SERVICE DATA SHEET - Electric Range with ES 1040 Electronic Oven Control

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.

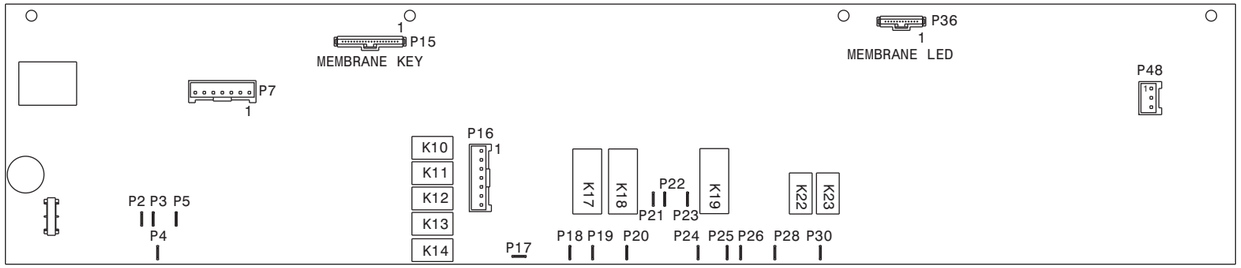
Oven Calibration

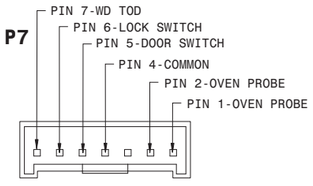
Set the electronic oven control for normal baking at 350°F. Obtain an average oven temperature after a minimum of 5 cycles. Press **cancel** key to end bake mode.

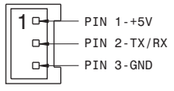
Temperature Adjustment

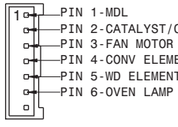
1. While in a non-cooking mode, press and hold the **bake** key for 6 seconds.
2. The current calibration offset (temperature adjustment) should appear in the temperature display.
3. Use the number keypad (0-9) to enter the desired amount of adjustment (up to 35°F).
4. Press the **bake** key to change 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** key to accept the change or the **cancel** key to reject the change.

NOTE: Changing calibration affects all baking modes. The adjustments made will not change the self-cleaning temperature.

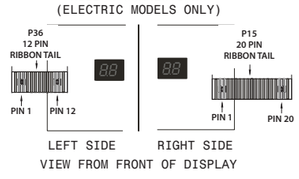








P3 - N
P4 - L2
P5 - L1
P17 - L1 IN
P19 - BAKE
P20 - BROIL
P21 - L1 IN
P23 - L2 OUT
P24 - L2 IN
P28 - L2 IN
P30 - WZ



CONNECTOR-PIN #	P15-1	P15-2	P15-3	P15-4	P15-5	P15-6	P15-8	P15-9	P15-10	P15-18	P15-19	P36-1	P36-2	P36-3	P36-4	P36-5	P36-6	P36-7	P36-8
P15-7	CONNECT LOOP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P15-11	1	BAKE	CONV CONVERT	COOK TIME	CONTROL LOCK	9	-	WZ ON/OFF	-	-	-	-	-	-	-	-	-	-	-
P15-12	4	BROIL	MY FAVORITES	END TIME	COOKTOP LOCK	6	-	WZ SELECT	-	-	-	-	-	-	-	-	-	-	-
P15-13	7	SLOW COOK	CONV ROAST	SET CLOCK	OVEN LIGHT	3	-	WD ON/OFF	LF SIZE	-	-	-	-	-	-	-	-	-	-
P15-14	START	CONV BAKE	KEEP WARM	TIMER ON/OFF	0	2	-	WD SELECT	RR SIZE	-	-	-	-	-	-	-	-	-	-
P15-15	CANCEL	CONV BROIL	RAPID PREHEAT	SELF CLEAN	8	5	CONNECT LOOP		RF SIZE	-	-	-	-	-	-	-	-	-	-
P15-16	LF ON/OFF	LF LOW	LF MED	LF HIGH	LR ON/OFF	LR LOW	-	LR MED	LR HIGH	-	CONNECT LOOP	-	-	-	-	-	-	-	-
P15-17	RF ON/OFF	RF LOW	RF MED	RF HIGH	RR ON/OFF	RR LOW	-	RR MED	RR HIGH	CONNECT LOOP	-	-	-	-	-	-	-	-	-
P15-20	-	-	-	-	CONNECT LOOP	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P36-9	-	-	-	-	-	-	-	-	-	-	-	WZ ON (BOTTOM)	WZ_LOW (LOWEST)	WZ MED LOW	WD ON BOTTOM	LF1 SIZE (BOTTOM)	LF2 SIZE (TOP)	RR1 SIZE (BOTTOM)	WD MED
P36-10	-	-	-	-	-	-	-	-	-	-	-	WZ MED	WZ MED HIGH	WZ HIGH (HIGHEST)	WD LOW LOWEST	RR2 SIZE (TOP)	RF1 SIZE (BOTTOM)	RF2 SIZE (TOP)	WD HIGH
P36-11 (UNUSED)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P36-12	-	-	-	-	-	-	-	-	-	-	-	CONNECT LOOP	-	-	-	-	-	-	-

IMPORTANT

DO NOT REMOVE THIS BAG OR DESTROY THE CONTENTS

WIRING DIAGRAMS AND SERVICE INFORMATION ENCLOSED

REPLACE CONTENTS IN BAG

To test keypad function, check for continuity between indicated pin locations while pressing the keypad. EXAMPLE: test the BAKE key on connector P15 with the P2 and P11; test the Warmer Zone Medium on connector P36 with P1 and P10.

Tech Sheet Abbreviations and Terminology	
EOC = Electronic Oven Control VSC = Variable Speed Control PS = Power Supply board (PS1, PS2, etc.)	RTD = Resistance temperature device (Temp. probe/sensor) TCO = Thermal cut out, also "thermo disc" or "thermal limiter" PS = Power Supply board (PS1, PS2, etc.)

PN 316904476 Rev A (1305)

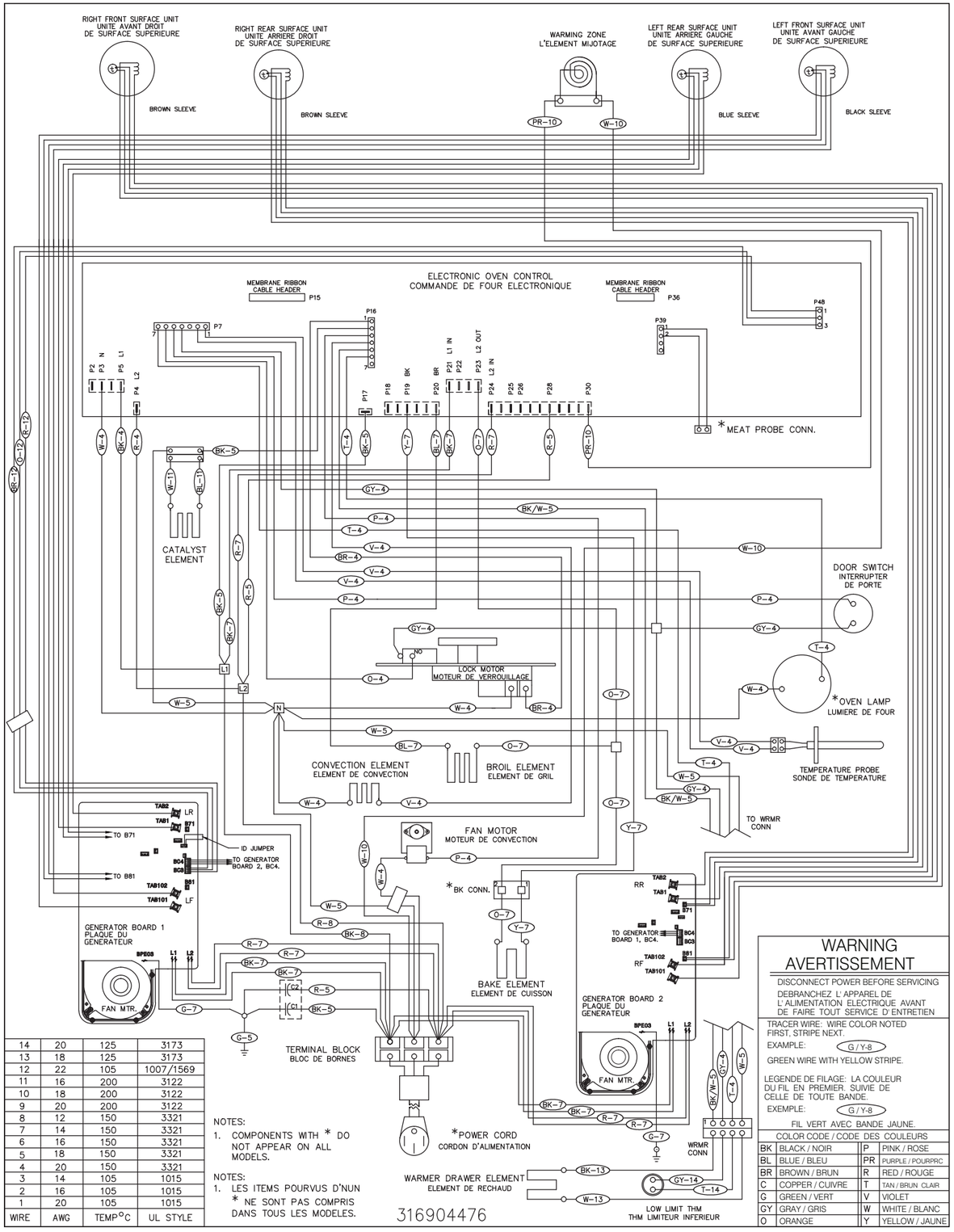
Electronic Oven Control Fault Code Descriptions		
Fault Code	Likely failure condition/cause	Suggested corrective action
F10	Runaway temperature. Oven heats when no cook cycle is programmed.	**If Oven is cold:** 1. If fault code is present with cold oven, test oven temperature sensor probe circuit resistance. Use RTD scale found in the tech sheet. 2. Replace probe or repair wiring connections if defective. 3. If temperature sensor probe circuit is good but fault code remains when oven is cold replace the EOC. **If Oven is overheating:** 1. If oven is severely overheating/heating when no cook cycle is programmed, test oven temperature sensor probe circuit resistance using the RTD scale found in the service tech sheet. Also verify that the temperature sensor probe in properly installed in the oven cavity. 2. Disconnect power from the range, wait 30 seconds and reapply power. If oven continues to heat when the power is reapplied, replace the EOC. **NOTE:** Severe overheating may require the entire oven to be replaced should damage be extensive.
F11	Shorted keypad or selector switch.	1. Reset power supply to range - Disconnect power, wait 30 seconds and reapply power. 2. Check/reseat ribbon harness connections between touch panel and EOC. 3. Test keyboard circuits using test matrix. Replace touch panel if defective. 4. If keyboard circuits check correctly, replace the EOC.
F12 F13	EOC Internal software error or failure.	Disconnect power, wait 30 seconds and reapply power. If fault returns upon power-up, replace EOC.
F14	Keyboard tail failure.	1. Check/reseat ribbon harness connections between keyboard touch panel and EOC. 2. Test keyboard circuits using test matrix (below). Replace touch panel if defective. 3. If keyboard circuits check correctly, replace EOC.
F17 F18	EOC Internal hardware error of failure.	Disconnect power, wait 30 seconds and reapply power. If fault returns upon power-up, replace EOC.
F30	Open oven sensor probe circuit.	Check resistance at room temperature and compare to RTD Sensor resistance chart. If resistance is correct replace the EOC. If resistance does not match the RTD chart, replace RTD sensor probe. Check sensor wiring harness between EOC and sensor probe connector.
F31	Shorted oven sensor probe circuit.	Check resistance at room temperature. If less than 500 ohms, replace RTD sensor probe. Check for shorted sensor probe harness between EOC and probe connector. If resistance is correct, replace the EOC.
F42	EOC internal software configuration error.	Usually this failure code would only appear if the EOC has been replaced with an incorrect version. Verify that the correct replacement part number is being used.
F50	Internal signal voltage error.	Disconnect power, wait 30 seconds and reapply power. If fault returns when power is reapplied, replace EOC.
F51	Display communication error.	
F60	EOC oven temperature. Higher than normal temperature detected on the EOC board.	1. Verify proper assembly of backguard panel. Check for damaged or loose panels, brackets, endcaps, etc. 2. Check for blocked ventilation slots in control panel rear cover. 3. Inspect oven vent for proper assembly and air flow. 4. Verify operation of cooling fan (if present).
F64	Time Base failure. The EOC cannot determine if connected to 50Hz or 60Hz power supply.	Confirm that range is connected to proper power source (50Hz or 60Hz). Generators or other portable power supplies and solar grids, etc., may not provide proper power supply. If power source is correct, replace the EOC.
F65	Keyboard short circuit or internal EOC failure.	1. Test keyboard circuits using test matrix. Replace touch panel if defective. 2. If keyboard circuits check correctly, replace the EOC
F66	EOC internal power supply failure.	Disconnect power, wait 30 seconds and reapply power. If fault returns upon power-up, replace EOC.
F68	High voltage condition. L1 or L2 may be crossed with Neutral on incoming PS.	1. Verify proper incoming line voltage and polarity of L1, L2 and Neutral power supply connections at range terminal block. 2. If power supply voltage and polarity are correct, replace EOC.
F90 F91 F95	Door lock motor or latch circuit failure.	**If lock motor runs:** 1. Test continuity of wiring between EOC 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 assembly. 3. If motor runs and switch contacts and wiring harness test correctly, replace the EOC. **If lock motor does not run:** 1. Test continuity of lock motor windings. Replace lock motor assembly 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 EOC.

RTD SCALE	
Temperature °F (°C)	**Resistance (ohms)**
32 ± 1.9 (0 ± 1.0)	1000 ± 4.0
75 ± 2.5 (24 ± 1.3)	1091 ± 5.3
250 ± 4.4 (121 ± 2.4)	1453 ± 8.9
350 ± 5.4 (177 ± 3.0)	1654 ± 10.8
450 ± 6.9 (232 ± 3.8)	1852 ± 13.5
550 ± 8.2 (288 ± 4.5)	2047 ± 15.8
650 ± 9.6 (343 ± 5.3)	2237 ± 18.5
900 ± 13.6 (482 ±7.5)	2697 ± 24.4
Probe circuit to case ground	Open circuit/infinite resistance

	EOC Relays - ES1030 Oven Control (Electric)									
	L1 to Bake	L1 to Broil	L1 to Motor Door Latch	L1 to Conv Bake Fan	L1 to Conv. Heating Element	L2 In to L2 Out	L1 to Warming Drawer	L1 to Catalyst Element	L1 to Oven Lamps	Door Switch Contacts **COM-NO**
Bake/Time Bake	X◊	X*		X†	X†	X				
Conv Bake	X◊	X*		X	X	X				
Broil		X				X				
Clean	X◊	X*				X		X		
Unlocked										
Locking			X							
Locked										
Unlocking			X							
Door Open									X	O
Door Closed									O	X
Oven Lamps ON									X	
Warming Drawer							X◊			

NOTE: X=Circuit Contacts Closed O = Circuit Contacts Open * = Alternates with Bake Element † = During Preheat ◊ = Cycles as Needed

General Troubleshooting Diagram



14	20	125	3173
13	18	125	3173
12	22	105	1007/1569
11	16	200	3122
10	18	200	3122
9	20	200	3122
8	12	150	3321
7	14	150	3321
6	16	150	3321
5	18	150	3321
4	20	150	3321
3	14	105	1015
2	16	105	1015
1	20	105	1015
WIRE	AWG	TEMP°C	UL STYLE

NOTES:
1. COMPONENTS WITH * DO NOT APPEAR ON ALL MODELS.

NOTES:
1. LES ITEMS POURVUS D'NUN * NE SONT PAS COMPRIS DANS TOUS LES MODELES.

WARNING
AVERTISSEMENT

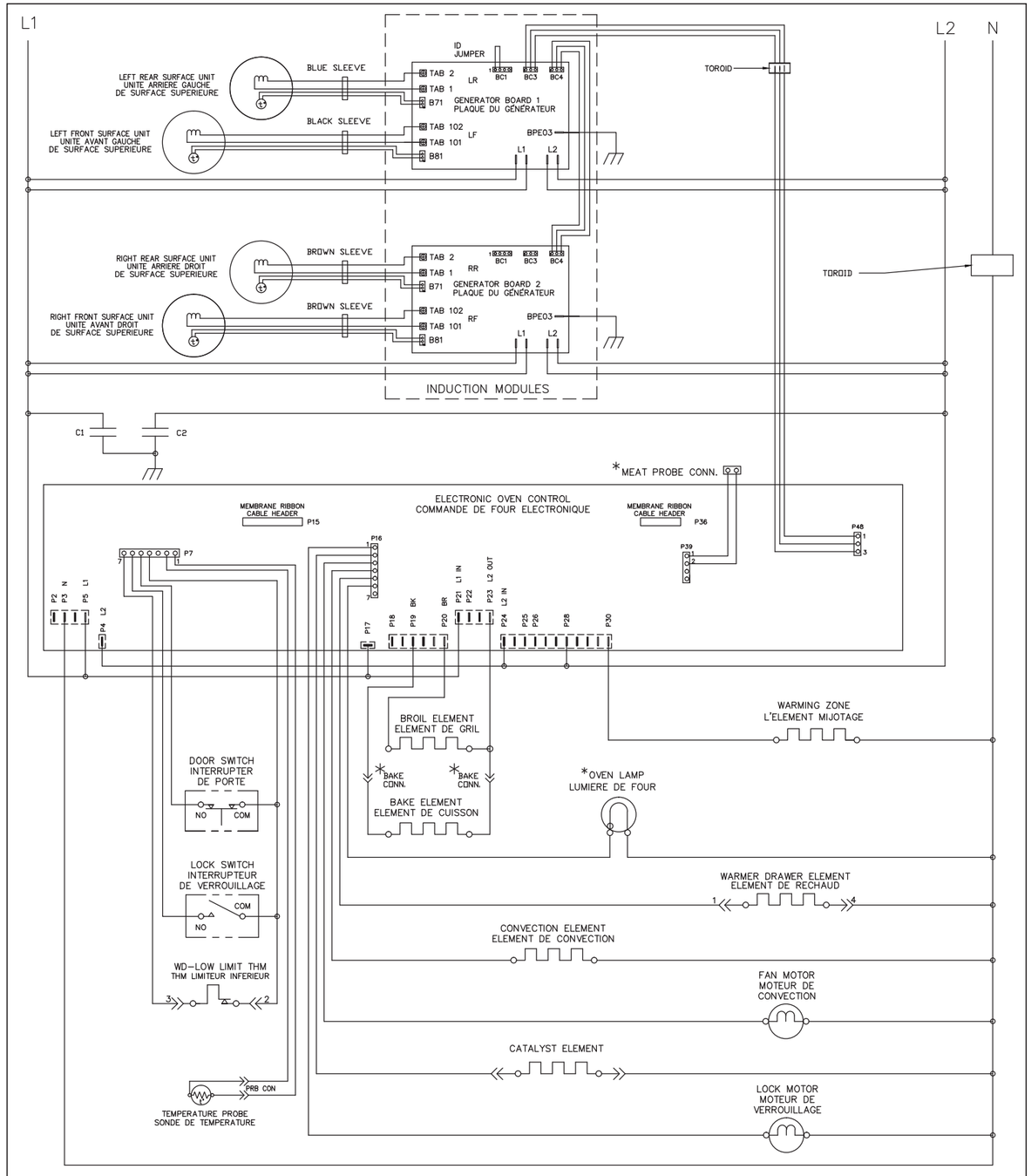
DISCONNECT POWER BEFORE SERVICING
DEBRANCHEZ L' APPAREL DE L' ALIMENTATION ELECTRIQUE AVANT DE FAIRE TOUT SERVICE D' ENTRETIEN

TRACER WIRE: WIRE COLOR NOTED FIRST, STRIPE NEXT.
EXAMPLE: G / Y-8
GREEN WIRE WITH YELLOW STRIPE.

LEGENDE DE FILAGE: LA COULEUR DU FIL EN PREMIER, SUIVIE DE CELLE DE TOUTE BANDE.
EXEMPLE: G / Y-8
FIL VERT AVEC BANDE JAUNE.

COLOR CODE / CODE DES COULEURS			
BK	BLACK / NOIR	P	PINK / ROSE
BL	BLUE / BLEU	PR	PURPLE / POURPRC
BR	BROWN / BRUN	R	RED / ROUGE
C	COPPER / CUIVRE	T	TAN / BRUN CLAIR
G	GREEN / VERT	V	VIOLET
GY	GRAY / GRIS	W	WHITE / BLANC
O	ORANGE	Y	YELLOW / JAUNE

General Troubleshooting Schematic



NOTES:
1. CIRCUIT SHOWN WITH ALL CONTROLS SET TO OFF.
2. COMPONENTS WITH * DO NOT APPEAR ON ALL MODELS.

NOTES:
1. ILLUSTRATION DE CIRCUIT AVEC TOUTES LES COMMANDES REGLEES A OFF. PORTE DE FOUR FERMEE ET DEVERROUILLEE.
2. LES ITEMS POURVUS D'NUN * NE SONT PAS COMPRIS DANS TOUS LES MODELES.

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