INSTALLATION, OPERATION, AND SERVICE MANUAL
POWER VENT STORAGE TYPE GAS WATER HEATER
MODELS PVG/PVCG

THESE INSTRUCTIONS ARE INTENDED AS AN AID TO QUALIFIED SERVICE PERSONNEL FOR PROPER INSTALLATION, ADJUSTMENT AND OPERATION OF THIS WATER HEATER. READ THESE INSTRUCTIONS THOROUGHLY BEFORE ATTEMPTING INSTALLATION OR OPERATION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN IMPROPER INSTALLATION, OPERATION, SERVICE OR MAINTENANCE, POSSIBLY RESULTING IN FIRE, ELECTRICAL SHOCK, SCALD INJURY, CARBON MONOXIDE POISONING, EXPLOSION, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

INSTALLER:

- ATTACH THESE INSTRUCTIONS TO OR ADJACENT TO THE WATER HEATER.
- BEFORE LEAVING THE PREMISES REVIEW THIS INSTALLATION, OPERATION AND SERVICE MANUAL TO BE SURE THE HEATER HAS BEEN INSTALLED CORRECTLY. START AND OPERATE THE UNIT FOR ONE COMPLETE CYCLE AND MAKE SURE THE WATER TEMPERATURE IS ACCEPTABLE TO THE CONSUMER AT THE FIXTURES.

OWNER:

- RETAIN THESE INSTRUCTIONS AND WARRANTY FOR FUTURE REFERENCE. RETAIN THE ORIGINAL RECEIPT AS PROOF OF PURCHASE.

THIS MANUAL IS NOT TO BE USED WITH GAS STORAGE TYPE WATER HEATERS CERTIFIED FOR INSTALLATION IN MANUFACTURED HOMES (MOBILE HOMES).

AN ODORANT IS ADDED BY THE GAS SUPPLIER TO THE GAS USED BY THIS WATER HEATER.

⚠WARNING

AN ODORANT IS ADDED BY THE GAS SUPPLIER TO THE GAS USED BY THIS WATER HEATER. THIS ODORANT MAY FADE OVER AN EXTENDED PERIOD OF TIME. DO NOT DEPEND UPON THIS ODORANT AS AN INDICATION OF LEAKING GAS. IF A GAS LEAK IS SUSPECTED, CHECK FOR LEAKS BY USING A CHLORIDE-FREE SOAP AND WATER SOLUTION, OR OTHER APPROVED METHOD. IF A LEAK CANNOT BE FOUND BUT IS STILL SUSPECTED, FOLLOW THE STEPS UNDER "WHAT TO DO IF YOU SMELL GAS" AS OUTLINED ON THIS PAGE. FAILURE TO OBSERVE THIS WARNING COULD RESULT IN PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH.

⚠WARNING

THIS WATER HEATER MUST BE BRACED, ANCHORED, OR STRAPPED TO AVOID FALLING OR MOVING DURING AN EARTHQUAKE. CONTACT LOCAL UTILITIES FOR CODE REQUIREMENTS IN YOUR AREA OR CALL THE 800 NUMBER SHOWN ON FRONT OF THIS MANUAL AND REQUEST INSTRUCTIONS 6600933 FOR EXAMPLES.

⚠ Recognize this symbol as an indication of Important Safety Information.

⚠WARNING: If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

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

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

TO OBTAIN TECHNICAL, WARRANTY OR SERVICE ASSISTANCE DURING OR AFTER THE INSTALLATION OF THIS WATER HEATER, CALL TOLL FREE

1-800-999-9515.

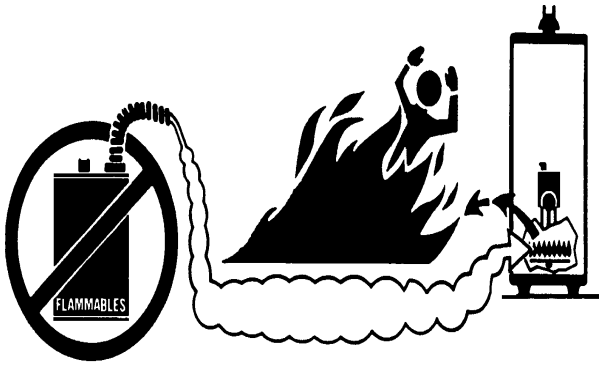
WHEN CALLING FOR ASSISTANCE, PLEASE HAVE THE FOLLOWING INFORMATION READY:

1. **MODEL NUMBER**
2. **7 DIGIT PRODUCT NUMBER**
3. **SERIAL NUMBER**
4. **DATE OF INSTALLATION**

DESIGN CERTIFIED

6510187
March 2000
Supersedes 6510162

⚠ DANGER



⚠ Vapors from flammable liquids will explode and catch fire causing death or severe burns.

Do not use or store flammable products such as gasoline, solvents or adhesives in the same room or area near the water heater.

Keep flammable products:

1. **far away from the water heater.**
2. **in approved containers,**
3. **tightly closed and**
4. **out of children's reach.**

Water heater has a main burner and pilot flame. The pilot flame:

1. **is on all the time and**
2. **will ignite flammable vapors.**

Vapors:

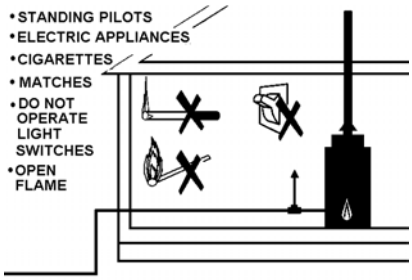
1. **cannot be seen,**
2. **are heavier than air**
3. **go a long way on the floor and**
4. **can be carried from other rooms to the pilot flame by air currents.**

Do not install this heater where flammable products will be stored or used unless the main burner and pilot flames are at least 18 inches above the floor. This will reduce but not eliminate the risk of vapors being ignited by the main burner or pilot flame.

⚠DANGER

DO NOT USE THIS WATER HEATER WITH ANY GAS OTHER THAN THE ONE LISTED ON THE DATA PLATE. This water heater is equipped for use with one type gas only. Check the data plate near the gas control valve for the correct gas. FAILURE TO USE THE CORRECT GAS CAN CAUSE PROBLEMS WHICH CAN RESULT IN DEATH, SERIOUS BODILY INJURY OR PROPERTY DAMAGE. If you have any questions or doubts consult your gas supplier or gas utility company. Water heaters using bottled propane or liquefied petroleum gas (LPG) are different from natural gas models. A natural gas water heater will not function safely on bottled propane or liquefied petroleum gas (LPG) and a propane gas water heater will not function safely on natural gas. Do not attempt to convert a water heater from natural gas to LPG or from LPG to natural gas.

WHEN REMOVING PURGED GASES FROM A PIPING SYSTEM, DO NOT CREATE A HAZARDOUS CONDITION BY DISCHARGING THE GASES INTO A CONFINED AREA OR IN AN AREA THAT CONTAINS AN IGNITION SOURCE.



⚠ DANGER

Water temperature over 125°F can cause severe burns instantly or death from scalds.

Children, disabled and elderly are at highest risk of being scalded.

See the instruction manual before setting the water temperature at the water heater.

Feel the water before bathing or showering.

Temperature limiting valves are available for use.

GENERAL SAFETY WARNINGS

BEFORE ATTEMPTING TO INSTALL OR OPERATE THIS WATER HEATER, MAKE SURE YOU READ AND UNDERSTAND THE ENTIRE INSTALLATION, OPERATION AND SERVICE MANUAL. SPECIAL ATTENTION MUST BE GIVEN TO ALL THE SAFETY WARNINGS PROVIDED THROUGHOUT THIS MANUAL. FAILURE TO FOLLOW THESE WARNINGS COULD RESULT IN A FIRE OR EXPLOSION CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR DEATH. IF YOU HAVE DIFFICULTY UNDERSTANDING THE INSTRUCTIONS IN THIS MANUAL OR ARE NOT AN EXPERIENCED INSTALLER, DO NOT PROCEED, BUT GET HELP FROM A QUALIFIED INSTALLATION OR SERVICE TECHNICIAN. FOR ANY QUESTIONS DURING OR AFTER THE INSTALLATION OF THIS WATER HEATER, CALL 1-800-999-9515.

⚠ DANGER ⚠

- **TAMPERING WITH THE THERMOSTAT, IGNITER CONTROL, GAS VALVE OR TEMPERATURE AND PRESSURE RELIEF VALVE IS DANGEROUS AND MAY RESULT IN SERIOUS INJURY OR DEATH. TAMPERING VOIDS ALL WARRANTIES. ONLY PROPERLY TRAINED, QUALIFIED SERVICE PERSONNEL SHOULD SERVICE THESE COMPONENTS. DO NOT ATTEMPT TO MODIFY OR CHANGE THIS WATER HEATER IN ANY WAY.**
- **DO NOT ATTEMPT TO CONVERT THIS WATER HEATER FROM NATURAL GAS TO L.P. OR FROM L.P. TO NATURAL GAS. THIS CAN RESULT IN PROPERTY DAMAGE, FIRE, EXPLOSION, BODILY HARM OR DEATH.**
- **DO NOT INSTALL THIS WATER HEATER IN A MOBILE HOME**
- **DO NOT INSTALL THIS WATER HEATER OUTDOORS.**
- **RESIDENTIAL AREAS WHERE FLAMMABLE LIQUIDS (GASOLINE, SOLVENTS, LIQUID PROPANE, BUTANE, ETC.) OR OTHER SUBSTANCES WHICH EMIT FLAMMABLE VAPORS ARE STORED MAY NOT BE SUITABLE FOR WATER HEATER INSTALLATION. NATURAL AIR MOVEMENTS CAN CARRY FLAMMABLE VAPORS SOME DISTANCE FROM WHERE THEY ARE STORED OR USED. NEAR GROUND LEVEL VENTS CAN DRAW THESE VAPORS INTO THE WATER HEATER WHERE THE PILOT FLAME OR MAIN BURNER CAN IGNITE THEM CAUSING PROPERTY DAMAGE, SERIOUS BURNS OR DEATH. NEVER STORE OR USE FLAMMABLE SUBSTANCES IN THE SAME ROOM OR AREA CONTAINING A GAS WATER HEATER. IF SUCH FLAMMABLES MUST BE USED, ALL GAS BURNING APPLIANCES IN THE VICINITY MUST BE SHUT OFF AND THEIR PILOT LIGHTS EXTINGUISHED. OPEN THE DOORS AND WINDOWS FOR VENTILATION WHILE FLAMMABLE SUBSTANCES ARE IN USE.**
- **FLAMMABLE VAPORS MAY BE DRAWN TO THIS WATER HEATER FROM OTHER AREAS OF THE STRUCTURE BY AIR CURRENTS.**
- **WATER HEATERS INSTALLED IN RESIDENTIAL GARAGES MUST BE INSTALLED SUCH THAT THE PILOT FLAME AND MAIN BURNER FLAME ARE NO LESS THAN 18 INCHES ABOVE THE FLOOR. THIS IS TO REDUCE BUT NOT ELIMINATE THE RISK OF IGNITING FLAMMABLE VAPORS WHICH MAY BE PRESENT IN A GARAGE. THIS WATER HEATER MUST BE LOCATED OR PROTECTED TO AVOID PHYSICAL DAMAGE BY VEHICLES OR FLOODING.**
- **THE WATER HEATER IS CERTIFIED FOR INSTALLATION ON A COMBUSTIBLE FLOOR. HOWEVER WHEN THIS WATER HEATER IS INSTALLED OVER CARPETING, THE CARPETING MUST BE PROTECTED BY A METAL OR WOOD PANEL BENEATH THE WATER HEATER AND EXTENDING BEYOND THE FULL WIDTH AND DEPTH OF THE WATER HEATER BY AT LEAST THREE INCHES IN ANY DIRECTION. IF THE WATER HEATER IS INSTALLED IN A CARPETED ALCOVE OR CLOSET, THE ENTIRE FLOOR MUST BE COVERED BY THE PANEL. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A FIRE HAZARD.**
- **THIS WATER HEATER AND ANY OTHER GAS FUEL BURNING APPLIANCE MUST BE PROVIDED WITH ENOUGH FRESH AIR FOR PROPER VENTILATION OF THE FLUE GASES.**
- **VENTILATION AND COMBUSTION AIR SUPPLIES CANNOT BE TAKEN FROM AREAS THAT CONTAIN NEGATIVE PRESSURE PRODUCING DEVICES SUCH AS FIREPLACES, EXHAUST FANS AND AIR CIRCULATION SYSTEMS. INLET AIR CANNOT BE TAKEN FROM AN ATTIC EQUIPPED WITH POWER VENTILATION.**
- **PROPER VENT PIPE INSTALLATION IS CRITICAL TO THE SAFE OPERATION OF THIS WATER HEATER. FAILURE TO PROPERLY VENT THIS WATER HEATER CAN CAUSE AN EXPLOSION, FIRE, OR CARBON MONOXIDE POISONING WHICH CAN RESULT IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.**
- **CONNECTION OF THE VENT PIPE TO THE OUTLET OF THE VENT ASSEMBLY BLOWER MUST BE PROPERLY SEALED TO PREVENT LEAKAGE OF THE PRODUCTS OF COMBUSTION INTO THE LIVING SPACE.**
- **OBSTRUCTIONS OR HOLES IN THE VENT PIPE CAN CAUSE TOXIC FUMES TO ENTER THE HOME RESULTING IN CARBON MONOXIDE POISONING OR DEATH. THE VENT PIPE MUST BE REPLACED IF IT IS LEAKING.**
- **NEVER OPERATE AN EMPTY OR PARTIALLY FILLED WATER HEATER. THIS CAN RESULT IN SERIOUS DAMAGE TO THE TANK.**
- **DO NOT ATTEMPT TO OPERATE THIS WATER HEATER WITH THE COLD WATER SHUTOFF VALVE CLOSED.**
- **DO NOT ATTEMPT TO OPERATE THIS WATER HEATER WITHOUT A PROPERLY INSTALLED TEMPERATURE AND PRESSURE RELIEF VALVE. FAILURE TO INSTALL AND MAINTAIN A NEW AND PROPERLY LISTED TEMPERATURE AND PRESSURE RELIEF VALVE WILL RELEASE THE MANUFACTURER FROM ANY CLAIMS WHICH MIGHT RESULT FROM EXCESSIVE TEMPERATURE OR WATER PRESSURE.**
- **WATER SUPPLY TO THIS HEATER MUST NOT EXCEED 180° F. WATER TEMPERATURES IN EXCESS OF 180° F WILL CAUSE THE HIGH LIMIT CONTROL (ECO) TO OPEN AND SHUT OFF THE GAS SUPPLY TO THE UNIT. THE HIGH LIMIT CONTROL IS A SINGLE USE TYPE THAT WILL REQUIRE THE REPLACEMENT OF THE THERMOSTAT BEFORE THE BURNER CAN OPERATE.**
- **THIS WATER HEATER IS EQUIPPED FOR ONE TYPE OF GAS ONLY. DO NOT USE THIS WATER HEATER WITH ANY GAS OTHER THAN THE ONE LISTED ON THE DATA PLATE LOCATED NEAR THE GAS CONTROL. FAILURE TO USE THE CORRECT GAS CAN RESULT IN PROPERTY DAMAGE, BODILY INJURY OR DEATH.**
- **CONTAMINANTS IN THE GAS PIPING MAY FOUL THE GAS CONTROL / THERMOSTAT CAUSING A MALFUNCTION, FIRE OR EXPLOSION. BE SURE ALL GAS PIPING IS CLEAN AND CLEAR ON THE INSIDE BEFORE ATTACHING THE GAS LINE.**
- **DO NOT USE AN OPEN FLAME OR ANY KIND OF SPARK TO CHECK GAS PIPING FOR LEAKS.**

GENERAL SAFETY WARNINGS

⚠DANGER⚠

- **THE GAS LINE MUST BE OF ADEQUATE SIZE SO AS TO PREVENT UNDUE PRESSURE DROP AND NEVER SMALLER THAN THE PIPE SIZE TO THE GAS VALVE ON THE WATER HEATER. FAILURE TO PROPERLY SIZE THE GAS LINE CAN RESULT IN A FIRE OR EXPLOSION CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.**
- **DO NOT ATTEMPT TO LIGHT THIS WATER HEATER UNTIL IT IS PROPERLY INSTALLED AND YOU UNDERSTAND ALL OF THE SAFETY WARNINGS AND PRECAUTIONS.**
- **ADJUSTING THE THERMOSTAT PAST THE 120° F BAR ON THE TEMPERATURE DIAL WILL INCREASE THE RISK OF SCALD INJURY. SEE SECTION "WATER TEMPERATURE REGULATION".**
- **HOUSEHOLDS WITH SMALL CHILDREN, ELDERLY, IMPAIRED OR DISABLED MEMBERS AND ANYONE WITH TEMPERATURE SENSITIVE SKIN MAY REQUIRE A LOW TEMPERATURE SETTING TO REDUCE THE RISK OF SCALD INJURY.**
- **HOT WATER CAN PRODUCE FIRST DEGREE BURNS WITHIN:**

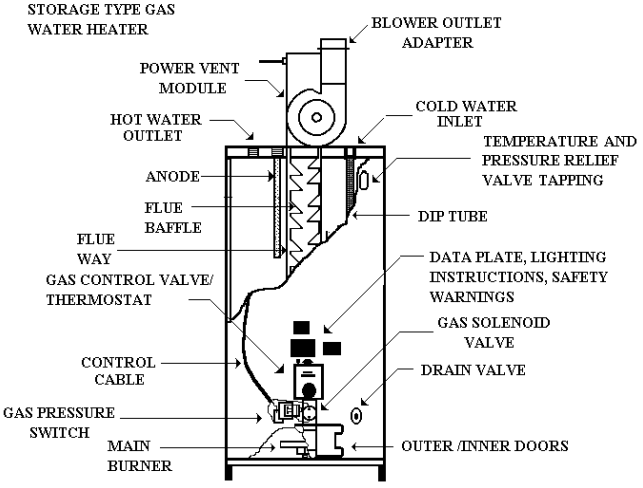
  3 SECONDS AT 140°F (60°C)

  20 SECONDS AT 130°F (54°C)

  8 MINUTES AT 120°F (49°C)
- **DO NOT ATTEMPT TO BYPASS OR JUMPER THE ECO. THIS WILL VOID THE WARRANTY AND RELEASE THE MANUFACTURER FROM ANY LIABILITY FOR ANY ACCIDENT RESULTING FROM ELIMINATING THE ECO FROM THE WATER HEATER CIRCUIT.**
- **HYDROGEN GAS CAN BE PRODUCED IN A HOT WATER SYSTEM THAT HAS NOT BEEN USED FOR A LONG PERIOD OF TIME (GENERALLY TWO WEEKS OR MORE). HYDROGEN GAS IS EXTREMELY FLAMMABLE AND CAN IGNITE WHEN EXPOSED TO A SPARK OR FLAME. TO PREVENT THE POSSIBILITY OF INJURY UNDER THESE CONDITIONS, WE RECOMMEND THE HOT WATER FAUCET BE OPENED FOR SEVERAL MINUTES AT THE KITCHEN SINK BEFORE USING ANY ELECTRICAL APPLIANCE WHICH IS CONNECTED TO THE HOT WATER SYSTEM. IF HYDROGEN IS PRESENT, THERE WILL PROBABLY BE AN UNUSUAL SOUND SUCH AS AIR ESCAPING THROUGH THE FAUCET AS WATER BEGINS TO FLOW. DO NOT SMOKE OR HAVE ANY OPEN FLAME NEAR THE FAUCET AT THE TIME IT IS OPEN.**
- **REPAIR, REPLACEMENT, SERVICE AND CLEANING OF WATER HEATER PARTS MUST ONLY BE PERFORMED BY A QUALIFIED SERVICE TECHNICIAN.**

TABLE OF CONTENTS

FIGURE 1
PVG/PVCG POWER VENT
STORAGE TYPE GAS
WATER HEATER



1. Some models may vary slightly in appearance.
2. Some models may have the Temperature and Pressure Relief Valve Tapping on the top of the heater.

IMPORTANT: TO INSURE PROPER INSTALLATION AND OPERATION OF THIS PRODUCT, COMPLETELY READ ALL INSTRUCTIONS PRIOR TO ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE, MAINTAIN OR REPAIR THIS PRODUCT. UPON UNPACKING OF THE WATER HEATER, INSPECT ALL PARTS FOR DAMAGE PRIOR TO INSTALLATION AND START-UP.

CONSUMER INFORMATION

This water heater is design-certified by CSA International as a Category IV, non-direct vented water heater which takes its combustion air either from the installation area or from air ducted to the unit from the outside.

This water heater should be installed in accordance with the latest edition of the "National Fuel Gas Code", ANSI Z223.1, NFPA 54 and the requirements and codes of the local utilities or other authorities having jurisdiction. This is available from the following:

National Fire Protection Agency
1 Batterymarch Park
Quincy, MA 02269

American Gas Association
1515 Wilson Boulevard
Arlington, VA 22209

Local Authorities (Check your telephone listings.)

CONSUMER RESPONSIBILITIES

This manual has been prepared to acquaint you with the installation, operation and maintenance of your gas water heater and to provide important safety information in these areas.

We urge you to read all of the instructions thoroughly before attempting the installation or operation of this water heater. This manual should be kept for future reference.

The manufacturer of this water heater will not be liable for any damages caused by failure to comply with the in-stallation and operating instructions outlined in this manual.

If you lack the necessary skills required to properly install this water heater or you have difficulty following the directions, you should not proceed but have a qualified person perform the installation of this water heater.

A data plate identifying your water heater can be found next to the gas control valve/thermostat. When referring to your water heater always have the information listed on the data plate readily available.

Retain your original receipt as proof of purchase.

HIGH ALTITUDE INPUT RATING

The input rating on the data plate of this water heater is for installations up to 2000 feet of elevation. For installations at elevations above 2000 feet, the rating should be reduced by 4 percent for each 1000 feet above sea level. For correct orifice at altitudes above 2000 feet: consult the National Fuel Gas Code, your local utility or water heater supplier.

WATER HEATER MODIFICATION/ TAMPERING

⚠ DANGER

TAMPERING WITH THE THERMOSTAT, IGNITER CONTROL, GAS VALVE, OR TEMPERATURE AND PRESSURE RELIEF VALVE IS DANGEROUS AND MAY RESULT IN SERIOUS INJURY OR DEATH. TAMPERING VOIDS ALL WARRANTIES. ONLY PROPERLY TRAINED, QUALIFIED SERVICE PERSONNEL SHOULD SERVICE THESE COMPONENTS. DO NOT ATTEMPT TO MODIFY OR CHANGE THIS WATER HEATER IN ANY WAY.

INSULATION BLANKET

Some governing bodies may require the use of external insulation blankets when water heaters are installed in newly constructed homes and additions. If an insulation blanket is applied to this water heater **CAUTION** must be exercised so as to not restrict its proper function and operation. Please note the following:

- The space between the base of the water heater and the floor must remain unobstructed to allow for proper air flow. As time passes, the blanket may sag and obstruct the air passage resulting in unsafe water heater operation.
- Do not apply an insulation blanket to the top of the water heater as this may obstruct the draft hood.
- Do not cover the temperature and pressure relief valve or any labels or instruction materials applied to the water heater. These labels must remain visible for reference by the user. Do not remove these labels as they are a permanent part of the water heater as required by the certification agencies and/or the Federal Government.
- Do not cover any access panels leading to burner compartments. Do not cover the thermostat controls, doors, or the temperature and pressure relief valve on the water heater.

GAS CONVERSION

⚠ DANGER

DO NOT ATTEMPT TO CONVERT THIS WATER HEATER FROM NATURAL GAS TO L.P. OR FROM L.P. TO NATURAL GAS. THIS CAN RESULT IN PROPERTY DAMAGE, FIRE, EXPLOSION, BODILY HARM OR DEATH.

LOCATION REQUIREMENTS AND CONSIDERATIONS

GENERAL INFORMATION

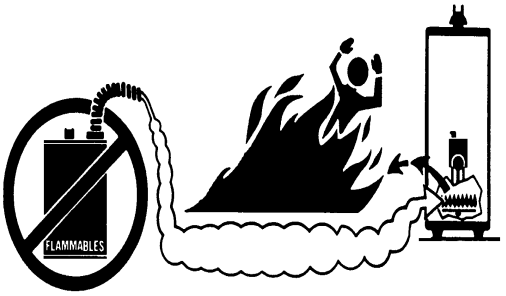
⚠ WARNING

DO NOT INSTALL THIS WATER HEATER IN A MOBILE HOME. This water heater is not approved for installation in a mobile home. **DO NOT INSTALL OUTDOORS.** This water heater is certified for indoor installation only. Failure to follow these instructions could result in **FIRE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.**

⚠ DANGER

AREAS WHERE FLAMMABLE LIQUIDS (GASOLINE, SOLVENTS, LIQUID PROPANE, BUTANE, ETC.) OR OTHER SUBSTANCES WHICH EMIT FLAMMABLE VAPORS ARE STORED MAY NOT BE SUITABLE FOR WATER HEATER INSTALLATION. NATURAL AIR MOVEMENTS CAN CARRY FLAMMABLE VAPORS SOME DISTANCE FROM WHERE THEY ARE STORED OR USED. NEAR GROUND LEVEL VENTS CAN DRAW THESE VAPORS INTO THE WATER HEATER WHERE THE PILOT FLAME OR MAIN BURNER CAN IGNITE THEM CAUSING PROPERTY DAMAGE, SERIOUS BURNS OR DEATH. NEVER STORE OR USE FLAMMABLE SUBSTANCES IN THE SAME ROOM OR AREA CONTAINING A GAS WATER HEATER. IF SUCH FLAMMABLES MUST BE USED, ALL GAS BURNING APPLIANCES IN THE VICINITY MUST BE SHUT OFF AND THEIR PILOT LIGHTS EXTINGUISHED. OPEN THE DOORS AND WINDOWS FOR VENTILATION WHILE FLAMMABLE SUBSTANCES ARE IN USE.

⚠ DANGER



VAPORS FROM FLAMMABLE LIQUIDS WILL EXPLODE AND CATCH FIRE CAUSING DEATH OR SEVERE BURNS.

⚠ WARNING

FLAMMABLE VAPORS MAY BE DRAWN TO THIS WATER HEATER FROM OTHER AREAS OF THE STRUCTURE BY AIR CURRENTS.

IMPORTANT: This water heater should not be installed near a corrosive or potentially corrosive air supply. Water heater corrosion and component failure can be caused by the heating and breaking down of airborne chemicals. These materials are corrosive at low concentration levels with little or no odor to reveal their presence. Examples of potentially corrosive locations and compounds are:

- Beauty shops, dry cleaning establishments, photo processing labs
- Liquid or powdered bleaches, swimming pool chemicals, spray can propellants, cleaning solvents
- Refrigerants
- Calcium and sodium chloride
- Waxes and process chemicals
- Products of this sort should not be stored near the water heater or air inlet.

LOCATION REQUIREMENTS AND CONSIDERATIONS

⚠ WARNING

IT IS NOT DESIRABLE TO INSTALL A GAS FIRED WATER HEATER IN A RESIDENTIAL GARAGE. IF INSTALLATION IN A RESIDENTIAL GARAGE IS YOUR ONLY OPTION, THIS WATER HEATER MUST BE INSTALLED SUCH THAT THE PILOT FLAME AND MAIN BURNER FLAME ARE NO LESS THAN **18 INCHES ABOVE THE FLOOR (SEE FIGURE 2 BELOW).** THIS IS TO REDUCE **BUT NOT ELIMINATE** THE RISK OF IGNITING FLAMMABLE VAPORS WHICH MAY BE PRESENT IN A GARAGE. **THE WATER HEATER MUST BE LOCATED OR PROTECTED TO AVOID PHYSICAL DAMAGE BY VEHICLES OR FLOODING. FAILURE TO FOLLOW THESE WARNINGS CAN CAUSE A FIRE OR EXPLOSION, RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.**

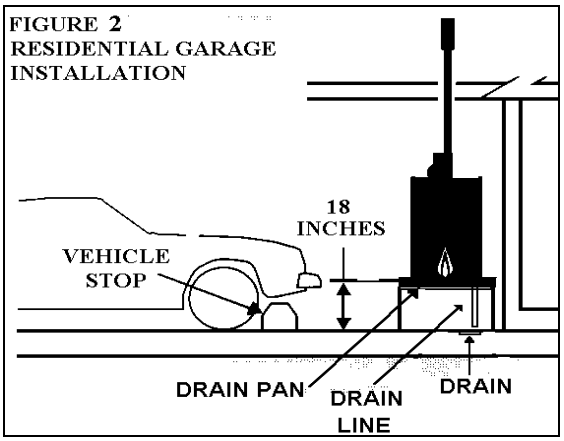


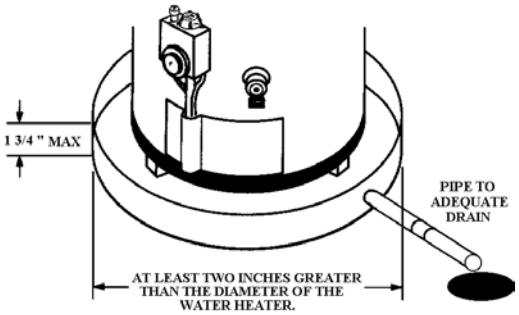
FIGURE 2
RESIDENTIAL GARAGE
INSTALLATION

SITE LOCATION

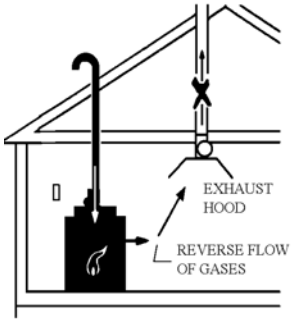
1. Select a location near the center of the water piping system. It must be installed indoors and in a vertical position on a level surface. **DO NOT** install in bathrooms, bedrooms or any occupied room normally kept closed.
2. Locate the water heater as close to the chimney or gas vent as is practical. Consider the vent system piping and combustion air supply requirements when selecting the water heater location. The venting system must be able to run from the water heater to the termination with a minimal length and elbows. **THE VENT PIPE CANNOT EXCEED THE MAXIMUM ALLOWABLE LENGTH OF 40 FEET WITH 3 LONG RADIUS ELLS.**
3. Locate the water heater near the existing gas piping. If installing a new gas line, locate the water heater to minimize the pipe length and elbows.

IMPORTANT

4. The water heater should be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the water heater or to lower floors of the structure. It is recommended that a suitable drain pan be installed under the water heater as shown above. This pan is to protect the property from damage which may occur from normal condensate formation on the tank jacket or leaks in the tank and pipe connections. The pan must limit the water level to a maximum depth of 1 3/4 inches and be two inches wider than the heater and piped to an adequate drain. Locate the water heater near a suitable inside drain. Outside drains are subject to freezing temperatures. The piping should be at least 3/4" ID and pitched for proper drainage. This pan must not restrict combustion air flow. **UNDER NO CIRCUMSTANCES IS THE MANUFACTURER TO BE HELD LIABLE FOR ANY WATER DAMAGE IN CONNECTION WITH THIS WATER HEATER.**



5. The water heater should be located in an area not subject to freezing temperatures. Water heaters located in unconditioned areas (i.e. attics, basements, etc.) may require the insulation of the water piping and drain piping to protect against freezing. The drain and controls must be easily accessible for operation and service. Maintain proper clearances as specified.
6. Do not locate the water heater near an air-moving device. The operation of air-moving devices such as exhaust fans, ventilation systems, clothes dryers, fireplaces, etc., can affect the proper operation of the water heater. Special attention must be given to conditions these devices may create to avoid unsatisfactory operation of the equipment.



CLEARANCE/ACCESSIBILITY

Minimum clearances from combustible materials are stated on the data plate adjacent to the thermostat of the water heater. **REFER TO THE DATA PLATE OF THE WATER HEATER FOR THE CORRECT CLEARANCES FROM COMBUSTIBLE CONSTRUCTION MATERIALS.** Figure 3 may be used as a reference guide to locate the specific clearance locations. A minimum of 24 inches of front clearance should be provided for inspection and service.

⚠ WARNING

THE WATER HEATER IS CERTIFIED FOR INSTALLATION ON A COMBUSTIBLE FLOOR. HOWEVER, WHEN THIS WATER HEATER IS INSTALLED OVER CARPETING, THE CARPETING MUST BE PROTECTED BY A METAL OR WOOD PANEL BENEATH THE WATER HEATER AND EXTENDING BEYOND THE FULL WIDTH AND DEPTH OF THE WATER HEATER BY AT LEAST THREE INCHES IN ANY DIRECTION. IF THE WATER HEATER IS INSTALLED IN A CARPETED ALCOVE OR CLOSET, THE ENTIRE FLOOR MUST BE COVERED BY THE PANEL. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A FIRE HAZARD.

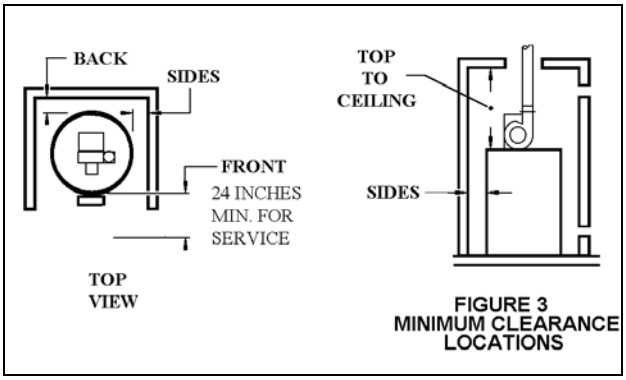


FIGURE 3
MINIMUM CLEARANCE
LOCATIONS

VENTILATION AND COMBUSTION AIR SUPPLY

GENERAL INFORMATION

⚠ WARNING

THIS WATER HEATER AND ANY OTHER FUEL BURNING APPLIANCE MUST BE PROVIDED WITH ENOUGH FRESH AIR FOR PROPER VENTILATION OF THE FLUE GASES. MOST HOMES WILL REQUIRE THAT OUTSIDE AIR BE SUPPLIED INTO THE WATER HEATER AREA. FAILURE TO DO SO CAN RESULT IN EXPLOSION, FIRE, PROPERTY DAMAGE, CARBON MONOXIDE POISONING, PERSONAL INJURY OR DEATH.

Adequate facilities for providing air for combustion and ventilation must be provided in accordance with the "National Fuel Gas Code", ANSI Z223.1-Latest Edition, NFPA 54 or the applicable provisions of the local building codes.

IMPORTANT: Air for combustion and ventilation must not come from a corrosive atmosphere. Any failure due to corrosive elements in the atmosphere is excluded from warranty coverage.

The following types of installation (but not limited to the following) will require outdoor air for combustion due to chemical exposure and may reduce but not eliminate the presence of corrosive chemicals in the air:

- Beauty shops
- Photo processing labs
- Commercial buildings
- Buildings with indoor pools
- Water heaters installed in laundry, hobby or craft rooms.
- Water heaters installed near chemical storage areas

Combustion air must be free of acid-forming chemicals such as sulfur, fluorine, and chlorine. These elements are found in aerosol sprays, detergents, bleaches, cleaning solvents, air fresheners, paint and varnish removers, refrigerants, and many other commercial and household products. When burned, vapors from these products form highly corrosive acid compounds. These products should not be stored near the water heater or air inlet.

Combustion and ventilation air requirements are de-termined by the location of the water heater. The water heater may be located in either an open (unconfined) area or in a confined area or small enclosure such as a closet or small room. **Confined spaces are areas with less than 50 cubic feet for each 1,000 BTUH of the total input for all gas-using appliances.**

WATER HEATER LOCATION - UNCONFINED SPACE

A water heater in an unconfined space uses indoor air for combustion and requires at least **50 cubic feet for each 1,000 BTUH of the total input for all gas appliances.** The table below shows a few examples of the minimum square feet required for various BTUH inputs.

BTUH INPUT	MIN. SQ. FEET WITH 8' CEILING	TYPICAL ROOM SIZE WITH 8' CEILING
30,000	188	9 X 21
45,000	281	14 X 20
60,000	375	15 X 25
75,000	469	15 X 31
90,000	563	20 X 28
105,000	657	20 X 33
120,000	750	25 X 30
135,000	844	28 X 30

Areas which are being used for storage or contain large space consuming items may not be suitable for water heater installation. The area must be open and be able to provide the proper air requirements to the water heater.

IMPORTANT: Water heaters installed in open spaces in buildings with unusually tight construction may still require outdoor air to function properly. In this situation, outside air openings should be sized the same as for a confined space.

MODERN CONSTRUCTION USUALLY REQUIRES SUPPLYING OUTSIDE AIR INTO THE WATER HEATER AREA.

CONSULT THE LOCAL CODES OF YOUR AREA FOR SPECIFIC VENTILATION AND COMBUSTION AIR REQUIREMENTS.

For the correct and safe operation of this water heater, ample air must be supplied for the combustion, ventilation and dilution of flue gases. Small enclosures and confined areas must have **two permanent openings** so that sufficient fresh air can be drawn from outside of the enclosure. One opening shall be **within 12 inches of the top and one within 12 inches of the bottom of the enclosure** as shown in Figure 4 below.

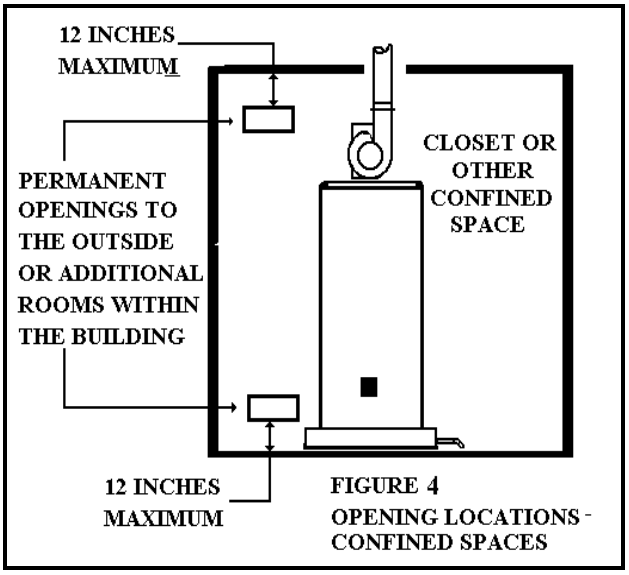


FIGURE 4
OPENING LOCATIONS - CONFINED SPACES

The size of each opening (free area) is determined by the total Btuh input of all gas utilization equipment (i.e. water heaters, furnaces, clothes dryers, etc.) and the method by which the air is provided. The Btuh input can be found on the water heater data plate. Additional air can be provided by two methods:

1. **All air from inside the building.**
2. **All air from outdoors.**

ALL AIR FROM INSIDE THE BUILDING

When additional air is to be provided to the confined area from additional room(s) within the building, the total volume of the room(s) must be of sufficient size to properly provide the necessary amount of fresh air to the water heater and other gas utilization equipment in the area. If you are unsure that the structure meets this requirement, contact your local gas utility company or other qualified agency for a safety inspection.

Each of the two openings shall have a minimum free area of 1 square inch per 1,000 Btuh of the total input rating of all gas utilization equipment in the confined area, but not less than 100 square inches (Figure 5).

⚠ CAUTION

AIR CANNOT BE TAKEN FROM AREAS THAT CONTAIN NEGATIVE PRESSURE PRODUCING DEVICES SUCH AS FIREPLACES, EXHAUST FANS, AND AIR CIRCULATION SYSTEMS.

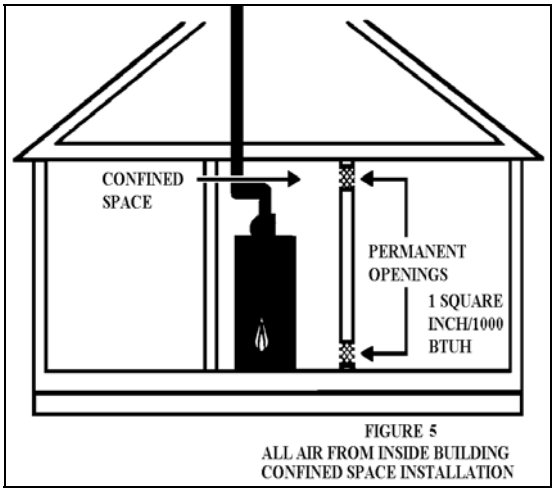


FIGURE 5
ALL AIR FROM INSIDE BUILDING
CONFINED SPACE INSTALLATION

ALL AIR FROM OUTDOORS

Outdoor fresh air can be provided to a confined area either directly or by the use of vertical and horizontal ducts. The fresh air can be taken from the outdoors or from crawl or attic spaces that freely communicate with the outdoors. Attic or crawl spaces cannot be closed and must be properly ventilated to the outside.

Ductwork must be of the same cross-sectional area as the free area of the opening to which they connect. The minimum dimension of rectangular air ducts cannot be less than 3 inches.

The size of each of the two openings is determined by the method in which the air is to be provided. Refer to Table 1 to calculate the minimum free area for each opening. Figures 6, 7, and 8 are typical examples of each method.

⚠CAUTION

INLET AIR CANNOT BE TAKEN FROM AN ATTIC EQUIPPED WITH POWER VENTILATION.

LOUVERS AND GRILLES

In calculating free area for ventilation and combustion air supply openings, consideration must be given to the blocking affect of protection louvers, grilles, and screens. These devices can reduce air flow which in turn may require larger openings to achieve the required minimum free area. Screens must not be smaller than 1/4 inch mesh. If the free area through a particular design of louver or grille is known, it should be used in calculating the specified free area of the opening. If the design and free area are not known, it can be assumed that most wood louvers will allow 20 - 25% of free area while metal louvers and grilles will allow 60 - 75% of free area. Louvers and grilles must be locked open or interconnected with the equipment so that they are opened automatically during equipment operation.

Keep louvers and grilles clean and free of debris or other obstructions.

TABLE 1
MINIMUM FREE AREA OF PERMANENT OPENINGS FOR VENTILATION AND COMBUSTION AIR SUPPLY - ALL AIR FROM OUTSIDE ONLY.

OPENING SOURCE	MINIMUM FREE AREA PER OPENING (SQ. IN.)	REFERENCE DRAWING
DIRECT TO OUTDOORS*	1 SQUARE INCH PER 4000 BTUH	FIGURE 6
VERTICAL DUCTS	1 SQUARE INCH PER 4000 BTUH	FIGURE 7
HORIZONTAL DUCTS	1 SQUARE INCH PER 2000 BTUH	FIGURE 8

Example: A water heater with an input rate of 50,000 Btuh using horizontal ducts would require each opening to have a minimum free area of 25 square inches.
Minimum Free Area = 50,000 Btuh x 1 sq. in. / 2000 Btuh = 25 Sq Inches

* These openings may communicate directly with the outdoors through a ventilated attic, a ventilated crawl space, or through an outside wall.

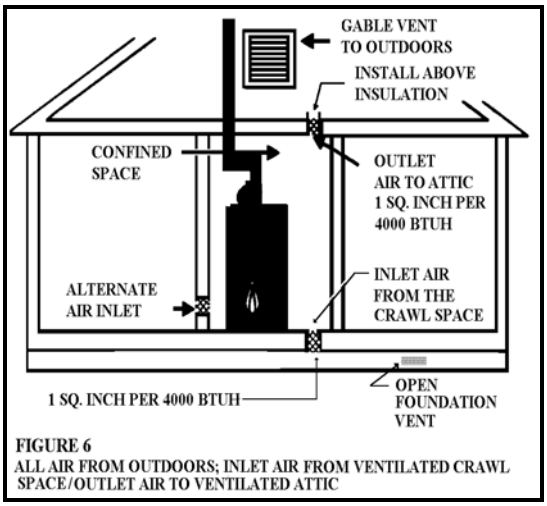


FIGURE 6
ALL AIR FROM OUTDOORS; INLET AIR FROM VENTILATED CRAWL SPACE/OUTLET AIR TO VENTILATED ATTIC

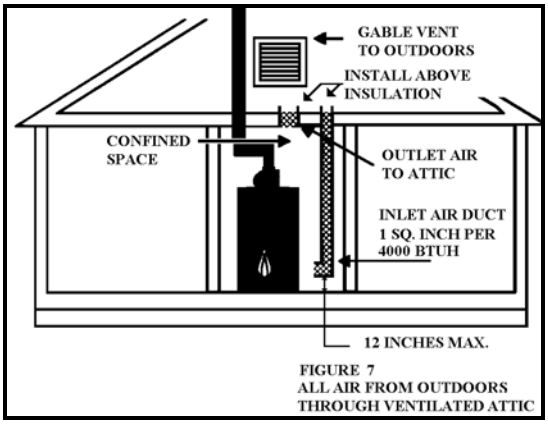


FIGURE 7
ALL AIR FROM OUTDOORS
THROUGH VENTILATED ATTIC

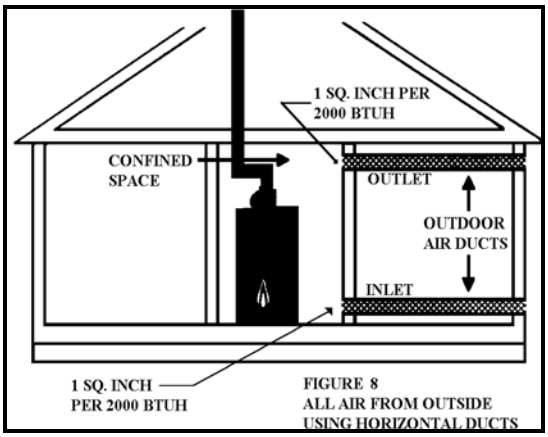


FIGURE 8
ALL AIR FROM OUTSIDE
USING HORIZONTAL DUCTS

VENT PIPING SYSTEM

GENERAL INFORMATION

⚠ DANGER

PROPER VENT PIPE INSTALLATION IS CRITICAL TO THE SAFE OPERATION OF THIS WATER HEATER. FAILURE TO PROPERLY VENT THIS WATER HEATER CAN CAUSE AN EXPLOSION, FIRE OR CARBON MONOXIDE POISONING WHICH CAN RESULT IN PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH.

This water heater has been certified by CSA International for use with the specified plastic pipe material.

This vent pipe system must be installed in accordance with the "National Fuel and Gas Code", NFPA 54, ANSI Z223.1 - Latest Edition.

The National Fuel and Gas Code allows the use of plastic pipe for venting if it is accepted by the local code or the authority having jurisdiction.

Some local jurisdictions may be opposed to plastic vent pipe. Check with your local code official before installing this system.

Use only 3 inch Schedule 40 PVC, ABS-DWP, or CPVC plastic pipe and fittings for this vent pipe system. All fittings must be Long Sweep. DO NOT USE SHORT RADIUS OR MEDIUM SWEEP FITTINGS. **THE USE OF SHORT RADIUS FITTINGS WILL CAUSE THIS WATER HEATER TO MALFUNCTION OR NUISANCE TRIP ON THE PRESSURE SWITCH CAUSING THE BURNER TO NOT OPERATE PROPERLY.**

Pipe and fittings are available from your water heater dealer or through most plumbing supply houses.

BLOWER OUTLET ADAPTER

The blower outlet adapter must be secured to the outlet of the power vent blower opening using silicone adhesive sealant and sheet metal screws as shown in Figure 9.

1. Apply an even 1/8 inch bead of silicone adhesive sealant around the inside of the adapter's square opening. Locate this bead 1/4 inch from the top of the opening.
1. Slide the adapter approximately 1/2 inch onto the blower opening and secure with two sheet metal screws.

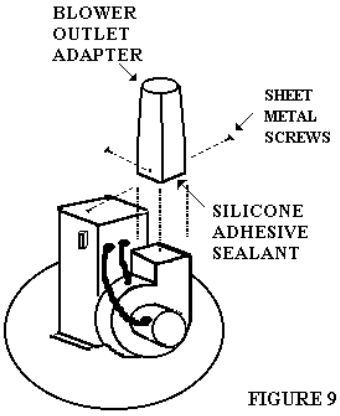


FIGURE 9

IMPORTANT: This connection must be properly sealed to prevent the leakage of the products of combustion into the living area. Excess silicone adhesive inside the adapter can cause enough restriction in the vent pipe to cause intermittent burner operation.

VENT PIPE INSTALLATION

When installing this vent pipe system, please note the following:

- Use only Schedule 40 PVC, CPVC, or ABS-DWV plastic pipe and fittings.
- Maximum vent pipe length is 40 feet with three 90 degree **long sweep** elbows.
- The minimum clearance from plastic vent pipe to combustible materials is 0 (zero) inches.
- Venting should be as direct as possible with a minimum pipe length and fittings.
- Vent diameter must not be reduced.
- Support all fittings and pipe runs with proper pipe hold-down hardware at least every three feet.
- Do not use damaged pipe or fittings.
- All joints must be properly cemented.
- Vent piping installed in unconditioned spaces must be properly insulated
- Make sure the inside of the pipe is clean and free of cuttings and loose dirt.
- Size and cut all piping before cementing. Make clean, square cuts.
- Do not connect this venting system with an existing vent or chimney.
- Do not common vent with the vent pipe of any other water heater or appliance.
- Do not run plastic vent pipe through a fire break wall.
- Do not screw, nail, rivet or make any holes in the vent pipe or fittings.
- Do not turn on the water heater until the adhesive has completely cured.

⚠ DANGER

CONNECTION OF THE VENT PIPE TO THE OUTLET OF THE VENT ASSEMBLY BLOWER MUST BE PROPERLY SEALED TO PREVENT LEAKAGE OF THE PRODUCTS OF COMBUSTION INTO THE LIVING SPACE.

IMPORTANT: Fittings such as elbows and couplings must not be attached directly to the blower outlet. A short length of vent pipe (2 inches minimum) must be used to connect an elbow or coupling to the blower outlet as shown in Figure 10.

Use silicone adhesive sealant to secure the vent pipe to the blower outlet. Use a good grade of pipe cement to secure the vent pipe and fittings to each other.

For PVC, CPVC, and ABS pipe:

1. Cut the pipe ends square, remove the ragged edges and burrs.
2. Chamfer the pipe end, apply a primer to the fitting and pipe.
3. Apply an even coat of a good grade of pipe cement inside the fitting. Apply a liberal amount of cement to the outside of the pipe to socket depth.
4. Assemble the parts quickly while the cement is still wet. Twist the pipe 1/4 turn during insertion and hold together for 30 seconds.
5. Wipe off the excess cement and do not handle for 15 minutes. Cure time will vary according to temperature, humidity, and fit.

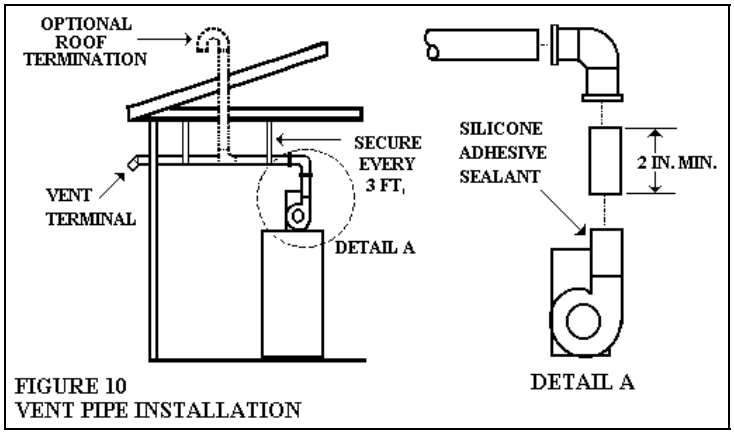
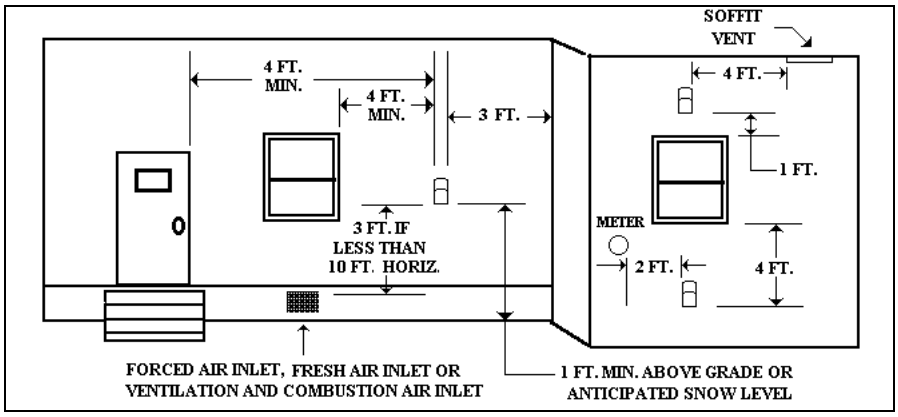


FIGURE 10
VENT PIPE INSTALLATION

VENT TERMINAL LOCATIONS

The vent outlet must not terminate:

- near walkways
- under a covered area or patio
- into an alley or other publicly accessible areas
- opposite a window where air currents would draw the ex-haust into the enclosure.
- in areas where children or animals could block the pipe or inhibit the proper operation of the water heater.
- in areas where dripping condensate may cause problems such as above patios, flowerbeds and planters.



IMPORTANT: Do not use the warm air that discharges from the vent outlet as a heat source.

Vent termination clearances are as follows:

- 12 inches above roof or grade level and/or twelve inches above maximum snow level.
- 4 ft. below, 4 ft. horizontally from, or 1 ft. above any door, window or gravity air inlet to the building.
- 3 feet above any forced air inlet located with 10 feet.
- 2 ft. horizontally from gas or electric meters. Do not install above a gas meter, regulator, or electric meter.
- 3 ft. from an inside corner formed by two exterior walls

.

VENT TERMINAL INSTALLATION

⚠ DANGER

OBSTRUCTIONS OR HOLES IN THE VENT PIPE CAN CAUSE TOXIC FUMES TO ENTER THE HOME RESULTING IN CARBON MONOXIDE POISONING OR DEATH.

THROUGH THE WALL

The vent terminal is a 45 degree elbow. This is shipped with the water heater and must be used as the vent terminal.

Install as follows:

1. Extend the vent outlet pipe 2 inches beyond the surface of the vertical outside wall. Caulk the area between the pipe and the outside wall.
2. Glue the vent terminal onto the vent outlet pipe as shown. Make sure that the vent terminal outlet is facing downward to the ground.

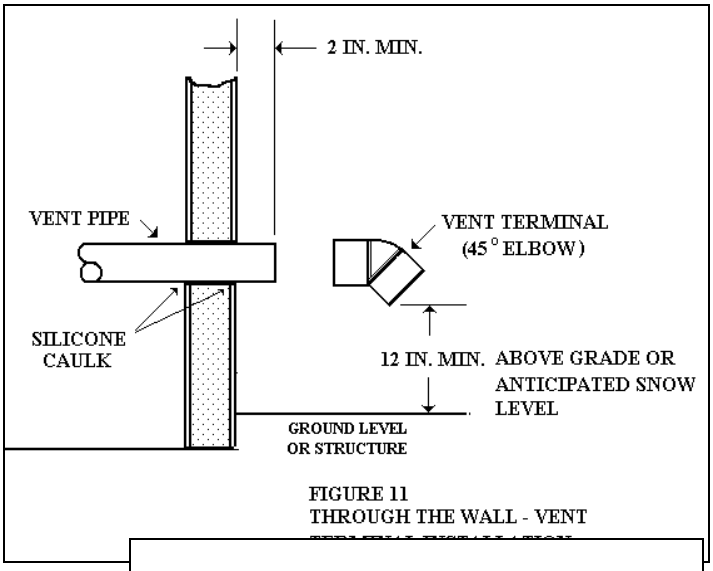


FIGURE 11
THROUGH THE WALL - VENT

THROUGH THE ROOF

This water heater may be vented vertically through a roof by using a U-bend pipe fitting as a vent terminal. Install as follows:

1. Extend the vent outlet pipe above the roof so that the outlet of the vent terminal will be at least 12 inches above the roof or anticipated snow level as shown.
2. Install roof flashing or other approved means to seal the pipe where it exits the roof. Caulk all gaps and openings to insure a tight seal.
3. Glue the U-bend vent terminal onto the vent pipe with the outlet of the terminal facing downward towards the roof.

⚠ CAUTION

MOISTURE IN THE FLUE GASES MAY CONDENSE AND FORM ON THE INTERIOR OF THE GAS VENT PIPE. VENT PIPING INSTALLED IN UNCONDITIONED SPACES MUST BE INSULATED. IMPROPER LOCATION OR INSTALLATION CAN CAUSE STRUCTURAL DAMAGE TO THE RESIDENCE.

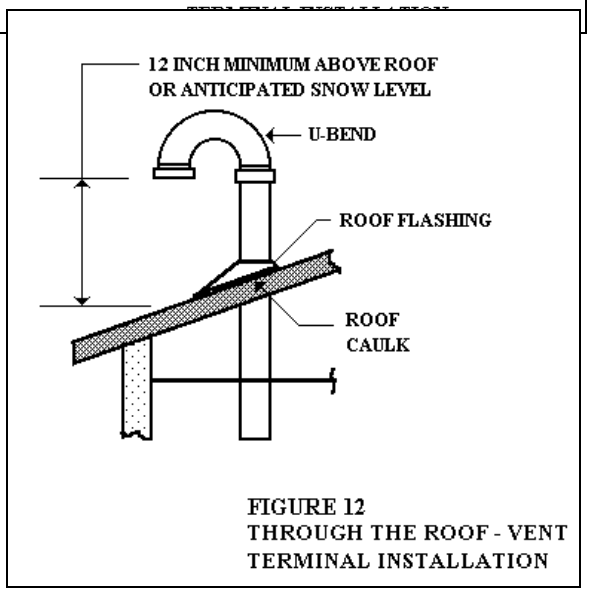


FIGURE 12
THROUGH THE ROOF - VENT TERMINAL INSTALLATION

WATER SYSTEM PIPING

GENERAL INFORMATION

Water piping, fittings, and valves must be properly installed for the correct and safe operation of this water heater. Please note the following:

DO NOT install this water heater with iron piping. The system should be installed only with new piping that is suitable for potable (drinkable) water such as copper, CPVC, or polybutylene. DO NOT use PVC water piping.

DO NOT use any pumps, valves, or fittings that are not compatible with potable water.

DO NOT use valves that may cause excessive restriction to water flow. Use full flow ball or gate valves only.

DO NOT use 50/50 tin-lead solder (or any lead based solder) in potable water lines. Use 95/5 tin-antimony or other equivalent material.

DO NOT tamper with the thermostat, gas valve, ignitor control or temperature and pressure relief valve. Tampering with any of the components is DANGEROUS and can result in property damage, severe injury or death. Tampering voids all warranties. Only qualified technicians should service these components.

DO NOT use with piping that has been treated with chromates, boiler seal, or other chemicals.

DO NOT add any chemicals to the system piping which will contaminate the potable water supply.

DO NOT install check valve type devices in the cold water supply line to the water heater.

⚠ CAUTION

NEVER OPERATE AN EMPTY OR PARTIALLY FILLED WATER HEATER. THIS CAN RESULT IN SERIOUS DAMAGE TO THE TANK.

TEMPERATURE & PRESSURE RELIEF VALVE

⚠ WARNING

DO NOT ATTEMPT TO OPERATE THIS WATER HEATER WITHOUT A PROPERLY INSTALLED TEMPERATURE AND PRESSURE RELIEF VALVE. FAILURE TO FOLLOW THIS INSTRUCTION CAN RESULT IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

For protection against excessive pressures and temperatures, a temperature and pressure relief valve must be installed in the opening marked "T & P RELIEF VALVE" (see Figure 13). This valve must be design certified by a nationally recognized testing laboratory that maintains periodic inspection of the production of listed equipment or materials as meeting the requirements for Relief Valves and Automatic Shut-off Devices for Hot Water Supply Systems., ANSI Z21.22. The function of the temperature and pressure relief valve is to discharge water in large quantities in the event of excessive temperature or pressure developing in the water heater. The valve must not exceed the working pressure of the water heater as stated on the data plate. **TO PREVENT PROPERTY DAMAGE, PERSONAL INJURY OR DEATH, THE RELIEF VALVE MUST BE ALLOWED TO OPERATE PROPERLY.**

Only a new temperature and pressure relief valve should be used with your water heater. Do not use an old or existing valve as they may damaged or not be adequate for the working pressure of the new water heater. Do not place any valve between the relief valve and the tank.

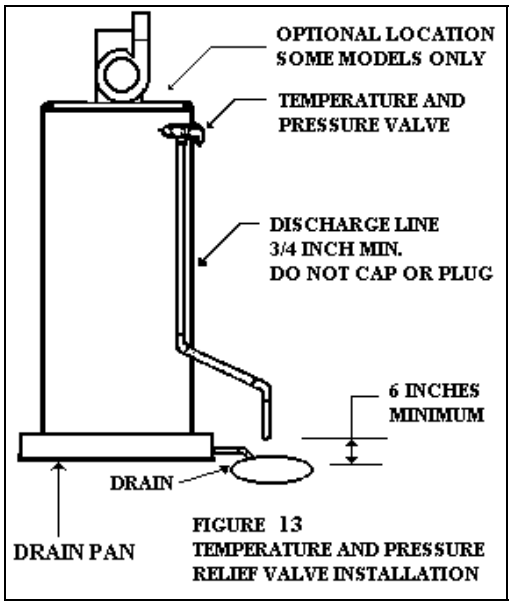


FIGURE 13
TEMPERATURE AND PRESSURE
RELIEF VALVE INSTALLATION

THE TEMPERATURE & PRESSURE RELIEF VALVE:

- Must not be in contact with any electrical part.
- Must be connected to an adequate discharge line.
- Must not exceed the working pressure shown on the data plate of the water heater.

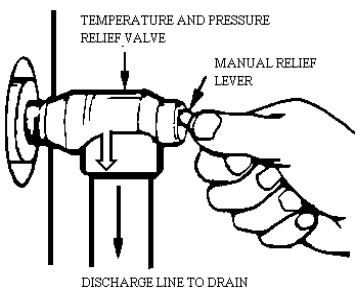
THE DISCHARGE LINE:

- Must not be smaller than the pipe size of the relief valve.
- Must not be capped, blocked, plugged or contain any valve between the relief valve and the end of the discharge line.
- Must terminate 6 inches above a floor drain or external to the building.
- Must be capable of withstanding 250°F (121°C) without distortion.
- Must be installed to allow complete drainage of both the temperature and pressure relief valve and discharge line.

⚠ WARNING

FAILURE TO INSTALL AND MAINTAIN A NEW PROPERLY LISTED TEMPERATURE AND PRESSURE RELIEF VALVE WILL RELEASE THE MANUFACTURER FROM ANY CLAIMS WHICH MIGHT RESULT FROM EXCESSIVE TEMPERATURE OR WATER PRESSURE.

Manually operate the temperature and pressure relief valve at least once a year to make sure it is working properly. To prevent water damage, the valve must be properly connected to a discharge line which terminates at an adequate drain. Standing clear of the outlet (discharged water may be hot), slowly lift and release the lever handle on the temperature and pressure relief valve to allow the valve to operate freely and return to its closed position. If the valve fails to completely reset and continues to release water, immediately shut off the manual gas valve and the cold water inlet valve and call a qualified service technician.



⚠WARNING

DISCHARGING WATER MAY BE HOT AND CAN CAUSE SCALD INJURIES AND PROPERTY DAMAGE. DISCHARGE LINES MUST BE PROPERLY INSTALLED AND PIPED TO AN ADEQUATE DRAIN.

CLOSED SYSTEM/THERMAL EXPANSION

Periodic discharge of the temperature and pressure relief valve may be due to thermal expansion in a closed water supply system. The water utility supply meter may contain a check valve, backflow preventer or water pressure reducing valve. This will create a closed water system. During the heating cycle of the water heater, the water expands causing pressure inside the water heater to increase. The temperature and pressure relief valve may discharge hot water under these conditions which results in a loss of energy and a build-up of lime on the relief valve seat. To prevent this from happening, there are two recommendations:

1. Install a 125 PSI pressure relief valve in the cold water supply line. **Make sure the discharge of this valve is directed to an open drain and protected from freezing.**
2. Install a diaphragm-type expansion tank that is suitable for potable water on the cold water supply line. The expansion tank must have a minimum capacity of 1.5 U.S. gallons for every 50 gallons of stored water.

Contact the local water supplier or plumbing inspector for information on how to control this situation. Do not plug the temperature and pressure relief valve.

PIPING INSTALLATION

Piping, fittings, and valves should be installed according to the installation drawing (Figure 14). If the indoor installation area is subject to freezing temperatures, the water piping must be protected by insulation.

Water supply pressure should not exceed 80% of the working pressure of the water heater. The working pressure is stated on the water heater's data plate. If this occurs a pressure limiting valve with a by-pass may need to be installed in the cold water inlet line. This should be placed on the supply to the entire house in order to maintain equal hot and cold water pressures.

IMPORTANT: Heat cannot be applied to the water fittings on the heater as they may contain nonmetallic parts. If solder connections are used, solder the pipe to the adapter before attaching the adapter to the hot and cold water fittings.

IMPORTANT: Always use a good grade of joint compound and be certain that all fittings are drawn up tight.

1. Install the water piping and fittings as shown in the Figure 14. Connect the cold water supply (3/4 NPT) to the fitting marked "C". Connect the hot water supply (3/4 NPT) to the fitting marked "H". Make sure the dip tube is in the cold water fitting before connecting the hot and cold water lines. (Note: 75T75 has 1"NPT)

IMPORTANT: Some models may contain energy saving heat traps to prevent the circulation of hot water within the pipes. Do not remove the pink and blue inserts within the heat traps.

2. Installation of unions in both the hot and cold water supply lines is recommended for ease of removing the water heater for service or replacement.
3. The manufacturer of this water heater recommends installing a tempering valve or an anti-scald device in the domestic hot water line as shown in Figure 15. These valves reduce the point of use temperature of the water by mixing cold and hot water and are readily available for use. Contact a licensed plumber or the local plumbing authority.
4. If installing the water heater in a closed water system, install a relief valve or expansion tank in the cold water line as specified under "Closed System/Thermal Expansion".
5. Install a shutoff valve in the cold water inlet line. It should be located close to the water heater and be easily accessible. Know the location of this valve and how to shut off the water to the heater.
6. Install a temperature and pressure relief valve and discharge line in the opening marked "T & P RELIEF VALVE". Install as specified under "Temperature and Pressure Relief Valve, pg. 11 ".
7. After piping has been properly connected to the water heater, open the nearest hot water faucet and allow the tank to completely fill with water. To purge the lines of any excess air and sediment, keep the hot water faucet open for 3 minutes after a constant flow of water is obtained. Close the faucet and check all connections for leaks.

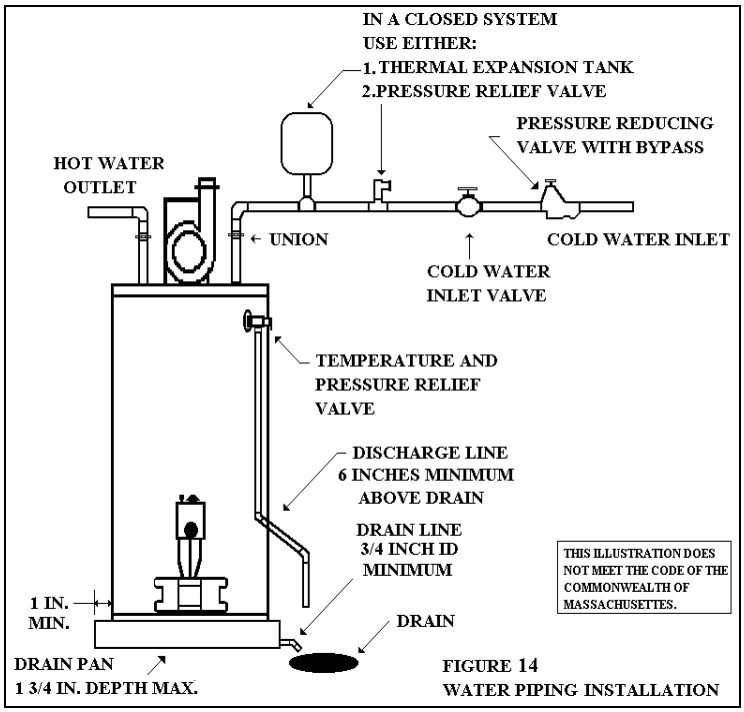
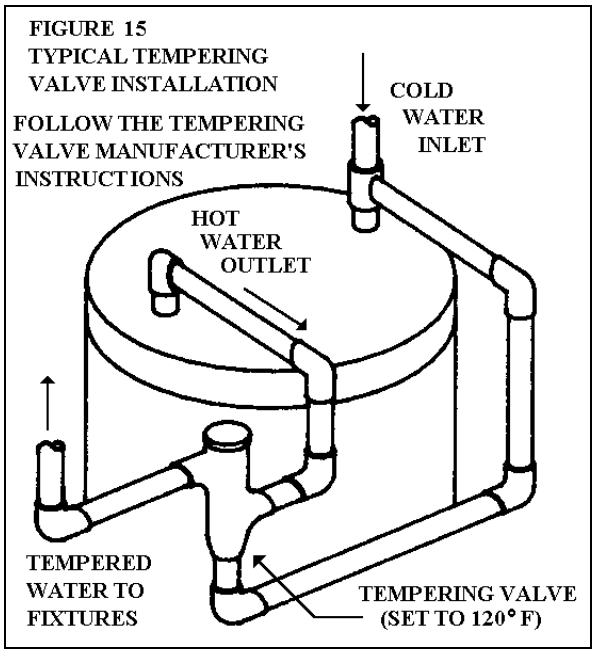


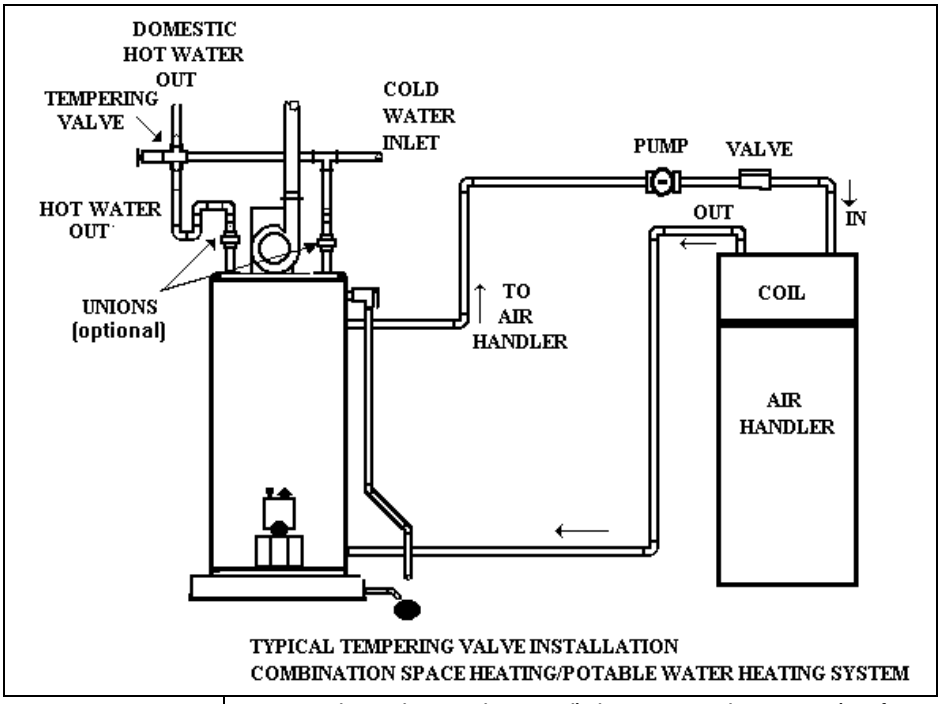
FIGURE 14
WATER PIPING INSTALLATION



COMBINATION SPACE HEATING/POTABLE WATER HEATING SYSTEM

Some water heater models are equipped with inlet/outlet tappings for use with space heating applications. If this water heater is to be used to supply both space heating and domestic potable (drinking) water, the instructions listed below must be followed.

- Be sure to follow the manual(s) shipped with the air handler system.
- **This water heater is not to be used as a replacement for an existing boiler installation.**
- **Do not use with piping that has been treated with chromates, boiler seal or other chemicals**.
- **This water piping contains potable (drinkable) water. Do not add boiler treatment or any chemicals to any water heater piping.**
- If the space heating system requires water temperatures in excess of 120°F, a tempering valve or an anti-scald device should be installed per its manufacturer's instructions in the domestic (potable) hot water supply to limit the **risk of scald injury**.
- Pumps, valves, and fittings must be compatible with potable water piping.
- Some jurisdictions may require a backflow preventer in the incoming cold water line. This may cause the temperature and pressure relief valve on the water heater to discharge or weep due to expansion of the heated water. A diaphragm-type expansion tank suitable for potable water will normally eliminate this weeping condition. Please read and follow the manufacturer's instructions for the installation of such tanks.
- Also see "General Information, Water System Piping", pg. 11 for additional instructions on the safe and correct installation and operation of this water heater.



TYPICAL TEMPERING VALVE INSTALLATION
COMBINATION SPACE HEATING/POTABLE WATER HEATING SYSTEM

SOLAR INSTALLATION

If this water heater is used as a **SOLAR STORAGE HEATER OR AS A BACKUP FOR THE SOLAR SYSTEM,** the water supply temperatures to the water heater tank may be in excess of 120°F. A tempering valve or other temperature limiting valve must be installed in the water supply line to limit the supply temperature to 120°F. An anti-scald device must be installed in the domestic hot water supply line to limit the risk of scald injury.

Solar Water Heating Systems can often supply water with temperatures exceeding 180°F and may result in water heater malfunction. Please read the following warning.

⚠WARNING

WATER SUPPLY TO THIS HEATER MUST NOT EXCEED 180°F. WATER TEMPERATURE IN EXCESS OF 180°F WILL CAUSE THE HIGH LIMIT CONTROL TO OPEN AND SHUT OFF THE GAS SUPPLY TO THE UNIT. THE HIGH LIMIT CONTROL IS A SINGLE USE TYPE THAT WILL REQUIRE THE REPLACEMENT OF THE THERMOSTAT BEFORE THE BURNER CAN OPERATE.

GAS SUPPLY AND PIPING

GENERAL INFORMATION

DANGER

THIS WATER HEATER IS EQUIPPED FOR ONE TYPE OF GAS ONLY. DO NOT USE THIS WATER HEATER WITH ANY GAS OTHER THAN THE ONE LISTED ON THE DATA PLATE LOCATED NEAR THE GAS CONTROL. FAILURE TO USE THE CORRECT GAS CAN RESULT IN PROPERTY DAMAGE, BODILY INJURY, OR DEATH.

This water heater must only be connected to gas supplied by a commercial utility.

GAS PIPING

Install the gas piping according to all local and state codes or with the "National Fuel Gas Code", ANSI Z223.1 (NFPA 54)-Latest Edition.

Do not use copper and brass piping and fittings (except tin-lined copper tubing) if the gas contains more than 0.3 grains of hydrogen sulfide per 100 standard cubit feet of gas. Contact your local gas utility company if you are unsure about this.

Table 2 and or Table 3 are provided as a sizing reference for commonly used gas pipe materials. Consult the "National Fuel and Gas Code" for the recommended gas pipe size of other materials.

DANGER

THE GAS LINE MUST BE OF ADEQUATE SIZE SO AS TO PREVENT UNDUE PRESSURE DROP AND NEVER SMALLER THAN THE PIPE SIZE TO THE GAS VALVE ON THE WATER HEATER. FAILURE TO PROPERLY SIZE THE GAS LINE CAN CAUSE A FIRE OR EXPLOSION RESULTING IN PROPERTY DAMAGE, BODILY INJURY OR DEATH.

TABLE 2
NATURAL GAS PIPE CAPACITY TABLE (CU. FT./HR)

Capacity of gas pipe of different diameters and lengths in cu. ft. per hr. with pressure drop of 0.3 in. and specific gravity of 0.60 (natural gas).

Nominal Iron Pipe Size, Inches	Length of Pipe, Feet									
	10	20	30	40	50	60	70	80	90	100
1/2	132	92	73	63	56	50	46	43	40	38
3/4	278	190	152	130	115	105	96	90	84	79
1	520	350	285	245	215	195	180	170	160	150
1-1/4	1050	730	590	500	440	400	370	350	320	305
1-1/2	1600	1100	890	760	670	610	560	530	490	460

After the length of pipe has been determined, select the pipe size which will provide the minimum cubit feet per hour required for the gas input rating of the water heater. By formula:

$$\text{Cu. Ft. Per Hr. Required} = \frac{\text{Gas Input of Water Heater (BTU/HR)}}{\text{Heating Value of Gas (BTU/FT}^3\text{)}}$$

The gas input of the water heater is marked on the water heater data plate. The heating value of the gas (BTU/FT3) may be determined by consulting the local natural gas utility.

WARNING

CONTAMINANTS IN THE GAS PIPING MAY FOUL THE THERMOSTAT CAUSING A MALFUNCTION, FIRE, OR EXPLOSION. BE SURE ALL GAS PIPING IS CLEAN AND CLEAR ON THE INSIDE BEFORE ATTACHING THE GAS LINE.

TABLE 3
LP GAS PIPE CAPACITY TABLE

Maximum capacity of pipe in thousands of BTU per hour of undiluted liquefied petroleum gases (at 11 inches water column pressure). Based on a Pressure Drop of 0.5 Inch Water Column.

Nominal iron pipe size, in.	Length of Pipe, Feet											
	10	20	30	40	50	60	70	80	90	100	125	150
1/2	275	189	152	129	114	103	96	89	83	78	69	63
3/4	567	393	315	267	237	217	196	185	173	162	146	132
1	1071	732	590	504	448	409	378	346	322	307	275	252
1-1/4	2205	1496	1212	1039	913	834	771	724	677	630	567	511

Example: Input BTU requirement of the water heater, 100,000 BTUH Total pipe length, 80 feet = 3/4" IPS required.

When installing gas piping, use a pipe joint compound that is resistant to the action of propane (LPG) gases. Apply the compound to male threads only. Do not apply the compound to the first 2 threads. Do not use TEFLON tape.

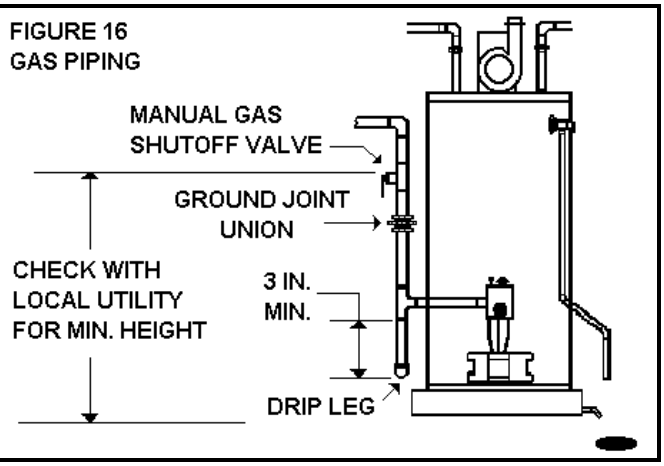
Do not use pipe joint compound or TEFLON tape on the union connection.

When making pipe connections, use a back-up wrench to prevent any twisting of the control valve/thermostat assembly. Do not use excessive force when tightening the pipe joint at the thermostat inlet.

Refer to Figure 16 and install as follows:

1. Install a readily accessible manual shutoff valve in the gas supply line as recommended by the local utility. Know the location of this valve and how to turn off the gas to this unit.

FIGURE 16
GAS PIPING



GAS SUPPLY AND PIPING (CONT.)

2. Install a drip leg (if not already incorporated as part of the water heater) as shown. The drip leg must be no less than 3 inches long for the accumulation of dirt, foreign material and water droplets.
3. Install a ground joint union between the gas valve/thermostat and the manual shutoff valve. This is to allow easy removal of the gas valve/ thermostat.

IMPORTANT: Refer to the "Gas Pressure Testing" section on this page before pressure testing the gas lines.

4. Turn the gas supply on and check for leaks. Use a chloride-free soap and water solution (bubbles forming indicate a leak) or other approved method. **Do not use an open flame. ALL LEAKS MUST BE FIXED IMMEDIATELY.**

⚠ DANGER

DO NOT USE AN OPEN FLAME OR ANY KIND OF SPARK TO CHECK GAS PIPING FOR LEAKS. IF LEAKING GAS IS PRESENT, AN EXPLOSION OR FIRE MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

IMPORTANT: This water heater's gas controls and its gas connection must be leak tested before placing the appliance in operation.

IMPORTANT: Air may be present in the gas lines and could prevent the pilot from lighting on initial start-up. The gas lines should be purged of air by a qualified service technician after installation of the gas piping system.

The gas supply pressure must not exceed the maximum supply pressure as stated on the water heater's data plate. The minimum supply pressure is for the purpose of input adjustment

GAS PRESSURE TESTING

IMPORTANT: Subjecting the gas valve/thermostat to pressures exceeding 14" W.C. (1/2 psi, 3.7 kPa) may cause damage resulting in an extremely hazardous condition.

- If the code requires the gas lines to be tested at a pressure exceeding 14" W.C., the water heater and its manual shutoff valve must be **disconnected** from the gas supply piping system and the line capped.
- If the gas lines are to be tested at a pressure less than 14" W.C. the water heater must be **isolated** from the gas supply piping system by closing its manual shutoff valve.

A U.L. RECOGNIZED FUEL GAS AND CO DETECTOR(S) ARE RECOMMENDED IN ALL APPLICATIONS AND THEIR INSTALLATION SHOULD BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND/OR LOCAL LAWS, RULES, REGULATIONS, OR CUSTOMS.

ELECTRICAL CONNECTIONS

⚠ WARNING

ELECTRICAL WIRING CONNECTIONS MUST ONLY BE PERFORMED BY A QUALIFIED ELECTRICIAN.

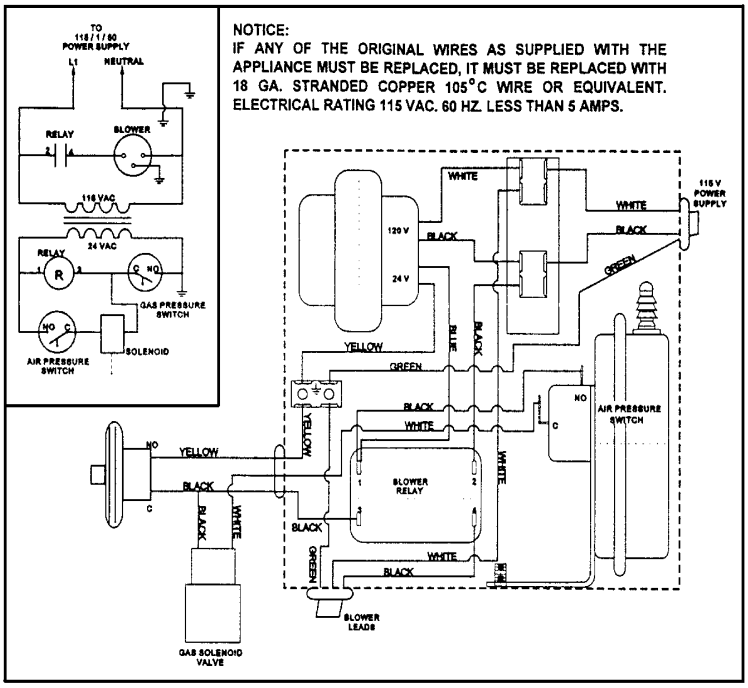
The electrical rating of this water heater is 115 volts and less than 5 amps. All electrical wiring and connections must be properly grounded in accordance with the local codes or in the absence of local codes, with the National Electric Code ANSI/NFPA 70 - Latest Edition. In Canada, all electrical connections must be in accordance with the Canadian Electrical Code Part 1-022.1.

The electrical service to the water heater must be equipped with the proper overload fuse or breaker protection for the specified electrical rating.

The power vent module is supplied with a flexible, grounded power cord and connects to a standard three wire, grounding type receptacle. **Do not use an extension cord.**

⚠ WARNING

THIS WATER HEATER MUST BE ELECTRICALLY GROUNDED IN ACCORDANCE WITH THE PREVAILING ELECTRICAL CODE.



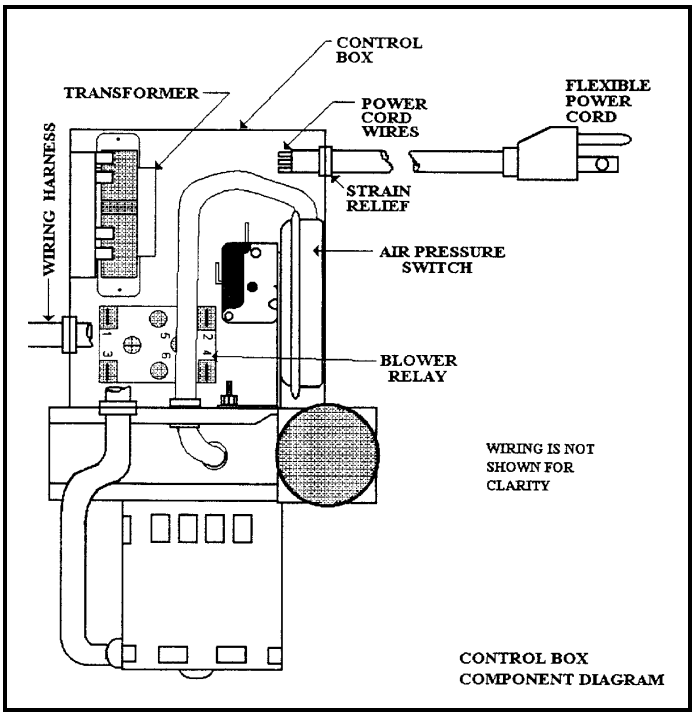
ELECTRICAL CONNECTIONS (CON'T)

Some local codes may prohibit the use of a flexible power cord. If wiring in conduit is required:

1. **TURN OFF THE POWER TO THE ELECTRICAL SERVICE.**
2. Remove the two screws holding the top cover plate onto the control box. Remove the cover plate and set aside.
3. Cut the flexible power cord on the inside of the control box as near to the strain relief as possible. Remove the strain relief and power cord from the control box housing.
4. Install a listed conduit into the hole in the housing. If needed, enlarge the hole accordingly to accommodate the conduit. Feed the field wire through the conduit and into the control box.
5. Splice the field wiring into the existing wiring using a method in accordance with the prevailing local or national codes. **DO NOT REVERSE THE ELECTRICAL CONNECTIONS. REVERSING THE ELECTRICAL CONNECTIONS WILL CAUSE AN ELECTRICAL SHOCK HAZARD.**
   - Black - Line or "Hot"
   - White - Neutral
   - Green - Ground
6. Replace the top cover plate and secure with two screws.
7. Restore the power to the electrical service.

⚠CAUTION

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



Verify proper operation after servicing.

INSTALLATION CHECKLIST

WATER HEATER LOCATION

◊ Centrally located with the water piping system. Located close to the gas piping and vent pipe system as possible.

◊ Located indoors and in a vertical position. Protected from freezing temperatures.

◊ Proper clearances from combustible surfaces maintained and not installed directly on a carpeted floor.

◊ Provisions made to protect the area from water damage.

◊ Installation area free of corrosive elements and flammable materials.

◊ Sufficient room to service the water heater.

◊ Water heater not located near an air moving device.

VENTILATION AND COMBUSTION AIR SUPPLY

◊ Sufficient fresh air supply for proper water heater operation.

◊ Fresh air not taken from areas that contain negative pressure producing devices.

◊ Fresh air supply free of corrosive elements and flammable vapors.

◊ Fresh air openings sized correctly with consideration given to the blocking effect of louvers and grilles.

◊ Ductwork is the same cross-sectional area as the openings.

VENT PIPE SYSTEM

◊ Installed with 3 inch, Schedule 40, PVC, ABS-DWP, or CPVC plastic pipe and fittings only. **Do not use Foam Core PVC pipe and fittings.**

◊ No short radius or medium sweep fittings. Use only long sweep fittings and elbows.

◊ Maximum vent pipe length of 40 feet maximum with three 90° long sweep ells not exceeded. Vent pipe supported and secure.

◊ Vent pipe terminal opening facing downward and installed with proper clearances.

◊ Vent pipe system in accordance with "National Fuel Gas Code", NFPA 54, ANSI Z223.1-Latest Edition or prevailing provisions of local codes.

◊ Flue baffle engaged in slots provided in the flue tube.

◊ Vent pipe system not obstructed in any way.

WATER SYSTEM PIPING

◊ Temperature and pressure relief valve properly installed with a discharge line run to an open drain and protected from freezing.

◊ All piping properly installed and free of leaks.

◊ Heater completely filled with water.

◊ Closed system pressure build-up precautions installed.

◊ Tempering valve or anti-scald device installed per manufacturer's instructions

GAS SUPPLY AND PIPING

◊ Gas supply is the same type as listed on the water heater data plate.

◊ Gas line equipped with shut-off valve, union and drip leg.

◊ Approved pipe joint compound used.

◊ Adequate pipe size and of approved material.

◊ Chloride-free soap and water solution or other approved means used to check all connections and fittings for possible gas leaks.

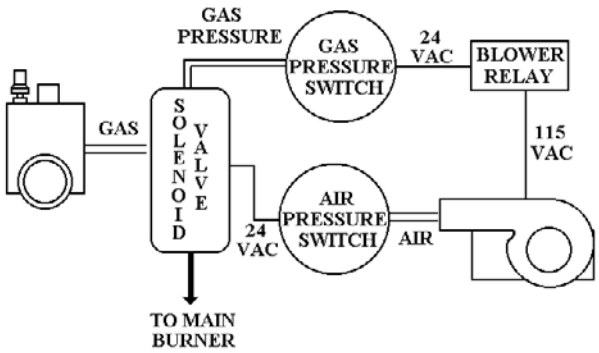
ELECTRICAL

◊ Installed in accordance with the prevailing electrical codes.

SEQUENCE OF OPERATION

When the thermostat senses a need for hot water, a valve is opened which allows gas to flow to the closed solenoid valve. As gas pressure builds up within the solenoid, the gas pressure switch closes and 24 VAC flows to the blower relay.

The blower relay contacts close and send 115 VAC to the vent blower which turns it on. Air flow from the vent blower closes the air pressure switch sending 24 VAC to the solenoid valve. The solenoid valve opens and allows gas to flow to the burner which is lit by the pilot.



START-UP / OPERATION

⚠ WARNING

IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PER-SONAL INJURY OR LOSS OF LIFE.

Read these directions thoroughly before attempting to light or relight the pilot. Check the data plate near the gas valve control/thermostat for the correct gas. Do not use this water heater with any gas other than the one listed on the data plate. If you have any questions or doubts consult your gas supplier or gas utility company.

DO NOT:

- Operate the water heater if it has been subjected to physical damage, flooding, or fire.
- Operate the water heater unless the tank is filled with water.
- Operate the water heater if the cold water supply inlet valve is closed.
- Allow flammable liquids such as gasoline or paint thinner to be stored or used near this water heater.
- Allow combustible materials such as newspapers, rags or mops to accumulate near this water heater.
- Set or store anything on top of this water heater as it may block the blower air intake.
- Light this water heater until all lighting instructions are understood and followed. Lighting instructions are clearly given in this manual and on the water heater label.
- Light this water heater if you smell gas around the appliance area.

IF YOU SMELL GAS:

1. Open the windows.
2. Get all people out of the building.
3. Do not light matches or any other appliance. Do not smoke.
4. Do not touch any electrical switches (on or off) or use any phones in your residence.
5. Extinguish any open flames immediately.
6. Shut off the gas at the manual shut-off valve. (If using liquid propane gas, shut off the gas at the L.P. tank outside of your residence.)
7. Use an outside phone and immediately call the gas company and the fire department. Give your name and address and ask for instructions.
8. Do not go back into the building . Wait for help to arrive outside of the building.

L.P.G. (BOTTLED PROPANE) MODELS

Liquefied Petroleum Gas is over 50% heavier than air and in the occurrence of a leak in the system the gas will settle at FLOOR LEVEL. Basements, crawl spaces, skirted areas under mobile homes (even when ventilated), closets and areas below ground level will serve as pockets for the accumulation of gas. **Before lighting an L.P. gas water heater, smell all around the appliance at floor level**. If you smell gas, follow the directions as given above.

When your L.P. tank runs out of fuel, turn off the gas at all gas appliances including pilot lights. After the tank is refilled, all appliances must be re-lit according to their manufacturer's instructions.

WATER EXPOSURE

Do not try to light this water heater if the gas valve, main burner, or pilot have been exposed to water in any way. Immediately call a qualified service technician to inspect the water heater. DO NOT attempt to repair these parts. Water heaters subjected to flood conditions or anytime the main burner, gas controls, or pilot have been submerged in water require replacement of the entire water heater.

LIGHTING THE WATER HEATER

⚠ WARNING

DO NOT ATTEMPT TO LIGHT THIS WATER HEATER UNTIL IT IS PROPERLY INSTALLED AND YOU UNDERSTAND ALL OF THE SAFETY WARNINGS AND PRECAUTIONS.

Check the Gas Control Valve/Thermostat and determine which model is being used for your water heater. Refer to either Figure 17A or 17B and light the water heater according to its directions.

CHECKING THE DRAFT

After successfully lighting the water heater, allow the unit to operate for 15 minutes and check the blower module for proper draft. Pass a match flame around the relief opening of the blower module. A steady flame drawn into the opening indicates proper draft. If the flame flutters or is blown out, combustion products are escaping from the relief opening. If this occurs, do not operate the water heater until proper adjustments or repairs are made to the vent pipe system.

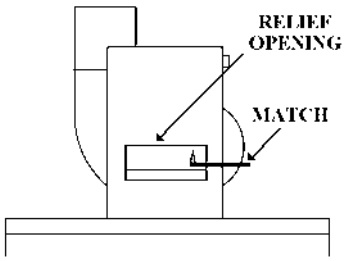


FIGURE 17A : LIGHTING INSTRUCTIONS (ROBERTSHAW THERMOSTAT)

FOR YOUR SAFETY READ BEFORE LIGHTING

⚠ WARNING

If you do not follow these directions 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 all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS:

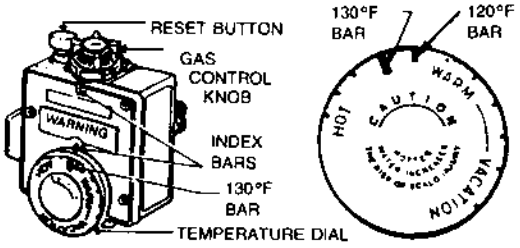
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

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 move by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

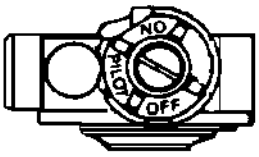
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance. Water heaters subjected to flood conditions or anytime the gas controls, main burner or pilot have been submerged in water require replacement of the entire water heater.

LIGHTING INSTRUCTIONS

1. STOP! It is imperative that you read all the safety warnings before lighting the pilot.
2. Remove outer and inner doors.
3. Turn the temperature dial counterclockwise ↶ to its lowest setting.

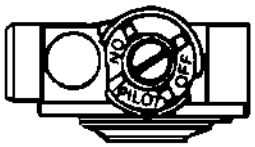


4. Turn gas control knob clockwise ↷ to the "OFF" position.



5. To clear any gas that may have accumulated wait ten (10) minutes. If you then smell gas, STOP! Follow "B" in the safety warning above. If you do not smell gas go to the next step.
6. Find pilot - follow the smaller metal tube from the thermostat to the pilot.

7. Turn the gas control knob counterclockwise ↶ to "PILOT".



8. Light match and hold to pilot. Depress the reset button all the way in; hold until pilot lights. Repeat immediately if pilot does not light on the first try. Continue to hold the button for about (1) minute after the pilot is lit. Release the reset button and it will pop back up. Pilot should remain lit. If the pilot light goes out, repeat steps 3 - 8.

IMPORTANT: If the pilot will not stay lit after several tries, turn gas control knob to "OFF" and call your service technician or gas supplier.

IMPORTANT: If the reset button does not pop up when released, stop and immediately shut off the gas at the line valve or tank. Call your service technician or gas supplier.

9. Replace the inner door.
10. Turn the gas control knob counterclockwise ↶ to "ON".
11. Set the temperature dial to the desired setting.
12. Replace the outer door.

TO TURN OFF GAS TO APPLIANCE

1. Turn the temperature dial counterclockwise ↶ to its lowest setting.
2. Turn the gas control knob clockwise ↷ to the "OFF" position.

FIGURE 17B : LIGHTING INSTRUCTIONS (WHITE-RODGERS THERMOSTAT)

FOR YOUR SAFETY READ BEFORE LIGHTING

⚠ WARNING

If you do not follow these directions 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 a hand. When lighting the pilot, follow these instructions exactly.

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

WHAT TO DO IF YOU SMELL GAS:

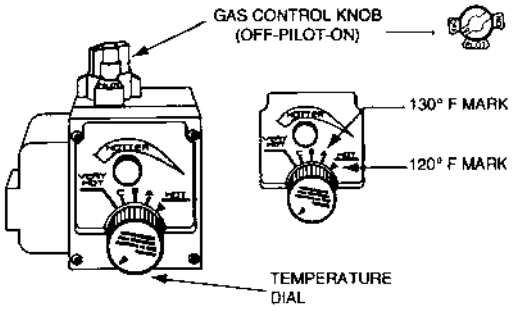
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
  Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

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 move 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 technic-ian to inspect the appliance. Water heaters subjected to flood conditions or any time the gas controls, main burner or pilot have been submerged in water require replacement of the entire water heater.

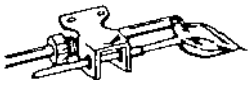
LIGHTING INSTRUCTIONS

1. STOP! It is imperative that you read all the safety warnings before lighting the pilot.
2. Remove outer and inner doors.
3. Set the thermostat to its lowest setting. (Rotate clockwise).
4. Depress the gas control knob slightly and turn clockwise to "OFF". If the knob is "ON", turn it clockwise to "PILOT" then depress the knob slightly and turn clockwise to "OFF".



NOTE: Knob cannot be turned from "PILOT" to "OFF" unless knob is depressed slightly. Do not use tools or excessive force.

5. To clear any gas that may have accumulated wait ten (10) minutes. If you then smell gas, STOP! Follow "B" in the safety warning above. If you do not smell gas go to the next step.
6. Find the pilot - Follow the smaller metal tube from thermostat to the pilot.
7. Turn the gas control knob counterclockwise to "PILOT".



8. Light the match and hold to the pilot. Depress the control knob all the way; hold until pilot lights. Continue to hold the control knob down for about (1) minute after the pilot is lit. Release knob and it will pop back up. Pilot should remain lit. If the pilot light goes out, repeat steps 3 -8.

IMPORTANT: If the pilot will not stay lit after several tries, turn gas control knob to "OFF" and call your service technician or gas supplier.

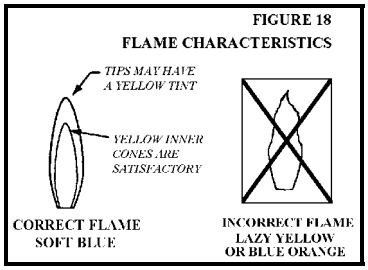
IMPORTANT: If the knob does not pop up when released, turn the knob to "OFF", stop and immediately call your service technician or gas supplier.

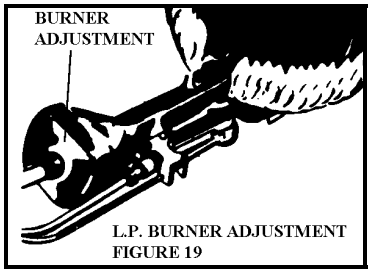
9. Replace the inner door.
10. Turn the gas control knob counterclockwise to "ON".
11. Set the temperature dial to the desired setting.
12. Replace the outer door.

TO TURN OFF THE GAS TO APPLIANCE

1. Set the thermostat to its lowest setting.
2. Turn gas control knob clockwise to "PILOT".
3. Depress the gas control knob slightly and turn clockwsie to "OFF". Do not use tools or force.

BURNER FLAMES





Inspect the burner flames and compare them to the drawings in Figure 18. A properly operating burner should produce a soft blue flame. Blue tips with yellow inner cones are satisfactory. The tips of the flame may have a slight yellow tint. The flame should not be all yellow or have a sharp blue-orange color. Contaminated air may cause an orange colored flame. A main burner adjustment is provided for L.P. gas water heaters only. This is a primary air controlling device and is located at the end of the burner venturi. (See Figure 19). Loosen the screw and open the device to sharpen the flame. Close the device to soften the flame. Retighten the screw after adjusting the flame. Natural gas models do not have a field adjustment. Contact a qualified service technician if the flame is not satisfactory.

WATER TEMPERATURE REGULATION

The thermostat is adjusted to its lowest temperature when it is shipped from the factory. Water temperature can be regulated by moving the temperature dial to the preferred setting. **The preferred starting point is 120°F**. Align the index bar on the thermostat with the desired water temperature as shown in Figures 20 and 21. **There is a hot water scald potential if the thermostat is set too high.**

⚠WARNING

ADJUSTING THE THERMOSTAT PAST THE 120°F BAR ON THE TEMPERATURE DIAL WILL INCREASE THE RISK OF SCALD INJURY.

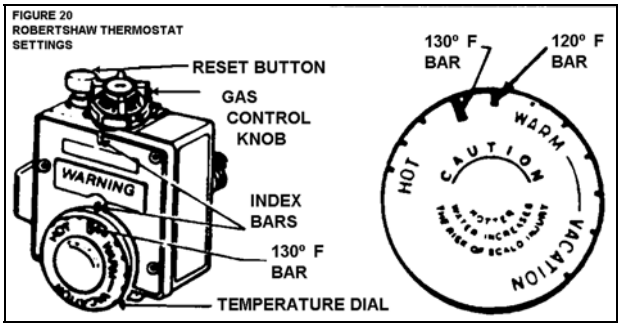
During low demand periods when hot water is not being used, a lower thermostat setting will reduce energy losses and may satisfy your normal hot water needs. If hot water use is expected to be more than normal, a higher thermostat setting may be required to meet the increased demand.

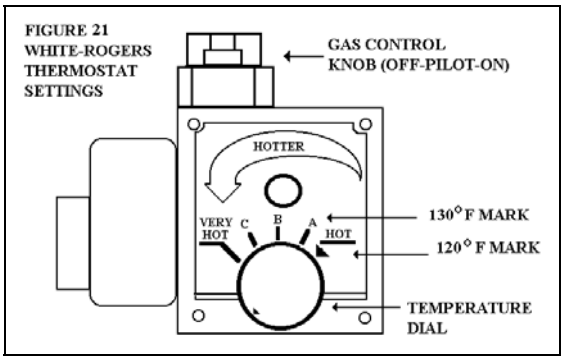
When leaving your home for extended periods (vacations, etc.) turn the temperature dial to its lowest setting. This will maintain the water at low temperatures with minimum energy losses and prevent the tank from freezing during cold weather.

⚠WARNING

HOT WATER CAN PRODUCE FIRST DEGREE BURNS WITHIN:

3 SECONDS AT 140°F (60°C)
20 SECONDS AT 130°F (54°C)
8 MINUTES AT 120°F (49°C)





⚠WARNING

HOUSEHOLDS WITH SMALL CHILDREN, ELDERLY, IMPAIRED OR DISABLED MEMBERS AND ANYONE WITH TEMPERATURE SENSITIVE SKIN MAY REQUIRE A LOWER TEMPERATURE SETTING TO REDUCE THE RISK OF SCALD INJURY.

STACKING

Stacking occurs when short draws of hot water (3 gallons or less) are taken from the water heater tank. This causes increased cycling of the burner and can result in increased water temperatures at the hot water outlet. Always install an anti-scald device in the hot water supply line to reduce the risk of scald injury.

EMERGENCY SHUT DOWN

IMPORTANT: Should overheating occur or the gas supply fail to shut off, turn off the water heater's manual gas control valve and call a qualified service technician.

OPERATINAL CONDITIONS

CONDENSATION

Moisture from the products of combustion condenses on the tank surface and forms drops of water which may fall onto the burner or other hot surfaces. This will produce a "sizzling" or "frying" noise. **This condensation is normal and should not be confused with a leaking tank.** Condensation may increase or decrease at different times of the year.

High efficient Energy Saver water heaters will produce larger amounts of condensation on initial light up or when a large amount of hot water is being used. **Do not confuse this with a "tank leak".** Once the water reaches a temperature of 120°F and the tank warms up (usually 30 - 45 minutes), the condensation will stop.

Operating the water heater at the lowest thermostat setting may increase the amount of condensation. Adjusting the thermostat slightly higher may eliminate this problem.

IMPORTANT: It is always recommended that a suitable drain pan be installed under the water heater to protect the area from water damage resulting from normal condensation production or a leaking tank or piping connections (See pages 5 and 6, "Location Requirements and Considerations"). Under no circumstances is the manufacturer to be held responsible for any water damage in connection with this water heater.

WATER HEATER SOUNDS

During the normal operation of the water heater, sounds or noises may be heard. These noises are common and may result from the following:

1. Normal expansion and contraction of metal parts during periods of heat-up and cool-down .
2. Condensation causes sizzling and popping within the burner area and should be considered normal.

OPERATIONAL CONDITIONS (CON'T)

3. Sediment build-up in the tank bottom will create varying amounts of noise and may cause premature tank failure. Drain and flush the tank as directed under "Draining and Flushing".

SMOKE/ODOR

The water heater may give off a small amount of smoke and odor during the initial start-up of the unit. This is due to the burning off of oil from the metal parts of a new unit and will disappear after a few minutes of operation.

SAFETY SHUT-OFF

This water heater is designed to automatically shut-off in the event of the following:

1. The pilot flame is extinguished for any reason.
2. The water temperature exceeds 180°F (83°C).

A flame-sensing thermocouple is used to determine if a pilot flame is present and will immediately shut off the gas supply to the main burner and the pilot burner if the flame is absent.

A high temperature limit switch or ECO (Energy Cut Off) is used to shut off the unit if the water temperature exceeds 180°F (83°C). The ECO is a single use switch and requires complete replacement of the entire thermostat. If the ECO should function, the water heater cannot be used until the thermostat is replaced by a qualified service agency. Contact your local dealer for service information.

⚠DANGER

DO NOT ATTEMPT TO BY-PASS OR JUMPER THE ECO AS THIS CAN RESULT IN PROPERTY DAMAGE, BODILY INJURY OR DEATH. THIS WILL VOID THE WARRANTY AND RELEASE THE MANUFACTURER FROM ANY LIABILITY FOR ANY INCIDENT RESULTING FROM ELIMINATING THE ECO FROM THE WATER HEATER CIRCUIT.

WATER ODOR

Each water heater contains at least one anode rod which will slowly dissipate while protecting the tank from corrosion. Certain water conditions will cause a reaction between this rod and the water. The most common complaint associated with the anode rod is one of a "rotten egg smell" produced from the presence of hydrogen sulfide gas dissolved in the water. **Do not remove this rod as it will void any warranties, stated or implied.** The parts list includes a special anode that can be ordered if water odor or discoloration occurs. This rod may reduce but not eliminate water odor problems. The water supply system may require special filtration equipment from a water conditioning company to successfully eliminate all water odor problems

HYDROGEN GAS BUILD-UP

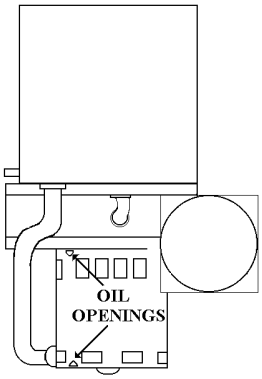
⚠DANGER

HYDROGEN GAS CAN BE PRODUCED IN A HOT WATER SYSTEM THAT HAS NOT BEEN USED FOR A LONG PERIOD OF TIME (GENERALLY TWO WEEKS OR MORE). HYDROGEN GAS IS EXTREMELY FLAMMABLE AND CAN IGNITE WHEN EXPOSED TO A SPARK OR FLAME. TO PREVENT THE POSSIBILITY OF INJURY UNDER THESE CONDITIONS, WE RECOMMEND THE HOT WATER FAUCET BE OPENED FOR SEVERAL MINUTES AT THE KITCHEN SINK BEFORE USING ANY ELECTRICAL APPLIANCE WHICH IS CONNECTED TO THE HOT WATER SYSTEM. IF HYDROGEN IS PRESENT, THERE WILL PROBABLY BE AN UNUSUAL SOUND SUCH AS AIR ESCAPING THROUGH THE FAUCET AS WATER BEGINS TO FLOW. DO NOT SMOKE OR HAVE ANY OPEN FLAME NEAR THE FAUCET AT THE TIME IT IS OPEN.

MAINTENANCE

BLOWER MOTOR

1. Lubricate the motor every 6 months with 4 drops of S.A.E. 20 oil in the openings as shown. **DO NOT OVEROIL.**
2. Remove any foreign materials from the vent pipe system before operating the blower. The blower wheel must be clear of debris or soot and allowed to rotate freely.



DRAINING AND FLUSHING

The water heater should be drained if being shut down during freezing temperatures. It is recommended that the tank be drained, flushed and cleaned every 6 months to remove sediment which may build-up during operation. To drain the tank perform the following steps:

1. Turn off the gas to the water heater at the Manual Gas Shutoff Valve.
2. Close the cold water inlet valve.
3. Open a nearby hot water faucet.
4. Open the water heater drain valve and allow all the water to drain from the tank.
5. Flush the tank with water as needed to remove sediment.
6. Close the drain valve, refill the tank, and restart the heater as directed under "Start-Up/Operation".

If the water heater is going to be shut down for an extended period, the drain valve should be left open.

NOTE: Condensation may occur when refilling the tank and should not be confused with a tank leak.

⚠DANGER

WATER DRAINING FROM THIS HEATER MAY BE HOT AND CAN RESULT IN SCALD INJURY. DO NOT ALLOW ANYONE TO COME IN CONTACT WITH THE DRAINING WATER AND TERMINATE THE DRAIN HOSE TO AN ADEQUATE DRAIN

3 MONTH INSPECTION

At least every 3 months a visual inspection should be made of the venting and air supply system, piping systems, main burner and pilot burner. Check the water heater for the following:

- Obstructions, damage, or deterioration in the venting system. Make sure the ventilation and combustion air supplies are not obstructed.
- Build-up of soot and carbon on the main burner and pilot burner. Check for a soft blue flame.
- Leaking or damaged water and gas piping.
- Presence of flammable or corrosive materials in the installation area.

IMPORTANT: VERIFY PROPER OPERATION AFTER SERVICING THIS WATER HEATER.

⚠WARNING

OBSTRUCTIONS OR HOLES IN THE VENT PIPE CAN CAUSE TOXIC FUMES TO ENTER THE HOME RESULTING IN CARBON MONOXIDE POISONING OR DEATH. THE VENT PIPE MUST BE REPLACED IF IT IS LEAKING.

REPLACEMENT PARTS

Replacement parts may be ordered through your plumber or the local distributor. Parts will be shipped at prevailing prices and billed accordingly. When ordering replacement parts, always have the following information ready:

1. Model, serial and product number.
2. Type of gas.
3. Item number.
4. Parts Description.

See page 26 for a list of available repair parts.

TROUBLESHOOTING

Water heater service should only be performed by a qualified service technician. Refer to the Trouble-shooting Chart on pages 24 and 25 for determining the cause of water heater problems.

SELF-CLEANING (SOME MODELS)

Some water heaters may include a self-cleaning "DE-LIMER" device that inhibits the build-up of lime and other sediment on the metal surfaces of the water heater. By installing a series of magnets in the dip tube, a magnetic field is formed which automatically suspends lime-causing particles and sediment as cold water passes into the tank. This controls sediment and lime build-up within the tank resulting in higher efficiencies and lower operation costs.

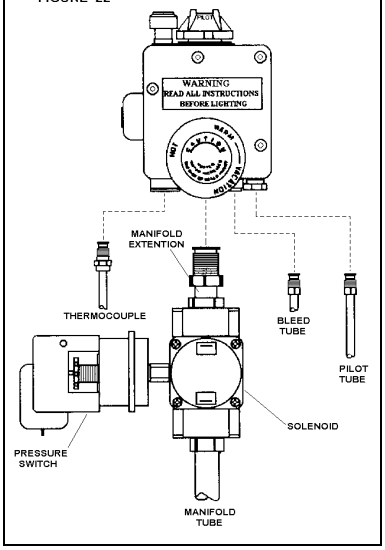
REMOVING THE BURNER ASSEMBLY

⚠WARNING

REMOVAL AND REPLACEMENT OF THE BURNER ASSEMBLY INVOLVES THE DISCONNECTION OF GAS PIPING AND LEAK TESTING. THE FOLLOWING PROCEDURES SHOULD ONLY BE PERFORMED BY A QUALIFIED SERVICE TECHNICIAN.

1. Turn the gas control knob on the combination gas control valve/thermostat clockwise to the "OFF" position.
2. Disconnect electrical power to water heater.
3. Label all wires before disconnecting. Disconnect wires from the pressure switch and solenoid valve.
4. Remove the outer and inner doors.
5. Disconnect the thermocouple, pilot tube, bleed tube and manifold extension at the thermostat (Figure 22). Note that L.P. gas systems use reverse (left-handed) threads on the manifold tube.

FIGURE 22



6. Grasp the manifold tube and push down slightly to free the manifold, pilot tube, bleed tube and thermocouple. Pull the burner out slightly to free it from the holding bracket. Tilt the burner to one side and remove it from the burner compartment (Figure 23).
7. Check the burner to see if it is dirty or clogged. The burner may be cleaned with soap and hot water. If a sooty condition exists, refer to the Troubleshooting Chart , "Smoking and Carbon Formation".

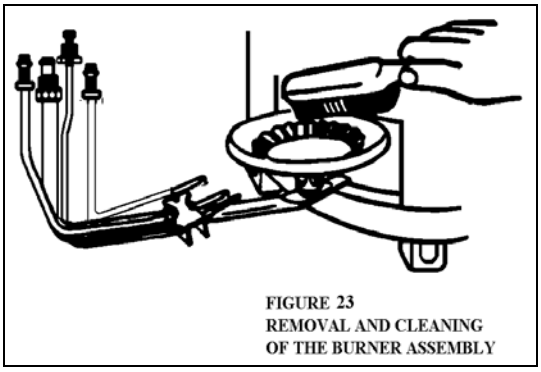


FIGURE 23
REMOVAL AND CLEANING
OF THE BURNER ASSEMBLY

REPLACING THE BURNER ASSEMBLY

1. Insert the burner into the burner compartment making sure that the manifold tab engages with the holding bracket inside the burner compartment (Figure 24). The tab is located at the bottom of the burner for L.P. models. The manifold tube will now line up with the thermostat connection.

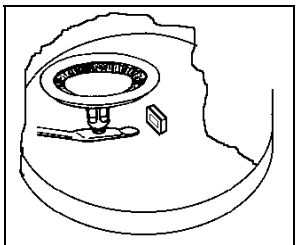


FIGURE 24

2. Reconnect the manifold extension, bleed tube and pilot tube. Do not cross thread these fittings. L.P. gas systems use reverse (left-handed) threads on the manifold tube. Do not apply any thread sealant (pipe dope, Teflon tape, etc.) to these connections.
3. Reconnect the thermocouple. The thermocouple nut should be started and turned all the way in by hand. An additional quarter turn with a 3/8" open end wrench will then be sufficient to seat the lockwasher.

   IMPORTANT: Overtightening may damage the thermocouple or the thermostat.
4. Reconnect wires to pressure switch and solenoid valve. Turn on electrical power to water heater.
5. Relight the water heater according to the lighting instructions in Figure 17A or 17B..
6. Check for gas leaks with a chloride-free soap and water solution or other approved method. **FIX ALL LEAKS IMMEDIATELY.**

⚠DANGER

DO NOT USE AN OPEN FLAME OR ANY KIND OF SPARK TO CHECK GAS PIPING FOR LEAKS. IF LEAKING GAS IS PRESENT, AN EXPLOSION OR FIRE MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

NOTE:
The burner assembly shown in Fig. 23, and 25 are typical for Natural Gas models. LPG models and models equipped with Low Nox burners will vary in appearance.

REMOVAL AND REPLACEMENT OF THE GAS CONTROL VALVE/ THERMOSTAT

⚠ WARNING

REMOVAL AND REPLACEMENT OF THE GAS CONTROL VALVE / THERMOSTAT INVOLVES THE DISCONNECTION OF GAS PIPING, MANIFOLD TUBE, PILOT TUBE, BLEED TUBE AND THERMOCOUPLE. IT IS RECOMMENDED THAT THIS PROCEDURE BE PERFORMED BY A QUALIFIED SERVICE TECHNICIAN.

1. On the gas control valve/thermostat turn the temperature dial counterclockwise to its lowest setting. Turn the gas control knob clockwise to the "OFF" position. See Figures 20 and 21 page 20.
2. Disconnect electrical power to water heater.
3. Turn off the gas at the manual shutoff valve on the gas supply pipe. See Figure 16 on page 14.
4. Drain the water heater. Refer to section "Draining and Flushing" on page 21 and follow procedure.
5. Disconnect the thermocouple, pilot tube, bleed tube and manifold extension at the thermostat. See Figure 22 page 22. Note that L.P. gas systems use reverse (left-handed) threads on the manifold tube extension.
6. Refer to Gas Piping Figure 16 on page 14 and disconnect the ground joint union in the gas piping. Disconnect the remaining pipe from the gas valve/thermostat.

⚠ CAUTION

WHEN REMOVING THE GAS CONTROL VALVE / THERMOSTAT DO NOT USE PIPE WRENCH OR VISE TO GRIP BODY OR ANY TYPE OF BLUNT INSTRUMENT INTO THE INLET OR OUTLET CONNECTIONS. USING THESE TYPE TOOLS MAY RESULT IN DAMAGE TO THE GAS CONTROL VALVE / THERMOSTAT.

7. Turn the gas control valve/thermostat counterclockwise. Remove the gas control valve/thermostat.

To replace the gas control valve/ thermostat repeat the previous procedure in reverse order.

- Be sure to use Approved Teflon Tape or Pipe Joint Compound on the gas piping connections and fitting on the back of gas valve that screws into tank.
- Be sure to remove the pilot ferrule nut from the new gas control valve/ thermostat.
- Turn gas supply on and check for leaks. Use a chloride-free soap and water solution (bubbles forming indicate a leak) or other approved method. Do not use an open flame. **ALL LEAKS MUST BE FIXED IMMEDIATELY.**
- Be sure tank is completely filled with water before lighting and activating the water heater. Refer to Figure 17A or 17B for lighting procedure.
- If additional information is required, contact the Service Department at the 800 number shown on the front of this manual.

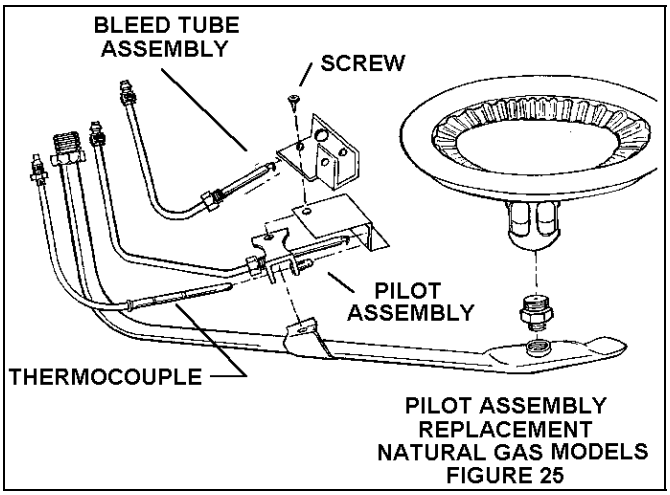
THERMOCOUPLE AND/OR PILOT ASSEMBLY REPLACEMENT

Reference Figures 25 and 26 for the following procedures.

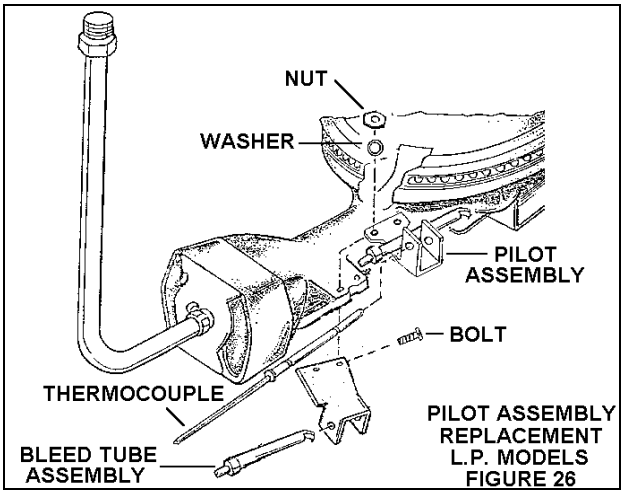
1. Remove the burner assembly as directed in “Removal of the Burner Assembly”, page 22.
2. Grasp the thermocouple line and gently pull the thermocouple from the pilot assembly.
3. Push the replacement thermocouple through the hole in the pilot bracket until it snaps in place. The end of the thermocouple should extend approximately 1/4 inch past the tip of the pilot assembly.
4. Replace the burner assembly as directed in "Replacing the Burner Assembly" on page 22.

If the thermocouple will not disengage from the pilot assembly, the entire pilot assembly must be replaced:

1. Remove the No. 8-32 screw which holds the pilot assembly and pilot shield (if provided) to the main burner.
2. Install the replacement pilot assembly to the main burner making sure the pilot shield (if provided) is in the correct location.



PILOT ASSEMBLY REPLACEMENT NATURAL GAS MODELS FIGURE 25



PILOT ASSEMBLY REPLACEMENT L.P. MODELS FIGURE 26

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
HIGH OPERATION COSTS	1. Improper calibration 2. Thermostat set too high 3. Sediment or lime in tank 4. Heater too small for job 5. Wrong piping connections 6. Leaking faucets 7. Gas leaks 8. Wasted hot water 9. Long runs of exposed piping 10. Hot water piping in exposed wall 11. No flue baffle	1. Replace thermostat 2. Set temperature dial to lower setting. 3. Drain/Flush-Provide water treatment if needed 4. Install adequate heater 5. Correct piping-dip tube must be in cold inlet 6. Repair faucets 7. Check with utility-repair at once 8. Advise customer 9. Insulate piping 10. Insulate piping 11. Install flue baffle
PILOT WILL NOT LIGHT OR REMAIN LIT	1. Low gas pressure 2. Air in gas line 3. No gas 4. Dirt in gas lines 5. Pilot line or orifice clogged 6. Thermocouple connection loose 7. Defective thermocouple 8. Cold drafts 9. Thermostat ECO switch open 10. Pilot and bleed tubes switched at the thermostat	1. Check with gas utility company 2. Bleed air from gas line. 3. Check with gas utility company 4. Notify utility-install dirt trap in gas line 5. Clean, locate source and correct 6. Finger tighten-then 1/4 turn with wrench 7. Replace thermocouple 8. Locate source and correct 9. Replace thermostat 10. Switch pilot and bleed tube at the fittings located on the thermostat bottom.
BLOWER NOT OPERATING	1. No gas. 2. No pilot light. 3. Blower unplugged. 4. No power at outlet. 5. Defective control cable. 6. Defective gas pressure switch. 7. Defective blower relay. 8. Defective blower.	1. Check with the gas utility company. 2. Light the pilot or troubleshoot as directed under “Pilot Will Not Remain Lit”. 3. Plug power cord int a 115 VAC outlet. 4. Check breaker or fuse. Restore power to outlet 5. Replace control cable. 6. Temporarily jumper across the two terminal on the switch. If the blower operates, replace the switch. 7. Check voltages. Replace if defective. 8. Replace blower.
BLOWER OPERATES, BURNER WILL NOT IGNITE	1. Insufficient air flow to the air pressure switch. 2. Main burner line clogged. 3. Low gas pressure 4. Defective thermostat 5. Heater installed in a confined area. 6. Defective air pressure switch. 7. Defective solenoid.	1. Check for the following: a) Short ells used in vent system. b) Low voltage to the blower motor. c) Maximum vent pipe length exceeded. d) Obstructions within the vent pipe system. 2. Clean, locate source and correct. 3. Check gas pressure for minimum requirements as stated on the data plate. 4. Replace thermostat 5. Provide fresh air ventilation. 6. Temporarily jumper across the two terminals on the switch. If the burner ignites, replace the switch. 7. Replace the solenoid.
HIGH VENT PIPE TEMPERATURE OR MELTING	1. Lack of combustion air. 2. Overfiring 3. Missing or wrong flue baffle.	IMMEDIATELY TAKE THE UNIT OUT OF SERVICE AND CONTACT AN AUTHORIZED SERVICE REPRESENTATIVE OR THE FACTORY
BURNER FLAME FLOATS AND LIFTS OFF PORTS	1. High gas pressure 2. Orifice too large 3. Flue clogged 4. Heater installed in a confined area 5. Cold drafts	1. Check with utility 2. Replace with correct orifice 3. Clean flue and burner-locate source & correct 4. Provide fresh air ventilation 5. Locate source and correct
BURNER FLAME YELLOW-LAZY	1. Insufficient secondary air 2. Low gas pressure 3. Flue clogged 4. Main burner line clogged 5. Heater installed in a confined area 6. Obstruction in main burner orifice 7. Main burner needs adjusting (L.P. only)	1. Provide ventilation to water heater 2. Check with gas utility company 3. Clean, locate source and correct 4. Clean, locate source and correct 5. Provide fresh air ventilation 6. Clean or replace orifice 7. See page 20, “Burner Flames” for flame adjustment.

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
BURNER FLAME TOO HIGH	1. Insufficient secondary air 2. Orifice too large	1. Provide ventilation to water heater 2. Replace with correct orifice
FLAME BURNS AT ORIFICE	1. Low gas pressure 2. Defective thermostat	1. Check with gas utility company 2. Replace thermostat
PILOT FLAME TOO SMALL	1. Low gas pressure 2. Pilot line or orifice clogged 3. Wrong pilot burner	1. Check with utility 2. Clean, locate source and correct 3. Replace with correct burner
PILOT FLAME TOO LARGE	1. Wrong pilot burner	1. Replace with correct burner
INSUFFICIENT HOT WATER	1. Low gas pressure 2. Orifice too small 3. Improper calibration 4. Thermostat set too low 5. Sediment or lime in tank 6. Water heater too small 7. Wrong piping connections 8. Leaking faucets 9. Wasted hot water 10. Long runs of exposed piping 11. Hot water piping in outside wall	1. Check with gas utility company 2. Replace with correct orifice 3. Replace thermostat 4. Turn temperature dial to higher setting 5. Drain/flush-provide water treatment if needed 6. Install adequate heater 7. Correct piping-dip tube must be in cold inlet 8. Repair faucets 9. Advise customer 10. Insulate piping 11. Insulate piping
SLOW HOT WATER RECOVERY	1. Insufficient secondary air 2. Low gas pressure 3. Orifice too small 4. Improper calibration 5. Thermostat set too low 6. Heater too small 7. Wrong piping connections 8. Wasted hot water 9. Flue clogged	1. Provide ventilation to water heater. Check flue way , flue baffle and burner. 2. Check with gas utility company 3. Replace with correct orifice 4. Replace thermostat 5. Turn temperature dial to lower setting 6. Install adequate heater 7. Correct piping-dip tube must be in cold inlet 8. Advise customer 9. Clean flue, locate source and correct
DRIP FROM RELIEF VALVE	1. Excessive water pressure 2. Heater stacking 3. Closed water system	1. Use a pressure reducing valve and relief valve. 2. Lower the thermostat setting 3. See page 12, “Closed System/Thermal Expansion”.
THERMOSTAT FAILS TO SHUT OFF	1. Defective thermostat 2. Improper calibration	1. Replace thermostat 2. Replace thermostat
CONDENSATION	1. Temperature setting too low	1. Increase the temperature setting. See page 20.
COMBUSTION ODORS	1. Insufficient secondary air 2. Flue clogged 3. Heater installed in a confined area 4. House too “tight”	1. Provide fresh air ventilation to the water heater 2. Clean, locate source and correct. 3. Provide fresh air ventilation to the water heater 4. Provide fresh air ventilation to the water heater
SMOKING AND CARBON FORMATION (SOOTING)	1. Insufficient secondary air 2. Low gas pressure 3. Orifice too large 4. Flue clogged 5. Defective thermostat 6. Heater installed in a confined area 7. Burner flame yellow-lazy	1. Provide ventilation to water heater. Check flue way, flue baffle, and burner. 2. Check with gas utility company 3. Replace with correct orifice 4. Clean, locate source and correct 5. Replace thermostat 6. Provide fresh air ventilation. 7. See “Burner Flame Yellow-Lazy” above.
SMELLY WATER	1. Sulfides in the water	1. Replace the anode with a special anode.
DISCOLORATION OF JACKET ABOVE COMBUSTION AREA	1. Burner orifice too large 2. Flue clogged 3. High gas pressure	1. Replace with correct orifice 2. Clean, locate source and correct 3. Adjust pressure to proper setting by qualified service personnel only.

REPAIR PARTS

The following parts may be ordered through your plumber or the local distributor. Parts will be shipped at prevailing prices and billed accordingly.

When ordering repair parts always give the following information:

1. Model ,serial and product number
2. Type of gas
3. Item number
4. Parts description

IMPORTANT: PARTS ARE NOT FIELD REPAIRABLE. DEFECTIVE PARTS MUST BE REPLACED WITH THE ORIGINAL FACTORY REPLACEMENT PARTS.

REFER TO THE PARTS ILLUSTRATION ON THE FOLLOWING PAGE.

LEGEND

▲ Special anode rod (see page 21)

■ Temperature and Pressure Relief Valve is required, but may not be factory installed.

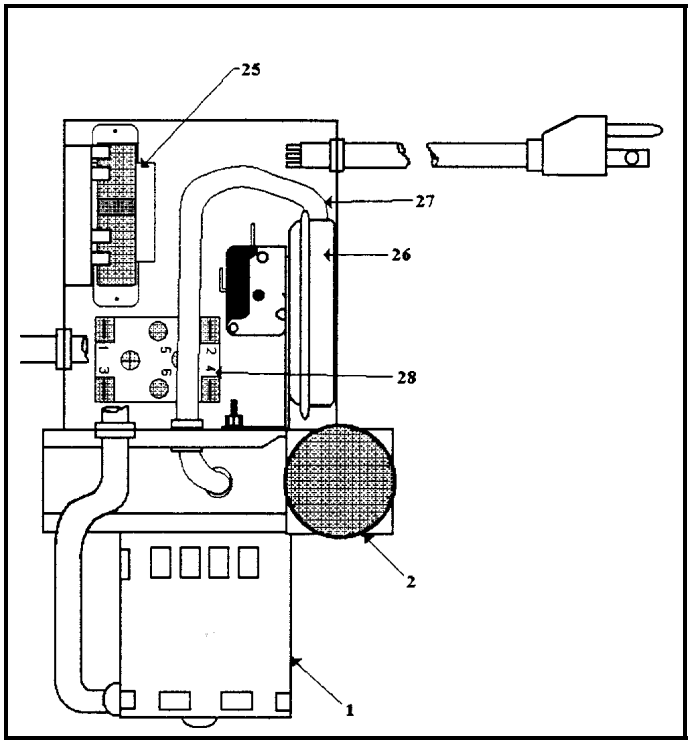
★ It is imperative the replacement main burner, orifice, manifold, pilot burner, and the thermostat be ordered for the proper gas type. Natural gas thermostat will be marked "FOR NATURAL GAS ONLY". Propane gas thermostats will be marked “FOR L.P. GAS ONLY”.

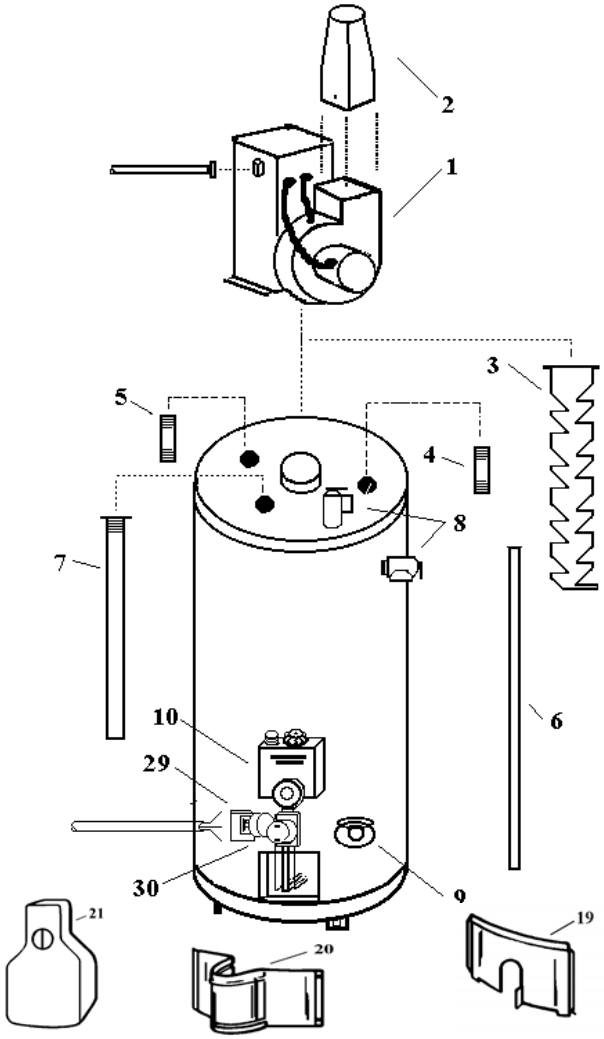
REPAIR PARTS LIST

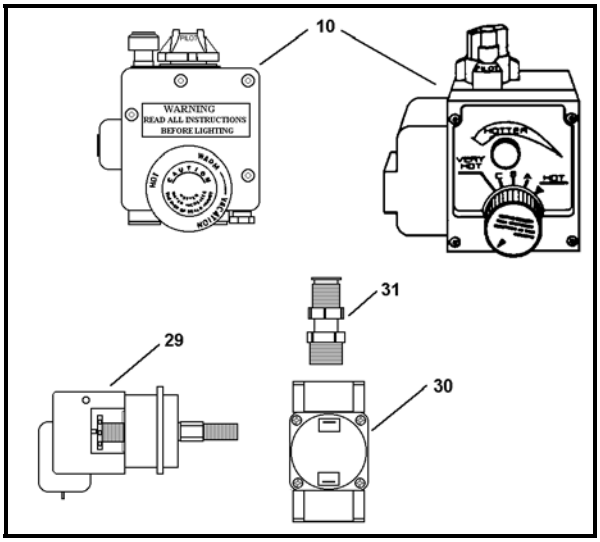
ITEM NO.	PARTS DESCRIPTION
1	BLOWER MOTOR ASSEMBLY
2	BLOWER OUTLET ADAPTER
3	BAFFLE ASSEMBLY
4	HEAT TRAP (COLD) - SOME MODELS
5	HEAT TRAP (HOT) - SOME MODELS
6	COLD WATER DIP TUBE
7	ANODE ROD ▲
8	TEMPERATURE & PRESSURE RELIEF VALVE (LOCATED TOP OR SIDE) ■
9	DRAIN VALVE
10	THERMOSTAT ★
11	MANIFOLD ★
12	ORIFICE ★
13	MAIN BURNER ★
13A	BURNER NATURAL LOW NOx
14	PILOT ASSEMBLY ★
15	PILOT TUBE
16	THERMOCOUPLE
17	SCREW 8-32 X .375 RH PH TYPE F
18	SCREW 8-32 X .250 SELF TAPPING
19	INNER DOOR
20	OUTER DOOR
21	ALTERNATE OUTER DOOR- SOME MODELS
22	PILOT SHIELD - SOME MODELS
23	AIR SHUTTER - L.P. MODELS ONLY
24	BLEED TUBE
25	TRANSFORMER
26	AIR PRESSURE SWITCH
27	AIR HOSE
28	BLOWER RELAY
29	GAS PRESSURE SWITCH
30	GAS VALVE SOLENOID
31	MANIFOLD EXTENSION
32	SCREW 8-32 X .750 PH RH MS
33	HEX NUT KEPS

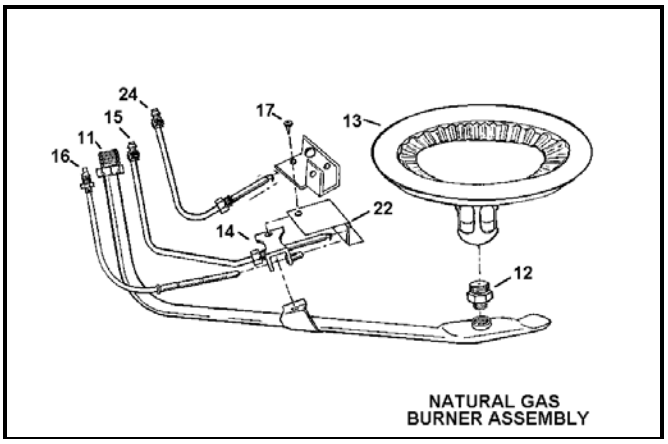
REPAIR PARTS (CONT.)

PARTS ILLUSTRATION

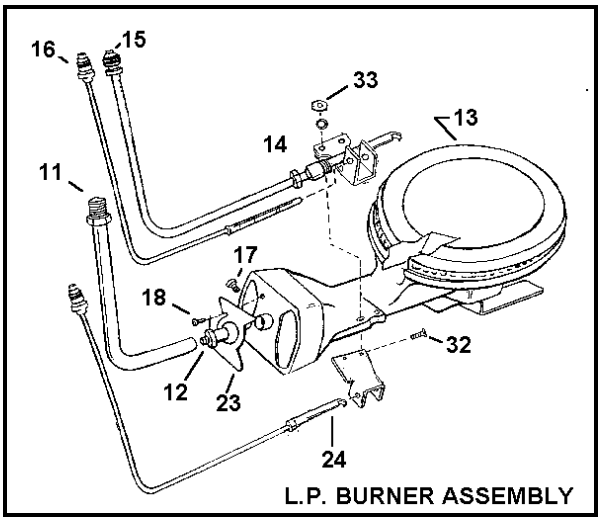








NATURAL GAS
BURNER ASSEMBLY



L.P. BURNER ASSEMBLY