

## Thermal Expansion Danger

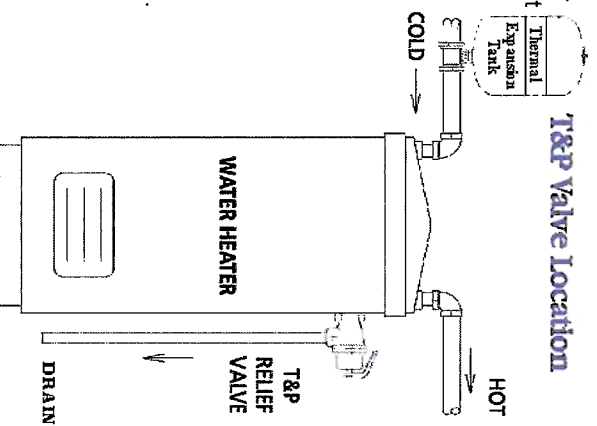
Most homes are supplied with hot water from an electric or gas heated tank. Until the heating element stops working, and one is faced with a cold shower, the water heater is usually taken for granted. However, if not properly maintained, a water heater may become a safety hazard.

Water expands in volume as its temperature rises. The extra volume caused by thermal expansion must go somewhere. If not, the heated water creates an increase in pressure. This is the principle of a steam engine.

The temperature and pressure in the water heater is reduced when hot water is withdrawn from a faucet and cold water enters the tank. The increase in pressure from thermal expansion can also be reduced by water flowing back into the public water system. However, when a check valve, pressure-reducing valve or backflow preventer is installed in the service pipe a "closed system" is created. Provisions must be made for thermal expansion in these cases.

The thermostat of the water heater normally maintains the water temperature at about 130° F (54° C). However, if the thermostat fails to shut off the heater, the temperature of the water will continue to increase.

If the water temperature increases to more than 212° F (100° C), the water within the tank becomes "super heated". When this super heated water is suddenly exposed to the atmosphere when a faucet is opened, it instantly turns to steam. As the pressure within the tank continues to build up under super heated conditions, the tank may explode.



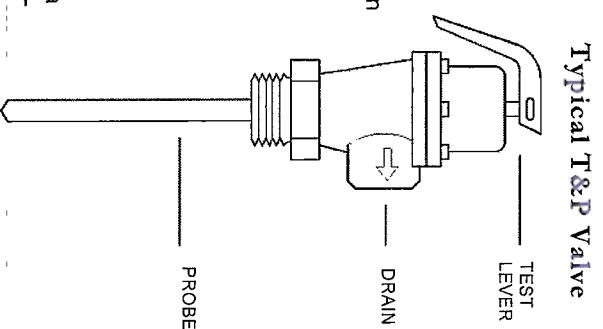
## Why the Installation of a Backflow Preventer is Required on a Water Service

Water normally flows in one direction, from the public water system through the customer's cold or hot water plumbing to a sink tap or other plumbing fixture. The plumbing fixture is the end of the potable water system and the start of the waste disposal system.

Under certain conditions water can flow in the reverse direction. This is known as **backflow**. Backflow occurs when a backsiphonage or backpressure condition is created in a water line.

**Backsiphonage** may occur due to a loss of pressure in the water distribution system during a high withdrawal of water for fire protection, a water main or plumbing system break, or a shutdown of a main or plumbing system for repair. A reduction of pressure below atmospheric pressure creates a vacuum in the piping. If a hose bib was open and a flowing hose was submerged in a wading pool during these conditions, the non-potable water in the pool would be siphoned into the house plumbing then back into the public water system.

**Backpressure** may be created when a source of pressure, such as a pump, creates a pressure greater than that supplied from the distribution system. If a pump supplied from a non-potable source, such as a landscape pond, were accidentally connected to the plumbing system, the non-potable water could be pumped into the potable water supply.



## What the Homeowner Should Do to Ensure Protection from Thermal Expansion

- The homeowner should check to see that an expansion tank and T & P Valve are in place.
- If there is any doubt, the homeowner should contact a licensed plumber.
- The T & P Valve should be periodically inspected to ensure that it is properly operating.
- Some T & P Valves are equipped with a test lever. Manually lifting the lever unseats the valve, allowing water to discharge. If water continues to leak from the T & P Valve after closing, the valve may need to be replaced. A drain line must be installed to avoid water damage and scalding injury when the valve operates.
- The T & P Valve should be periodically removed and visually inspected for corrosion deposits and to insure it has not been improperly altered or repaired.
- Installation specifications may vary; the above work can best be done by a licensed plumber. Installations should always be in accordance with Manufacturers Instructions.