws securing the control door assembly to the combustion chamber.
5. Carefully remove control door and burner assembly from combustion chamber. Be careful not to damage the control door gasket.
6. Clean all foreign materials from the top of the burner.
7. After cleaning, replace control door and burner assembly by reversing above procedure. Control door gasket should be replaced if its condition is in doubt.

Cleaning Burner Compartment

Because cold air is attracted to the flame during furnace operation, a build up of lint from carpeting, bedding, dust, etc. in the burner area will occur. It is necessary to clean this area regularly. Use a vacuum cleaner with a narrow attachment to reach small areas. Be careful in and around the pilot. A change in its adjustment could be made if moved during cleaning. A properly adjusted burner with nearly all gasses will produce a flame which has a clear blue cone having a bluish-red or bluish-violet outer mantle.

Cleaning Blower (If Equipped)

Turn off electric power supply at disconnect switch, fuse box or service panel before servicing. For maximum motor life of optional blower inspect the motor yearly and clean any lint or dust from fan blades, fan motor and ventilating holes. Oil yearly with two drops of SAE 20 high temperature oil.

Vent System

Check vent cap and tubes to be sure there are no blocked inlet air or flue openings. The flow of combustion and ventilation air must not be obstructed. Clean or replace before using furnace.

Furnace Area

For better circulation and more effective heating, do not place obstructive furniture closer than four feet to the front of the cabinet or two feet to the side of the cabinet.



The furnace area must be kept clear and free from combustible material, gasoline and other flammable vapor and liquids.

Cabinet Finish

Clean the cabinet with a damp cloth. Never use abrasive cleaners. Cabinets are finished in heat-resistant powder paint - DO NOT refinish.

Pilot Burner

Light pilot using instructions in "Lighting the Pilot". Leave thermostat at lowest setting. Pilot flame should surround 1/2 to 5/8 inches of the generator tip. If flame needs adjusting, do so as follows:

1. Remove screw cover over pilot adjusting screw.
2. Insert small screwdriver. Adjust flame as needed. Turn screw counterclockwise  to increase flame, clockwise  to decrease.
3. Turn thermostat to highest setting. Main burner should light quickly and smoothly. Turn thermostat to lowest setting. Main burner should go out. Pilot should remain lit.
4. Replace screw cover with gasket over pilot adjusting screw. (Figure 16).

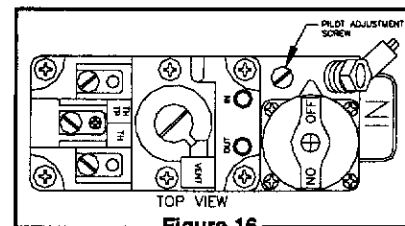


Figure 16

Warning

Danger of bodily injury or death. If equipped with accessory blower, turn off electric power supply at disconnect switch, fuse box or service panel before removing any doors or access or service panels from unit.

Installations in the State of Massachusetts

All installations in the State of Massachusetts must use the following requirements when installing, maintaining or operating direct-vent propane or natural gas-fired space heaters. For direct-vent appliances, mechanical-vent heating appliances or domestic hot water equipment, where the bottom of the vent terminal and the air intake is installed below four feet above grade the following requirements must be satisfied:

1. If there is not one already present, on each floor level where there are bedroom(s), a carbon monoxide detector and alarm shall be placed in the living area outside the bedroom(s). The carbon monoxide detector shall comply with NFPA 720 (2005 Edition).
2. A carbon monoxide detector shall be located in the room that houses the appliance or equipment and shall:
 - a. Be powered by the same electrical circuit as the appliance or equipment such that only one service switch services both the appliance and the carbon monoxide detector.
 - b. Have battery back-up power;
 - c. Meet ANSI/UL 2034 Standards and comply with NFPA 720 (2005 Edition); and
 - d. Have been approved and listed by a Nationally Recognized Testing Laboratory as recognized under 527 CMR.

A carbon monoxide detector shall:

- a. Be located in the room that houses the appliance or equipment;
 - b. Be either hard-wired or battery powered or both; and
 - c. Shall comply with NFPA 720 (2005 Edition).
3. A product-approved vent terminal must be used, and if applicable, a product-approved air intake must be used. Installation shall be in strict compliance with the manufacturer's instructions. A copy of the installation instructions shall remain with the appliance or equipment at the completion of the installation.
 4. A metal or plastic identification plate shall be mounted at the exterior of the building, four feet directly above the location of vent terminal. The plate shall be of sufficient size to be easily read from a distance of eight feet away, and read "Gas Vent Directly Below".

Blower Accessory 2302 and 2303

This accessory can be operated using the factory equipped three-prong (grounding) plug and cord and may be field wired. See field wiring installation instructions below. When using the plug and cord, for your protection against shock hazard, it must be plugged directly into a properly grounded three-prong receptacle. **DO NOT REMOVE THE PRONG.** All electrical work must conform to your local codes and ordinances, or in their absence, with National Electrical Code ANSI/NFPA 70. In Canada, Canadian Electrical Code C22.1. It must also be electrically grounded. If you are not familiar with wiring codes in general, have a competent electrician do the job.

Warning

Danger of property damage bodily injury or death. Unplug service cord from electrical outlet before removing or working on this blower kit.

Mounting

Model 2302

1. Remove the knock-out plates "A" and "B" from right side of the furnace (Figure 1).
2. Remove the junction box cover and place blower and junction box in position as shown below.
3. Attach the blower and junction box to the inner casing using the pre-punched holes with screws "C" and "D" provided with this kit. See Figure 1 below for proper mounting hole to use with your furnace model (see rating plate for furnace model number). Reattach junction box cover.
4. After blower and junction box are installed, rotate bushing "H" if needed to prevent motor wire from binding against blower casing.
5. Plug in factory supplied three-prong (grounding) plug and cord or see field wiring instructions below.

Model 2303

1. Set the blower on top of the furnace with rear flange of the blower cabinet behind the furnace cabinet. This will place the back of the blower cabinet against the wall surface. (See Figure 2).
2. Plug in service cord

Field Wiring

Model 2302

1. Remove junction box cover and disconnect factory installed three-prong (grounding) plug and cord.
2. Install 115V line in accordance with local codes, connecting as shown in the wiring diagram below. (Figure 1)
3. Reattach junction box cover.

Important: Oil yearly with SAE 20 high temp oil.

Blower Operation

Model 2302

The automatic fan switch turns on the blower after the furnace has been operating a few minutes and turns off the blower after the furnace shuts off. The blower will not operate unless the fan switch (pull chain) is pulled to the "ON" position, either "HIGH" or "LOW". To check the fan switch (pull chain) position, turn the automatic fan switch dial to 70, then pull the chain on the fan switch to obtain the high, low or off position. Set the automatic fan switch dial to 110 and readjust it higher or lower as necessary to obtain blower operation within 4 to 5 minutes after the furnace burner is in operation.

Model 2303

You must select "ON" for continuous blower operation or "AUTO" for automatic blower operation. If blower is set on "AUTO" when the furnace heats up, the heat sensor switch is activated and the blower will turn off. The blower will not operate if the fan switch is set in the "OFF" (center) position.

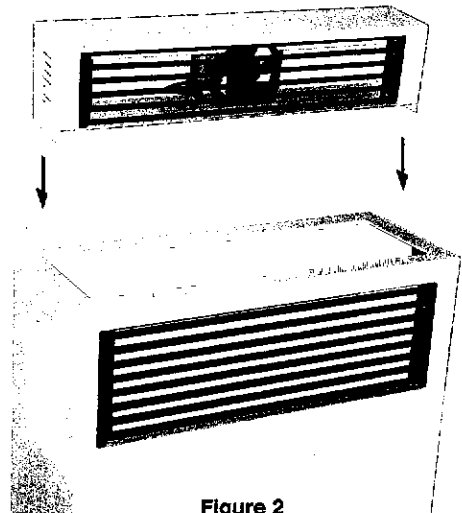


Figure 2

Blower Accessory 2303

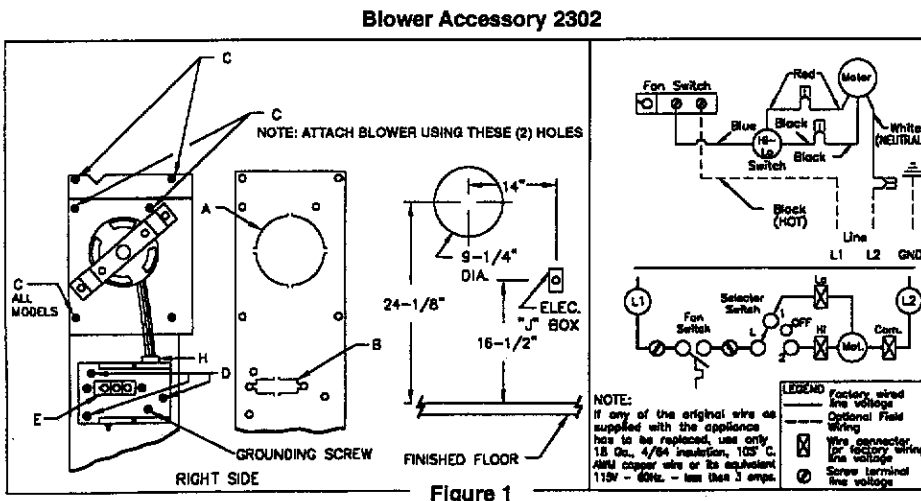


Figure 1

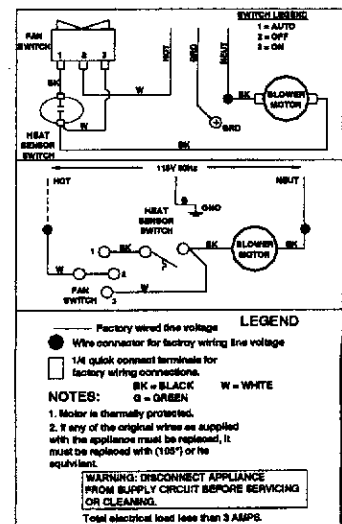
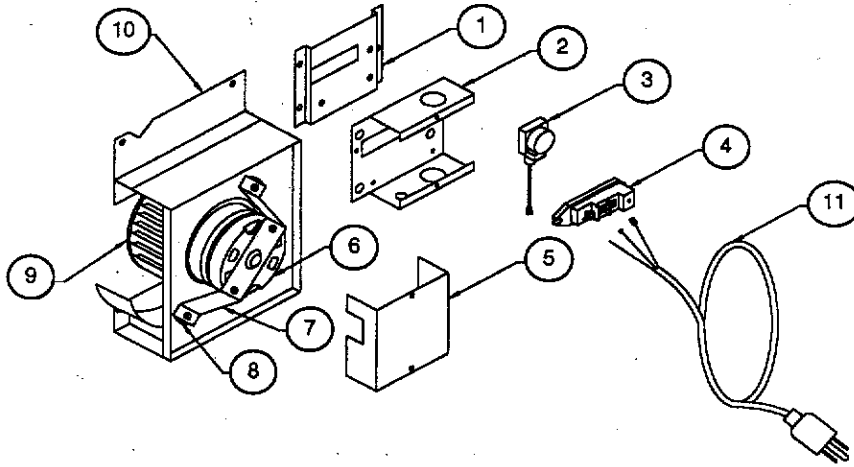


Figure 3

Blower Accessory 2302 and 2303 Replacement Parts List

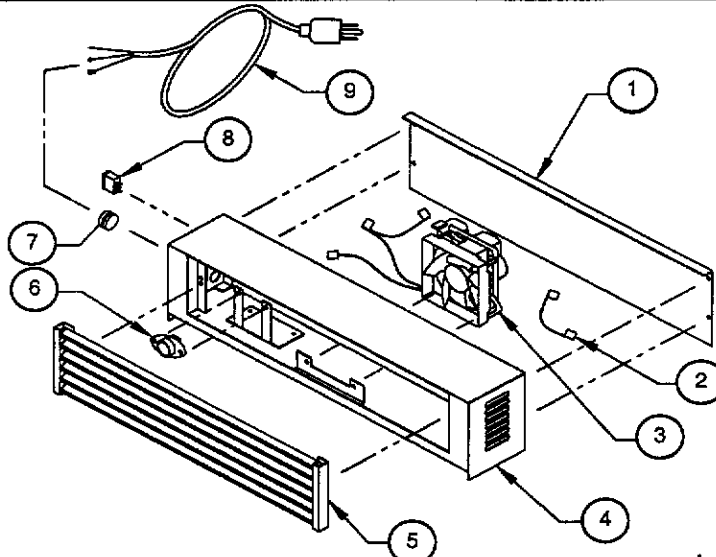
Model 2302

Ref. Number	Part Number	Description
1	6A24	Switch Box Bracket
2	6B33	Switch Box
3	P321017	Fan Switch (Pull Chain)
4	P129700	Automatic Fan Switch
5	6A23	Switch Box Cover
6	P130600	Motor
7	6A93	Motor Support
8	P128400	Vibration Isolator (2 Required)
9	P130700	Blower Wheel
10	6B64	Blower Frame
11	P323335	Plug and Cord



Model 2303

Ref. Number	Part Number	Description
1	8A128	Back Plate
2	P101000	Wire
3	8B94	Fan Blower Assembly
4	8B93	Blower Casing Assembly
5	8B90	Louver Assembly
6	P323095	Heat Sensor Switch
7	P500158	Strain Relief
8	P323080	Fan Switch
9	P323335	Plug and Cord



Note: Screws and bolts are standard hardware items and may be purchased locally.

Troubleshooting

<i>Symptom</i>	<i>Possible Causes</i>	<i>Corrective Action</i>
1. Pilot will not stay lit after carefully following lighting instructions.	A. Generator producing insufficient millivolts.	Check pilot flame. It must impinge on the generator. Be sure generator is fully inserted in bracket. Make sure pilot lighting door is tightly closed.
	B. Generator defective.	Check generator with millivolt meter. Take reading at generator terminals of valve with pilot burning and thermostat contacts closed. The reading should be 140 millivolts or more.
	C. Loose or dirty generator connections at gas valve.	Clean and/or tighten connections at valve.
	D. Grounded thermostat lead wire.	Remove thermostat lead wires from valve terminals. If pilot now stays lit, trace thermostat wiring circuit for a ground. May be grounded to furnace, gas supply, nails or staples.
	E. Defective gas valve.	Replace gas valve after above is verified.
2. Pilot burning - no gas to the main burner.	A. Valve not turned to on position after lighting pilot.	Turn gas valve knob to "ON" position.
	B. Thermostat not turned to a position calling for heat.	Set thermostat to a position calling for heat.
	C. Plugged burner orifice.	Check - clean or replace.
	D. Improperly wired or broken thermostat wires. Defective thermostat.	Check connections at valve terminals. Jumper across thermostat terminals on valve. If valve operates, check thermostat wires.
	E. Pilot generator may not be generating sufficient millivoltage to open valve.	See 1A and 1C above.
	F. Defective valve.	Replace gas valve after above is verified.
3. Burner comes "on" but goes "off" after operating for no apparent reason.	A. Tubes not properly installed.	Check vent tube and air inlet tube. Follow installation instructions. Be sure joints are tight and both tubes are in place. Use only tubes furnished. Do not extend tubes beyond original length.
	B. Furnace may be overrated.	Check for high pressure at the valve. See rating plate for specified min. / max. supply pressure. Check burner orifice.
4. Furnace operates, but turns "off" before room temperature is attained.	A. Thermostat location.	Check thermostat location. It should not be in the path of warm air discharge from furnace, near a lamp or above a T.V. or stereo set.
	B. Defective thermostat.	Check thermostat calibration or replace.
5. Furnace not producing sufficient heat.	A. Furnace may be too small for space being heated.	Check heat calculations.
	B. Furnace not burning at full rate.	Check for low gas pressure. Check burner orifice.
6. Furnace operates, but will not shut "off" when room temperature is attained.	A. Thermostat wiring defective.	Thermostat lead wires may be shorted together, by a nail or staple. Check by removing thermostat leads from valve terminals.
	B. Thermostat location.	Check thermostat location. If on an outside wall or there is a hole in the wall behind thermostat causing cold air to contact thermostat. Relocate the thermostat.
	C. Defective thermostat.	Check thermostat calibration or replace.
	D. Dirt under valve seat or valve stuck open.	Replace valve.

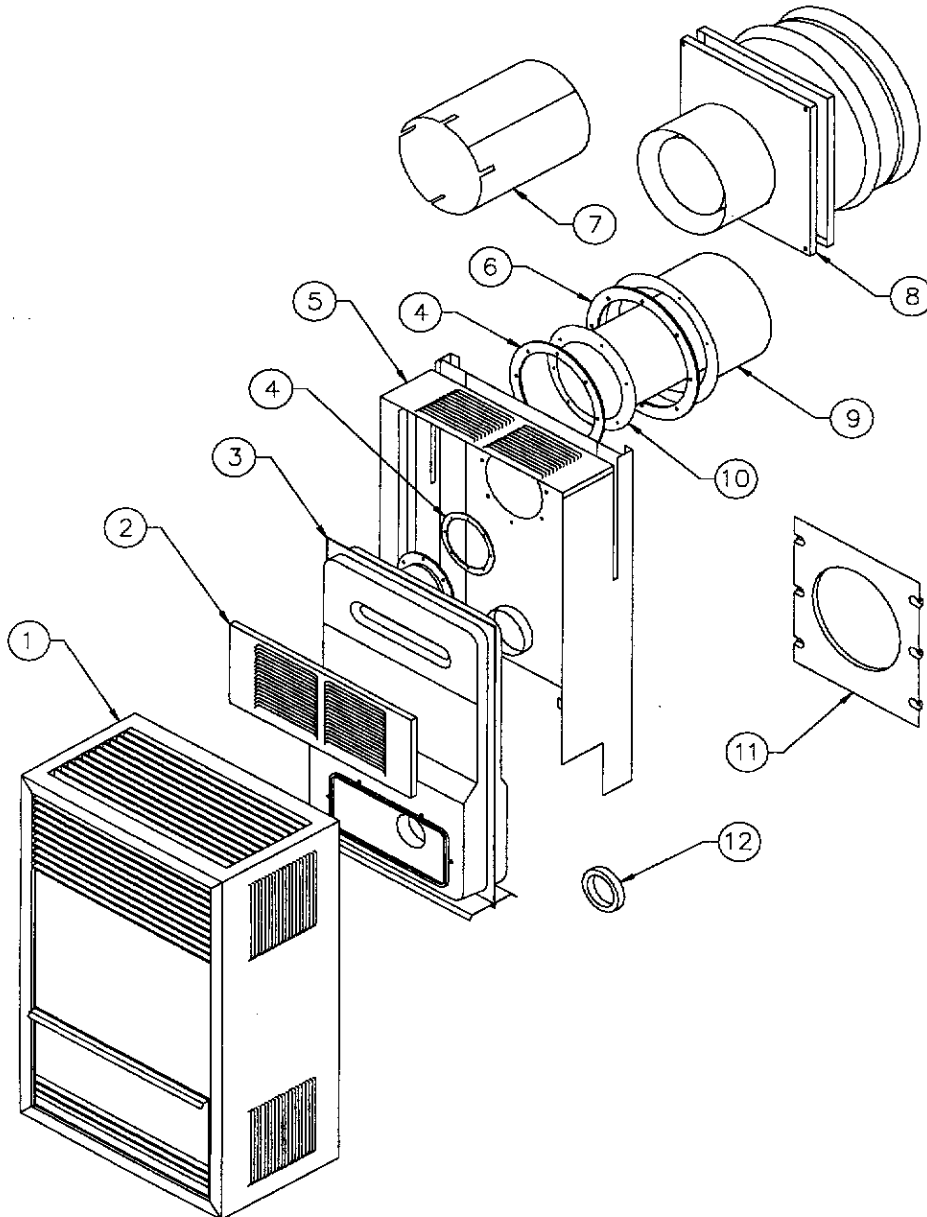
Troubleshooting

<i>Symptom</i>	<i>Possible Causes</i>	<i>Corrective Action</i>
7. Pilot outage problem.	A. Pilot flame may be low or blowing (high), causing safety to drop out. B. Broken or no gaskets or control or pilot observation doors.	Adjust pilot flame. Check vent tube and air inlet tube. Be sure pilot lighting door is closed. Pilot orifice or aerating hole may be plugged (check for spiders, webs or other material). Clean and replace.
8. Abnormal operation.	A. Delayed ignition - pilot flame may be too low. B. Expansion noise ticking.	Adjust pilot flame. Casing may be distorted by being fastened to an uneven wall. Vent tube and air inlet tube may be in a bind with a vent cap assembly. Be sure hole through the wall is correct and parts fit without binding.
9. Noisy Blower.	A. Housing rattling. B. Blower dirty. C. Blower wheel bent.	Tighten blower screws. Clean blower wheel. Straighten or replace.
10. Blower does not run.	A. Fan switch not set. B. Check bearings.	Select fan speed. Add oil as outlined in blower instructions.

Replacement Parts List

Ref. Number	Description	1403621	1403622	1403621.5
		1433621	1433622	1433621.5
		1453621	1453622	1453621.5
1	Face Panel	4309	4309	4309
2	Combustion Chamber Shield	8A72	8A72	8A72
3	Combustion Chamber	8B77	8B77	8B77
4	Flue Tube Gasket (2 Required)	P147001	P147001	P147001
5	Inner Casing	8B62	8B62	8B62
6	Air Inlet Gasket	P147000	P147000	P147000
7	Air Inlet Shield (Standard Maximum 9" Thick Wall)	6C54-1	6C54-1	6C54-1
8	Vent Cap	9306	9306	9306
9	Air Inlet Collar (Standard Maximum 9" Thick Wall)	6C51	6C51	6C51
10	Flue Extension (Standard Maximum 9" Thick Wall)	8A51	8A51	8A51
11	Mounting Spacer Plate	8B64	8B64	8B64
12	Air Inlet Gasket	P121800	P121800	P121800

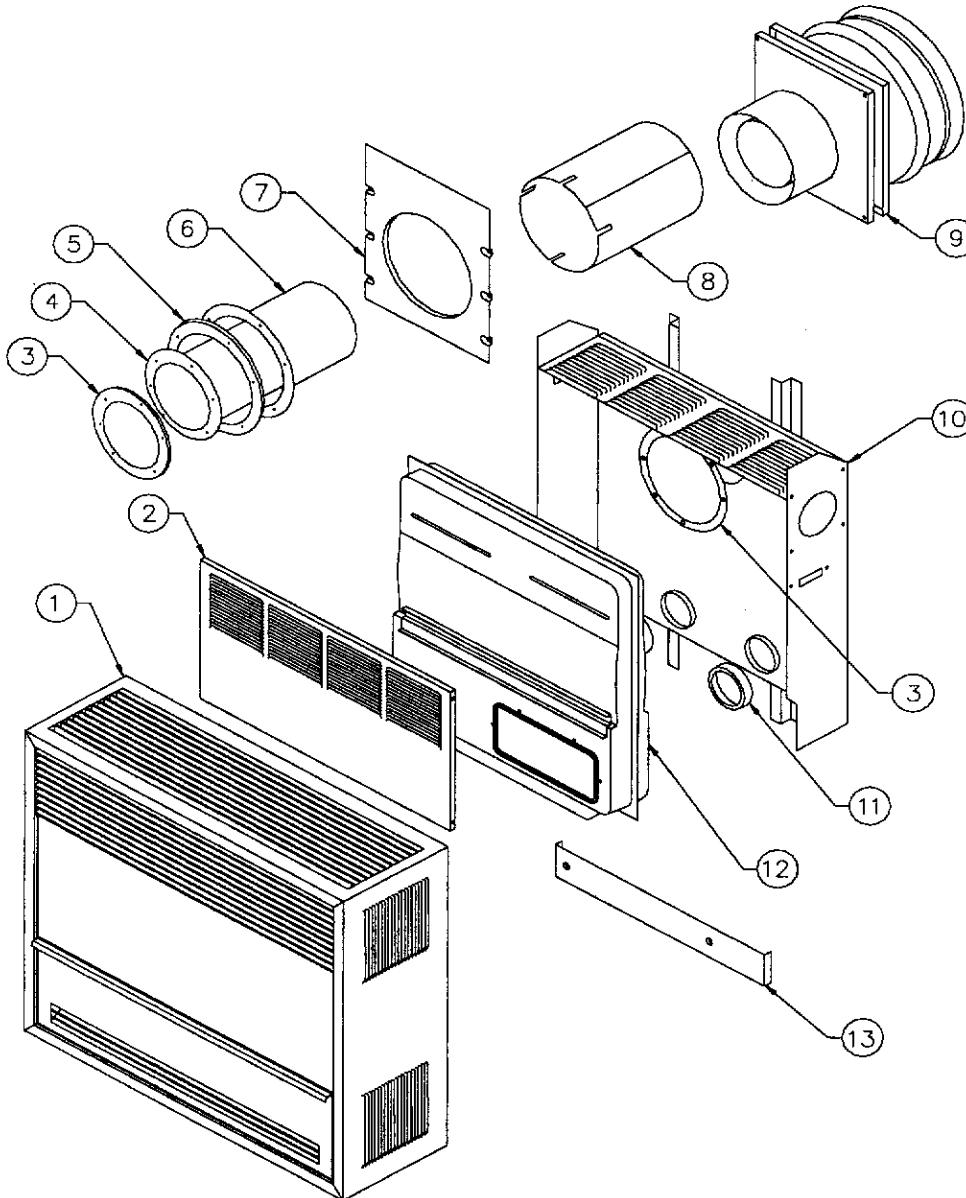
Note: Screws and bolts are standard hardware items and may be purchased locally.



Replacement Parts List

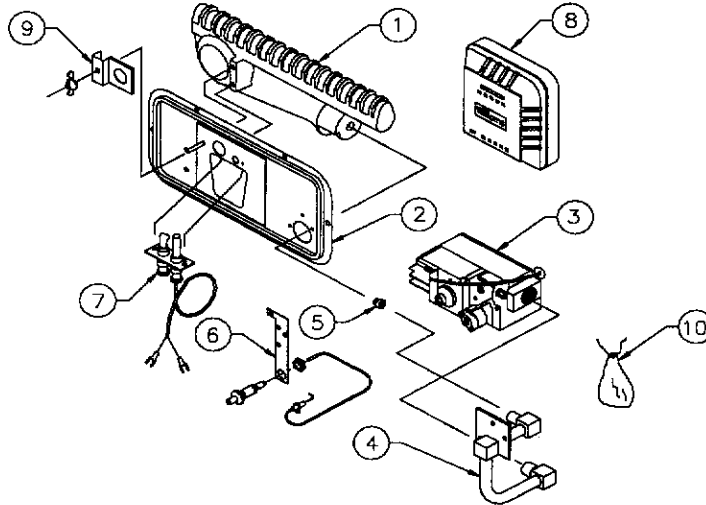
Ref. Number	Description	2203621	2203622	3003621	3003622	3003621.5
		2233621	2233622	3033621	3033622	3033621.5
		2253621	2253622	3053621	3053622	3053621.5
1	Face Panel	4313	4313	4313	4313	4313
2	Combustion Chamber Shield	6B149	6B149	6B149	6B149	6B149
3	Flue Tube Gasket (2 Required)	P147001	P147001	P147001	P147001	P147001
4	Flue Extension (Standard Maximum 9" Thick Wall)	8A51	8A51	6A190	6A190	6A190
5	Air Inlet Gasket	P147000	P147000	P147000	P147000	P147000
6	Air Inlet Collar (Standard Maximum 9" Thick Wall)	6C51	6C51	6C51	6C51	6C51
7	Mounting Spacer Plate	6C66	6C66	6C66	6C66	6C66
8	Air Inlet Shield (Standard Maximum 9" Thick Wall)	6C54-1	6C54-1	6C54-1	6C54-1	6C54-1
9	Vent Cap	9306	9306	9306	9306	9306
10	Inner Casing	6D20	6D20	6D20	6D20	6D20
11	Air Inlet Gasket (2 Required)	P121800	P121800	P121800	P121800	P121800
12	Combustion Chamber	6304	6304	6304	6304	6304
13	Leg Cover Plate	6B25	6B25	6B25	6B25	6B25

Note: Screws and bolts are standard hardware items and may be purchased locally.

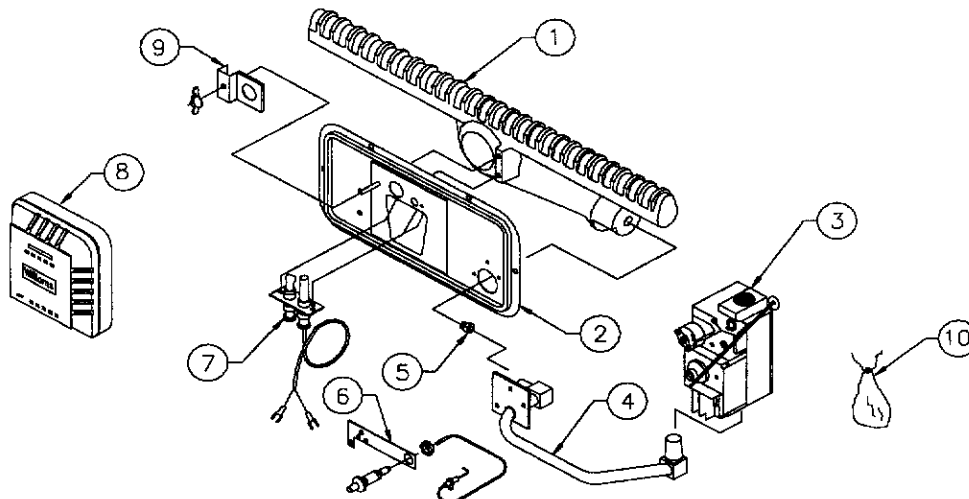


Replacement Parts List

Ref. Number	Description	1403621	1403622	1403621.5
		1433621	1433622	1433621.5
		1453621	1453622	1453621.5
1	Burner	P168400	P168400	P168400
2	Control Door with 7811 Gasket	8A103	8A103	8A103
3	Gas Valve	P295201A	P295200A	P304800
4	Manifold with P147200 Gasket	8A57	8A57	8A57
5	Burner Orifice	P090558	P090551	P090558
6	Manual Spark Igniter	P322400	P322400	P322400
7	Pilot	P322399	P322398	P322399
8	Thermostat	P322016	P322016	P322016
9	Observation Door with P100100 Gasket	12B40	12B40	12B40
10	Gas Conversion Kit to Natural Gas Mobile Home	-	-	7673



Ref. Number	Description	2203621	2203622	3003621	3003622	3003621.5
		2233621	2233622	3033621	3033622	3033621.5
		2253621	2253622	3053621	3053622	3053621.5
		1	Burner	P147400	P147400	P147400
2	Control Door with 7811 Gasket	8A103	8A103	8A103	8A103	8A103
3	Gas Valve	P295201A	P295200A	P295201A	P295200A	P304800
4	Manifold with P147200 Gasket	6B76	6B76	6B76	6B76	6B76
5	Burner Orifice	P090555	P090545	P090553	P090542	P090553
6	Manual Spark Igniter	P322400	P322400	P322400	P322400	P322400
7	Pilot	P322398	P322399	P322398	P322399	P322398
8	Thermostat	P322016	P322016	P322016	P322016	P322016
9	Observation Door with P100100 Gasket	12B40	12B40	12B40	12B40	12B40
10	Gas Conversion Kit to Natural Gas Mobile Home Models Only	-	-	-	-	7674



Note: Screws and bolts are standard hardware items and may be purchased locally.

Your Warranty

The Manufacturer, Williams Furnace Co., warrants this wall furnace or heater to the original purchaser under the following conditions:

Limited One-Year Warranty

1. Any part thereof which proves to be defective in material or workmanship within one year from date of original purchase for use will be repaired or replaced at the Manufacturer's option, FOB its factory.
2. No liability is assumed by the Manufacturer for removal or installation labor costs, nor for freight or delivery charges.

Limited Extended Warranty

1. In addition to the above limited one-year warranty on the complete unit, any combustion chamber which burns out or rusts under normal installation, use or service conditions during a period of nine years following expiration of the one-year warranty period will be exchanged for a like of functionally similar part, FOB Manufacturer's factory.
2. No liability is assumed by the Manufacturer for removal or installation labor costs, nor for freight or delivery charges.

Limitations

1. THIS LIMITED WARRANTY IS THE ONLY WARRANTY MADE BY THE MANUFACTURER. IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE LIMITED TO THE SAME ONE-YEAR TERM AS THIS EXPRESS WARRANTY. UNDER NO CIRCUMSTANCES SHALL THE MANUFACTURER BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, SPECIAL OR CONTINGENT DAMAGES OR EXPENSES ARISING DIRECTLY OR INDIRECTLY FROM ANY DEFECT IN THE PRODUCT OR ANY COMPONENT OR FROM THE USE THEREOF. THE REMEDIES SET FORTH HEREIN ARE THE EXCLUSIVE REMEDIES AVAILABLE TO THE USER AND ARE IN LIEU OF ALL OTHER REMEDIES.

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

2. This warranty does not include any charge for labor or installation.
3. This warranty does not extend to painted surfaces nor to damage or defects resulting from accident, alteration, misuse or abuse, or improper installation.
4. This warranty does not cover claims which do not involve defective workmanship or materials.

Duties Of The Consumer

1. The heating equipment must be installed by a qualified installer and operated in accordance with the installation and homeowners instructions furnished with the equipment.
2. Any travel, diagnostic costs, service labor, and labor to repair the defective unit will be the responsibility of the owner.
3. A bill of sale, cancelled check, payment record or permit should be kept to verify purchase date to establish the warranty period.
4. Have the installer enter the requested information in the space below.

General

1. The Manufacturer neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with said equipment.
2. Service under this warranty should be obtained by contacting your dealer. Provide the dealer with the model number, serial number and purchase date verification.
3. If, within a reasonable time after contacting your dealer, satisfactory service has not been received, contact: Customer Service Department, 250 West Laurel St., Colton, CA 92324, for assistance.
4. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE.

Installation Information

Model No. _____ Serial No. _____

Original Purchaser _____

Address _____

City and State _____ Zip _____

Dealer _____

Address _____

City and State _____ Zip _____

Installation Date _____ Installer _____

Installer: Please leave these instructions with the consumer.

Consumer: Please retain these instructions for future reference.

How to Order Repair Parts

All parts listed may be ordered from your equipment supplier. The model and serial number will be found on the rating plate near the gas valve. When ordering parts, always provide:

1. Model number
2. Serial number
3. Part number and description