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**Oven, Stove, Range
and Cooktop Repair**

Foreword

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Oven, Stove, Range and Cooktop Repair


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Chapter 5

GAS STOVE & COOKTOPS

5-1 NORMAL OPERATION

Temperature is controlled in a surface burner by varying the flow of gas to it with a manual gas valve. Ignition is achieved in one of two ways; either a standing pilot flame or a spark ignition. Gas shoots out of jets on the side of the burner and into a flame tube, which carries the gas to the ignition source. The flame then chases the gas back up the tube to ignite the burner. (See figure 5-A) This allows two or more burners to share the same ignition source.

INSTALL NOW – REMOVE ALL ADS

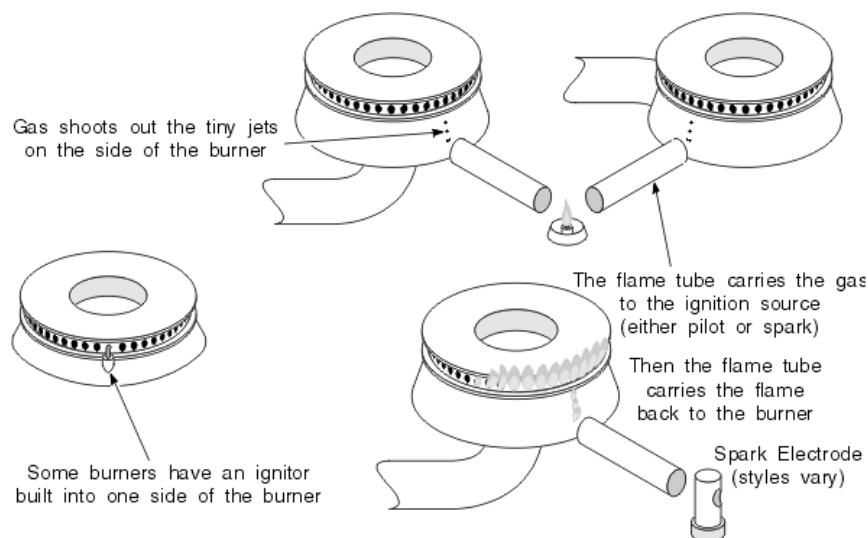
TURN OFF ALL ADS

Some burners have an ignitor built in. Since each burner has its own ignitor, flame tubes are not used in these units.

TROUBLESHOOTING

The most common problems with gas stove burners is that a pot boils over and stuff clogs the gas flame tube jets. In spark ignition systems, another common problem is that the ignitor switch fails and the ignitor doesn't spark for one burner, or the switch shorts and the electrodes won't stop sparking at all.

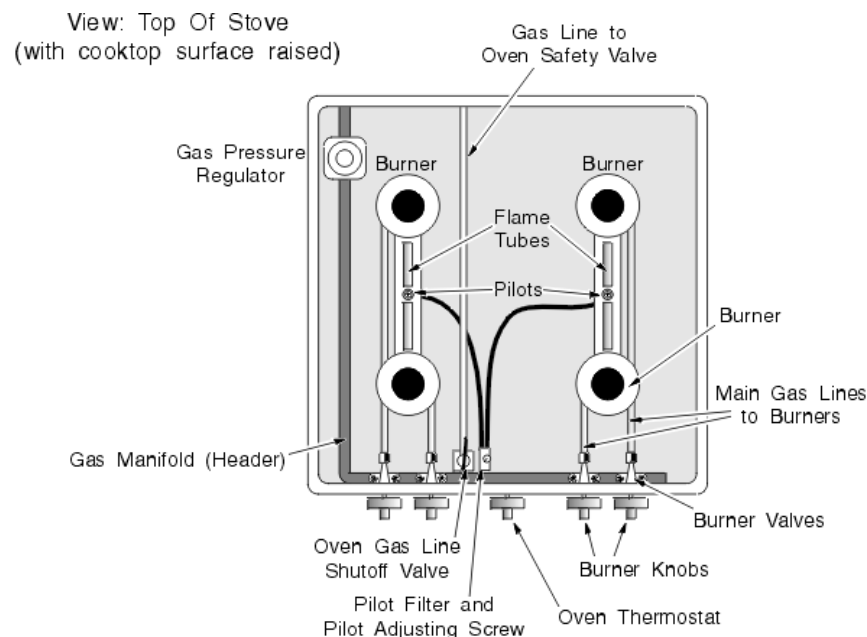
Figure 5-A: Gas Burner Ignition



5-2 PILOT IGNITION

Gas is supplied to the gas stove pilots by tubes coming directly off the main gas header (manifold.) There will usually also be a filter. (see figure 5-B) Somewhere in the gas line to the pilot there will be at least one pilot adjustment screw, usually on the filter or at the pilot itself. The pilots rarely need adjustment. If you do need to adjust them, they usually need to be set at about 1/4 inch tall, mostly blue flame with just a tinge of yellow at the tip. If there is a shield around them, you do not want the flame touching the shield. If turning on the burner makes the pilot blow out, either it is partly clogged with ash (See section 5-4) or the flame is too low.

Figure 5-B: Gas Stove Manifold and Pilot Adjustment



5-3 SPARK IGNITION

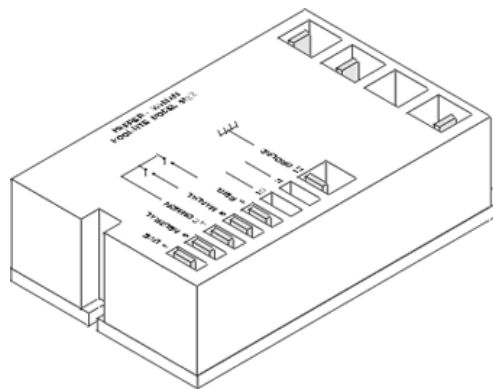
except that in place of the pilots, there are electrodes that spark to ignite the gas.

Spark ignition systems use a spark module to generate a pulsing, high-voltage spark to ignite the gas. (figure 5-C) The spark module is an electronic device that produces 2-4 high-voltage electrical pulses per second. These pulses are at very low amperage, measured in milliamps, so the risk of shock is virtually nil.

But the voltage is high enough to jump an air gap and ignite gas. When the spark is operating, you hear a tick-tick-tick, 2-4 ticks per second.

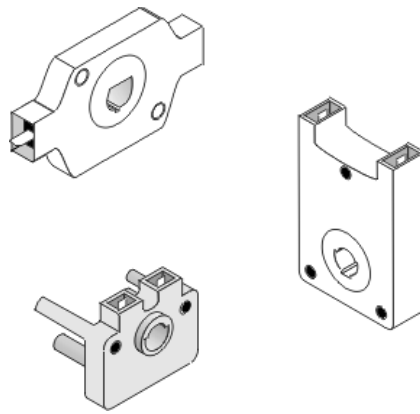
The spark ignition module (figure 5-C) is usually located inside a metal box under the cooktop surface or inside the back panel of the stove. To find the spark module on your cooktop, follow the electrical leads from the spark electrodes; they will attach directly to the module.

Figure 5-C: Typical Spark Module



A rotary switch attached to the gas stove valve spindle closes to activate the spark module. (see figure 5-D) All cooktop ignitors spark at once; in some stoves, the oven ignitor sparks, too.

Figure 5-D: Typical Spark Ignition Switches



TROUBLESHOOTING SPARK IGNITION

Trouble with surface spark ignition systems usually shows up in one of two ways. Either the electrode will not spark, or it will not *stop* sparking.

When troubleshooting cooktop electrodes keep something in mind. In some cooktops, the electrodes are wired in series; in others, they are wired in parallel. If the electrodes are in series, and one is not sparking, none will spark.

Also, all spark electrodes use the same spark module, but different switches. So if one burner is not igniting, while the gas valve is still open to that burner, try turning on another burner that doesn't share the same ignitor. In this way you can isolate the problem to the switch (which it is, 99 percent of the time,) the electrode, or the spark module.

To confirm your diagnosis, pull the leads from the switch, touch them together and see if the ignitor sparks. In testing these switches, do not forget that they operate on 110 volts. If you get too fast and loose with pulling the leads off to test them, you might zap yourself. Try using two pairs of insulated needlenose pliers to pull the leads off the switch.

If the ignitors will not stop sparking, usually one of the ignitor switches has shorted, due to moisture getting into it. To figure out which, pull one lead off each switch, one at a time, until the ticking stops. Replace the defective switch. In certain cooktops, a failure in the spark module will cause this symptom. If none of the switches seem to be defective, replace the spark module.

5-4 PILOTS AND BURNER ORIFICE MAINTENANCE & REPAIR

Natural gas, they tell us, is clean burning. Well, it makes good ad copy, but it's not 100 percent true. There are trace impurities in gas, and when they burn they become ash. And over a long long period of time this ash can build up and clog tiny gas orifices, like pilot orifices. The symptoms may be that the pilot will not stay lit, or blows out too easily.

There is also a little "cup" around the pilot light in a surface burner to regulate air for proper combustion

You can usually clean them out with an old toothbrush and some compressed air, but pilot orifices are generally so inexpensive that it's cheaper and safer to replace them. If you choose to clean them out, use a soft-bristle brush like a toothbrush, and not a wire brush. A wire brush might damage the orifice. Be careful not to push the ash into the orifice and impact it.

The surface burner jets are a different animal. The problem is, that pot that boils over can leave some pretty crusty stuff on the burners. The challenge is to get that crusty stuff off without enlarging the gas holes. Sometimes the crusty stuff is not crusty but gummy, and this can be even more fun to get off the burner.

There's no magic way to do this. Depending on what's clogging the gas holes, you may be able burn it off, or at least char it so it can be scraped or knocked off. Use a propane torch or one of the other stove burners if you can get it into the correct position.

You may also be able to use alcohol or some other non-petroleum solvent to knock it loose. If you do, make sure the solvent is completely gone before you put the burner back into service. (Petroleum-based solvents might leave a residue)

Try poking it out with a straight pin if possible. You can use a welding tip cleaner, or a small twist drill, to poke into the holes but only if it fits in the hole with plenty of clearance. Do not use a drill motor with a twist drill; just push it in and out by hand. Use it as if it was a file. Use a twist drill or tip cleaner that is MUCH smaller than the diameter of the hole. Do not use anything with a remote chance of enlarging the hole. Remember, the objective is to take off the crusty stuff without taking off any of the metal.

Sometimes a gas stove burner is just too badly clogged, or the holes are too small, and the burner must be replaced.

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