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Water Heater Energy Saving

A water heater is like a trusty workhorse – steady, reliable and practically maintenance-free. By giving your water heater a little attention can extend its life and significantly reduce your energy costs. Water heating can account for up to 20 percent of your home’s energy use – second only to space heating and cooling.

How Water Heaters Work

When you turn on the hot water tap, heated water is drawn into your home’s pipes from the top of your water heater. To replace the water being used, fresh cold water flows into the bottom of the tank, activating the heating element. Gas and electric storage water heaters basically operate the same way. However, gas heaters have a pilot light at the bottom to ignite the burner. They also have a flue running through the center of the tank to exhaust combustion gases. And while gas models have only a single burner, electric heaters may have a lower and an upper heating element inside the tank.

Both heaters must have a temperature/pressure release valve near the top of the tank. This valve will allow steam or hot water to escape safely, should a thermostat malfunction occur. It should be checked annually to ensure that it’s working properly.

Energy-Saving Options

There are several strategies you can take to save water, energy, and money. By following these five steps, you can ensure that your water heater will operate efficiently.

1. Adjust the Thermostat

Your tank is probably keeping your water hotter than necessary. Most electric heaters are set at 140°F, but this high setting is only needed if you have a dishwasher without a booster heater. Turn the temperature down to 120°F (midway between low and medium on a gas heater dial), and you will cut your water-heating costs by six to 10 percent. Since gas water heaters do not have a temperature thermostat, use a cooking thermometer to test the temperature of the water at the tap. You will also slow tank and pipe mineral build-up and corrosion. Mark the current setting with a permanent marker so that if you need to adjust the temperature later, you can easily see where you started.

Electric heaters may have both an upper and a lower thermostat you’ll need to adjust. However, before removing the thermostat access panels, be sure to first turn the electricity off at the circuit breaker or fuse box.

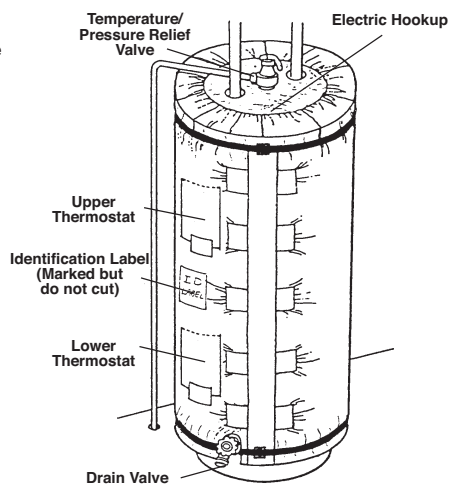
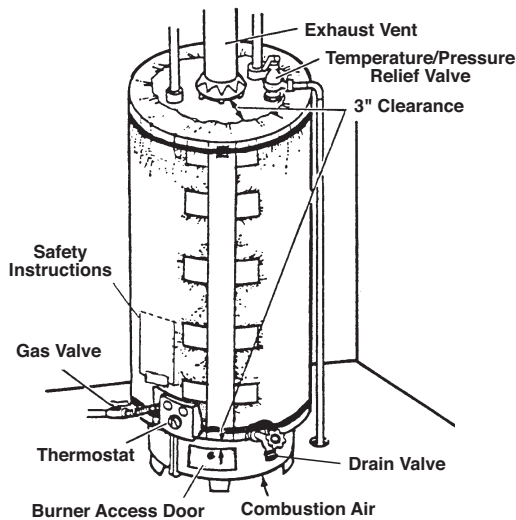
When you’re going to be away from home for several weeks, turn the thermostat down to the lowest setting or turn the heater off completely. Electric heaters can be shut off at the electrical circuit breaker box. If you turn-off a gas heater, be sure to learn how to re-light the pilot light (see page 3). It only takes about an hour to reheat the water once the heater is



Electric Thermostat



Gas Thermostat



reduce both heating element efficiency and the overall capacity of the water heater. You can reduce this build-up by periodically flushing water from the tank.

The drain valve is located near the bottom of the tank. Open the valve and let the murky water drain into a bucket until it runs clear (usually after one to two gallons). If the valve hasn't been opened in years, you may want to have a garden hose cap handy the first time you drain, in case it's difficult to shut off and avoid drips. In some areas, depending on the hardness of the water, monthly flushing is recommended, and

turned back on.

2. Insulate the Tank

Unless the owner's manual specifically states not to, wrap your water heater with an insulating blanket, especially if it is located in a cold space (garage, crawl space, etc.). If possible, put the heater in a heated space. Wrapping the tank in a blanket of fiberglass insulation will reduce standby heat loss by 25 to 45 percent. Standby heat loss results from keeping water heated at all times so that it is ready when needed – it's on "standby." Some of the heat is transferred through the tank and pipes out into the surrounding air. Insulating can result in a savings of four to nine percent on your water-heating bill. Water heater insulation kits are available for about \$20 at your local hardware store. They are easy to apply and will pay for themselves in less than a year. Be sure to carefully follow the directions. It's especially important to not cover exhaust vents and air intakes on gas models with insulation and to cut the insulation so you can access the thermostat panels on electric heaters. Never cover the pressure temperature relief valve. It's a good idea to put a strap near the top and near the bottom to further secure the insulation.

3. Insulate Hot Water Pipes

To save even more, reduce heat loss by insulating the first five feet of your hot and cold water pipes from the water heater. You can insulate your hot lines beyond five feet if they are accessible using pre-formed foam insulation, available in different diameters and lengths at your local hardware store.

Keep tank and pipe insulation at least three inches away from the gas burner and the hot exhaust vent/pipe and draft hood on gas water heaters.

4. Flush the Tank

Over time, sediment and scale (dirt and mineral deposits from the water) build up inside your water tank. They

in others the tank need only be flushed once a year.

5. Install Heat Traps

Heat traps are one-way valves placed inside both the hot and cold water lines running into your water heater. They keep the hot water from rising out and the cold water from dropping in to your water heater when you're not drawing water from a tap or for an appliance. If your existing water heater does not have heat traps, or you are not sure, contact a plumber to check your system and install them. New water heaters should have them as an option or already installed.

New Water Heaters

If you're in the market for a new water heater or are doing homework to know what's available once the old one quits working, you will have a variety of choices to consider and discuss with your heating contractor or plumber.

High Efficiency Gas Storage Water Heaters

A High-Efficiency Gas Water Heater is an upgraded version of the conventional gas water heater. It has better insulation and heat traps and more efficient burners. Look for storage tanks with a high thermal resistance (R-value) of around R-25 to reduce standby heat losses.

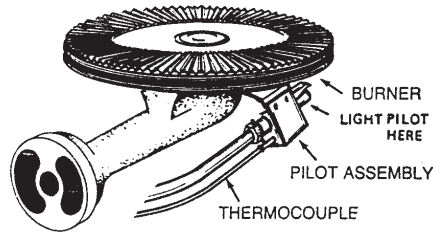
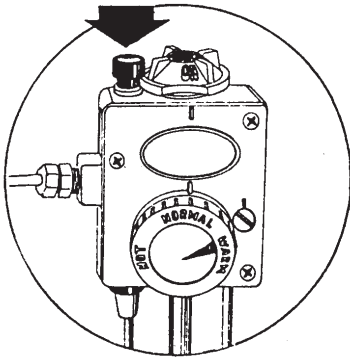
Gas-Condensing Water Heaters

Regular gas water heaters vent combustion gases to the outdoors at a high temperature. A gas-condensing water heater is more efficient because it uses/captures more of the combustion gas's high temperature to heat the water.

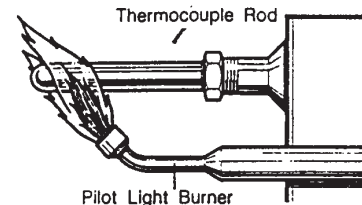
Heat Pump Water Heaters

Instead of generating heat to heat water, a heat pump uses heat from the surrounding air to heat water. It's like how a refrigerator works, only in reverse. They may not work as efficiently during winter if a living space's heated

Pilot Reset Button



Gas Burner Assembly



Courtesy of Publications International, Ltd.

air is pulled/pumped to heat the water.

Tankless (on-demand) Water Heaters

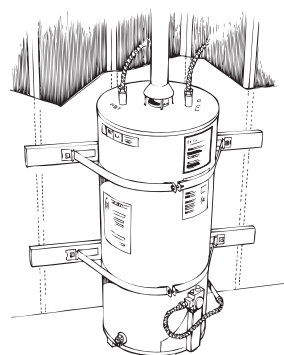
Most water heaters keep water heated at all times – whether needed or not. Powered by either gas or electricity, tankless water heaters save energy by heating water only when it is needed. How do they work? A flow sensor detects when the hot water faucet is turned on or the warm/hot water selection is made for an appliance. For a gas-powered heater, the gas valve opens and the burner fires-up. The system measures the incoming water temperature and calculates how quickly the water should flow past the burner through to the faucet or appliance. The burner's heat is transferred to the water. While these systems can supply a limitless amount of heated water, they must be sized for your hot water needs.

Solar Water Heating System

You can also heat your water using the sun's energy. There are several types of solar hot water systems that work well. The sun's energy is absorbed by a south-facing "collector" that heats a fluid (water or antifreeze). The fluid transfers its heat to potable water stored in a tank. These systems typically require a back-up system for higher than usual demand or cloudy days. The back-up can be a tankless water heater.

Seismic Bracing

While Tennessee is not known as a major earthquake prone area, we do experience an occasional quake. West Tennessee has experienced major quakes in the past. Whether it's for earthquakes or general safety, it's not a bad idea to secure the hot water heater to keep it from tipping over. Bracing code requires that a strap be anchored to the wall on the top and bottom thirds of the vertical dimensions of the tank. Straps are to be four inches above the control.



Courtesy of Span Disaster Services, Inc.

Lighting a Gas Water Heater Pilot Light

Instructions for lighting a pilot light should be on a plate mounted to the water heater. The instructions, which apply to most gas water heaters, are repeated here:

1. **Turn the thermostat indicator knob to OFF.**
 - a. This shuts off gas supply to the heater.
 - b. Wait 5 minutes for any gas that might be in the combustion chamber to clear the heater.
 - c. If closed, open the gas valve in the gas supply pipe.
 - d. Turn the indicator knob to PILOT.
2. **Depress the indicator knob and light the pilot.** (Continue holding the indicator knob for one minute after the pilot is lit. The pilot flame should remain on when the knob is released.)
3. **Turn the indicator knob to ON.** The main burner should ignite.
4. **Set the water temperature dial to the desired temperature.**
5. **Repeat these instructions if it is necessary to relight the heater.**

If the pilot light goes off when you release the reset button, try holding the button down again for an additional 10 to 15 seconds. If it still fails to stay on, either the thermocouple is defective or it is not positioned properly in the flame of the pilot. The flame from the pilot should bathe the top 1/2 inch of the thermocouple rod. If it does not, loosen the bracket nuts and reposition the rod. In case you are wondering what the thermocouple does, it acts as a safety cutoff for the gas valve. When the pilot is lighted, the heat generates a slight electric current in the thermocouple, which then allows gas to come from the gas valve. When the pilot goes out, the thermocouple stops sending the current, and the gas supply stops. If the thermocouple is faulty, replace it.

If you still cannot get the pilot lighted, there is probably something obstructing the flow of gas. Check the tiny orifice for clogs, and clean it if necessary, or call a plumber or heating contractor for maintenance.

