

# SERVICE DATA SHEET

## Electric Ranges with Convection Electronic Oven Control with Double Line Break

**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, but without limitation, of such practices.

1. Before servicing or moving an appliance remove power cord from electrical outlet, trip circuit breaker to OFF, or remove fuse.
2. Never interfere with the proper installation of any safety device.
3. **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 safety hazard.**
4. 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 uninsulated 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.

### CONVECTION BAKE or CONVECTION ROAST MODE

To set the oven for the Convection mode, follow these steps:

1. Press the **CONV BAKE** or **CONV ROAST** (some models) pad.
2. Press the number pads (0-9) to select the desired temperature and then press the **START** pad. The **CONV** icon will glow, signifying that the Convection function has been activated. The fan (and convection assist element) will come on and run continuously while the oven is in the Convection mode. The fan and convection element icons will glow while the fan is running. The fan will stop if the door is opened and begin operating again when the door is closed.
3. To cancel the Convection Bake/Roast function, press **CANCEL** or **CLEAR** on the oven control as you would to cancel any baking function.

### FAN MOTOR

The fan motor is mounted on the main back on the back side of the range. It can be accessed by removing the rear wire shields.

### FAN BLADE

The fan blade is mounted in the rear of the oven 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 the blade when removing or installing.

Access to the fan blade is gained by removing the fan shroud located inside the oven and held in place by two screws. The fan blade is held in place with a 13 mm 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 the motor vibrations increase, the noise made by the fan will be greater.

### FAN OPERATION

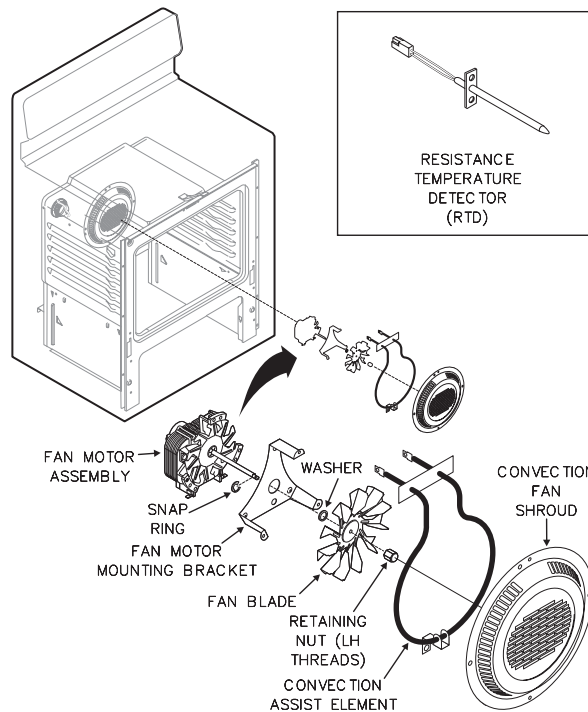
The fan motor runs continuously while in Convection Bake/Roast mode unless the door is opened.

If the fan does not operate, check the following:

- Is the oven control in Convection Bake/Roast mode?
- Are 120 volts available at the fan motor?
- Is the fan motor coil resistance 14.5 ohms  $\pm 10\%$ ?
- Is the door/light switch working properly?

### MOTOR MOUNTING BRACKET

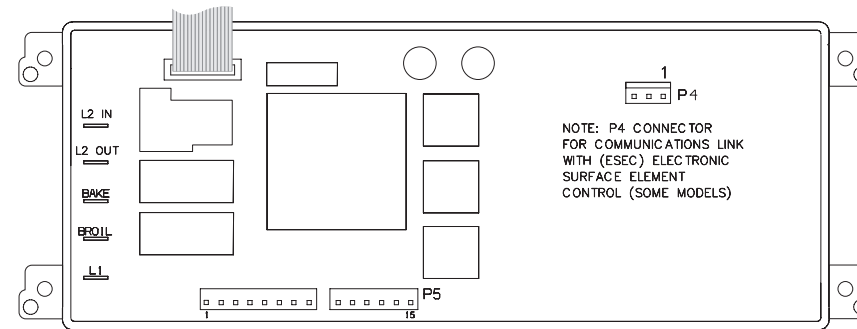
The fan motor on the rear of the range is mounted through the main back to a mounting bracket that is attached with three screws to the backside of the rear oven wall. Should it become necessary to replace this bracket, the main back must be removed to access the mounting screws.



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### ELECTRONIC OVEN CONTROL (REAR VIEW)



### OVEN CALIBRATION

Set the electronic oven control for normal baking at 350°F. Obtain an average oven temperature after a minimum of 5 cycles. Press **CANCEL** or **CLEAR** to end bake mode.

### TEMPERATURE ADJUSTMENT

1. While in a non-cooking mode, press and hold the **BAKE** pad for 6 seconds.
2. The current calibration offset (temperature adjustment) should appear in the temperature display.
3. Use the number pads (0-9) to enter the desired amount of adjustment (up to 35°F).
4. Press the **CLEAN** pad to change the sign of the adjustment to a (-) if necessary. A positive adjustment will not display a sign.
5. Once the desired adjustment (-35° to 35° F) has been entered, press the **START** pad to accept the change or the **CLEAR/CANCEL** pad to reject the change.

**Note:** Changing calibration affects all Baking modes. The adjustments made will not change the self-cleaning temperature.

### ELECTRONIC OVEN CONTROL FAULT CODE DESCRIPTIONS

**Note:** Four fault codes are displayed by this control - **F1**, **F2**, **F3** or **F9**. Generally, **F1** display implies the electronic oven control itself has detected an internal malfunction. **F2** implies the oven control has detected a problem with the communications link with the electronic surface element control (ESEC - some models). **F3** implies the control has detected a sensor probe failure. **F9** implies the control has detected a latch motor assembly problem. In any of these cases, an alarm will accompany a displayed **F1**, **F2**, **F3** or **F9**.

Fault Code	Likely Failure Condition/Cause	Suggested Corrective Action
<b>F1</b>	<ol style="list-style-type: none"> <li>1. Shorted keypad.</li> <li>2. Control's internal checksum may have become corrupted.</li> <li>3. Control has sensed a potential runaway oven condition. Control may have shorted relay, RTD sensor probe may have gone bad.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace EOC.</li> <li>2. Disconnect power, wait 30 seconds and reapply power. If fault returns upon power-up, replace EOC.</li> <li>3. 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> </ol>
<b>F2</b>	Control has detected a problem with the communications link with the electronic surface element control (ESEC - some models).	Check the wiring between the controls. Replace the control if necessary.
<b>F3</b>	<ol style="list-style-type: none"> <li>1. Open RTD sensor probe. Note: The EOC will initially display an <b>F1</b> for this condition. The EOC thinks a runaway oven condition exists.</li> <li>2. Shorted RTD sensor probe. Note: The <b>F3</b> for shorted probe should only occur when the oven is active or when an attempt is made to enter a mode.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check resistance at room temperature and compare to RTD sensor resistance chart. If resistance does not match the chart, replace RTD sensor probe.</li> <li>2. Check resistance at room temperature, if less than 500 ohms, replace RTD sensor probe.</li> </ol>
<b>F9</b>	Control has detected a problem with the Motor Door Latch Assembly.	Check the wiring. Replace the Motor Door Latch Assembly if necessary.

### REMOVING AND REPLACING WARMER DRAWER (some models)

**To Remove Warmer Drawer:**

1. **CAUTION** Turn power off before removing the warmer drawer.
2. Open the drawer to the fully opened position.
3. On the right glide you will find a shield attached with a hex-head screw (see figure 1). Using a 1/4" socket and ratchet remove the shield.
4. Locate glide lever on each side of drawer, pull up on the left glide lever and push down on the right glide lever.
5. Pull the drawer away from the range.

**To Replace Warmer Drawer:**

1. Replace shield on the right glide of the drawer body.
2. **Pull the bearing glides to the front** of the chassis glide (see figure 2).
3. Align the glide on each side of the drawer with the glide slots on the range.
4. Push the drawer into the range until levers "click" (approximately 2"). Pull the drawer open again to seat bearing glides into position. **If you do not hear the levers "click" or the bearing glides do not feel seated remove the drawer and repeat steps 2-4.** This will minimize possible damage to the bearing glides.

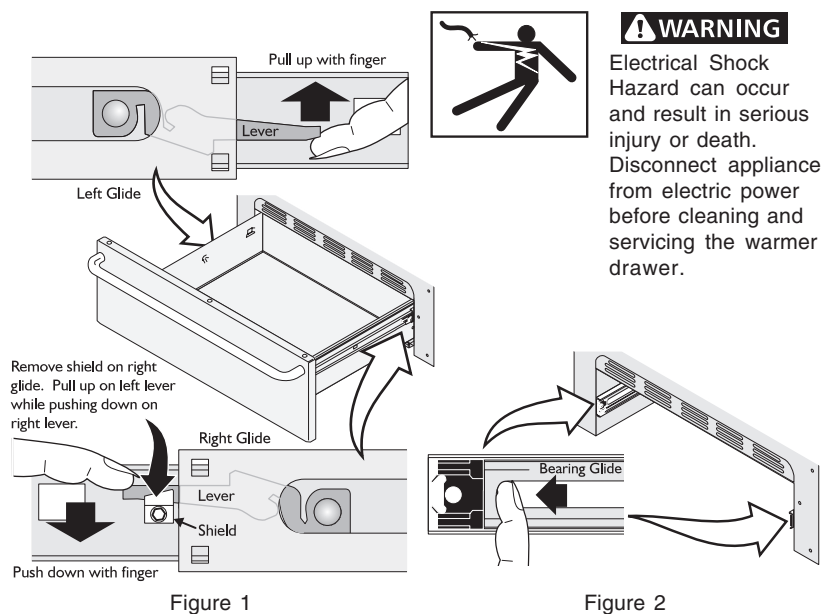


Figure 1

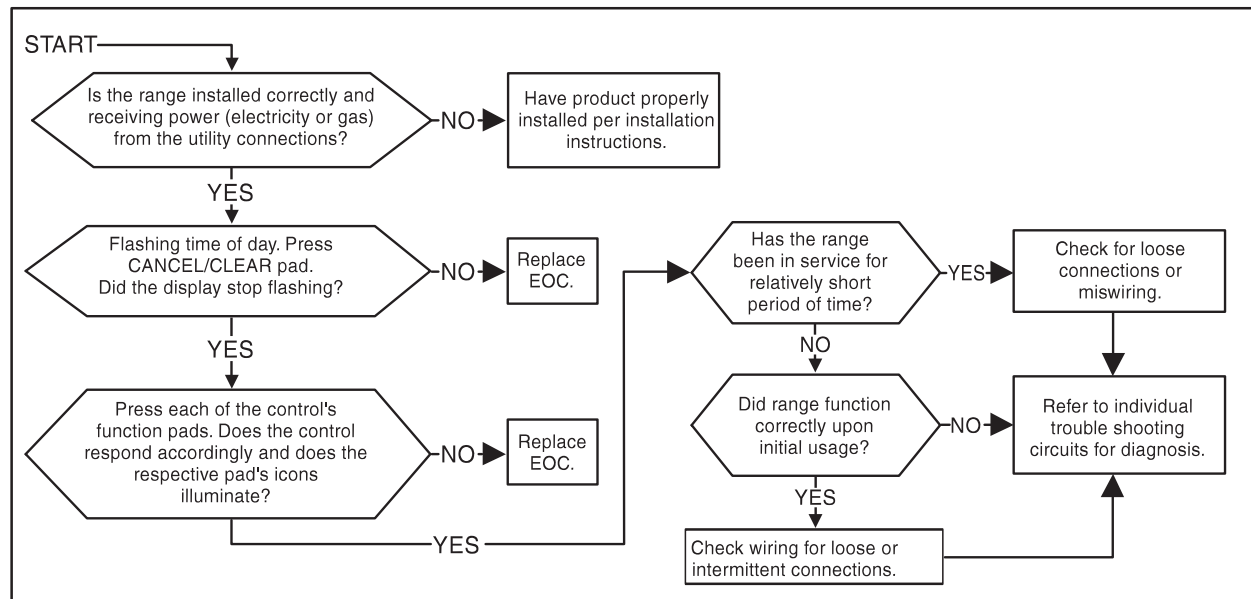
Figure 2

**CIRCUIT ANALYSIS MATRIX**

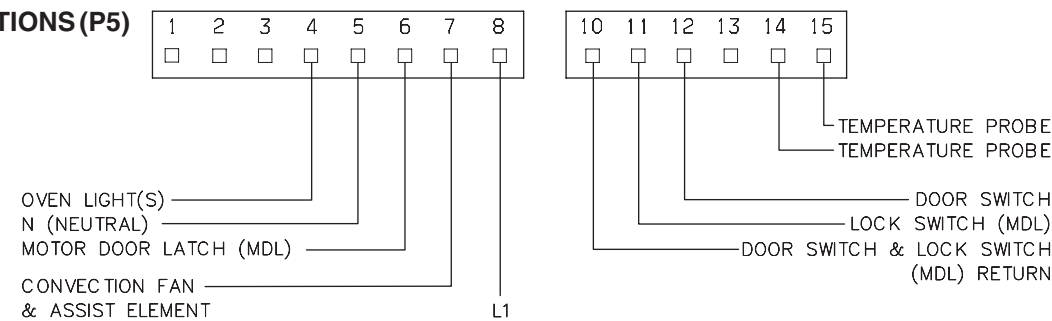
	EOC Relays						Door Switch COM-NO	Warmer Drawer Lock Switch (Motor Door Latch)
	L1 to Bake	L1 to Broil	L1 to Motor Door Latch	L1 to Convection Fan & Element	L1 to Oven Light(s)	L2 IN to L2 OUT (DLB)		
Bake/Time Bake **	X	X*				X		X
Convection Bake/Roast	X	X*		X		X		X
Broil		X				X		X
Clean	X					X		
Oven Light(s)					X			
Unlocked								X
Locking			X					X
Locked								
Unlocking			X					X
Door Open					X			
Door Closed							X	

Note: X=Check listed circuits. \*=Alternates with Bake element. \*\*=Includes "Meats", "Cakes" and "Breads" modes if equipped.

**ELECTRONIC OVEN CONTROL (EOC) TROUBLESHOOTING GUIDE**



**E.O.C. CONTROL CONNECTIONS (P5)**



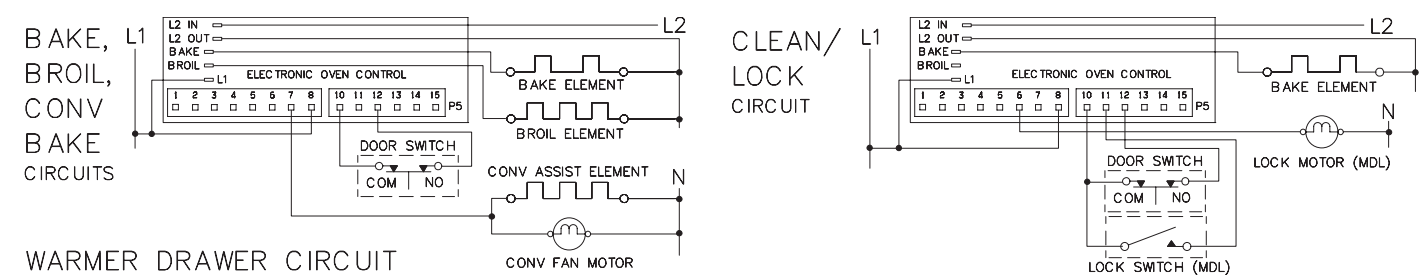
**TROUBLESHOOTING SCHEMATICS**

**NOTE: CIRCUITS SHOWN WITH ALL CONTROLS SET TO OFF. OVEN DOOR CLOSED AND UNLOCKED.**

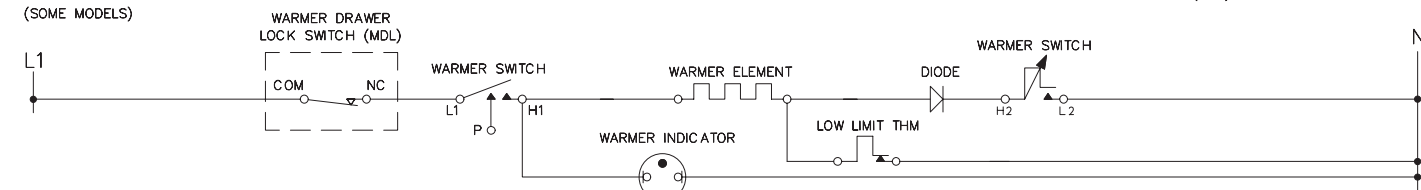
**LIGHTING CIRCUIT**



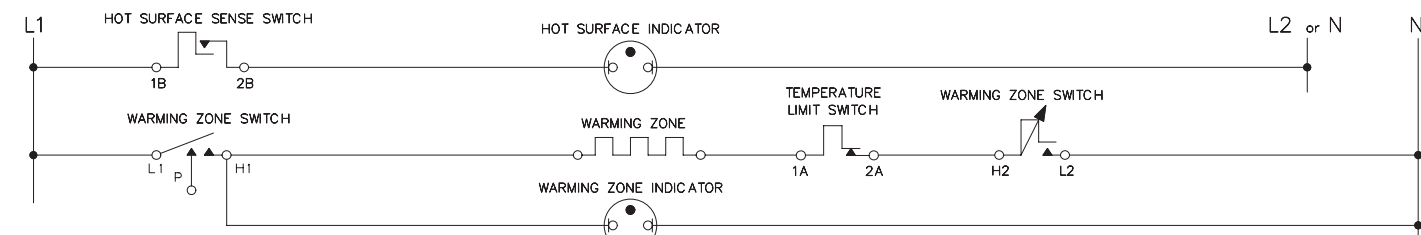
**TROUBLESHOOTING SCHEMATICS (continued)**



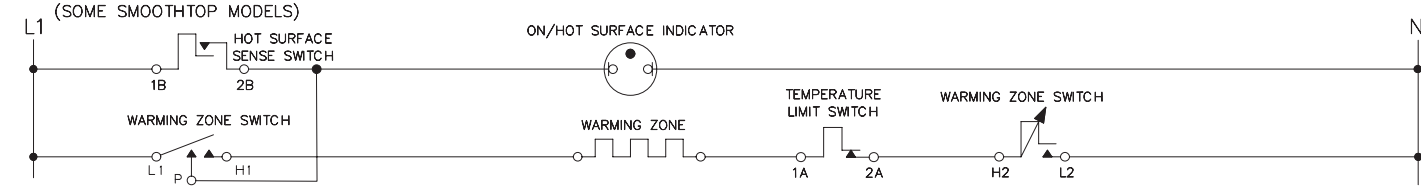
**WARMER DRAWER CIRCUIT (SOME MODELS)**



**WARMER ZONE CIRCUIT SEPARATE ON & HOT SURFACE INDICATOR LIGHTS (SOME SMOOTHTOP MODELS)**

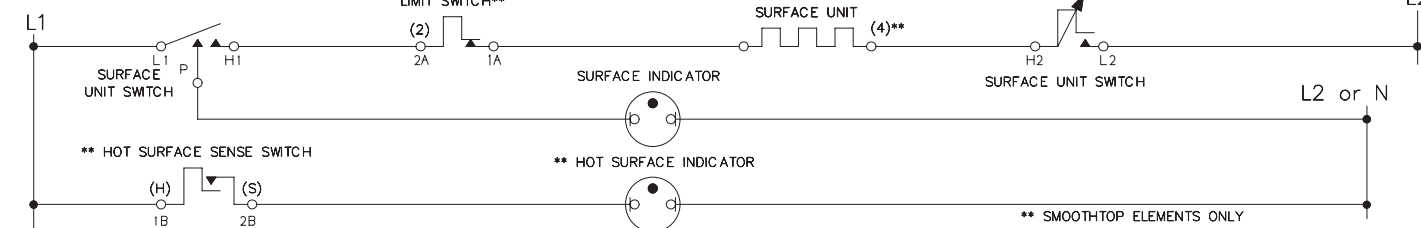


**WARMER ZONE CIRCUIT COMBINATION ON & HOT SURFACE INDICATOR LIGHT (SOME SMOOTHTOP MODELS)**

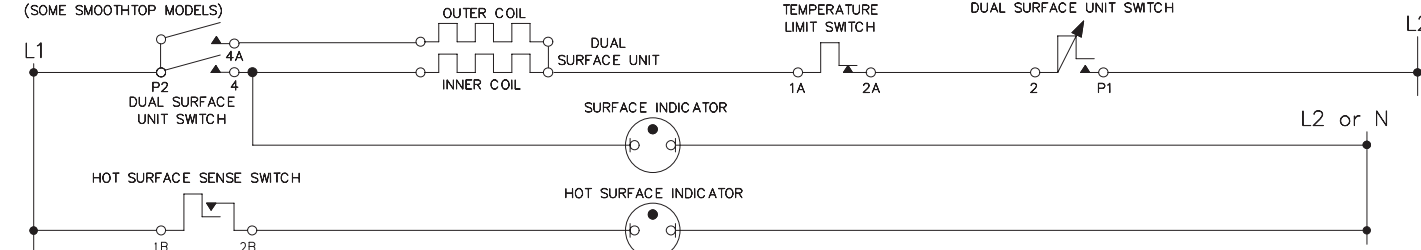


**NOTE: The following schematics apply to surface elements that do not have electronic controls (digital displays above the knobs). For surface elements with electronic controls (ESEC), refer to separate Service Data Sheet.**

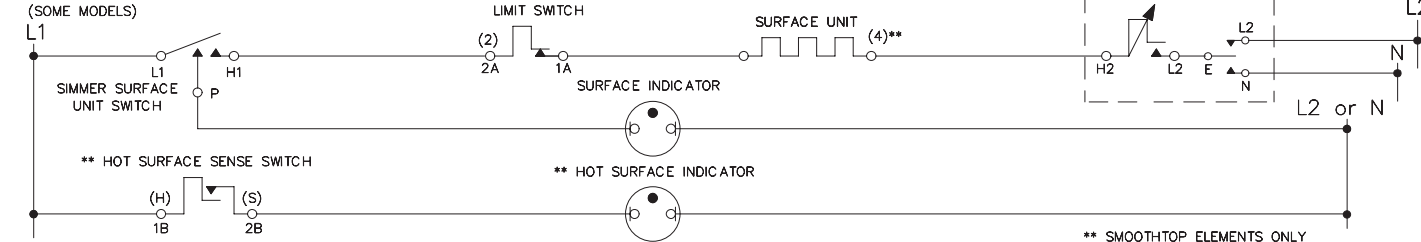
**TOP ELEMENT CIRCUIT**



**DUAL TOP ELEMENT CIRCUIT (SOME SMOOTHTOP MODELS)**



**TOP SIMMER ELEMENT CIRCUIT (SOME MODELS)**



# SERVICE DATA SHEET

Electric Smoothtop Ranges with Electronic Surface Element Control (ESEC)

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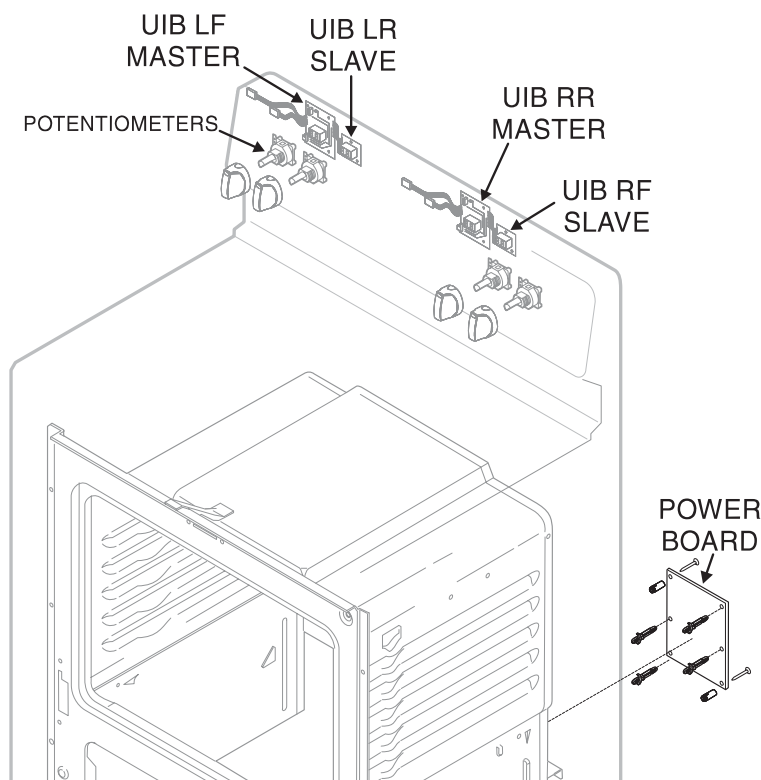
## ELECTRONIC SURFACE ELEMENT CONTROL (ESEC)

- This range is equipped with an Electronic Surface Element Control (ESEC), which precisely controls the smoothtop cooking elements at multiple settings. (The Warming Zone element is not controlled by the ESEC). For the user, the elements are operated in the same way as with conventional controls, by pushing in and turning the knob to the desired setting. The setting is shown in the digital display above the knob, instead of using graphics on the control panel.

**ESEC Hot Element Indicator ("HE")** - While an element surface is hot, that element's display will show "HE". This is in place of the usual hot surface indicator light on ranges with conventional controls.

**ESEC Lockout Feature ( "- - ")** - The electronic oven control's Clean and Lock features will not operate when a surface element is ON. Conversely, the surface elements controlled by the ESEC will not operate when an oven control Clean or Lock mode is active. When the oven control is in a Clean or Lock mode, "- -" will appear in the ESEC displays to signify that the surface elements are locked out. **NOTE:** The "HE" (hot element) display will always have priority over the "- -" display.

**ESEC System Components** - The ESEC system consists of a **Power Board** (main control board mounted on the mainback of the range), two **User Interface Boards** or **UIB's** (circuit boards with digital displays, mounted in the backguard), four **Potentiometers** (push-to-turn control for each element) and the **ESEC Harness** that connects the boards and the oven control. The ESEC boards communicate with each other to control the elements and with the oven control for the lockout modes. (See the ESEC System Diagram.)



## Notes on Replacing Parts

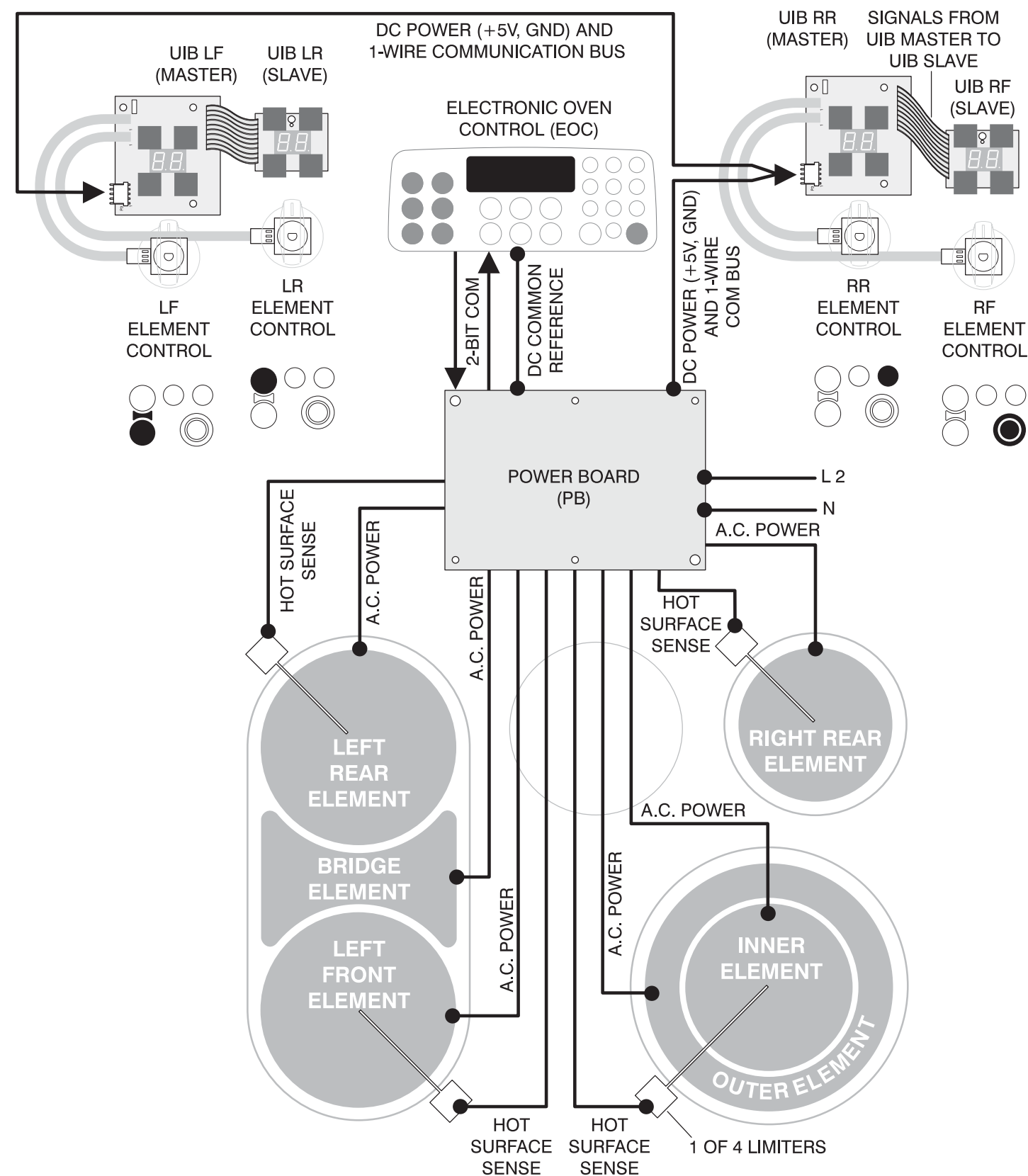
**Replacing Potentiometers** - Each of the four push-to-turn controls is mounted to the control panel with a hex nut and lockwasher. When replacing a potentiometer, do not over-tighten the hex nut - a torque of only 5 in.-lbs. is required to properly mount the potentiometer. Over-tightening the hex nut will negatively affect the smooth feel of the knob turn and can damage the potentiometer.

**Replacing the Power Board** - When replacing the main control board (power board) on the back of the range, do not over-tighten the 2 screws that secure the Power Board. A torque of only 10 in.-lbs. is required to tighten the screws. Over-tightening the screws can damage the plastic standoffs and possibly the board itself.

# SERVICE DATA SHEET

Electric Smoothtop Ranges with Electronic Surface Element Control (ESEC)

## ESEC SYSTEM DIAGRAM

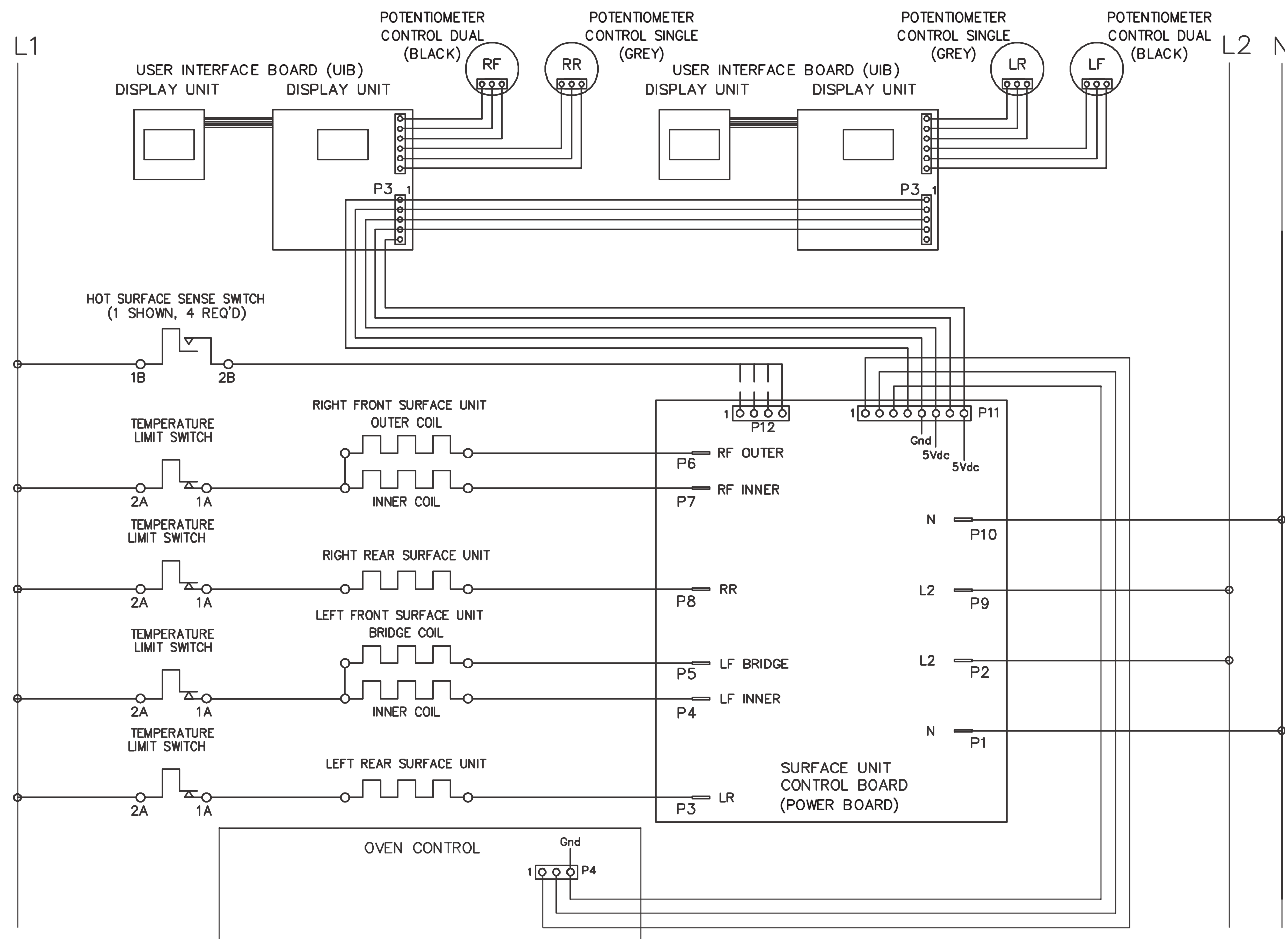


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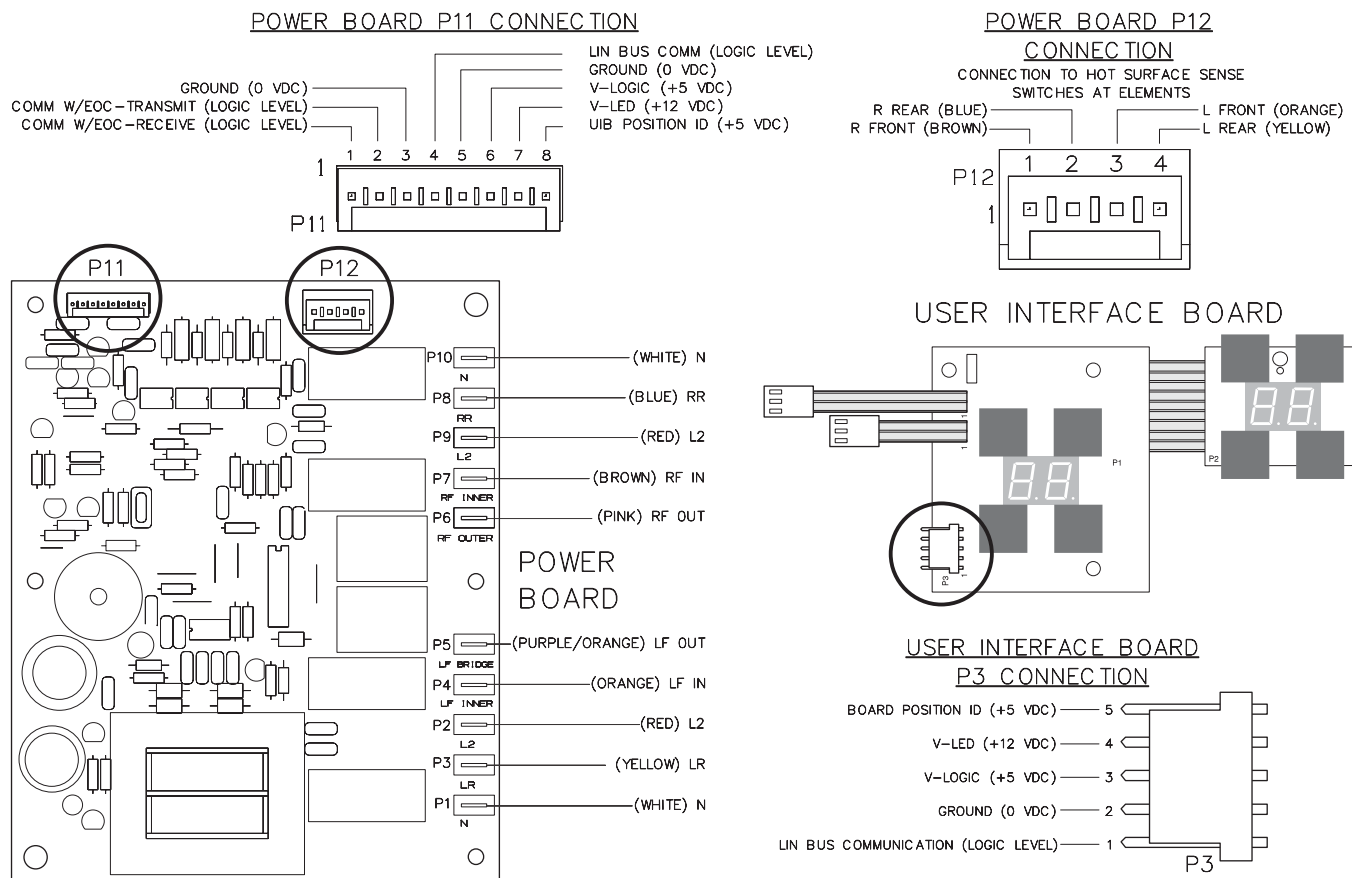
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## ESEC SYSTEM SCHEMATIC



## ESEC POWER BOARD AND USER INTERFACE BOARD WIRING



## ELECTRONIC SURFACE ELEMENT CONTROL (ESEC) TROUBLESHOOTING GUIDE

Symptom	Likely Failure Condition/Cause	Suggested Corrective Action
"Er" in displays	<b>Initialization Error</b> 1. One or more knobs ON at power-up. 2. One or more knobs ON when oven control comes out of a Clean or Lock mode. 3. Bad ESEC wire harness connection. 4. Damaged UIB (P3) connector or Power Board (P11) connector.	1. Turn all knobs OFF to reset control. 2. Turn all knobs OFF to reset control. 3. Check continuity of ESEC harness connections - replace harness if necessary. 4. Check if connectors have been damaged. If damaged, replace board.
"F5" in displays	<b>Communication break between Power Board and UIB's</b> 1. Bad ESEC wire harness connection. 2. Damaged UIB (P3) connector or Power Board (P11) connector. 3. Bad Left UIB - F5 is seen and beeps are heard when one of the right side knobs is turned on, while the left side displays are blank. 4. Bad Right UIB - F5 is seen and beeps are heard when one of the left side knobs is turned on, while the right side displays are blank. 5. Bad Power Board - F5 is seen on both sides when knobs on both sides are turned on, and no beeps are heard.	1. Check continuity of ESEC harness connections between Power Board and UIB's - replace harness if necessary. 2. Check if connectors have been damaged. If damaged, replace board. 3. Check harness and connector (P3) at left UIB are okay, replace left UIB. 4. If harness and connector (P3) at right UIB are okay, replace right UIB. 5. If harness and power board connector (P11) are okay, replace power board.
"F6" in displays	<b>Communication break between Power Board and Oven Control</b> 1. ESEC harness 3-wire connector not properly seated to Oven Control connector (P4). 2. Damaged Oven Control (P4) connector or Power Board (P11) connector. 3. Bad ESEC wire harness connection. 4. Bad Oven Control. 5. Bad Power Board.	1. Reseat the ESEC harness connector properly to the Oven Control connector (P4). 2. Check if connectors have been damaged. If damaged, replace control/board. 3. Check continuity of ESEC harness connections between Power Board and Oven Control - replace harness if necessary. 4. If harness and connector are okay, replace Oven Control. 5. If harness, connector and Oven Control are okay, replace Power Board.
"F7" in displays	<b>One or more potentiometers not connected properly, or one or more bad potentiometers</b> 1. One or more potentiometers not connected to UIB. 2. One or more bad potentiometers. 3. Bad UIB or UIB connection to potentiometer.	1. Reseat all potentiometer connectors. 2. With all connectors properly seated, turn all potentiometers to OFF position. -- If F7 persists: replace potentiometers one at a time until F7 disappears. -- If F7 disappears: turn on potentiometers one at a time & replace any potentiometer that causes F7 to re-appear. 3. If potentiometers are okay, replace UIB.
"HE" and no Element Power	At power-up, "HE" in display and Surface Element will not come ON Surface element and its associated hot surface limiter mis-wired.	Correct wiring of that element and its hot surface limiter.
"HE" in display even when surface is cold	1. Hot surface limiter on that element is "sticky" or welded closed. 2. Bad Power Board.	1. With power disconnected, check continuity of hot surface limiter contacts (1B-2B) at that element's terminal block. If contacts are closed even when the surface is cold (120VAC connected to P12 Power Board connector), replace element. 2. If hot surface limiter contacts (1B-2B) are open (120VAC not connected to P12 Power Board connector), replace power board.
Surface Element hot, but no "HE" appears	<b>Power Board does not see 120 VAC (from element's hot surface limiter) at P12 connector</b> 1. Four-wire connector from surface element harness not properly connected to Power Board P12 connector. 2. Miswiring of surface element harness. 3. Bad surface element. 4. Bad Power Board.	1. Check the four-wire connector and seat properly to Power Board P12 connector. 2. Check surface harness for correct wiring from each element's hot surface limiter - correct wiring or replace harness if necessary. 3. Turn on all elements to Hi. Wait a while to ensure all surfaces are hot. Check the voltage at all four P12 pins - if one of them does NOT read 120 VAC and the wiring from that element is correct, replace that surface element. 4. Turn on all elements to Hi. Wait a while to ensure all surfaces are hot. Check the voltage at all four P12 pins - if all read 120 VAC and the wiring from that element is correct, replace the Power Board.
All displays blank when all knobs are ON	1. ESEC wire harness not connected to UIBs or Power Board. 2. Power Board not receiving power from harness. 3. Bad ESEC wire harness. 4. Bad Power Board.	1. Check harness connections and reseat if necessary. 2. Verify that Neutral (white wire) is connected at terminal P1 and that L2 (red wire) is connected at terminal P2 on the Power Board. Correct wiring or replace harness if necessary. 3. Check continuity of ESEC harness connections. Replace harness if necessary. 4. If connections and harness are okay, replace Power Board.
No "Hi" or "Lo" at detent	1. Bad potentiometer. 2. Bad UIB.	1. Replace potentiometer. 2. Replace UIB.
Element does not come on	1. Miswiring at surface elements. 2. Miswiring at Power Board. 3. Bad Power Board.	1. Check wiring to surface elements. Correct wiring if necessary. 2. Check connections to Power Board terminals near relays & correct if necessary. 3. If wiring is correct, replace power board.
Missing segments in display	Bad UIB.	Replace UIB.