

Instruction Manual For Residential Side Plumbing Electric Water Heaters



GAMA certification applies to all residential electric water heaters with capacities of 20 to 120 gallons with input rating of 12kw. or less at a voltage no greater than 250V.

ALL TECHNICAL AND WARRANTY QUESTIONS: SHOULD BE DIRECTED TO THE LOCAL DEALER FROM WHOM THE WATER HEATER WAS PURCHASED. IF YOU ARE UNSUCCESSFUL, PLEASE WRITE TO THE COMPANY LISTED ON THE RATING PLATE ON THE WATER HEATER.

—WARNING—

READ THE GENERAL SAFETY SECTION BEGINNING ON INSIDE COVER AND THEN THIS ENTIRE MANUAL BEFORE INSTALLING OR OPERATING THIS WATER HEATER.

General Safety

▲ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE. Refer to this manual for assistance or consult the local electric utility for further assistance.

▲ WARNING

At the time of manufacture this water heater was provided with a combination temperature-pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, and the latest edition of ANSI Z21.22 and the code requirements of ASME. If replaced, the valve must meet the requirements of local codes, but not less than a combination temperature and pressure relief valve certified as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22 by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials.

The valve must be marked with a maximum set pressure not to exceed the marked hydrostatic working pressure of the water heater (150 lbs. p.s.i.) and a discharge capacity not less than the water heater input rate as shown on the model rating plate. (Electric heaters - watts divided by 1000 x 3412 equal BTU/Hr. rate.)

Your local jurisdictional authority, while mandating the use of a temperature-pressure relief valve complying with ANSI Z21.22 and ASME, may require a valve model different from the one furnished with the water heater.

Compliance with such local requirements must be satisfied by the installer or end user of the water heater with a locally prescribed temperature-pressure relief valve installed in the designated opening in the water heater in place of the factory furnished valve.

For safe operation of the water heater, the relief valve must not be removed from its designated opening or plugged.

The temperature-pressure relief valve must be installed directly into the fitting of the water heater designated for the relief valve. Position the valve downward and provide tubing so that any discharge will exit only within 6 inches above, or at any distance below the structural floor. Be certain that no contact is made with any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances. Excessive length, over 30 feet, or use of more than four elbows can cause restriction and reduce the discharge capacity of the valve.

No valve or other obstruction is to be placed between the relief valve and the tank. Do not connect tubing directly to discharge drain unless a 6" air gap is provided. To prevent bodily injury, hazard to life, or property damage, the relief valve must be allowed to discharge water in quantities should circumstances demand. If the discharge pipe is not connected to a drain or other suitable means, the water flow may cause property damage.

The Discharge Pipe:

- Must not be smaller in size than the outlet pipe size of the valve, or have any reducing couplings or other restriction.
- Must not be plugged or blocked.
- Must be of material listed for hot water distribution.
- Must be installed so as to allow complete drainage of both the temperature-pressure relief valve, and the discharge pipe.
- Must terminate at an adequate drain.
- Must not have any valve between the relief valve and tank.

▲ WARNING

HAZARD OF ELECTRICAL SHOCK! Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned "OFF". Failure to do this could result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

▲ WARNING

HOTTER WATER CAN SCALD: Water heaters are intended to produce hot water. Water heated to a temperature which will satisfy clothes washing, dish washing, and other sanitizing needs can scald and permanently injure you upon contact. Some people are more likely to be permanently injured by hot water than others. These include the elderly, children, the infirm, or physically/mentally handicapped. If anyone using hot water in your home fits into one of these groups or if there is a local code or state law requiring a certain temperature water at the hot water tap, then you must take special precautions. In addition to using the lowest possible temperature setting that satisfies your hot water needs, some type of tempering device, such as a mixing valve, should be used at the hot water taps used by these people or at the water heater. Mixing valves are available at plumbing supply or hardware stores. Follow manufacturers instructions for installation of the valves. Before changing the factory setting of the thermostat, read the "Temperature Regulation" section in this manual.

▲ WARNING

WATER HEATERS EQUIPPED FOR ONE VOLTAGE ONLY: This water heater is equipped for one type voltage only. Check the rating plate near the bottom access panel for the correct voltage. DO NOT use this water heater with any voltage other than the one shown on the model rating plate. Failure to use the correct voltage can cause problems which can result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE. If you have any questions or doubts consult your electric company.

▲ WARNING

INSULATING JACKETS: When installing an external water heater insulation jacket on an electric water heater:

- a. DO NOT cover the temperature-pressure relief valve.
- b. DO NOT put insulation over the access covers or any access areas.
- c. DO NOT cover or remove operating instructions, and safety related warning labels and materials affixed to the water heater.

▲ WARNING

Do not use this appliance if any part of it has been under water. An electrical short or malfunction could occur. The water heater should be replaced.

▲ CAUTION

WATER HEATERS EVENTUALLY LEAK: Installation of the water heater should be accomplished in such a manner that if the tank or any connections should leak, the flow of water will not cause damage to the structure. For this reason, it is not advisable to install the water heater in an attic or upper floor. When such locations cannot be avoided, a suitable drain pan should be installed under the water heater. Drain pans are available at your local hardware store. Such a drain pan must be piped to an adequate drain. Under no circumstances is the manufacturer to be held liable for any water damage in connection with this water heater.

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Introduction

Thank You for purchasing this water heater. Properly installed and maintained, it should give you years of trouble free service.

Abbreviations Found In This Instruction Manual

UL-Underwriters Laboratories, 333 Pfingsten Rd., Northbrook, IL 60062
National Electrical Code-This publication is available from your local government or public library or electric company or by writing to UL above.
ANSI-American National Standards Institute

Preparing for the New Installation

1. Read the "General Safety" section on page 2 of this manual first and then the entire manual carefully. If you don't follow the safety rules, the water heater will not operate properly. It could cause DEATH, SERIOUS BODILY INJURY AND/OR PROPERTY DAMAGE.
This manual contains instructions for the installation, operation, and maintenance of this electric water heater. It also contains warnings throughout the manual that you must read and be aware of. All warnings and all instructions are essential to the proper operation of the water heater and your safety. Since we cannot put everything on the first few pages, **READ THIS ENTIRE MANUAL BEFORE ATTEMPTING TO INSTALL OR OPERATE THE WATER HEATER.**
2. The installation must conform with the instructions in this manual; electric company rules; and Local Codes, or in the absence of Local Codes, with the latest edition of the National Electrical Code. This publication is available from your local government or public library or electric company or by writing Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062.
3. If after reading this manual you have any questions or do not understand any portion of the instructions, call the manufacturer whose name appears on the rating plate.
4. Carefully plan the place where you are going to put the water heater. Correct electrical wiring and connections are very important in preventing death from possible electrical shock and fires.
Examine the location to ensure the water heater complies with the "Locating the New Water Heater" section.
5. For California installation this water heater must be braced, anchored, or strapped to avoid falling or moving during an earthquake. See instructions for correct installation procedures. Instructions may be obtained from your local dealer, wholesaler, public utilities or California Office of the State Architect, 400 P Street, Sacramento, CA 95814.
6. Massachusetts Code requires this water heater to be installed in accordance with Massachusetts 248-CMR 2.00: State Plumbing Code and 248-CMR 5.00.

Locating the New Water Heater

Facts to Consider About the Location

You should carefully choose an indoor location for the new water heater, because the placement is a very important consideration for the safety of the occupants in the building and for the most economical use of the appliance. **This water heater is not intended for outdoor installation.**

Whether replacing an old water heater or putting the water heater in a new location, the following critical points must be observed.

1. The location selected should be indoors as close to and as centralized with the water piping system as possible. This water heater, as well as all water heaters, will eventually leak. Do not install without adequate drainage provisions where water flow will cause damage.

▲ CAUTION

WATER HEATERS EVENTUALLY LEAK: Installation of the water heater should be accomplished in such a manner that if the tank or any connections should leak, the flow of water will not cause damage to the structure. For this reason, it is not advisable to install the water heater in an attic or upper floor. When such locations cannot be avoided, a suitable drain pan should be installed under the water heater. Drain pans are available from a local plumbing contractor or hardware store. Such a drain pan must be piped to an adequate drain. Under no circumstances is the manufacturer to be held liable for any water damage in connection with this water heater.

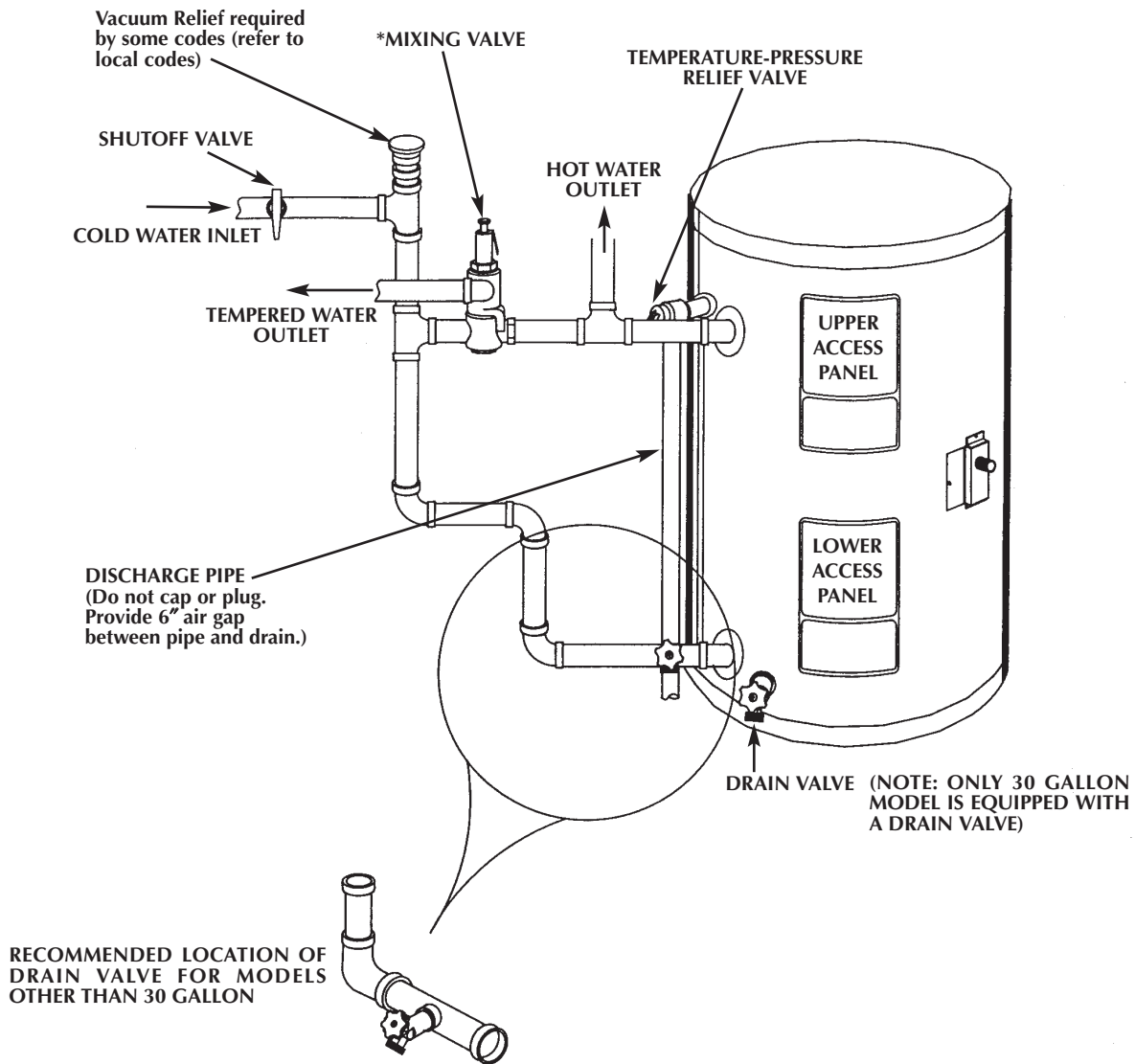
▲ CAUTION

INSTALLATION IN RESIDENTIAL GARAGES: The water heater must be located and/or protected so it is not subject to physical damage by a moving vehicle.

2. The location selection must provide adequate clearances for servicing and proper operation of the water heater.

Typical Installation

CHECK ALL CONNECTIONS FOR LEAKS.
CONSULT THE LOCAL UTILITY COMPANY TO EXAMINE INSTALLATION FOR PROPRIETY AND SAFETY.



▲ WARNING

HOTTER WATER CAN SCALD: Water heaters are intended to produce hot water. Water heated to a temperature which will satisfy clothes washing, dish washing, and other sanitizing needs can scald and permanently injure you upon contact. Some people are more likely to be permanently injured by hot water than others. These include the elderly, children, the infirm, or physically/mentally handicapped. If anyone using hot water in your home fits into one of these groups or if there is a local code or state law requiring a certain temperature water at the hot water tap, then you must take special precautions. In addition to using the lowest possible temperature setting that satisfies your hot water needs, some type of tempering device, such as a mixing valve, should be used at the hot water taps used by these people or at the water heater. Mixing valves are available at plumbing supply or hardware stores. Follow manufacturers instructions for installation of the valves, Before changing the factory setting of the thermostat, read the "Temperature Regulation" section in this manual.

NOTE: To protect against untimely corrosion of hot and cold water fittings, it is strongly recommended that dielectric unions or couplings be installed on this water heater when connected to copper pipe.

Installing the New Water Heater

Water Piping

▲ WARNING

HOTTER WATER CAN SCALD: Water heaters are intended to produce hot water. Water heated to a temperature which will satisfy clothes washing, dish washing, and other sanitizing needs can scald and permanently injure you upon contact. Some people are more likely to be permanently injured by hot water than others. These include the elderly, children, the infirm, or physically/mentally handicapped. If anyone using hot water in your home fits into one of these groups or if there is a local code or state law requiring a certain temperature water at the hot water tap, then you must take special precautions. In addition to using the lowest possible temperature setting that satisfies your hot water needs, some type of tempering device, such as a mixing valve, should be used at the hot water taps used by these people or at the water heater. Mixing valves are available at plumbing supply or hardware stores. Follow manufacturers instructions for installation of the valves. Before changing the factory setting of the thermostat, read the "Temperature Regulation" section in this manual.

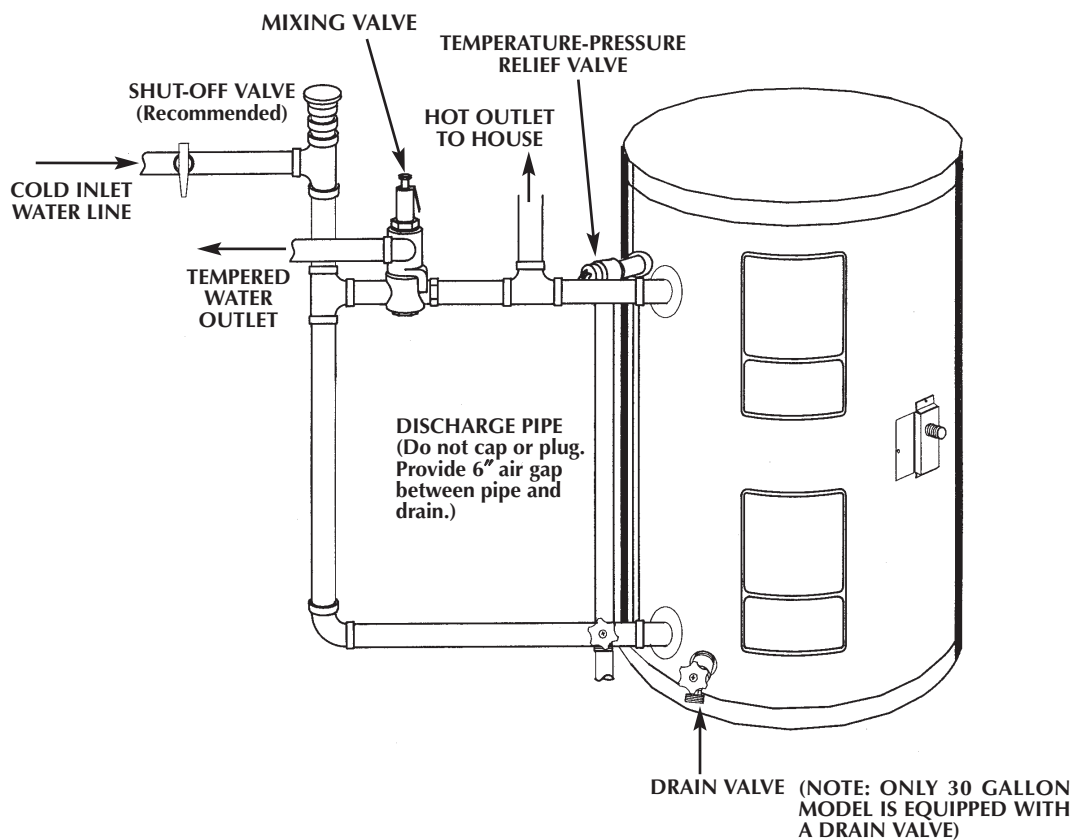
If a water heater is installed in a closed water supply system; such as one having a back-flow preventer, check valve, water meter with a check valve, etc... in the cold water supply; means shall be provided to control thermal expansion. Contact the water supplier or plumbing contractor on how to control this situation.

The illustration shows the attachment of the water piping to the water heater. The water heater is equipped with $\frac{3}{4}$ inch water connections .

NOTE: If using copper tubing, solder tubing to an adapter before attaching the adaptor to the cold water inlet connection. Do not solder the cold water supply line directly to the cold water inlet. It will harm the dip tube and damage the tank.

NOTE: This water heater is super insulated to minimize heat loss from the tank. Further reduction in heat loss can be accomplished by insulating the hot water lines from the water heater.

"This appliance has been designed certified as a water heater complying with Standards for Safety—UL174."



Installing the New Water Heater (cont'd)

Temperature-Pressure Relief Valve

▲ WARNING

At the time of manufacture this water heater was provided with two combination temperature-pressure relief valves certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, and the latest edition of ANSI Z21.22 and the code requirements of ASME. If replaced, the valves must meet the requirements of local codes, but not less than a combination temperature and pressure relief valve certified as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22 by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials.

The valves must be marked with a maximum set pressure not to exceed the marked hydrostatic working pressure of the water heater (150 lbs. p.s.i.) and a discharge capacity not less than the water heater input rate as shown on the model rating plate. (Electric heaters - watts divided by 1000 x 3412 equal BTU/Hr. rate.)

Your local jurisdictional authority, while mandating the use of a temperature-pressure relief valve complying with ANSI Z21.22 and ASME, may require a valve model different from the ones furnished with the water heater.

Compliance with such local requirements must be satisfied by the installer or end user of the water heater with a locally prescribed temperature-pressure relief valve installed in the designated opening in the water heater in place of the factory furnished valve.

For safe operation of the water heater, the relief valves must not be removed from their designated openings or plugged. The temperature-pressure relief valves must be installed directly into the fitting of the water heater designated for the relief valve. Provide tubing so that any discharge will exit only within 6 inches above, or at any distance below the structural floor. Be certain that no contact is made with any live electrical part. The discharge openings must not be blocked or reduced in size under any circumstances. Excessive length, over 30 feet, or use of more than four elbows can cause restriction and reduce the discharge capacity of the valves.

No valve or other obstruction is to be placed between the relief valves and the tank. Do not connect tubing directly to discharge drain unless a 6" air gap is provided. To prevent bodily injury, hazard to life, or property damage, the relief valves must be allowed to discharge water in quantities should circumstances demand. If the discharge pipes are not connected to a drain or other suitable means, the water flow may cause property damage.

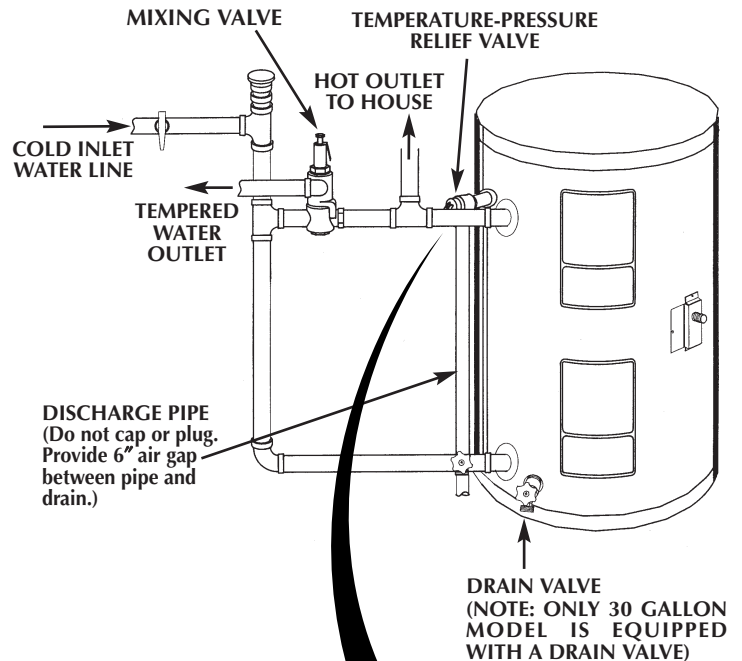
The Discharge Pipes:

- Must not be smaller in size than the outlet pipe size of the valve, or have any reducing couplings or other restrictions.
- Must not be plugged or blocked.
- Must be of material listed for hot water distribution.
- Must be installed so as to allow complete drainage of both the temperature-pressure relief valve, and the discharge pipe.
- Must terminate at an adequate drain.
- Must not have any valve between the relief valve and tank.

▲ WARNING

The temperature-pressure relief valve must be manually operated at least once a year. Caution should be taken to ensure that (1) no one is in front of or around the outlet of the temperature-pressure relief valve discharge line, and (2) the water manually discharged will not cause any bodily injury or property damage because the water may be extremely hot.

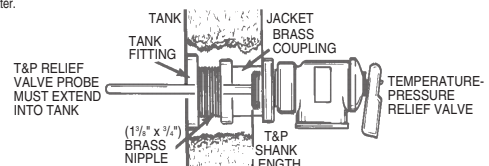
If after manually operating the valve, it fails to completely reset and continues to release water, immediately close the cold water inlet to the water heater, follow the draining instructions, and replace the temperature-pressure relief valve with a new one.



WARNING "RELIEF VALVE OPENING"

This water heater is provided with a combination Temperature-Pressure Relief Valve listed as complying with the standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22 and the code requirements of ASME.

Your local jurisdictional authority, while mandating the use of a Temperature-Pressure Relief Valve complying with ANSI Z21.22 and ASME, may require a valve model different from the one furnished with the water heater. Compliance with such local requirements must be satisfied by the installer or end user of the water heater with a locally prescribed Temperature-Pressure Relief Valve installed in the designated opening in the water heater.



- If a short shank (less than 2") temperature-pressure relief valve is to be installed (as shown), a nipple and coupling must be used.
- If a long shank (2" or longer) is to be installed, do not use the nipple and coupling.

"Install Temperature-Pressure protective equipment required by local codes, but not less than a combination Temperature-Pressure Relief Valve certified as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot-Water Supply Systems, ANSI Z21.22 by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials. The valve must be oriented, provided with tubing, or otherwise installed so that discharge can exit only within 6 inches above, or at any distance below the structural floor, and cannot contact any live electrical part." For safe operation of the water heater, the Relief Valve must not be removed or plugged. See manual heading - "Temperature-Pressure Relief Valve" for installation and maintenance of Relief Valve, discharge pipe and other safety precautions.

Installing the New Water Heater (cont'd)

Filling the Water Heater

To fill the water heater with water:

1. Close the water heater drain valve by turning the handle to the right (clockwise). The drain valve is on the lower front of the water heater.
2. Open the cold water supply valve to the water heater.
NOTE: The cold water supply valve must be left open when the water heater is in use.
3. To insure complete filling of the tank, allow air to exit by opening the nearest hot water faucet. Allow water to run until a constant flow is obtained. This will let air out of the water heater and the piping.

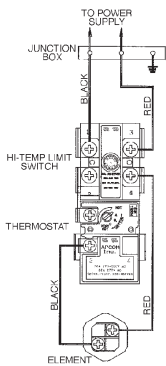
⚠ CAUTION

Never use this water heater unless it is completely full of water. To prevent damage to the tank and heating element, the tank must be filled with water. Water must flow from the hot water faucet before turning "ON" power.

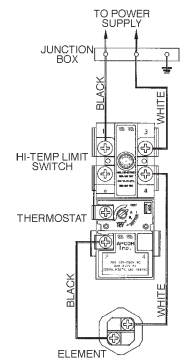
4. Check all new water piping for leaks. Repair as needed.

Wiring Diagrams

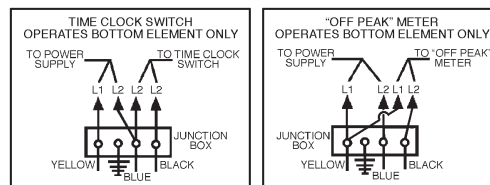
STANDARD SINGLE ELEMENT
240 VOLT



STANDARD SINGLE ELEMENT
120 VOLT

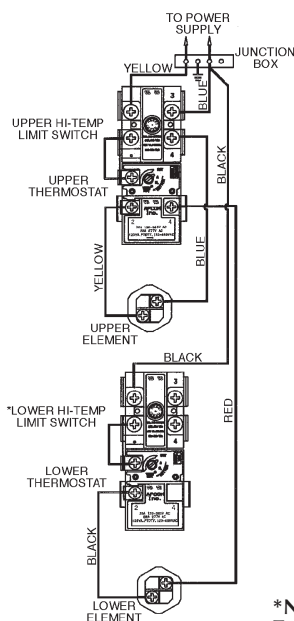


240 VOLT "OFF PEAK" NON-SIMULTANEOUS OPERATION
BOTTOM ELEMENT ON SEPARATE TIME CLOCK OR "OFF PEAK" METER

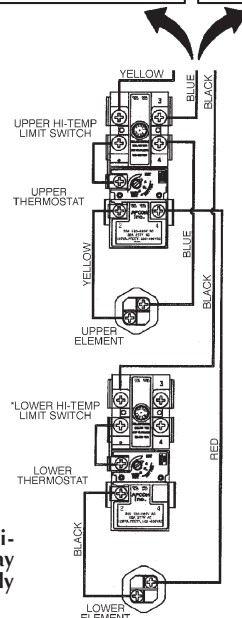


2 WIRE 240 VOLT POWER
SUPPLY NON-SIMULTANEOUS
OPERATION

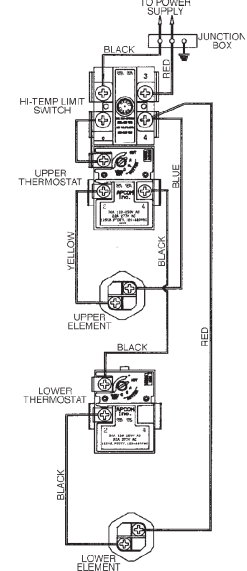
WIRING FOR 3 WIRE LEAD
WATER HEATERS



*Note: Some Lower Hi-Temp. Limit Switches may have 4 terminals. Use only the 2 terminals on left.



STANDARD WIRING FOR
2 WIRE LEAD WATER HEATERS



Installing the New Water Heater (cont'd)

Wiring

▲ CAUTION

Never use this water heater unless it is completely full of water. To prevent damage to the tank and heating element, the tank must be filled with water. Water must flow from the hot water faucet before turning "ON" power.

You must provide all wiring of the proper size outside of the water heater. You must obey local codes and electric company requirements when you install this wiring.

If you are not familiar with electric codes and practices, or if you have any doubt in your ability to connect the wiring to this water heater, obtain the service of a competent electrician. Contact a local electrical contractor and/or the local electric utility.

▲ WARNING

WATER HEATERS EQUIPPED FOR ONE VOLTAGE ONLY: This water heater is equipped for one type voltage only. Check the rating plate near the bottom access panel for the correct voltage. **DO NOT** use this water heater with any voltage other than the one shown on the model rating plate. Failure to use the correct voltage can cause problems which can result in **DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE**. If you have any questions or doubts consult your electric company.

▲ CAUTION

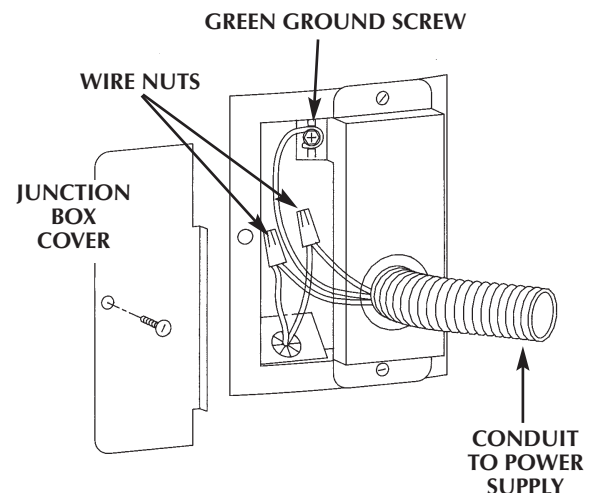
If wiring from your fuse box or circuit breaker box was aluminum for your old water heater, replace it with copper wire. If you wish to reuse the existing aluminum wire, have the connection at the water heater made by a competent electrician. Contact a local electrical contractor and/or the local electric utility.

1. Provide a way to easily shut off the electric power when working on the water heater. This could be with a circuit breaker or fuse block in the entrance box or a separate disconnect switch.
2. Install and connect a circuit directly from the main fuse or circuit breaker box. This circuit must be the right size and have its own fuse or circuit breaker.

3. If metal conduit is used for the grounding conductor:
 - A. The grounding electrode conductor shall be of copper, aluminum, or copperclad aluminum. The material shall be of one continuous length without a splice or joint.
 - B. Rigid metal conduit, intermediate metal conduit, or electrical metallic tubing may be used for the grounding means if conduit or tubing is terminated in fittings approved for grounding.
 - C. Flexible metal conduit or flexible metallic tubing shall be permitted for grounding if all the following conditions are met:
 1. The length in any ground return path does not exceed 6 feet.
 2. The circuit conductors contained therein are protected by overcurrent devices rated at 20 amperes or less.
 3. The conduit or tubing is terminated in fittings approved for grounding.

For complete grounding details and all allowable exceptions, refer to the latest edition of the National Electrical Code.

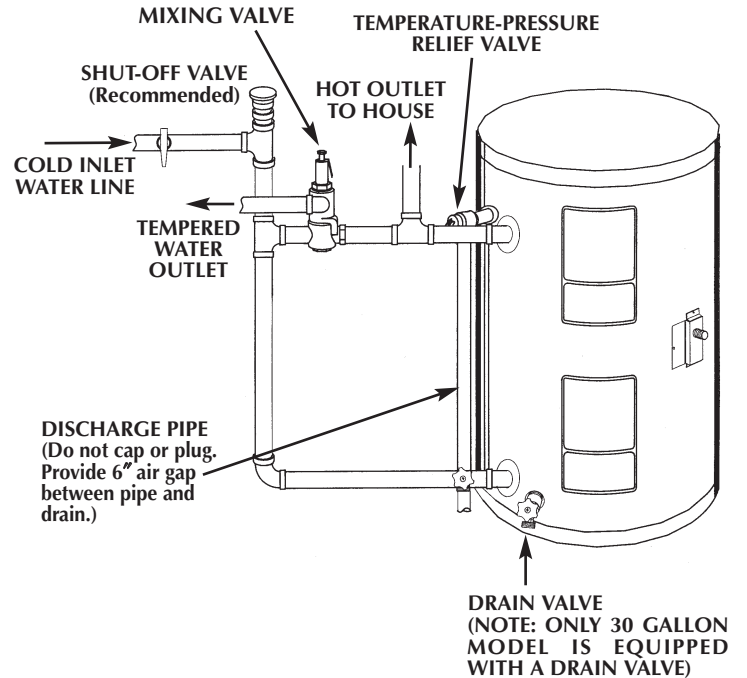
4. A standard 1/2" conduit opening has been made in the water heater junction box for the conduit connection.
5. Use wire nuts and connect the power supply wiring to the wires inside the water heater's junction box.
6. The water heater must be electrically "grounded" by the installer. A green ground screw has been provided on the water heater's junction box. Connect ground wire to this location.
7. Replace the wiring junction cover using the screw provided.



Installing the New Water Heater (cont'd)

Installation Checklist

1. Is the fuse or circuit breaker size correct? See "Wiring" in the "Installing the New Water Heater" section.
2. Are the wires from the circuit breaker or fuse service to the water heater's junction box of the correct wire size (gauge). See "Wiring" in the "Installing the New Water Heater" section.
3. Is the new temperature-pressure relief valve properly installed, and piped to an adequate drain? See "Temperature-Pressure Relief Valve" section.
4. Is the water heater completely filled with water? See "Filling the Water Heater" instructions in the "Installing the New Water Heater" section.
5. Will a water leak damage anything? See "Locating the New Water Heater" section.
6. Are the cold and hot water lines connected to the water heater correctly? See "Water Piping" in the "Installing the New Water Heater" section.
7. Is there adequate clearance for maintenance around the water heater?
8. Do you need to call an electrical contractor and/or the local electric company to check your wiring?



Temperature Regulation

▲ WARNING

HOTTER WATER CAN SCALD: Water heaters are intended to produce hot water. Water heated to a temperature which will satisfy clothes washing, dish washing, and other sanitizing needs can scald and permanently injure you upon contact. Some people are more likely to be permanently injured by hot water than others. These include the elderly, children, the infirm, or physically/mentally handicapped. If anyone using hot water in your home fits into one of these groups or if there is a local code or state law requiring a certain temperature water at the hot water tap, then you must take special precautions. In addition to using the lowest possible temperature setting that satisfies your hot water needs, some type of tempering device, such as a mixing valve, should be used at the hot water taps used by these people or at the water heater. Mixing valves are available at plumbing supply or hardware stores. Follow manufacturers instructions for installation of the valves. Before changing the factory setting of the thermostat, read the "Temperature Regulation" section in this manual.

▲ WARNING

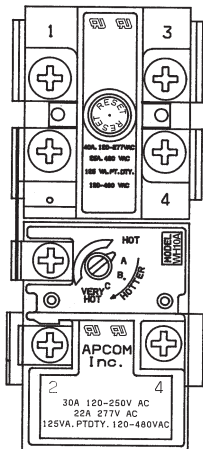
Never allow small children to use a hot water tap, or to draw their own bath water. Never leave a child or handicapped person unattended in a bathtub or shower.

Temperature Regulation (cont'd)

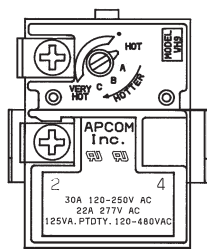
Thermostats

The thermostat(s) of this water heater have been factory set at a position which approximates 120°F (HOT) to reduce the risk of scald injury.

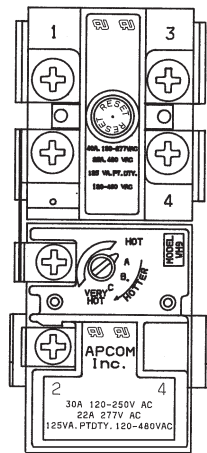
The upper thermostat is factory set at a position which approximates 120°F (HOT) and is adjustable if a different water temperature is desired. Read all warnings in this manual and on the water heater before proceeding.



ADJUSTABLE UPPER THERMOSTAT
BEHIND UPPER ACCESS PANEL
(DUAL ELEMENT MODELS ONLY)



ADJUSTABLE LOWER
THERMOSTAT
(For dual element models)



ADJUSTABLE LOWER
THERMOSTAT
WITH HIGH LIMIT

The lower thermostat is factory set at a position which approximates 120°F (HOT) and is adjustable if a different water temperature is desired. Read all warnings in this manual and on the water heater before proceeding.

Temperature Settings

HOT– Is a thermostat setting of approximately 120°F, which will supply hot water at the most economical temperatures.

A– Is a thermostat setting of approximately 130°F.

B– Is a thermostat setting of approximately 140°F.

C– Is a thermostat setting of approximately 150°F.

VERY HOT– Is a thermostat setting of approximately 160°F. It is recommended that the dial be set lower whenever possible.

NOTE: Water temperature range of 120°–140°F recommended by most dishwasher manufacturers.

Thermostat Adjustment

On dual element models, both the upper and lower thermostats have been factory set at HOT (approximately 120°F) to reduce the risk of scald injury.

The upper and lower thermostats are adjustable if a different water temperature is desired. Read all warnings in the “Temperature-Regulation” section before proceeding. To adjust the temperature setting for both upper and lower thermostats:

NOTE: It is not necessary to adjust the upper thermostat. However, if it is adjusted above the factory set point (120°F/HOT) it is recommended that it not be set higher than the lower thermostat setting.

1. Turn “OFF” the electrical power to the water heater at the junction box.

▲ WARNING

HAZARD OF ELECTRICAL SHOCK! Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned “OFF”. Failure to do this could result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

2. Take “OFF” the access panel(s).
3. Turn the water temperature dial clockwise (↻) to increase the temperature, or counter clockwise (↺) to decrease the temperature.
4. Replace the access panel(s).
5. Turn “ON” the power supply.

For Your Information

Start Up Conditions

THERMAL EXPANSION

Water supply systems may, because of such events as high line pressure, frequent cut-offs, the effects of water hammer among others, have installed devices such as pressure reducing valves, check valves, back flow preventers, etc...to control these types of problems. When these devices are not equipped with an internal by-pass, and no other measures are taken, the devices cause the water system to be closed. As water is heated, it expands (thermal expansion) and closed systems do not allow for the expansion of heated water.

The water within the water heater tank expands as it is heated and increases the pressure of the water system. If the relieving point of the water heater's temperature-pressure relief valve is reached, the valve will relieve the excess pressure. **The temperature-pressure relief valve is not intended for the constant relief of thermal expansion.** This is an unacceptable condition and must be corrected.

It is recommended that any devices installed which could create a closed system, have a by-pass and/or the system have an expansion tank to relieve the pressure built by thermal expansion in the water system. Expansion tanks are available for ordering through a local plumbing contractor. Contact the local plumbing contractor for assistance in controlling these situations.

STRANGE SOUNDS

Possible noises due to expansion and contraction of some metal parts during periods of heat-up and cool-down do not represent harmful or dangerous conditions.

Operational Conditions

SMELLY WATER

In each water heater there is installed at least one anode rod (see parts section) for corrosion protection of the tank. 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". This odor is derived from hydrogen sulfide gas dissolved in the water. The smell is the result of four factors which must all be present for the odor to develop:

- a. a concentration of sulfate in the supply water.
- b. little or no dissolved oxygen in the water.
- c. a sulfate reducing bacteria within the water heater. (This harmless bacteria is non-toxic to humans.)
- d. an excess of active hydrogen in the tank. This is caused by the corrosion protective action of the anode.

Smelly water may be eliminated or reduced in some water heater models by replacing the anode(s) with one of less active material, and then chlorinating the water heater tank and all hot water lines.

If the smelly water persists after the anode replacement and chlorination treatment, we can only suggest that continuous chlorination and filtering conditioning equipment be considered to eliminate the water problem.

Do not remove the anode leaving the tank unprotected. By doing so, all warranty on the water heater tank is voided.

"AIR" IN HOT WATER FAUCETS

▲ WARNING

HYDROGEN GAS: 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 explosive. 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 any electrical appliances which are connected to the hot water system are used (such as a dishwasher or washing machine). If hydrogen gas is present, there will probably be an unusual sound similar to air escaping through the pipe as the hot water faucet is opened. There must be no smoking or open flame near the faucet at the time it is open.

RUMBLING NOISE

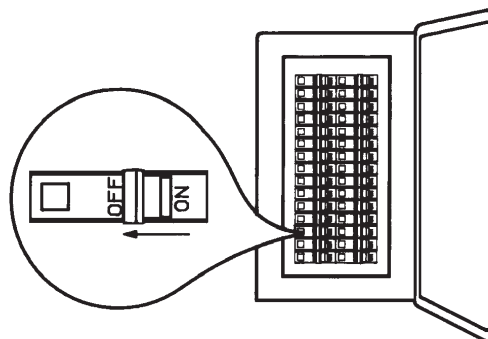
In some water areas, scale or mineral deposits will build up on your heating elements. This buildup will cause a rumbling noise. Follow "Element Cleaning/Replacement" instructions to clean and replace the elements.

HIGH TEMPERATURE SHUT OFF SYSTEM

The water heater has a high limit shut off system with a reset button located on the thermostat.

Follow the resetting instructions which refer to the high limit behind the access panel.

1. Before beginning, turn "OFF" electrical power supply to the water heater.

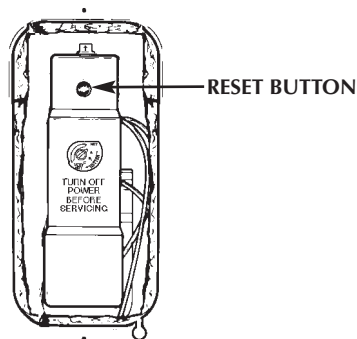


For Your Information (cont'd)

▲ WARNING

HAZARD OF ELECTRICAL SHOCK! Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned "OFF". Failure to do this could result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

2. Remove the two screws securing the access panel and remove panel.
3. Remove the insulation block to expose the opening.
4. Reset the high limit by pushing in the red button marked "RESET".



5. Replace the insulation block so that it completely covers the thermostat and element.
6. Replace the access panel.
7. Turn "ON" electric power to the water heater.

▲ CAUTION

If the high limit must be reset again, call a serviceman to find out why the high limit turned "OFF" the electric power.

NOT ENOUGH OR NO HOT WATER

1. In a new installation, the water heater may not be properly connected. Make sure the cold water supply valve is open. Review and check piping installation. Make sure that the cold water line is connected to the cold water inlet to the water heater and the hot water line to the hot water outlet on the water heater.
2. Make sure the electrical supply to the water heater is "ON".
3. Check for loose or blown fuses in your water heater circuit. Circuit breakers weaken with age and may not handle their rated load and should be replaced.
4. Make certain the disconnect switch, if used, is in the "ON" position.
5. Check to see the electric service to your house has not been interrupted. If this is the case, contact the local electric utility.
6. Are the thermostats set to the desired temperature? See "Temperature Regulation" section.
7. If you had experienced very hot water and now no hot water, the problem may be due to the high temperature shut off system. See "High Temperature Shut Off System" in the "Operational Conditions" section.
8. During very cold weather, the incoming water will also be colder and it will require a longer time to become heated.
9. The hot water usage may exceed the capacity of the water heater. If so, wait for water heater to recover after abnormal demand. Also examine pipes and faucets for possible water leaks.
10. If you can not determine the problem, then call a local serviceman.

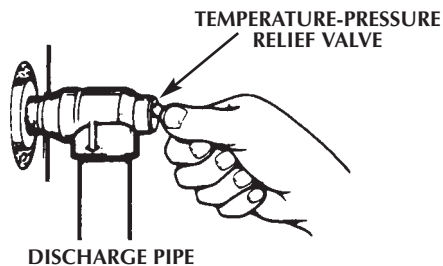
WATER IS TOO HOT

Adjust the thermostat to a lower setting. See the "Temperature Regulation" section.

Periodic Maintenance

Temperature-Pressure Relief Valve Operation

The temperature-pressure relief valve must be manually operated at least once a year.



▲ WARNING

The temperature-pressure relief valve must be manually operated at least once a year. Caution should be taken to ensure that (1) no one is in front of or around the outlet of the temperature-pressure relief valve discharge line, and (2) the water manually discharged will not cause any property damage or bodily injury. The water may be extremely hot.

If after manually operating the valve, it fails to completely reset and continues to release water, immediately close the cold water inlet to the water heater, follow the draining instructions, and replace the temperature-pressure relief valve with a new one.

Failure to install and maintain a new properly listed temperature-pressure relief valve will release the manufacturer from any claim which might result from excessive temperature or pressure.

▲ WARNING

If the temperature-pressure relief valve on the appliance weeps or discharges periodically, this may be due to thermal expansion. The water heater may have a check valve installed in the water line or a water meter with a check valve. Consult a local plumbing contractor and/or the local water utility for further information. Do not plug the temperature-pressure relief valve.

Draining

The water heater should be drained if being shut down during freezing temperatures. Also periodic draining and cleaning of sediment from the tank may be necessary.

1. Before beginning turn "OFF" the electric power supply to the water heater.

▲ WARNING

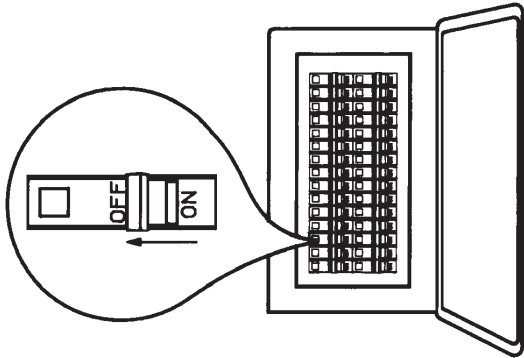
HAZARD OF ELECTRICAL SHOCK! Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned "OFF". Failure to do this could result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

2. CLOSE the cold water inlet valve to the water heater.
3. OPEN a nearby hot water faucet and leave open to allow for draining.
4. Connect a hose to the drain valve and terminate to an adequate drain or outdoors.
5. OPEN the water heater drain valve to allow for tank draining.
NOTE: If the water heater is going to be shut down and drained for an extended period, the drain valve should be left open with hose connected allowing water to terminate to an adequate drain.
6. Close the drain valve.
7. Follow "Filling the Water Heater" instructions in the "Installing the New Water Heater" section.
8. Turn "ON" power to the water heater.

Periodic Maintenance (cont'd)

Thermostat Removal

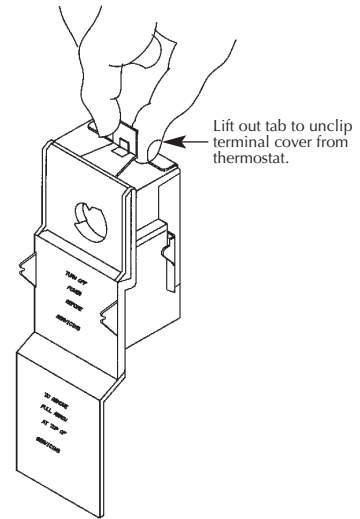
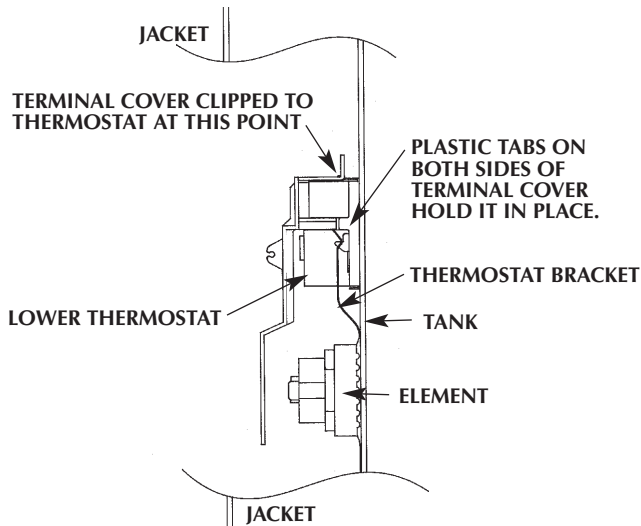
1. Turn "OFF" the electrical power to the water heater at the junction box.



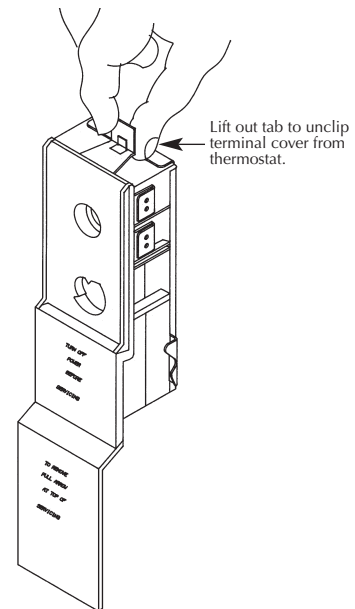
▲ WARNING

HAZARD OF ELECTRICAL SHOCK! Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned "OFF". Failure to do this could result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

2. Remove the access panel and remove the insulation block.
3. A. **Models with Lower Thermostat without high limit:** Lift out the tab as shown to unclip the terminal cover from the thermostat. The terminal cover can now be removed from the thermostat.



- B. **Models with Upper or Lower Thermostat with High Limit:** Lift out the tab as shown below to unclip the terminal cover from the thermostat. The terminal cover can now be removed from the thermostat.



4. Remove the two wires attached to the thermostat.
 5. Remove the thermostat from behind the thermostat bracket.
 6. Disconnect wires from thermostat and slide out of the bracket.
 7. Place the new lower thermostat in the bracket making sure it fits firmly against the tank.
 8. Attach the wires to the new thermostat.
- NOTE: Some of the terminals may require straight-in wiring through an eye-opening. If wires are now looped, re-cut and strip wire $\frac{3}{8}$ " to a straight length and insert.
9. Put plastic terminal cover back in place.
 10. Carefully replace insulation block to cover the thermostat and element.
 11. Replace access panel, then turn the electric power on.

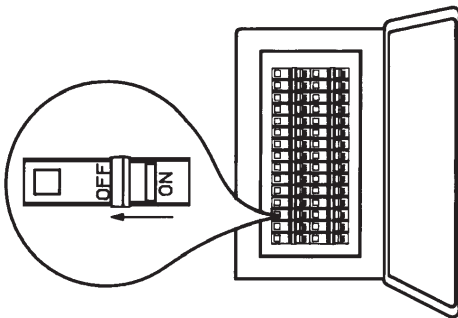
Periodic Maintenance (cont'd)

Element Cleaning/ Replacement

NOTE: These instructions are written for element cleaning and element replacement for the lower element. If it is necessary to clean or replace the upper element, then repeat these instructions.

To remove the element from the tank in order to clean or replace it:

1. Before beginning turn "OFF" the electric power supply to the water heater.



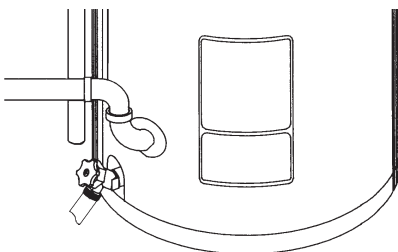
⚠ WARNING

HAZARD OF ELECTRICAL SHOCK! Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned "OFF". Failure to do this could result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

2. Turn off the water supply to the water heater at the water shutoff valve or water meter.



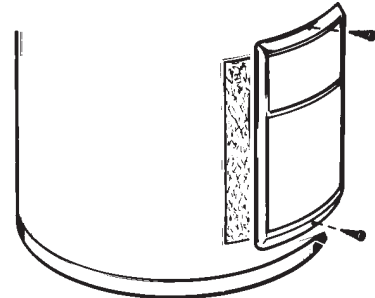
3. Attach a hose to the water heater drain valve and put the other end in a floor drain or outdoors. Open the water heater drain valve. Open a nearby hot water faucet which will relieve pressure in the water heater and speed draining. **Note: Only 30 gallon model is equipped with a drain valve. It is recommended that all other models have a drain valve installed in the cold water inlet line; see Typical Installation section.**



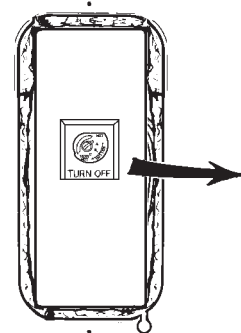
⚠ WARNING

The water passing out of the drain valve may be extremely hot. To avoid being scalded, make sure all connections are tight and that the water flow is directed away from any person.

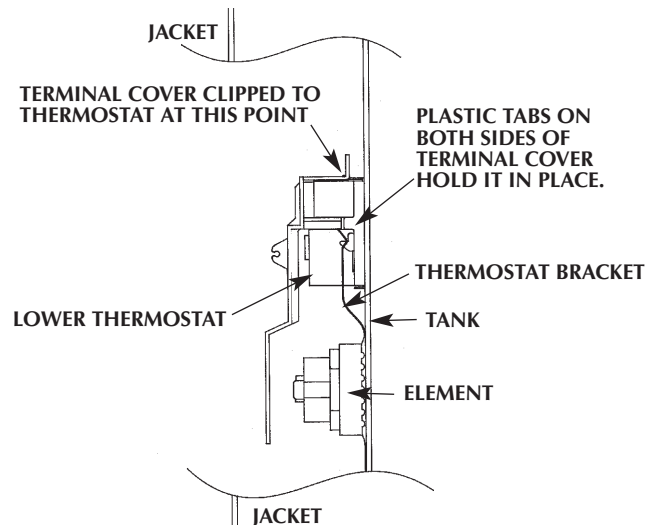
4. Remove the two screws securing the access panel, and remove panel.



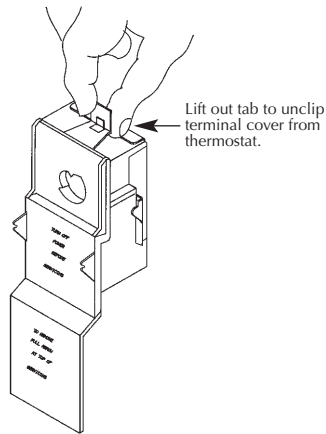
5. Remove the insulation block to expose the opening.



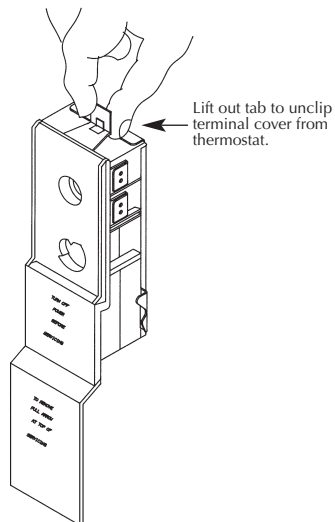
6. A. **Models with Lower Thermostat without High Limit:** Lift out the tab as shown to unclip the terminal cover from the thermostat. The terminal cover can now be removed from the thermostat.



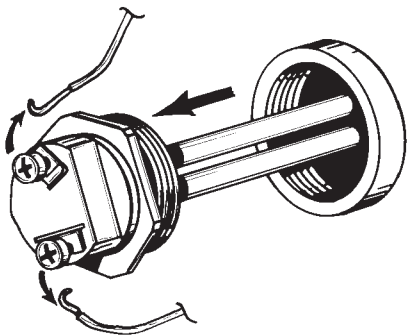
Periodic Maintenance (cont'd)



B. Models with Upper or Lower Thermostat with High Limit: Lift out the tab as shown below to unclip the terminal cover from the thermostat. The terminal cover can now be removed from the thermostat.



7. Disconnect the two wires on the element and unscrew the old element from the tank.

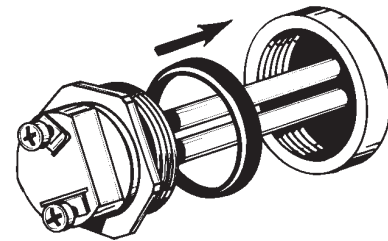


8. Clean the area around the element opening. Remove any sediment from or around the element opening and inside the tank.
9. If you are cleaning the element you have removed, do so by scraping or soaking in vinegar or a de-liming solution.

▲ WARNING

Replacement elements must (1) be the same voltage and (2) no greater wattage than listed on the model rating plate affixed to the water heater.

10. A new gasket should be used in all cases to prevent a possible water leak. Place the new element gasket on the thread side of the cleaned or new element and screw into tank, securing tightly using an element wrench.



11. Close the drain valve by turning the handle to the right (clockwise).
12. Open the cold water supply valve to the water heater.

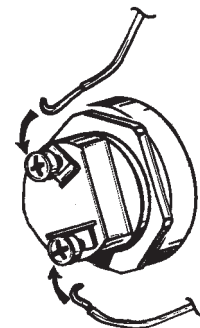
NOTE: The cold water supply valve must be left open when the water heater is in use.

13. To insure complete filling of the tank, allow air to exit by opening the nearest hot water faucet. Allow water to run until a constant flow is obtained. This will let air out of the water heater and the piping.

▲ WARNING

Never use this water heater unless it is completely full of water. To prevent damage to the tank and heating element, the tank must be filled with water. Water must flow from the hot water faucet before turning "ON" power.

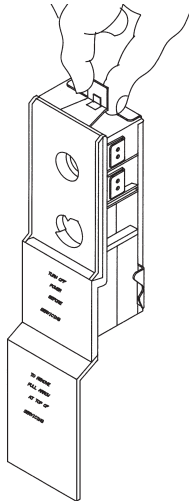
14. Check element for water leaks. If leakage occurs, tighten element or repeat steps 2 and 3, remove element and reposition gasket. Then repeat steps 10 through 14.
15. Reconnect the two wires to the element and then check to make sure the thermostat remains firmly against the surface of the tank.



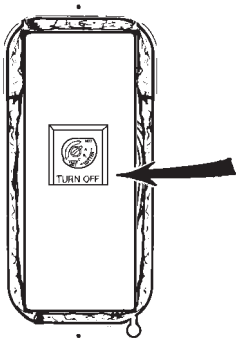
Periodic Maintenance (cont'd)

Element Cleaning/ Replacement (cont'd)

16. Replace terminal cover on thermostat making sure the locking tabs on the terminal cover are in place.

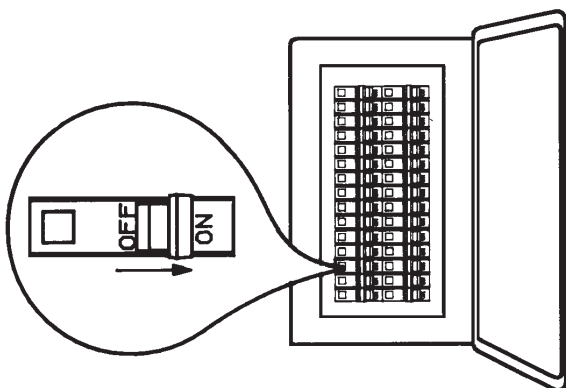


17. Replace the insulation block so that it covers the thermostat and element.



18. Replace access panel.

19. Turn "ON" electric power to water heater.



Drain Valve Washer Replacement (Note: only 30 gallon model is equipped with drain valve.)

NOTE: For replacement, use a $1\frac{7}{32}$ " x $1\frac{3}{64}$ " x $\frac{1}{8}$ " thick washer available at your nearest hardware store.

1. Before beginning turn "OFF" the electrical power supply to the water heater.

▲ WARNING

HAZARD OF ELECTRICAL SHOCK! Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned "OFF". Failure to do this could result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

2. Follow "Draining" instructions. See "Draining" instructions in the "Periodic Maintenance" section.
3. Turning counter clockwise, remove the hex cap below the screw handle.
4. Remove the washer and put the new one in place.
5. Screw the handle and cap assembly back into the drain valve and retighten using a wrench. **DO NOT OVER TIGHTEN.**
6. Follow "Filling the Water Heater" instructions in the "Installing the New Water Heater" section.
7. Check for leaks.
8. Turn "ON" electric power to the water heater.



Service

If a condition persists or you are uncertain about the operation of the water heater, let a qualified person check it out. Call a local plumbing contractor or qualified serviceman, the local electric utility, or the local water utility.

Leakage Checkpoints

Use this guide to check a “Leaking” water heater. Many suspected “Leakers” are not leaking tanks. Often the source of the water can be found and corrected.

If you are not thoroughly familiar with electric codes, the water heater, and safety practices, contact a local electrical contractor and/or the local electric utility to check the water heater.

- (A) *Condensation may be seen on pipes in humid weather or pipe connections may be leaking.
- (B) Small amounts of water from temperature-pressure relief valve may be due to thermal expansion or high water pressure in your area.
- (C) *The temperature-pressure relief valve may be leaking at the tank fitting.
- (D) The elements may be leaking at the tank fitting.

▲ WARNING

HAZARD OF ELECTRICAL SHOCK! Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned “OFF”. Failure to do this could result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

Turn electrical power “OFF”, remove access panels and fold back insulation. If leaking around elements, follow proper draining instructions and remove element. Reposition or replace gasket on element. Place element into opening and tighten securely. Then follow “Filling the Water Heater” instructions in the “Installing the New Water” section.

- (E) Water from a drain valve may be due to the valve opened slightly. Note: Only 30 gallon model is equipped with a drain valve.
- (F) *The drain valve may be leaking at the tank fitting.
- (G) *Water in the water heater bottom or on the floor may be from condensation, loose connections or the temperature-pressure relief valve. DO NOT replace the water heater until a full inspection of all possible water sources is made and necessary corrective steps taken.

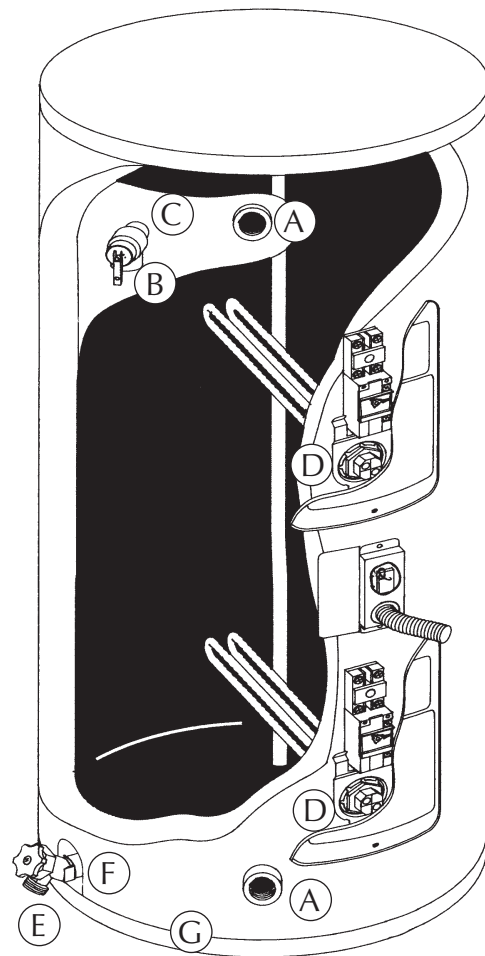
Leakage from other appliances, water lines, or ground seepage should also be checked.

▲ CAUTION

Read this manual first, then before checking the water heater make sure the electric supply has been turned “OFF”, and never turn the electric supply “ON” before the tank is completely full of water.

▲ CAUTION

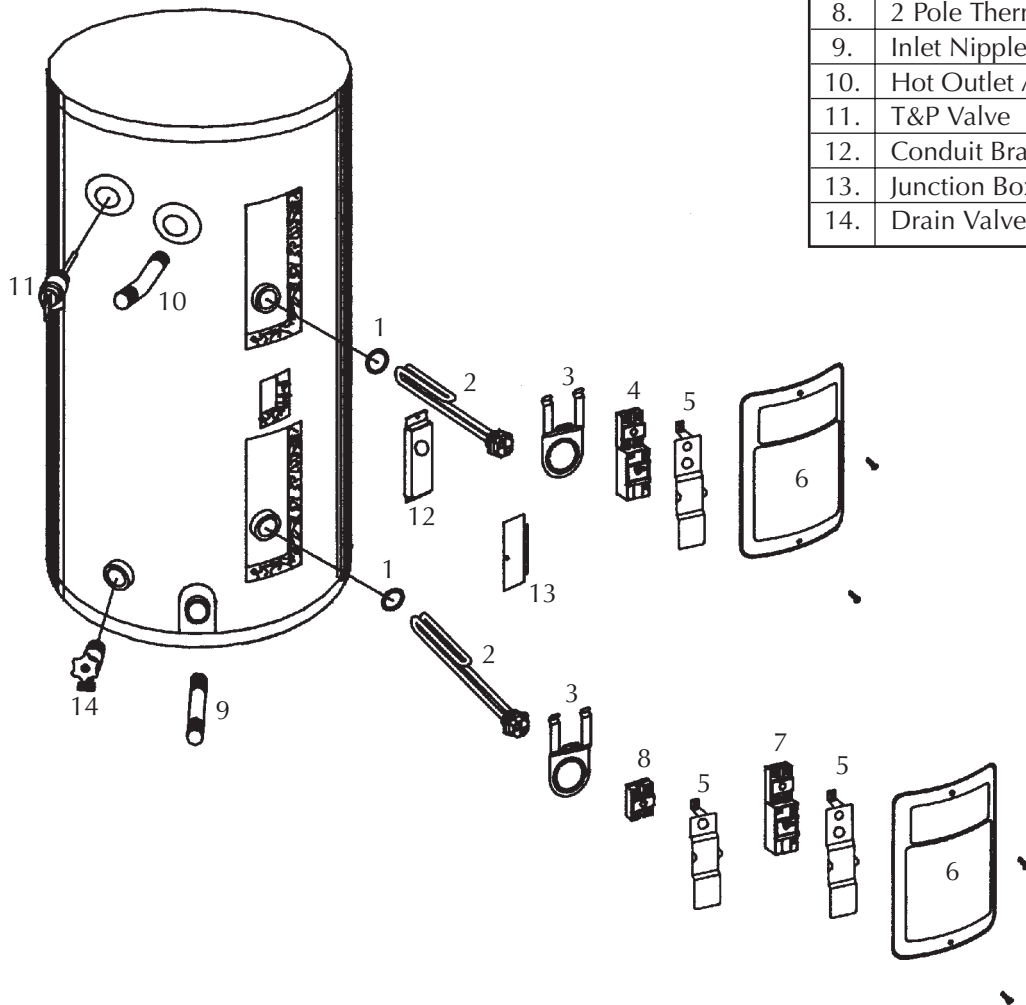
Never use this water heater unless it is completely full of water. To prevent damage to the tank and heating element, the tank must be filled with water. Water must flow from the hot water faucet before turning “ON” power.



*To check where threaded portion enters tank, insert cotton swab between jacket opening and fitting. If cotton is wet, follow “Draining” instructions in the “Periodic Maintenance” section and then remove fitting. Put pipe dope or teflon tape on the threads and replace. Then follow “Filling the Water Heater” instructions in the “Installing the New Water Heater” section.

Repair Parts

KEY NO.	PART DESCRIPTION
1.	Element Gasket
2.	Element (Upper and Lower)
3.	Thermostat Bracket
4.	Upper Thermostat w/Hi Limit
5.	Terminal Cover
6.	Access Panel
7.	Lower Thermostat w/4 Pole Hi Limit
8.	2 Pole Thermostat
9.	Inlet Nipple
10.	Hot Outlet Assembly
11.	T&P Valve
12.	Conduit Bracket
13.	Junction Box Cover
14.	Drain Valve (30 gal. model only)



Now that you have purchased this water heater, should a need ever exist for repair parts or service, simply contact the company it was purchased from or direct from the manufacturer listed on the rating plate on the water heater.

Be sure to provide all pertinent facts when you call or visit.

Selling prices will be furnished on request or parts will be shipped at prevailing prices and you will be billed accordingly.

The model number of your Water Heater will be found on the rating plate located beside the access panels.

WHEN ORDERING REPAIR PARTS, ALWAYS GIVE THE FOLLOWING INFORMATION:

MODEL NUMBER
SERIAL NUMBER

VOLTAGE AND ELEMENT WATTAGE
PART DESCRIPTION

THIS IS A REPAIR PARTS LIST, NOT A PACKING LIST.