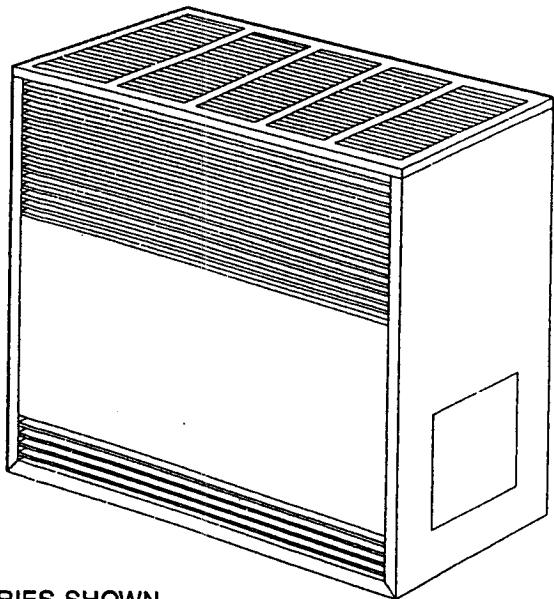




# INSTALLATION & OPERATING INSTRUCTION MANUAL

**MODEL NOS:  
FOR NAT. GAS ONLY**  
 2001612; 2001622  
 3501512; 3501522  
 3501912; 3501922  
 5001512; 5001522  
 5001912; 5001922  
 6501512; 6501522  
 6501912; 6501922



350 MODEL SERIES SHOWN

**MODEL NOS.  
FOR L.P. GAS ONLY**  
 2001611; 2001621  
 3501511; 3501521  
 3501911; 3501921  
 5001511; 5001521  
 5001911; 5001921  
 6501511; 6501521  
 6501911; 6501921

## READ THIS OWNERS MANUAL CAREFULLY BEFORE YOU INSTALL YOUR NEW WILLIAMS VENTED ROOM HEATER

**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:** Do not install any of these furnaces (Natural or L.P. Gas) in mobile homes, trailers, or recreational vehicles.

**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.

## IMPORTANT

TO THE PURCHASER: Keep this warranty and the installation and homeowner's instructions for your future reference.

## LIMITED 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 heat exchanger which burns out or rusts under normal installation, use and service conditions during a period of nine years following expiration of the one-year warranty period will be exchanged for a like or 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 limitations 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 homeowner's 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, 225 Acacia 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. \_\_\_\_\_

Orig. Purchaser \_\_\_\_\_

Address \_\_\_\_\_

City and State \_\_\_\_\_ Zip \_\_\_\_\_

Dealer \_\_\_\_\_

Address \_\_\_\_\_

City and State \_\_\_\_\_ Zip \_\_\_\_\_

Installation date \_\_\_\_\_ Signed by \_\_\_\_\_ (Dealer or authorized representative who certifies that this appliance has been installed in accordance with Manufacturer's instructions and local codes.)

## **A Word From The Manufacturer**

Dear Customer,

To set up our furnace assembly procedures, several hundred quality assurance, safety audit and design performance tests have been conducted according to the standards provided by the American National Standards Institute, the Department of Energy and our certification agency — the American Gas Association Laboratories.

This was done to assure you of receiving the best value and most reliable appliance of its type available today.

We are confident that your Williams furnace can provide you years of low cost, efficient, heating comfort.

Thank you for purchasing a Williams furnace.

Sincerely,  
Employees of Williams Furnace Company

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### **Introduction**

Please read our instructions before you install and use your heater. This will help you obtain the full value from this heater. It could help you avoid needless service costs, if the answer to the problem is found within this instruction manual.

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### **Basic Description**

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 vented room heater.

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

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

Warmed air is discharged into the room in which the heater is located.

The heater contains a single multi-slot gas burner.

Combustion air is drawn in from the room where the heater is located and is vented out of the heater vertically through vent piping to a roof vent top. (Vent equipment is not supplied with heater).

The heat exchanger is built of heavy gauge steel treated for corrosion resistance. The heater cabinet is also constructed of heavy gauge steel and has an enamel paint finish.

The heater controls are located behind an access door on the side of the heater. All models are equipped with AGA listed gas valves and pilots.

#### **NOTE, ALL MODELS:**

This appliance is equipped with a vent safety shutoff system, designed to protect against improper venting of combustion products. Operation of this room heater when not connected to a properly installed and maintained venting system or tampering with the vent safety shutoff system can result in carbon monoxide (CO) poisoning and possible death.

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### **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."

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

## 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. 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 heater in an alcove.
3. DO NOT install these heaters in a travel trailer, recreational vehicle or mobile home.
4. MAINTAIN all clearances specified in section "Locating Room Heater" and "Vent Installation."
5. BE SURE heater 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" 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 col-

umn. The maximum inlet gas supply pressure is 13" water column.

7. ANY SAFETY SCREEN, GUARD OR PARTS REMOVED FOR SERVICING FROM THIS APPLIANCE MUST BE REPLACED PRIOR TO OPERATING THE APPLIANCE TO AVOID PROPERTY DAMAGE, BODILY INJURY OR DEATH.
8. INSTALL the heater vent directly to the outdoors, so that harmful 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. See page 7. The flow of this air to the heater must not be blocked.
10. 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.
11. ALLOW heater to cool before servicing. Always shut off electricity and gas to heater when working on it. This will prevent any electrical shocks or burns.
12. DUE TO HIGH TEMPERATURES, locate the heater out of traffic and away from furniture and draperies.
13. ALERT children and adults to the hazards of high surface temperature and to keep away to avoid burns or clothing ignition.
14. CAREFULLY supervise young children when they are in the same room with the heater.
15. DO NOT place clothing or other flammable material on or near heater.
16. 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 on the 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.
17. BEFORE INSTALLING optional blower: To avoid electrical shock, turn off electrical circuits that pass through the wall where you are going to install the heater.
18. 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 heater and while cutting or drilling holes in wood and/or sheet metal.
19. 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 HEATER IF ANY PART HAS BEEN UNDER WATER. IMMEDIATELY CALL A QUALIFIED SERVICE TECHNICIAN TO INSPECT THE HEATER AND TO REPLACE ANY PART OF THE CONTROL SYSTEM AND ANY GAS CONTROL WHICH HAS BEEN UNDER WATER.

**LOCATING THE HEATER — MINIMUM FRESH AIR OPENING IS 1 SQUARE INCH PER 1,000 BTU/HR.**

**WARNING:** Gas burning appliances require air for combustion and proper venting. Minimum fresh air opening of 1 square inch per 1000 BTU per hour input rating must be provided for ventilation. **EXAMPLE:** A 30,000 BTU per hour input unit requires the equivalent of a 30 inch wide window be open 1 inch for safe operation.

- A. In choosing the location for the heater, the following factors should be considered:
  1. Convenience to gas supply.
  2. Arrangement of rooms or area to be heated.
  3. Probable location of furniture.
  4. General appearance.
  5. Safe clearance from anything that could catch fire.
- B. Locate the heater centrally in the area which it is to heat. The ideal location is at the source of cold air, which is an outside wall. If the heater is on an outside wall, the cold air will be warmed before it moves through the room.
- C. Place the heater where the air will circulate freely throughout the area to be heated. If one heater is intended to heat the entire house, it is advisable to consider the installation of grilles immediately below the ceilings to permit circulation of hot air from room to room. Return air grilles are also desirable.
- D. Be certain the heater is placed where the air is free to circulate around it. Never install the heater in a wall recess. The minimum clearance required to any wall or object can be found on the rating plate located inside the furnace control door on the base plate. We recommend a 24-inch min. clearance from the burner access door for the ease of lighting and for observation of pilot and burner flames.
- E. **NOTE:** Heater must be installed so that drafthood is in the same pressure zone as the combustion air.
- F. The heater may be placed directly on wood floors. Heavy pile or shag rugs may restrict normal air flow. Some floor coverings discolor easily from even low heat. To assure safe operation, a floorboard extending the full depth and width of the appliance must be placed under the heater.
- G. Do not place heater where curtains, draperies, or any other material may come into contact with any part of the heater.

**GAS CONTROLS**

- A. All models are regulated on Natural and L.P. gases. The regulator is built into the gas control valve.
- B. All models are equipped with a 100% pilot safety shut-off and a vent safety shut-off system.
- C. **CAUTION:** Do not connect 115V electrical service line to gas control valve or wall thermostat.

**GAS SUPPLY**

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.

Gas pressures and input 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.

Orifice change may be required to suit gas supplied. Check with your WILLIAMS service department.

For heater located at elevations between sea level and 4500 feet, the measured input must not be greater than the input shown on the rating plate of the heater. For elevations above 4500 feet, the measured input must not exceed the input of the rating plate reduced by 4 percent for each 1000 feet that the heater is above sea level.

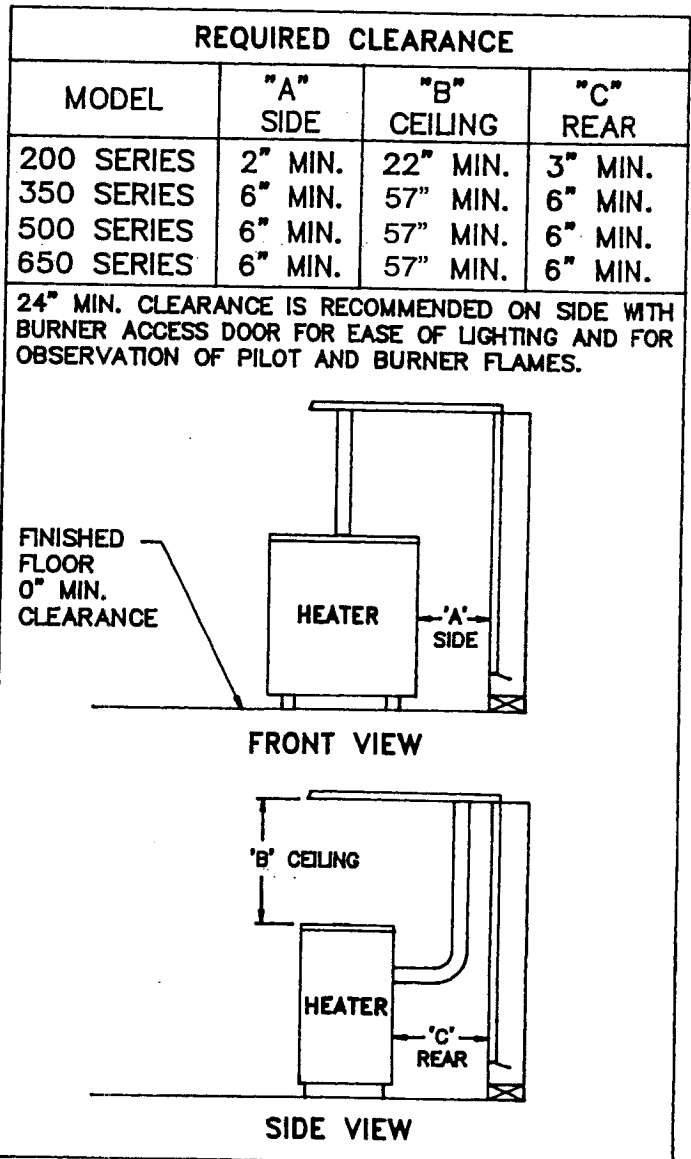


Fig. 1

## PIPING THE GAS TO THE HEATER

State and local authorities have established codes regulating the installation of gas burning equipment. Consult your gas supplier or gas company for complete information. In the absence of local codes, all aspects of the installation must comply with the national fuel gas code ANSI Z223.1. In Canada: Follow CAN/CGA-B149.1(2) Canadian Standard.

- A. Use 1/2-inch pipe or semi-rigid tubing for natural and liquefied petroleum gases. **DO NOT USE FLEXIBLE HOSE.** Appliance connectors of corrugated metal tubing and fittings that are listed by a nationally recognized testing agency may be used if accepted by the local code authorities. **FOLLOW THE MANUFACTURERS INSTALLATION INSTRUCTIONS.** This type of connector may only be installed in the room where the heater is located.
- B. A manual shut-off valve and union must be installed in the gas supply line just ahead of the connection to the heater. The manual valve must include a 1/8-inch NPT plugged tapping accessible for connection of a test gauge.
- C. Unions in the gas supply lines shall be of the ground joint type. Compounds used on threaded pipe joints must be resistant to the action of liquefied petroleum gases.

### WARNING:

WHEN CONNECTING FIELD PIPING, USE A SECOND WRENCH TO KEEP THE HEATER VALVE FROM TURNING. SUPPORT FIELD PIPING PROPERLY, STRESS AND OVERTIGHTENING COULD DAMAGE THE GAS VALVE AND RESULT IN DANGEROUS GAS LEAKS WHICH CAN CAUSE DANGEROUS CONDITIONS INCLUDING PROPERTY DAMAGE, BODILY INJURY, AND EVEN DEATH.

- D. A dripleg Fig. 2 should be installed to constitute a trap to catch any condensate that may be in the gas. The dripleg should be readily accessible for cleaning.
- E. The heater must be disconnected from the gas supply system and from the heater individual shut-off valve when the system is tested at a pressure in excess of 1/2 PSIG.
- F. **IMPORTANT: CHECK ALL FACTORY AND FIELD PIPE JOINTS FOR GAS LEAKS BEFORE AND AFTER LIGHTING THE HEATER. USE A SOAP SOLUTION. NEVER USE A MATCH OR OPEN FLAME. CORRECT ANY LEAK, NO MATTER HOW SMALL.**
- G. **IMPORTANT: PIPING SUPPLY SHALL BE SUPPORTED TO PREVENT SAGGING DAMAGE TO CONTROLS AND HAZARDOUS GAS LEAKS. TO PREVENT FREEZING WHERE THE SUPPLY PIPE IS EXPOSED TO COLD AIR, WRAP THE PIPE OR RUN IT UNDERGROUND.**

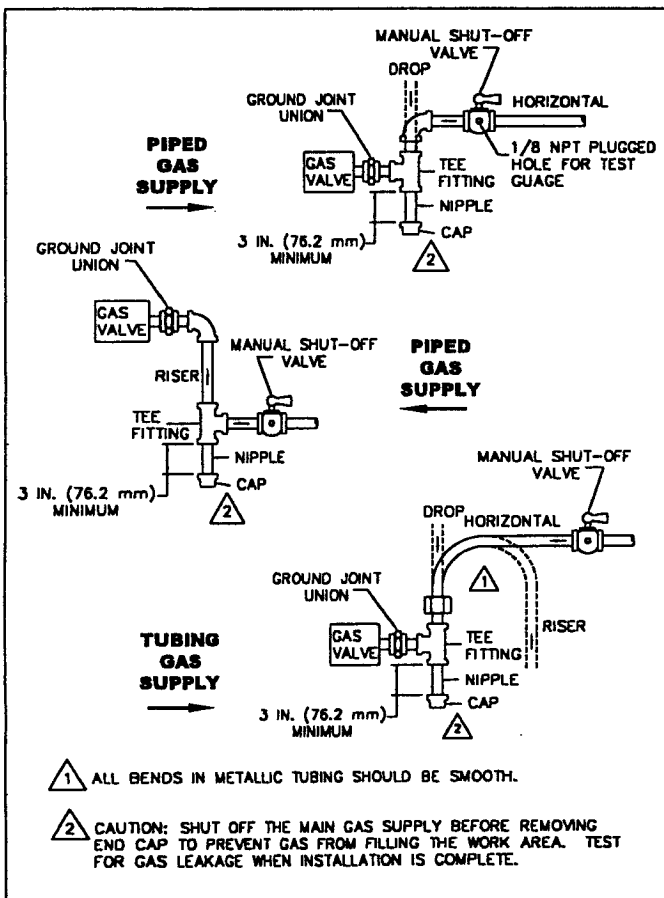


Fig. 2

### IMPORTANT

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/CGA B149.)

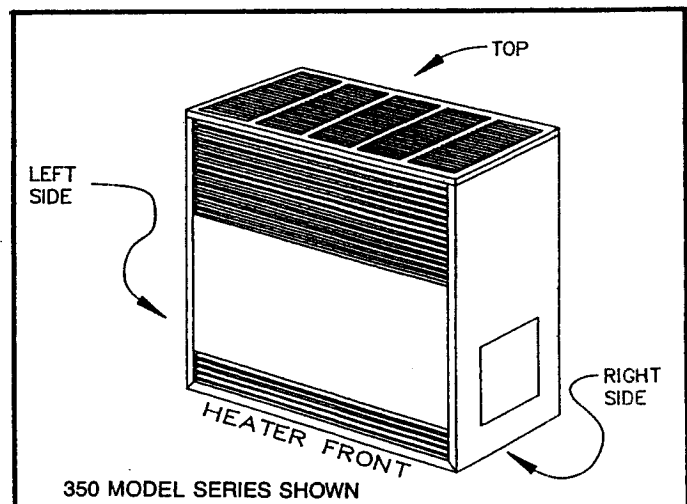
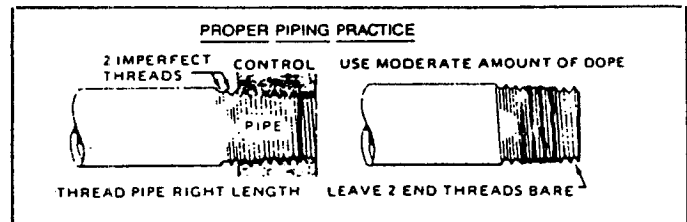
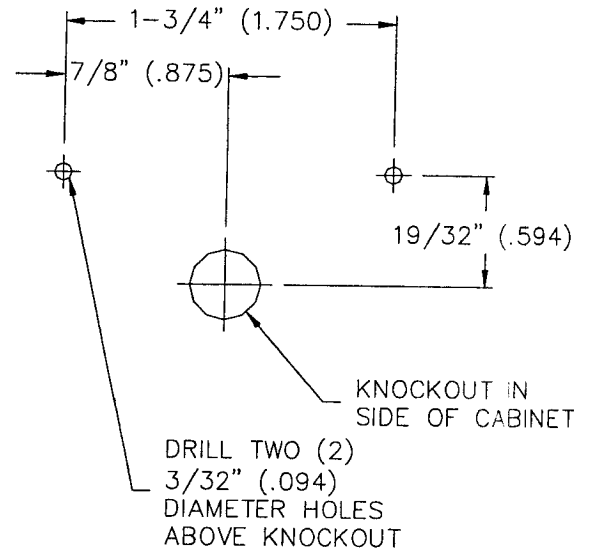


Fig. 3

## Cabinet Mounted Thermostat

**Models:** 200162(1,2); 350(1,2)(5,9)2(1,2); 500(1,2)(5,9)2(1,2) & 650(1,2)(5,9)2(1,2)

1. Locate the knockout on the desired side (right or left hand) of furnace to mount the thermostat. Remove knockout by tapping lightly with a screwdriver. It will be also necessary to cut the inside panel insulation about a 1/2" for clearance to the knockout.
2. Drill two (2) 3/32" (.0937) thermostat mounting holes into side of cabinet. See illustration to the right.
3. Cut the thermostat wire to the desired length. See chart below.
4. Connect thermostat wires to thermal screws on the back of the thermostat base. See the instructions packed with the thermostat.
5. Feed the thermostat wires thru the knockout and route thru metal clip to the gas valve. The 200162(1,2) model does not have metal clip. **IMPORTANT: KEEP THERMOSTAT WIRE AWAY FROM COMBUSTION CHAMBER.**
6. Mount the thermostat to the side of cabinet with screws provided. Replace thermostat cover.
7. Connect thermostat wire to the gas valve as shown in your instruction manual.



**LOCATION OF THERMOSTAT MOUNTING HOLES**  
(Not to scale)

### CHART FOR THERMOSTAT WIRE LENGTH

Model number	Thermostat mounted on right side of cabinet	Thermostat mounted on left side of cabinet
200162(1,2)	31 inches	66 inches
350(1,2)(5,9)2(1,2)	45 inches	62 inches
500(1,2)(5,9)2(1,2)	47 inches	76 inches
650(1,2)(5,9)2(1,2)	49 inches	82 inches

**WARNING**

**DANGER OF ILLNESS  
BODILY INJURY OR DEATH**  
THE FURNACE AND ANY OTHER FUEL BURNING APPLIANCE MUST BE PROVIDED WITH ENOUGH FRESH AIR FOR PROPER COMBUSTION AND VENTILATION OF FLUE GASES. MOST HOMES WILL REQUIRE THAT OUTSIDE AIR BE SUPPLIED INTO THE FURNACE AREA.

**WARNING**

**DANGER OF PROPERTY DAMAGE,  
BODILY INJURY OR DEATH**  
EVEN WHEN HOUSE MEETS REQUIREMENTS FOR UNCONFINED SPACE WITH ADEQUATE AIR INFILTRATION IT IS RECOMMENDED THAT A FRESH AIR INTAKE BE INSTALLED TO LESSEN THE POSSIBLE DANGERS FROM ANY FUTURE CHANGES ON THE HOME.

**VENTING**

**WARNING:** This heater is equipped with a vent safety shut-off system to protect against improper venting of its combustion products. Tampering with or removal of this control will void the limited warranty and can result in carbon monoxide (CO) poisoning and possible death.

- A. An effective flue is necessary to carry off water vapor, carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), and other products of combustion. For proper venting, follow the following basic rules for gravity venting, which are:
  - 1. Keep the flue gases hot.
  - 2. Follow the vent manufacturer's installation instructions.
  - 3. Select the proper vent size.
  - 4. Provide constant fresh air replacement.
- B. For new installation, it is recommended that a Type "B" vent in accordance with its listing be used. A Type "B" vent is one made of non-combustible, corrosion resistant material of sufficient thickness and cross sectional area and heat insulating quality to avoid excess temperature on adjacent combustible material and certified by a nationally recognized testing agency. Existing brick flues should be lined to provide an effective vent. Brick chimneys, even in good repair, may be too large and will not provide sufficient draft to effectively vent a heater.
- C. Use vent pipe of the same size as the outlet on back of heater. In no case should a smaller vent be used.
- D. Avoid a horizontal run of vent pipe whenever possible. When a horizontal run is necessary, the pipe must pitch upward at least 1/4" to the foot, and must be supported securely and joints fastened by sheet metal screws or rivets. Under no circumstances should the vent run downhill.
- E. Never put a damper or barometric draft control in a gas vent pipe.
- F. Never end a vent in an open attic or run vent through a wall to the outside without extending it upward above the roof.
- G. Always terminate vent with an approved cowl.
- H. **WARNING: ALWAYS SECURE VENT PIPE TO OUTLET ON BACK OF HEATER WITH A SHEET METAL SCREW.**

**IMPORTANT:**

Inspect venting system prior to each heating season.

**WARNING**

**DANGER OF ILLNESS,  
BODILY INJURY OR DEATH**  
DRAFTHOOD SPILLAGE WITH UNOBSTRUCTED VENTS, INDICATES THAT ADDITIONAL AIR MUST BE BROUGHT INTO THE STRUCTURE FROM THE OUTSIDE. KEEP A WINDOW OPEN (MINIMUM 2 INCHES) NEAR THE APPLIANCE UNTIL A PERMANENT AIR DUCT IS INSTALLED.

**WARNING: DANGER OF PROPERTY DAMAGE, BODILY INJURY OR LOSS OF LIFE. DO NOT INSTALL FURNACE IN ANY AREA WHERE OXYGEN IS IN USE.**



# Thermostat Installation

Models with the last two digits "11" (or) "12" utilize a built-in thermostat control system operated by a heat sensing bulb located in the burner compartment.

## IMPORTANT

Handle the bulb with care. Do not kink the connecting tubing.

Models with the last two digits "21" (or) "22" are operated by a millivolt type thermostat. Current to the thermostat is supplied by the pilot generator. Anticipation settings are not required.

1. If an old thermostat is being replaced and is in a satisfactory location and the wiring appears to be in good condition, use existing wiring. If in doubt, use new wire.
2. If a new location is chosen or if this is a new installation, thermostat cable 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 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 cable or a stiff wire through wall until even with thermostat location.
6. Snag thermostat cable through hole and pull cable through hole in wall so that 6 inches of cable protrudes.
7. Route cable to heater.

## MOUNTING THE THERMOSTAT

1. To remove thermostat cover, squeeze both sides and lift.
2. Connect thermostat wires to the thermal 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. Be sure to level thermostat for best appearance, fasten thermostat base to wall through mounting holes with screws provided.
5. Replace the thermostat cover.

## CAUTION

Do not run wire in any location where it might be damaged. Avoid slicing thermostat wire unless the spliced wires are properly cleaned, soldered and taped.

## NOTE

Use #18 Ga. wire as supplied for maximum length of 20 feet. If longer length is needed, use #16 Ga. for maximum length of 25 feet.

Refer to installation instructions packed in the thermostat carton if you have any doubt about the above procedures. Connect thermostat wire, previously run to burner compartment from thermostat, to control valve as shown in Fig. 4.

## CAUTION

LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION. VERIFY PROPER OPERATION AFTER SERVICING.

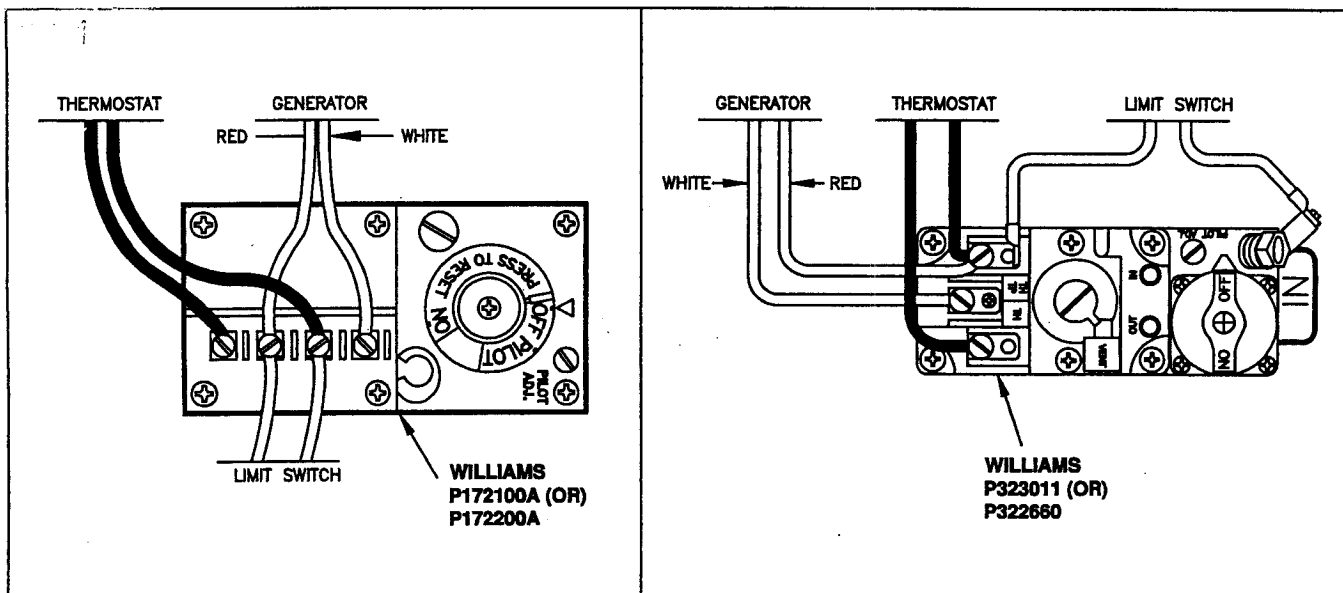


Fig. 4

## Start-Up Procedure

### WARNING

DANGER OF PROPERTY DAMAGE, BODILY INJURY OR DEATH. LIQUEFIED 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 STARTUP OF UNIT BEFORE THOROUGHLY VENTILATING AREA.

Check the heater operation as outlined in the following instructions. If any sparking, odors or unusual noises are encountered, shut off electric power immediately. Recheck for wiring errors, or obstructions in or near fan motor (if equipped).

### CHECK GAS INPUT AND PRESSURES

For heater located at elevations between sea level and 4500 feet, the measured input must not be greater than the input shown on the rating plate of the heater. For elevations above 4500 feet, the measured input must not exceed the input of the rating plate reduced by 4 percent for each 1000 feet that the heater is above sea level.

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

Rated input will be obtained on 2500 Btu propane at 10.5 inch manifold pressure and factory-sized orifices. If LP gas having a different heating value is supplied, orifices must be changed by a qualified service technician before the heater 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 of 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 WILLIAMS service department for proper orifice sizing.

### CHECK THERMOSTAT

Check thermostat operation. When set above temperature shown on the thermostat, the main burner should light. Make certain the thermostat turns off the heater when room temperature reaches the selected setting and starts the heater when room temperature falls a few degrees.

### CHECK THE GAS INPUT (NATURAL GAS ONLY)

#### WARNING

NATURAL GAS HEATING VALUE (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 HEAT EXCHANGER FAILURE, ASPHYXIATION, FIRE OR EXPLOSION, RESULTING IN DAMAGE, BODILY INJURY OR DEATH. REFER TO THE NATURAL FUEL GAS CODE (NFPA-54) TO BE SURE THE FURNACE IS BURNING FUEL AT THE PROPER RATE.

Underfiring could cause inadequate heat, excessive condensation or ignition problems. Overfiring could cause sooting flame impingement or overheating of heat exchanger.

Before starting natural gas input check, obtain heating value 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:

Step 1: Turn off gas supply to all other appliances except the furnace.

Step 2: With the heater 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 heater.

Step 3: Assuming natural gas with a heating value of 1000 Btu per cubic foot and 34 seconds per cubic foot as determined by step (2), 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 heater.

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

### CHECK PILOT BURNER

The pilot flame must envelop 1/2 to 5/8 inch of thermocouple or generator. See Fig. 5. Pilot flame is preset at the factory, so ordinarily does not require field adjustment. If adjustment is needed, see page 14.

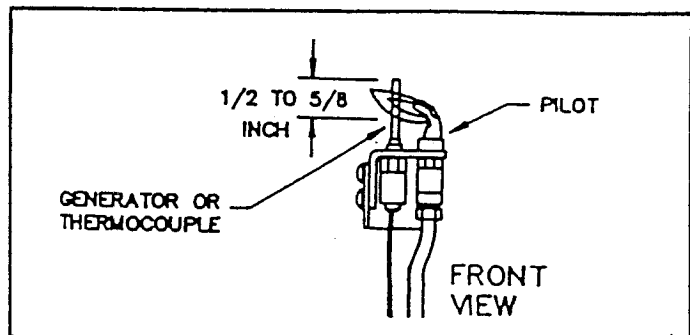


Fig. 5

## FOR YOUR SAFETY, READ BEFORE LIGHTING

### WILLIAMS GAS CONTROL VALVE P500419 OR P500420

**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 lighted 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.

**WHAT TO DO IF YOU SMELL GAS**

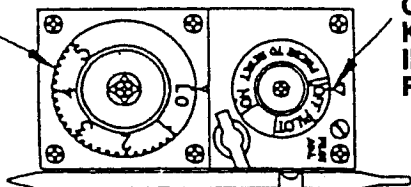
- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.

- If you cannot reach your gas supplier, call the fire department.
- 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, don't 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.

### OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above.
2. Turn off all electric power to the appliance (if applicable).
3. Open control access panel.
4. Turn temperature dial clockwise ↻ to "LO".
5. Push in gas control knob slightly and turn clockwise ↻ to "OFF."

**TEMPERATURE DIAL**



**GAS CONTROL KNOB SHOWN IN "OFF" POSITION**

9. Push in gas control knob slightly and turn counterclockwise ↻ to "PILOT."
10. Push in control knob all the way and hold in. Immediately light the pilot.



**THERMO-PILOT COUPLE BURNER**

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 to "OFF" and call your service technician or gas supplier.
11. Close pilot observation door, tighten wingnut (if equipped).
  12. Turn gas control knob counterclockwise ↻ to "ON". Sensing bulb is now activated. Set temperature dial to desired temperature (1 - 5).
  13. Close control access panel.
  14. Turn on all electric power to the appliance (if applicable).

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

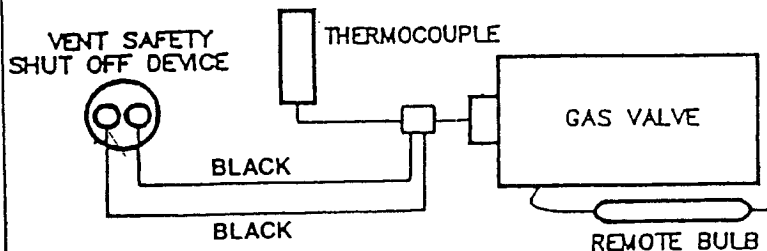
6. Wait five (5) minutes to clear out any gas, then smell for gas, including near the floor. If you then smell gas, stop! Follow "B" in the safety information above. If you don't smell gas, go to next step.
7. Loosen wingnut and open the pilot observation door (if equipped).
8. Find pilot—follow metal tube from gas control. The pilot is mounted on side of burner.

### TO TURN OFF GAS TO APPLIANCE

1. Turn off all electric power to the appliance if service is to be performed (if applicable).
2. Open control access panel.
3. Push in gas control knob slightly and turn clockwise ↻ to "OFF." Do not force.
4. Close control access panel.

**WARNING: DUE TO HIGH SURFACE TEMPERATURES — KEEP CHILDREN, CLOTHING, FURNITURE OR ANY COMBUSTIBLE MATERIAL AWAY FROM FURNACE.**  
**IMPORTANT: KEEP BURNER AND CONTROL COMPARTMENT CLEAN.**

#### CONNECTION WIRING DIAGRAM FOR BUILT-IN THERMOSTAT MODELS



**LEGEND**

— FACTORY WIRED LOW VOLTAGE

**NOTES:**

IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, USE ONLY 18GA. 4/84 INSULATION, 105°C. AWM COPPER WIRE OR EQUIVALENT. FOR FIELD - WIRED CONNECTIONS USE NO. 18 AWG WIRES RATED FOR AT LEAST 105°C (221°F)


## FOR YOUR SAFETY, READ BEFORE LIGHTING

### WILLIAMS GAS CONTROL VALVE P501704 OR P501705

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

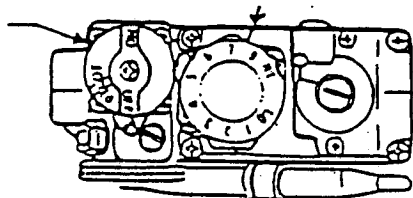
- A. This appliance has a pilot which must be lighted by hand. When lighting the pilot, follow these instructions exactly.
- B. BEFORE LIGHTING smell around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
- WHAT TO DO IF YOU SMELL GAS**
- Do not try to light any appliance.
  - Do not touch any electric switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- C. If you cannot reach your gas supplier, call the fire department.
- 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, don't 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.

## OPERATING INSTRUCTIONS

1. STOP! Read the safety information above.
2. Turn off all electric power to the appliance (if applicable).
3. Open control access panel.
4. Push in gas control knob slightly and turn clockwise  to "OFF."


TEMPERATURE DIAL

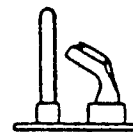
GAS CONTROL KNOB SHOWN IN "OFF" POSITION



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



5. 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 don't smell gas, go to the next step.
6. Loosen wingnut and open the pilot observation door (if equipped).
7. Find pilot—follow metal tube from gas control. The pilot is mounted on side of burner.

8. Turn knob on gas control counterclockwise  to "PILOT."
9. Push in control knob all the way and hold in. Immediately light the pilot.




THERMO-PILOT COUPLE BURNER

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 9.

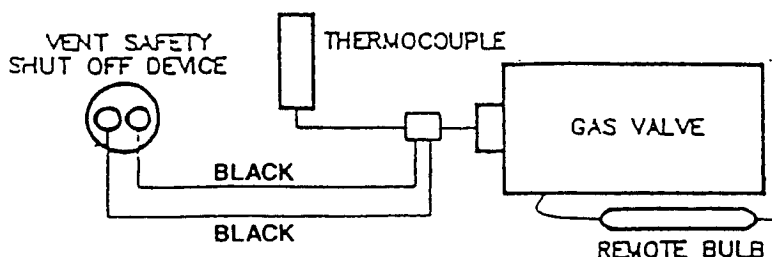
- If knob does not pop up when released, stop and immediately call your service technician or gas supplier.
  - If the pilot will not stay lit after several tries, turn the gas control knob to "OFF" and call your service technician or gas supplier.
10. Close pilot observation door, tighten wingnut (if equipped).
  11. Turn gas control knob counterclockwise  to "ON". Burner is now under control of the thermostatic sensing element. Turn temperature dial (numbered 1 through 8) counterclockwise  toward 8 to obtain desired temperature.
  12. Close control access panel.
  13. Turn on all electric power to the appliance (if applicable).

## TO TURN OFF GAS TO APPLIANCE

1. Turn off all electric power to the appliance if service is to be performed (if applicable).
2. Open control access panel.
3. Push in gas control knob slightly and turn clockwise  to "OFF." Do not force.
4. Close control access panel.

**WARNING:** DUE TO HIGH SURFACE TEMPERATURES — KEEP CHILDREN, CLOTHING, FURNITURE OR ANY COMBUSTIBLE MATERIAL AWAY FROM FURNACE.  
**IMPORTANT:** KEEP BURNER AND CONTROL COMPARTMENT CLEAN.

## CONNECTION WIRING DIAGRAM FOR BUILT-IN THERMOSTAT MODELS



### LEGEND

— FACTORY WIRE LOW VOLTAGE

NOTES: IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, USE ONLY 18GA, 4/84 INSULATION, 105° C. AWG COPPER WIRE OR EQUIVALENT. FOR FIELD — WIRE CONNECTIONS USE NO. 18 AWG WIRES RATED FOR AT LEAST 105° C (221° F)

## FOR YOUR SAFETY, READ BEFORE LIGHTING

### WILLIAMS GAS CONTROL VALVE P172100A & P172200A

**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 lighted 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.

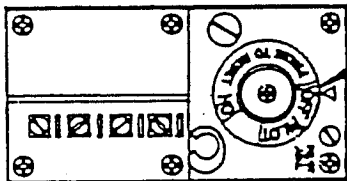
**WHAT TO DO IF YOU SMELL GAS**

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.

- If you cannot reach your gas supplier, call the fire department.
- 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, don't 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.

## OPERATING INSTRUCTIONS

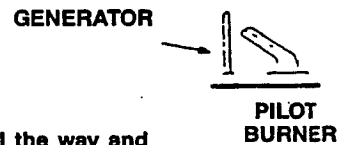
1. **STOP!** Read the safety information above.
2. Turn off all electric power to the appliance (if applicable).
3. Set the thermostat to lowest setting.
4. Open control access panel.
5. Push in gas control knob slightly and turn clockwise to "OFF"



**GAS CONTROL KNOB SHOWN IN "OFF" POSITION**

**NOTE:** Knob cannot be turned from "PILOT" to "OFF" unless knob is pushed in slightly. Do not 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 don't smell gas, go to the next step.
7. Loosen wingnut and open the pilot observation door (if equipped).
8. Find pilot—follow metal tube from gas control. The pilot is mounted on side of burner.



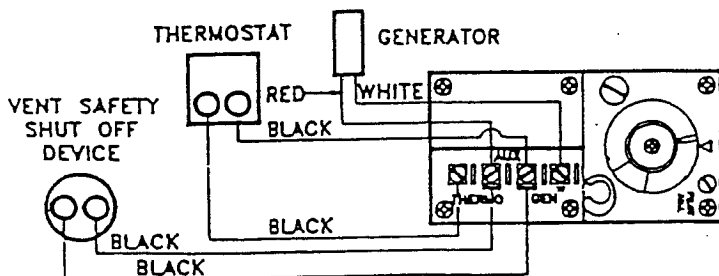
9. Push in gas control knob slightly and turn counterclockwise to "PILOT."
10. Push in control knob all the way and hold in. Immediately light the pilot. Continue to hold the control knob in for about one (1) minute after the pilot is lit. Release knob and it will pop back up. Pilot should remain lit. 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 to "OFF" and call your service technician or gas supplier.
11. Close pilot observation door, tighten wingnut (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. Turn off all electric power to the appliance if service is to be performed.
3. Open control access panel.
4. From "ON" position, depress and turn gas control knob clockwise to "OFF" position. Do not force.
5. Close control access panel.

**WARNING: DUE TO HIGH SURFACE TEMPERATURES — KEEP CHILDREN, CLOTHING, FURNITURE OR ANY COMBUSTIBLE MATERIAL AWAY FROM FURNACE.**  
**IMPORTANT: KEEP BURNER AND CONTROL COMPARTMENT CLEAN.**

### CONNECTION WIRING DIAGRAM FOR WALL THERMOSTAT MODELS



**LEGEND**

- FACTORY WIRED LOW VOLTAGE
- ⊗ SCREW TERMINAL LOW VOLTAGE

**NOTE:** IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, USE ONLY 18GA. 4/84 INSULATION, 105° C. AWG COPPER WIRE OR EQUIVALENT. FOR FIELD - WIRED CONNECTIONS USE NO. 18 AWG WIRES RATED FOR AT LEAST 105°C (221°F)

## FOR YOUR SAFETY, READ BEFORE LIGHTING

### WILLIAMS GAS CONTROL VALVE P323011 OR P322660

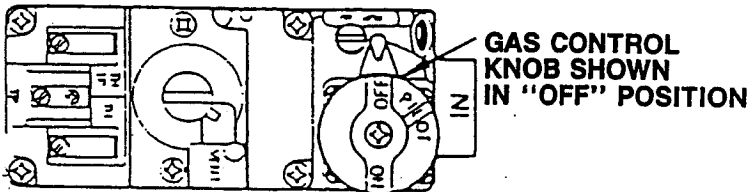
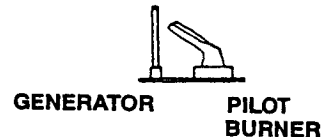
**WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

- A. This appliance has a pilot which must be lighted 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.
- WHAT TO DO IF YOU SMELL GAS**
- Do not try to light any appliance.
  - Do not touch any electric switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.
  - 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, don't 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.

## OPERATING INSTRUCTIONS

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

9. Turn knob on gas control counterclockwise to "PILOT."



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

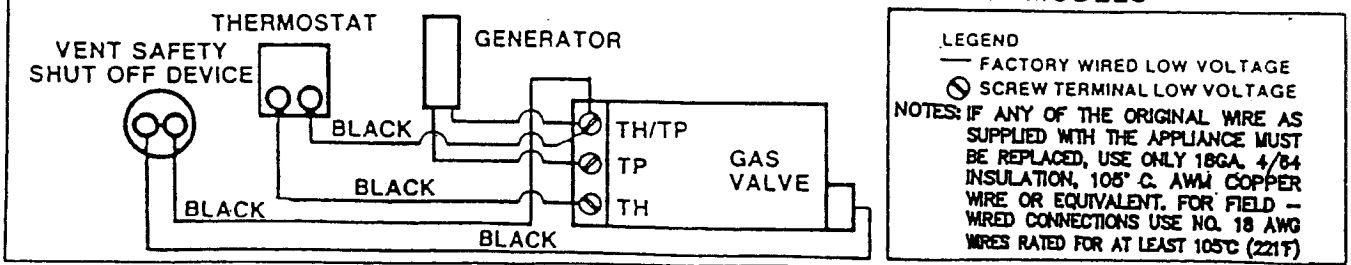
6. Wait five (5) minutes to clear out any gas, then smell for gas, including near the floor. If you then smell gas, stop! Follow "B" in the safety information above. If you don't smell gas, go to the next step.
7. Loosen wingnut and open the pilot observation door (if equipped).
8. Find pilot—follow metal tube from gas control. The pilot is mounted on side of burner.
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 to "OFF" and call your service technician or gas supplier.
11. Close pilot observation door, tighten wingnut (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. Turn off all electric power to the appliance if service is to be performed.
3. Open control access panel.
4. Push in gas control knob slightly and turn clockwise to "OFF" position. Do not force.
5. Close control access panel.

**WARNING: DUE TO HIGH SURFACE TEMPERATURES — KEEP CHILDREN, CLOTHING, FURNITURE OR ANY COMBUSTIBLE MATERIAL AWAY FROM FURNACE.**  
**IMPORTANT: KEEP BURNER AND CONTROL COMPARTMENT CLEAN.**

### CONNECTION WIRING DIAGRAM FOR WALL THERMOSTAT MODELS



# How To Care For Your Heater

## CABINET FINISH

Clean cabinet with damp rag. Never use abrasive cleaners. Cabinets are finished with heat resistant baked enamel — DO NOT refinish with wall paint.

## REMOVABLE CABINET TOP (350, 500, & 650 MODEL SERIES ONLY)

For ease of cleaning, access or replacement of internal parts, the top of this heater can be removed by following these steps: Refer to Fig. 6.

1. Remove (3) Brackets on rear of heater securing Cabinet Top to Back Plate.
2. Pull Cabinet Top forward and lift up. Reinstall Cabinet Top by reversing the procedures noted above.

NOTE: Take Special care to engage the (6) clips located on the bottom of the Cabinet Top into the top flange of heater sides.

## HEATER AREA

Keep the area near the heater clear and free from combustible materials, gasoline, and other flammable liquids and vapors.

## COMBUSTION AND VENTILATION AIR

The combustion and ventilation air supply must not be blocked

Do not put anything in or on the heater cabinet.

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.

## ANNUAL UPKEEP NEEDED

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

## CLEANING BLOWER (If equipped)

Shut off electricity. Clean any lint or dirt from fan blades, fan motor, and exposed air passages. Use a brush.

## PILOT BURNER

Light pilot using instructions in OPERATING YOUR FURNACE on pages 10 through 13. Leave thermostat at lowest setting.

Pilot flame should surround 1/2 to 5/8 inch of the generator or thermocouple tip. Refer to Fig. 5, page 9. If flame needs adjusting, do so as follows:

## ADJUST PILOT BURNER Refer to Fig. 7.

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.

## BURNER CLEANING

Check burner. If cleaning is required, contact a qualified service technician to clean and service burner.

NOTE: A properly adjusted burner with nearly all gases will produce a flame which has clear blue cone having a bluish-red or bluish-violet outer mantle. In the case of PURE BUTANE GAS, a very slightly yellow tip (1/4" maximum length) is usually present.

## CLEANING BURNER COMPARTMENT

Because cold air is attracted to the flame during furnace operation, a build up of lint from bedding and dust (etc.) in the burner area will occur each heating season. 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 struck during cleaning.

## DANGER

A BUILDUP OF ANY DUST, LINT OR FOREIGN MATERIAL IN THE PRIMARY AIR OPENING OF THE BURNER CAN INTERFERE WITH THE PROPER AIR GAS MIXTURE AND CAN RESULT IN A YELLOW FLAME WHICH CAN PRODUCE CARBON MONOXIDE AND SOOT. THIS CONDITION IF ALLOWED TO DEVELOP, CAN LEAD TO BODILY INJURY INCLUDING DEATH. IT IS IMPERATIVE THAT THE BURNER BE KEPT CLEAN.

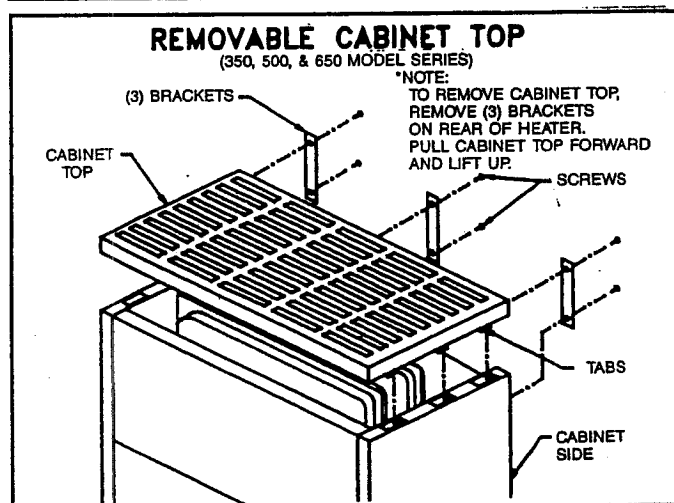


Fig. 6

## VENT SYSTEM

Make sure that no parts of the venting system are blocked or rusted. Clean or replace before using furnace.

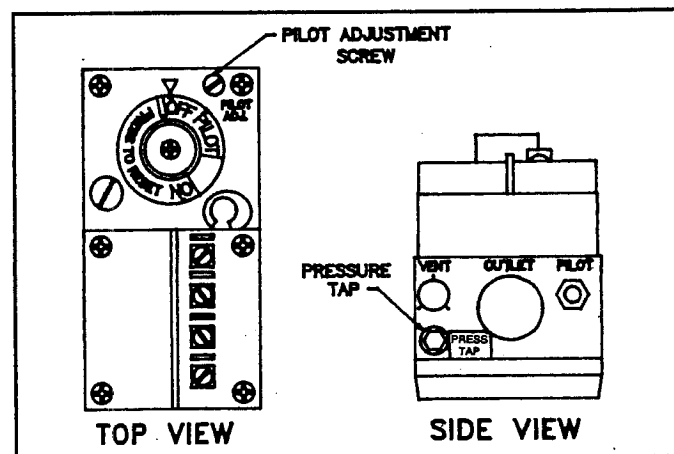


Fig. 7

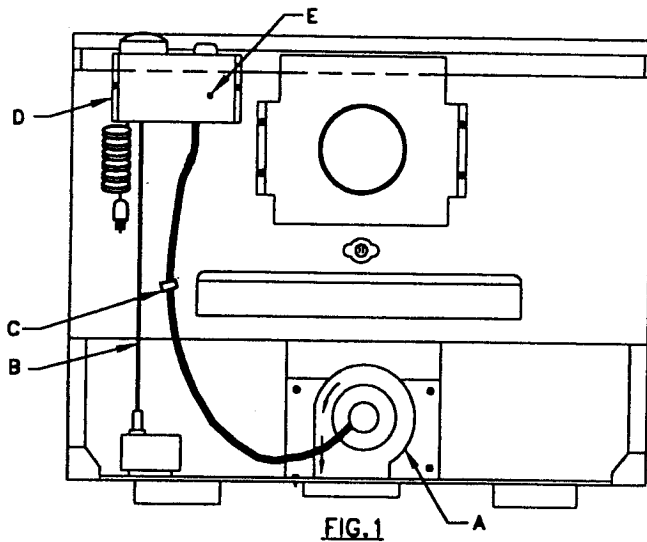
# INSTALLATION & OPERATING INSTRUCTION

## 2101 BLOWER ACCESSORY

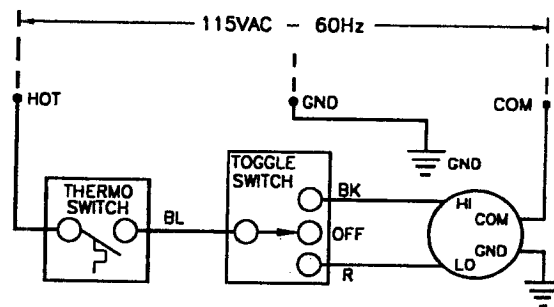
(AVAILABLE ONLY FOR 350, 500 & 650 MODEL SERIES)

### WARNING

DANGER OF PROPERTY DAMAGE, BODILY INJURY OR DEATH, TURN OFF ELECTRICAL POWER SUPPLY AT DISCONNECT SWITCH, FUSE BOX OR SERVICE PANEL BEFORE REMOVING OR WORKING ON FAN BY MAKING ADJUSTMENTS TO THE ON/OFF CYCLE TIMING OF THE ADJUSTABLE THERMO SWITCH. This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three prong receptacle. DO NOT CUT OR REMOVE THE PRONG. Oil motor every 6 months with a few drops of SAE 20 motor oil. NOTE: 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. If you are not familiar with wiring codes in general, have a competent electrician do this job.



A: MOTOR & BLOWER	E. ACCESS TO
B: CONTROL ROD	ADJUSTABLE
C: CABLE CLAMP	THERMO SWITCH
D: CONTROL BOX	



### WIRING DIAGRAM

### 2101 BLOWER ACCESSORY

LEGEND	---	HIGH VOLTAGE FIELD
	—	HIGH VOLTAGE FACTORY
	●	WIRE CONNECTOR FOR LINE VOLTAGE FACTORY WIRING
BK=BLACK BL=BLUE W=WHITE R=RED G=GREEN		
IF ANY OF THE ORIGINAL WIRES AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, IT MUST BE REPLACED WITH 105°C WIRE OR ITS EQUIVALENT.		

### A. BLOWER ACCESSORY KIT INSTALLATION

This accessory is installed on back of the heater and will increase circulation of warm air. A 115V outlet near the heater (within 5 feet to rear of heater) is required.

HOW TO INSTALL: REFER TO FIG. 1

- STEP 1.** Remove control rod (B) by detaching the cotter pin at base of rod on the gas valve. (Note: Save cotter pin for reattachment of control rod in step 3).
- STEP 2.** Remove existing temperature control bracket and replace with new control box (D), securing with (2) screws. See FIG.1 for location.
- STEP 3.** Replace control rod by inserting rod thru control box (D) and attaching base of control rod to gas valve with the cotter pin removed in step 1.
- STEP 4.** Place motor & blower (A) on furnace floor, securing with (4) screws as shown in FIG. 1. (Attach (3) screws to inlet duct and (1) screw to furnace floor).  
NOTE: Install by using the existing screw holes in the inlet duct and furnace floor only. Be sure to align opening in base of motor & blower with the opening in the furnace floor, opening on side for motor & blower should align with opening on inlet duct.
- STEP 5.** Secure cable clamp (C) to the furnace with a screw provided. (See FIG. 1)



# INSTALLATION & OPERATING INSTRUCTION

## 2101 BLOWER ACCESSORY

(AVAILABLE ONLY FOR 350, 500 & 650 MODEL SERIES)

### B. BLOWER OPERATION: REFER TO FIG. 2

1. Insert blower electrical plug (8) into 115V wall outlet.
2. Turn heater on and allow to operate for a few minutes. (Blower will operate when heater has warmed up).
3. Set blower speed select switch (15) to either "LO" or "HI" position to obtain desired air movement. (Blower will not operate if blower speed switch is set in "OFF" position).
4. Turn temperature dial (16) to desired temperature setting.

**DANGER— BEFORE MAKING ANY ADJUSTMENTS TO ADJUSTABLE THERMO SWITCH, MAKE SURE SERVICE CORD (POWER SUPPLY) IS DISCONNECTED.**

5. Use a small standard screwdriver and insert through the hole provided on wraparound control box (14) to reach slotted screw head dial on top of adjustable thermo switch (11).
6. Turn the dial on adjustable thermo switch (11) counterclockwise to shorten the cycle time or clockwise to lengthen the cycle time.
7. To turn off blower, set blower speed select switch (15) to "OFF" position.

### - REPLACEMENT PARTS -

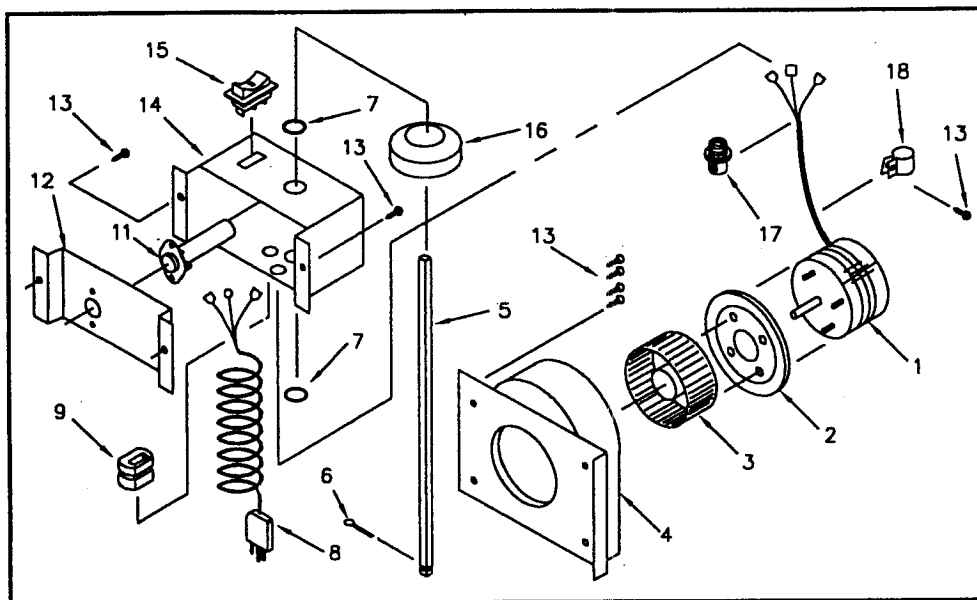


FIG. 2

### - REPLACEMENT PARTS LIST -

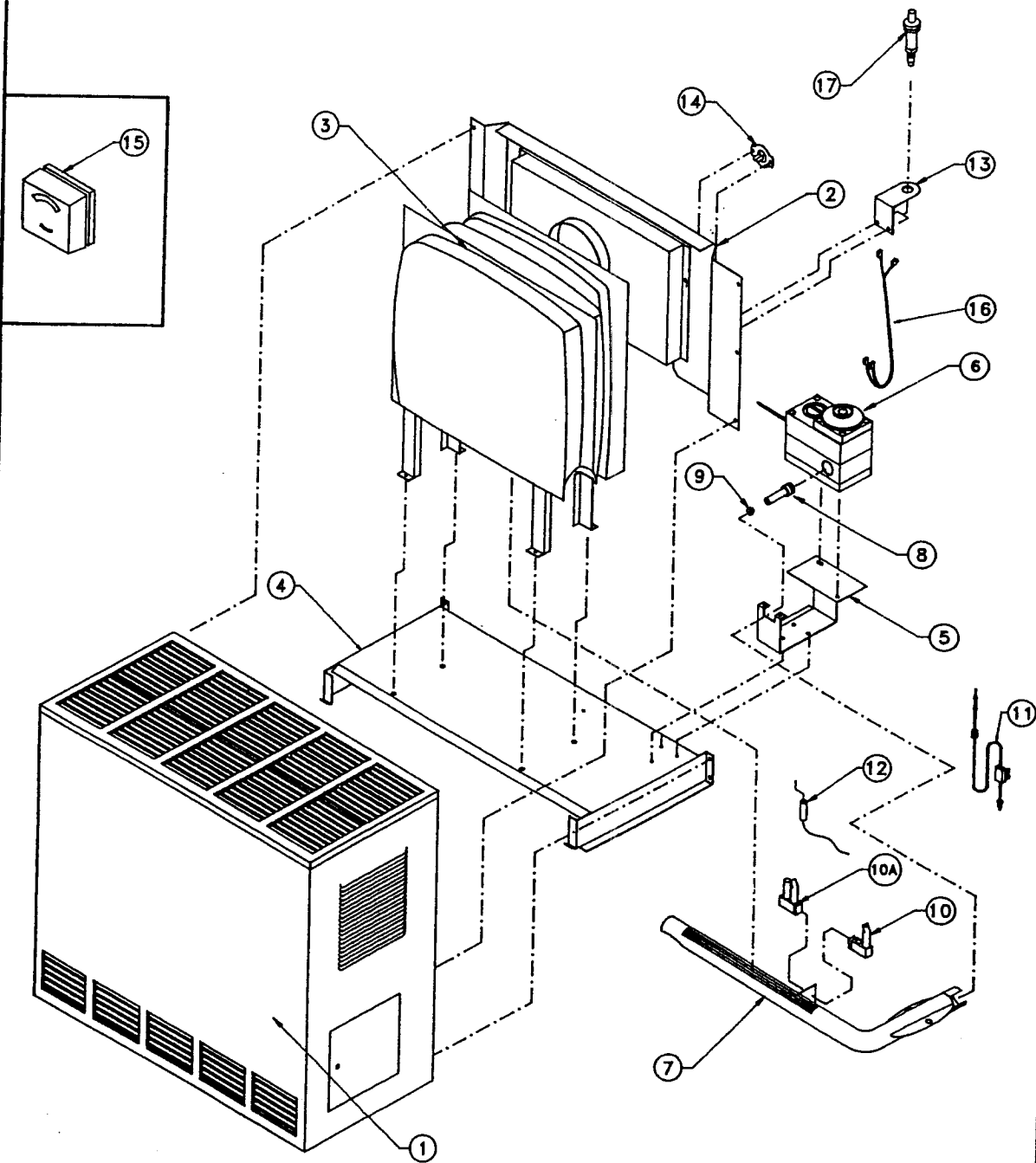
ITEM NO.	PART NO.	DESCRIPTION	ITEM NO.	PART NO.	DESCRIPTION
1	K000096	MOTOR ASSEMBLY	9	P500158	STRAIN BUSHING
2	K7003-6087	MOTOR MOUNTING PLATE	10	P097500	#8-32 X 3/8 SCREW
3	P500137	BLOWER WHEEL	11	P323078	ADJUSTABLE THERMO SWITCH
4	K5150-6029	BLOWER HOUSING ASSY.	12	K000062	CONTROL BOX, BASE
5	K000674-1	CONTROL ROD (350 MODELS)	13	P065800	#10 X 1/2 SCREW
5	K000674-2	CONTROL ROD (500 MODELS)	14	K000061	WRAPAROUND CONTROL BOX
5	K000674-2	CONTROL ROD (650 MODELS)	15	P320911A	SPEED SELECT SWITCH
6	P500125	COTTER PIN	16	P501768	TEMPERATURE DIAL
7	P500026	GROMMET	17	P500145	SET SCREW, BOX CON.
8	P500156	CORD & PLUG	18	P500161	CABLE CLAMP

USE ONLY MANUFACTURE'S AUTHORIZED PARTS.

NOTE: Screws, bolts and washers are standard hardware items and may be purchased locally.

# WILLIAMS GAS FIRED ROOM HEATER

## REPLACEMENT PARTS FOR 20016 MODEL SERIES



FOR PARTS LIST  
SEE PAGE 18

USE ONLY MANUFACTURER'S  
AUTHORIZED PARTS

## REPLACEMENT PARTS LIST FOR MODELS

**2001611(.3); 2001612(.3);  
2001621(.3); 2001622(.3)**

ITEM	DESCRIPTION	2001611(.3)	2001612(.3)	2001621(.3)	2001622(.3)
1	WRAPPER ASSEMBLY	K000275	K000275	K000275	K000275
2	DRAFT DIVERter ASSEMBLY	K000274	K000274	K000274	K000274
3	COMBUSTION CHAMBER ASSEMBLY	K000279	K000279	K000279	K000279
4	BASE PLATE	K000265	K000265	K000265	K000265
5	VALVE BRACKET ASSEMBLY	K000571	K000571	K000571	K000571
6	CONTROL VALVE	P295101A	P295100A	P323012	P323011
7	BURNER ASSEMBLY	K000301	K000301	K000301	K000301
8	ORIFICE ADAPTER	P500393	P500393	P500393	P500393
9	BURNER ORIFICE	P090556	P090547	P090556	P090547
10	PILOT, NAT.	---	P179900	---	---
	PILOT, L.P.G.	P322954	---	---	---
10A	PILOT, NAT.	---	---	---	P501617
	PILOT, L.P.G.	---	---	P501618	---
11	THERMOCOUPLE	P322391	P322391	---	---
12	IGNITOR	P322392	P322392	P322276	P322276
13	IGNITOR BRACKET	7A189	7A189	7A189	7A189
14	VENT LIMIT CONTROL	P500406	P500406	P500406	P500406
15	THERMOSTAT	---	---	P322016	P322016
16	WIRE ASSEMBLY	P500409	P500409	P500409	P500409
17	MANUAL SPARK IGNITOR	P285500	P285500	P285500	P285500

NOTE: Screws, bolts and washers are standard hardware items and may be purchased locally.

FOR PARTS ILLUSTRATION, SEE PAGE 17

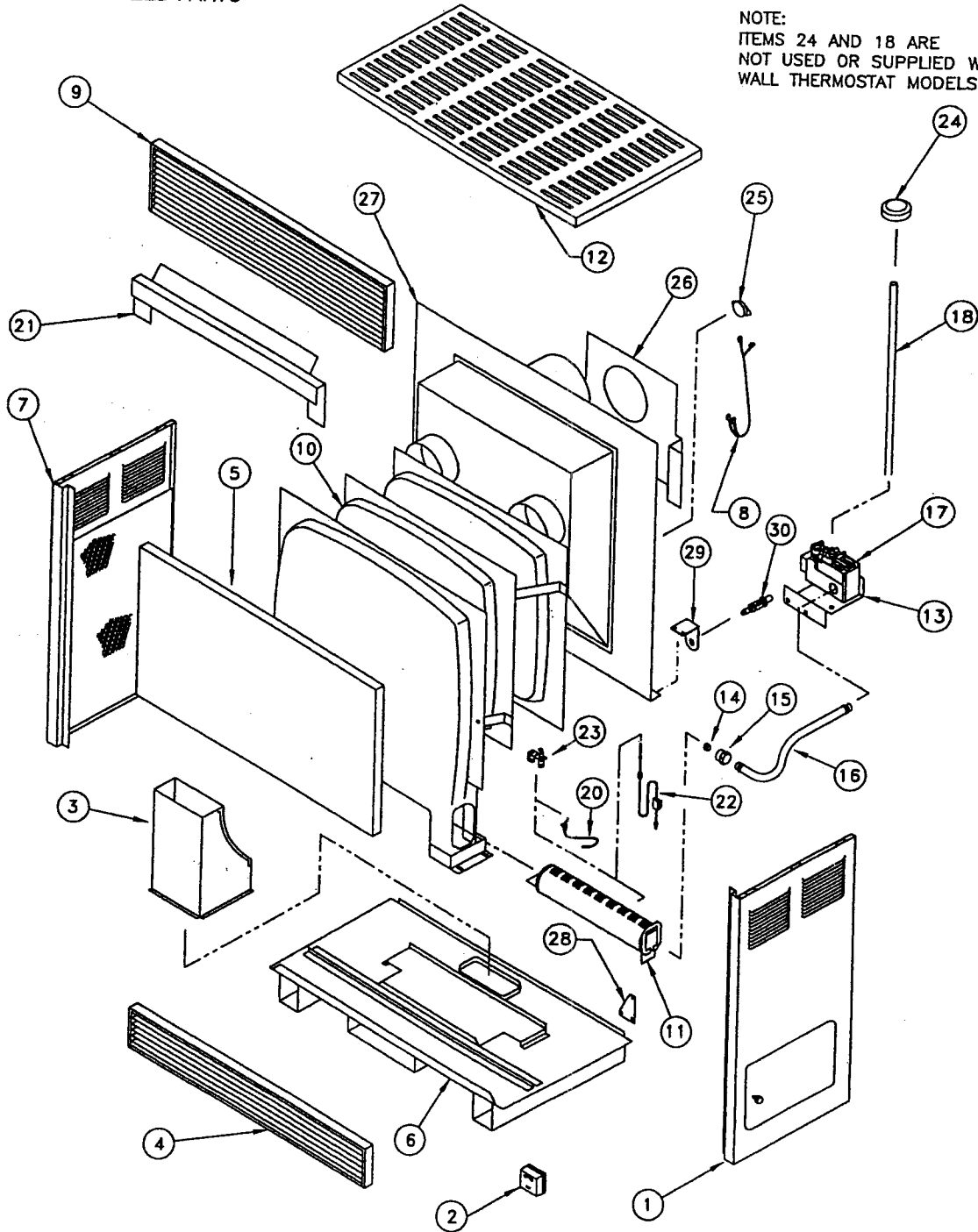
# WILLIAMS GAS FIRED ROOM HEATER

## REPLACEMENT PARTS

350, 500, & 650 MODEL SERIES  
(ENCLOSED CONSOLES)

FOR PARTS LISTING  
SEE PAGE 20 (OR) 21  
USE ONLY MANUFACTURER'S  
AUTHORIZED PARTS

NOTE:  
ITEMS 24 AND 18 ARE  
NOT USED OR SUPPLIED WITH  
WALL THERMOSTAT MODELS



## PARTS LIST FOR MODELS

**3501511; 3501512; 3501911; 3501912; 5001511; 5001512;  
5001911; 5001912; 6501511; 6501512; 6501911; 6501912**

ITEM	DESCRIPTION	3501512 3501912	3501511 3501911	5001512 5001912	5001511 5001911	6501512 6501912	6501511 6501911
1	(R.H.) SIDE PANEL	K000204	K000204	K000205	K000205	K000206	K000206
2	NOT USED (OR PROVIDED)	---	---	---	---	---	---
3	INLET DUCT	K7000-6022	K7000-6022	K7000-6022	K7000-6022	K7000-6022	K7000-6022
4	BOTTOM LOUVER ASSEMBLY	K000182-1	K000182-1	K000182-2	K000182-2	K000182-3	K000182-3
5	CENTER PANEL	K000220	K000220	K000221	K000221	K000222	K000222
6	CABINET BOTTOM	K5000-6003	K5000-6003	K5000-6004	K5000-6004	K5000-6019	K5000-6019
7	(L.H.) SIDE PANEL	K000207	K000207	K000208	K000208	K000209	K000209
8	WIRE ASSEMBLY	P500409	P500409	P500416	P500416	P500416	P500416
9	TOP LOUVER ASSEMBLY	K000181	K000181	K000212-1	K000212-1	K000212-2	K000212-2
10	COMBUSTION CHAMBER ASSEMBLY	K000242	K000242	K000240	K000240	K000045	K000045
11	50mm BURNER	F501620	F501620	F501621	F501621	F501622	F501622
12	CABINET COVER ASSEMBLY	K000223	K000223	K000224	K000224	K000225	K000225
13	VALVE SUPPORT BRACKET	K000555	K000555	K000555	K000555	K000555	K000555
14	BURNER ORIFICE	F500336	F500352	F500330	F500347	F500328	F500343
15	ORIFICE FITTING	F500086	F500086	F500086	F500086	F500086	F500086
16	MANIFOLD ASSEMBLY	K000564	K000564	K000565	K000565	K000566	K000566
17	GAS CONTROL VALVE	F501704	F501705	F501704	F501705	F501704	F501705
18	CONTROL ROD	K000674-1	K000674-1	K000674-2	K000674-2	K000674-2	K000674-2
19	PILOT TUBE	P012000	P012000	P012000	P012000	P012000	P012000
20	IGNITOR	P322392	P322392	P322392	P322392	P322392	P322392
21	SHIELD COVER	---	---	K7011-6030	K7011-6030	K7011-6031	K7011-6031
22	THERMOCOUPLE	P321828	P321828	P322391	P322391	P322391	P322391
23	PILOT BURNER	P179900	P322954	P179900	P322954	P179900	P322954
24	CONTROL KNOB	F501768	F501768	F501768	F501768	F501768	F501768
25	VENT LIMIT CONTROL	F500472	F500472	F500406	F500406	F500118	F500118
26	REAR HEAT SHIELD	K7003-6370	K7003-6370	K7003-6371	K7003-6371	K7003-6372	K7003-6372
27	BACK PLATE	K000226	K000226	K000227	K000227	K000228	K000228
28	REAR CORNER BRACE	K7003-6097	K7003-6097	K7003-6097	K7003-6097	K7003-6097	K7003-6097
29	IGNITOR BRACKET	7A189	7A189	7A189	7A189	7A189	7A189
30	MANUAL SPARK IGNITOR	P285500	P285500	P285500	P285500	P285500	P285500

\* NOT SHOWN

NOTE: Screws, bolts and washers are standard hardware items and may be purchased locally.

FOR PARTS ILLUSTRATION, SEE PAGE 19

## PARTS LIST FOR MODELS

**3501521; 3501522; 3501921; 3501922; 5001521; 5001522;  
5001921; 5001922; 6501521; 6501522; 6501921; 6501922**

ITEM	DESCRIPTION	3501522 3501922	3501521 3501921	5001522 5001922	5001521 5001921	6501522 6501922	6501521 6501921
1	(R.H.) SIDE PANEL	K000204	K000204	K000205	K000205	K000206	K000206
2	THERMOSTAT	P322016	P322016	P322016	P322016	P322016	P322016
3	INLET DUCT	K7000-6022	K7000-6022	K7000-6022	K7000-6022	K7000-6022	K7000-6022
4	BOTTOM LOUVER ASSEMBLY	K000182-1	K000182-1	K000182-2	K000182-2	K000182-3	K000182-3
5	CENTER PANEL	K000220	K000220	K000221	K000221	K000222	K000222
6	CABINET BOTTOM	K5000-6003	K5000-6003	K5000-6004	K5000-6004	K5000-6019	K5000-6019
7	(L.H.) SIDE PANEL	K000207	K000207	K000208	K000208	K000209	K000209
8	WIRE ASSEMBLY	P500409	P500409	P500416	P500416	P500416	P500416
9	TOP LOUVER ASSEMBLY	K000181	K000181	K000212-1	K000212-1	K000212-2	K000212-2
10	COMBUSTION CHAMBER ASSEMBLY	K000242	K000242	K000240	K000240	K000045	K000045
11	50mm BURNER	P501620	P501620	P501621	P501621	P501622	P501622
12	CABINET COVER ASSEMBLY	K000223	K000223	K000224	K000224	K000225	K000225
13	VALVE SUPPORT BRACKET	K000555	K000555	K000555	K000555	K000555	K000555
14	BURNER ORIFICE	P500336	P500352	P500330	P500347	P500328	P500343
15	ORIFICE FITTING	P500086	P500086	P500086	P500086	P500086	P500086
16	MANIFOLD ASSEMBLY	K000564	K000564	K000565	K000565	K000566	K000566
17	GAS CONTROL VALVE	P323011	P322660	P323011	P322660	P323011	P322660
18	NOT USED (OR PROVIDED)	---	---	---	---	---	---
19	PILOT TUBE	P012000	P012000	P012000	P012000	P012000	P012000
20	IGNITOR	P322276	P322276	P322276	P322276	P323215	P323215
21	SHIELD COVER	---	---	K7011-6030	K7011-6030	K7011-6031	K7011-6031
22	NOT USED (OR PROVIDED)	---	---	---	---	---	---
23	PILOT BURNER	P501617	P501618	P501617	P501618	P501617	P501618
24	NOT USED (OR PROVIDED)	---	---	---	---	---	---
25	VENT LIMIT CONTROL	P500472	P500472	P500406	P500406	P500118	P500118
26	REAR HEAT SHIELD	K7003-6370	K7003-6370	K7003-6371	K7003-6371	K7003-6372	K7003-6372
27	BACK PLATE	K000226	K000226	K000227	K000227	K000228	K000228
28	REAR CORNER BRACE	K7003-6097	K7003-6097	K7003-6097	K7003-6097	K7003-6097	K7003-6097
29	IGNITOR BRACKET	7A189	7A189	7A189	7A189	7A189	7A189
30	MANUAL SPARK IGNITOR	P285500	P285500	P285500	P285500	P285500	P285500

\* NOT SHOWN

NOTE: Screws, bolts and washers are standard hardware items and may be purchased locally.

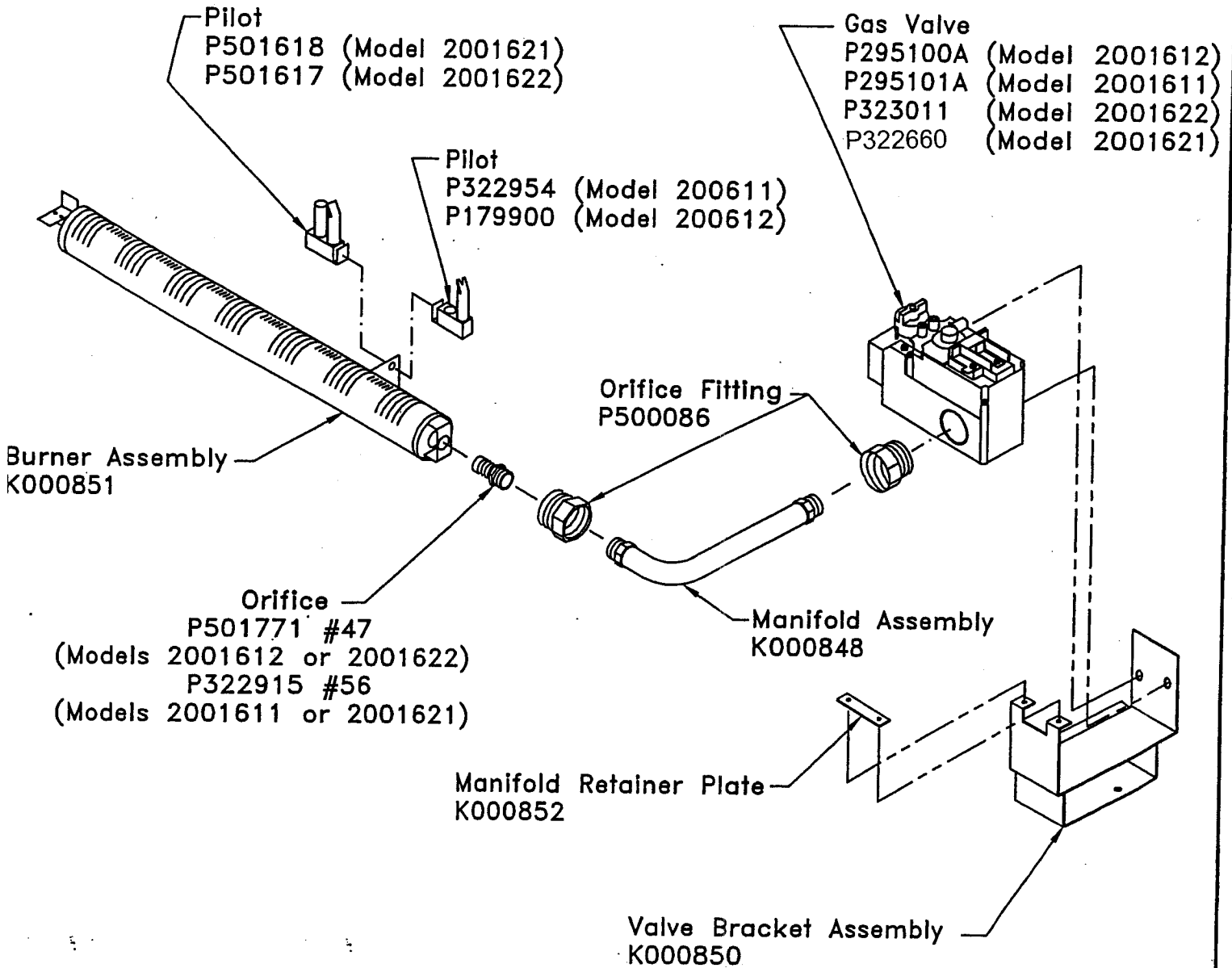
FOR PARTS ILLUSTRATION, SEE PAGE 19

# ADDENDUM

This information provided supercedes previous printed literature as presented with furnace.

TO BE USED WITH INSTRUCTION MANUAL P500407 REV. 10/00 FOR THE 200 CONSOLE FURNACE WITH GAS VALVE P295100A, P295101A, P323011 (OR) P323012

Please be advised that the replacement part numbers listed below supercede what is listed and shown on pages 17 and 18 of instructon manual P500407 Rev. 10/2000. Also, refer to page 11 (Models 2001611 and 2001612) or page 12 (Models 2001621 and 2001622) for lighting and operating instructions and for wiring connection to the gas valve.

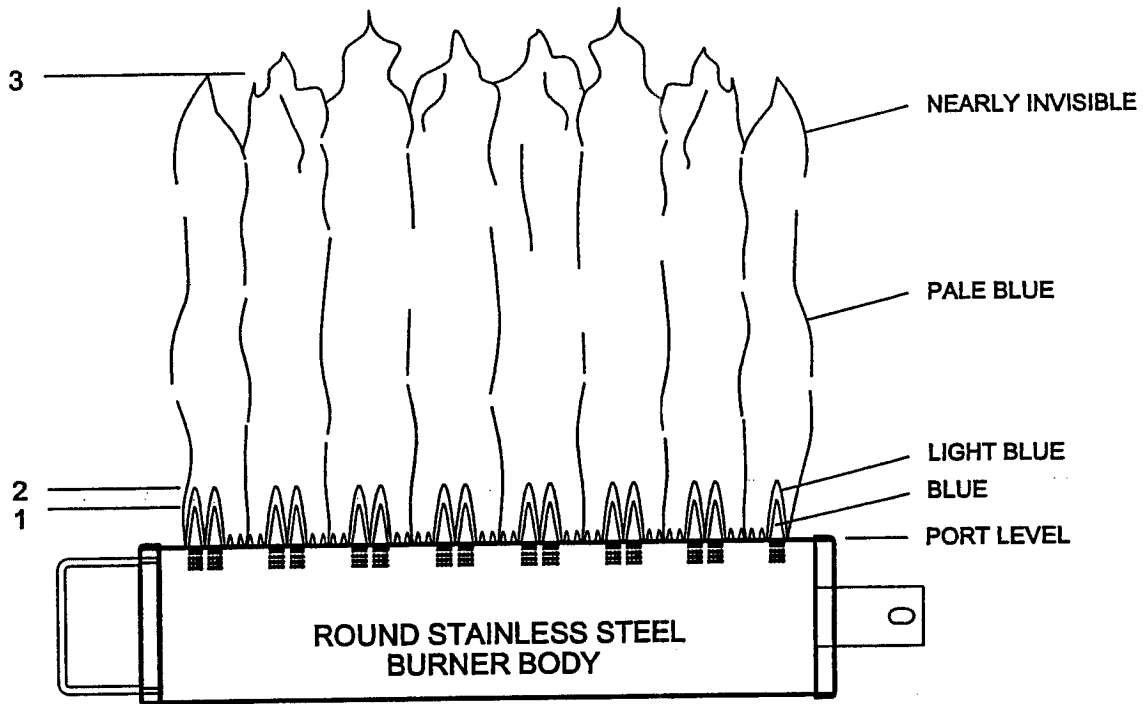


USE ONLY MANUFACTURER'S AUTHORIZED PARTS

# ADDENDUM

This information provided supercedes previous printed literature as presented with furnace.

TO BE USED WITH INSTRUCTION MANUALS FOR ALL S.R.O., MAGNUM PLUS, CONSOLES, FORSAIRE, FORSAIRE MAGNUM AND FLOOR FURNACE EQUIPPED WITH STAINLESS STEEL BURNER



## BURNER FLAME CHARACTERISTICS

### NORMAL APPEARANCE (AS SHOWN ABOVE)

#### NATURAL GAS:

- 1 = INNER CONE - BLUE COLOR - 3/8 TO 5/8 INCH ABOVE PORTS.
- 2 = SECONDARY INNER CONE - LIGHT BLUE - 1 TO 2 INCHES ABOVE PORTS.
- 3 = TOTAL FLAME - FROM BLUE TO NEARLY INVISIBLE - APPROX. 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 - APPROX. 6 INCHES ABOVE PORTS.

#### NOTE:

START THE FURNACE AND LET IT OPERATE ABOUT 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 OBSERVATIONS. 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, FOR MODELS EQUIPPED WITH ROUND STAINLESS STEEL BURNERS.

### 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

SUPPLEMENTAL TO INSTRUCTION MANUALS: P321004, P321005, P322436, P500407 AND P500473



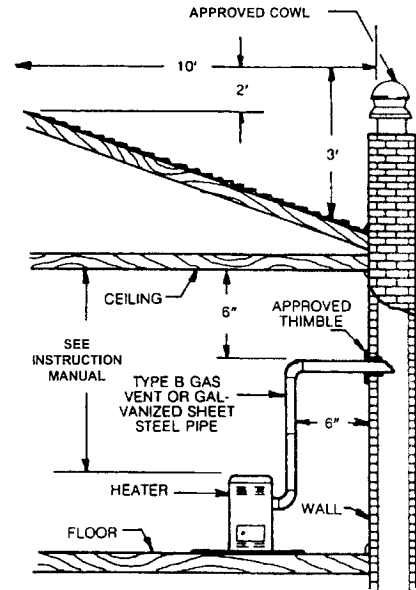
# SUPPLEMENTAL VENTING INSTRUCTIONS

This heater must be properly vented.

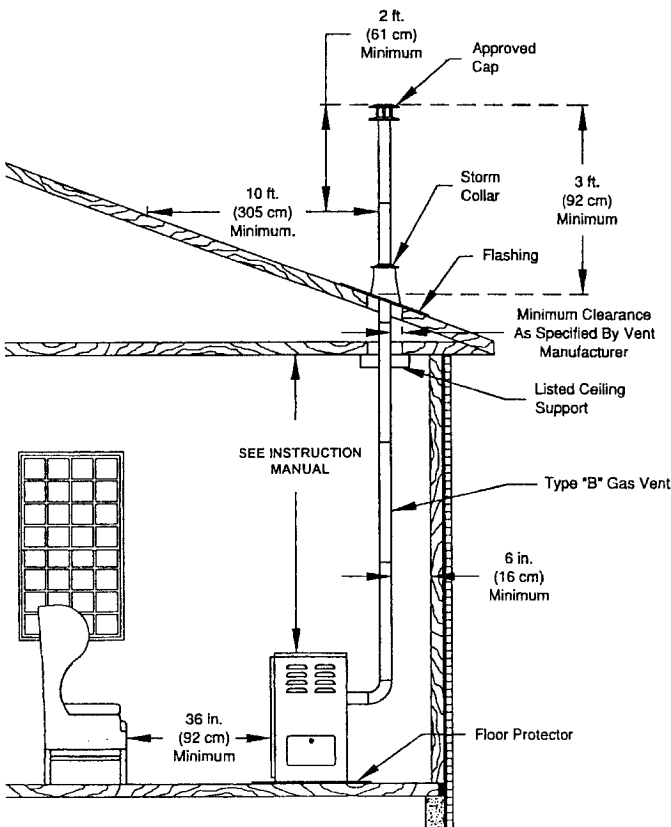
Follow the proper and safe venting procedure described on this sheet and in the instruction manual.

## TYPICAL METHODS OF SAFELY VENTING YOUR HEATER

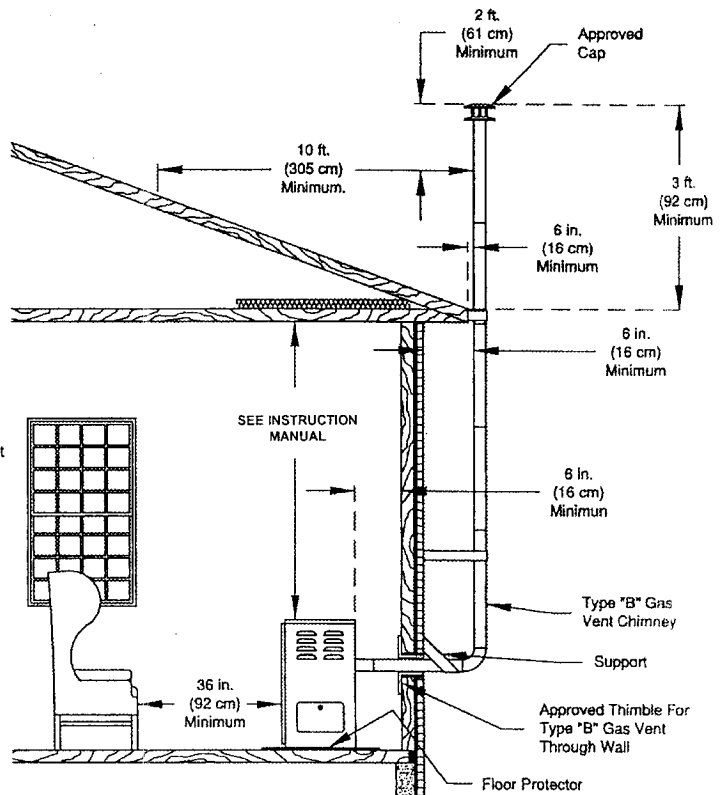
1. Any horizontal run of vent pipe must slope upward a minimum of 1/4" per foot. Secure all joints of the vent with sheet metal screws.
2. Where the vent passes through the ceiling or wall, a thimble is required to keep the ceiling from catching fire. Use only a thimble designed for use with Type "B" gas vent, certified by a nationally recognized testing agency.
3. The vertical (straight up and down) part of the vent must end 2 feet above any part of the roof within 10 feet of the vent. This is to make sure the "draw" of the vent is not obstructed in any way.
4. A cowl or cap, approved by a nationally recognized testing agency must be installed on top of the vent to keep out rain and snow and to prevent obstructions of the vent. The cowl will also prevent excessive downdraft that can cause carbon monoxide to spill into the home. Do not use a "home-made" cowl. They are dangerous and can restrict the draft of the vent.
5. Safe clearances are shown below. To prevent a home fire make sure the heater is installed no closer than the distances shown in figures that apply to your type of venting.
6. If you are venting into a masonry chimney, it must be lined, in good repair and must not serve a wood or coal burning appliance. The flue must be at least as large in diameter as the vent connector. The top of the chimney must be two feet higher above any part of the roof within ten feet horizontally of the chimney and must be three feet higher than the point where it passes through the roof line. If installed in front of a fireplace, the pipe must pass through a sheet metal cover on the fireplace that fits tightly.



VENTING INTO A MASONRY CHIMNEY



STRAIGHT UP VENTING WITH TYPE "B" GAS VENT



VENTING INTO AN OUTSIDE TYPE "B" GAS VENT



## owners manual

**MODEL NOS.  
FOR NAT. GAS ONLY**  
 2001612; 2001622  
 3501512; 3501522  
 3501912; 3501922  
 5001512; 5001522  
 5001912; 5001922  
 6501512; 6501522  
 6501912; 6501922

**MODEL NOS.  
FOR L.P. GAS ONLY**  
 2001611; 2001621  
 3501511; 3501521  
 3501911; 3501921  
 5001511; 5001521  
 5001911; 5001921  
 6501511; 6501521  
 6501911; 6501921

### Service Hints

If your heater fails to work right, you may avoid inconvenience and the cost of a service call by checking the following points before you call for service.

FOR YOUR SAFETY	FOR YOUR SAFETY
Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.	If you smell gas: 1. Open windows. 2. Don't touch electrical. 3. Extinguish any open flame. 4. Immediately call your gas supplier.

#### POSSIBLE CAUSE

**If your heater is not heating or not giving enough heat —**

Thermostat is not set correctly.

Pilot is out.

Pilot is on but burner won't come on.

Burner is not operating properly.

Air flow restricted.

**Pilot goes out time after time —**  
 Heater flue blocked.

**If burner is noisy —**  
 Gas input amount is incorrect.  
 Too much primary air.

**If blower does not run —**  
 (if equipped)  
 Fan switch not set.  
 Blower not connected to electric power.

**If blower motor is noisy —**  
 (if equipped)  
 Housing rattling.  
 Blower dirty.  
 Blower wheel bent.

#### WHAT TO DO

Reset thermostat to desired setting.

Check pilot. Relight if necessary following instructions for "Operating Your Heater."

If gas valve is set at other than "On" heater will not operate. Shut heater down and follow instructions for relighting in "Operating Your Heater" section.

Check flame. If it is yellow the burner is not getting enough air. Or if flame is blue and noisy and seems to lift off the burner, the burner is getting too much air. See page 14.

Check that doors, drapes or furniture are not blocking heater louvers.

Locate vent outlet blockage and clean.

Contact Williams Service Department.  
 Contact Williams Service Department.

Select fan speed.  
 Connect to electric power.

Tighten screws.  
 Clean blower wheel.  
 Straighten or replace.

See troubleshooting section for more detailed information.

### How to Order Repair Parts

When ordering repair parts, always give the following information:

1. MODEL NUMBER
2. MFG. DATE CODE
3. PART NUMBER
4. PART DESCRIPTION

All parts listed herein may be ordered from your equipment supplier.

The Model Number of your Williams room heater will be found on the rating plate near gas valve, inside control compartment.



**WILLIAMS FURNACE COMPANY**  
 250 West Laurel Street  
 Colton, CA 92324 USA  
 (909) 825-0993

**MANUFACTURED  
 IN THE U.S.A.**  
*Established 1916*  
**FAX: (909) 824-8009**