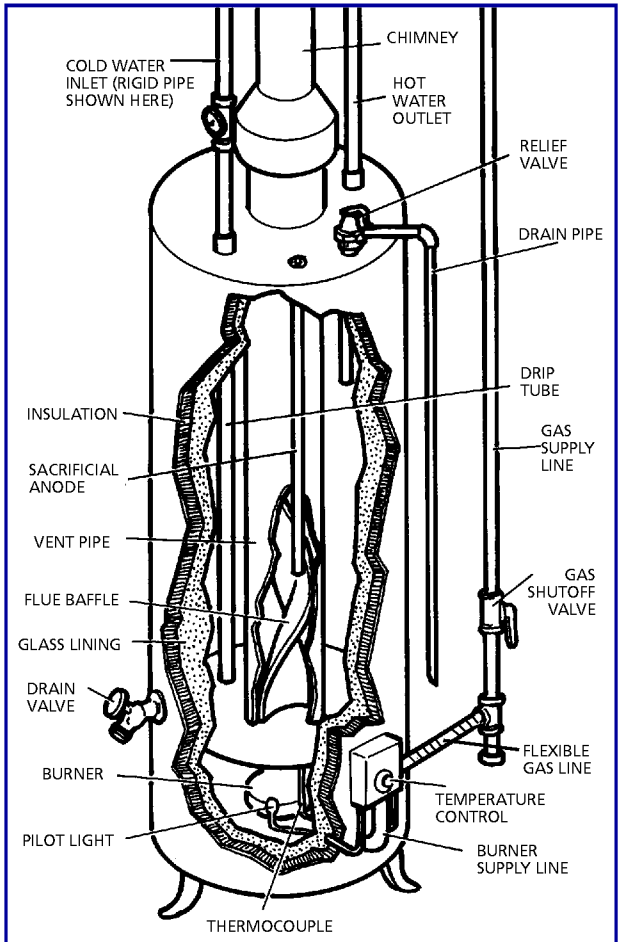
HOW-TO BOOKLET #3017

GAS HOT WATER



ANATOMY OF A TYPICAL RESIDENTIAL GAS WATER HEATER.

TOOL & MATERIAL CHECKLIST

- ❑ Pipe/Adjustable Wrench
- ❑ Voltage Tester
- ❑ Flex Gas Line/Shut-Off Valve
- ❑ Torch/Solder/Flux
- ❑ Pressure Relief Valve
- ❑ Blanket/Pipe Insulation
- ❑ Joint Compound/Teflon Tape
- ❑ Pliers
- ❑ Dielectric Union/Water Flex Lines
- ❑ Vent Pipe
- ❑ Water Shut-Off Valve
- ❑ Water Pan
- ❑ Pipe
- ❑ Earthquake Straps (CA)

Read This Entire How-To Booklet for Specific Tools and Materials Not Noted in The Basics Listed Above.

Gas water heaters are wonderfully simple and efficient. They very seldom need repairs, but they do need some maintenance to keep them producing all that hot water that you have taken for granted for many years. In this How-To Booklet, you find a list of maintenance tasks that you can do, plus a couple of repair techniques in the event the gas water heater develops problems.

Water heaters can gobble up a lot of energy, so they should be properly set to conserve gas. The right setting is 140 degrees, if you have a dishwasher and washing machine. If you don't own these two appliances, turn the setting on the thermostat at the bottom of the heater to 110 degrees. This setting heats the water to the right degree for average bathroom, kitchen, and laundry needs.

If the water heater springs a leak in its tank, immediately turn off the water and power and replace the water heater with a new one. It doesn't pay to attempt to repair a leaking hot water tank. If you buy a new heater of about the same physical size, the replacement is little more than a take-the-old-heater-out and install the new heater in its place. All the fittings (or most of them) will be the same. Be sure to empty the tank first, however. Water is heavy.

A WATER HEATER MUST BE LEVEL

To function properly, the heater must be setting level on the floor. Check the level of the appliance every three to four years. Floors can go out of level with time—a normal condition—causing the heater to tip.

To set the heater straight, put the level on top of the heater. Drive wooden shingle shims under the base of the heater until the heater is level again. Cedar shingles work best because water and dampness will not cause the wood to rot.

IF HOT WATER IS DISCOLORED

Sediment probably is to blame. Try this:

Open the valve near the bottom of the heater. You may need pliers to turn the handle, but don't force it.

Catch about two or three gallons of water in a bucket. Then close the valve. This procedure removes sediment from the bottom of the heater tank.

If the water heater is new, drain the heater about every two months. If the water heater is an old one, it's best not to drain it. Draining can cause leaking that you might not be able to stop.

THE WATER WON'T HEAT

First check the gas line and make sure that the pilot light is burning. If the pilot light is not burning, relight it according to the directions on a metal tag usually fastened to the front of the heater tank. No tag? Then follow these relighting instructions:

1. Turn the gas lever or handle to the setting marked "Pilot." It will be marked on the control.
2. Press down on the reset button, also on the control panel. It should be marked, or it will have a red-colored cap. Hold this button down.
3. Reach into the opening and hold the match to the thermocouple pilot. You may need to keep the pilot light button depressed for up to a minute until the thermocouple warms and keeps the pilot lit.

Be careful with the match so as not to burn your fingers. If the pilot will not light or stay lit you may need to replace the thermocouple (see section on "Changing A Thermocouple").

THE SMELL OF GAS

If you smell gas near the water heater, joints along the supply pipe may be leaking. You can test this by mixing up a container of soapy water.

With a brush (a small paint brush is ideal), coat the fittings with soapy water. If the joint is leaking, the solution will bubble, giving you a clue.

With a wrench or pliers, try tightening the joint just a tad. Do not overtighten it. A partial turn usually is plenty. Test the joint for leaks again with soapy water. If tightening doesn't work, better call a pro immediately. Leaking gas can spell big trouble.

CLEANING THE HEATER

Water heaters should be kept clean. The space around them should be open, clean, and litter free as well.

Vacuum around the heater once a year to remove dirt, dust and grime. The area can get dirty quickly due to its placement near the furnace.

Cleaning the inside is a messy job and may be best left to a professional chimney/water heater cleaner.

HOW TO REPLACE THE HEATER

This job sounds tougher than it really is. The hot water heater is completely self-contained, meaning that once you have hooked it up you are done, just add water.

Try to purchase the same capacity water heater as before, unless you need greater capacity. The newer heaters are more compact than the older models.

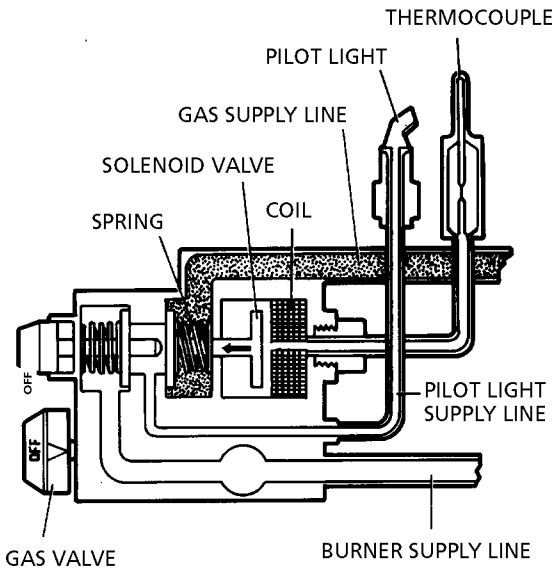
Always follow the manufacturer's instructions and recommendations for installation.

1. Turn off the water at the main shut-off valve first, then the shut-off valve to the water heater, if you have one.
2. Turn off the gas at the supply entrance to the tank. If there is no shut-off valve, turn off the gas at the meter or call your local gas company to shut it off for you. **NOTE:** Check that the gas is off by checking that the pilot light is out, listening and smelling for gas, and by doing the soapy water test. (See "The Smell Of Gas" section).
3. With the gas off, disconnect the gas line to the heater. You can add a local gas shut-off if one is not already in place.
4. Drain the water from the tank by hooking a garden hose to the drain valve and draining it outside or into a floor drain. Open some faucets so that water in the lines drain, too.
5. Disconnect the water lines with an adjustable wrench, pipe wrench or slip joint pliers. If the pipes are galvanized steel without a union, cut the pipe and remove it from the heater and the next threaded fitting. NOTE: Use two wrenches in opposing action when disconnecting from copper pipe to prevent twisting soldered fittings off the pipe.
6. Disconnect the flue and remove the old heater. Clean the area and place a drain pan/insulation pad where the new heater will go.
7. Replace the old heater with the new one. Get someone to help because they are heavy.
8. Install the relief valve, drain pipe (if desired), and other fittings onto the heater as per the manufacturer's instructions. Use teflon tape on plastic or copper and joint compound on galvanized pipe to make a good seal. **NOTE:** It is possible to add some items to the heater before installing, such as the relief valve, nipples, etc.
9. Connect the water pipes with flexible supply lines. Use a threaded nipple extending from the heater and another at the water line. If the distance is too great, add a length of pipe to reach. Add a shut-off valve to the cold water line at this time if one does not already exist.

NOTE: Always use dielectric unions or couplers built into the supply lines to prevent electrolysis. Failure to do so can cause you to lose your warranty and will make the tank rust out from the inside in months, rather than years.

10. Connect the gas with a flexible supply line to the gas pipe. Test the seal by turning on the gas slowly and brushing soapy water around the joints. There should be no bubbles. (See "The Smell Of Gas" section.) **NOTE:** If you cannot get a good seal, call your gas company or plumber to assist.

11. Reattach the flue and turn on the main water valve and check for leaks. When the tank is full, light the pilot and set the temperature between 110 and 140 degrees. **NOTE:** Attach the flue as per written specs and local codes.



Thermocouple in normal position.

12. Secure the heater with earthquake straps (California) or other required tie downs. Drain several gallons from the tank initially and continue to drain several gallons periodically to remove sediment. Insulate both the heater and pipes to stop condensation and keep your heating costs low.

CHANGING A THERMOCOUPLE

Very simply put, a thermocouple gets hot and produces heat-generated electricity. Without this small charge of current, a solenoid valve closes, via a spring device, and shuts off the gas supply. When you can't light the pilot, the problem often is a faulty thermocouple, although it can be a faulty solenoid. Since thermocouples are inexpensive and easy to change, try this repair first. If it doesn't work, suspect the solenoid, which probably will have to be professionally changed.

Thermocouples often are found in the Plumbing Departments of home center stores, or they may be stocked near the water heater display. Most times they are pre-packaged and labeled, and sometimes the manufacturer furnishes installation instructions. If not, here are the replacement basics:

1. Turn off the gas supply at the gas shutoff valve. The valve turns so the handle is at right angles to the pipe, if it is an "in line" valve, which most are.

2. Let the heater cool.

3. Open the panel to the gas burner where the thermocouple is located.

4. With a wrench, carefully unscrew the copper lead and the connection nut on the gas line. We've included a "general" illustration to show this connection.

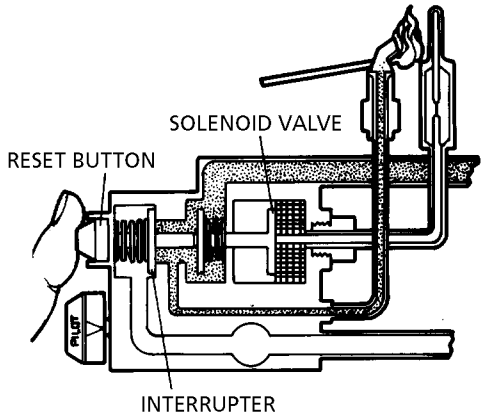
5. Inside the panel opening, unscrew the bracket nut that holds the thermocouple tube in position next to the pilot light tube. This usually is a "collar" type fitting.

6. Insert the new thermocouple into the hole in the bracket, steel tube in an up position and the copper lead in a down position. Again, see illustration.

7. Under the bracket, screw the bracket nut over the tube. Then push the connection nut to the threaded connection where the copper lead connects to the gas line. You may have to flex the tubing slightly.

8. Now screw the copper lead to the connection with the gas line under the thermostat control. All nuts should be tight. But do not overtighten them.

9. Test the new part by lighting the pilot. Press down on the reset button, as illustrated below, after you turn on the gas supply.



Thermocouple usually is in this configuration. Line or tube runs from coupling at control to bracket at thermocouple. Be sure to press reset when re-lighting pilot; drawing shows how solenoid valve works in controls.

SAVE ENERGY THREE WAYS

You may be able to lower the cost of operating a gas water heater (by saving fuel) with the products and techniques illustrated here.

Heater Jackets. Manufacturers claim a fuel savings when the water heater has been encased in a blanket of insulation as shown directly below. These insulation "jackets" are especially made to fit a hot water heater and are secured with special ties.

Pipe Insulation. By wrapping hot water pipes with pipe insulation made for this purpose, you can keep hot water hot longer, and, therefore, save fuel. A big advantage is that hot water will flow at the faucet faster—so there also is some savings on water. There are several "styles" of pipe insulation available.

Lower Thermostats. As discussed elsewhere in this Booklet, keep the water thermostat at 110 to 140 degrees. If you run out of hot water often, the problem isn't temperature but the small capacity of the heater. You may want to replace it with a large model.