



TOPIC: GAS SHUT OFF for low water in water heater?

CONCLUSION: Necessary safeguards are already in place.

The installation of the WHID (Water Heater Isolation Device) will shut off the water to the water heater in the event of:

- Leak in the inner steel tank wall.
- Elevated temperature that causes the T&P valve to operate.

LEAK IN THE TANK

When approximately 1/2-1 cup of water leaks from the inner steel tank, the pressure inside the tank drops, thus causing the hydraulically controlled WHID to shut the water supply. Because only a 1/2 cup of water has been lost, the tank remains full.

RESULT: The heating element or burner, in conjunction with the thermostat, will maintain the water at the set temperature until the water heater has been inspected.

THERMAL EXPANSION

If the water tank has a “runaway thermostat” the T&P valve will discharge (as designed). The discharge will simulate a “leaking tank”, the pressure will drop, and the WHID will shut down the water supply. At this point, we must assume that the “runaway thermostat” will keep heating the water: the water will boil, and turn to steam, again and again, until the cycle is broken:

ELECTRIC WATER HEATER

The T&P will keep discharging, until the water level lowers to the top heating element. If the HIGH LIMIT switch doesn't “break”, then the heating element will overheat, and eventually fail.

RESULT: With only the bottom heating element working, the water will no longer “flash” to steam.



GAS WATER HEATER

Like the electric water heater, the cycle will continue, and the T&P will keep discharging. The gas burner will continue firing, raising the water temperature, and the stack temperature.

The good news, gas water heaters have numerous safeguards. :

- Water Temperature Limit Switch
- HIGH LIMIT SWITCHES (thermocouples, which break circuit).
- Single use ECO (Emergency Cut Off) in the burner sleeve.

When any of these switches are exceeded, the pilot light's circuit is broken, thus shutting off the gas at the control valve.



The primary HIGH LIMIT SWITCH is located near the Gas Control Valve, and measures the temperature at the burner unit.

RESULT: If the burner gets to hot, the thermocouple switch will break the pilot light's circuit and shut off the gas at the control valve.



Power Venters also have a HIGH LIMIT SWITCH which measures the flu's stack gas.

RESULT: When the stack temperature rises above limit, the thermocouple switch will break the pilot light's circuit and shut off the gas at the control valve.