

**Thermador**  
THE HEART OF THE KITCHEN.™

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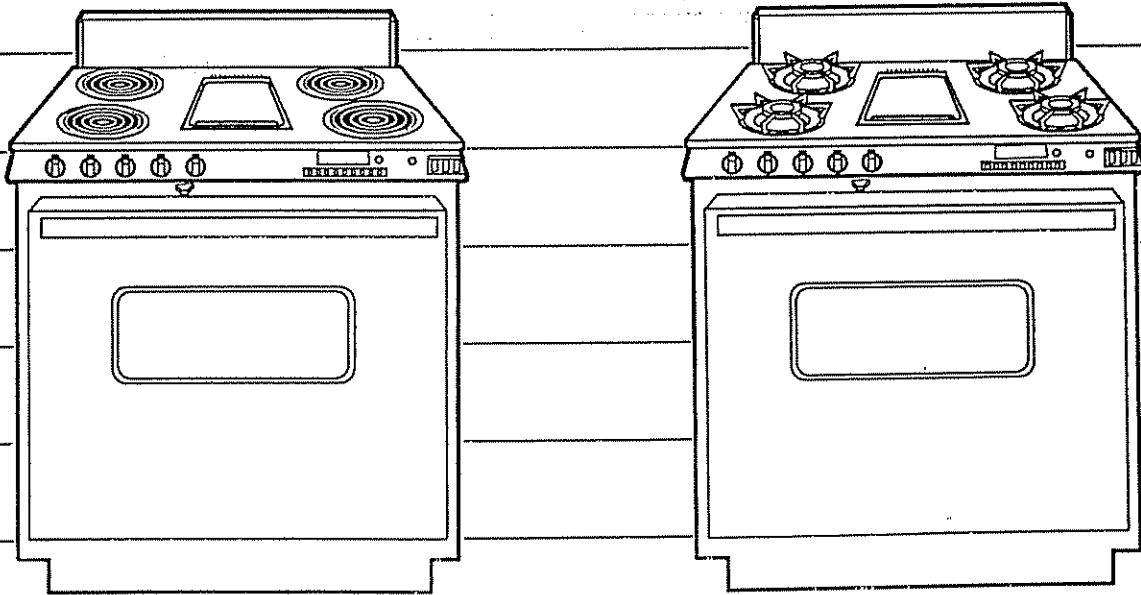
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# 30" RANGE SERVICE MANUAL

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Models ESC30, ESC30CV, GSC30 and GSC30CV



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## INTRODUCTION

This manual contains the information necessary for servicing the Thermador Drop-In ranges. It is designed solely for use by qualified service personnel. The service information in this manual is organized to help you find what you need quickly. This introduction contains general information applicable to any servicing activity. Read this entire section before proceeding.

*Operation and Features* provides the basics of how these units operate.

*Legend* is a key to the abbreviations used for the components on the wiring diagrams and schematics.

*Troubleshooting* helps you determine the probable cause of a malfunction and its most likely solution or test procedure.

*Servicing Guidelines* presents specific service tips along with general information important for overall customer safety and satisfaction.

*Cooktop Servicing, Oven Servicing, and Ventilating System Servicing* present step by step procedures for disassembling, testing, and repairing specific components of the range.

*Installation Instructions* will be useful when correcting faulty installation or after removing the unit from the cabinet for servicing.

## WARRANTY REPAIRS AND PARTS REPLACEMENT

Thermador ranges are guaranteed to be free from defects in material and workmanship for a period of one year from the date of installation. Replacement parts for the electric surface elements, the Griddle'n'Grill element and the element switches are warranted for a period of five years. Thermador agrees to replace or repair any part found to be defective in accordance with the terms of the warranty card supplied with each range.

Within the warranty period, dealers and service agencies are reminded of the following conditions:

1. Always replace complete assemblies. Do not attempt to disassemble range components while making field repairs.
2. The warranty applies only to work performed by a factory authorized service agency on appliances used in normal family households.

## INSTALLATION REQUIREMENTS

Check your local building code for the proper mode of installation. In the absence of local codes this unit should be installed in accordance with the *National Fuel Gas Code #Z223.1 - 1988* and *National Electrical Code ANSI/NFPA No. 70 - 1990* or the *CAN/CGA - B149 Installation Code for Gas Burning Appliances* and *C22.1 Canadian Electrical Code Part 1*. For further information see the *Installation Instructions* section.

### Gas Range, Models GSC30 and GSC30CV

This range is equipped for natural gas. Be certain the unit installed is equipped for the correct type of gas being used. Refer to the model and serial plate located behind the Griddle'n'Grill pan. To convert the

unit to propane gas you will need a propane conversion kit, model SLP 14-28-357.

**CAUTION:** The propane gas supply tank must be equipped with its own high pressure regulator in addition to the pressure regulator supplied inside the range. The maximum gas pressure to this appliance shall not exceed 14.0 inches water column ("WC).

### Electric Range, Models ESC30 and ESC30CV

The electrical supply must be a 3 wire, single phase AC with a grounded neutral. The unit is supplied with a flexible metallic conduit which should be connected to a metallic conduit system for proper grounding of the range. Local codes may permit grounding directly through the neutral line.

## MODEL AND SERIAL PLATE

The model and serial plate for this range is located in the Griddle'n'Grill compartment attached to the rear panel. When ordering parts for the range, always be sure to include the model number, and serial number.

The model and serial plate shows the ratings of the burners and elements, the type of fuel for which the unit is equipped, the pressure at which the unit was adjusted when it left the factory, and installation requirements.

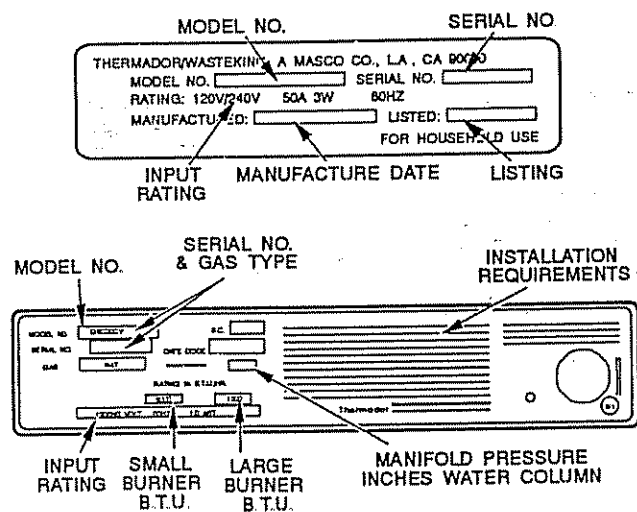


Figure 1. Model and Serial Plate

## OPERATION AND FEATURES

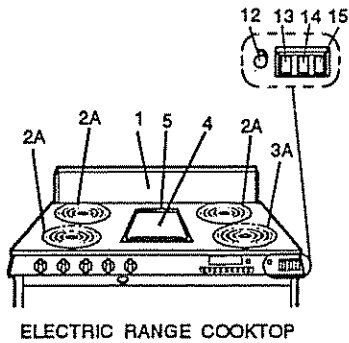
Thermador 30" Drop-In Self-Cleaning Gas and Electric Ranges have several engineering features that make their operation simple and safe for both the user and the adjoining cabinets.

Model ESC30 and ESC30CV electric ranges are equipped with four surface elements, a Griddle'n'Grill feature, an electric/convection oven, and on ESC30CV only a Cook'n'Vent® electric oven system.

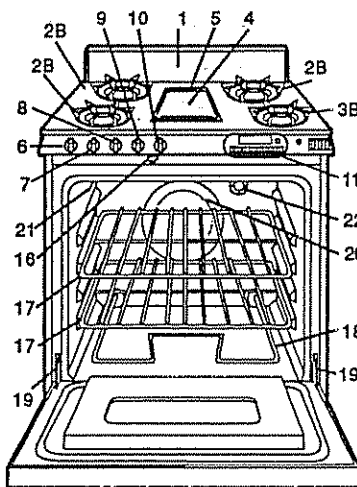
Model GSC30 and GSC30CV gas ranges are equipped with four gas burners, a Griddle'n'Grill feature, an electric/convection oven, and on GSC30CV only a Cook'n'Vent® electric oven system.

## FEATURES

- Self-cleaning oven which completely removes all hard baked-on fat or soil from the oven at 850°F to 875°F.
- Triple-duty oven temperature control.
- Fail-safe door latch that prevents opening the oven door until the cleaning cycle is complete and the oven temperature has lowered to a safe level.
- Cook'n'Vent system that allows local ventilation of the surface units.
- Blower-operated cooling and venting system that operates throughout the self-cleaning cycle and holds temperature on adjoining cabinet surfaces below the U.L. limit of 194°F.



ELECTRIC RANGE COOKTOP



GAS RANGE COOKTOP

Figure 2. Range Features

## RANGE CONTROLS

Cooktop functions, excluding Cook'n'Vent, are controlled by one of five knobs located on the front panel. Heat/flame settings are continuous and are controlled by turning the appropriate knob to desired setting from LO to HI. The gas flame may flare up when the valve is turned from LO to OFF since the valve goes past HI.

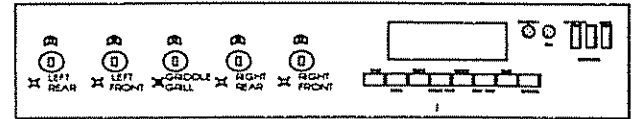


Figure 3. Range Controls

1. COOK'N' VENT ONLY IN MODELS ESC30CV AND GSC30CV
- 2A. 1250 WATT ELEMENT
- 2B. 9000 BTU/HR BURNER
- 3A. 2100 WATT ELEMENT
- 3B. 11000 BTU/HR BURNER
4. GRIDDLE'N'GRILL
5. OVEN VENT
6. FRONT, LEFT BURNER CONTROL
7. REAR, LEFT BURNER CONTROL
8. GRIDDLE/GRILL ELEMENT CONTROL
9. REAR RIGHT BURNER CONTROL
10. FRONT RIGHT BURNER CONTROL
11. DISPLAY WINDOW/TOUCH PAD
12. COOK'N' VENT FAN CONTROL
13. VENTILATION UP/DOWN SWITCH
14. CONVECTION SWITCH
15. OVEN LIGHT SWITCH
16. OVEN DOOR LATCH
17. OVEN RACKS
18. OVEN BAKE ELEMENT
19. OVEN DOOR HINGES
20. CONVECTION FAN
21. OVEN THERMOSTAT
22. OVEN LIGHT

### Element/Burner ON Indicator

A window above each cooktop control knob gives visual indication that the element/burner is ON. During operation, these windows show the heat setting selected with lighted numbers or words.

### Touch Pads

Pressing a touch pad controls the oven's functions by selecting the desired cooking/cleaning mode: BAKE, TIMED BAKE, BROIL or CLEAN. Each mode has several functions.

### Display Window

This window is located to the center right on control panel and displays:

- 0:00--Time of day
- TIMER--Minute timer counting down when in use
- BAKE, TIMED BAKE, BROIL, or CLEAN--Cooking/cleaning mode selected
- 000--Oven temperature
- OVEN ON--Range oven is in operation
- STOP TIME or TIME--Displays cooking/cleaning hours for TIMED BAKE or CLEAN mode
- DELAY OVEN or DELAY CLEAN--Shows that delayed start program is set
- DOOR--Indicates that the latch lever must be moved to LOCKED position for the CLEAN cycle

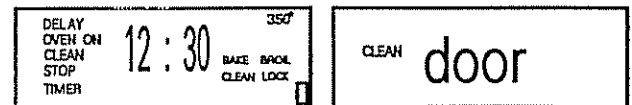


Figure 4. Display Window

### Time/Temp Knob

Turning this knob has different effects depending on what is shown in the display window.

- *Time of Day displayed*--TIME/TEMP knob changes current Time of Day setting.
- *BAKE or BROIL mode selected*--TIME/TEMP knob sets desired cooking temperature.
- *TIMED BAKE mode selected*--TIME/TEMP knob sets COOK TIME and STOP TIME.
- *CLEAN mode selected*--TIME/TEMP knob sets STOP TIME.

### Up/Down Switch

Pressing the UP/DOWN switch raises and lowers the Cook'n'Vent ventilator.

### Fan Knob

Turning the FAN knob activates the Cook'n'Vent blower and adjusts the blower's drawing power.

### Convection Switch

Pressing the bottom of the CONVECT switch turns on the convection fan. A red band is visible when the switch is down. The convection fan operates only when the oven is on, even with the colored band visible.

### Oven Light Switch

Press the bottom of the LIGHT switch to turn on the oven light; press the top to turn it off. (A red band at the top of the switch indicates the light is on.) The oven light does not operate during the CLEAN cycle.

### Clock

The clock controls all the timed functions of the oven (TIMED BAKE, CLEAN and DELAY START) and must be set prior to operating in timed modes. Set the clock when the oven is first connected to power, as follows:

1. Press the CLOCK pad.
2. Turn the TIME/TEMP knob until the correct time of day appears in the display window.
3. Press the CLOCK pad again to set the time entered.

### Minute Timer

The minute timer precisely times all cooking functions. It displays minutes and seconds up to 59 minutes 59 seconds (59:59). It shows hours and minutes from 1 hour 0 minutes (1:00) to 9 hours 50 minutes (9:50). When its countdown is complete, two zeros (:00) appear in the display window and you should hear three 1-second beeps, followed by 1 beep every 10 seconds until the timer is turned off.

## OVEN THERMOSTAT

The oven thermostat performs three functions:

1. Controls oven temperature for baking.
2. Controls infrared heat of upper element for broiling.
3. Controls oven temperature during self-cleaning cycle.

## OVEN/COOKTOP SOUNDS

- *Component cooling fan*—Automatically turns on whenever the oven is used and turns off as the oven cools. Keeps electronic controls and components cool during operation.
- *Convection fan*—Operates during any CONVECTION program when the CONVECT switch is turned on. Operates automatically during the CLEAN cycle.
- *Cook'n'Vent blower*—Operates with the fan control knob. The ventilator must be raised to the full up position in order for the blower to operate.

## CONTROL PANEL SOUNDS

- *One beep every second*—Starts 5 seconds after the first programming step in a series is performed. Indicates additional step(s) to be performed before the oven will operate.
- *One beep*—Indicates oven is preheated to a selected temperature.
- *Three 1-second beeps*—Indicates a TIMED BAKE program is completed.
- *Three 1-second beeps followed by 1 beep every 10 seconds*—Indicates minute TIMER has counted down to zero.

## SELF-CLEANING FEATURE

The self-cleaning feature enables the range to clean itself of normal soil. This is accomplished by slowly raising the oven temperature to approximately 850°F to 875°F where oven soil breaks up and disappears. The oven door must be locked during the CLEAN cycle, because the inrush of air when door is opened, combined with an oven temperature of 500°F or higher, could cause combustion of grease and soil.

### Door Latch Operation

The latch is operated by a lever above the oven door. To latch the door, move the lever to the right into LOCK position. If the door is not latched, DOOR appears in the display window, and a single beep is sounded every second until the door is latched. To unlatch the door, move the lever to the left.

### Lock Fail-Safe Mechanism

A fail-safe interlocking circuit prevents the oven from heating for cleaning unless the oven door is latched and all controls are properly set. Once the CLEAN cycle begins, the door is automatically locked and cannot be opened until the temperature lowers to a safe level. A bi-metal coil senses the oven cavity temperature. During the CLEAN cycle, the higher temperature causes the coil to retract. This keeps the locking bolt in the door latch assembly from moving, which in turn prevents the oven door from being opened. About 90 seconds after the latch locks, the panel displays the word LOCK. As the oven cools to a temperature below 300°F, the LOCK indicator goes off, and the oven door can be opened.

### Range Use During CLEAN

The two right elements on the electric range and the Griddle'n'Grill on the gas and electric range are locked out during the self-cleaning operation until LOCK disappears from the display window and the oven door can be opened.

## COOLING AND VENTILATING

The range is cooled and ventilated by means of an integral centrifugal component cooling blower. The electronic cooling motor draws air from the cabinet through the 6 holes in the side of the oven. The blower pushes air across the circuit board, the clock, and other components. During the CLEAN cycle, the convection fan turns on in order to cool the wires in the rear of the oven. The cooling systems of the range maintain temperatures that hold adjoining cabinet surfaces well below the U.L. limit of 194°F.

The efficiency of the exhaust system depends on the cleanliness of the ventilator, especially the filters, which should be cleaned frequently. The ventilating system should not be used without the filters in place.

## LEGEND

The wiring diagrams, schematics, and other sections will use an abbreviation for the name of a component. The following legend lists these abbreviations and the component names they represent.

### Abbreviation      Component Name

C	Capacitor for snorkel assembly
GM	Gear motor for snorkel
BM	Blower motor for snorkel assembly
ECM	Electronic cooling motor for solid state components
BLT	Blower thermostat to activate the ECM and CM
CM	Convection motor
HTC	High temperature cutout thermostat
NC	Normally closed switch
NO	Normally open switch
VS	Vent switch for snorkel assembly
RTS	Resistance temperature sensor (Sensor)
ERC	Electronic range control (Clock)
SW	Switch
LF	Left front
LR	Left rear
RF	Right front
RR	Right rear
SFT	Stalled fan thermostat used to cut the current to the relay board
E1 to E8	Terminals located on the relay board
K1 to K4	Relays located on the relay board

### Wire Leads

#### Abbreviation      Color

R	Red
BR	Brown
BK	Black
W	White
G	Green

# TROUBLESHOOTING

The troubleshooting chart in this section lists most of the problems for which service calls will be required. Use of this chart will save the service technician valuable time and will in many cases point out additional items to check during the same service call. If necessary,

refer to the schematic diagrams at the end of this section to further isolate a trouble.

Certain items listed in the troubleshooting chart are related to the use of the range. This is due to the frequency of service calls requested when the problem is improper use of the range. When encountered, this type of problem is usually easily handled by thoroughly explaining the proper operation of the range to the customer.

The troubleshooting chart refers to repair instructions located elsewhere in this manual. Turn to the referenced paragraphs and read them completely before starting to make the repair. Following the troubleshooting chart are other sections on soil patterns, circuit checks, and error codes that will be useful when diagnosing problems.

Symptom	Possible Cause	Action
Range will not operate (lights, oven and surface elements will not come on).	No power to the range.	Check for blown fuse or open circuit breaker. Check power supply line connection for 240 Volts.
Oven will not bake.	<ul style="list-style-type: none"> <li>a. No input power to oven.</li> <li>b. Relay not operating</li> <li>c. No input voltage to bake or broil elements</li> <li>d. Open circuit in bake element.</li> <li>e. Open circuit in broil element.</li> <li>f. Defective high temperature cutout.</li> <li>g. Clock defective.</li> <li>h. Oven relay defective.</li> <li>i. Oven not installed properly causing high temperature cutoff to activate.</li> </ul>	<ul style="list-style-type: none"> <li>Check for blown fuse or open circuit breaker.</li> <li>Check for improper or broken wiring.</li> <li>Check 9 pin relay connector.</li> <li>Check relay and repair or replace as necessary. Refer to <i>Circuit Checks</i>, page 10.</li> <li>Check for 120/240 input power to elements. If voltage is not found, check stalled fan thermostat and high temperature cutout for continuity, and circuit for open wiring. Repair or replace defective components. Refer to <i>Cooktop Servicing</i>, page 17.</li> <li>Check for continuity at bake element terminals. If no continuity, replace bake element. Refer to <i>Oven Bake Element Replacement</i>, page 23.</li> <li>Check for continuity at broil element terminals. If no continuity, replace broil element. Refer to <i>Oven Broil Element Replacement</i>, page 23.</li> <li>Check high temperature cutout and replace if defective. Refer to <i>High Temperature Cutout</i>, page 21.</li> <li>Replace ERC board assembly. Refer to <i>Circuit Checks</i>, page 10.</li> <li>Repair or replace relay. Refer to <i>Relay Board Removal</i>, page 20.</li> <li>Check that installation and venting has been done properly. Correct any deficiencies. Refer to <i>Installation Instructions</i>, page 25.</li> </ul>
Oven will not broil.	Possible causes are the same as for causes a. through i. above.	Action is the same as for a. through i. above.
Oven will not self-clean.	ERC board defective.	Replace the ERC board. Refer to <i>Circuit Checks</i> , page 10.

Symptom	Possible Cause	Action
Oven operates on bake but fails to operate properly on timed bake.	<ul style="list-style-type: none"> <li>a. Wiring between the relay board and control defective</li> <li>b. Touch pad defective.</li> <li>c. Clock processor defective.</li> <li>d. Clock or timer improperly set.</li> </ul>	<p>Check the wiring and repair or replace if defective</p> <p>Check touch pad button switches for continuity and replace the touch pad if defective.</p> <p>Replace display board assembly. Refer to <i>Touch Pad/Display Board</i>, page 24.</p> <p>Set timer in accordance with procedure of <i>Clock</i>, page 4. Explain the proper timed bake operation to the customer.</p>
Foods in oven not cooking sufficiently; cakes and breads do not brown or rise properly.	<ul style="list-style-type: none"> <li>a. Thermostat control calibrated too low.</li> <li>b. Oven door not sealing properly.</li> </ul>	<p>Calibrate thermostat. Refer to <i>Oven Temperature Control Calibration</i>, page 24.</p> <p>Check the oven door hinges and replace if worn or broken. Refer to <i>Oven Door Hinge Assembly Replacement</i>, page 22.</p>
Foods in oven overcooked with brown or burnt edges; meats dried on outside, undercooked on inside.	Oven thermostat control calibrated too low.	Calibrate thermostat. Refer to <i>Oven Temperature Control Calibration</i> , page 24.
Oven will not clean. Refer to Soil Patterns after Clean Cycle, following these troubleshooting charts.	<ul style="list-style-type: none"> <li>a. Door latch not moved to clean position.</li> <li>b. Latch switches not closing.</li> <li>c. Faulty wire connections.</li> <li>d. Thermostat defective.</li> <li>e. Relay defective.</li> <li>f. Defective high temperature cutout.</li> <li>g. Clock defective.</li> </ul>	<p>Move latch to clean position. Explain the oven clean operation to the customer.</p> <p>Replace latch switches. Refer to <i>Oven Door Latch Switches</i>, page 19.</p> <p>Repair wire connections as required.</p> <p>Test thermostat and replace if defective. Refer to <i>Circuit Checks</i>, page 10.</p> <p>Test the relay board. Repair or replace relay as required.</p> <p>Replace high temperature cutout.</p> <p>Replace ERC assembly. Refer to <i>Touch Pad/Display Board</i>, page 21.</p>
Convection blower fails to start during clean cycle or fails to operate properly.	<ul style="list-style-type: none"> <li>a. Open circuit in wiring to blower.</li> <li>b. Blower motor defective.</li> <li>c. Blower thermostat defective.</li> <li>d. Clock processor defective.</li> </ul>	<p>Repair wiring as required.</p> <p>Use an ohmmeter to check for resistance across the blower motor terminals. Replace blower motor if defective.</p> <p>Replace blower thermostat.</p> <p>Replace display board assembly. Refer to <i>Touch Pad/Display Board</i>, page 21.</p>
Oven light fails to come when the switch is set to ON. <i>Note: The oven light is not turned on by opening the oven door.</i>	<ul style="list-style-type: none"> <li>a. Oven light burned out.</li> <li>b. Oven light switch defective.</li> <li>c. Oven light receptacle defective.</li> </ul>	<p>Replace bulb. Refer to <i>Oven Light and Oven Light Receptacle Replacement</i>, page 24.</p> <p>Replace light switch.</p> <p>Replace oven light receptacle.</p>
Oven door latch cannot be moved to or from the locked position.	Oven door is not fully closed.	Release latch and close the oven door.



Symptom	Possible Cause	Action
Surface elements not heating.	<p>a. Element defective.</p> <p>b. Defective switch.</p> <p>c. Broken wiring from switch to heating element.</p> <p>d. Oven door latch in clean position disconnecting right two circuit elements (electric range) or Griddle'n'Grill (gas range).</p>	<p>Check element for proper resistance and replace if not correct. Refer to element resistance table.</p> <p>Check control for continuity and perform control check. Replace if open.</p> <p>Repair or replace defective wiring as required.</p> <p>Move latch to unlocked position.</p>
Surface elements heating too hot when control set to LO.	Defective element switch.	Check switch for proper resistance and replace if not correct. Refer to <i>Resistance Check</i> , page 10.
Griddle'n'Grill element not heating.	<p>a. Element not making proper contact in receptacle.</p> <p>b. Open heating element.</p> <p>c. Defective switch.</p> <p>d. Broken wiring from switch to heating element.</p>	<p>Check for proper installation of element. Repair or replace receptacle if defective.</p> <p>Check element for proper resistance and replace if not correct. Refer to element resistance table.</p> <p>Check griddle/grill continuity and perform control check. Replace if open.</p> <p>Repair or replace defective wiring as required.</p>
Elements won't cycle.	Switch contacts shorted closed.	Check the contacts if bad or mechanically not closing and replace if defective.
Gas burner will not ignite.	Improper gas flow or no gas flow to burner.	<p>Check the gas pressure.</p> <p>Check the top burner positioning. Check gas shut-off valve at wall. Check for bend or possible obstruction in gas line, pressure regulator, or orifices.</p>
Burner will not light with proper gas flow.	No spark to ignition plug.	Check if power is being supplied to the unit. Check plug wire for proper connection. Check spark switch with ohmmeter for normally closed circuit. If spark switch is OK, replace spark module.
Igniter lights but stays on continuously.	Defective wiring	Check for proper grounding at the spark module.
Burner cycles on and off.	Insufficient gas flow to burner.	Check for bend or possible obstruction in gas line, pressure regulator, or burners. Check pressure on both sides of the gas pressure regulator and orifice. If low on the wall side, have the house pressure regulator checked. If low on the range side, replace pressure regulator.
Burners go out if set below "2".	The installed regulator does not match the type of gas, natural or liquid propane, being used.	Install the correct pressure regulator for the type of gas being used.
Low or no spark at any ignition plug.	a. Low or no power to the range.	Check if power is being supplied to the unit. Correct damaged wiring, miswiring, connections, modules, or spark switches.
	b. High voltage circuitry is faulty.	Check spark intensity using a screwdriver connected by test leads to the terminal on the high voltage side of the spark module. While turning the spark switch, place the screwdriver 3/16" from the range frame and check for a strong blue spark. If spark is weak or absent, replace spark module.

Symptom	Possible Cause	Action
Continuous sparking	<ul style="list-style-type: none"> <li>a. Improper or no earth ground to unit.</li> <li>b. Spark switch wiring reversed at the module.</li> <li>c. Igniter plug too short.</li> <li>d. Cracked igniter plug.</li> </ul>	<p>Ground the unit properly. Install a spark kit.</p> <p>Correct the wiring.</p> <p>Install correct spark kit.</p> <p>Replace the igniter plug. Install a spark kit.</p>
Intake will not go UP or DOWN.	<ul style="list-style-type: none"> <li>a. Momentary up/down switch shorted or broken.</li> <li>b. Circuit breaker tripped.</li> <li>c. Gear motor switch open.</li> <li>d. Gear motor arm.</li> <li>e. Gear motor windings open.</li> </ul>	<p>With switch depressed check with ohmmeter across switch terminals for continuity.</p> <p>Check breaker and all wiring before resetting breaker.</p> <p>Switch should be N.C. to common going up and closed from N.O. to common going down.</p> <p>Adjust gear motor arm.</p> <p>Use ohmmeter to check for coil resistance. Check for power to the windings. Replace motor if necessary.</p>
Blower motor will not run.	<ul style="list-style-type: none"> <li>a. No voltage to blower motor.</li> <li>b. Open circuits through speed control.</li> <li>c. Circuit breaker tripped.</li> <li>d. Blower motor windings open.</li> <li>e. Blower motor capacitor open.</li> </ul>	<p>Check for faulty wiring bad connections.</p> <p>Check for voltage on wires 71 and 51 of the speed control switch on control panel. Replace if defective.</p> <p>Check breaker and all wiring before resetting breaker.</p> <p>Use ohmmeter to check for coil resistance. Check for power to the windings. Replace motor if necessary.</p> <p>Use ohmmeter to check for short across capacitor.</p>
Blower motor noisy.	<ul style="list-style-type: none"> <li>a. Blower wheel out of balance.</li> <li>b. Blower motor shaft out of alignment.</li> </ul>	<p>Adjust blower wheel.</p> <p>Visually check blower motor shaft and replace motor if out of alignment.</p>
Whistling noise when blower operating.	<ul style="list-style-type: none"> <li>a. Air is being drawn in through openings in the seams of the intake.</li> <li>b. Filters improperly installed.</li> <li>c. Hub loose on blower wheel</li> </ul>	<p>Visually check the intake assembly and ensure that the "V" seal is installed on the snorkel.</p> <p>Check ventilator filters and reinstall properly.</p> <p>Check the blower wheel hub.</p>
Insufficient air flow through ventilator.	<ul style="list-style-type: none"> <li>a. Ventilator filters dirty.</li> <li>b. Wrong size ducting or duct channel too long.</li> <li>c. Leaks in duct joints and seams.</li> <li>d. Obstruction in duct passage.</li> </ul>	<p>Remove ventilator filters, inspect and clean.</p> <p>Change ducting according to installation instructions supplied with the range unit.</p> <p>Visually check the ducting and install weather stripping and sealant as necessary. Verify proper duct installation according to installation instructions supplied with the range unit.</p> <p>Check for partially closed damper, crushed duct, or obstruction in passage.</p>

## SOIL PATTERNS AFTER CLEAN CYCLE

A self-cleaning problem can often be diagnosed by noticing the appearance of the soil or residue that remains after a CLEAN cycle. Improper cleaning will be evidenced by one of three soil patterns:

1. *Soil Brown and Soft.* The appearance of the soil is the same as that found after normal usage. This is an indication that the oven elements did not heat. Check the timer and element circuits for defects.
2. *Soil Dark Brown and Hard.* The oven probably reached a temperature of 600°F degrees, but the temperature did not reach the level needed to burn the soil off completely. This indicates that the CLEAN circuit has not energized. Check the timer CLEAN circuit for defects.
3. *Part of Soil Remaining.* This is evidence that cleaning took place but some spots and areas did not fully clean. Some conditions that cause this are:
  - a. Unusually heavy soil
  - b. One or more of the oven elements not heating properly.

Frequency of cleaning is a matter of customer judgement and should depend on the extent of soil to be cleaned. It is necessary in these cases to educate the customer on the cleaning operation of the unit. If an element is not heating, it must be serviced.

## CIRCUIT CHECKS

The BAKE, BROIL and CLEAN operations are controlled by the electronic clock and the relay board. Check the oven circuits by measuring the AC and DC voltages at the nine pin connector located on the relay board.

### AC Circuit Check

It is important to measure the AC voltages of the oven circuit first, since these voltages must be correct before a correct DC voltage can be obtained. To measure the oven circuit AC voltages:

1. Disconnect power to the range.
2. Remove the top and remove the front two access panels revealing the relay board.
3. Reconnect power to the range.
4. Set the oven control to OFF and measure the AC voltages across the pins as indicated in the table below.

#### Oven AC Voltages Minimums

Connect Across Pins	OFF
6 and 7	20.3V
8 and 9	3.2V

5. Replace the relay board if the AC voltages are incorrect in the OFF mode.

### DC Circuit Check

If the AC voltages obtained are correct, perform DC voltage measurements. To measure DC voltages:

1. Connect the negative (black) lead of the voltmeter to the range chassis and the positive (red) lead to the pin indicated in the table below.
2. Set the oven to the specified mode and measure the voltage at each pin indicated. Certain circuits require a 4 second delay between the time the control is set and the voltage reaches its proper level.
3. After the oven has reached a temperature above 350°F, 550°F during CLEAN cycle, turn the oven off. The values of the DC voltages on pin 5 should remain unchanged until the oven temperature cools to below 350°F. When temperature falls to less than 350°F the values will return to near zero (about .5VDC).

Pin/Signal	OFF	BAKE	BROIL	CLEAN	NOTES
1 - GND	0.0V	0.0V	0.0V	0.0V	
2 - Broil	0.0V	0.0V	-23.5V	-23.5V	after delay
3 - Bake	0.0V	-21.3V	0.0V	0.0V	
4 - Oven ON	0.0V	-28.8V	-28.8V	-28.8V	immediate
		-22.7V	-24.4V	-24.4V	after delay
5 - Oven temp	0.5V	-28.6V	-27.0V	-27.0V	immediate

4. If the DC voltages obtained are incorrect, recheck the AC voltages as described in the AC voltage check procedure and replace the oven clock/control board.
5. Monitor the oven elements for proper cycling to verify that the relays operate properly in each mode.
6. If voltages obtained are as listed in the table but there is no current flow through the element, check for a defective relay or an open oven element circuit.

### Resistance Check

Below is an element resistance/power chart showing the resistance, the wattage, and the voltage across each terminal of each element on both the electric and gas ranges. Refer to this chart when checking the range elements and performing circuit checks.

Element	Ohms	Wattage	Voltage
Bake Element	22.3	2600	240
Broil Element	5.8	3600	240
Large Surface	27.5	2100	240
Small Surface	45.1	1250	240
Griddle'n'Grill (Gas and Electric)	40	1400	240

**BAKE Circuit Check**

1. Remove the cooktop.
2. Remove the large front access panel under the cooktop that covers the latch and relay boards.
3. Attach a snap-around ammeter or wattage tester across the oven bake element supply cable at the terminal block, wire 22 or 24. See figure 13, page 18.
4. Select TIMED BAKE on the touch pad and program it to start five minutes in advance.
5. Set oven temperature to 400°F.
6. Allow the oven to be activated by the digital clock. If current is reaching the oven elements, the ammeter will give an indication.
7. If ammeter gives no indication, check the oven element and associated wiring for defects. Repair or replace if defective.
8. If the element is good, check the display and relay boards for defects. Replace if defective.

**BROIL Circuit Check**

1. Remove the cooktop.
2. Remove the large front access panel under the cooktop.
3. Attach a snap-around ammeter or wattage tester across the oven broil element supply cable at the terminal block, wire 26 or 27.
4. Select BROIL on the touch pad.
5. Set oven temperature to HIGH broil.
6. If current is reaching the oven elements, the ammeter will give an indication.
7. If ammeter gives no indication, check the oven element and associated wiring for defects. Repair or replace if defective.
8. If the element checks good, check the relay and ERC boards for defects. Replace if defective.

**CLEAN Circuit Check**

There are many components in the clean circuit that must be closed or opened during operation. To verify this:

1. Select CLEAN on the touch pad.
2. Move the oven door latch to the lock position.
3. Check that the right two elements are not heating on the electric range, and that the griddle/grill is not operating on the gas range during the clean cycle. This is normal operation.
4. Check that the ECM and CM are operating.
5. As the temperature reaches 550°F, check that the oven door latch is locked out and cannot be moved from the right (locked) position to the left (open) position.
6. Cancel the CLEAN operation. As the temperature lowers to below 350°F, check that the oven door latch can be opened.
7. Readjust or replace the latch switches if they do not function properly.
8. Check the residual soil patterns of the oven following the cleaning operation. Refer to *Soil Patterns after Clean Cycle*, page 9.

**CONTROL PANEL DISPLAY ERROR CODES**

Certain malfunctions that cause error codes to appear on the control panel display.

**F1 - Supervisory Relay Enable Shorted (non-cook mode):** Sounds alarm and inhibits cook modes if redundant supervisory relay enable circuit fails. Alarm fault monitor is always active in non-cook mode and requires removal of power until serviced. The Cancel Key will reset the display code and audible tone for a sample period of 16 seconds. The alarm will repeat if the fault persists.

**F2 - Bake/Clean Temp Runaway Alarm:** Sounds alarm and resets control to non-cook mode when Bake/Clean temperature exceeds programmed limits (635°C/965°F ±35°F). Alarm fault monitor is always active and requires the temperature to drop below the programmed limit and/or removal of power until serviced. The Cancel Key will reset the display code and causes an audible tone for a sample period of 16 seconds. The alarm will repeat if the fault persists.

**F3 - Open Temp Sensor:** Sounds alarm and inhibits cook modes. The Cancel Key resets the control to non-cook mode, which cancels the display code and audible tone. The alarm repeats if a cook mode is reactivated.

**F4 - Shorted Temp Sensor:** Sounds alarm and inhibits cook modes. The Cancel Key resets to non-cook mode, which cancels the display code and audible tone. The alarm repeats if a cook mode is reactivated.

**F5 - Supervisory Relay Enable Open (cook modes):** Sounds alarm and reset control to non-cook mode. The Cancel Key resets the display code and audible tone. The alarm repeats if a cook mode is reactivated.

**F6 - Missing AC Line Cycle Detector:** Displays code (no audible tone) and resets control to a non-cook mode if AC line cycles are missing for a sample period of one minute.

**F7 - Function Key Shorted:** Sounds alarm and resets control to non-cook mode if a Function Key short is detected for a 16 second sample period. A shorted Function Key will prevent recognition of the Cancel Key and requires removal of power until serviced.

**F8 - A/D Supervisory:** Sounds alarm and resets control to non-cook mode if calibration fault is detected for a 16 minute sample period. The Cancel Key resets the display code and audible tone. The alarm repeats if a cook mode is re-activated.

**F9 - Door Latch Supervisory (Door latched):** Sounds alarm and resets control to non-cook mode if the door latch supervisory logic fails for a sample period of 2 seconds (while the door is latched). Unlatching the door (if not locked) and Cancel Key may reset the display code and audible tone. If the door is locked (temperature 500°F), power must be removed until the oven door can be unlatched.

**SCHEMATICS**

The schematic wiring diagrams on the following pages are for the Thermador ESC30CV and GSC30CV ranges. Refer to these drawings during troubleshooting, circuit checks, and repair procedures.

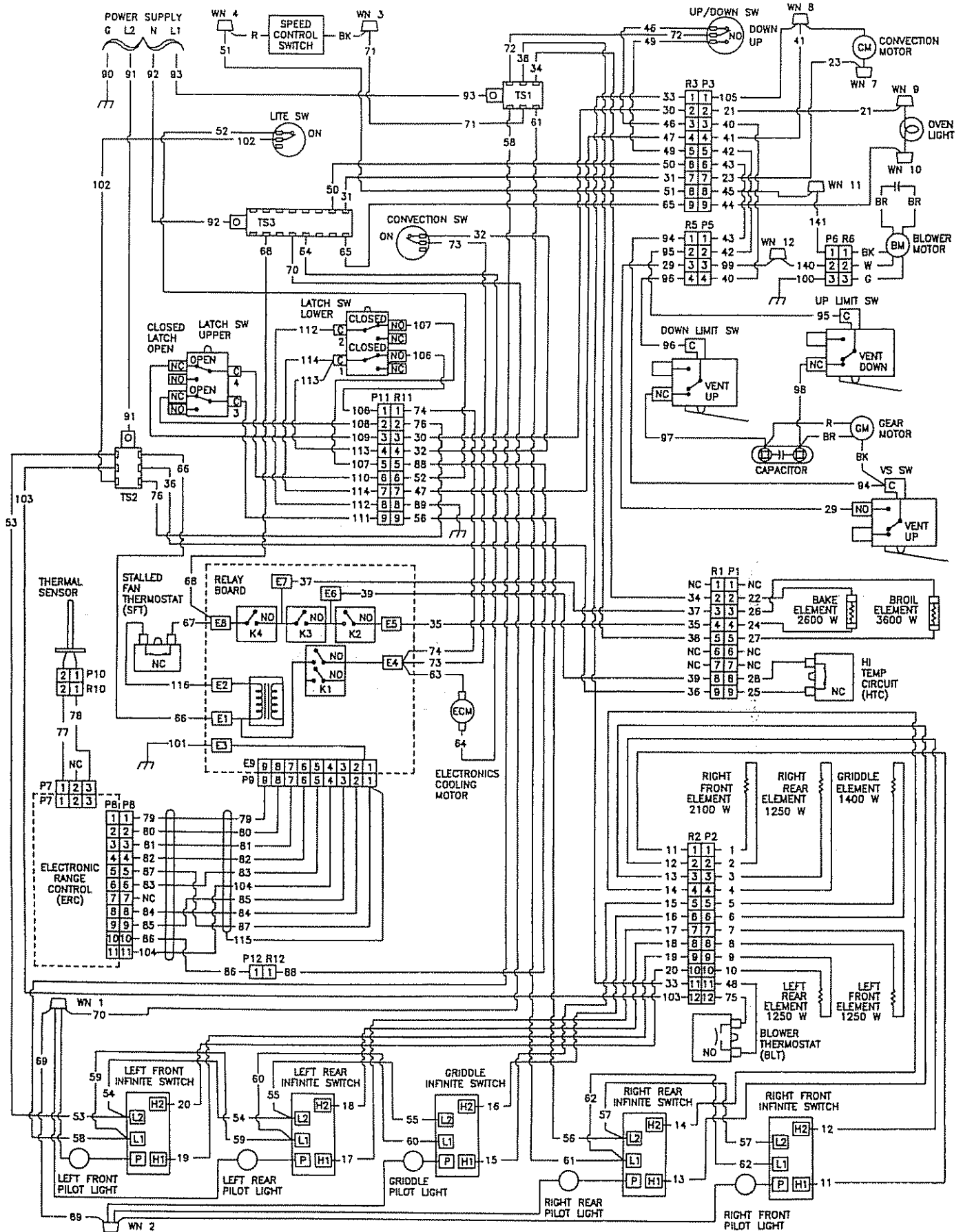
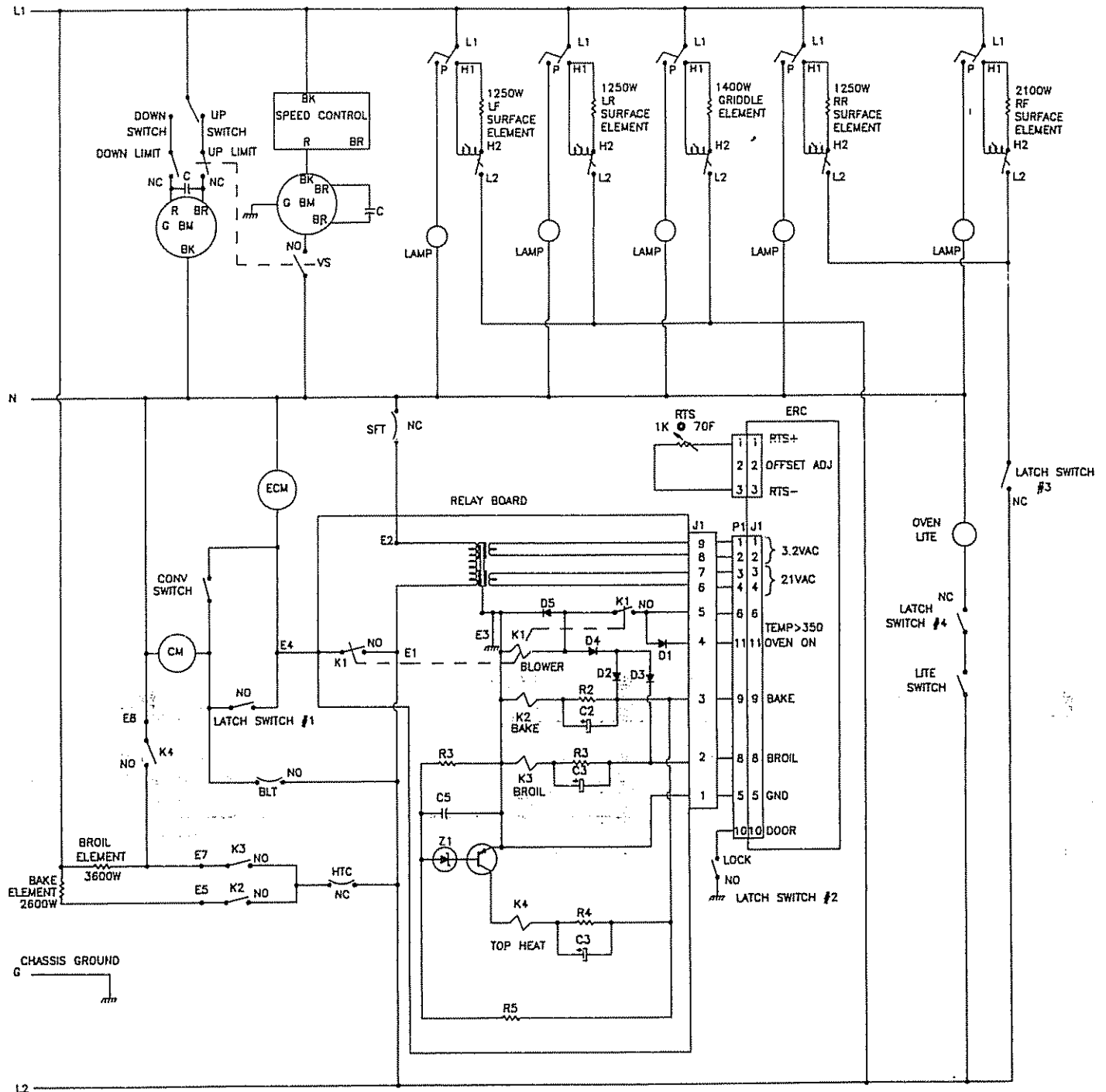


Figure 5. ESC30CV Wiring Diagram



- C = CAPACITOR
- GM = GEAR MOTOR
- BM = BLOWER MOTOR
- ECM = ELECTRONIC COOLING MOTOR
- BLT = BLOWER THERMOSTAT
- CM = CONVECTION MOTOR
- HTC = HIGH TEMP CUTOUT
- NC = NORMALLY CLOSED
- NO = NORMALLY OPEN
- VS = VENT SWITCH
- RTS = RESISTANCE TEMPERATURE SENSOR
- ERC = ELECTRIC RANGE CONTROL
- SW = SWITCH
- LF = LEFT FRONT
- LR = LEFT REAR
- RR = RIGHT REAR
- RF = RIGHT FRONT
- SFT = STALLED FAN THERMOSTAT
- E1-E8 = TERMINALS LOCATED ON RELAY BOARD
- K1-K4 = RELAYS LOCATED ON RELAY BOARD

- WIRE LEADS
- R = RED
  - BR = BROWN
  - BK = BLACK
  - W = WHITE
  - G = GREEN

RELAY COIL CONDITION CHART		BK	BR	CL
K1	ELECTRONIC COOLING MOTOR	A	A	A
K2	BAKE	B		C2
K3	BROIL		B	C1
K4	1/4 W BROIL	B		C2

A. STAYS ON AFTER TRIGGERED. TRIGGERED BY TURN-ON OF HEAT (X2,3 OR 4). TURNS OFF WHEN <350F, AFTER A PROGRAM CANCEL.

B. ON WHEN HEAT IS REQUIRED IN OVEN.

C1 ON FOR FIRST 45 MINUTES OF CLEAN PROGRAM, WHEN HEAT IS REQUIRED IN OVEN.

C2 ON FOR FIRST 15 MIN. OF CLEAN PROGRAM, WHEN HEAT IS REQUIRED IN OVEN.

Figure 6. ESC30CV Schematic

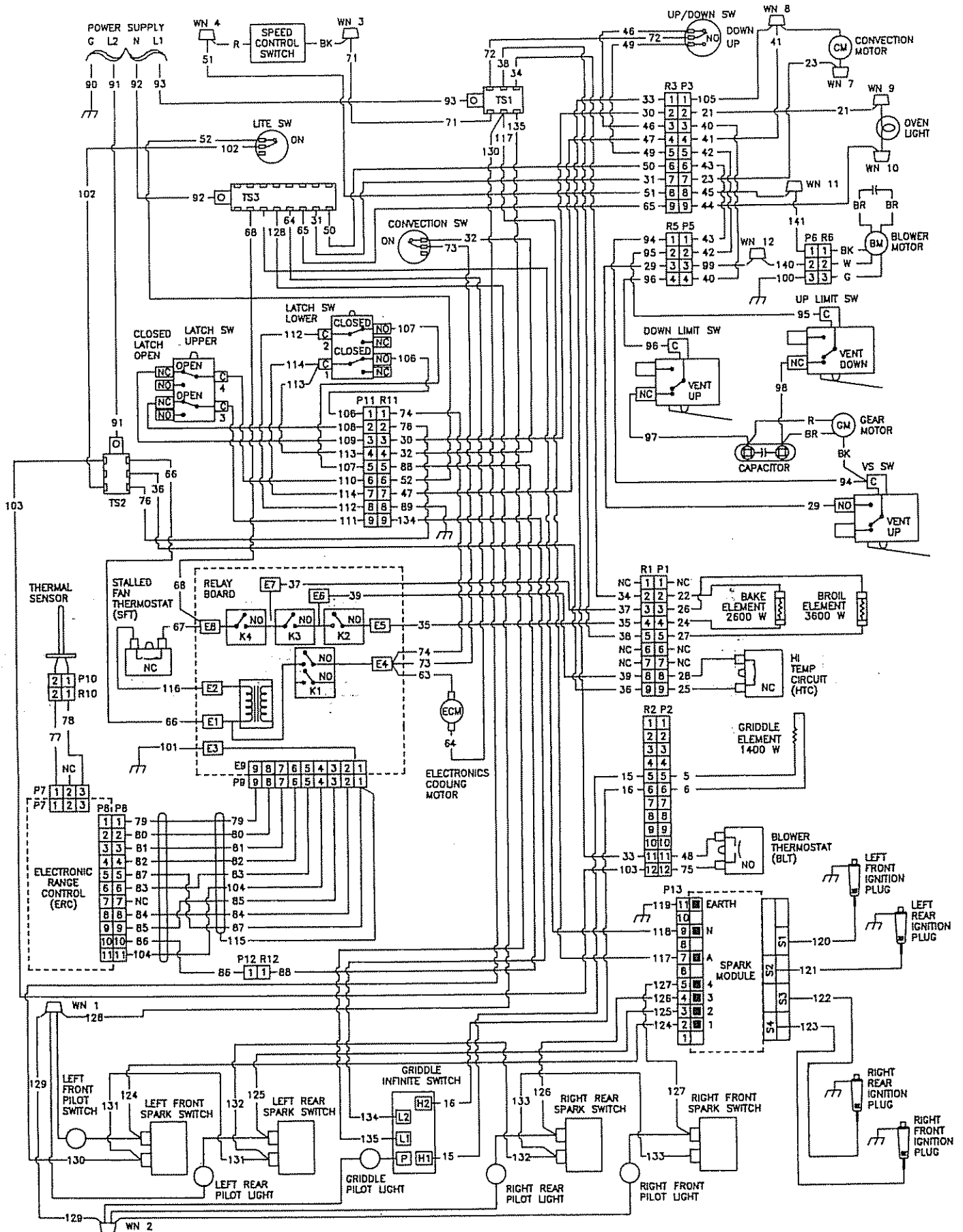
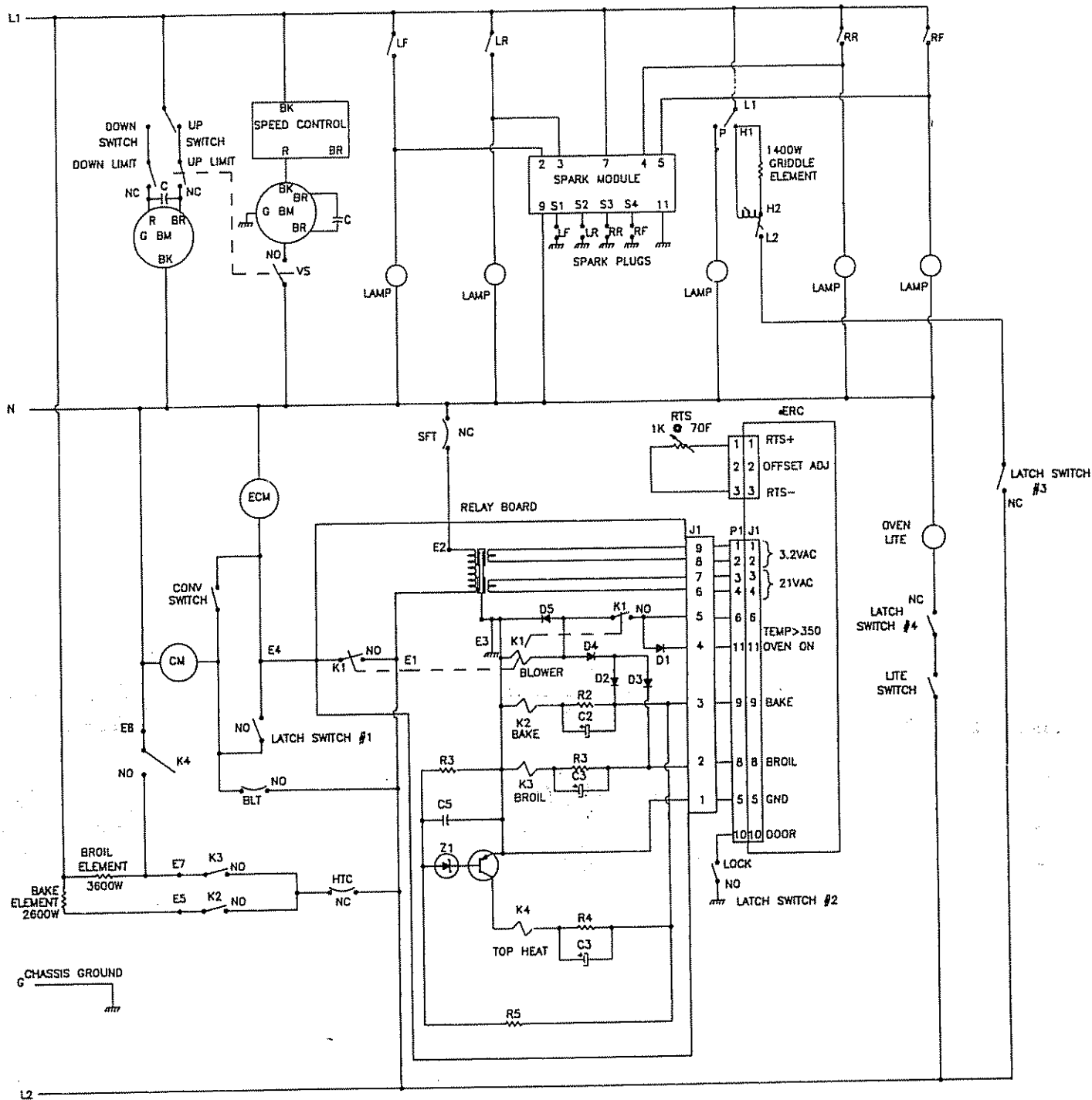


Figure 7. GSC30CV Wiring Diagram



- C = CAPACITOR  
 GM = GEAR MOTOR  
 BM = BLOWER MOTOR  
 ECM = ELECTRONIC COOLING MOTOR  
 BLT = BLOWER THERMOSTAT  
 CM = CONVECTION MOTOR  
 HTC = HIGH TEMP CUTOUT  
 NC = NORMALLY CLOSED  
 NO = NORMALLY OPEN  
 VS = VENT SWITCH  
 RTS = RESISTANCE TEMPERATURE SENSOR  
 ERC = ELECTRIC RANGE CONTROL  
 SW = SWITCH  
 LF = LEFT FRONT  
 LR = LEFT REAR  
 RR = RIGHT REAR  
 RF = RIGHT FRONT  
 SFT = STALLED FAN THERMOSTAT  
 E1-E8 = TERMINALS LOCATED ON RELAY BOARD  
 K1-K4 = RELAYS LOCATED ON RELAY BOARD

- WIRE LEADS**  
 R = RED  
 BR = BROWN  
 BK = BLACK  
 W = WHITE  
 G = GREEN

RELAY COIL CONDITION CHART		BK	BR	CL
K1	ELECTRONIC COOLING MOTOR	A	A	A
K2	BAKE	B		C2
K3	BROIL		B	C1
K4	1/4 W BROIL	B		C2

A. STAYS ON AFTER TRIGGERED. TRIGGERED BY TURN-ON OF HEAT (X2,3 OR 4). TURNS OFF WHEN <350F, AFTER A PROGRAM CANCEL.  
 B. ON WHEN HEAT IS REQUIRED IN OVEN.  
 C1 ON FOR FIRST 45 MINUTES OF CLEAN PROGRAM. WHEN HEAT IS REQUIRED IN OVEN.  
 C2 ON FOR FIRST 3HR. 15 MIN OF CLEAN PROGRAM, WHEN HEAT IS REQUIRED IN OVEN.

Figure 8. GSC30CV Schematic



## SERVICING GUIDELINES

### TOOLS AND EQUIPMENT

The table below is a list of tools and equipment required to service the Drop-In Gas and Electric ranges. Prior to starting on a service call, be sure all of these items are available for use.

<i>Description</i>	<i>Application</i>
Standard screwdrivers (small and large sizes)	Various applications
Phillips head screwdrivers	Various applications
Needle nose pliers	Removal of clips and connectors
Adjustable crescent type wrench	Removal of various nuts
Volt-Ohmmeter and insulated test leads	Troubleshooting and testing applications
Wire crimping tool	Electrical repairs and installation
Shielded thermocouple temperature indicating device (0° to 1000°F)	For oven calibration
Manometer	For gas pressure testing
Snap-around ammeter or 240 volt test light	For electrical element testing
3/32" Allen wrench	Removal of convection fan blades
Pipe dope	Sealing threads of gas fittings

### SAFETY PRECAUTIONS

These precautions must be followed before and during all servicing activities to ensure safety.

1. Before attempting any repairs other than replacing oven doors, disconnect the input power to the range at the wall circuit breaker or fuse panel.
2. When working with gas, shut off the gas supply at the wall shut-off valve.
3. Tipping the unit can cause serious bodily injury and damage to the range. Check that the anti-tip device is installed properly. To do this, remove the front panel below the oven door, and verify that the device is engaged.
4. Do *not* attempt to ignite the gas burners without their burner caps in place.
5. Be certain all utensils have been removed from the oven before attempting to operate the CLEAN cycle.

### CARE AND CLEANING

When cleaning this range:

1. Use the mildest cleaning procedure that will do the job efficiently and effectively. Some cleaners of the same type are harsher than others. Any part of this appliance may be cleaned with hot soapy water.
2. Use only clean soft cloths, sponges, paper towels, fibrous brushes, plastic, non-metal or steel wool soap pads for cleaning and scouring, as recommended in the *Range Care and Use Manual*.
3. Always rub metal finishes in the direction of the polish lines for maximum effectiveness and to avoid marring surfaces.
4. Always wipe surfaces dry to avoid water marks.

**WARNING:** Do *not* clean any removable parts of the range or Cook'n'Vent by placing them in the self-cleaning oven.

### SERVICE POINTERS

To gain maximum effectiveness from each service call.

1. Study this manual in advance to become familiar with its content and organization.
2. Read the operating instructions supplied with each range to become thoroughly familiar with the various range functions and operations.
3. Many problems are caused by faulty installation. Check the range to be sure it has been installed according to the installation instructions of this manual and local codes.
4. Take care to avoid damaging the porcelain finish of the range.
5. When repairing one item, check other components in the same area for apparent related signs of trouble.

### Post Service Checks

After completing the range repair, adjustment, or installation, and before presenting the bill, spend a few minutes in making a final check of the unit in the presence of the customer. This can help in building customer satisfaction and future service business. Check the unit for the following:

1. Control panel trims are in place and properly secure.
2. All knobs are installed on their respective controls.
3. Oven racks are in place in the oven.
4. Oven door is properly installed.
5. All functions of the range controls operate properly.
6. The gas burner caps are in place and the burners operate efficiently with the proper flame characteristics.
7. The clock operates properly and shows the correct time.
8. All electric elements are heating properly.
9. Oven door latch locks the oven when closed.
10. Range is securely attached to the blower box under the range.
11. Range exterior is wiped clean of any dirt, grease or finger marks incurred during servicing.

# COOKTOP SERVICING

**WARNING:** DISCONNECT POWER BEFORE SERVICING!

## CLEANING GAS BURNERS AND BURNER GRATES

For efficient operation, burners and burner grates must be kept clean. Normal cleaning is accomplished by wiping burners with a cloth and warm soapy water, then rinsing with a clean cloth and clear water.

For heavy soil the burner assembly must be removed from the cooktop and soaked in hot soapy water. Wipe off the burner thoroughly. If necessary, scrub with a non-abrasive cleaning pad. Rinse the burner well.

If any ports are clogged after soaking and rinsing, scrub again with non-abrasive pad and clean ports with a metal skewer or a straightened metal paper clip, being very careful not to enlarge or distort the ports.

Wipe the burner dry after cleaning and allow all water to drain from the inside of burner before replacing it on the rangetop.

**WARNING:** Do not use

Lye or any caustic compound, it will pit and dull the finish and may ruin burner.

Steel wool, abrasive cleansing powder, or in a dishwasher, they will dull the finish.

Metal polishes, they generally will *not* remove stains and may alter the finish.

## COOKTOP REMOVAL

Most cooktop components may be serviced without removing the cooktop from the range. If this is the case, the elements, element sockets and ignition plug connectors need not be removed, and the cooktop can be simply raised up out of the way.

### Electric

1. Remove the heating element by lifting and pulling the element from the socket.
2. Remove the screw from the clip attaching the element socket to the cooktop and place the socket under the cooktop.
3. Remove the drip pan.
4. Lift the Griddle'n'Grill from its left edge and remove as an assembly.
5. Remove the Griddle'n'Grill element socket by removing the screw attaching it to the cooktop.

Remove the two cooktop screws from the rear of griddle/grill compartment.

7. Lift the cooktop from the its rear corners and slide it toward the back of the range and lift it out.
8. Reverse this procedure to install.

### Gas

1. Remove the grates and burner caps.
2. Lift the Griddle'n'Grill from its left the edge and remove as an assembly.
3. Remove the Griddle'n'Grill element socket by removing the screw attaching it to the cooktop.
4. Using a spanner wrench, unscrew the nuts attaching the burner base to the gas pipe assembly and lift the burner 4" from the cooktop.
5. Locate and remove the ignition plug connector under the burner base.
6. Remove the burner base from cooktop.
7. Repeat steps 4 thru 6 for each burner assembly.
8. Remove the two cooktop screws from the rear of Griddle'n'Grill compartment.
9. Lift the cooktop from its rear corners and slide it back and lift it out.
10. Reverse this procedure to install.

## BLOWER THERMOSTAT REMOVAL

The blower thermostat is located on the right wall below the cooktop, enclosed in a cardboard cover. It triggers at 194°F, activating the electronics cooling fan. To remove the blower thermostat:

1. Pry cardboard cover from around thermostat.
2. Disconnect thermostat wires.
3. Check for an open circuit between the thermostat terminals with an ohmmeter.
4. If the terminals shows continuity, remove 2 screws holding thermostat to wall and remove thermostat.
5. Install a new thermostat by reversing this procedure.

## IGNITION PLUG REMOVAL

1. Remove the burner assembly from the cooktop and disconnect the wire from the ignition plug.
2. Using a screwdriver, press up on the ignition plug spring to release the spring pressure on the retaining ring located under the burner base.
3. Pull the retaining ring off the ignition plug using needlenose pliers.
4. Replace the ignition plug, spring and retaining ring as an assembly.
5. To install, place the ignition plug into the plug hole on the burner. Place the spring onto the plug. While applying upward pressure to the spring. Press the retaining ring onto the ignition plug.
6. Reconnect the wire to the ignition plug and replace the burner assembly onto the cooktop.

## GAS BURNER ASSEMBLY REMOVAL

Refer to *Gas Cooktop Removal*, steps 4 through 6.

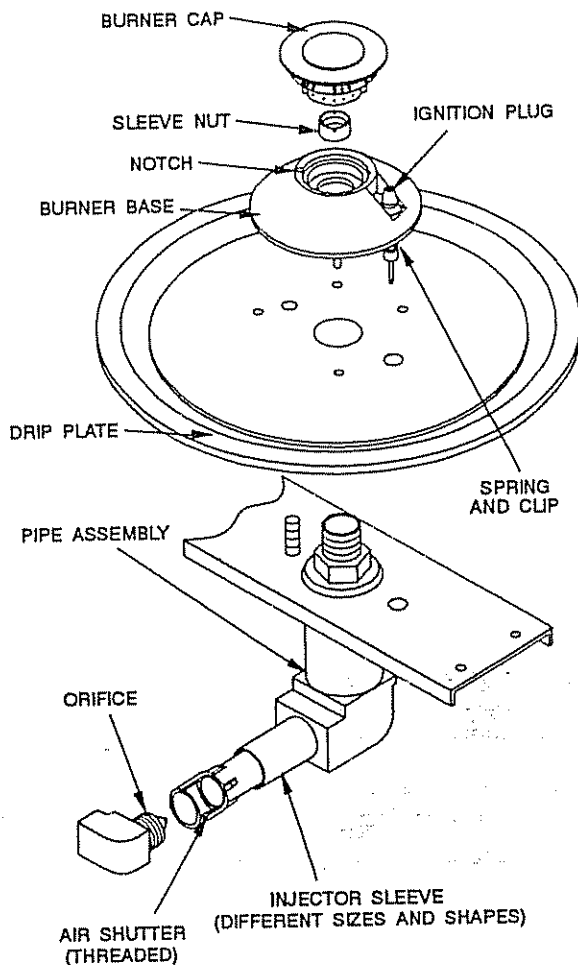


Figure 9. Burner Assembly

## GAS PIPE ASSEMBLY

1. Shut off the gas at the wall shutoff valve.
2. Remove the cooktop.
3. Remove the 4 screws from the right pipe assembly bracket.
4. Pull the pipe assembly slowly toward the rear of range until the pipe clears the injector sleeve and lift out. See Figure 9.
5. Repeat the procedure for the left pipe assembly.
6. Reverse this procedure to install.
7. Check the flame characteristics and adjust if necessary. Refer to *Burner Flame Adjustment*.

## Checking Gas Pressure

The gas regulator is used to maintain the correct gas pressure to the burners. It is located left of center under the cooktop. The regulator supplied with this unit is equipped for natural gas but may be converted for use with LP gas. Be sure the range installed is equipped for the correct type of gas being used as noted on the name plate. See figure 1, page 2. To check gas pressure at the regulator:

1. Turn gas OFF at wall shut-off valve.
2. Remove the top.
3. Connect a manometer between the range pressure regulator and the wall shut-off valve using a flex connector.
4. Turn ON the gas and check the system for leaks with the manometer, or use liquid leak detector at all joints and connections.
5. Use the manometer to check for proper gas pressure entering the regulator. Gas pressure is measured in inches of water column ("WC) and should enter the regulator at approximately 8"WC. The regulator will not operate effectively at incoming pressure below 5"WC or exceeding 14"WC.
6. Turn OFF gas supply and move the manometer to output side of the regulator. Reconnect all gas lines.
7. Check gas pressure leaving the regulator. The pressure should be steady at 4"WC.
8. Apply pipe dope to all fitting threads and reconnect gas lines. Recheck for leaks using soapy water.

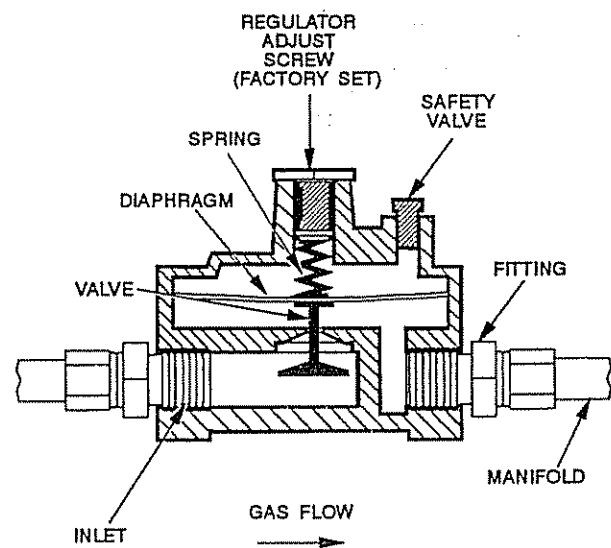


Figure 10. Gas Pressure Regulator

## Gas Pressure Regulator Removal

1. Loosen the fitting nuts from both ends of the regulator.
2. Remove 2 screws attaching regulator to the support flange and remove the regulator.
3. Reverse this procedure to install.

## BURNER FLAME CHARACTERISTICS

All burner adjustments are preset at the factory and should not need further adjustment. When connected to the designated gas supply, as shown on the model/serial plate, the properly adjusted burner flame will be steady, quiet, and have a sharp blue inner cone. The length of this blue cone will be approximately 1" for the two rear (9,000 BTU/HR) burners, and approximately 1-1/4" for the large (11,000 BTU/HR) right front burner.

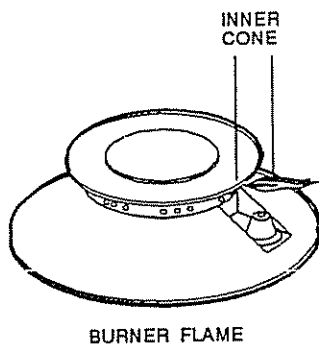


Figure 11. Burner Flame

A yellow flame indicates there is insufficient air in the air/gas mixture. A noisy or intermittent flame indicates there is excessive air in the mixture.

### Burner Flame Adjustments

Should it ever become necessary to adjust the air shutters due to poor flame characteristics, proceed as follows:

1. Turn off the gas at the unit shut-off valve and the electricity at the breaker or fuse box.
2. Perform the *Gas Cooktop Removal* procedure until the 4 air shutters located under the cooktop are revealed.
3. With the cooktop removed, replace the ignition plug wire, the burner base, and the burner cap of each burner assembly securely onto the burner pipe assembly. See figure 12.
4. Turn the gas supply and electrical supplies on. Turn the burners ON and check for proper flame characteristics.
5. If the flame is yellow there is insufficient air. Adjust the air shutter by turning it counterclockwise allowing more distance between the tip of the main jet and the body of the air shutter.
6. If the flame is noisy or intermittent, there is too much air. Adjust the air shutter by turning it clockwise to close the distance between the tip of the main jet and the body of the air shutter.
7. After the flame is properly adjusted, allow the burners and burner caps to cool completely.
8. Remove the burner cap and burner, and disconnect the ignition plug wire from each burner assembly.
9. Replace main top and screws and reassemble the burners onto the cooktop.
10. Recheck the burners for proper operation and flame characteristics.

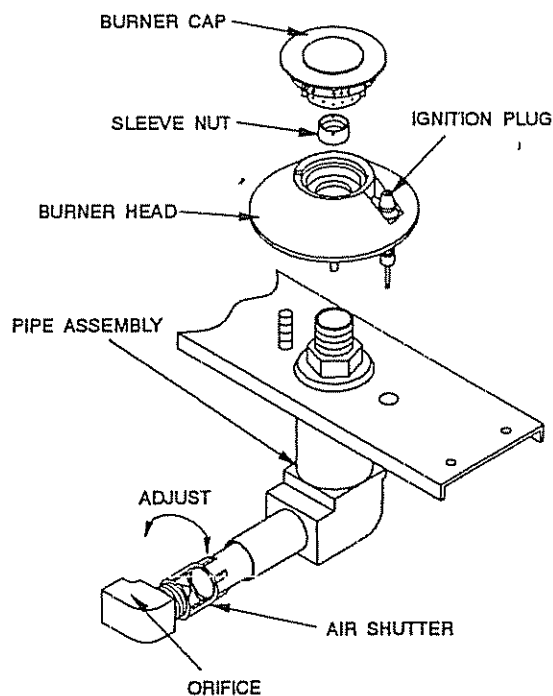


Figure 12. Burner Flame Adjustments

## COMPONENT ACCESS PANELS

There are four access panels located under the cooktop. The cooktop and gas piping assemblies must be removed before the access panels can be removed. To remove access panels, loosen the screws attaching them to the range floor. After removing the access panels the following components can be serviced:

- Electronics cooling blower.
- Cooktop relay board.
- Spark module.
- Oven door latch and latch switches.
- High temperature cutout and stalled fan thermostat.
- Oven thermostat connector.

## OVEN DOOR LATCH SWITCHES

The oven door latch switches operate to disable various functions of the range during cleaning. These functions are the Griddle'n'Grill on the gas unit, the right rear and right front elements on the electric unit oven compartment light on both units.

### Oven Door Latch Removal

1. Remove front two access panels.
2. Remove handle end piece from oven door latch handle.
3. Remove 2 screws holding latch switches to latch assembly.
4. Remove 4 screws holding latch assembly to compartment floor.
5. Pull latch assembly back and up to remove.
6. To replace, be certain heat shield is placed under latch assembly and the insulation sufficiently surrounds the bi-metal coil located on the underside of the latch assembly.

7. Slide the latch handle through slot above the oven door and settle the assembly into place, align the screw holes.
8. Install screws.
9. Install latch switches.

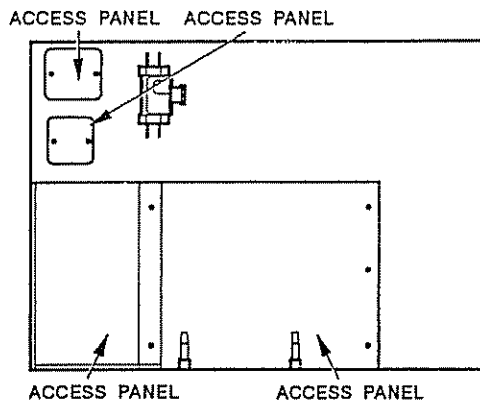


Figure 13. Component Access Panels

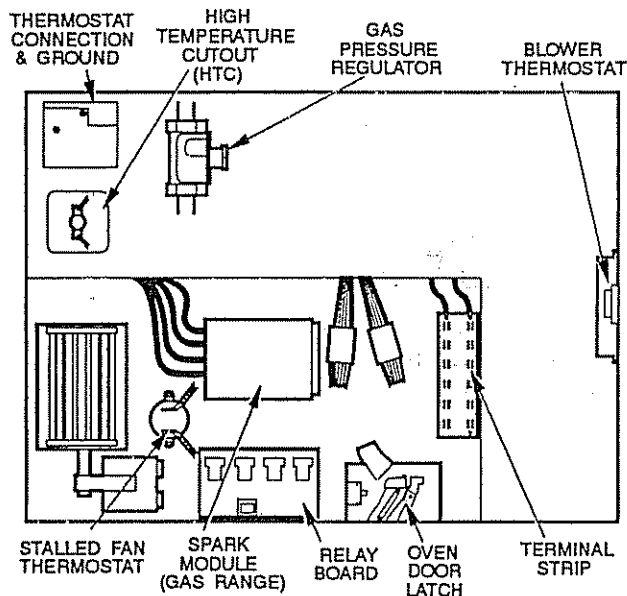


Figure 14. Components Under the Cooktop

## ELECTRONICS COOLING BLOWER ACCESS AND TESTING

1. Remove the cooktop, piping assembly, and front two access panels.
2. Disconnect the electrical wiring from the blower motor.
3. Connect an ohmmeter set to a low ohm setting across the blower motor terminals.
4. Readings should be approximately 24.5 ohms.

### Electronics Cooling Blower Removal

1. Remove the two screws attaching the blower assembly to the range.
2. Slide the blower assembly to the right and remove.

## SPARK MODULE REMOVAL

The spark module controls the spark to the individual ignition plugs. Burner ignition malfunction is most commonly due to the spark switch or the igniter itself. Should the spark module need replacing, proceed as follows.

1. Remove the cooktop, piping assembly and front two access panels.
2. Remove the 4 screws attaching the module to the compartment floor.
3. Unplug the 4 spark output wires connected to the left edge of the module and mark the location of each wire.
4. Disconnect the input connector on the right edge of the module and remove the module.
5. Reverse this procedure to replace the spark module.

## STALLED FAN THERMOSTAT

The stalled fan thermostat, when triggered, disables the relay board and all heating elements of the range except for the gas burners. To check the thermostat:

1. Remove the front 2 access panels.
2. Disconnect the 2 wires from thermostat and check for continuity across the terminals using an ohmmeter.
3. If readings indicate no continuity, remove the 2 screws attaching the thermostat to compartment floor and replace thermostat.

## RELAY BOARD REMOVAL

1. Remove front 2 access panels.
2. Disconnect connectors and wires from the relay board.
3. Using needlenose pliers to squeeze the tabs on the insert clips that are holding the relay board to compartment floor while prying corner up.
4. Repeat for each clip.
5. Board is easily lifted out of compartment after last insert clip has been released.
6. To install, clear area of loose wires and place board with holes lined up over insert clips.
7. Press relay board down firmly over clips and check that each corner is secure.
8. Reconnect wires and connectors to exact location from which it was removed. Refer to the wiring schematic.

## POWER TERMINAL STRIP REPLACEMENT

1. Remove the front 2 access panels.
2. Remove the wires from power terminal strip noting the location of each.
3. Remove 2 screws from the terminal strip and lift out.

## HIGH TEMPERATURE CUTOUT

The high temperature cutout (HTC) is triggered when the range surface temperature reaches 350°F or when the oven cavity temperature exceeds 1000°F. When triggered, the HTC disables the broil and bake elements of the oven. To check the HTC:

1. Connect an ohmmeter across the terminals of the HTC.
2. Readings should show continuity.
3. If the readings indicate no continuity, remove the 2 screws attaching the HTC to the rangetop.

## FRONT CONTROL PANEL

The front control panel contains the user controls necessary for operating the range, see *Operation and Features*. Complete removal of the front control panel is not necessary when servicing its individual components.

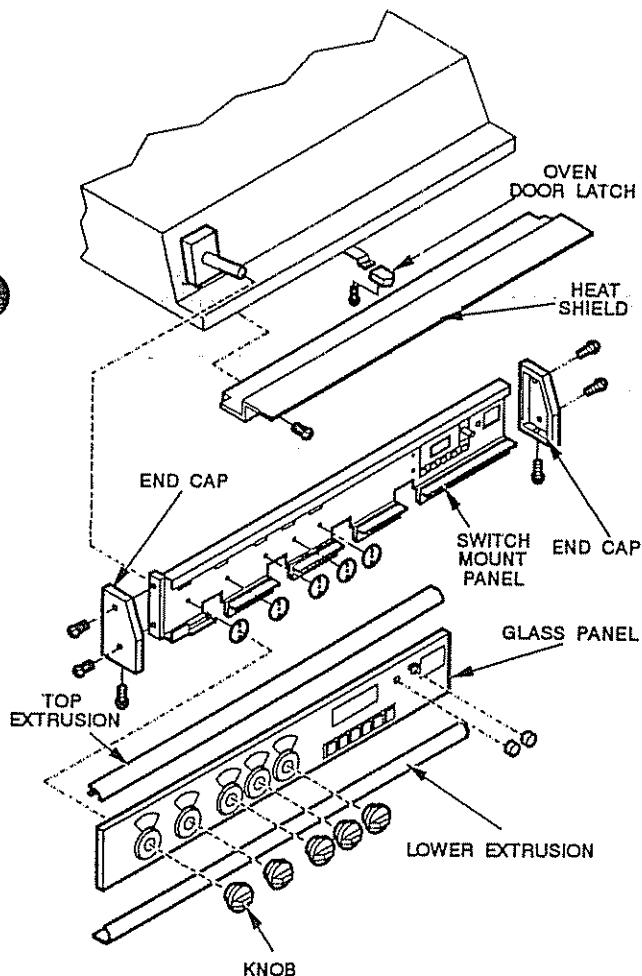


Figure 15. Front Control Panel

### Front Control Panel Removal

1. Pull the oven forward 3 to 4 inches if the end cap screws are inaccessible

2. Loosen the range installation side brackets by turning their attaching screws out 2 turns
3. Unscrew the 2 screws from each control panel end cap and work the caps free.
4. Remove the top extrusion frame.
5. Remove the oven door latch knob.
6. The 5 screws from the flat heat shield located above the oven door then remove the shield.
7. Remove the 5 screws located under the front control panel and remove the lower extrusion under the panel.
8. Remove the 7 control knobs from the panel.
9. Pull the glass panel up and out.
10. If it is necessary to completely remove the glass panel, detach each wire, noting its location, from the panel.
11. Remove the 2 screws on each side of the mounting panel from the burner box. Lower the mounting panel.
12. Reverse this procedure for installation.

### Touch Pad/Display Board

1. Remove front control panel enough to access the display board.
2. Remove 4 screws attaching the touch pad/display board to control panel.
3. Disconnect wires and connectors from the board and remove.
4. Reverse this procedure for installation.

### Control Panel Switch Assembly Removal

1. Remove front control panel enough to access the switch assembly.
2. Press in tabs on the switch assembly and push outward from the control panel.
3. Disconnect wires from switch assembly, noting the location of each.
4. Reverse this procedure for installation.

## SPARK SWITCH (GAS MODELS)

1. Shutoff gas to the range at the wall shut-off valve. Shut the power off at the breaker.
2. Remove front control panel enough to access the spark switches.
3. Remove 2 connectors from the spark switch.
4. Spark switch may be tested while still attached to the gas control valve by connecting the leads of an ohmmeter to the spark switch terminals.
5. While turning the gas control valve, measure the value of resistance across the terminals. A correct reading will be zero ohms.
6. Replace the switch if defective.
7. To replace, remove the screw attaching the spark switch to the gas control valve and remove the spark switch.
8. Install a new spark switch using reverse procedure.

## SURFACE ELEMENT CONTROL CHECK

1. Remove the element from its receptacle.
2. Attach a snap-around ammeter or 240 volt test light to the contacts in the element receptacle and reconnect the element.
3. Set the element control to LO and allow the circuit to cycle for 2 minutes.
4. Record the time intervals of the element cycle and compare to the chart below.
5. Replace the control if not cycling properly.

Knob Setting	Percent Input	Time in Seconds	
		On	Off
Low	5 1/2%	5	79
5	35%	5	12
8	52%	8.5	8
High	100%	Constant	0

*Note:* When checking more than one setting, check the lowest setting first. Allow five minutes to cool down before rechecking a lower setting after checking at a higher setting.

## ELECTRIC ELEMENT AND GRIDDLE'N'GRILL CONTROL REMOVAL

1. Remove front control panel enough to access the element controls.
2. Remove 2 screws from each control.
3. Disconnect wires from control and remove control.

# OVEN SERVICING

The majority of oven components can be serviced without removing the range from the countertop. Exercise care when replacing components that require pressing or pulling of the insulation so as not to defeat the temperature controlling ability of the range.

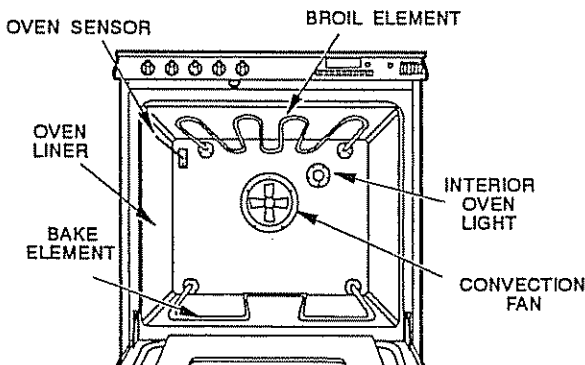


Figure 16. Oven Components

## OVEN DOOR REMOVAL

1. Lower oven door.
2. Place a steel rod or nail through top hole of *each* door hinge.

**CAUTION:** Do not remove rods from oven door hinges while the door is removed. Without the weight of the door, the powerful door return springs will forcefully snap the hinges closed. This can chip the porcelain and possibly injure the user.

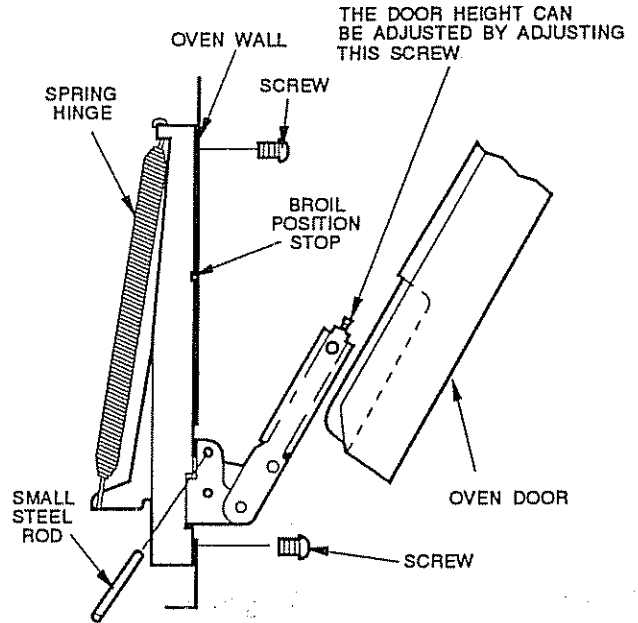


Figure 17. Oven Door Hinge Assembly

3. Raise the oven door to the stop.
4. Pull the door upward removing it from the hinges.
5. Disassemble door as necessary for part replacement.
6. Reassemble door in reverse order of disassembly.
7. Replace, by sliding door fully onto hinges.
8. Lower door and remove rods from hinges. Level the oven door, if necessary, using the adjusting screws located on the hinges. The door will close completely and evenly when leveled correctly.

### Oven Door Hinge Assembly Replacement

1. Remove the oven door.
2. Remove the two screws located above and below each hinge on the front oven trim.
3. Lean the hinge back into the oven wall cavity and work the bottom edge of the hinge out of the slot.
4. Replace the hinge as an assembly.

**CAUTION:** Do not remove the steel rods which hold the oven door hinge extended. The powerful door return spring will forcefully snap the hinge closed, possibly causing injury.

*Note:* The door hinge must be placed between the insulation shield and the outside wall of the oven. If the hinges are not installed properly, they will be exposed to high heat and the hinge springs will lose their temper.

## OVEN BAKE ELEMENT REPLACEMENT

1. The oven bake element is the element resting on the oven floor. Remove the 6 screws attaching the bake element to the rear oven liner.
2. Raise the front end of the element and work the element terminals out of the rear oven liner. Be careful not to pull the insulation out with the removal of the terminals.
3. Detach the connectors from the bake element terminals and remove the element.
4. Connect an ohmmeter across the element and check for 22.5 ohms.
5. Install a new bake element if the readings are high.
6. Reverse this procedure to replace.
7. Reconnect power to the range and set the oven to BAKE to verify proper functioning.

## OVEN BROIL ELEMENT REPLACEMENT

1. Remove 2 screws attaching the broil element and reflector to the top of the oven liner.
2. While supporting the element, remove 6 screws attaching the element to the rear oven liner.
3. Carefully lower the element while pulling forward, working the element terminals from the rear oven liner.
4. Detach the connectors from the element terminals and remove the element.
5. Connect an ohmmeter across the element and check for 16.2 ohms.
6. Install a new broil element if the readings are high.
7. Reverse procedure to replace.
8. Reconnect power to the range and set the oven to BROIL to verify proper functioning.

## OVEN CATALYST REMOVAL

1. Remove the broil element and reflector heat shield.
2. Remove 2 screws holding the oven catalyst to the top oven liner and remove catalyst.
3. Install by reversing this procedure.

## OVEN SENSOR REMOVAL

1. Remove the cooktop. See *Gas or Electric Cooktop Removal*.
2. Remove the left rear access panel below the cooktop.
3. Disconnect the sensor wires from the connector located under the left rear access panel below the cooktop.
4. Remove two screws from the flange attaching the sensor to the rear oven liner.
5. Carefully pull the sensor wires through the oven liner.

6. To replace, push the sensor connector into the hole in the oven liner.
7. Reach into the rear access compartment under the cooktop, grasping the connector with your fingers, and pull the wires until they stop.
8. Reconnect the wires.
9. Replace the screws into the flange and oven liner.

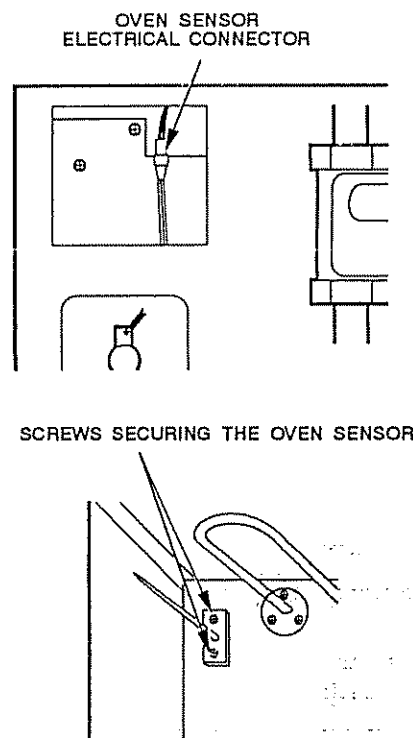


Figure 18. Oven Sensor

## REMOVING RANGE FROM COUNTERTOP

1. Disconnect power to the range at the supply circuit breaker or fuse panel and shut off gas at the wall supply shut-off valve.
2. Remove oven door.
3. Remove accessories from the oven.
4. Remove lower panel from the bottom of the range and disconnect the gas line from under the range (gas model only).
5. Disconnect the input power cable connections, noting the wire locations.
6. Loosen the retaining brackets located under the unit from the cabinet blower.
7. Slide the range forward and out from the countertop.
8. After completing the repair or replacement, reinstall the range into the countertop by reversing the removal procedures. Refer to *Installation Instructions* for complete installation procedures.



## OVEN LIGHT AND LIGHT RECEPTACLE REPLACEMENT

Be certain the oven light switch is in the OFF position before replacing the bulb.

1. Remove 2 screws from the oven light cover and remove the cover.
2. Remove and replace the oven light bulb.
3. Replace the cover, making sure the straight edge is towards the top and the screws are tightened securely.

### CAUTION:

Do not operate the oven with the oven light cover removed. If the cover or cover screws are damaged or broken, do not use the oven until a new assembly is in place. Replace the light bulb only with a 40 watt, 120 volt appliance bulb.

4. If oven light receptacle removal is necessary, remove the oven light cover and oven light.
5. Remove 2 screws holding the receptacle bracket in place, and remove the receptacle from the oven cavity and disconnect wires.
6. Install by reversing this procedure.

## OVEN TEMPERATURE CONTROL CALIBRATION

The oven temperature has been adjusted and tested at the factory; however, if a correction is necessary due to a repair or part replacement, the procedures outlined in this section should be performed as applicable.

1. Press "BAKE" pad.
2. Turn the "TIME/TEMP" knob to a temperature above 500°F.
3. Within one second of setting the temperature above 500°F, push and hold the "BAKE" pad for approximately 5 seconds.  
The display will show :00 in the Time of Day display.
4. For a "HOTTER" oven: Turn the TIME/TEMP knob counter-clockwise to raise the temperature a maximum of 35°F. The temperature adjusts in 5°F increments.

For a "COOLER" oven: Turn the TIME/TEMP knob clockwise to lower the temperature a maximum of 35°F. The temperature adjusts in 5°F increments.

5. Press the "CANCEL" pad to enter this new temperature calibration and to return to the regular display.  
Only the Time of Day is displayed.

If an accurate calibration is not obtainable, you may need to replace the oven sensor. See Oven Sensor Replacement, (Page 23).

## OVEN LINER REPLACEMENT

*Note:* It is recommended that the oven be self-cleaned at least twice before removing the oven liner. This will bake the insulation and prevent it from collapsing when the oven liner is removed.

1. Remove the oven door and the contents from the oven.
2. Remove the bake element, broil element, oven catalyst, oven light cover, oven sensor, and convection fan blades (see *Convection Fan Removal*) from the oven.
3. From inside the oven, remove four screws holding the oven liner to the range rear panel.
4. Slowly slide the oven liner from the oven cavity, being cautious not to chip or damage the porcelain coating.
5. Reverse oven liner removal for installation.

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## VENTILATING SYSTEM SERVICING

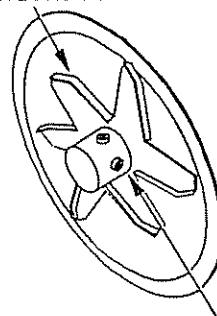
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## CONVECTION FAN ASSEMBLY REPLACEMENT

1. Remove the oven door.
2. Remove five screws from the convection fan cover.
3. Using a 3/32" allen wrench, remove the two allen screws from the fan blade assembly and remove the fan blades.

CONVECTION FAN



3/32" ALLEN SCREWS

Figure 19. Fan Blades

4. Disconnect the electrical connectors from the fan motor.
5. Remove the screws holding the fan motor to the panel, and remove the fan motor.
6. Reverse the removal procedure to install the fan assembly.

## VENTILATOR FILTER REMOVAL

1. Press vent UP switch on the front control panel and allow the ventilator to raise to its maximum height. Check that the blower is off.
2. Grasp the ventilator by the top of its front panel near the sides and pull up and forward. Remove the panel and set it aside.

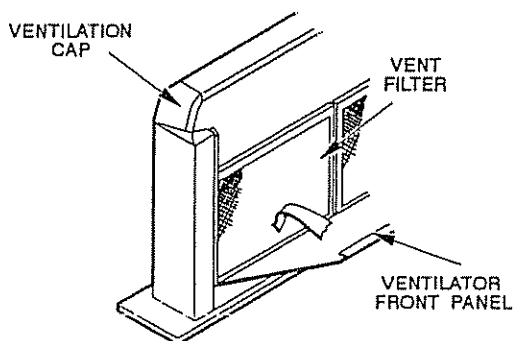


Figure 20. Ventilator Filter

3. Grasp the ventilator cap at both ends, lift up and remove.
4. Filters may be lifted out for cleaning or replacement.
5. The ventilator should be cleaned inside by scraping the grease with a plastic nylon spatula and wiping with a mild grease removing solvent.
6. Place the clean filters into the ventilator side by side on the support bars. The filters will lean forward, the tops resting against the inside front panel supports.
7. Replace the ventilator cap and front panel, hooking the top of the panel over the top ventilator side support.

## VENTILATOR ASSEMBLY REMOVAL

1. Remove the 4 screws located below the flip top.

REMOVE THESE FOUR SCREWS TO REMOVE THE TOP TRIM AND FLIP TOP. THE SNORKEL THEN SLIDES OUT.

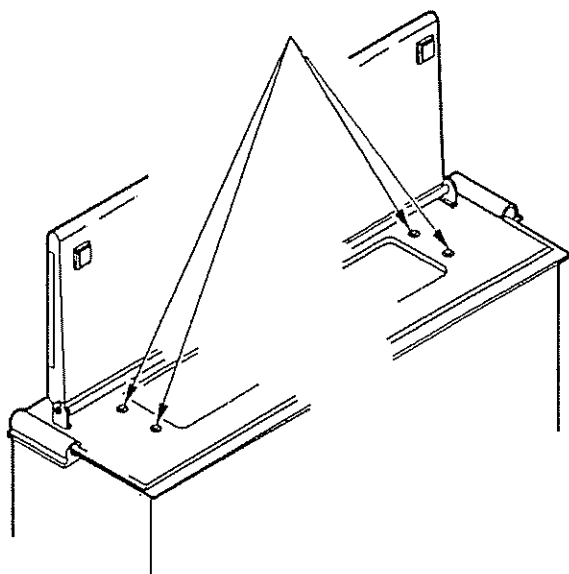


Figure 21. Ventilator Assembly

2. Remove the flitop.
3. Gently push back on the ventilator assembly and grasp its rear lip with your fingertips, then lift the assembly straight up and out.
4. Reverse procedure to install ventilator.

## VENTILATOR GEAR MOTOR REMOVAL

1. Remove the ventilator assembly
2. Remove the air and electrical box covers.
3. Remove the screws attaching the gear motor to the ventilator assembly.
4. Remove the pin from the scissors assembly and remove the assembly.
5. Remove the gear motor wheel from the gear motor assembly.
6. Remove the four screws holding the gear motor to the assembly and remove the motor.
7. Reverse the removal procedure to install.

# INSTALLATION INSTRUCTIONS

Many service calls are necessary as a result of faulty installation. The information provided in this section will be useful in determining whether installation has been done properly and will aid in the reinstallation of the range after removing it for servicing.

*Before installing or reinstalling this unit, read and become familiar with these instructions.*

*Important:* Local codes vary. Installation, electrical connections, and grounding must comply with all applicable codes.

Be certain the unit being installed is correct for the type of gas being used. Refer to the model and serial plate located behind the Griddle'n'Grill pan and the following table.

Model	Volts		Hz	Gas	
	Required	Circuit		Pressure	Manifold
ESC30CV	120/240	50 Ampere	60	-----	
GSC30CV	120/240	30 Ampere	60	Natural	4 inch WC
GSC30CV	120/240	30 Ampere	60	LP	10 inch WC

**CAUTION:** When connecting the unit to LP gas, make certain the LP gas supply tank is equipped with its own high pressure regulator in addition to the regulator supplied with the range. The maximum gas pressure to the regulator of this appliance is not to exceed 14.0" WC from the propane gas tank.

## ELECTRICAL SUPPLY (GAS AND ELECTRIC)

Disconnect the input power to the range before servicing this appliance. Before turning the power ON be sure that all controls are in OFF position.

The electrical supply should be 3 wire, single phase AC with a grounded neutral.

## GROUNDING

The unit is supplied with a flexible metallic conduit. When connected to a grounded metallic conduit system, the range is grounded through the system. Where local codes permit grounding directly through the neutral line, connect the base ground wire and the white wire to the white neutral supply. Where local code requires a separate ground separate white wire and bare ground wire. Connect the white wire to white neutral supply and ground the bare wire separately.

## RANGE INSTALLATION REQUIREMENTS

1. Installation is based on Standard American cabinets of 36" high x 24" deep. All measurements used are precise and care should be used when altering dimensions for nonstandard cabinets. For the standard cabinet, the bottom panel of the range will be 4" above the floor. The range can be adjusted a small amount up or down and in or out to align with adjoining cabinets. Space between countertop opening, cabinets, toe recess, and junction box should be provided as requested by the manufacturer.
2. Place the range on the floor in front of the cabinet opening.

**WARNING:** To avoid damage to the lower panel, do not change the factory adjustment or remove the panel until the range is mounted in the countertop. Move the range close to the countertop for electrical connection. Correct the flexible conduit to the electrical box using a 3/4" flexible conduit connector. Place the input supply line cable to the unit supply wires, being sure the neutral wire is connected in accordance with local code.

3. Adjust the slotted trim brackets located on both sides of the range to fit over 24" deep standard cabinets or adjust for nonstandard cabinets as necessary. When the range is installed, its outermost point will extend approximately 3-5/8" beyond the 24" deep cabinet.
4. Slide the unit into the counter space carefully to prevent counter damage. Before backing the range all the way into the countertop space, ensure that the cabinet blower flanges are within the guide channels located on the range underside, and connect gas lines if applicable. Also, for units using the integral blower, ensure that

the blower cord is not trapped between the blower and the range. Slide the unit completely into the countertop, allowing the right rear leg support to slide under the anti-tip bracket.

5. Remove the toe space front panel and using a 3/8" wrench, turn the three rear leg supports clockwise (to raise) or counterclockwise (to lower) the unit so that its weight is distributed evenly between the countertop and the leg supports. Repeat for the front leg supports.
6. Attach the blower box to the range with the wing nuts and retaining brackets of the bottom of the unit. The retaining brackets must be fully extended inward and under the cabinet blower or duct box flanges. Tighten the wing nuts securely. For maximum efficiency, a range blower system must be installed with a tested rating of not less than 325 CFM. Higher levels of air flow will give better performance.

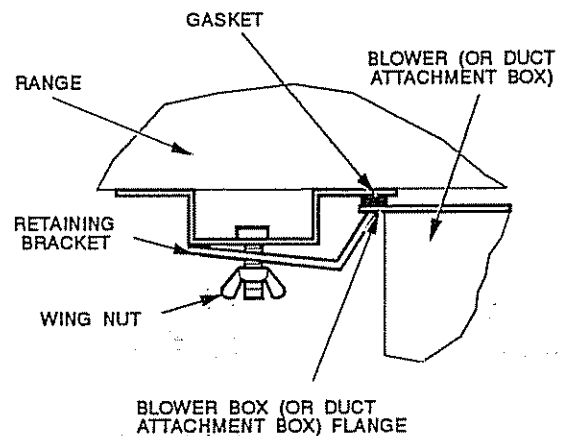


Figure 22. Blower Box and Range Interface

7. Replace the toe space front panel.
8. Connect the gas supply and check for leaks.
9. Check burner flame characteristics and adjust if necessary. A yellow flame indicates there is insufficient air. A noisy or intermittent flame indicates too much air. See *Burner Flame Adjustment*.

**Note:** Always use pipe dope on the gas pipe threads and be careful not to apply excessive pressure.

10. Perform post-service checks. See page 15.

**CAUTION:** Before turning the power on, make certain that all range controls are turned off.

# GLOSSARY

**AIR-GAS RATIO** - The ratio of air supply flow rate to the fuel gas supply flow rate.

**AIR SHUTTER** - An adjustable shutter on the primary air openings of a burner, controlling the amount of combustion air introduced into the burner body.

**AMPERAGE** - Amperage is the amount or the rate of flow of electrical current.

**AUTOMATIC GAS PILOT DEVICE** - A device, which acts to automatically shut off the gas supply to the appliance burner if the pilot is extinguished.

**BRITISH THERMAL UNIT** - (B.T.U.) - The quantity of heat required to raise the temperature of one pound of fresh water one degree F.

**BURNER** - A device for the final conveyance of gas, or a mixture of gas and air, to the combustion zone.

**BURNER FLEXIBILITY** - The degree to which a burner can operate with reasonable characteristics with a variety of fuel gases and/or variations in input rage (gas pressure).

**BURNER HEAD** - That portion of a burner beyond the outlet of the mixer tube which contains the burner ports.

**BURNER PORT** - (See Port)

**BURNING SPEED** - (See Flame Velocity)

**BUTANE** - A hydrocarbon fuel gas heavier than methane and propane and a major constituent of liquefied petroleum gasses.

**COLORIMETRIC DETECTION DEVICE** - A device for detecting the presence of a particular substance, such as carbon monoxide, in which the presence of that substance will cause a color change in a material in the detector.

**COMBUSTION** - The rapid oxidation of fuel gases accompanied by the production of heat or heat and light.

**COMBUSTION AIR** - Air supplied in an appliance specifically for the combustion of a fuel gas.

**COMBUSTION CHAMBER** - The portion of an appliance in where combustion normally occurs.

**COMBUSTION PRODUCTS** - Constituents resulting from the combustion of a fuel gas with the oxygen in air excluding excess air.

**CONVECTION** - The process of heating evenly by circulating the heat in air using a fan blower.

**D.M.S.** - Drill Manufacturer's Standard equivalent to Standard Twist Drill or Steel Wire Gage Numbers.

**DRAFT HOOD** - (Draft Diverter) A device built into an appliance, or made part of an appliance, or made part of a vent connector from an

appliance, designed to assure the ready escape of the products of combustion.

**DOWNDRAFT** - Excessive high air pressure existing at the outlet of chimney or stack which causes gases to flow downward in the stack.

**DRILLED PORT BURNER** - A burner in which the ports have been formed by drilled holes in a thick section in the burner head.

**EXCESS AIR** - Air passing through an appliance in excess of that which is required for complete combustion of the gas.

**FAHRENHEIT** - The common scale of temperature measurement in the English system of units based on the freezing point of water being 32°F and the boiling point of water being 212°F at standard pressure conditions.

**FLAME RETENTION DEVICE** - A device added to a burner which aids in holding the flame base close to the burner ports.

**FLAME ROLLOUT** - A condition where flame rolls out of a combustion chamber when the burner is turned on.

**FLAME VELOCITY** - The speed at which a flame moves through a fuel-air mixture.

**FLAMMABILITY LIMITS** - The maximum percentages of a fuel in an air-fuel mixture which will burn.

**FLASHBACK** - An undesirable flame characteristic in which burner flames strike back into a burner to burn there or to create a pop after the supply has been turned off.

**FLASHBACK ARRESTOR** - A gauze, grid or any other portion of a burner assembly used to avert flashback.

**FLASHTUBE** - An ignition device, commonly used for igniting gas on cooktop burners. An air-gas mixture from the burner body is injected into the end of a short tube. The mixture moves along the tube, is ignited by a standing pilot flame at the other open end of the tube and the flame travels back through the mixture in the flashtube to ignite the gas at the burner ports.

**FLOATING FLAMES** - An undesirable burner operating condition, usually indicating incomplete combustion in which flames leave the burner ports to "reach" for combustion air.

**FLUE GASES, FLUE PRODUCTS** - Products of combustion and excess air in appliance flues or heat exchangers before the draft hood.

**FLUE LOSS** - The heat lost in flue products exiting from the flue outlet of an appliance.

**FLUE OUTLET** - The opening provided in an appliance for the escape of flue gases.

**GAS VALVE** - A gas valve controls the amount of gas that is sent from the manifold to the burner.

**HARD FLAME** - A flame with a hot, tight, well-defined inner cone.

**HEATING SURFACE** - All surfaces which transmit heat from flames or flue gases to the medium being heated.

**HEATING VALUE** - The number of British thermal units produced by the complete combustion at constant pressure of one cubic foot of gas.

**IGNITER** - Spark producing electronic device which causes the gas to the burner units to ignite. The high voltage which triggers the spark is produced at the spark module.

**IGNITION** - The act of starting combustion.

**IGNITION TEMPERATURE** - The minimum temperature at which combustion can be started.

**INCHES OF WATER COLUMN** - A unit used in measuring pressures. One inch of water column equals a pressure of 0.578 ounces per square inch.

**INCOMPLETE COMBUSTION** - Combustion in which the fuel is only partially burned.

**INFRARED BURNER** - (Radiant Burner) - A burner which is designed to operate with a hot, glowing surface. A substantial amount of its energy output is in the form of infrared radiant energy.

**INJECTION** - Drawing primary air into a gas burner by means of a flow of fuel gas.

**INPUT RATE** - The quantity of heat or fuel supplied to an appliance, expressed in volume or heat units per unit time, such as cubic feet per hour or BTU per hour.

**INPUT RATING** - The gas-burning capacity of an appliance in BTU per hour as specified by the manufacturer. For operation at elevation above 2,000 feet, input ratings should be reduced at the rate of 4 percent for each 1,000 feet above sea level.

**JET BURNER** - A burner in which streams of gas or air-gas mixture collide in air at some point above the burner ports and burn there.

**LEAN MIXTURE** - An air-gas mixture which contains more air than the amount needed for complete combustion of the gas.

**LIFTING FLAMES** - An unstable burner flame condition in which flames lift or blow off the burner port(s).

**LIQUIFIED PETROLEUM GASES** - The terms "Liquified Petroleum Gases", "LPG" and "LP Gas" mean and include any fuel gas which is composed predominantly of any of the following hydrocarbons, or mixture of them: propane, propylene, normal butane or isobutane and butylenes.

**MANIFOLD** - The conduit of an appliance which supplies gas to the individual burners.

**MANIFOLD PRESSURE** - The gas pressure in an appliance manifold, upstream of burner orifices.

**MANUFACTURED GAS** - A fuel gas which is artificially produced by some process.

**METHANE** - A hydrocarbon gas with the formula  $CH_4$ , the principal component of natural gases.

**NATURAL GAS** - Any gas found in the earth, as opposed to gases which are manufactured.

**NEEDLE, ADJUSTABLE** - A tapered projection, coaxial and movable with respect to a fixed orifice used to regulate the flow of gas.

**NEEDLE, FIXED** - A tapered projection, the position of which is fixed, coaxial with an orifice which can be moved with respect to the needle to regulate flow of gas.

**ODORANT** - A substance added to an otherwise odorless, colorless and tasteless gas to give warning of gas leakage and to aid in leakage detection.

**ORIFICE** - An opening in a device through which gas is discharged, and whereby the flow of gas is limited and/or controlled. (See also Universal Orifice).

**ORIFICE CAP (HOOD)** - A movable fitting having an orifice which permits adjustment of the flow of gas by changing its position with respect to a fixed needle or other device extending into the orifice.

**ORIFICE SPUD** - A removable plug or cap containing an orifice which permits adjustment of the gas flow either by substitution with a spud having different sized orifices (fixed orifice) or by motion of an adjustable needle into or out of the orifice (adjustable orifice).

**PILOT** - A small flame which is used to ignite the gas at the main burner.

**PORT** - Any opening in a burner head through which gas or an air-gas mixture is discharged for ignition.

**PRESSURE REGULATOR** - A device for controlling and maintaining a uniform outlet gas pressure.

**PRIMARY AIR** - The combustion air introduced into a burner which mixes with the gas before it reaches the port.

**PRIMARY AIR INLET** - The opening or openings through which primary air is admitted into a burner.

**PROPANE** - A hydrocarbon gas heavier than methane but lighter than butane. It is used as a fuel gas alone, mixed with air or as a major constituent of liquified petroleum gases.

**RICH MIXTURE** - A mixture of gas and air containing too much fuel or too little air for complete combustion of the gas.

**SECONDARY AIR** - Combustion air externally supplied to a burner flame at the point of combustion.

**SOFT FLAME** - A flame partially deprived of primary air such that the combustion zone is extended and inner cone is weakened.

**SOOT** - A black substance, mostly consisting of small particles of carbon, which can result from incomplete combustion.

**SNG** - Supplementary natural gas. Gases which are manufactured to duplicate natural gas.

**SPARK MODULE** - The spark module converts AC to rectified DC to provide high voltage for a spark to ignite burners.

**SPARK SWITCH** - A spark switch transfers current from L1 to specified component.

**SPOILER SCREW** - (Breaker Bolt) - A screw or bolt moved in or out of the gas jet in a burner to control primary air injection.

**STANDARD CONDITIONS** - Pressure and temperature conditions selected for expressing properties of gases on a common basis. In gas appliance work, these are normally 30 inches of mercury and 60°F.

**STATIC PRESSURE** - The pressure exerted by a motionless gas.

**THERM** - A unit of heat energy equal to 100,000 BTU.

**UNIVERSAL ORIFICE** - A combination fixed and adjustable orifice designed for different gases, such as LPG and natural gas.

**UPDRAFT** - Excessively low air pressure existing at the outlet of a chimney or stack which tends to increase the velocity and volume of gases passing up the stack.

**UTILITY GASES** - Natural gas, manufactured gas, liquified petroleum gas-air mixtures or mixtures of any of these gases.

**VELOCITY PRESSURE** - Pressure exerted by a flowing gas by virtue of its movement in the direction of its motion. It is the difference between total pressure and static pressure.

**VENT** - A device, or opening, to transmit combustion products, pollutants and fumes from an enclosed area to the outdoors. This term also is used to designate a small hole or opening for the escape of a fluid (such as in a gas control).

**VENT GASES** - Products of combustion from gas appliances with air which is vented to the outdoors.

**VENTURI** - A section in a pipe or a burner body that narrows down and then flares out again.

**VOLTAGE** - Used to measure electrical pressure.

**WATTAGE** - Unit of measure of the capability of electricity to do work.

**WATER COLUMN** - Abbreviated as W.C. A unit used for expressing pressure. One inch water column equals a pressure of 0.578 ounces per square inch.

**YELLOW TIPS** - (Yellow Tipping) - The appearance of yellow tips in an otherwise blue flame, indicating the need for additional primary air.





***Thermado***

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