

CONTROL TIPS

A ROBERTSHAW® INFORMATIONAL GUIDE

THIS ISSUE

GAS RANGE – HOT SURFACE IGNITION IDENTIFICATION, OPERATION AND TROUBLESHOOTING

Ignitor Identification

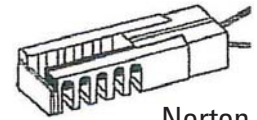
Two types of hot surface ignitors are found in gas ranges. The major difference and key identification features are their shape and length. Ignitors made by Norton are rectangular (usually called flat or square). Ignitors made by Carborundum are cylindrical (usually called round).

Each type of ignitor has a different operating current rating and the appropriate model bimetal gas valve must be used:

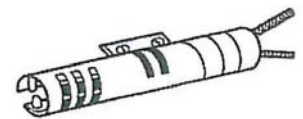
Norton ignitors limit the operating current flow in the circuit to 3.2 to 3.6 amps.

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

NOTE: A special powder-blue flat ceramic Norton model is available as an adaptive replacement for many Carborundum models.



Norton



Carborundum

Ignitor System Operation

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

1. The thermostat, or an electronic range control,
2. hot surface ignitor and
3. 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. (See Figure 1)

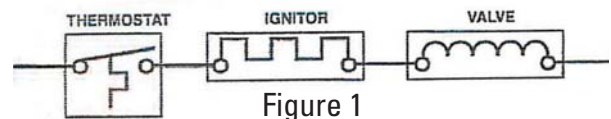


Figure 1

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. (See Figure 2)

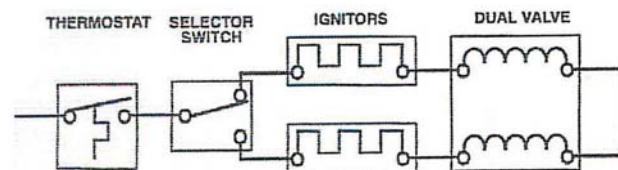


Figure 2

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.

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

- A. 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.)
- B. Check internal fuses, switches and 120V AC power supply.
- C. If power is working:
 1. Disconnect oven power and remove wires at B and C. (See Figure 3)
 - a. Check continuity between wire B and terminal C. If continuity is present go to Step D.
 2. If continuity is not present, remove wire at D and probe terminals D and C for continuity. If no continuity, replace the bimetal valve.
 3. If continuity is present at D and C, probe wires B and D. If no continuity, replace the ignitor.
- D. If continuity is present in step C.1.a, check thermostat.
 1. 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.

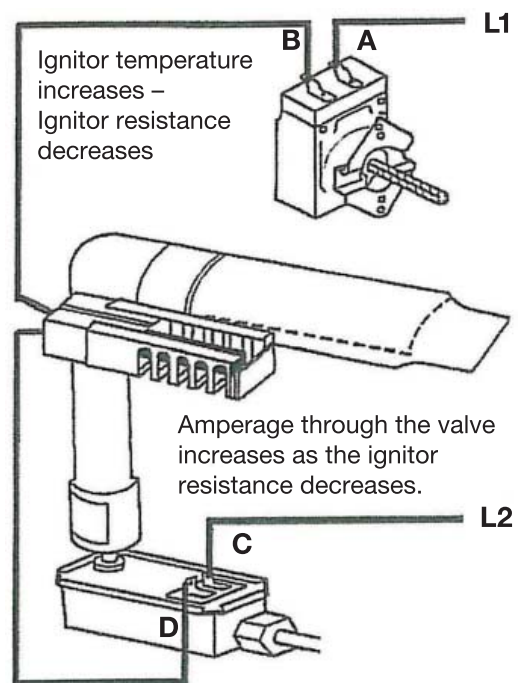
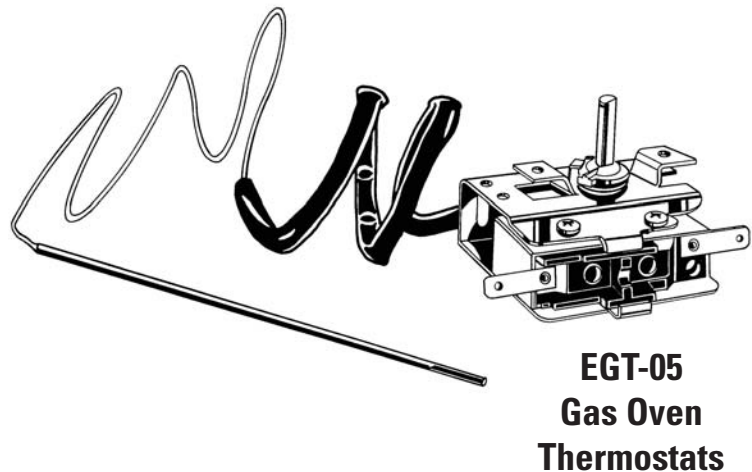
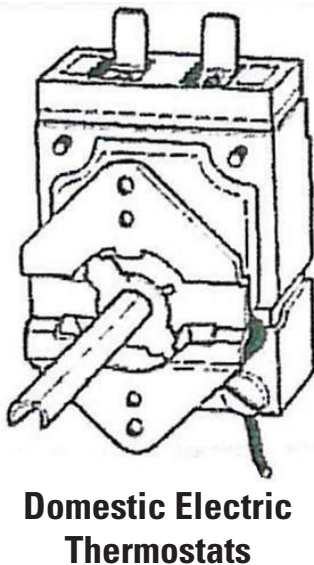
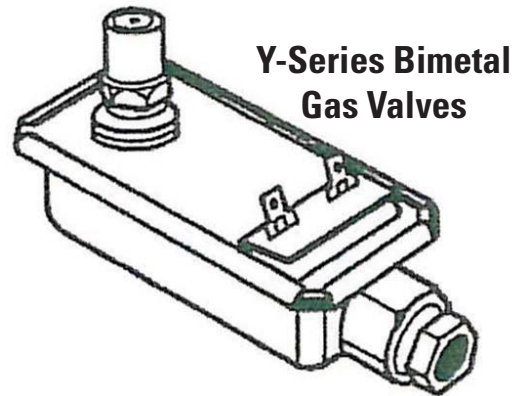
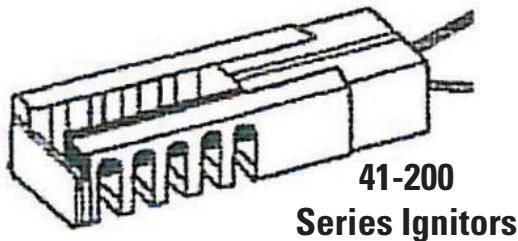


Figure 3

Ignitor Glows With No Ignition

- A. Check that gas is turned on to the range.
 - B. Check that ignitor mounting screws are tight and the ignitor is properly positioned with relationship to the main burner ports.
 - C. Check amp draw at bimetal valve. Power on. Thermostat set at 350°F.
 1. Using wrap-around amp meter, test one leg for amp draw at D or C.
Norton (flat) Ignitor – 3.2 to 3.6 amps
Carborundum (round) Ignitor – 2.5 to 3.0 amps. If amp draw not within proper range, replace the ignitor.*
 2. If correct amp draw is present, replace valve.
- * Norton (flat) ignitor with powder-blue ceramic body has Carborundum value of 2.5 to 3.0 amps.

- CAUTION:**
1. For safety purposes, when measuring the current flow through the ignitor circuit, shut-off the main or the oven gas shut-off valve.
 2. A simple circuit is shown. Actual circuit may include fuses, clock, selector switch or other items.



Invensys. Controls

191 E. North Avenue
Carol Stream, IL 60188
www.invensyscontrols.com
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For Customer Service:
Telephone 1.800.304.6563
Facsimile 1.800.426.0804
HVACCustomerService@invensyscontrols.com

For Technical Service:
Telephone 1.800.445.8299
Facsimile 1.630.260.7243
technicalservice@invensys.com

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