

Electric Wall Oven with Electronic Oven Control

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## NOTICE

This service data sheet is intended for use by persons having electrical and mechanical training and a level of knowledge of these subjects generally considered acceptable in the appliance repair trade. **The manufacturer cannot be responsible, nor assume any liability, for injury or damage of any kind arising from the use of this data sheet.**

## SAFE SERVICING PRACTICES

To avoid the possibility of personal injury and/or property damage, it is important that safe servicing practices be observed. The following are examples of some, but not all, of these 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 power cord from electric outlet, trip circuit breaker to OFF, or remove fuse and turn off gas supply.
3. Never interfere with the proper installation 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 POTENTIAL HAZARD.
6. Prior to returning the product to service, ensure that:
  - All electric 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 reassembled.
  - All panels are properly and securely reassembled.

# MICROWAVE INFORMATION

SPECIFICATION	
ITEM	DESCRIPTION
Power Requirements	120 Volts 14.3 Amperes, 1700 watts 60 Hertz Single phase, 3 wire grounded
Control Complement	Touch Control System Clock ( 1:00 - 12:59 ) Timer (0 - 99 min. 99 seconds)  Microwave Power for Variable  Cooking Repetition Rate; P-HI ..... Full power throughout the cooking time P-90 ..... approx. 90% of Full Power P-80 ..... approx. 80% of Full Power P-70 ..... approx. 70% of Full Power P-60 ..... .. approx. 60% of Full Power P-50 ..... approx. 50% of Full Power P-40 ..... approx. 40% of Full Power P-30 ..... approx. 30% of Full Power P-20 ..... approx. 20% of Full Power P-10 ..... approx. 10% of Full Power P-0 ..... No power throughout the cooking time  Add 1 minute pad, Sensor cooking pads, Defrost pads, Number selection pads, Power Level pad, Timer/Clock pad, STOP/Clear pad, One touch cooking pads, and Start pad.
Oven Cavity Light	Yes

## GENERAL INFORMATION

### GROUNDING INSTRUCTIONS

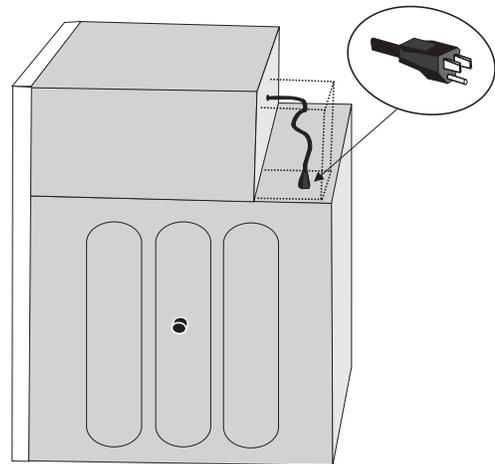
This oven is equipped with a three prong grounding plug. It must be plugged into the wall oven receptacle that is properly installed and grounded in accordance with the National Electrical Code and local codes and ordinances.

In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current.

**WARNING: Improper use of the grounding plug can result in a risk of electric shock.**

### Electrical Requirements

The electrical requirements are a 120 volt 60 Hz, AC only, a branch circuit protection fuse, 20 amp is provided in series with the ac outlet on top of the wall oven support.

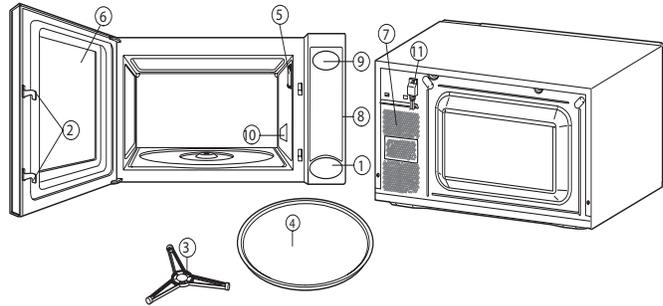


\*Note: Branch circuit fuse 20 amp shall be replaced with class cc type.

# MICROWAVE INFORMATION

## OVEN DIAGRAM

1. One touch door open button. Push to open door.
2. Door latches. The oven will not operate unless the door is securely closed.
3. Removable turntable support.
4. Removable turntable. The turntable will rotate clockwise or counterclockwise.
5. Oven lamp. It will light when oven is operating or door is opened.
6. Oven door with see-through window.
7. Ventilation openings. (Rear)
8. Auto-Touch control panel.
9. Time display: Digital display, 99 minutes 99 seconds.
10. Wave guide cover.
11. Power supply cord



## TOUCH CONTROL PANEL

### NOTE:

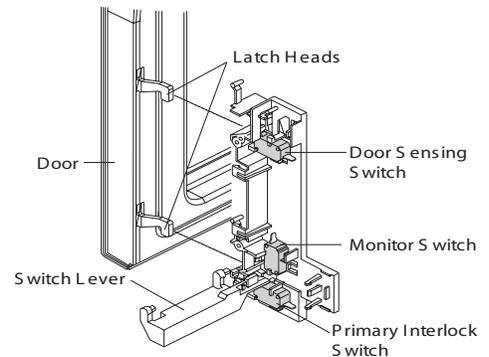
The directed features are disabled after one minute when the oven is not in use. These features are automatically enabled when the door is opened and closed or the STOP/ CLEAR pad is pressed.



## DESCRIPTION AND FUNCTION OF COMPONENTS

### DOOR OPEN MECHANISM

The door is opened by pushing the open button on the control panel, refer to the Figure D-1. When the open button is pushed, the open button pushes up the switch lever, and then the switch lever pushes up the latch head. The latch heads are moved upward and released from latch hook. Now the door will open.



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## MICROWAVE INFORMATION

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### DESCRIPTION AND FUNCTION OF COMPONENTS

#### DOOR SENSING AND PRIMARY INTERLOCK SWITCHES

The primary interlock switch is mounted in the lower position of the latch hook and the door sensing switch in the secondary interlock system is mounted in the upper position of the latch hook. They are activated by the latch heads on the door. When the door is opened, the switches interrupt the power to all high voltage components. A cook cycle cannot take place until the door is firmly closed thereby activating both interlock switches. The secondary interlock system consists of the door sensing switch and secondary interlock relay located on the control circuit board.

#### MONITOR SWITCH

The monitor switch is activated (the contacts opened) by the latch head on the door while the door is closed. The switch is intended to render the oven inoperative, by means of blowing the C/T fuse, when the contacts of the secondary interlock relay (RY2) and primary interlock switch fail to open when the door is opened.

##### Functions:

1. When the door is opened, the monitor switch contact close (to the ON condition) due to their being normally closed. At this time the secondary interlock relay (RY2) and primary interlock switch are in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch contacts are first opened and then the door sensing switch and the primary interlock switch contacts close. (On opening the door, each of these switches operate inversely.)
3. If the door is opened, and the secondary interlock relay (RY2) and primary interlock switch contacts fail to open, the C/T fuse blows simultaneously with closing of the monitor switch contacts.

CAUTION: BEFORE REPLACING A BLOWN C/T FUSE TEST THE DOOR SENSING SWITCH, SECONDARY INTERLOCK RELAY (RY2), RELAY (RY1), PRIMARY INTERLOCK SWITCH AND MONITOR SWITCH FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

**NOTE: C/T FUSE AND MONITOR SWITCH ARE REPLACED AS AN ASSEMBLY.**

#### TURNTABLE MOTOR

The turntable motor rotates the turntable located on the bottom of the oven cavity, so that the foods on the turntable cook evenly during cooking. The turntable may turn in either direction.

#### COOLING FAN MOTOR

The cooling fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channeled through the oven cavity to remove steam and vapors given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

#### CAVITY TEMPERATURE FUSE

The cavity temperature fuse located on the top of the oven cavity, is designed to prevent damage to the oven by fire. If the food load is overcooked, by either error in cook time or defect in the control unit, the cavity temperature fuse will open. Under normal operation, the cavity temperature fuse remains closed. However, when abnormally high temperatures are reached within the oven cavity, the cavity temperature fuse will open at 302OF(150OC) causing the oven to shut down. NOTE: This is fuse. It does not reset.

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## MICROWAVE INFORMATION

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### DESCRIPTION AND FUNCTION OF COMPONENTS

#### C/T TEMPERATURE FUSE

The C/T fuse located near the magnetron is designed to prevent damage to the magnetron if an over heated condition develops in the tube due to cooling fan failure, obstructed air guide, dirty or blocked air intake, etc.

Under normal operation, the C/T fuse remains closed. However, when abnormally high temperatures are reached within the magnetron, the C/T fuse will open at 302 F(150 °C) causing the oven to shut down.

1. The C/T fuse blows when the contacts (COM-NO) of the secondary interlock relay (RY2) and primary interlock switch remain closed with the oven door open and when the monitor switch closes.
2. If the wire harness or electrical components are shortcircuited, this monitor fuse blows to prevent an electric shock or fire hazard.

NOTE: This is fuse. It does not reset.

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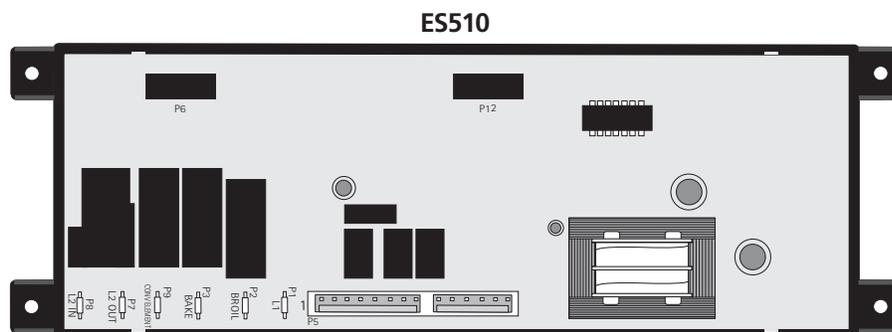
## LOWER OVEN INFORMATION

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#### ES510 ELECTRONIC OVEN CONTROL

1. This self-cleaning controller offers Bake, Broil, Preheat, Convection Bake and Convection Roasting modes, Timed and Delayed Baking, and Cleaning functions.
2. Convection operates with an element and a fan dedicated to convection.
3. This Controller has a touch sensitive membrane.



**NOTE:** The Controller's are not field repairable. Only temperature settings can be changed. See oven calibration.

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## LOWER OVEN INFORMATION

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### CONVECTION MODE

The convection oven uses the addition of a fan and an element to heat and to move the air already in the oven. Moving the heated air helps to destratify the heat and cause uniform heat distribution. Cooking times can be reduced by as much as 30%. The air is drawn in through a fan shroud and the element located on the rear wall of the oven. It is then discharged around the outer edges of this shroud. The air circulates around the food and then enters the shroud again. As with conventional electric ranges, there is still an oven vent which discharges through the bottom of the control panel.

To set the control in convection mode, follow these steps:

1. Press the **CONV. BAKE/ROAST** pad.
2. Enter the desired temperature on the keypad (set point).
3. Press the **START** pad.

The oven will automatically start and the fan will begin to run. To cancel the convection baking/roasting function, press the **CANCEL** pad.

**NOTE:** The fan runs continuously while in the convection mode. The fan and the convection element will stop if the door is opened while convection baking/roasting. The bake element will continue to operate if the door is opened.

### PREHEAT

During a preheat mode, the oven uses a bake element to reach the controller set point. The element uses full power when it's on. When the set point is reached, the preheat mode is converted to a normal bake mode.

### NORMAL BAKE

During a normal bake mode, the controller preheats the oven with the bake element. When the desired temperature is reached, the controller adds top heat by cycling the broil element on for 12 to 18 seconds per minute. The bake element is on for the remaining time of the minute. Both elements use full power when they are on but they are never on at the same time.

### CLEAN

During a cleaning process, the oven uses bake and broil elements.

### CLEAN AND TIMED CLEAN

When these modes are selected, the door locks right after start button is pushed.

### FIRST RISE

It is normal to see a temperature overshoot in the first rise of all modes when you monitor the temperature.



### OVEN CALIBRATION

Set the electronic oven control for normal baking at 350°F/176°C. Obtain an average oven temperature after a minimum of 5 cycles. Press Cancel to end bake mode.

**Note:** Changing calibration affects all the cooking modes but not the clean mode.

## LOWER OVEN INFORMATION

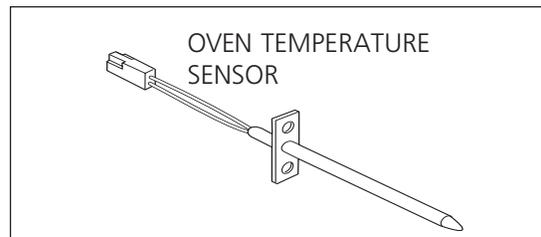
### ELECTRONIC OVEN CONTROL

ELECTRONIC OVEN CONTROL (EOC) FAULT CODE DESCRIPTIONS		
Fault Code Series	Likely Failure Condition/Cause	Suggested Corrective Action
<b>F1</b>	<p><b>(F10)</b> Control has sensed a potential runaway oven condition. Control may have shorted relay, RTD sensor probe may have gone bad.</p> <p><b>(F11)</b> Shorted keypad.</p> <p><b>(F13)</b> Control's internal checksum may have become corrupted.</p> <p><b>(F14)</b> Misconnected flat cables.</p>	<ol style="list-style-type: none"> <li>1. Check RTD sensor probe and replace if necessary. If oven is overheating, disconnect power. If oven continues to overheat when the power is reapplied, replace EOC. Severe overheating may require the entire oven to be replaced, should damage be extensive.</li> <li>2. Press CLEAR key.</li> <li>3. Disconnect power, wait 30 seconds and reapply power. If fault returns upon power-up, replace EOC.</li> <li>4. Disconnect power; verify flat cable connections (P6 or P12).</li> </ol>
<b>F3</b>	<p><b>(F30)</b> Open RTD sensor probe/ wiring problem. Note: EOC may initially display an "F1", thinking a runaway condition exists.</p> <p><b>(F31)</b> Shorted RTD sensor probe / wiring problem. Note: "F3" is displayed when oven is in active mode or an attempt to enter an active mode is made.</p>	<ol style="list-style-type: none"> <li>1. Press CLEAR key.</li> <li>2. Check wiring in probe circuit for possible open condition. Check RTD resistance at room temperature (compare to probe resistance chart). If resistance does not match the chart, replace the RTD sensor probe.</li> <li>3. Let the oven cool down and restart the function</li> </ol>
<b>F9</b>	<p><b>(F90 to F94)</b> Door motor mechanism failure.</p>	<ol style="list-style-type: none"> <li>1. Press CLEAR key.</li> <li>2. If CLEAR key does not eliminate problem, turn off power for 30 seconds, then turn on power.</li> <li>3. Check wiring of Lock Motor, and Lock Switch and Door Switch circuits.</li> <li>4. Unplug P5, apply power (L1) directly to the Lock Motor, if the motor does not rotate, replace Lock Motor Assembly. Plug P5.</li> <li>5. Check Lock Switch A for proper operation (do they open and close, check with ohmmeter). The Lock Motor may be powered as in above step to open and close Lock Switch. If the Lock Switch is defective, replace Motor Lock Assembly.</li> <li>6. If all above steps fail to correct situation, replace control.</li> </ol>

## LOWER OVEN INFORMATION

### RTD SCALE

Temp. °F	Temp. °C	Resistance (ohms)
32 ± 1.9	0.0 ± 1.1	1000 ± 4.0
75 ± 2.5	23.9 ± 1.4	1091 ± 5.3
250 ± 4.4	121.1 ± 2.4	1453 ± 8.9
350 ± 5.4	176.7 ± 3.0	1654 ± 10.8
450 ± 6.9	232.2 ± 3.8	1852 ± 13.5
550 ± 8.2	287.8 ± 4.6	2047 ± 15.8
650 ± 9.6	343.3 ± 5.3	2237 ± 18.5
900 ± 13.6	482.2 ± 7.6	2697 ± 24.4



### CIRCUIT ANALYSIS MATRIX

	ELEMENTS			Conv.Fan P5-7	Light P5-4	Door Motor P5-6	Lock Motor Switches		CoolingFan DLB L2 out	Door Switch P5-12 COM-NO
	Bake P3	Broil P2	Conv. P9				P5-10 & P5-11	A P5-10 & P5-13		
Bake	X	X*							X	
Broil		X							X	
Conv. Bake	X		X	X					X	
Conv. Roast	X	X*		X					X	
Clean	X	X*							X	
Locking						X	NC	NO		
Locked							NO	NC		
Unlocking						X	NO	NC		
Unlocked							NC	NO		
Light					X					
Door Open					X					X
Door Closed										

\* Denotes Top heat

■ Relay will operate in this condition only

### ELECTRICAL RATING

	27" Wall Oven (ES510)	30" Wall Oven (ES510)
<b>KW Rating 240/208 V</b>	See nameplate	See nameplate
<b>Broil Element Wattage</b>	3400W / 2553W	2750W / 2066W
<b>Bake Element Wattage</b>	2700W / 2028W	3400W / 2553W
<b>Conv. Element Wattage</b>	350W / 263W	350W / 263W

### 2 SPEEDS COOLING FAN

A relay and a thermostat (170°/140°) control the speeds of the blower.

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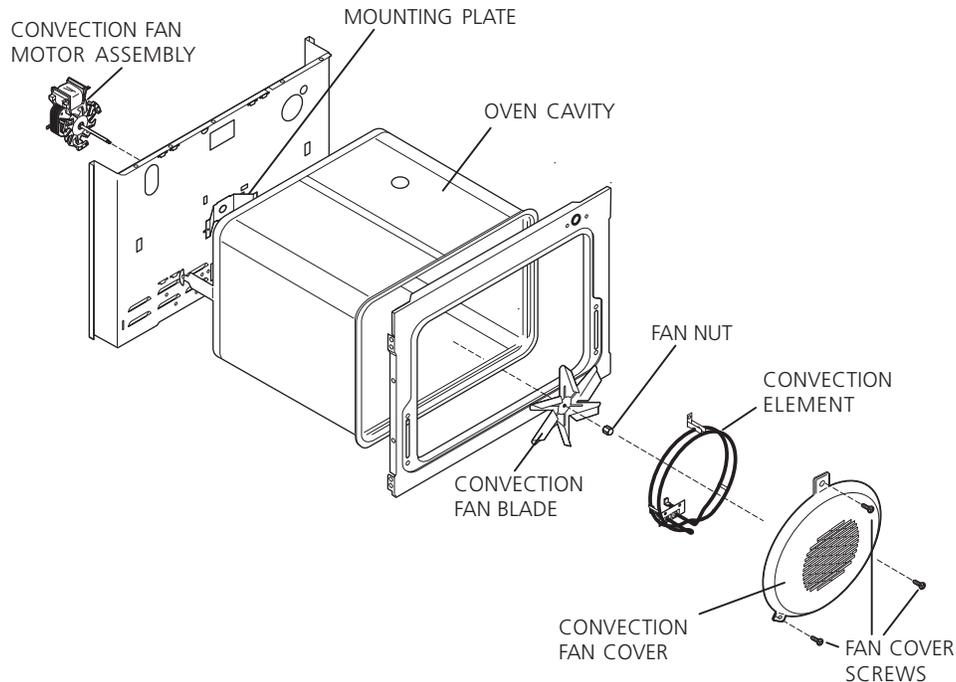
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## LOWER OVEN INFORMATION

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### EXPLODED VIEW OF CONVECTION SYSTEM



#### FAN BLADE

The fan blade is mounted in the rear of the unit and has a "D" shaped mounting hole. Only minimum clearance exists between the oven back, fan blade, and fan shroud. Be careful not to bend blade when removing or installing.

Access to the fan blade is gained by removing the fan shroud, held in place by three screws, from the inside of the oven.

The fan blade is held in place with a hex nut that has left handed threads. When removing this nut, gently hold the fan blade, and turn the nut clockwise. If one of the blades becomes deformed, it may be bent back into shape using a flat surface as a reference.

A flat washer is located on the motor shaft between the snap ring on the shaft and the fan blade.

**NOTE:** If the fan blade is bent and motor vibrations increase, the noise made by the fan will be greater.

#### MOUNTING PLATE OVEN

The fan motor on the rear of the unit is mounted to the main back (with three screws). There is a mounting plate held in place between the main back (with 2 screws) and the rear oven wall (with 2 screws). Should it be necessary to replace the oven cavity, you must remove the 2 screws located inside the unit at the rear of the oven cavity.

#### CONVECTION FAN MOTOR

The 120 volt fan motor is located on the outside of the rear of the oven.

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## LOWER OVEN INFORMATION

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### FAN RELAY

The convection fan motor runs continuously while in the convection mode unless the door is opened. If the fan does not operate, check the following:

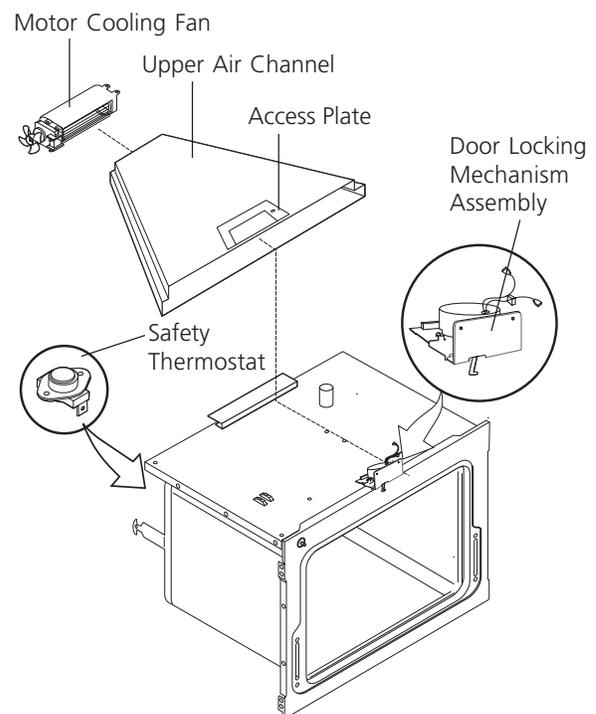
- Display illuminated on the electronic control.
- Voltage output between terminals P5-7 and Neutral.
- 120 Volts available at fan motor.
- Fan motor coil resistance 15 ohms  $\pm$  10%.
- Door/light switch.

### DOOR LOCK MECHANISM

The appliance is equipped with an electronic oven control and has an auto locking door latch feature. When the self clean cycle is programmed, the door is locked by a motor operated latch system. The interior of oven doesn't need to heat up to 500°F/260°C before the door locks. However, until the temperature inside oven reaches 500°F/260°C, the self-clean program can be canceled and door will unlock immediately. After oven reaches temperatures over 500°F/260°C, the door will not unlock until temperature drops below 500°F/260°C.

If a problem appears and the door stays locked it is possible for the **servicer** to unlock the door without removing the appliance from its place. Follow the steps below:

1. Trip the circuit breaker to **OFF** position.
2. Remove the 2 screws, which are fixing the oven door latch, located between the control panel and the oven door.
3. When the screws are removed it is possible to unlock the latch with a flat screwdriver, or one of the tools supplied with the wall oven which are used to take off the oven from the cabinet. Insert the tool tip through the slot on top of the oven door. During this step it's important to take care to not damage the appliance.
4. As soon as the latch is in the unlock position, you can open the door.
5. Replace the motor latch:
  1. To have access to the door latch assembly, remove the 3 screws under the control panel which are fixing it.
  2. Remove the access plate located on the upper air channel by removing the screw.
  3. Replace the motor latch by a new one and reassemble in reverse order.



## LOWER OVEN INFORMATION

### OVEN DOOR REMOVAL AND REPLACEMENT

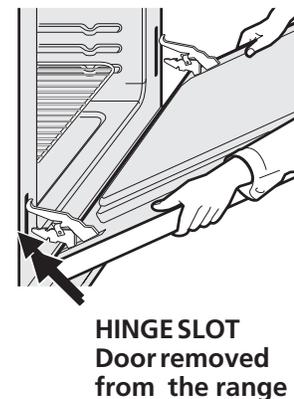
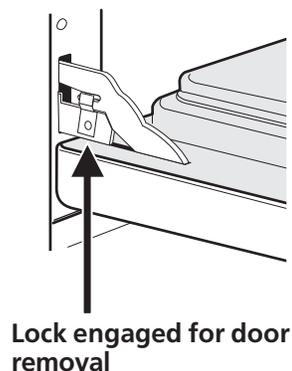
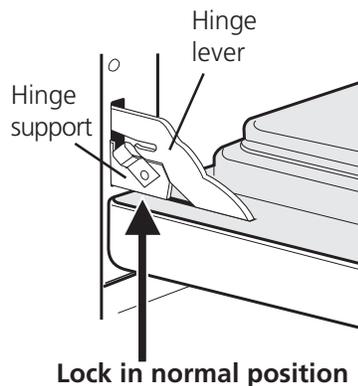
#### To Remove the Oven Door:

1. Open the door to the fully opened position.
2. Pull up the lock located on each hinge support and engage it in the hinge lever. You may have to apply a little downward pressure on the door to pull the locks fully over the hooks.
3. Grab the door by the sides, pull the bottom of the door up and toward you to disengage the hinge supports. Keep pulling the bottom of the door toward you while rotating the top of the door toward the range to completely disengage the hinge levers.

#### To Replace the Oven Door:

1. Grab the door by the sides; place the hinge supports in the hinge slots. Open the door to the fully opened position.
2. Disengage the lock from the hinge levers on both sides.  
**Note:** Make sure the hinge supports are fully engaged before unlocking the hinge levers.
3. Close the oven door.

**CAUTION** The door is heavy. After removing door, lay it flat on the floor with the inside of the door facing down.



### "HIDDEN BAKE" COVER REMOVAL AND REPLACEMENT (SOME MODELS)

#### To remove the "hidden bake" cover:

1. In order to remove the "hidden bake" cover, pull the back edge with one hand about 1/2" inch and lift up the "hidden bake" cover with both hands. (See picture)
2. When re-installing the "hidden bake" cover, be sure to put it all the way to the back of the oven and lay it down on the 2 shoulder screws. Then push the front edge of the cover in its place below the front bracket.

To have easier access to the oven floor, you can remove the oven door by following the instructions above.

**IMPORTANT:** Always replace the "hidden bake" cover before the next use.



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**NOTES**

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