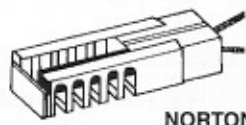


## GAS RANGE - HOT SURFACE IGNITION IDENTIFICATION, OPERATION AND TROUBLESHOOTING

### IGNITOR IDENTIFICATION

Two types of Hot Surface Ignitors are found in gas ranges. The major difference, and key identification features are their shape and length.

Ignitors made by NORTON are rectangular (usually called flat or square).  
Ignitors made by CARBORUNDUM are cylindrical (usually called round).



NORTON



CARBORUNDUM

Each type of ignitor has a different operating current rating and the appropriate model bimetal gas valve must be used: NORTON ignitors limit the operating current flow in the circuit to 3.2 to 3.6 amps.

CARBORUNDUM ignitors limit the operating current flow in the circuit to 2.5 to 3.0 amps.

(A special "powder-blue" flat ceramic NORTON model is available as an adaptive replacement for many CARBORUNDUM models).

### IGNITOR SYSTEM OPERATION

The hot surface ignition system in gas ranges has three main components.

1. The thermostat, or an electronic range control.
2. The hot surface ignitor.
3. The bimetal gas oven safety valve.

Other items such as fuses, timers, contactors, door switches, etc. may be included in the circuit, but the three basic components remain the same.

In a typical bake system, the thermostat, ignitor and valve are wired in series. (Figure 1).

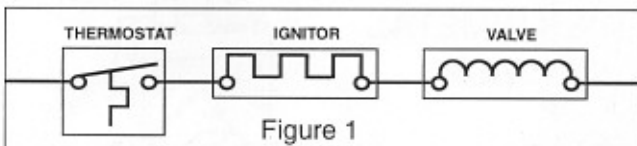


Figure 1

Some applications use a single thermostat, a selector switch (bake and broil), two ignitors and a "dual" bimetal valve. This is usually a series-parallel circuit, and when troubleshooting, each circuit must be checked individually. (Figure 2).

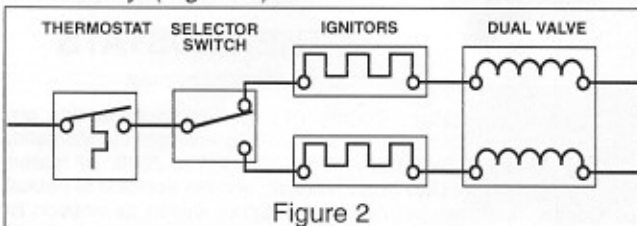


Figure 2

When the thermostat is set at a selected temperature, the contacts close and supply power to the circuit. With power applied, the ignitor begins to heat and glow in a few seconds.

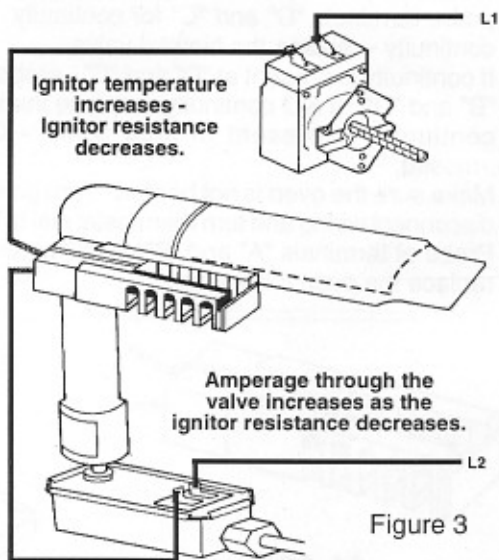


Figure 3

The electrical resistance of the ignitor will decrease as the surface temperature of the ignitor increases. The current flowing in the circuit increases in proportion to the drop in ignitor resistance.

Current flows through the heater coil of the valve causing the bimetal arm to flex, opening the valve and allowing gas to flow to the burner where it is ignited by the glowing ignitor. The rising current flow in the circuit raises the amount of heat produced by the heater coil. The bimetal arm in the valve will reach a flexing temperature and open the valve when the current flow approaches its peak which is 3.2 to 3.6 amps with the NORTON ignitors, and 2.5 to 3.0 amps with the CARBORUNDUM models.

The surface temperature of the ignitor is approximately 2500°F by the time the bimetal valve opens. The gas flows out of the valve into the burner and ignition occurs. The ignitor will remain energized at all times when the burner is lit. When the oven reaches the selected temperature, the thermostat contacts open and remove power from the ignitor/valve circuit. With power removed, the heater coil and bimetal arm will cool and the valve will close in a few seconds extinguishing the burner flame.

## IGNITOR SYSTEM TROUBLESHOOTING

### IGNITOR DOES NOT GLOW

1. Disconnect or remove ignitor and measure its resistance. Cold resistance should be between 50 and 150 Ohms. (The value of the resistance is not important as long as the ignitor is not open or shorted).
2. Check internal fuses, switches and 120 VAC power supply.
3. If power is working -
  - A. Disconnect oven power and remove wires at "B" and "C" (Figure 4).
    - 1) Check continuity between wire "B" and terminal "C". If continuity is present go to Step 4.
    - B. If continuity NOT present - remove wire at "D" and probe terminals "D" and "C" for continuity. If NO continuity - replace the bimetal valve.
    - C. If continuity is present at "D" and "C" - probe wires "B" and "D". If NO continuity - replace the ignitor.
4. If continuity is present in step 3.A.1 - Check thermostat.
  - A. Make sure the oven is not heated. Turn power off, disconnect wiring and turn thermostat dial to 350°F. Probe at terminals "A" and "B". If NO continuity - replace the oven thermostat.

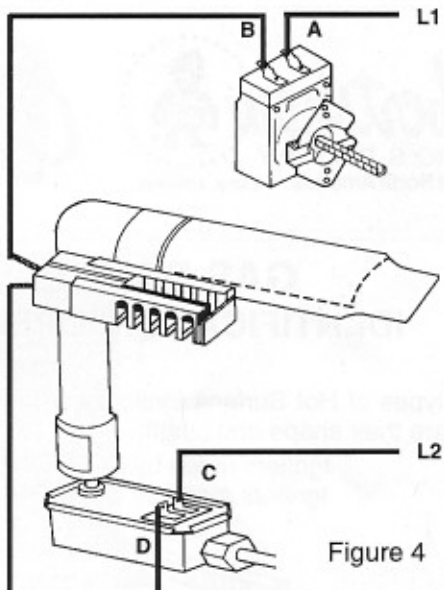


Figure 4

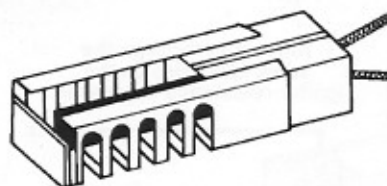
### IGNITOR GLOWS WITH NO IGNITION

1. Check that gas is turned on to the range.
2. Check ampere draw at bimetal valve. Power on. Thermostat set at 350°F.
  - A. Using wrap-around amp. meter - test one leg for amp. draw at "D" or "C".
    - 1) NORTON (flat) Ignitor - 3.2 to 3.6 amps.
    - 2) CARBORUNDUM (round) Ignitor - 2.5 to 3.0 amps. \*
 If amp. draw NOT within proper range - replace the ignitor.
  - B. If correct amp. draw is present - replace valve.

For safety purposes, when measuring the current flow through the ignitor circuit, shut off the main or the oven gas shut-off valve.

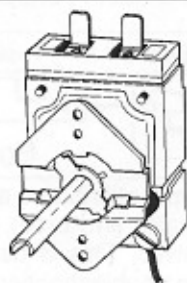
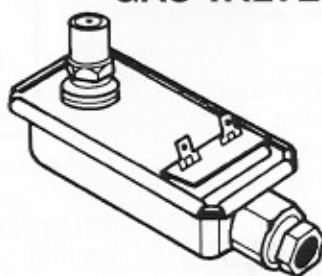
\* NORTON (flat) ignitor with "powder-blue" ceramic body has CARBORUNDUM value of 2.5 to 3.0 amps.

**Caution:** A simple circuit is shown. Actual circuit may include fuses, clock, selector switch, or other items.



**41-200  
SERIES  
IGNITORS**

### 4090 SERIES BIMETAL GAS VALVES



**5441 SERIES  
THERMOSTATS**



Uni-Line Control Tips is a bimonthly publication. Comments and suggestions for this, and future issues are welcome. Requests or input must be submitted in writing to the Marketing Services Department, "Control Tips", P.O. Box 2000, Corona, CA 91718-2000. All materials submitted becomes the property of Uni-Line North America, and the decision to publish rests therein. Copies of "Control Tips" may be made without prior written permission for distribution to servicing personnel and entities so long as Publication and Copyright Credit is given to Robertshaw Controls Company, Uni-line North America.

P.O. BOX 2000  
LITHO IN U.S.A. 8/95

CORONA, CA 91718-2000

FAX (CA Only) 909/737-8261

FAX (Outside CA) 800/426-0804

© 1995 Robertshaw Controls Company

3-935