

# **SERVICE MANUAL**

**for**

## **Bosch Evolution 300 and 500 Series Free-standing Gas Ranges**



### **Models**

HGS3023UC, HGS3053UC, HGS3063UC, and  
HGS5053UC

*The information provided in this document is intended for trained, qualified personnel only. The proper function and the safety of the appliance can be affected by an improper repair, and even serious threats to life or physical condition may arise. BSH Home Appliances Corporation is not liable for damages caused by improper repairs performed by unauthorized parties. Local codes and standards apply and must be observed. Contact the Technical Support Team for further assistance.*

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#### Terms and Abbreviations Used in this Manual

GND = GROUND  
RTD = RESISTANCE TEMPERATURE DEVICE  
(Temperature Sensor Probe)

## GENERAL INFORMATION

### Safe Servicing Practices - All Appliances

To avoid personal injury and/or property damage, it is important that Safe Servicing Practices be observed. The following are some limited examples of safe practices:

1. DO NOT attempt a product repair if you have any doubts as to your ability to complete it in a safe and satisfactory manner.
2. Before servicing or moving an appliance:
  - Remove the power cord from the electrical outlet, trip the circuit breaker to the OFF position, or remove the fuse.
  - Turn off the gas supply.
  - Turn off the water supply.
3. Never interfere with the proper operation of any safety device.
4. USE ONLY REPLACEMENT PARTS CATALOGED FOR THIS APPLIANCE. SUBSTITUTIONS MAY DEFEAT COMPLIANCE WITH SAFETY STANDARDS SET FOR HOME APPLIANCES.
5. GROUNDING: The standard color coding for safety ground wires is GREEN, or GREEN with YELLOW STRIPES. Ground leads are not to be used as current carrying conductors. It is EXTREMELY important that the service technician reestablish all safety grounds prior to completion of service. Failure to do so will create a hazard.
6. Prior to returning the product to service, ensure that:
  - All electrical connections are correct and secure
  - All electrical leads are properly dressed and secured away from sharp edges, high-temperature components, and moving parts
  - All non-insulated electrical terminals, connectors, heaters, etc. are adequately spaced away from all metal parts and panels
  - All safety grounds (both internal and external) are correctly and securely connected
  - All panels are properly and securely reassembled
  - All gas connections are secure and have been leak tested

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## Product Overview and Features

Bosch 300 and 500 series freestanding gas ranges feature sealed gas surface burners, continuous surface grates, self-cleaning oven, electronic oven control, wide view oven window, interior oven light, and a removeable storage drawer.

500 series gas ranges feature an oval center surface burner while 300 series ranges have a round center surface burner. The oven functions are controlled by the ES337 electronic oven control module.

Current finish options available are white, black, and black with stainless steel. All 300 and 500 series gas ranges operate on 120 volt 60 hz AC power supply.

500 Series



HGS5053UC

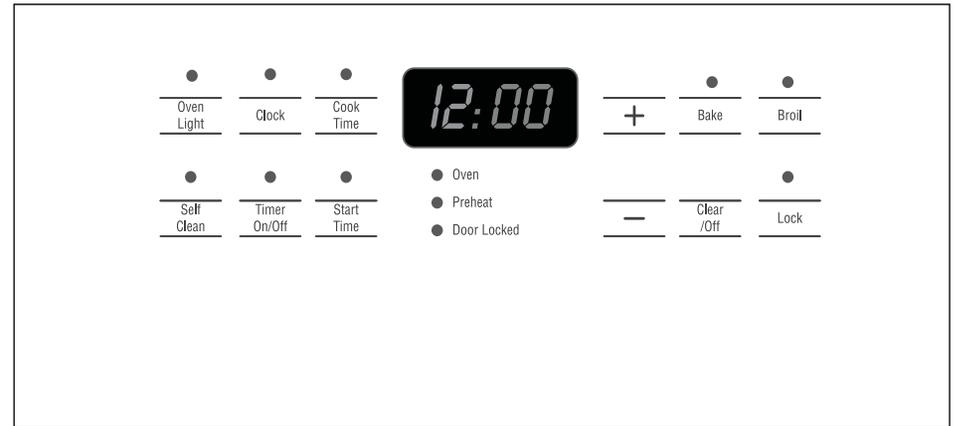
## Electronic Oven Control Module

The Bosch 300 series gas range uses an ES337 electronic oven control for all oven operations including Bake, Broil, Time Bake, Self-clean, and Oven Lockout. The control module also features a count-down timer and interior oven light control key.

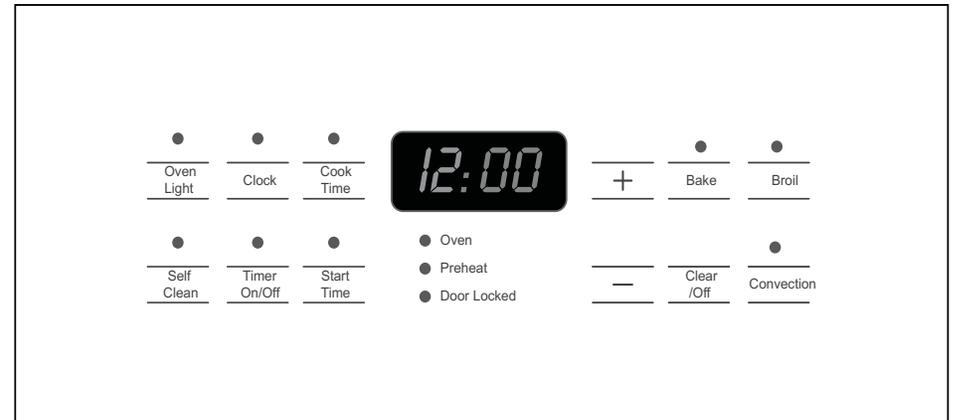
The Bosch 500 series range range electronic oven control has all of the features listed for the 300 series range except for Oven Lockout. In place of the Lock keypad found on the 300 series ranges, the Convection keypad is found on these models.

Both electronic oven control styles also feature silent control panel option, temperature conversion between °C (Celsius) or °F (Fahrenheit), and user-adjustable temperature calibration. More detail on how these as well as other features are accessed and controlled can be found in the *Use and Care Manual* provided with each range.

### 300 Series (models without convection bake)



### 500 Series (models with convection bake)



## Model Number Information

The information contained in this service manual applies to the following models:

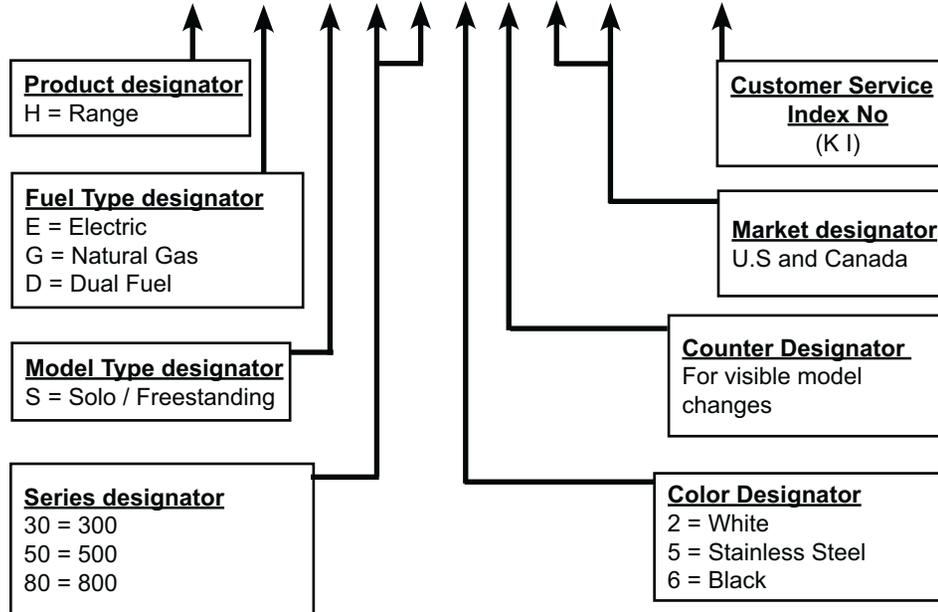
**HGS3023UC HGS5053UC**

**HGS3053UC**

**HGS3063UC**

### Explanation of Model Number and Feature Designators

**H G S 5 0 5 3 U C 1 or /01**

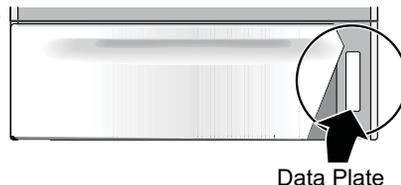


### Explanation of FD Number

The FD number indicates production year and month. On some data plates, it is incorporated in the serial number (i.e., 99906008803 . . . = FD8906). On other data plates, the FD number is printed below and to the right of the model number. See examples at right.

### Data Plate Location

The data plate shows the model and serial number. Refer to the data plate on the appliance when requesting service. The data plate location is shown in the following picture. Open storage drawer (some models) or remove lower front panel (some models).



Before calling for service assistance, be prepared to provide the complete model number and FD number reflected on the data plate. Examples are shown below.

### 2009 Bosch Evolution Series Free Standing Range (FSR) Data Tag Formats

The format of the data tags used on the following FSRs has changed since the beginning of production for the following models:

HGS3023UC, HGS3053UC, HGS3063UC, HGS5053UC

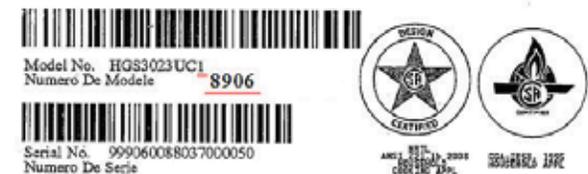
#### Initial Production July 2009

- Model number truncated (HGS3023U1=HGS3023UC/01)
- FD number not identified  
(Convert using positions 3-5 of serial number; 906=FD 8906)



#### Implemented Early September 2009

- Model number truncated (HGS3023U1=HGS3023UC/01)
- FD number printing, but not identified with "FD"



#### Implemented mid-October 2009

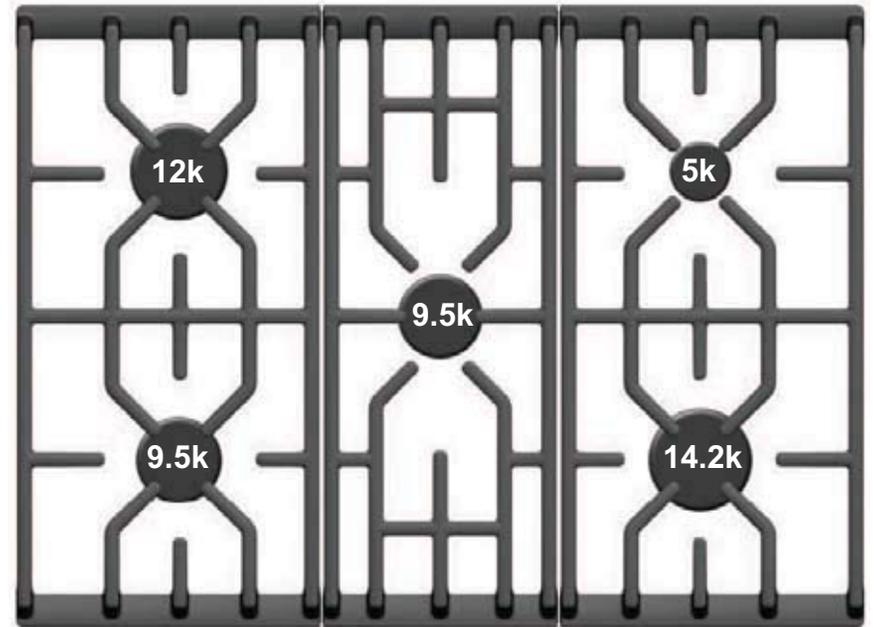
- Model number in standard format
- FD number printing and identified



## Gas Cooktop Operation

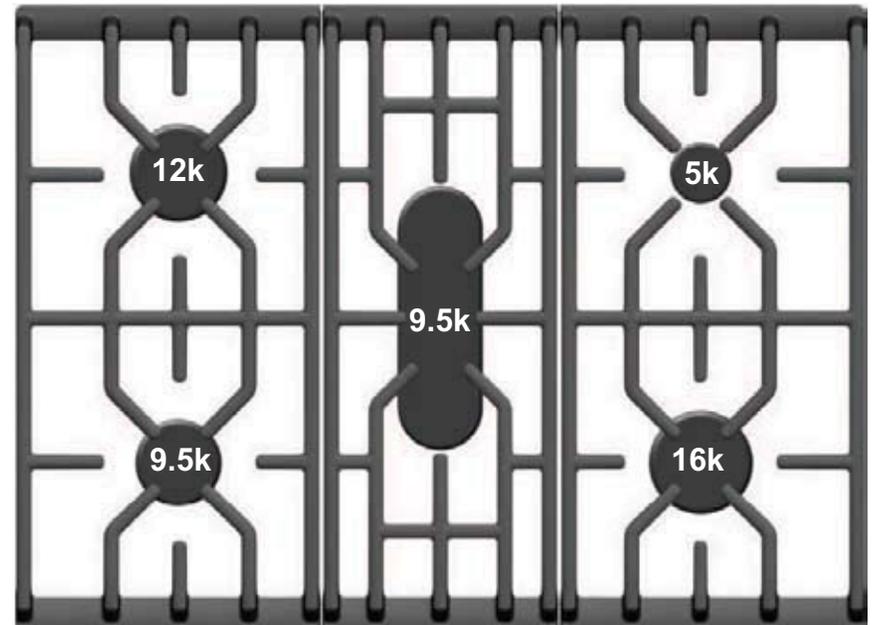
### Cooktop Configuration and Burner Specifications

300 Series gas ranges are equipped with five sealed-type surface burners with electronic spark ignition. Surface burner sizes on the 300 series are 12,000, 9500 (2), 5000, and 14,200 BTU. The illustration at right shows the cooktop layout, burner configuration, and BTU rating of each surface burner location.



**300 Series Cooktop**

500 Series gas ranges are equipped with five sealed-type surface burners with electronic spark ignition. Surface burner sizes on the 500 series are 12,000, 9500 (2), 5000, and 16,000 BTU. The center burner of the 500 series range is an elongated oval burner ideal for using griddles or other oblong cookware. The illustration at right shows the cooktop layout, burner configuration, and BTU rating of each surface burner location.



**500 Series Cooktop**

## Gas Cooktop Operation

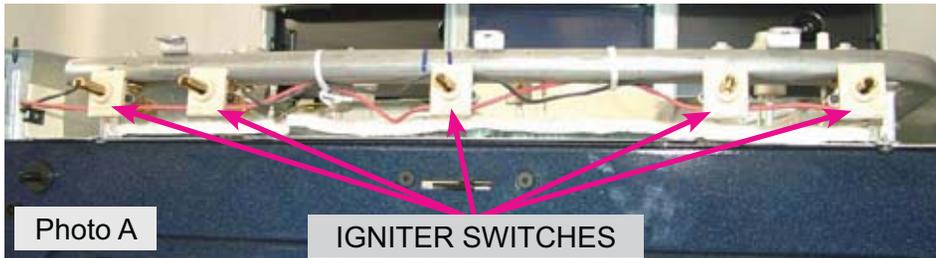
### Surface Burner Ignition Process

The ignition process of the surface burners on the 300 series and 500 series ranges is identical. Each surface burner is independently operated and controlled by a gas valve attached to a common manifold pipe. The shaft of the valve extends through the front of the manifold panel located just above the oven door, and a knob is installed on the shaft.

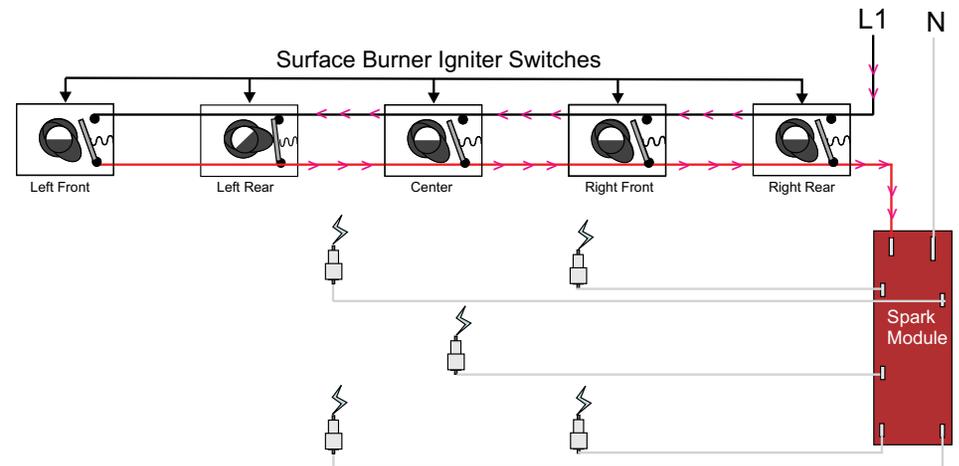
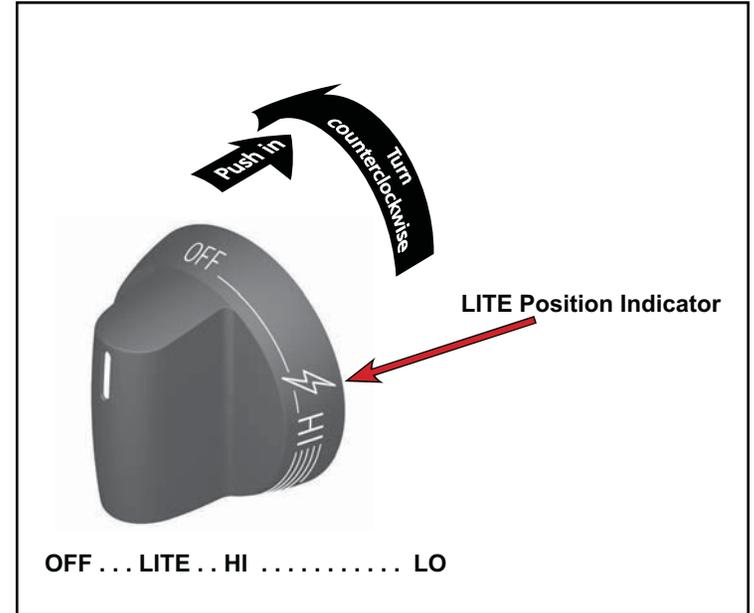
To operate any surface burner, the knob must first be pushed inward before it can be rotated. When the knob is rotated counter-clockwise, the valve opens to allow gas to flow to the burner and activates the electronic spark module, which generates the spark to light the gas.

In order for the burner to light properly, the knob must be stopped at the LITE position indicated on the knob by the lightning bolt graphic shown in the illustration at right. If the knob is rotated beyond the LITE position, no spark is generated and the burner will not ignite; however, gas will continue to flow to the surface burner.

Whenever any surface burner control knob is rotated to the LITE position, the spark module will generate a spark at all surface burners simultaneously, even if other burners have already been lighted. Activation of the spark module is accomplished by means of a switch that fits onto each surface burner control valve as seen in photo A below. As the valve is rotated, the switch cam is rotated.



The surface igniter switches are assembled in a continuous harness and wired in a parallel circuit, allowing any one of them to activate the spark module. If one switch is defective, they must all be replaced as an assembly.



In the illustration above, the Left Rear surface igniter switch is rotated to the LITE position, closing the contact in the switch, and supplying L1 voltage to the spark module. The module fires all surface burner igniters at the same time.

## Surface Burner Flame Characteristics

A properly operating burner will have clean blue flames with no yellow tipping, excessive noise, or lifting away from the burner head. Photo B at right illustrates a typical flame at high setting.

Yellow flames indicate improper fuel-to-air ratio and can be caused by improper gas pressure, improper conversion for use with LP gas, or contaminated fuel supply. See *Surface Burner Flame Adjustment* for further information.



# Gas Oven Operation

## Oven Burner Specifications

300 and 500 Series ranges have identical bake and broil burner ratings, as listed in the chart below. Note that the oven bake burner BTU rating is decreased when the range is used on LP gas.

Gas Burner Ratings	(Natural / Liquid Propane)
Bake Burner	18,000 BTU / 16,000 BTU
Broil Burner	13,500 BTU / 13,500 BTU

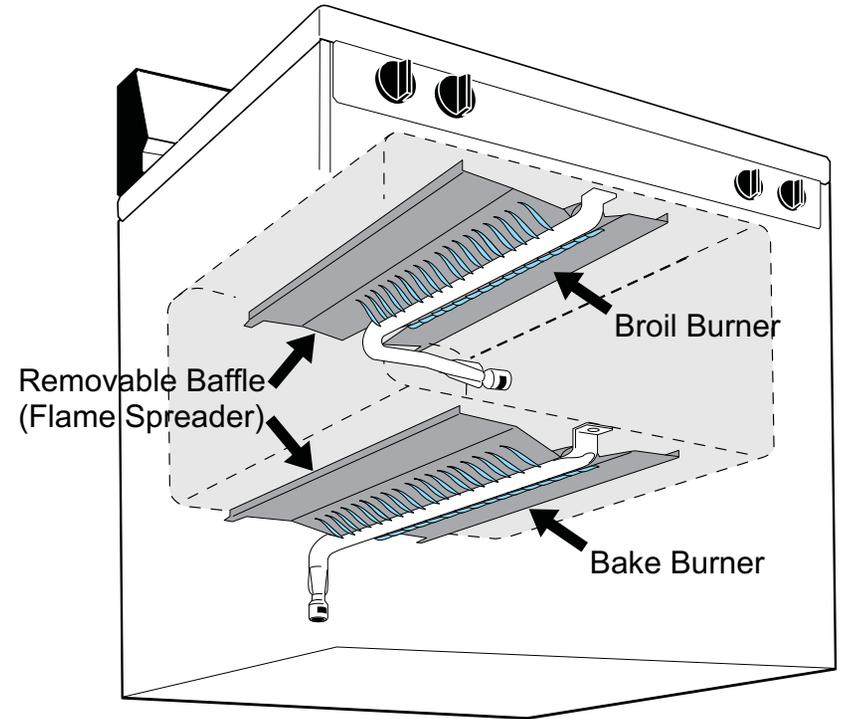
## Oven Operating Temperatures

The oven can be programmed to bake at any temperature from 170°F to 550°F (77°C to 287°C).

When broiling, the oven control has two selectable preset ranges, HI and LO. When broiling on the HI setting, the maximum oven temperature is 550°F. When broiling on the LO setting, the maximum oven temperature is 350°F.

In self-clean mode, the oven target temperature average is 825°F. The actual oven temperatures will fluctuate between 810°F and 840°F during the self-clean cycle to achieve this average temperature.

After self-clean is completed, the oven door will remain locked until the internal oven temperature is below 500°F.



## Oven Burner Cycling

When a **Bake** cycle is programmed, only the bake burner is used. (This includes the **Preheat** cycle.)

When the bake cycle begins in a cold oven, the control will initiate a **Preheat** operation. This is indicated by the illumination of the **Preheat** indicator light on the control panel in addition to the **Oven** indicator light. During preheat, the oven temperature will exceed the selected bake temperature by a wide margin, then cool down a few degrees below the set point. This process may happen more than once and is based on a formula that is programmed into the control.

Average preheat time from a cold start to 350°F is 12 - 15 minutes. When preheating is complete, the **Preheat** indicator light will go out and the control will beep to signal that the food can be put into the oven.

During the course of a typical bake cycle, the oven control will cycle the bake burner on as required to maintain an average oven temperature near the selected bake temperature. When set to bake at 350°F, it is common to see oven temperature swings from 325°F to 375°F. The frequency of this cycling will depend on many factors, including the food being cooked, ambient air temperature, frequency of door opening, etc. It should be noted that the **Oven** indicator light will glow when the burner is turned on and will go out when the burner is turned off.

When a **Broil** cycle is selected, only the broil burner is used. The oven control will keep the broil burner on until the maximum temperature has been reached for the broil level selected on the oven control. 550°F for HI, 350°F for LO. There is no preheat operation for the broil cycle and the oven temperature is not closely regulated as in a bake cycle.

## Convection Fan Operation

500 Series gas ranges feature convection baking that utilizes a convection fan to circulate air throughout the oven cavity during baking for faster, more even baking results. The convection fan will not operate during the first six minutes of preheat in order to allow proper venting of oven exhaust gases. After the oven has heated for six minutes and the fan has begun to operate, it will remain on during the entire convection bake cycle unless the oven door is opened. When the door is closed, the fan will resume running.

## Calibrating Oven / Temperature Offsets

Oven performance can be customized to suit the preferences of the individual consumer by programming a temperature offset into the control. The oven temperature should be tested prior to making any calibration adjustments.

To test oven temperature, set the electronic control for normal baking at 350°F. After the oven has completed the preheat cycle, obtain an average oven temperature after a minimum of five cycles. Press CANCEL or CLEAR to terminate Bake mode.

If necessary, the oven can be adjusted a maximum of +35°F higher or -35°F lower than the factory default 0 setting by following the steps below.

**Note:** Changing calibration affects all baking modes but will not affect the self-clean temperature.

### To calibrate oven temperature:

1. Press BAKE.
2. Set the temperature to 550°F (287°C) by pressing and holding the + key.
3. **Within two seconds**, press and hold the BAKE key until the 2-digit display appears, then release the BAKE key. The display now indicates the number of degrees offset between the original factory temperature setting and the current temperature setting. If the oven control has the original factory calibration, the display will read **0**.
4. Adjust the temperature up or down in 5° increments by pressing and holding the + or - key. Adjust until the desired offset appears in the display. When lowering the oven temperature, - will appear before the number to indicate that the oven will be cooler by the displayed number of degrees.
5. When the desired offset has been entered, press CLEAR/OFF to return to time-of-day display.

**Note:** If the oven is extremely hot from use or testing, the control may not readily go into the calibration / temperature offset mode. If this occurs, open the oven door to allow cooling for 5-10 minutes, then retry.

## Electronic Oven Control Operation

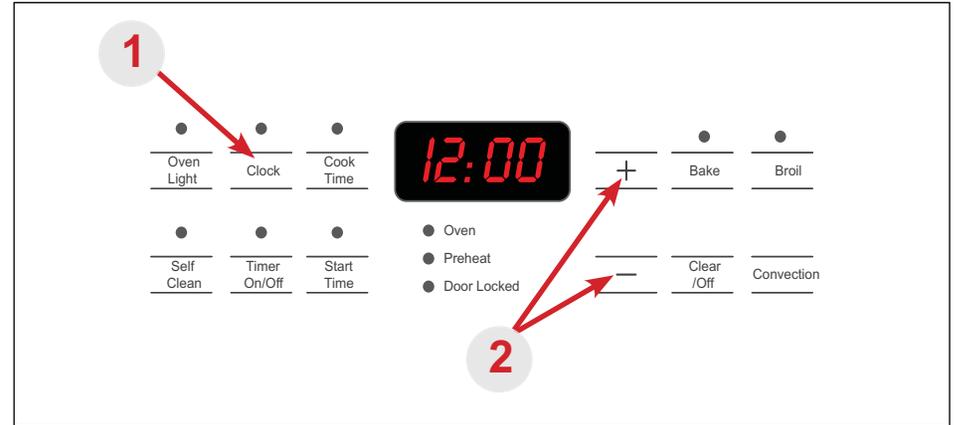
### Power-Up Display

When the appliance is first plugged in, or when the power supply to the appliance has been interrupted, the display will flash **12:00**.

To set the clock:

1. Press **CLOCK** once (do not hold pad down).
2. **Within 5 seconds**, press and hold **+** or **-** until the desired time of day appears in the display.

**Note:** The clock cannot be changed during any timed Bake or Self-clean cycle.



### Service Diagnostic Mode

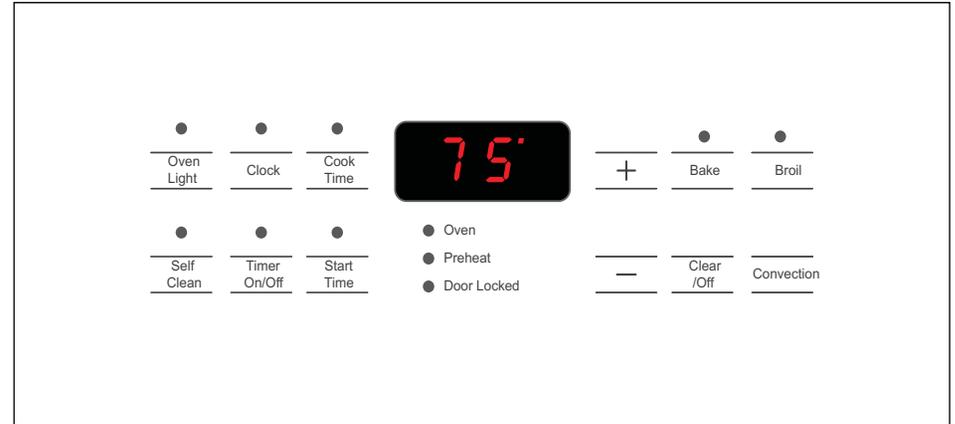
In addition to the failure/fault codes that are built into the control, Service Mode can be activated to monitor the oven temperature as reported by the oven sensor to the control. This mode may be useful when using a thermometer to test oven temperature since it will allow the technician to monitor the temperature recorded by the thermometer and compare it to the temperature reported by the sensor probe.

To enter Service Mode, unplug or turn off the power to the range. While holding the CLEAR/OFF keypad down, restore power to the range. The control will now show the internal oven temperature that is being reported by the sensor.

While in Service Mode, Bake, Broil, or Self-clean can be operated normally.

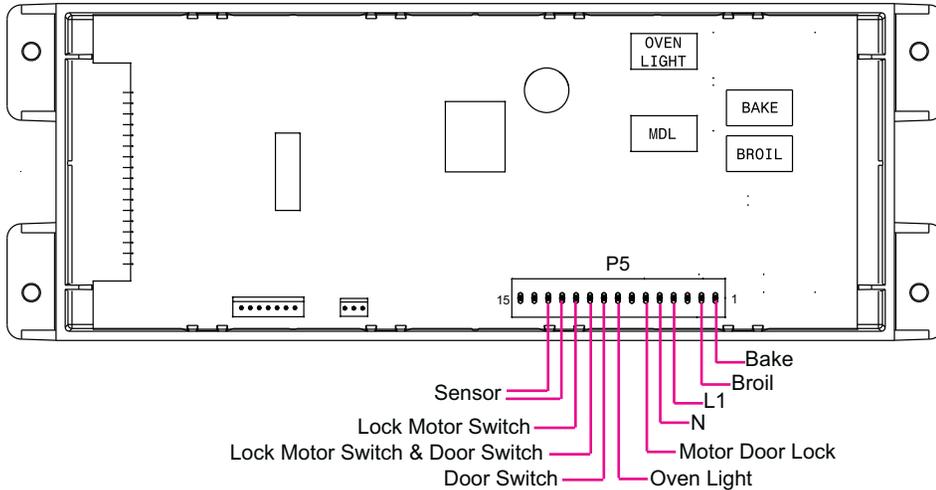
To exit Service Mode, press the CLEAR/OFF keypad or disconnect power to the range.

**Note:** If the oven cavity temperature reaches 500°F, during Self-clean, the door will remain locked until the oven cools below 500°F.



## Relay and Plug Connections

RELAY AND PLUG CONNECTION LOCATIONS ON 300 SERIES GAS RANGE CONTROLS

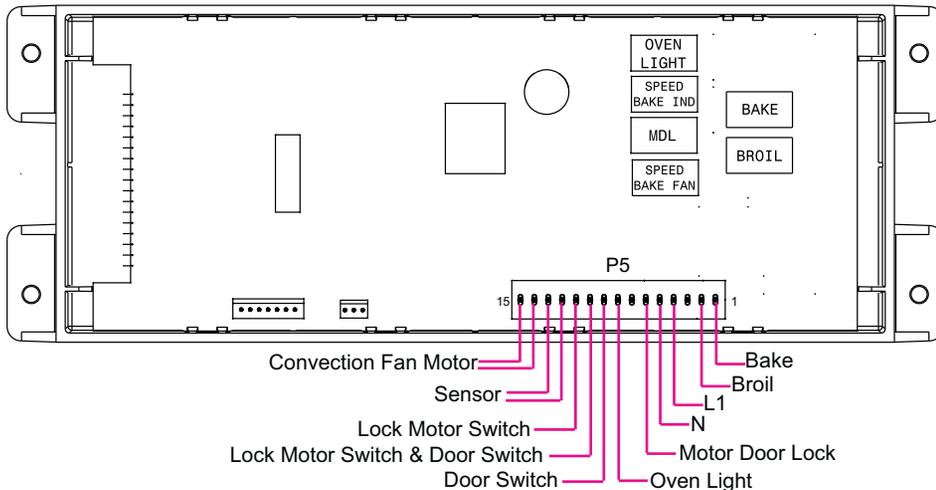


## Temperature Sensor Operation and Testing

The oven temperature is monitored by the electronic oven control through the temperature sensor located inside the oven cavity. The sensor, or RTD as it is sometimes called, increases its resistance as the surrounding air temperature increases. The oven control interprets any increase in the resistance of the sensor circuit as an increase in oven temperature. If the wires or harness connections between the control and the sensor are loose or otherwise defective, the resistance detected by the control may be much higher than the actual sensor resistance. In some cases, this can cause a false error message to be displayed on the control such as F10 or F30.

Before assuming that a sensor is defective, test the sensor resistance through the wire harness that attaches to the control. Disconnect the wires from the control and test with an ohmmeter. Normal resistance at room temperature is approximately 1091 ohms. If the resistance is correct for the temperature listed in the chart below, then the sensor is good and should not be replaced.

RELAY AND PLUG CONNECTION LOCATIONS ON 500 SERIES GAS RANGE CONTROLS



The accompanying chart can be used to test the resistance of the oven temperature sensor probe. For accurate testing, use a high quality thermometer or temperature meter to determine actual oven temperature before reading the resistance of the probe.

RTD SCALE	
Temperature (°F)	Resistance (ohms)
32 ± 1.9	1000 ± 4.0
75 ± 2.5	1091 ± 5.3
250 ± 4.4	1453 ± 8.9
350 ± 5.4	1654 ± 10.8
450 ± 6.9	1852 ± 13.5
550 ± 8.2	2047 ± 15.8
650 ± 9.6	2237 ± 18.5
900 ± 13.6	2697 ± 24.4
Probe circuit to case ground	Open circuit / Infinite Resistance

## SERVICING THE RANGE

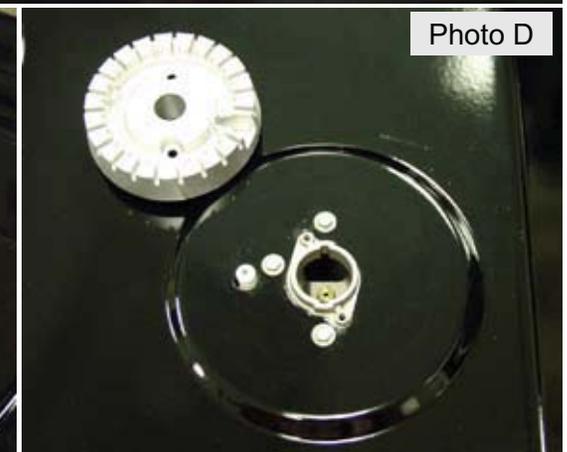
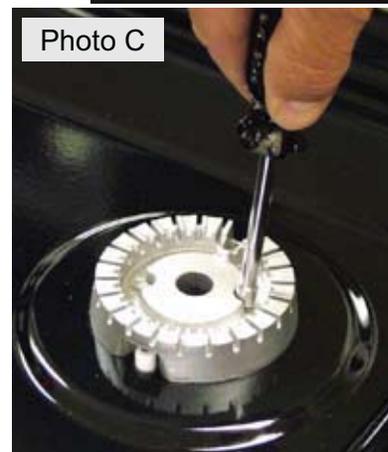
### Surface Burners - 300 Series Ranges

The surface burners on the 300 Series range are secured to the cooktop by two screws. Photo A at right shows the five burner model with grates removed and burner caps in place.

To remove and replace any of the burners, first lift off the burner caps as seen in photo B.

Using a 3/16" nut driver, turn the screws counter-clockwise to remove as shown in photo C.

The burner can then be lifted away from the cooktop, providing access to the mounting screws for the orifice holder assembly, igniter tip, and burner orifice, as seen in photo D.



## Oval Burner - 500 Series Ranges

The surface burners on 500 series gas ranges are the same as those on the 300 series ranges with the exception of the center oval burner shown in photo A.

This burner has a decorative cap that can be removed but is not a serviceable item. The cap and burner are replaced as an assembly.

The oval burner can be lifted off to access the orifice holder and orifice without removing any screws. Once the burner is removed, the orifice holder and igniter tip are visible. The orifice can be serviced through the hole in the orifice holder assembly (photo B).



Photo A



Photo B

Photo C shows the oval burner removed from the range and the cap removed from the burner.



The top plate on the burner can be removed by taking out the two screws seen in photo D from the underside of the burner.



With the top plate separated from the burner, the interior of the burner and plate are accessible for cleaning in the event they should become clogged from boil-overs or other types of food spills (photo E).



## Surface Burner Orifices

With the surface burner removed, the burner orifice can be accessed for cleaning, replacement, or for LP conversion.

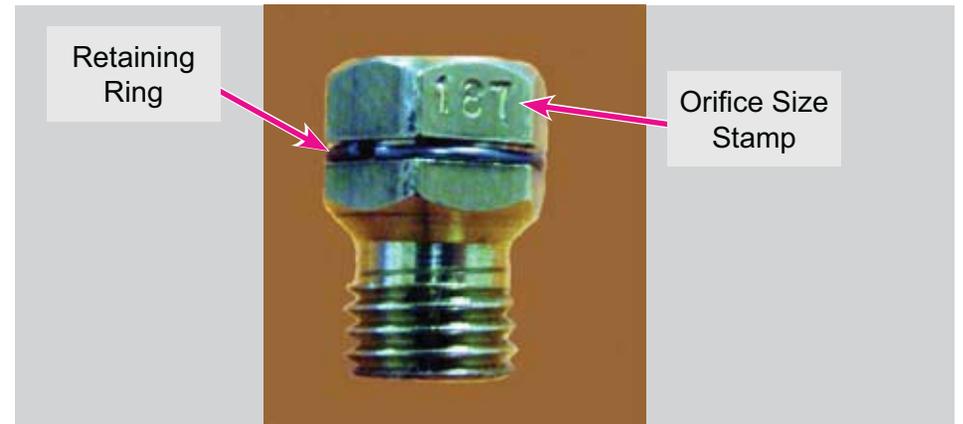
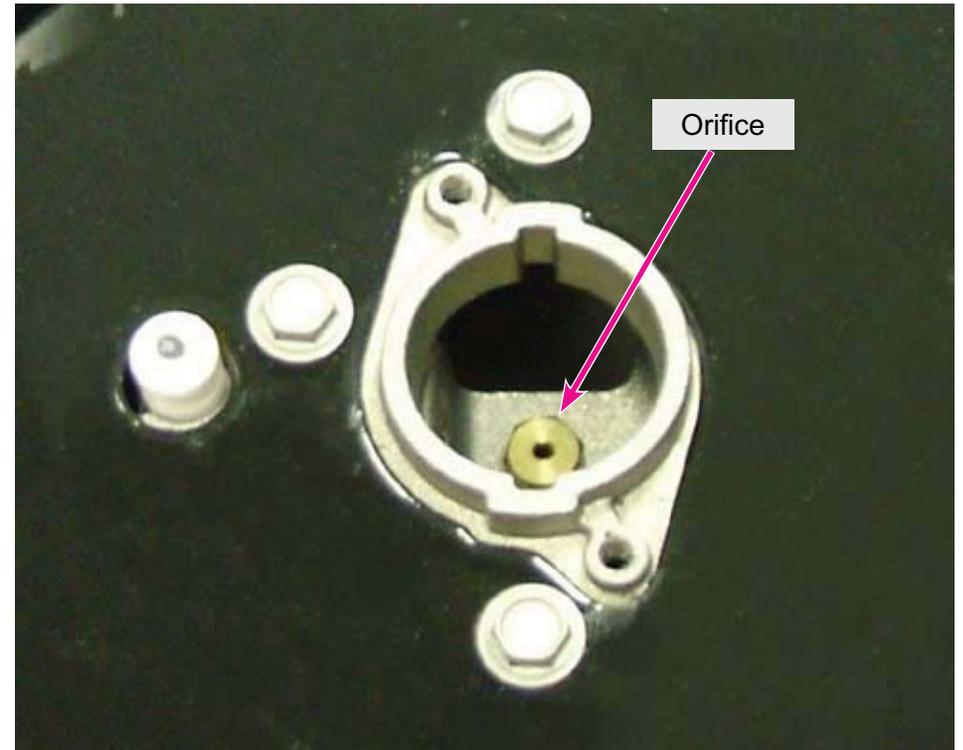
The surface burner orifice can be removed using a 7mm socket wrench or nut driver.

Each orifice has a retaining ring to help prevent the orifice from falling out of the nut driver as it is being lifted out of the orifice holder assembly. Take care to ensure that the retaining ring is seated inside the nut driver when reinstalling the orifice.

With the orifice removed, the size stamp is visible. The size stamp can be used to determine if the proper orifice size is being used for a specific burner.

The following chart can be used as a guide to identify the proper orifices for the various burner sizes and styles that are currently used on the 300 and 500 series ranges. Future models may change, so you should always refer to the parts list for the specific model being serviced.

BTU Rating/Style	5000	9500	9500/Oval	12000	14000	16000
Natural Gas Orifice	1.07	1.46	1.54	1.67	1.87	1.98
LP Gas Orifice	.66	.93	.89	1.02	1.09	1.18
LP Orifice Marking Color	Pink	White	None	Yellow	Brown	Silver
BTU Rating after LP Conversion	5000	9500	8000	12000	14000	16000



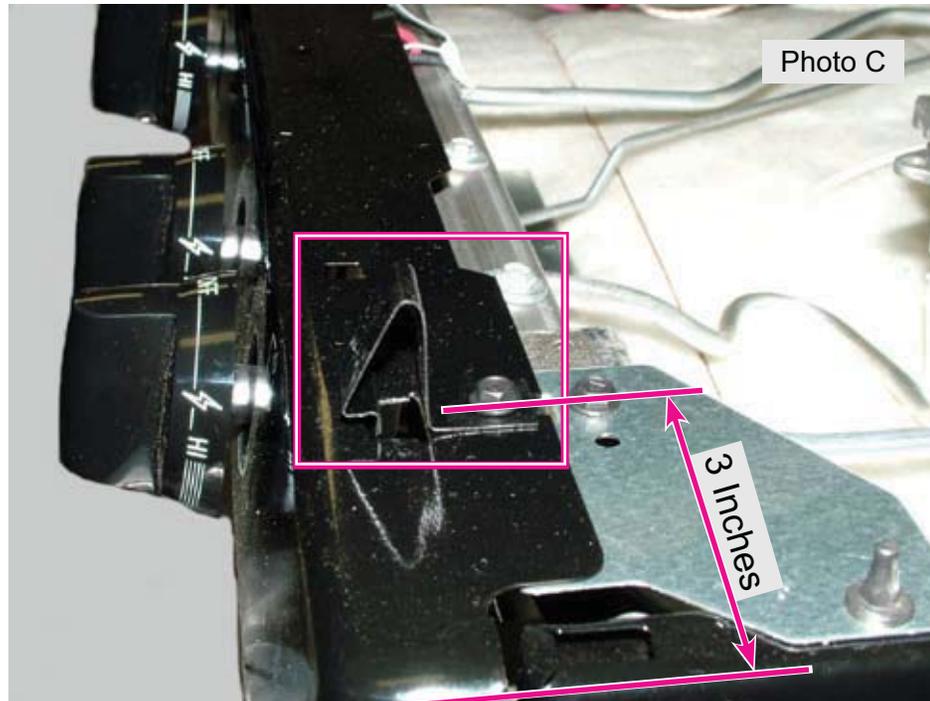
## Cooktop Removal

The cooktop must be removed to access the surface burner igniter, orifice holder assemblies, burner valves, spark module, and other components. To remove the cooktop, begin by removing the burner caps and surface burners as previously described.

Next, using a 1/4 inch socket wrench or nut driver, remove the screws that secure each orifice holder assembly to the cooktop. The arrows in photo A at right indicate the screw locations for the left-front orifice holder assembly. Remove all screws at all burner locations before attempting to remove the cooktop.

After the screws are removed, insert a putty knife or similar tool between the bottom edge of the cooktop and the manifold panel, near the right-front corner, as shown in photo B. Push in on the putty knife to release the lock clip that holds the cooktop down. The corner of the cooktop can be easily lifted when the clip is released. Repeat this step on the opposite side.

Photo C shows detail and location of the cooktop lock clip.



Carefully lift the cooktop approximately 4 inches, making sure that the orifice holder assemblies are released from the top as seen in photo A. Pull the cooktop forward to disengage the rear edge from the tab of the chassis support bracket, and lift it away from the range.



Photo A

When reinstalling the cooktop, engage the rear edge under the chassis support bracket tabs seen in photo B, then press the front edge down to engage the front locking clips.

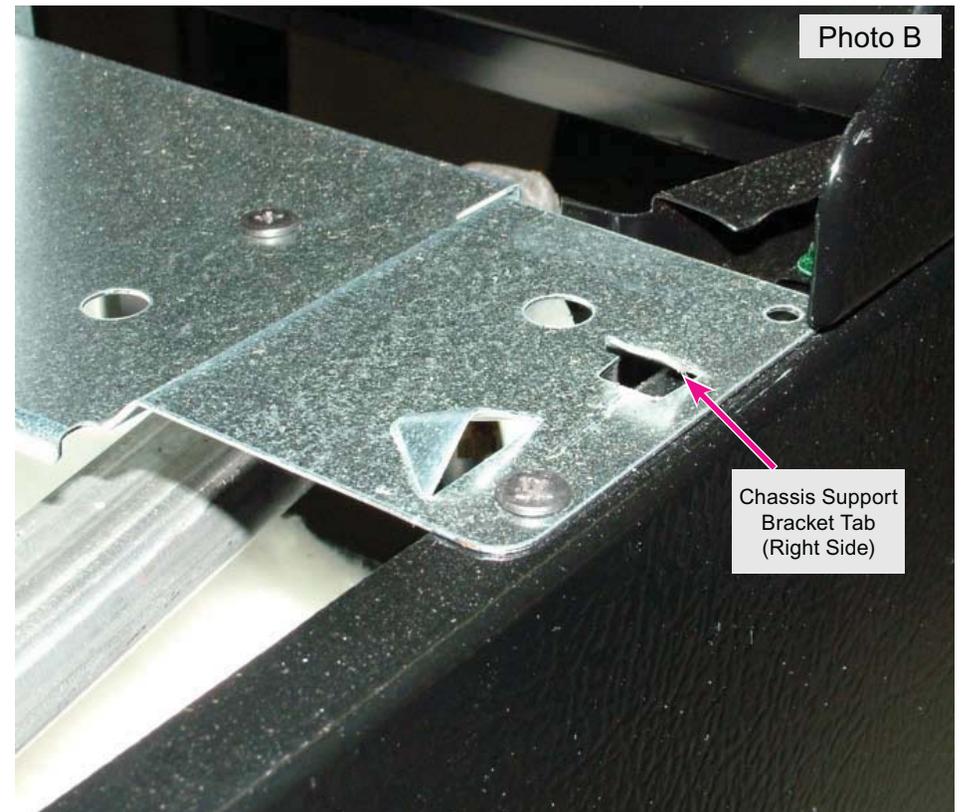
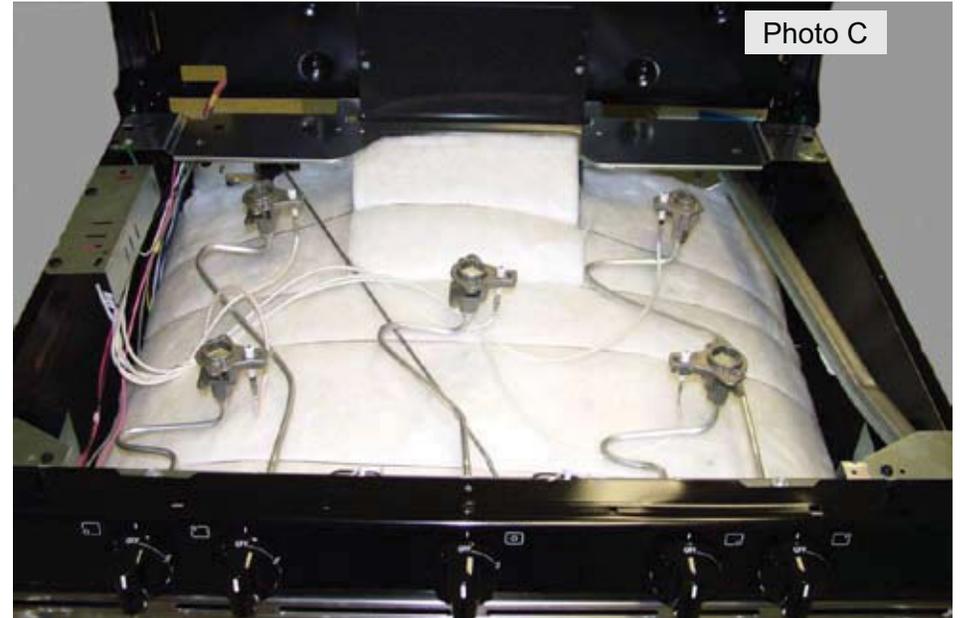


Photo B

Chassis Support  
Bracket Tab  
(Right Side)

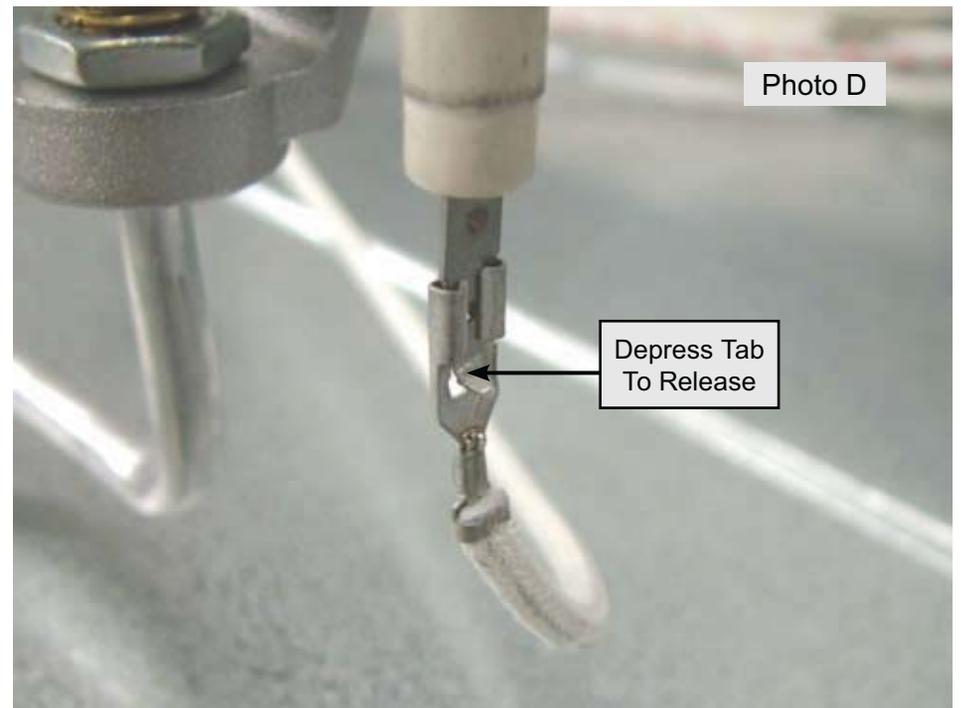
## Surface Burner Igniters

With the cooktop removed, the orifice holder assemblies and igniters are accessible as seen in photo C. The surface burner igniter is part of the orifice holder assembly and is replaced as a complete unit.



After removing the cooktop, disconnect the gas line running from the surface burner control valve to the orifice holder assembly being replaced, by first disconnecting the wire from the spark module to the igniter. The wire terminal is a locking-type terminal as seen in photo D. To disconnect the wire, **first depress the locking tab**, then pull the wire off the spade terminal on the igniter.

**Note:** *Failure to depress the locking tab before disconnecting the igniter wire may reduce subsequent locking strength by as much as 80%.*

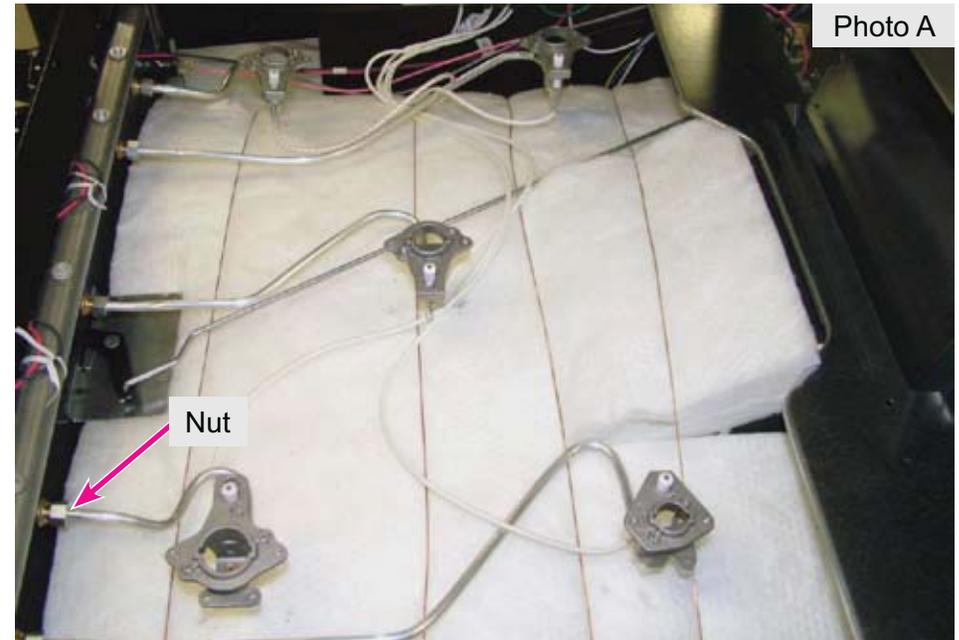


Loosen the nut that secures the gas tube to the burner control valve as seen in photo A. The orifice holder assembly and igniter can now be removed from the range.

When replacing an orifice holder assembly, it is important to make sure that the nut is properly tightened to prevent gas leaks. The factory torque specifications in inch/pounds for this fitting are:

Minimum 25 - Maximum 40

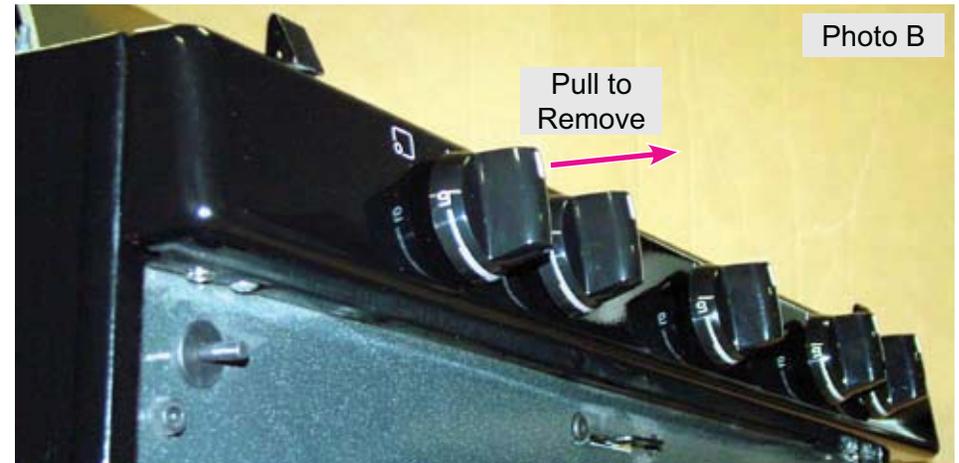
If the range has previously been converted for use with LP (propane) gas, you must remove the LP orifice from the original assembly and install it into the replacement orifice holder.



### Surface Burner Control Valves

To replace a surface burner control valve, remove the surface burners and cooktop as described in the previous sections. Disconnect the orifice holder assembly from the valve being replaced.

Remove the surface burner control valve knobs by pulling the knob forward off the valve shaft (photo B).



Confirm that the metal insert remains in the knob when it is removed. If the insert stays on the shaft, retrieve it and reinstall it into the knob (photo C).

If the insert is left out of the knob it will be very loose on the shaft.



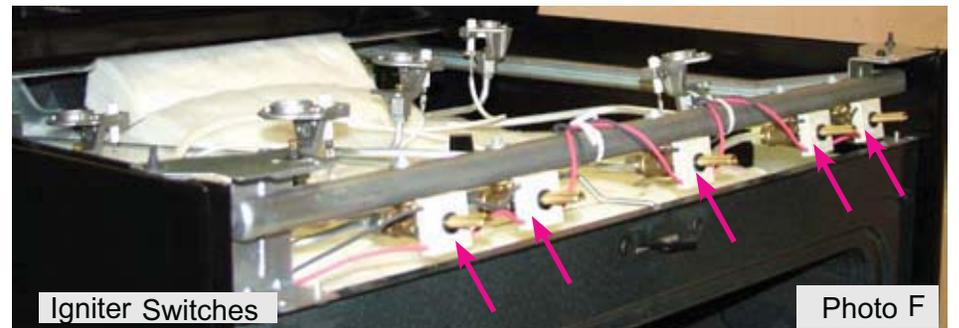
From the underside of the manifold panel, remove the two screws at the outside corners that secure the manifold panel to the oven chassis (photo D).



From the top side of the manifold panel, remove the screws which secure the two cooktop lock clips and remove the clips (photo E). The manifold panel can now be removed by pulling forward.

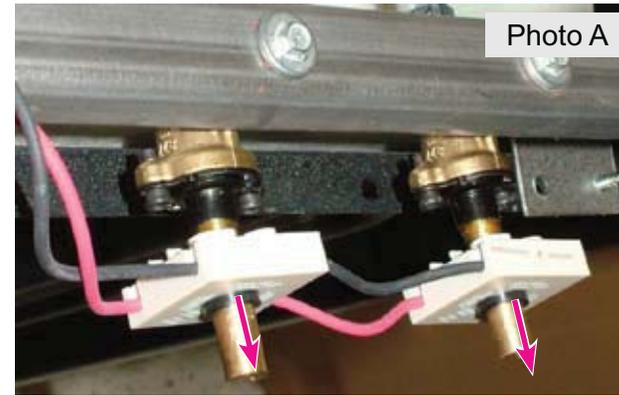


With the panel removed, the surface burner igniter switches are accessible (photo F). The switches are connected together in a harness and must be replaced as a complete assembly.



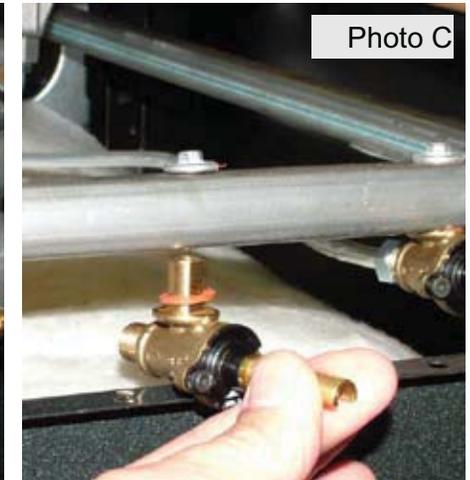
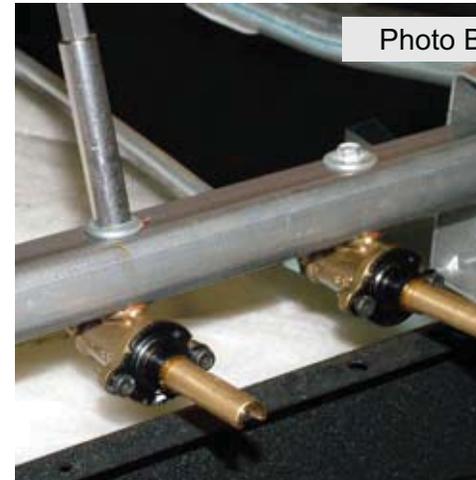
The switches slide over the burner valve shafts and are secured by sockets on the back side of the switch that snap onto studs on the front side of the valve. Pull forward to unsnap the switch housing from the valve (photo A).

When replacing the switches, make sure that the switches snap securely and lock onto the studs in the valve body. The slack in the wire harness should be on top of the manifold tube and secured with the wire twist ties as shown in photo F on the preceding page.

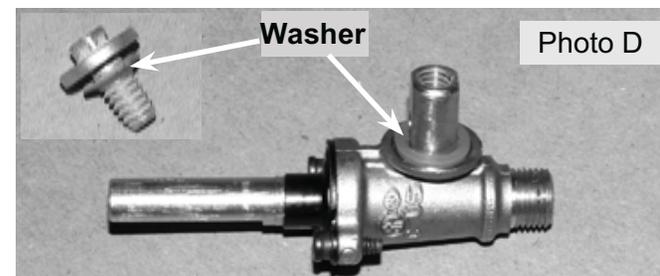


To release the surface burner valve from the manifold pipe, use a 1/4" socket or nut driver to loosen the valve mounting screw (photo B).

The valve can be removed by pulling it downward, away from the underside of the pipe (photo C).



**IMPORTANT NOTE:** When reinstalling the burner valve, always confirm that the washers on the burner mounting screw and valve body are not damaged and are properly positioned (photo D).



## Surface Igniter Spark Module

To access the surface burner igniter spark module, remove the surface burners and cooktop as described in the previous sections. The spark module is mounted onto a bracket located on the left side, near the left rear burner as seen in photo E.

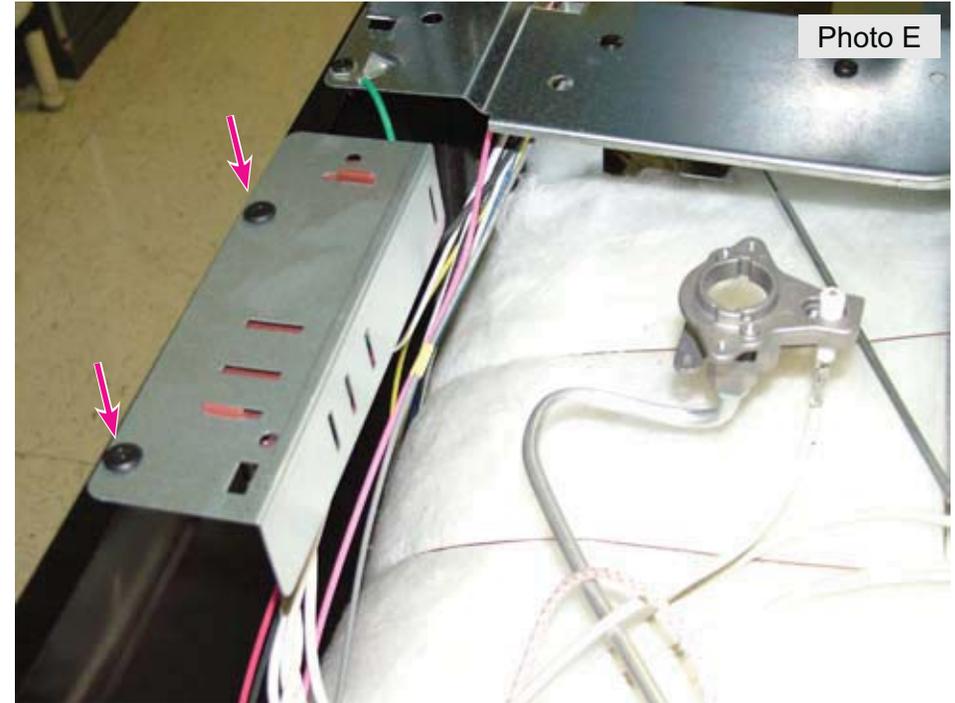


Photo E

To access the module, remove the two screws that fasten the bracket to the left hand body side, then roll the bracket and spark module over (photo F).

The spark module can also be accessed without removing the bracket by depressing the locking tabs that hold it onto the bracket.

When reinstalling the module, confirm that the red wire is connected to terminal L and the white/neutral wire is connected to terminal N on the module. The green wire should be attached to the terminal nearest the red wire. (In some models, the green wire may not be present.)

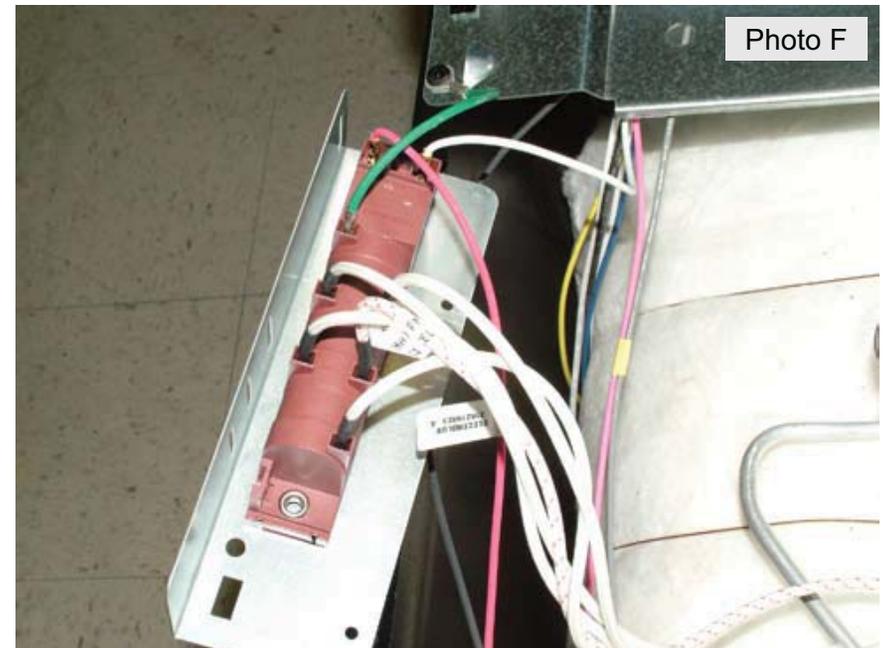
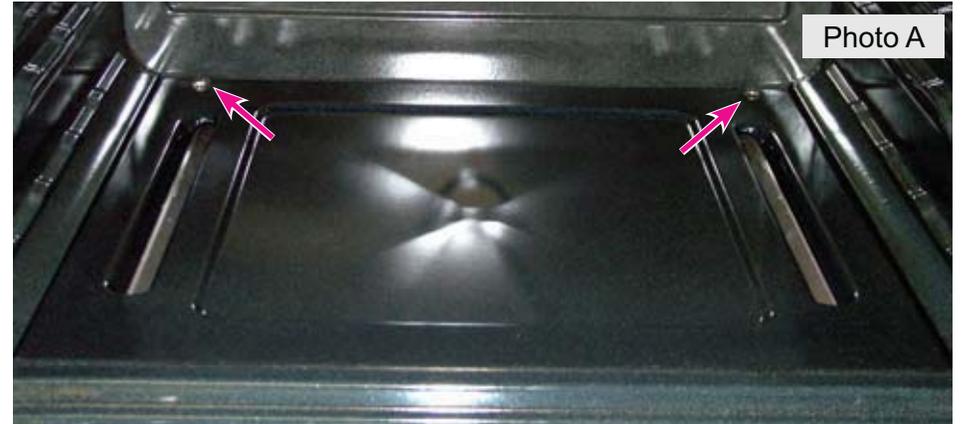


Photo F

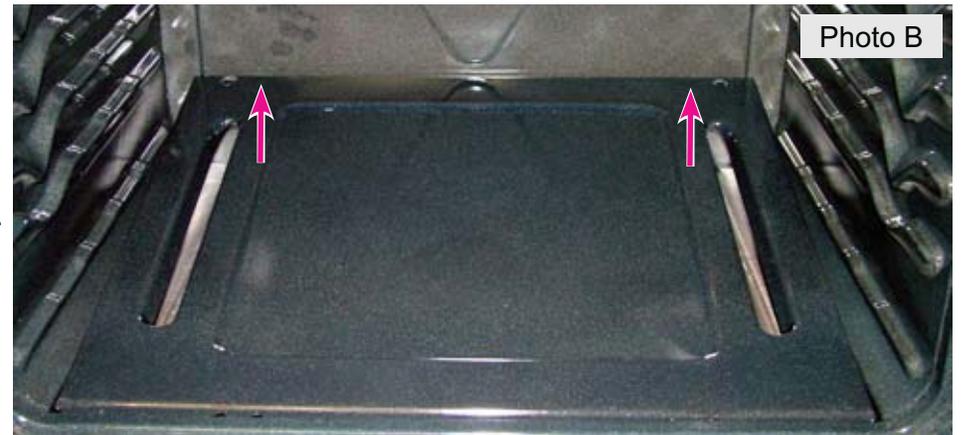
## Oven Bake Burner

To access the oven bake burner, first remove the oven door (see *Oven Door and Hinges*). Next, remove the two screws indicated by the arrows in photo A.



If the range has a convection fan, remove the convection fan baffle/cover on the rear wall of the oven cavity.

Lift the rear edge of the oven bottom panel upward about 3 inches and slide it toward the rear oven wall (photo B). This will allow the front lip of the oven bottom panel to release from the front cross brace of the chassis. The oven bottom panel can then be removed from the oven.

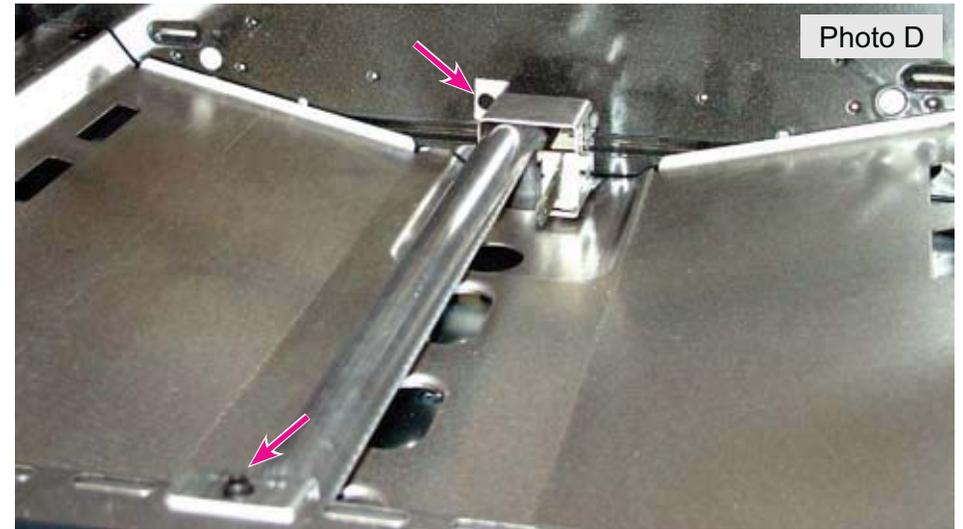


After removing the oven bottom panel, remove the two screws that secure the flame spreader/oven baffle to the chassis (photo C). Lift the front edge of the baffle up slightly and pull forward to remove the baffle from the oven.



The bake burner and igniter assembly are held in position by the two screws indicated by the arrows in photo D.

Prior to removing the bake burner, you must first unplug the bake burner igniter wire harness plug connector. To access this connector, remove the lower drawer.



The igniter harness connector is located on the left side, as seen in photo E. Unplug the connector, then lift the bake burner and igniter assembly out of the oven while guiding the connector plug and wire harness through the cut-out. Care should be taken to avoid damaging the bake igniter.

Follow this procedure for replacing either the bake burner or the igniter.



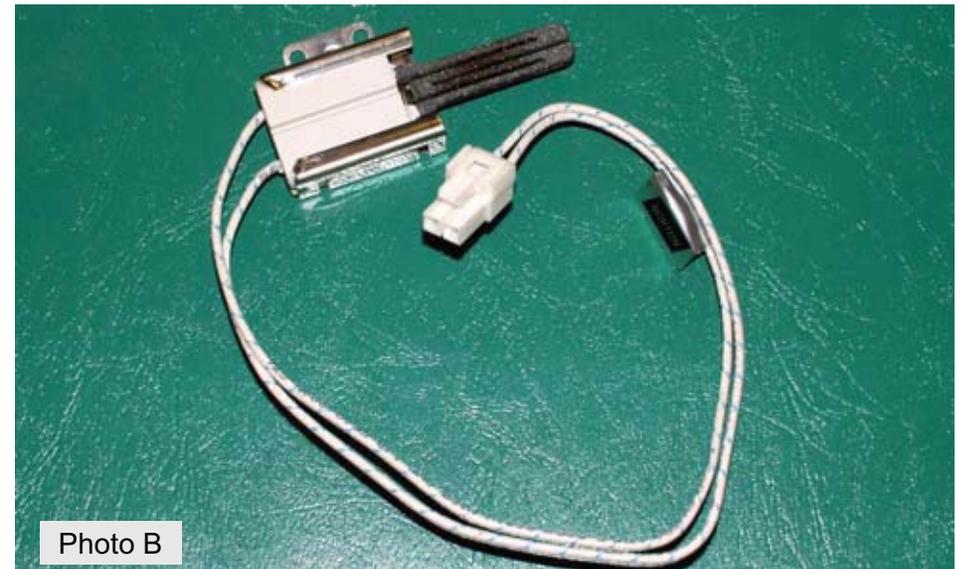
## Bake Burner Igniter

To access the bake burner igniter, first follow the steps in the *Oven Bake Burner* section.

To disconnect the igniter from the bake burner, remove the two screws indicated in photo A.

A close-up view of the bake burner igniter and harness can be seen in photo B.

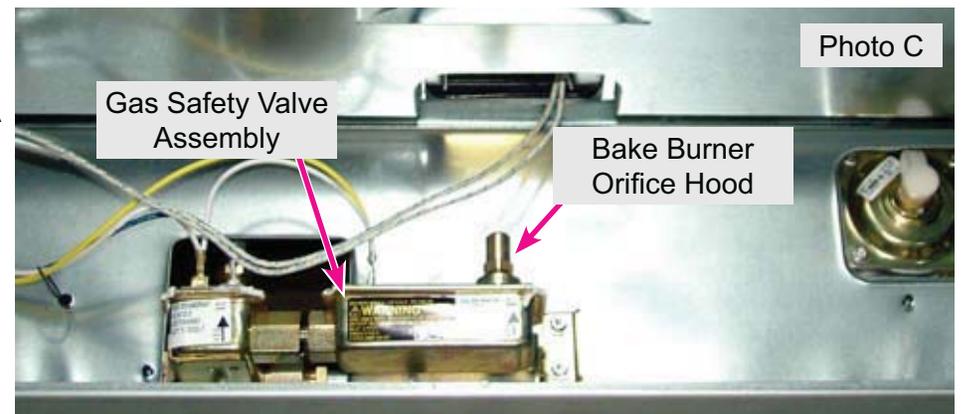
**Note:** The replacement field service igniter may have bare wire ends that must be connected by splicing into the original connector plug harness.



## Bake Burner Orifice

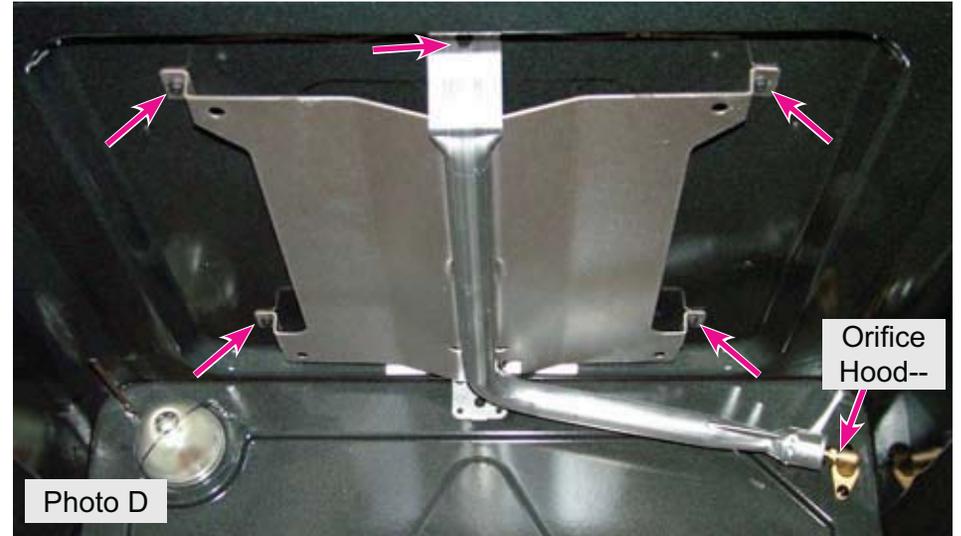
The bake burner orifice hood is on the gas safety valve located beneath the oven cavity. To access the orifice, remove the storage drawer. Photo A shows the orifice and safety valve assembly. (The bake burner has been removed for clarity.)

The bake burner orifice is pre-set for natural gas but can be adjusted for LP gas by turning the orifice hood clockwise until it is snug. See *Conversion from Natural Gas (NG) to Liquefied Petroleum (LP)* for additional information.

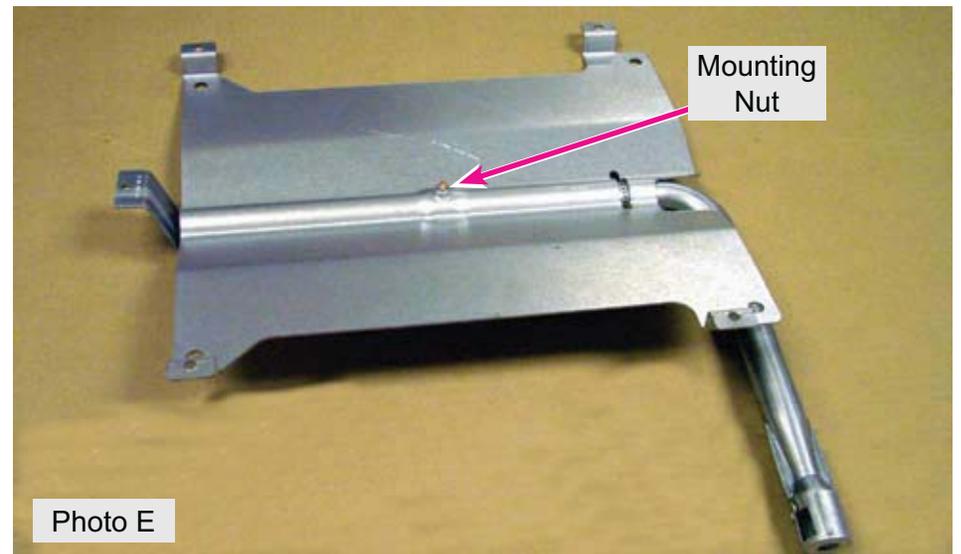


## Oven Broil Burner

The broil burner is attached to the flame spreader and mounted to the ceiling of the oven cavity by five screws indicated by the arrows in photo D. To remove the broil burner, take out the five screws, slide the assembly to the left to disengage the burner tube from the orifice spud, and pull it forward out of the oven cavity.

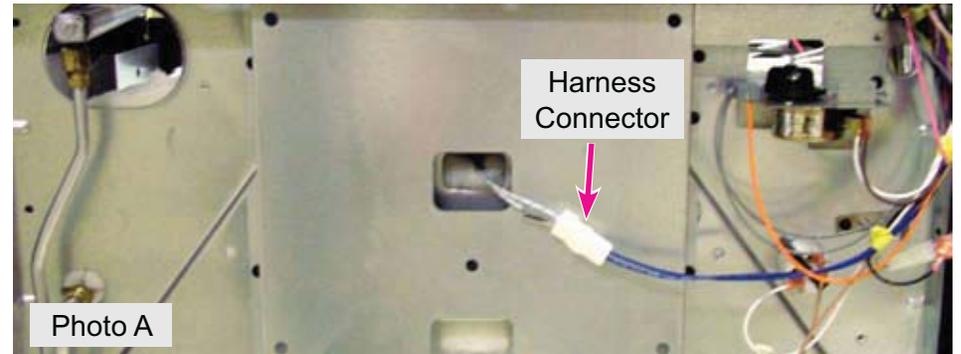


The broil burner tube is secured to the flame spreader by a threaded stud and nut in the center of the flame spreader as shown by the arrow in photo E. Remove the nut to separate the burner tube from the flame spreader for service or replacement of either part.

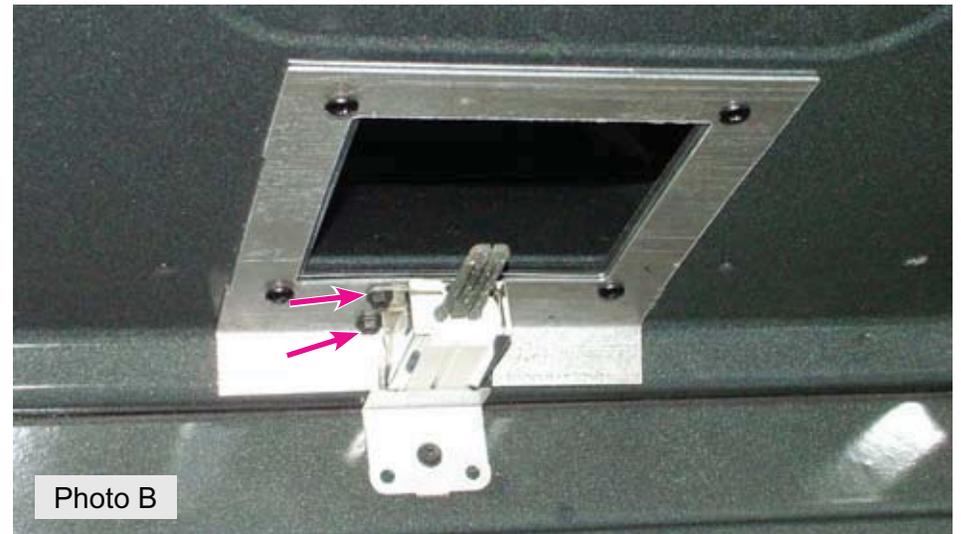


## Broil Burner Igniter

To remove and replace the broil burner igniter, slide range away from the wall and remove the lower rear panel. Unplug the igniter harness connector as shown in photo A.

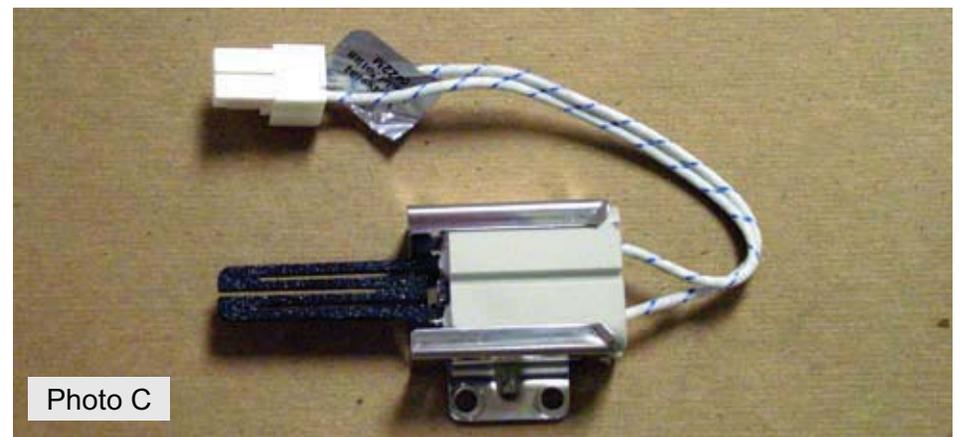


Remove the two screws indicated by the arrows in photo B. Carefully pull the igniter and attached harness forward out of the oven cavity.



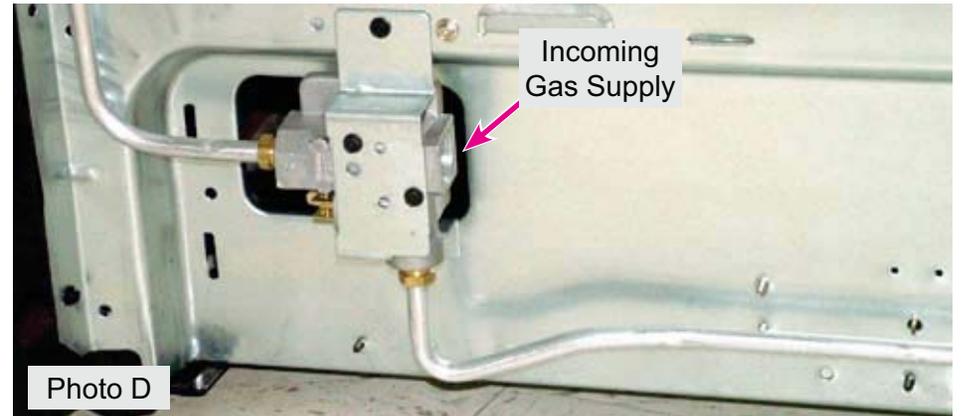
A close-up view of the broil burner igniter and harness can be seen in photo C.

**Note:** The replacement field service igniter may have bare wire ends that must be connected by splicing into the original connector plug harness.



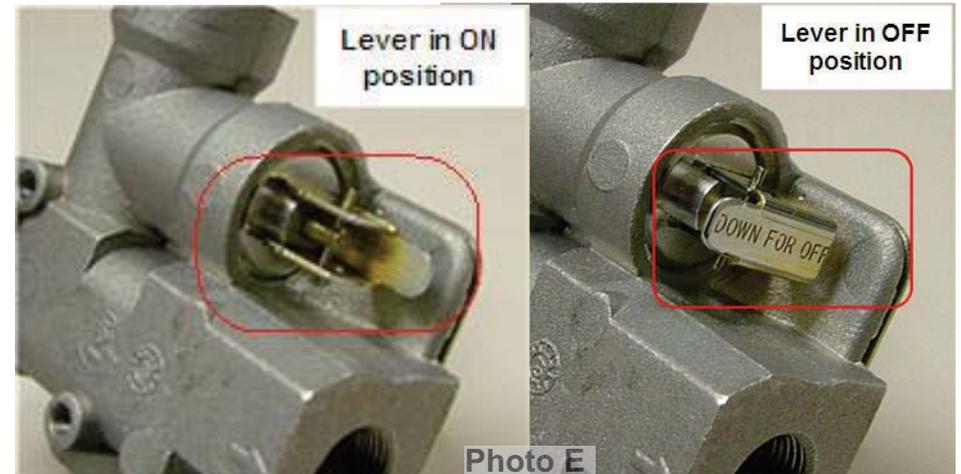
## Pressure Regulator

A single pressure regulator is used to control gas pressure to the bake, broil and surface burners. The regulator is mounted on the left rear corner of the range as seen in photo D. The incoming gas supply line is connected to the regulator opening indicated by the arrow in the photo.

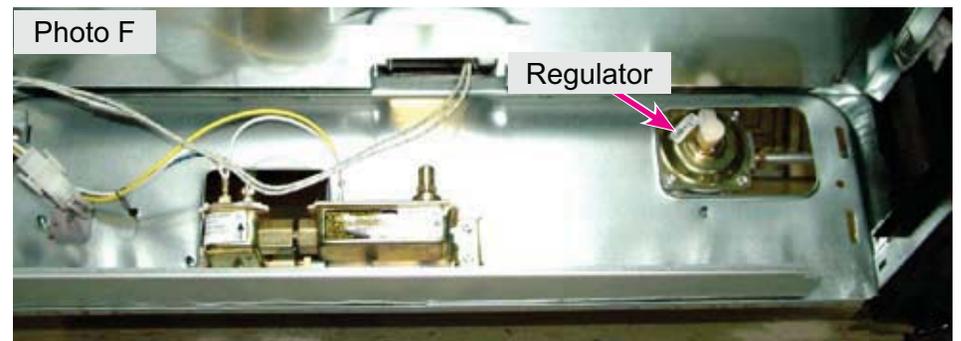


The pressure regulator has a shut-off lever that is used to turn off the gas supply to the oven burners only (photo E).

When this lever is in the off position, no gas is supplied to the bake or broil burner gas safety valves, and these burners cannot light. If the oven burners will not light but the igniters appear to be working, check to see if this lever has been turned to the OFF position.



When converting the range for use with LP gas or when making other adjustments, the pressure regulator can be accessed from the front of the range. Remove the storage drawer and the regulator can be accessed from the underside of the range as seen in photo F.



## Surface Burner Flame Adjustment

A properly operating burner will have clean blue flames with no yellow tipping, excessive noise, or lifting away from the burner head. Photo A illustrates a typical flame at high setting.

Yellow flames indicate improper fuel-to-air ratio and can be caused by improper gas pressure, improper conversion for use with LP gas, or contaminated fuel supply.

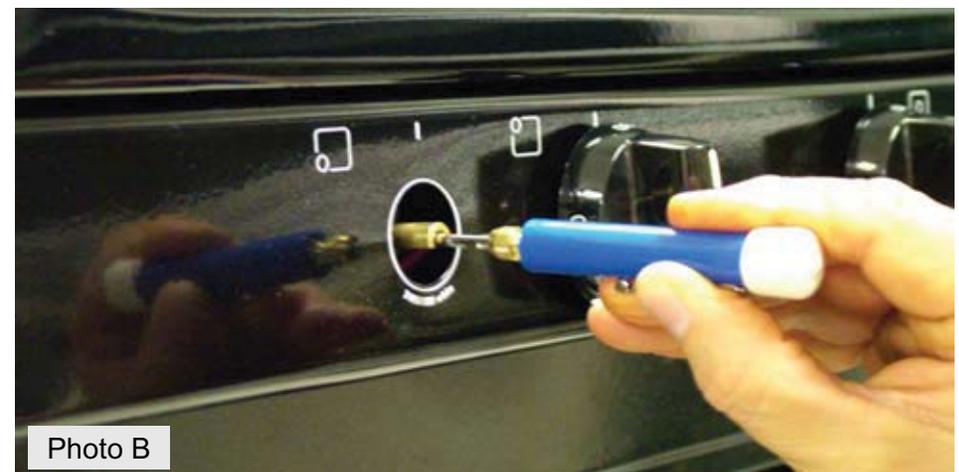
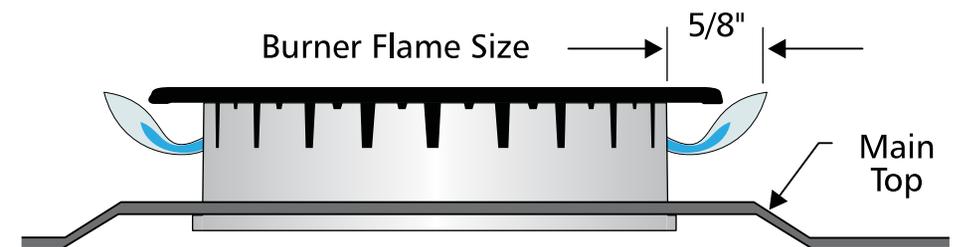
At the lowest setting, the flame should extend slightly above the burner cap and approximately 5/8" outward from the side of the burner as seen in the illustration at right.

Test to verify if "LOW" setting should be adjusted:

- Push in and turn control to LITE until burner ignites.
- Push in and quickly turn knob to LOWEST POSITION.
- If burner goes out, reset control to OFF.
- Remove the surface burner control knob.
- Insert a thin-bladed screwdriver into the hollow valve stem and engage the slotted screw inside (photo B).

Flame size can be increased or decreased with the turn of the screw. Turn counter-clockwise to increase flame size. Turn clockwise to decrease flame size. It may be necessary to hold the shaft securely with pliers or adjustable wrench to turn the adjustment screw.

2:18



## Oven Burner Flame Adjustment

The approximate flame length of the oven burners should be 1 inch, with a distinct inner blue flame.

### Bake Burner

To determine if the oven bake burner flame is proper, remove the oven bottom panel and burner baffle (illustration A), and set the oven to Bake at 300°F.

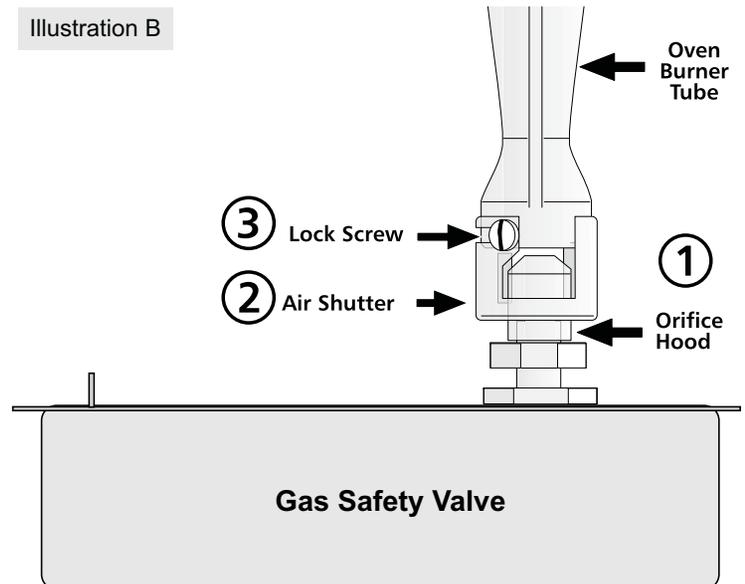
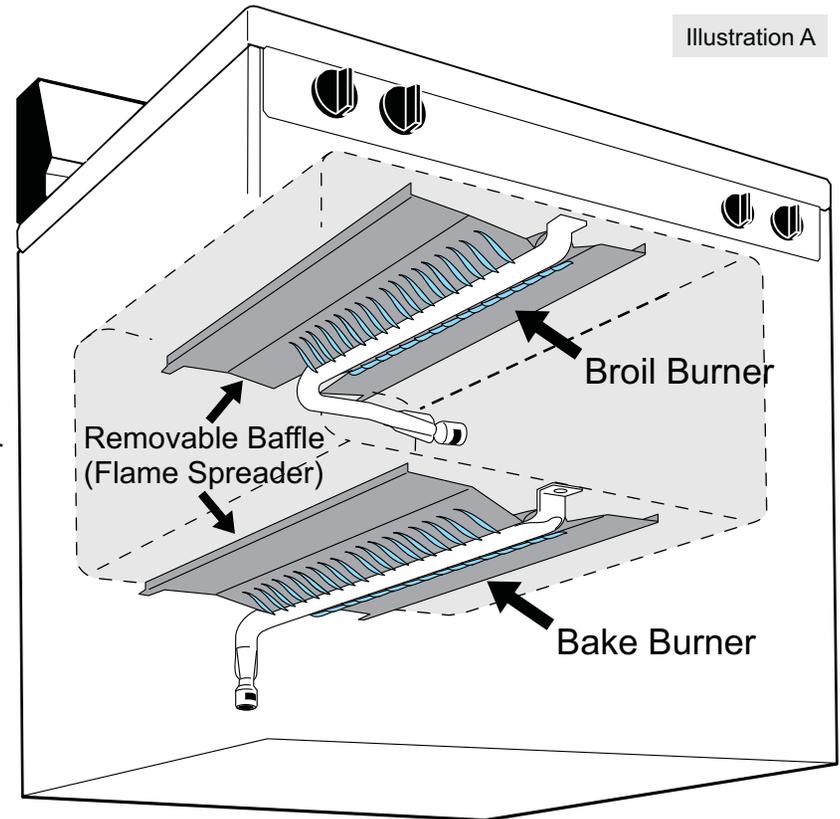
If the flame is yellow in color, increase air shutter opening size. If the flame is a distinct blue but too short, noisy, or lifting away from the burner tube, reduce the air shutter opening size.

To adjust the size of the air shutter opening, loosen lock screw (illustration B), reposition the air shutter, and tighten lock screw.

After all adjustments are complete, reinstall the burner baffle and oven bottom.

### Broil Burner

Flame adjustments for the broil burner are done from inside the oven and do not require removal of any panels or components. Adjust the air shutter in the same manner as described above for the bake burner.



## Conversion from Natural Gas (NG) to Liquefied Petroleum(LP) Gas

All models of the Bosch 300 and 500 series gas ranges can be converted for use with LP gas. The required LP conversion kit includes detailed instructions for conversion, including surface burner orifice size charts.

Conversion to LP gas requires the following steps:

- Conversion of the pressure regulator
- Replacement of surface burner NG orifices with appropriate LP orifices
- Adjustment of bake and broil burner orifice spuds

Additional steps that may be required after conversion:

- Adjustment of bake and broil burner air shutters
- Adjustment of the low flame setting of surface burners

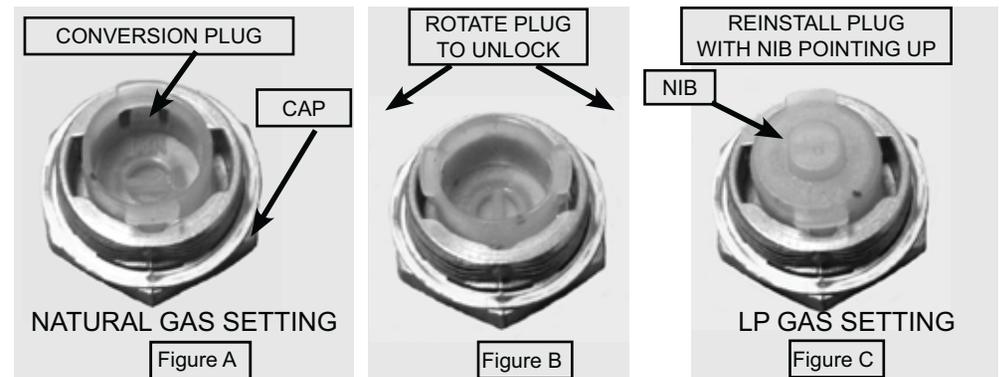
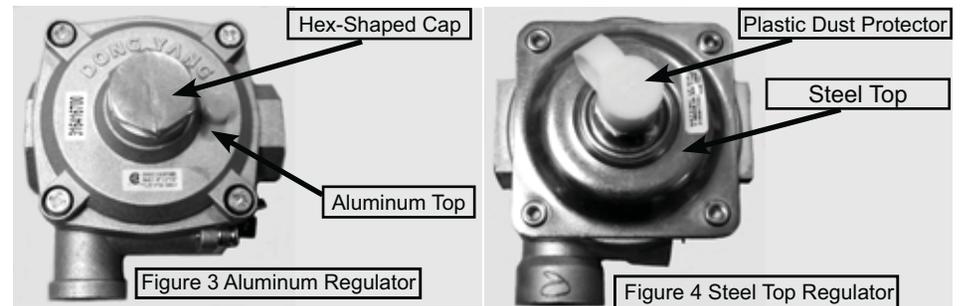
The following information is a general outline explaining the LP conversion process. Always review and follow the specified LP conversion kit instructions for your particular range when converting any gas range for use with LP Gas.

After removing the drawer, identify which type of regulator is installed on the range by comparing to the photos at right. Follow the appropriate conversion instructions found on the following pages.

### 1a. CONVERTING ALUMINUM REGULATOR

If the regulator has an aluminum top as pictured in figure 3, convert the regulator in the following manner:

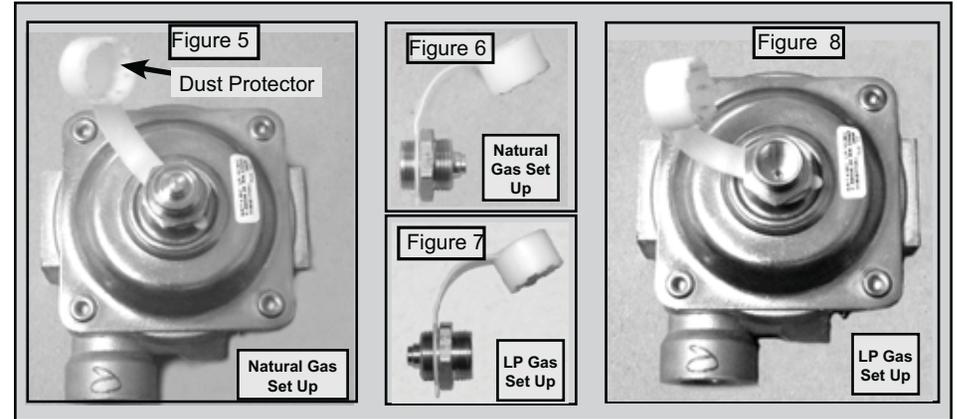
- Remove the regulator access cover if equipped. **Do not remove the pressure regulator or allow it to turn.**
- Unscrew the hex-shaped cap and turn it over to access the conversion plug inside the cap (figure A). **Do not remove the spring from the regulator.**
- Rotate the plug 90 degrees in either direction to align the tabs on the plug with the notches in the cap (figure B) and lift the plug out of the cap.
- Turn the plug over so that the nib on then end of the cap faces out and re-insert into the cap. Rotate the plug 90 degrees in either direction to lock it into the cap (figure C).
- Reinstall the cap and plug securely onto the regulator.
- Attach the LP conversion label as illustrated in the instruction sheet.



### 1b. CONVERTING STEEL TOP REGULATOR:

If the regulator has a steel top as pictured in figure 4 on the previous page, convert the regulator in the following manner:

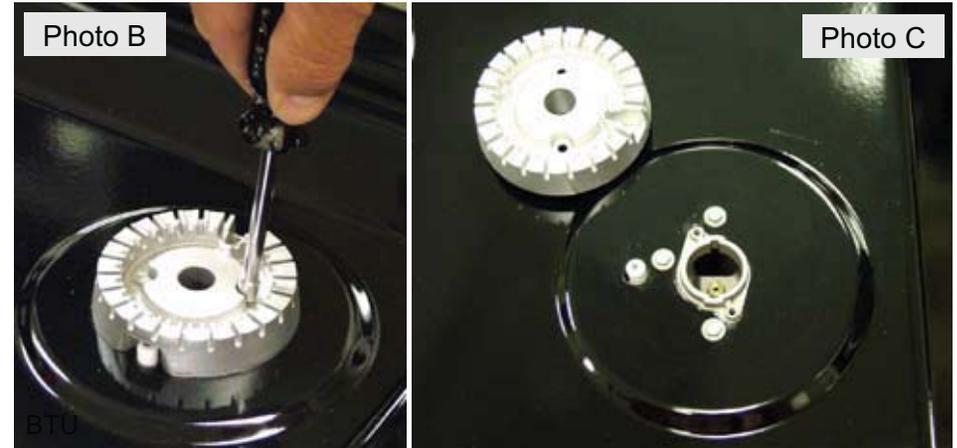
- A. Remove the regulator access cover if equipped. **Do not remove the pressure regulator or allow it to turn.**
- B. Remove the plastic dust protector from the cap (figure 5). Using a 5/8" wrench, unscrew the cap from the pressure regulator (figure 6). **Do not remove the spring from the regulator.**
- C. Turn the cap over so the hollow end faces outward. Place the solid end of the cap into the loop end of the dust protector (figure 7).
- D. Replace the cap on the regulator with the hollow end facing out (figure 8). **Do not over-tighten the cap.** Snap the dust protector over the regulator cap.
- E. Attach the LP conversion label as illustrated on page 8, then complete the remaining steps in the instructions provided with the LP kit.



**NOTE:** The pressure regulator cap may be made of brass or aluminum depending on the age of the product. The conversion process is the same for both types of caps.

### 2. CONVERTING SURFACE BURNERS

- A. Using a 3/16" nut driver, turn the burner mounting screws counter-clockwise to remove as shown (photo B).
- B. The burner can then be lifted away from the cooktop, providing access to the burner orifice as seen in photo C. Use a 7mm nut driver to remove the orifice from the orifice holder.
- C. With the orifice removed, the size stamp is visible. Using the size stamp on the NG orifice, determine the correct LP orifice from the chart below or from the instructions provided in the LP conversion kit.
- D. After installing the correct LP orifice, reinstall the surface burner mounting screws and burner cap.



Repeat this procedure for each surface burner.

The chart at right can be used as a guide to identify the proper orifices for the various burner sizes and styles that are currently used on the 300 and 500 series ranges. Future models may change, so always refer to the parts list or LP conversion kit for the specific model being serviced.

Rating/Style	5000	9500	9500/Oval	12000	14000	16000
Natural Gas Orifice	1.07	1.46	1.54	1.67	1.87	1.98
LP Gas Orifice	.66	.93	.89	1.02	1.09	1.18
LP Orifice Marking Color	Pink	White	None	Yellow	Brown	Silver
BTU Rating after LP Conversion	5000	9500	8000	12000	14000	16000

### 3. CONVERTING OVEN BAKE BURNER ORIFICE

- A. Locate the oven burner spud (figure 19).
- B. Using a 1/2" wrench, turn down the adjustable spud, which injects gas into the oven burner, until snug against the LP/Propane metering pin. **Do not over-tighten.**

### 4. CONVERTING WAIST-HIGH BROILER BURNER ORIFICE

- A. Open the oven door.
- B. Locate the broiler burner spud and turn down until snug against the LP/Propane metering pin. **Do not over-tighten** (figure 19).

**Note:** For operation at elevations above 2000 ft., appliance rating shall be reduced at the rate of 4 percent for each 1000 ft. above sea level.

### 5. RECONNECTING GAS AND ELECTRICAL SUPPLIES TO RANGE

Leak testing of the appliance shall be conducted according to the *Installation Instructions* provided with the range.

**CAUTION** Do not use a flame to check for gas leaks.

### 6. TESTING SURFACE BURNERS TO VERIFY IF "LOW" SETTING MUST BE ADJUSTED

- A. Push in and turn control to LITE until burner ignites.
- B. Push in and quickly turn knob to LOWEST POSITION.
- C. If burner goes out, reset control to OFF.
- D. Remove the surface burner control knob.
- E. Insert a thin-bladed screwdriver into the hollow valve stem and engage the slotted screw inside. Flame size can be increased or decreased with the turn of the screw. Turn counter-clockwise to increase flame size. Turn clockwise to decrease flame size. (See figures 20 & 21).

Adjust flame until you can quickly turn knob from LITE to lowest position without extinguishing the flame. Flame should be as small as possible without going out.

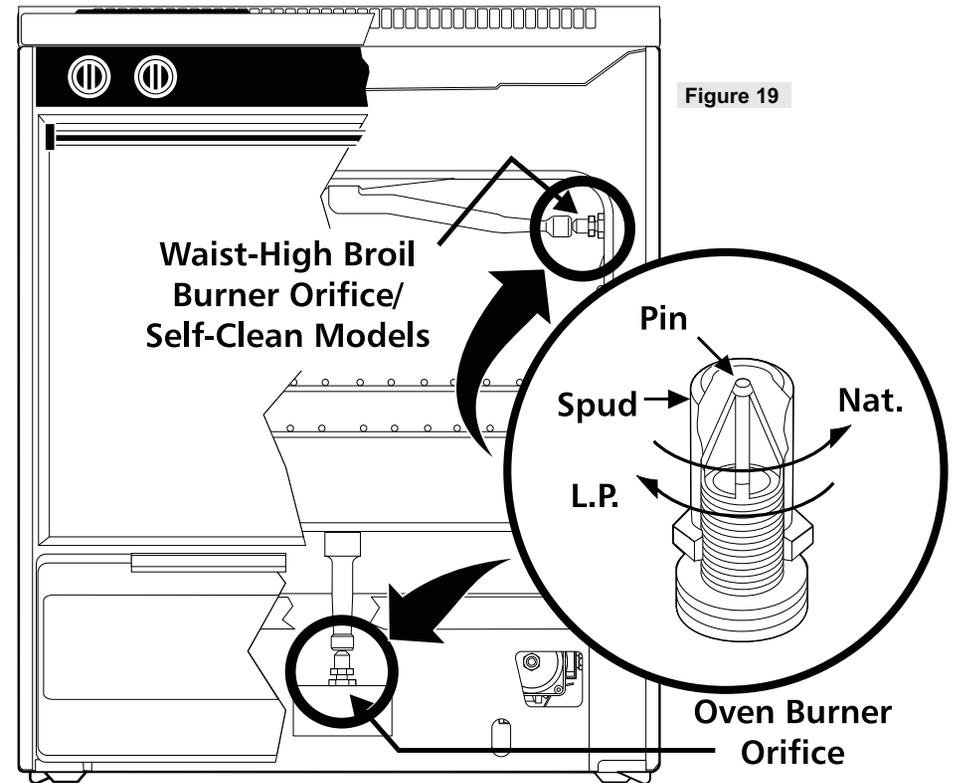


Figure 19

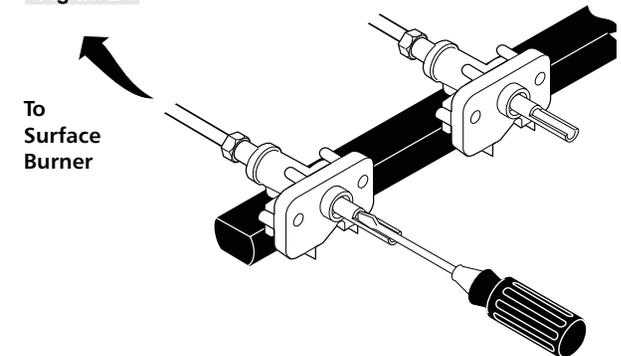
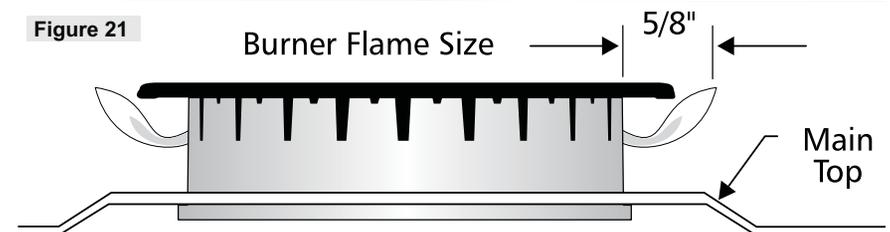


Figure 21



## 7. ADJUSTING THE BAKE BURNER AIR SHUTTER

The air shutter for the oven bake burner may need adjustment, especially if the unit has been converted for use with LP/Propane gas. The approximate flame length of the oven burner is 1 inch (distinct inner, blue flame) (see figure 22).

- A. To access the air shutter, remove the storage drawer or warmer drawer.
- B. Remove the oven bottom panel by removing the screws at rear of oven bottom. Lift up the rear of oven bottom panel and slide toward back of range to disengage from front of oven front frame.
- C. Remove burner baffle by removing nut located on top of baffle and two screws from front edge of oven front frame. Lift baffle straight up and out of the oven.
- D. Set the oven to bake at 350°F and observe the flame. If the flame is yellow in color, increase air shutter opening size. If the flame is a distinct blue color, but lifting away from the burner, reduce the air shutter opening size.
- E. Turn off oven and allow to cool before adjusting air shutter. To adjust, loosen lock-screw (3), reposition air shutter (2), and tighten lock-screw (3) (figure 23). Retest the burner by repeating step "D" above. When the burner flame is a distinct blue color burning steady, the air shutter is adjusted correctly.
- F. Replace burner baffle and oven bottom panel.

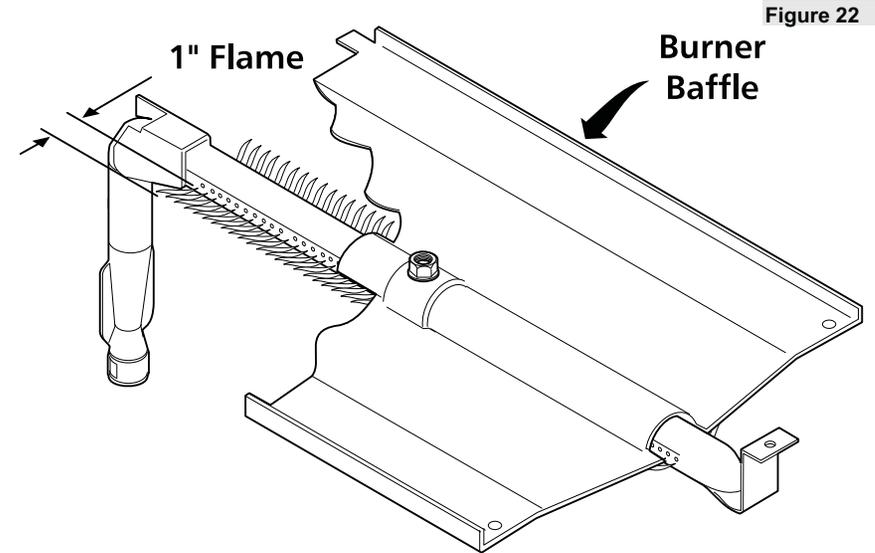


Figure 22

## 8. ADJUSTING THE BROIL BURNER AIR SHUTTER

- A. Observe the flame to determine if the broiler burner flame is properly adjusted. It should be steady with approximately 1" blue cones and no yellow or orange flame tips (figure 22).
- B. If adjustment to the air shutter is necessary, locate the broiler burner air shutter (figure 24), loosen shutter lock screw, and adjust to obtain optimum flame. This will normally be completely open for LP/Propane gas. If the flame is yellow in color, increase the air shutter opening size. If the flame is a distinct blue, but lifting away from the burner, reduce the air shutter opening size. Tighten the shutter set screw.

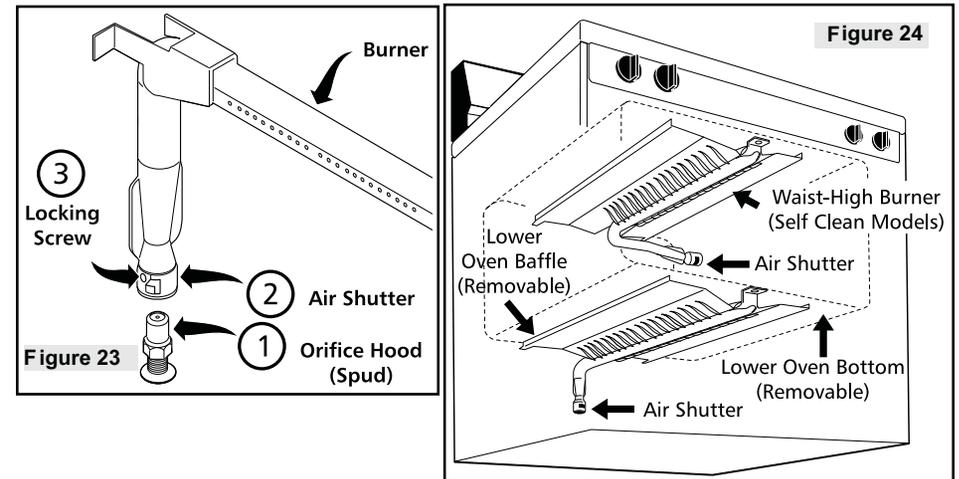


Figure 24

## 9. LABELING THE RANGE AFTER CONVERSION (REQUIRED)

After completing the conversion steps for the regulator, surface and oven burners, refer to the LP kit instructions for labeling requirements and instructions.

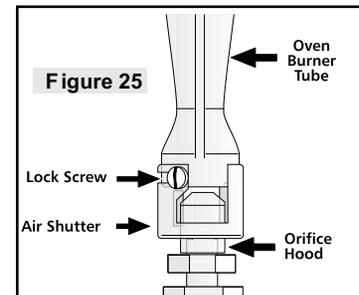


Figure 25

## Electronic Oven Control Module

**IMPORTANT: Over 75% of electronic control modules returned to the factory test good. Please perform all diagnostic tests before replacing control.**

The oven control module is accessed by removing the shield that covers the rear of the control panel backguard. The control module is secured to the control panel by four screws indicated by the arrows in photo A.

To remove the control, first disconnect the wiring harness connector by grasping the outer edges of the connector and pulling away from the control (photo B). Avoid excessive twisting or flexing of the connector plug to prevent damage to the harness or connector socket on the control module.

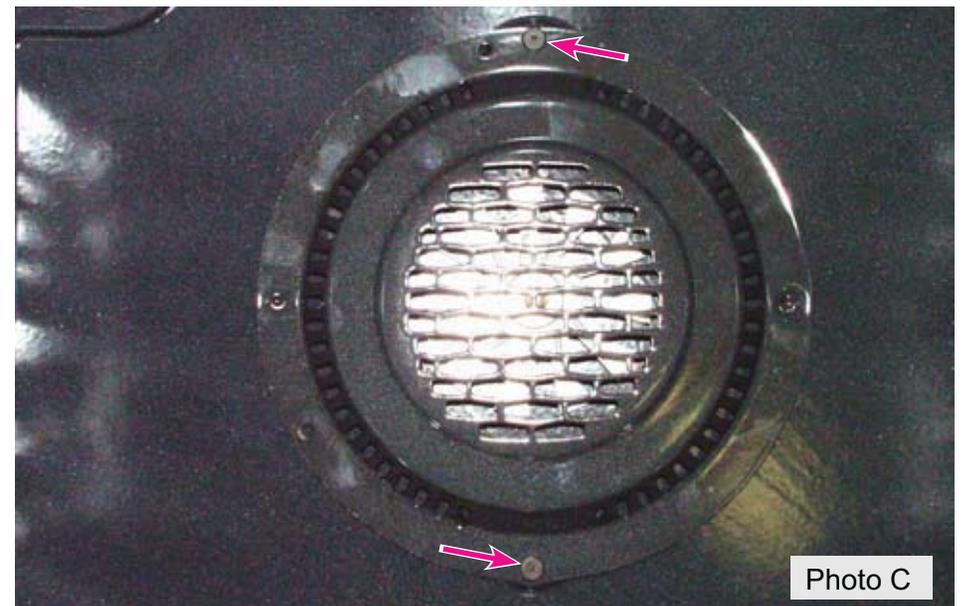
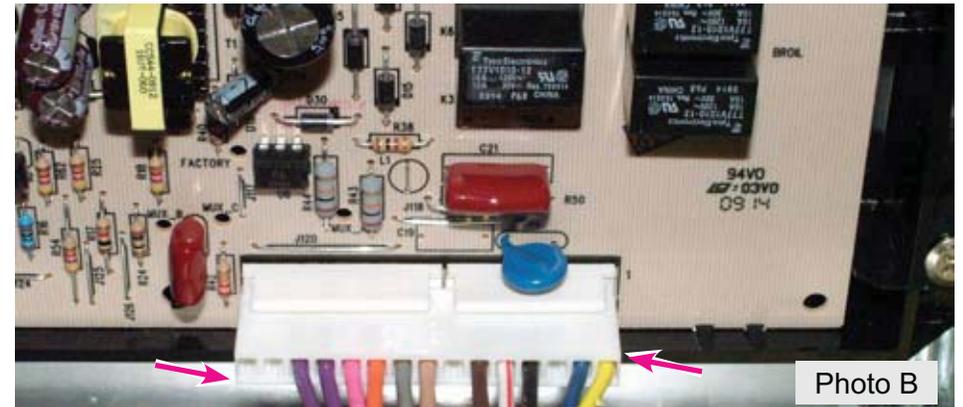
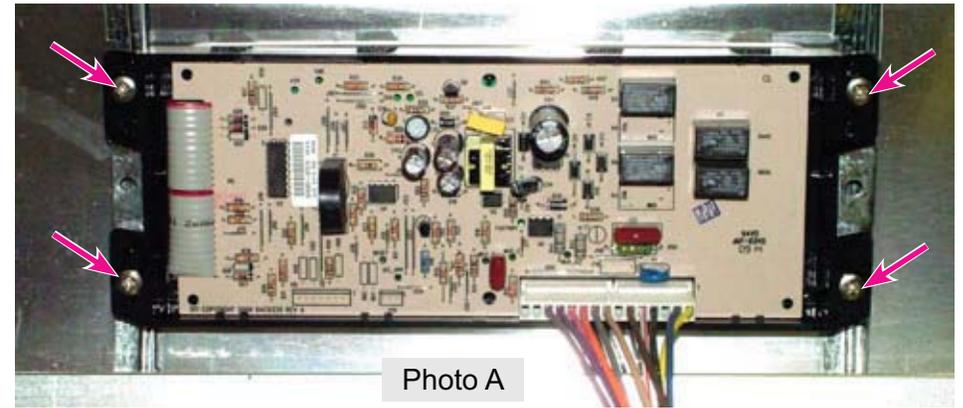
Take out the four mounting screws and remove the control module from the control panel.

When replacing the electronic control module with a new component, it is also necessary to replace the vinyl graphic overlay. Overlays are not included with the electronic controls and must be ordered separately.

## Convection Fan Motor and Blade

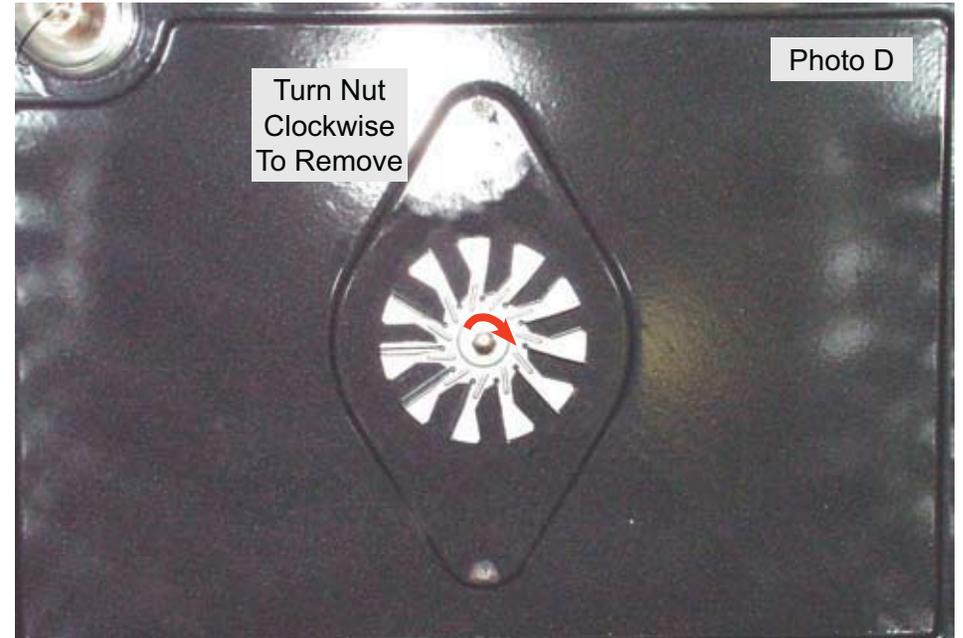
Some models feature a convection fan to circulate air throughout the oven cavity, providing faster, more uniform baking.

To access the convection fan blade, open the oven door or remove it as described in the *Oven Door and Hinges* section. Remove the two screws that secure the convection fan cover to the rear of the oven liner. The screws are indicated by the arrows in photo C.



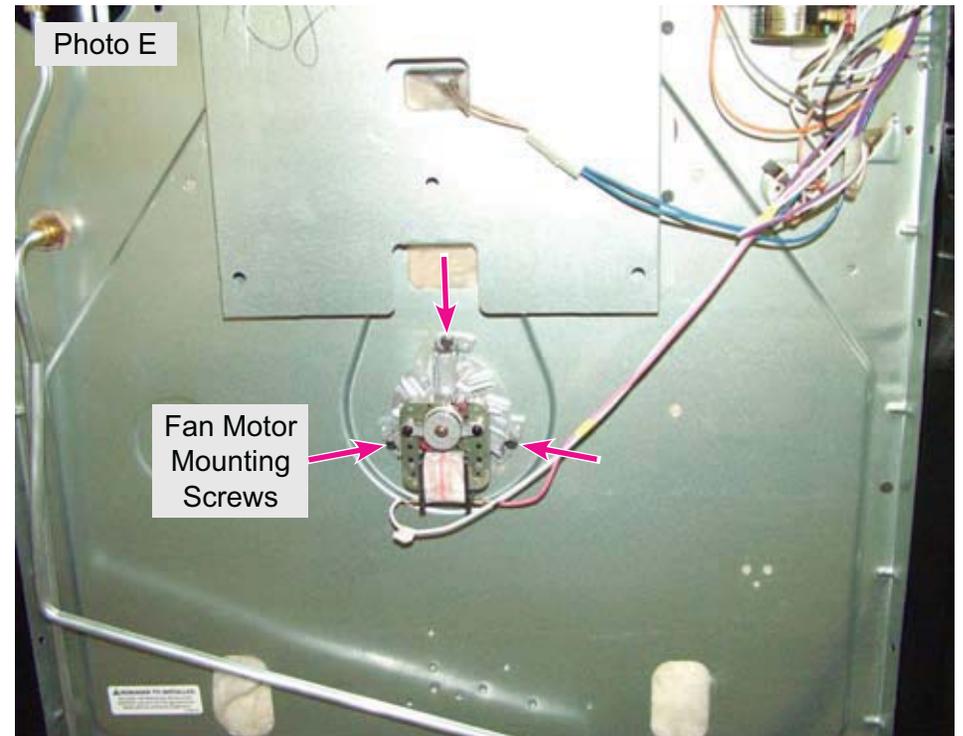
To remove the fan blade, hold it securely while turning the retaining nut clockwise to loosen (photo D).

Remove the nut and blade from the motor shaft.



To access the convection fan motor, slide the range away from the wall and remove the lower wire cover. With the cover removed, the fan motor connections can be accessed to check voltage or test continuity of the motor windings.

To replace the motor, first remove the fan blade, then take out the three motor mounting screws indicated by the red arrows in photo E.



## Oven Temperature Sensor (RTD)

The oven temperature sensor reacts to ambient temperature changes. At room temperature, the sensor resistance will measure approximately 1090 ohms. As the surrounding air temperature rises, the resistance of the sensor rises.

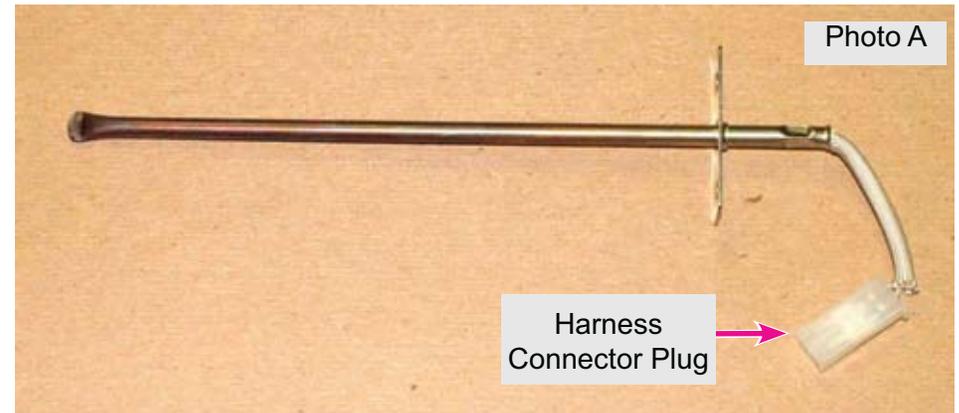
To test the sensor, it is recommended to make the initial test at the control module harness connector plug.

Disconnect the plug from the control module and use an ohmmeter to measure resistance between the two violet wires in the harness.

**IMPORTANT: 90% of the temperature sensors returned to the factory by field service technicians check good. Perform all recommended sensor tests before replacing.**

Figure 1 at right shows the RTD scale found in the tech sheet that is provided with the range. Use this scale to compare the resistance measurement to the known oven temperature. If the resistance is within the tolerance levels listed, then the sensor and connecting harness are not defective and need not be replaced.

If the resistance is significantly higher or lower than the RTD chart indicates, you should isolate the sensor from the harness and test the sensor via the harness connector plug on the sensor itself (photo A). When replacing a sensor, best practice is to replace the sensor complete with connector harness and plug. Splicing is not recommended as it can change the resistance value.

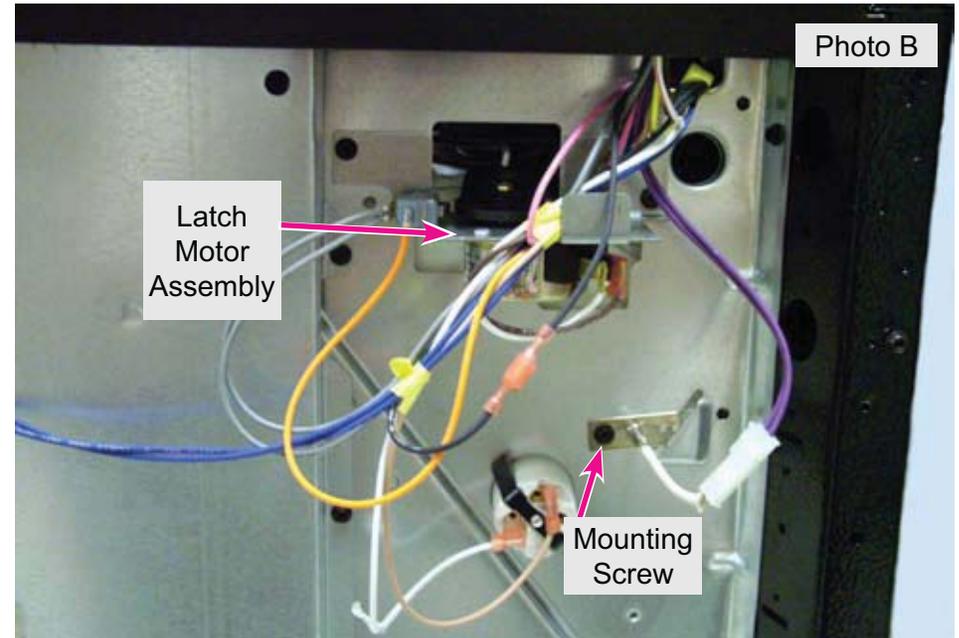


RTD SCALE	
TEMPERATURE °F	PROBE RESISTANCE Ω
32 ± 1.9	1000 ± 4.0
75 ± 2.5	1091 ± 5.3
250 ± 4.4	1453 ± 8.9
350 ± 5.4	1654 ± 10.8
450 ± 6.9	1852 ± 13.5
550 ± 8.2	2047 ± 15.8
650 ± 13.6	2237 ± 18.5
900 ± 13.6	2697 ± 24.4

Figure 1

To access the sensor, remove the lower wire shield on the back of the range. The sensor is located on the right hand side, just above the oven light socket, as seen in photo B. It is not necessary to remove the sensor from the range to test it.

If the sensor must be removed for service or replacement, disconnect the harness connector plug, then remove the single screw indicated in the photo by the arrow. After removing the screw, rotate the sensor counter-clockwise 90 degrees to disengage the sensor bracket from the slot on the range back panel. The sensor can now be pulled out of the oven chassis.

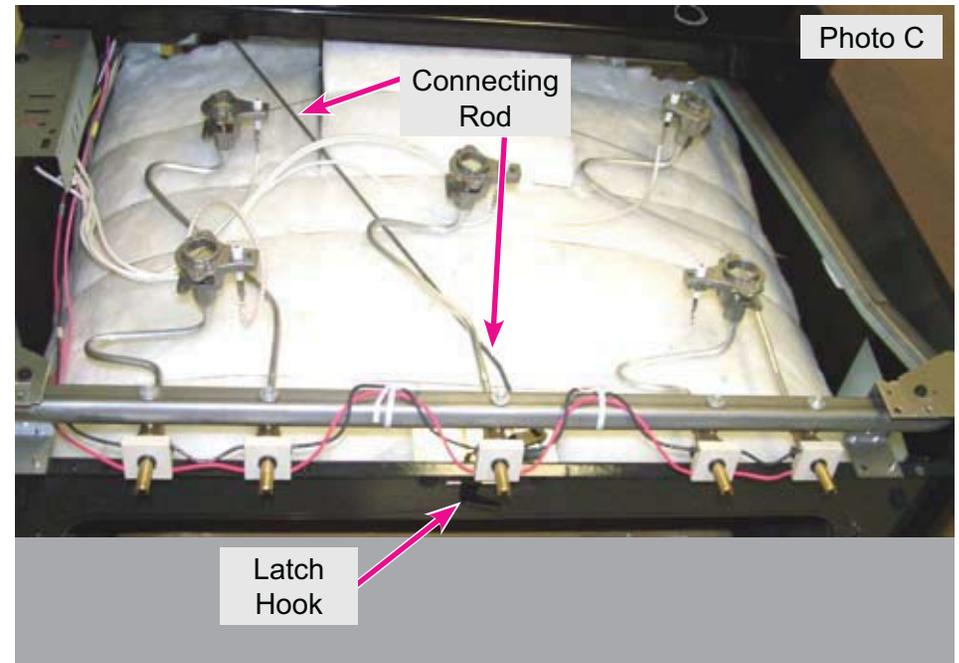


### Oven Door Latch

The oven door latch hook is operated by a latch motor that is mounted on the rear of the range chassis, just above the oven light socket as seen in photo B above.

The latch motor has a connecting rod that travels beneath the cooktop, below the orifice holder assemblies, to the latch hook mounted on the front frame of the oven chassis as seen in photo C.

To service or replace the latch hook or the connecting rod, it is necessary to remove the surface burners and cooktop as previously described in this manual.



The latch motor assembly includes a microswitch that is activated by the motor cam to signal the latch hook position to the control module (photo A).

This switch is referred to as the Lock Switch on the wiring diagram and schematic. When the cam on the latch motor depresses the plunger on the microswitch, the contacts in the switch are closed.

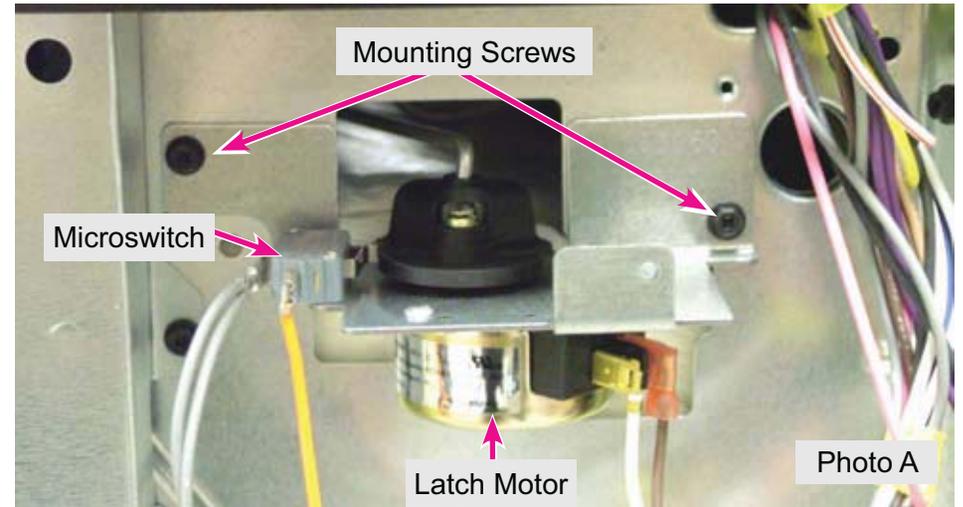
To access the latch motor assembly, slide the range away from the wall and remove the lower wire shield on the rear of the range. Disconnect the wires to the latch motor and to the microswitch.

Remove the two mounting screws seen in photo A.

Holding the outer casing of the lock motor, rotate the assembly upward to disengage the motor cam from the latch hook rod (photo B).

The entire assembly can now be removed from the range.

To reinstall, tilt the latch motor assembly upward and guide the end of the rod into the motor cam. Secure the assembly in place with the mounting screws and reconnect the wires to the switch and motor.



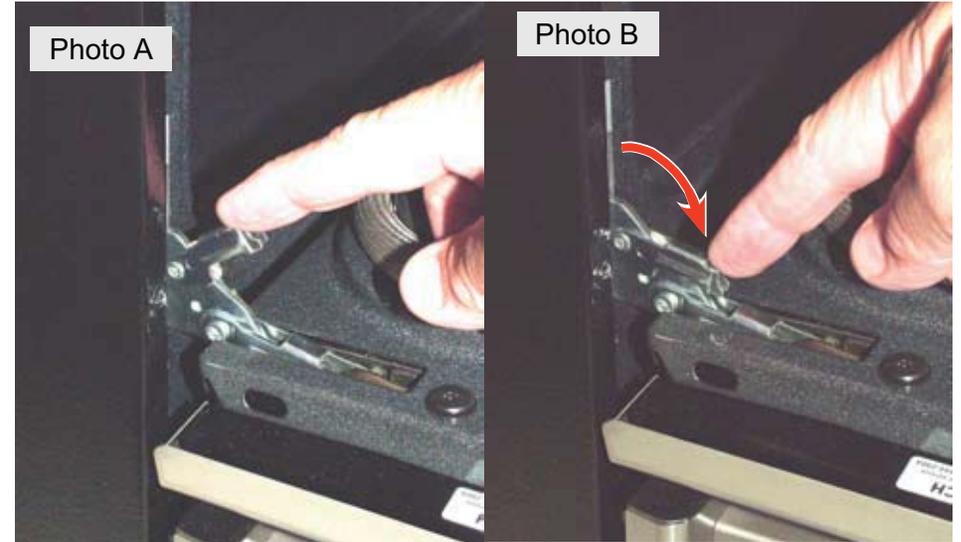
## Oven Door and Hinges

All components and parts of the oven door assembly can be serviced or replaced. The door is not available as a complete assembly.

### Removing the Door

Open the door fully and pull both hinge locks down until they stop (photos A & B).

Gently close the door until it stops against the hinge locks at approximately a 45 degree angle (photo C).



Grasping the door firmly on both sides, continue closing the door to disengage the hinges from the receivers (photo A).



When the door is about 4 inches away from being completely closed, it can be lifted off the range (photo B).



### **Reinstalling the Door**

To reinstall the door, reverse the previous steps. Use your knee to stabilize and help guide the hinge arms into the receiver slots in the frame.

Once the door is secure in the frame, open it fully and close the hinge locks back to their normal position.

Refer to the *Use and Care Manual* for additional information about removing the oven door.

## Servicing the Door

To service or replace the door components, remove the door as previously described, and place the door on a protected work surface with the handle down and hanging off the edge.

Begin disassembly by loosening the two screws which secure the handle to the door assembly (photo A). The screws will remain captive in the door assembly while the handle is lowered from below.



Remove the four screws located along the bottom edge of the door (photo B). The porcelain door liner assembly, with hinges and inner glass attached, can now be lifted away from the outer door panel.



With the door liner assembly removed, the outer door panel and outer glass are accessible (photo C).

When replacing the outer door glass, ensure that the foil tape is attached around the window opening as seen in the photo.



To remove the door hinge, lay the door liner assembly on a protected work surface with the side of the door overhanging as seen in photo D. Remove the two hinge mounting screws indicated by the arrows in the photo.



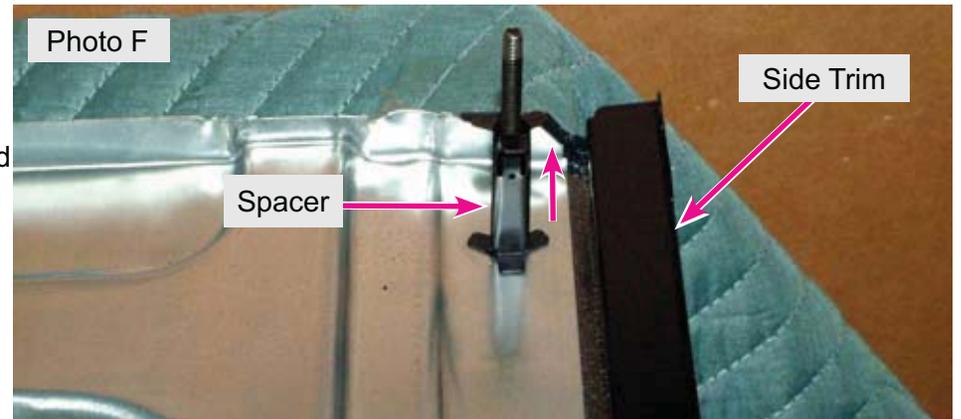
Lift the hinge assembly away from the liner assembly (photo E).

To remove the wool shield, take off both of the door hinges and the two side trims.



Remove the door spacers from the handle mounting screws by sliding them off the screws, and remove the screws (photo F).

**Note:** When reassembling the door, make sure that the spacers are placed on the screws to keep them in place and provide proper spacing between the door liner assembly and outer door panel.



Remove the remaining screws that secure the wool shield to the liner assembly, and lift the shield away from the liner (photo G).

**CAUTION: Wear gloves whenever handling insulation.**

**Note:** When reinstalling the wool shield, be sure that the bottom edge of the shield is nested under the upturned edge of the porcelain door liner (photo H).

Remove the four pieces of insulation which surround the inner door glass and spacer (photo I).

Carefully lift out the four pieces of insulation surrounding the window cut-out.

**Note:** When reinstalling the insulation, take care to tuck the insulation under the screw brackets on the porcelain liner.

Photo G



Photo H

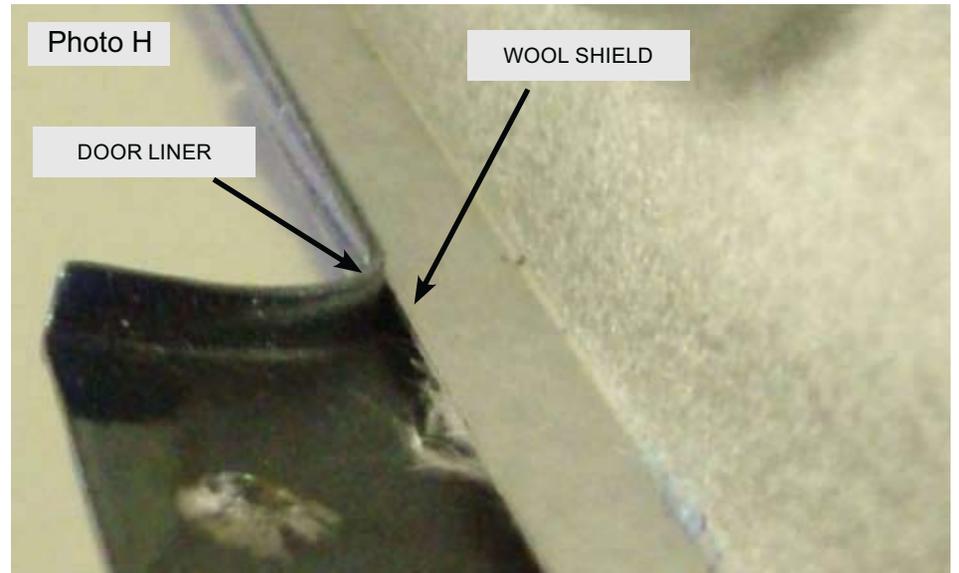


Photo I



Lift out the two inner door glass panels and spacer as seen in photo J.



This leaves only the porcelain door liner with door gasket still attached (photo K).

Note that the end of the gasket passes through two holes at the bottom of the liner.



The gasket is secured to the liner by metal spring clips that can be pulled out from the opposite side (photo L).



Note: Be sure to re-insert the loose ends of the gasket into the holes at the bottom of the door liner before reinstalling the inner door glass panes or insulation (photo M).

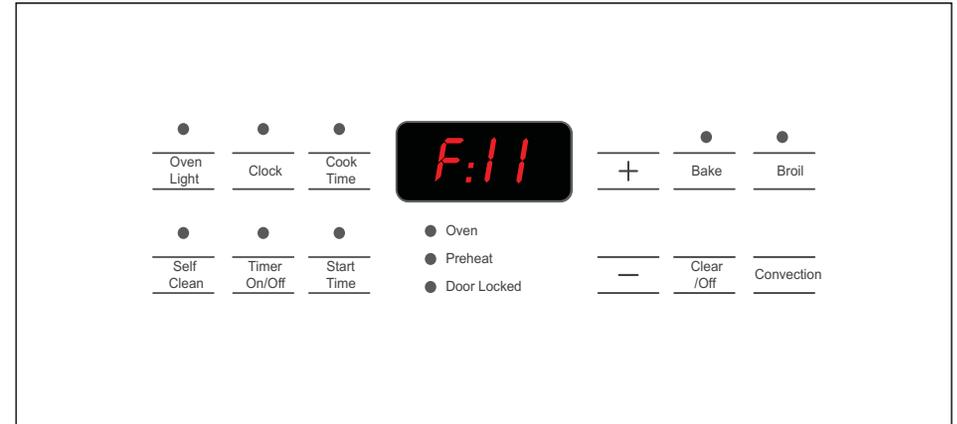


## TROUBLESHOOTING

### Electronic Control Module Failure/Fault Codes - ES337

When an error or failure occurs in the electronic oven control module, the control panel will usually produce an audible beep accompanied by a special display to indicate that there is a failure condition.

The illustration to the right shows an oven control displaying the F11 error code (Stuck Keypad). To correct the failure condition, follow the troubleshooting steps found in the tech sheet located on the back of the range.



The tech sheet found on the back of each range provides detailed information for checking component circuits and wiring as well as a listing of the failure/fault codes that may be displayed in the event of a specific failure condition. The following page illustrates an example of the fault code table as seen on the tech sheet .

For each fault code, there is a listing of the likely failure condition or cause, as well as suggested corrective actions to be taken. Perform the steps one at a time **in the order listed** to correct the specific failure condition.

## Fault Codes From Tech Sheet

**Note: Fault codes are not a foolproof system. Never assume that a part has failed based on a displayed fault code. For example, if the control module is displaying F30 (open sensor), the failure could be caused by a loose connection or faulty wire harness between the control module and sensor, or the sensor could simply be unplugged.**

FAULT CODE	LIKELY FAILURE CONDITION/ CAUSE	SUGGESTED CORRECTIVE ACTION
F10	Runaway Temperature	1. (F10 only) Check oven temp sensor probe & harness. Replace if necessary. If oven is overheating, disconnect power. If oven continues to overheat when the power is reapplied, replace control module. Severe overheating may require the entire oven to be replaced should damage be extensive. 2. (F11, 12 & 13) Disconnect power, wait 30 seconds and reapply power. 3. (F11, 12 & 13) If fault returns upon power-up, replace control module.
F11	Shorted Keypad	
F12	Bad Micro Identification	
F13	Bad EEPROM Identification/Checksum error	
F30	Open probe connection	1. (F30 or F31) Check resistance at room temperature & compare to <i>RTD Sensor Resistance</i> chart. If resistance does not match the RTD chart, replace RTD sensor probe. Check sensor wiring harness between control module & sensor probe connector. 2. (F30 or F31) Check resistance at room temperature; if less than 500 ohms, replace RTD sensor probe. Check for shorted sensor probe harness between control module & probe connector.
F31	Shorted Probe connection	
F90	Maximum oven door unlock time exceeded	<p><b>If lock motor runs:</b></p> 1. Test continuity of wiring between control module and lock switch on lock motor assy. Repair if needed. 2. Advance motor until cam depresses the plunger on lock motor switch. Test continuity of switch contacts. If switch is open, replace lock motor assy. 3. If motor runs, and switch contacts and wiring harness test good, replace the control module. <p><b>If lock motor does not run:</b></p> 1. Test continuity of lock motor windings. Replace lock motor assy if windings are open. 2. Test lock motor operation by using a test cord to apply voltage. If motor does not operate, replace lock motor assy. 3. If motor runs with test cord, check continuity of wire harness to lock motor terminals. If harness is good, replace the control module.
F91	Maximum oven door unlock attempts exceeded	
F92	Maximum oven door open time exceeded	
F93	Maximum oven door lock time exceeded	
F94	Maximum oven door lock attempts exceeded	

The fault codes in the Tech Sheet example on the previous page are explained in greater detail below.

**Note: Fault codes are not a foolproof system. Never assume that a part has failed based on a displayed fault code. For example, if the control module is displaying F30 (Open Sensor), the failure could be caused by a loose connection or faulty wire harness between the control module and sensor or the sensor could simply be unplugged.**

### **F10**

**F10** will be displayed by the control module whenever it detects higher than normal resistance from the oven temperature sensor. This condition is usually associated with extremely high internal oven temperature indicating that the oven burner or element does not shut, off creating a “runaway” oven condition.

F10 can also be displayed when the oven is completely cold. This is considered to be a false error code. To diagnose a false F10 code, disconnect the harness connector at the control module that has the two purple wires. Using an ohmmeter, measure the resistance between these two wires. If a normal resistance range of 1080 - 1110 ohms is present, then the sensor and harness are good and the failure is caused by a defective control module. *Note that this test is only conclusive if the F10 code is present at the time the test is performed.*

If the F10 code appears intermittently when the oven is not in use, or is not severely overheating, then the failure condition is most likely caused by a weak connection in the sensor harness connector or plug. The sensor connector plug and range harness connector plug can be cut out, and the wires connected directly, to eliminate the failure condition.

### **F11**

**F11** is displayed when the control module detects a stuck or shorted keypad switch. F11 can be caused by intentionally holding down any control keypad for more than 30 seconds.

F11 can sometimes be displayed if the temperature sensor circuit develops a “bleed” or short to chassis ground of the range. To check for this condition, disconnect the harness connector at the control module that has the two purple wires. Using an ohmmeter, measure the resistance between each of these violet wires to a ground screw or bare metal surface on the range. This test should reflect an open circuit or infinite resistance. If any continuity is detected, the temperature sensor or wiring harness may be the cause.

If the sensor circuit is open when performing the above test, then the failure is caused by a defective control module.

### **F12 & F13**

**F12 & F13** are displayed to indicate internal errors in the control module. These codes can sometimes be caused by power surges, line voltage fluctuations, or other issues in the incoming power supply. To troubleshoot an F12 or F13 code, disconnect the range from the power source for 30 seconds. If the failure code returns when power is reapplied, then the control module is defective and must be replaced.

## F30

**F30** is displayed to indicate that the control module detects an open oven temperature sensor circuit. To troubleshoot this condition, disconnect the harness connector at the control module that has the two violet wires. Using an ohmmeter, measure the resistance between these two wires. If a normal resistance range of 1080 - 1110 ohms is present, then the sensor and harness are good and the failure is caused by a defective control module.

If the circuit is open, go to the oven temperature sensor and disconnect it from the range wiring harness connector. Test the resistance of the sensor as described above. If a normal resistance range of 1080 - 1110 ohms is present then the sensor is good and the failure is caused by a faulty harness connector or broken wire in the harness.

## F31

**F31** is displayed to indicate that the control module detects a shorted oven temperature sensor circuit. To troubleshoot this condition, disconnect the harness connector at the control module that has the two violet wires. Using an ohmmeter, measure the resistance between these two wires. If a normal resistance range of 1080 - 1110 ohms is present, then the sensor and harness are good and the failure is caused by a defective control module.

If the circuit is shorted (zero resistance), go to the oven temperature sensor and disconnect it from the range wiring harness connector. Test the resistance of the sensor as described above. If a normal resistance range of 1080 - 1110 ohms is present, then the sensor is good and the failure is caused by a shorted wiring harness between the sensor and the control module.

## F90, F91, F92, F93, F94

**F90, F91, F92, F93, & F94** are displayed to indicate a failure of the oven door locking or unlocking operation. These codes can be displayed if the oven door fails to lock or unlock for a self-clean cycle or if the oven lockout feature is being used. To troubleshoot any of these failure codes, follow the procedure below:

### **If lock motor runs:**

1. Test continuity of wiring between control module and lock switch on lock motor assy. Repair if needed.
2. Advance motor until cam depresses the plunger on lock motor switch. Test continuity of switch contacts. If switch is open, replace lock motor assy.
3. If motor runs and switch contacts and wiring harness test good, replace the control module

### **If lock motor does not run:**

1. Test continuity of lock motor windings. Replace lock motor assy if windings are open.
2. Test lock motor operation by using a test cord to apply voltage. If motor does not operate, replace lock motor assy.
3. If motor runs with test cord, check continuity of wire harness to lock motor terminals. If harness is good, replace the control module.

## Troubleshooting Tips

### Electronic Oven Control Inoperative/No Display

- Verify proper power supply to range.
- Test for voltage to control module between L1 (black) & N (white) wires in control module P5 harness connector.
- If proper voltage is present but control module has no display, replace the control module.

### Convection Fan Does Not Operate

- Convection fan will not start until oven has been operating for six minutes.
- Test continuity of convection fan motor windings. Replace motor if windings are open.
- Test for voltage output to convection fan motor after oven has been operating for six minutes.

### Bake Burner Does Not Light

- Verify that gas supply to range is turned on with proper pressure.
- Confirm that the service lever on gas regulator is not turned off.
- Test continuity/resistance of oven igniter, gas safety valve, and connecting wires.
- If igniter glows, verify minimum current draw of 3.1 amps. If proper amperage is detected but safety valve does not open, replace safety valve. If amperage is below 3.1, replace igniter.
- If igniter does not glow, test for 120 volts output from control module P5 harness connector pin 1 (yellow wire) to pin 5 (white wire).

### Broil Burner Does Not Light

- Verify that gas supply to range is turned on with proper pressure.
- Confirm that the service lever on gas regulator is not turned off.
- Test continuity/resistance of oven igniter, gas safety valve, and connecting wires.
- If igniter glows, verify minimum current draw of 3.1 amps. If proper amperage is detected but safety valve does not open, replace safety valve. If amperage is below 3.1, replace igniter.
- If igniter does not glow, test for 120 volts output from control module P5 harness connector pin 2 (blue wire) to pin 5 (white wire).

### Oven Light Does Not Work

- Verify that light bulb is good.
- Test oven door switch contacts and wiring connections.
- Test wiring harness connections to light socket.
- With oven door open, test for 120 volts output from control module P5 harness connector pin 8 (tan wire) to pin 5 (white wire).

### **Oven Door Lock Motor Does Not Operate**

- Test continuity of lock motor windings and wiring harness connections.
- Check operation of oven door switch contacts.
- Test for 120 volts output from control module P5 harness connector pin 6 (brown wire) & pin 5 (white wire).

### **Surface Burner Igniters Do Not Spark**

- Verify proper power supply to range.
- Test for 120 volts at spark module L1 (red wire) & N (white wire) when surface burner switch is in LITE position.
- Test wiring harness connections between spark module and surface burner igniter switches.

## Electronic Control Module Troubleshooting and Testing

Using the **Gas Range Circuit Test Matrix**, it is possible to determine if the control module is sending proper voltage to a specific component. If the proper voltage is not detected, then the control module is defective and must be replaced.

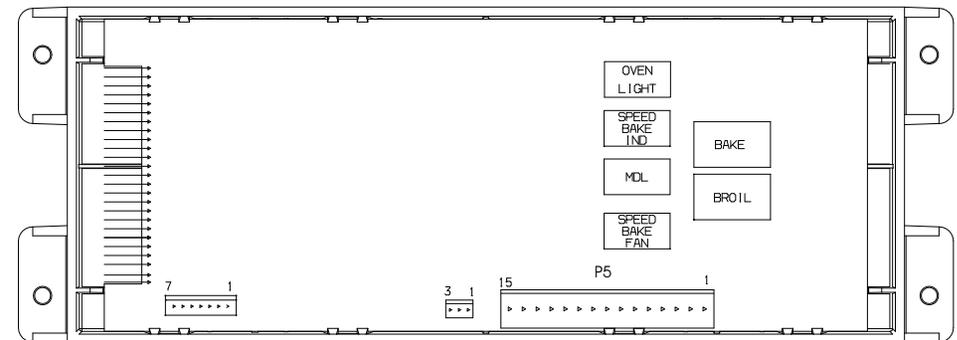
If the proper voltage is detected, but component does not operate, further testing is required to confirm that proper voltage is present at the component.

The control module relay circuits can be tested by following the circuit test matrix at right. Always verify the incoming power supply when performing diagnosis.

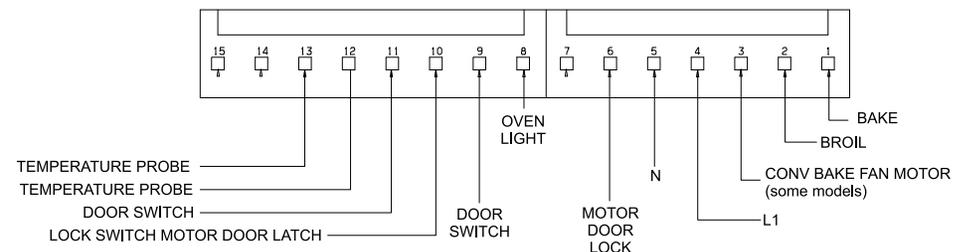
Gas Range Circuit Test Matrix - ES337						
	L1 to Bake	L1 to Broil	L1 to Motor Door Latch	L1 to Convection Fan	L1 to Oven Light(s)	Door Switch COM-NO
Bake/Time Bake	X	X				
Convection Bake	X			X		
Broil		X				
Clean	X					
Oven Light(s)					X	
Locking			X			
Unlocking			X			
Door Open					X	
Door Closed						X

NOTE: X = Relay Contacts Closed

Rear View of Control Module



P5 Harness Connector



## Gas Range Component Testing

If a component part that is controlled by the control module fails to operate, the cause could be due to a defect in the control module, faulty wiring harness connections, or the non-functioning component.

Component parts such as elements, fan motors, lock motors, etc., can be tested with a simple continuity check using an ohmmeter. Verify the continuity of the component and the wiring circuit between the component to the control module first.

If the component and wiring connections are good, test the output voltage from the control module to the component part.

### GAS Range Component Resistance Chart

<b>NOTE: Resistance measurements are approximate. Variations due to temperature changes and other factors are normal.</b>		
<b>COMPONENT</b>	<b>VOLTAGE RATING</b>	<b>RESISTANCE <math>\Omega</math> (OHMS)</b>
<b>CONVECTION FAN MOTOR WINDINGS</b>	<b>108 / 232</b>	<b>15 <math>\Omega</math></b>
<b>LOCK MOTOR WINDINGS</b>	<b>108 / 232</b>	<b>2000 <math>\Omega</math></b>
<b>GAS SAFETY VALVE</b>	<b>**</b>	<b>1.5 <math>\Omega</math></b>
<b>BAKE IGNITER</b>	<b>108 / 232</b>	<b>100 <math>\Omega</math></b>
<b>BROIL IGNITER</b>	<b>108 / 232</b>	<b>80 <math>\Omega</math></b>
<b>OVEN TEMPERATURE SENSOR PROBE (AT ROOM TEMPERATURE)</b>	<b>-</b>	<b>1100 <math>\Omega</math> * *(REFER TO RTD CHART)</b>

**\*\* Never apply line voltage to the oven safety valve terminals.**

For additional assistance, please contact the Bosch Technical Support Team

(800) 444-9091

Visit *QuickFinder* at <http://portal.mch.bshg.com/portal>

Service videos are available at [www.bsh-digitaltoolbox.com](http://www.bsh-digitaltoolbox.com)