

# U.S. Range

A **WELBILT** Company

## OWNER MANUAL

# INSTALLATION INSTRUCTIONS

### GAS CONVECTION OVENS



## CG SERIES



All U.S. Range Equipment is manufactured for use with the type of gas specified on the rating plate and for installation in accordance with ANSI Z223.1-1 (latest edition) of the National Fuel Gas Code. Copies may be obtained from the American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209.

#### FOR YOUR SAFETY:

**DO NOT STORE OR USE  
GASOLINE OR OTHER FLAMMABLE  
VAPORS AND LIQUIDS IN THE  
VICINITY OF THIS OR ANY  
OTHER APPLIANCE.**

#### WARNING:

**IMPROPER INSTALLATION,  
ADJUSTMENT, ALTERATION,  
MAINTENANCE CAN CAUSE  
PROPERTY DAMAGE, INJURY OR  
DEATH. READ THE INSTALLATION,  
OPERATING AND MAINTENANCE  
INSTRUCTIONS THOROUGHLY  
BEFORE INSTALLING OR SERVICING  
THIS EQUIPMENT.**

Instructions to be followed in case the user smells gas are to be posted in a prominent location. This information shall be obtained by contacting the local gas company or gas supplier.

**PLEASE RETAIN THIS MANUAL FOR FUTURE REFERENCE.**

The models denoted with "M" are equipped with MANUAL controls, and those denote with "E" are equipped with ELECTRONIC controls.

**WARNING**

"Solid state control failure may result if exposed to temperatures above 140 degree F. for a continuous period of time. Care must be taken in installation to allow for air flow around units, especially when placed near other heat-producing sources. Recommended 4" spacing of control side of oven from other heat-producing sources."

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# **LIMITED WARRANTY PARTS & LABOR**

## **1. WARRANTY AND REMEDY**

A. NEW EQUIPMENT. Unless otherwise expressly stated on the face hereof, Seller warrants to Buyer, for a period of twelve months from the date of Buyer's purchase, or initial start-up of the equipment or 15 months from the date of shipment from the factory, whichever is sooner, that goods delivered hereunder are free from defects in materials and workmanship, except that materials furnished by Seller's suppliers and subcontractors are warranted by Seller only to the extent of the supplier's or subcontractor's expressed warranty to Seller, If during such period Buyer promptly notifies Seller in writing of any breach of such warranty and complies with any applicable warranty procedures of Seller, Seller shall, at Seller's option, re-preform services, repair or replace any defective goods at Seller's plant (Buyer to pay all transportation charges for returns) or refund the price of the goods or services or part thereof which gives rise to the claim. any labor required to repair or replace such defective parts will be paid by Seller only for defects for which Buyer notifies Seller during the first 12 months from the date of Buyer's purchase, or initial start-up of the equipment or 15 months from the date of shipment from the factory, whichever is sooner, under the following conditions:

1. warranty work must be performed by a factory-authorized service company;
2. factory authorization must be obtained before work is performed (non-stocking Maintenance & Repair Centers);
3. factory pays freight one way only; and

4. factory pays straight time service rates only.

Seller's obligation to pay for labor shall only be provided to buyers within the continental United States, Alaska and Hawaii. Seller's one year labor warranty includes authorized service agent travel time up to three (3) hours and mileage up to 100 miles. Any travel time or milage in excess of the above shall be Buyer's reponsibility. Seller shall make no allowance for repairs of alterations made by Buyer, unless made eith Seller's prior written consent.

This warranty will not apply to any equipment or part therefor which has been subjected to any accident, use of other than factory recommended procedures, abuse, tampering, serial number defaced or removed, or service by an unauthorized service agency.

Proper installation, adjustments, calilbration, and initial check-out is the responsibility of the dealer, the owner/user, or the installing contractor and is not covered by Seller's warranty.

B. REPLACEMENT PARTS. Any replacement part, except lamps and fuses, which proves to be defective in material or workmanship within 90 days from the date of replacement part installation will be repaired or replaced with out charge, FOB Authorized Distributor. This warranty covers only the repair or replacement of the defective part and does not include any labor charges for the removal and installation of any part or travel of other expense incidental to the repair or replacement of a part. Seller will not be responsible for problems found to be caused by use of a non-OEM part or replacement of a defective part with other than a factory OEM part.

THE FOLLOWING NEW EQUIPMENT AND REPLACEMENT PARTS WARRANTIES SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY OF BUYER AND THE FULL LIABILITY OF SELLER FOR ANY BREACH OF WARRANTY. THESE WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED, INCLUDING ANY WARRANTY OF PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE, AND SUPERSEDES AND EXCLUDES ANY ORAL WARRANTIES OR REPRESENTATIONS, OR WRITTEN WARRANTIES OR REPRESENTATIONS, NOT EXPRESSLY DESIGNATED IN WRITING AS A "WARRANTY" OR "GUARANTEE" OR SELLER, MADE OR IMPLIED IN ANY MANYAL, LITERATURE, ADVERTISING BROCHURE OR OTHER MATERIALS.

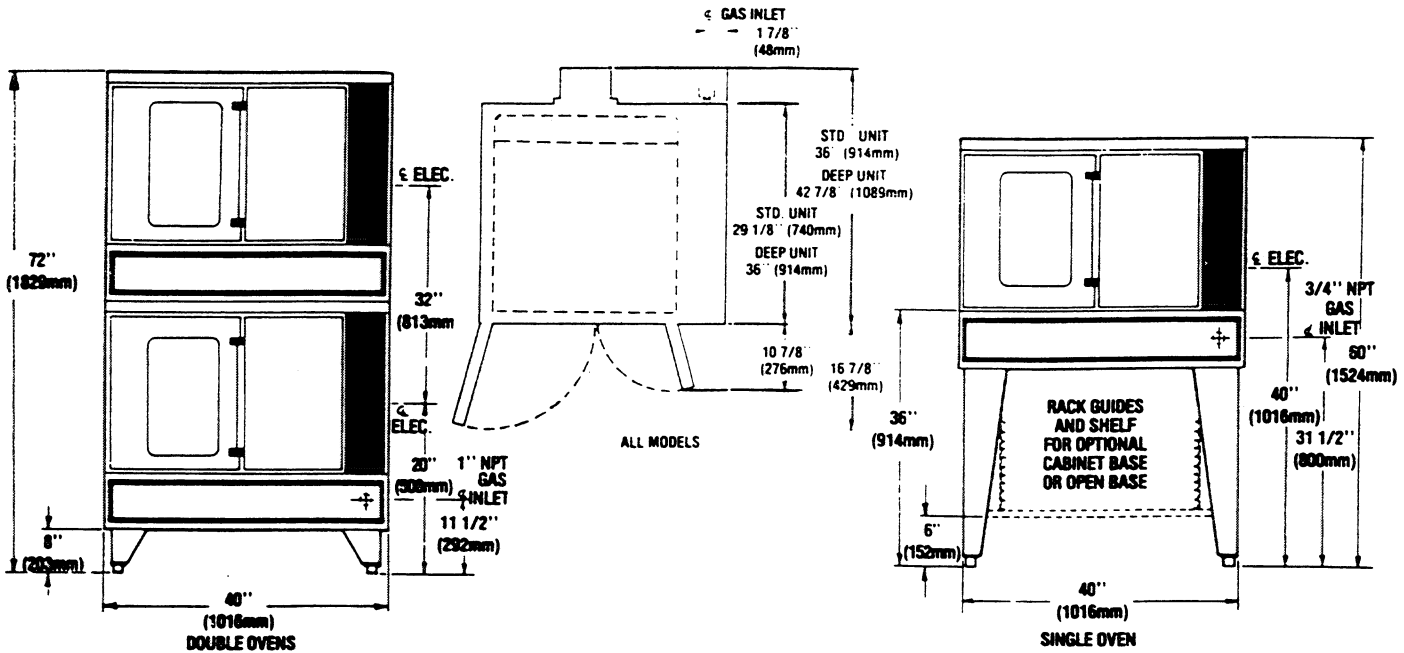
2. LIMITATION OF SELLER'S LIABILITY. Seller's liability on any claim of any kind, including negligence, with respect to the goods or services covered hereunder, shall in no case exceed the price of the goods or services or part thereof which gives rise to the claim. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THE NATURE OF PENALTIES.

3. LIMITATION OF ACTIONS. Any action for any liss or damage with respect the goods or services covered hereunder must be commenced by Buyer within one year agter Buyer's cause of action has accrued.

4. THIS WARRANTY APPLIES TO ORGINAL BUYER ONLY AND IS NOT TRANSFERABLE.

5. INFORMATION ON WARRANTY PROCEDURES. For further information on warranty procedures, please contact seller at (213) 770-8800.

# DIMENSIONS AND SPECIFICATIONS



| MODEL NO. | INTERIOR DIMENSIONS (per deck) |               |               | EXTERIOR DIMENSIONS (per deck) |              |              | SHIPPING WEIGHT<br>LBS. (Kg.) |
|-----------|--------------------------------|---------------|---------------|--------------------------------|--------------|--------------|-------------------------------|
|           | W                              | H             | D             | W                              | H (w/o Legs) | D            |                               |
| CG-100    | 29" (736 mm)                   | 20½" (520 mm) | 21½" (546 mm) | 40" (1016 mm)                  | 32" (813 mm) | 36" (914 mm) | 675 (308)                     |
| CG-200    | 29" (736 mm)                   | 20½" (520 mm) | 21½" (546 mm) | 40" (1016 mm)                  | 32" (813 mm) | 36" (914 mm) | 1350 (608)                    |

| MODEL NO. | INPUT CHART - NAT. GAS |              | ELEC CHARACTERISTICS |            |
|-----------|------------------------|--------------|----------------------|------------|
|           | BTU/HR                 | GAS INLET    | 120V/1 PHASE         | MOTOR      |
| CG-100    | 80,000                 | ONE @ ¾" NPT | ONE @ 5.2 AMPS       | 1/3 HP     |
| CG-200    | 160,000                | ONE @ 1" NPT | TWO @ 5.2 AMPS       | 1/3 HP ea. |

## Installation Notes

Specify Gas Type When Ordering

Gas input ratings shown here are for installations up to 2000 ft. (610 m) above sea level. BTU input ratings must be deflated for high altitude installations.

### Manifold Pressure:

NAT 4.0" WC  
LP 9.5" WC

### Combustible Wall Clearances:

Sides: 6" (152 mm) Back: 6" (152 mm) Base: 8" (203 mm)

### Entry Clearances:

Crated  
44½" (1130 mm)

Uncrated  
32½" (826 mm)

### WARNING

This product contains chemicals known to the State of California to cause cancer and/or birth defects of other reproductive harm. \*Installation and servicing of this product could expose you to airborne particles of glasswool/ceramic fibers. Inhalation of airborne particles of glasswool/ceramic fibers is known to the State of California to cause cancer. Operation of this product could expose you to carbon monoxide in not adjusted properly. Inhalation of carbon monoxide is known to the State of California to cause birth defects or other reproductive harm.

## INSTALLATIONS INSTRUCTIONS

### INSTALLATION NOTES:

#### Combustible Wall Clearance\*

Side: 6.0"  
Rear: 6.0"  
Base: 8.0"

#### Entry Clearance

Crated 44.5" (1067mm)  
Uncrated 32.5" (991mm)

\* For reduced clearance refer to ANSI Z223 1/NFPA #54.

\*\*Recommended 4" spacing on right side from high heat sources.

Clearances: From Combustible material 6" at rear and 6" sides.

The importance of the proper installation of Commercial Gas Cooking Equipment cannot be over stressed. Proper performance of the equipment is dependent, in great part, on the compliance of the installation with the manufacturer's specifications. In addition, compliance with the National Fuel Code ANSI Z223.1-1988(NFPA No. 54) or the latest edition and/or local codes is required to assure safe and efficient operation.

Before assembly and connection, check gas supply.

- A. The type of gas for which the unit is equipped is stamped on the data plate located behind lower front panel. Connect a unit stamped "NAT" only to natural gas; connect those stamped "PRO" only to propane gas.
- B. If it is a new installation, have gas authorities check meter size and piping to assure that the unit is supplied with sufficient amount of gas pressure required to operate the unit.
- C. If it is additional or replacement equipment, have gas authorities check pressure to make certain that existing meter and piping will supply fuel at the unit with not more than 1/2" water column pressure drop.

**NOTE:** When checking pressure be sure that all other equipment on the same gas line is on. A pressure regulator is supplied with this convection oven. Regulator is preset to deliver gas at pressure shown on the rating plate.

The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at pressures in excess of 1/2 PSIG (3.45 KP2).

The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressure equal to or less than 1/2 PSIG (3.45 KP2).

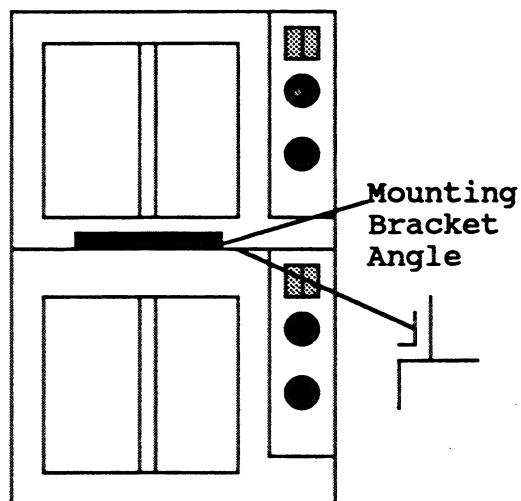
**NOTE:** Adequate clearance must be provided for servicing and proper operation.

## INSTALLATION FOR OVENS EQUIPPED WITH CASTERS

- A. The installation shall be made with a connector that complies with the Standard for Connectors for Moveable Gas Appliances, ANSI Z21.69a-1979 (or the latest edition) and a quick disconnect device that complies with the Standard for Quick-Disconnect Devices for use with gas fuel, ANSI Z21.41b-1983 (or latest edition).
- B. The front casters of the unit are equipped with brakes to limit the movement of the oven without depending on the connector and any quick-disconnect device or its associated piping to limit the appliance movement.
- C. Please be aware, there is a restraint on the unit and if disconnection of the restraint is necessary, be sure to reconnect the restraint after the oven has been returned to its originally installed position.

## DOUBLE DECK MODELS - CG200

- A. Position insert in bottom leg opening and tap insert up into leg till it seats at collar. Attach eight inch (8") legs to lower oven section. Raise unit. Do not lay unit on its back or sides. Place the front legs on the oven so as to line up with four (4) attaching bolt holes. Secure leg to oven frame using (4) 1/4 x 20 bolts and washers provided. Repeat at rear of unit.
- B. Remove combustion chamber front of top deck (located under oven doors). Raise top deck into place and line up body sides and back of the unit. Position mounting angle to line up with four attaching holes located in center of unit. You, the installer, must drill two holes in the main top of the bottom deck to secure the mounting angles. Secure mounting angle with four (4) metal screws provided. Fasten the rear of the two (2) units together, with mounting strips to line up four attaching holes located in the base of the top deck and the top of the lower deck.



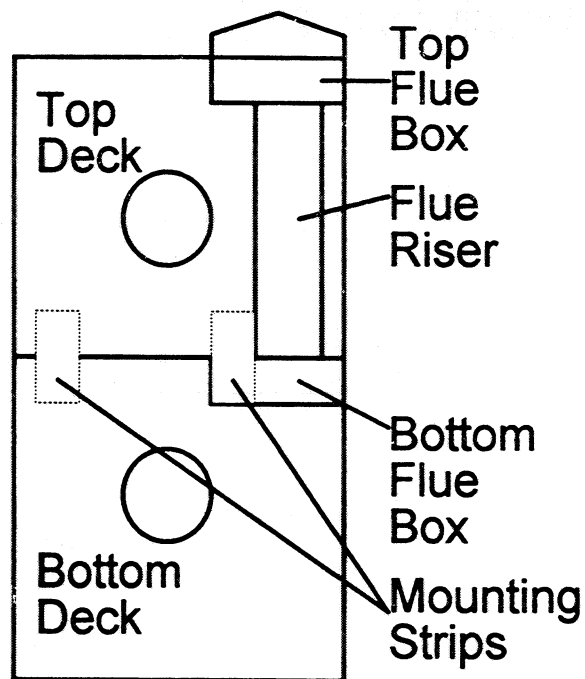
Front View

C. The flue for the Convection Oven consists of three pieces. A Lower flue box and an upper flue box and a riser which connects the two flue boxes. Attach flue box over flue opening at the rear of the top unit with screws provided. Do the same for bottom units. Once complete install the flue riser as shown in diagram.

D. Assemble the stacking pipes provided in the Stacking Kit. Check leveling of unit four(4) ways (by the oven rack inside the oven), and hook up gas feed line.

E. Plug the cord set of each unit into a 115 Volt power supply outlet.

F. Maintain Clearance from combustibles.



Rear View

**CAUTION:**  
**DISCONNECT POWER SUPPLY  
BEFORE ATTEMPTING TO CLEAN OR  
SERVICE.**

Each gas appliance shall be located with respect to building construction and other equipment so as to permit access to the appliance. Such access and clearance may be necessary for servicing and cleaning.

- NOTES -

**INSTALLATION OF LEGS, STAND**

VERIFY ALL PARTS ARE PRESENT BEFORE BEGINNING ASSEMBLY

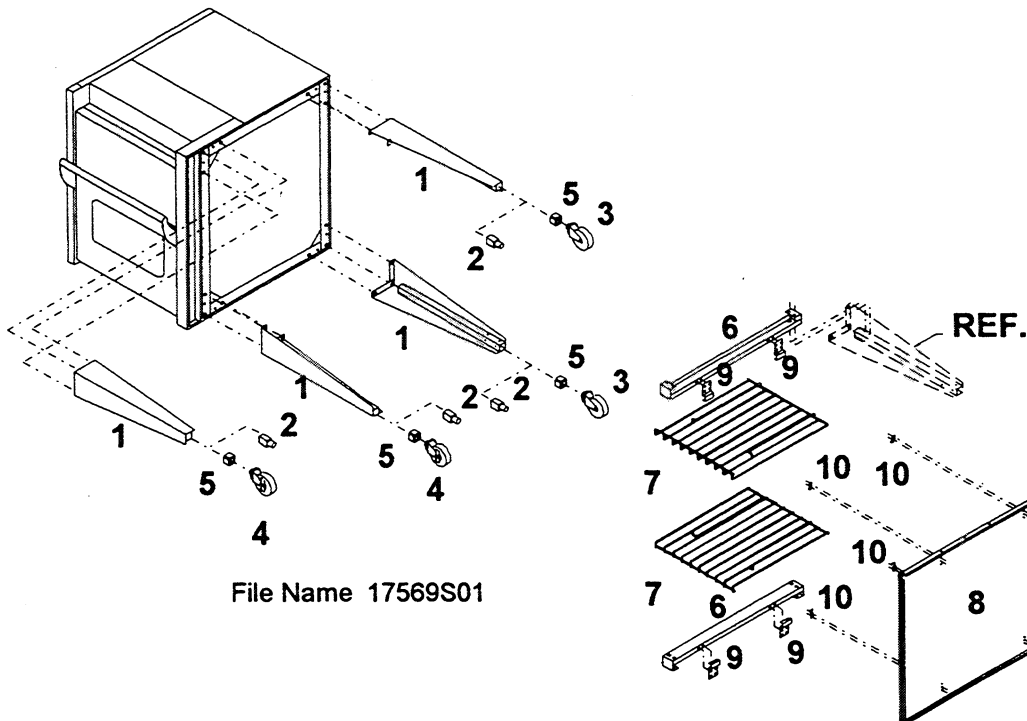
**PARTS LIST**

| ITEM # | QTY | DESCRIPTION   |
|--------|-----|---|
| 1.     | 4   | LEGS  |
| 2.     | 4   | SQUARE FOOT INSERTS (FOOT VERSION ONLY)                 |
| 3.     | 2   | HEAVY DUTY CASTERS WITHOUT BRAKES (CASTER VERSION ONLY) |
| 4.     | 2   | HEAVY DUTY CASTERS WITH BRAKES (CASTER VERSION ONLY)    |
| 5.     | 4   | CASTER PAD ASSEMBLIES (CASTER VERSION ONLY)             |
| 6.     | 2   | OPEN STAND UPPER RACK SUPPORT (OPEN BASE VERSIONS ONLY) |
| 7.     | 2   | RACK GUIDES (OPEN BASE VERSIONS ONLY)                   |
| 8.     | 1   | OPEN STAND LOWER RACK SUPPORT                           |
| 9.     | 4   | RACK GUIDE CLIPS (TOP)                                  |
| 10.    | 4   | RACK GUIDE CLIPS (BOTTOM)                               |
|        | 1   | BAG OF HARDWARE   |
|        | 12  | 3/8" - 16 x 3/4" BOLTS                                  |
|        | 12  | 3/8" FLAT WASHERS                                       |
|        | 16  | 10-24 x 3/4" HEX HEAD MACHINE SCREWS                    |
|        | 16  | #10 SPLIT RING LOCK WASHERS                             |
|        | 16  | 10 - 24 HEX NUTS  |
|        | 28  | #10 x 3/4" TRUSS HEAD SHEET METAL SCREWS                |

**TOOLS REQUIRED FOR ASSEMBLY**

- |                 |                               |
|-----------------|-------------------------------|
| 1. 9/16" Wrench | 3. 1" Wrench                  |
| 2. 3/8" Wrench  | 4. Phillips Head Screw Driver |
|                 | 5. Hammer (Foot Version Only) |

Diagram of unit shown on left side.



File Name 17569S01



## ASSEMBLY INSTRUCTIONS FOR OPEN BASE

1. Raise unit or lay it on its left side.
2. For foot versions take a hammer and lightly tap a square foot insert (2) into each leg.
3. For caster versions attach a caster pad assembly (5) to the bottom of each leg. Position caster pad (5) and drill four 11/64 diameter holes in leg and fasten caster pad to leg with #10 Phillips head sheet metal screws.
4. For caster versions screw the heavy duty casters with brake (4) into the front legs and the heavy duty casters without brakes (3) into the rear legs.
5. Attach each leg (1) with three 3/8" bolts and flat washers.
6. Mount right and left open stand upper rack support (6) to the front and rear legs using #10 Phillips head sheet metal screws.
7. Mount four rack clips (9) to the upper rack supports (6) with 10-24 bolts, nuts and lock washers. If the holes at the edge of the rack clip (9) are used it will accommodate 18" x 26" pans, if the holes in the center of the rack clip (9) are used it will accommodate oven racks.
8. Mount the open stand lower rack support (8) to the legs using #10 Phillips head sheet metal screws.
9. Place the rack guides (7) on the rack clips (9). Attach the bottom of each rack guide (7) to the lower rack support (8) with two lower rack clips (10) with 10-24 nuts, bolts and lock washers.
10. Make sure all bolts and screws are tight.
11. Stand the unit up.
12. Move the unit into its desired location.
13. Level the oven using a 1" wrench to adjust the feet or the casters.

## ASSEMBLY INSTRUCTIONS FOR STAND

1. Raise unit or lay it on its left side.
2. For foot versions take a hammer and lightly tap a square foot insert (2) into each leg.
3. For caster versions attach a caster pad assembly (5) to the bottom of each leg. Position caster pad (5) and drill four 11/64" diameter holes in leg and fasten caster pad to leg with #10 Phillips head sheet metal screws.
4. For caster versions screw the heavy duty casters with brakes (4) into the front legs and the heavy duty casters without brakes (4) into the rear legs, (single deck only).
5. Attach each leg (1) with three 3/8" bolts and flat washers.
6. Make sure all bolts and screws are tight.
7. Stand the unit up.
8. Move the unit to its desired location.
9. Level the oven using a 1" wrench and adjust the feet or the casters.
12. Attach the rack guides to the upper rack supports using the remaining rack guide clips. Attach these clips using #10-24 x 3/4" PHILIPS head machine screws, #10-24 hex nuts.
13. Tighten all screws and nuts.
14. Stand the unit up.
15. Move the unit to its desired location.
16. Level the oven using a 1" wrench to adjust the feet or the casters.

## ASSEMBLY INSTRUCTIONS FOR DOUBLE DECK CASTERS

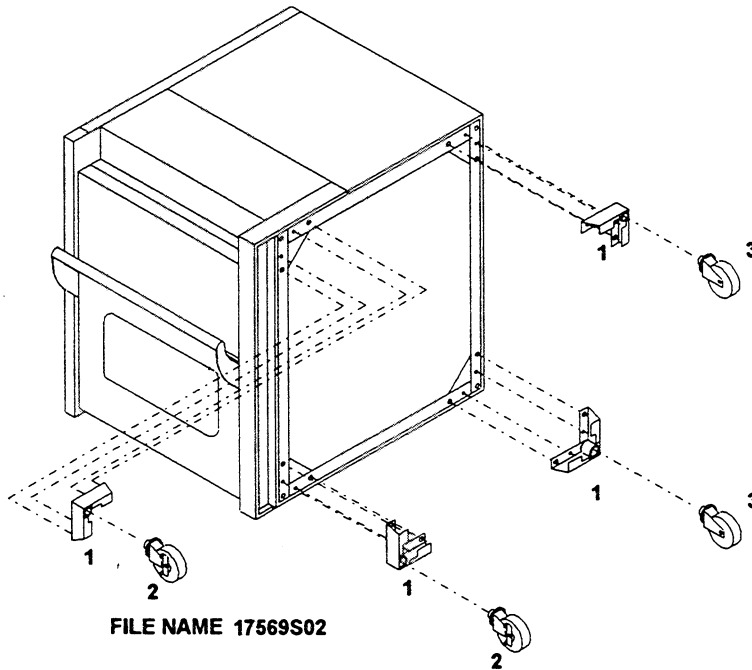
VERIFY ALL PARTS ARE PRESENT BEFORE BEGINNING ASSEMBLY

### PARTS LIST

| ITEM # | QTY | DESCRIPTION                        |
|--------|-----|------------------------------------|
| 1.     | 4   | CASTER PADS ASSEMBLY               |
| 2      | 2   | HEAVY DUTY CASTER WITHOUT BRAKE    |
| 3      | 2   | HEAVY DUTY CASTER WITH BRAKE       |
|        | 1   | BAG OF HARDWARE                    |
|        | 8   | 3/8" - 16 x 3/4" BOLTS             |
|        | 8   | 3/8" FLAT WASHER                   |
|        | 8   | 1/4" HEX TYPE B SHEET METAL SCREWS |
|        | 8   | SPLIT RING LOCK WASHERS            |

### TOOLS REQUIRED FOR ASSEMBLY

1. 9/16" Wrench
2. 3/8 " Wrench
3. 1" Wrench



## ASSEMBLY INSTRUCTIONS FOR DOUBLE DECK CASTERS

1. Raise unit or lay it on its left side.
2. Attach each caster pad (1) with two 3/8" bolts and flat washers and two 1/4" hex type "B" sheet metal screws and lock washers.
3. Screw the heavy duty casters with brakes (2) into the front casters pads and the heavy duty casters with out brakes (3) into the rear caster pads.
4. Make sure all bolts and screws are tight.
5. Stand the unit up.
6. Move the unit into its desired location.
7. Level the oven using a 1" wrench to adjust the casters.

## **GAS CONNECTIONS**

The 1" NPT inlet at the rear must be considered in piping the gas supply for double stack units. Undersized gas supply line(s) may restrict the gas supply and affect performance. If other gas appliances are supplied by the same supply line, the supply line must be sized to carry the combined volume without causing more than 1/2" pressure drop at the manifold of each appliance on the line at full rate.

## **ELECTRICAL CONNECTIONS**

A 15 AMP service must be provided for each oven. For 115v usage, a cord and plug is provided but connection to the electrical service must comply with local codes; or in the absence of local codes, with the National Electrical Code, ANSI/NFPA No. 70- 1990 (or the latest edition).

Each oven is electrically equipped with a cord set with a three prong plug which fits all standard 115v three prong grounded receptacle.

Wiring diagrams are attached to the rear of the unit and a copy of most common units wiring diagrams are included in this manual.

### **WARNING: ELECTRICAL GROUNDING INSTRUCTIONS**

All ovens, when installed, must be electrically grounded in accordance with local codes, or in the absence of local codes with the National Electrical Code ANSI/NFPA 70-1990 (or the latest edition).

This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. DO NOT CUT OR REMOVE THE GROUNDING PRONG FROM THIS PLUG.

## **VENTILATION AND AIR SUPPLY**

Proper ventilation is highly important for good operation. The ideal method of venting a GAS Convection Oven is through the use of a properly designed canopy which should extend 6" beyond all sides of the appliance and 6'6" from the floor.

A strong exhaust fan will create a vacuum in the room, for an exhaust system vent to work properly, replacement air must enter the room in which the vent is located. The amount of air which enters must equal the amount exhausted.

All gas burners and pilots need sufficient air to operate and large objects should not be placed in rear and bottom of this oven which would obstruct the air flow through the front.

### INSTALLATION OF A DIRECT FLUE

When the installation of a canopy type exhaust hood is impossible the oven may be direct vented. If the unit is to be connected directly to a direct flue, it is necessary that a flue cap assembly and 8" draft diverter (for double deck units) or a flue cap assembly and 6" draft diverter (for single deck units) be installed to insure proper ventilation. Direct venting as described above, should be positioned on the existing flue box and fastened with sheet metal screws provided. All parts described above are available from U.S. RANGE.

**NOTE:** Each oven has been factory tested and adjusted prior to shipment. It may be necessary to further adjust the oven as part of a proper installation. Such adjustments are the responsibility of the installer. Adjustments are not considered defects in material and workmanship, and they are not covered under the original equipment warranty.

**DO NOT UNDERSIZE VENT PIPE!** This can cause resistance to flow and impede good venting.

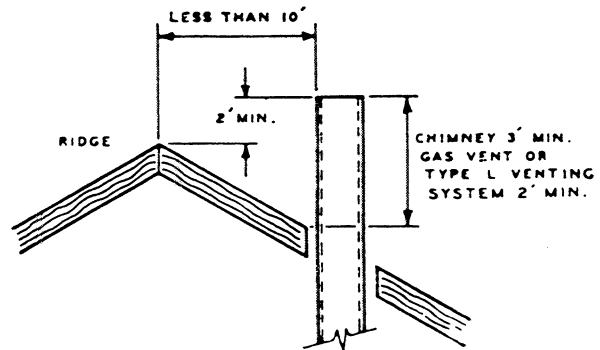
If a horizontal run must be used it should rise no less than 1/4" for each linear foot of run. The flue should rise 2' to 3' above the roof line or 2' to 3' above any portion of a building within a horizontal distance of 10 feet.

### TESTING AND LIGHTING INSTRUCTIONS

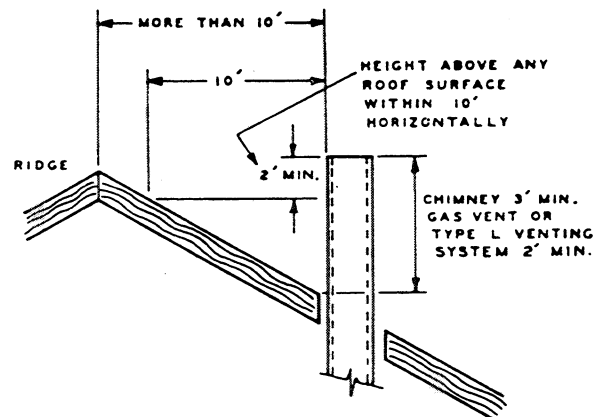
#### PILOT LIGHTING INSTRUCTIONS: MANUAL PILOT ONLY

1. Open combustion chamber door located directly under oven doors.
2. Depress and hold the red reset button located on the oven safety valve.
3. With a lighted taper, ignite the pilot which is located to the right of the burner package about 9" inward from the manifold.
4. Once the pilot ignites it is necessary to hold the red reset button until the pilot thermocouple is heated (appx. 1 min.).
5. Release the red button if the pilot does not stay lit, wait five minutes and repeat this procedure.

**NOTE:** During installation there will be air in the gas line, this air will have to bleed off before ignition can be established.



Termination Less Than 10 Feet From Ridge, Wall or Parapet



Termination More Than 10 Feet From Ridge, Wall or Parapet

**MODELS WITH INTERMITTENT ELECTRONIC IGNITION SYSTEMS & CONTROLS**

1. Turn on main gas valve. Open the combustion chamber drop door and leak test all fittings and connections with soap solution upstream from the service valve located on the redundant combination gas valve. Should any gas leaks be detected, turn OFF main gas valve, correct the problem and retest.

**CAUTION**

**DO NOT USE AN OPEN FLAME  
TO TEST FOR GAS LEAKS!**

2. Open shutoff valve located on the redundant combination gas valve. Activate rocker switch on control panel to cook position. Adjust thermostat to desired temperature. Amber light on control panel will cycle with burner. The pilot and burner is now ignited by direct spark. Check all fittings again and correct any leaks and recheck.

**NOTE:** All electronic ignition systems are supplied with a redundant gas valve. Therefore, the unit is not supplied with an external pressure regulator.

**NOTE:** During installation there will be air in the gas line, this air will have to bleed off before ignition can be established. The electronic ignition system has a eight second lock-out as a safety device.

**POWER FAILURE:**

In the event of a power failure, no attempt should be made to operate this oven. This unit is gas operated but has electrical features, motor, controls and solenoid.

**TO CONSERVE ENERGY:** Do not waste energy by leaving controls at high temperature settings during idle periods. Lower settings will keep oven warm and ready for next use period. Reset controls as required for heavy load period.

**IMPORTANT:** All gas burners need sufficient air to operate and objects should not be placed on main top rear of unit while in use. This could obstruct the venting system of the units flue products.

**FOR YOUR SAFETY: KEEP YOUR APPLIANCE AREA FREE FROM COMBUSTIBLES.**

## OPERATING INSTRUCTIONS

### MANUAL CONTROLS

**NOTE:** Manual pilot lighting is required on ovens with out intermittent spark ignition. On ovens with intermittent spark ignition, oven pilot will light at step #2.

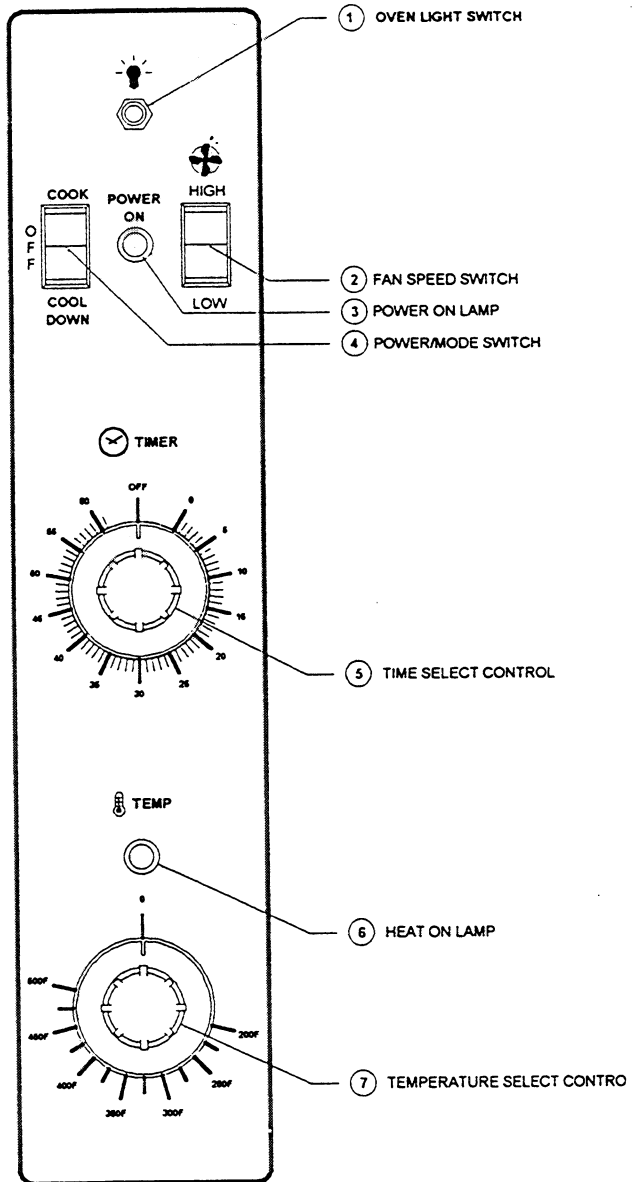
1. Set power/mode switch 4 to the COOK position. Set the fan speed switch 2 to the desired fan speed.
2. Set temperature dial 7 to desired temperature setting.
3. Allow a minimum 20 minute preheat time. When desired temperature is reached, the illuminated (amber) 6 indicating light will go out.
4. Load oven, for best results; load bottom to top. Set timer if desired. \*See cooking chart for suggested times and temperatures.

### AUTOMATIC COOL DOWN FEATURE

1. Turn temperature dial 7 to "OFF" position, set power/mode switch 4 to cool down position.
2. Open oven doors. Allow a minimum of 30 minutes for the oven temperature to be reached.
3. At the end of daily use, we recommend that the doors be left slightly open for complete cooling.

### SHUT DOWN INSTRUCTIONS

1. Turn thermostat dial 7 to off position. Return power/mode switch 4 to off.
2. If the unit is to be shut down for an extended period of time, close the manual gas service valve (located behind the combustion chamber safety cover).



**IMPORTANT**

All gas burners and pilots need sufficient air to operate and large objects should not be placed in front of this oven, which would obstruct the air flow through the front.

Objects should not be placed on main top rear of oven while in use. This could obstruct the venting system of the units flue products.

**POWER FAILURE**

In the event of a power failure, no attempt should be made to operate this oven.

This unit is gas operated but has electrical features, motor, electric thermostat and solenoid.

**FOR YOUR SAFETY: KEEP YOUR APPLIANCE AREA FREE FROM COMBUSTIBLES.**

**ELECTRONIC CONTROLS**

1. Set power/mode switch 4 to "COOK" position. Set fan speed switch 2 to the desired fan speed.

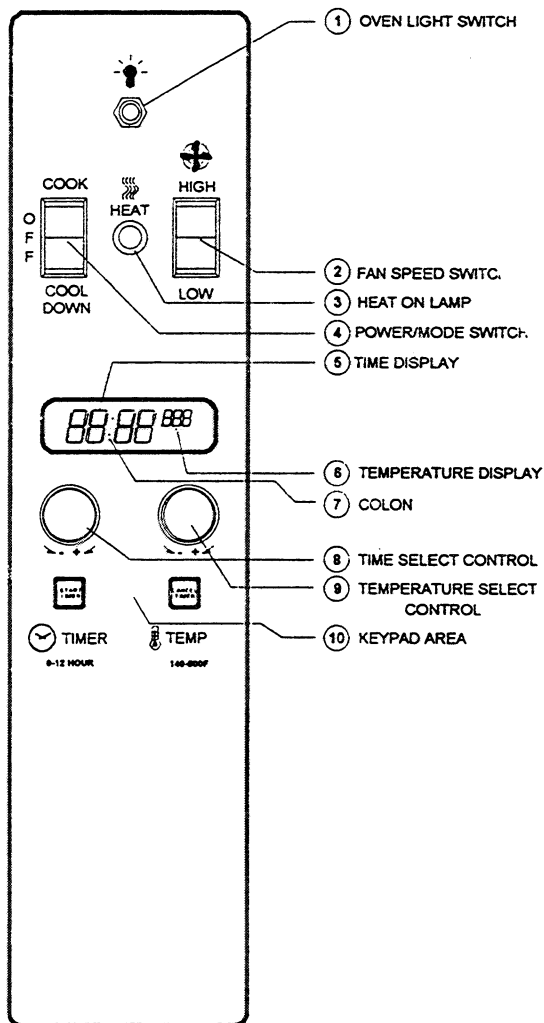
NOTE: Digital display 5 & 6 should be illuminated and the oven fan on.

2. Rotate temperature knob 9 to obtain desired cooking temperature. The temperature digits 6 will now flash until internal oven temperature has reached the desired cooking temperature.

Allow the oven a minimum of 20 minutes preheat time.

The cooking temperature may be increased or decreased at any time by rotating the temperature knob 9. The temperature digits 6 will again flash until oven reaches new temperature.

3. To set timer rotate time knob 8 until desired cooking time is indicated on the timer display digits 5 - digits will now flash indicating that timer is ready to be started.



To start timer depress timer start switch 10. Timer digits 5 will stop flashing and timer colon 7 will blink indicating the timer is counting down.

When the timer digits 5 reach 00:00 a tone will sound to alert the operator. The tone is continuous and must be canceled by depressing timer cancel switch 10.

The timer does not control oven; product must be removed by operator at time - 00:00 or oven switched off manually.

- To cool down oven cavity, set power/mode switch 4 to cool down position and open doors.

## COOK OR ROAST & HOLD CONTROL

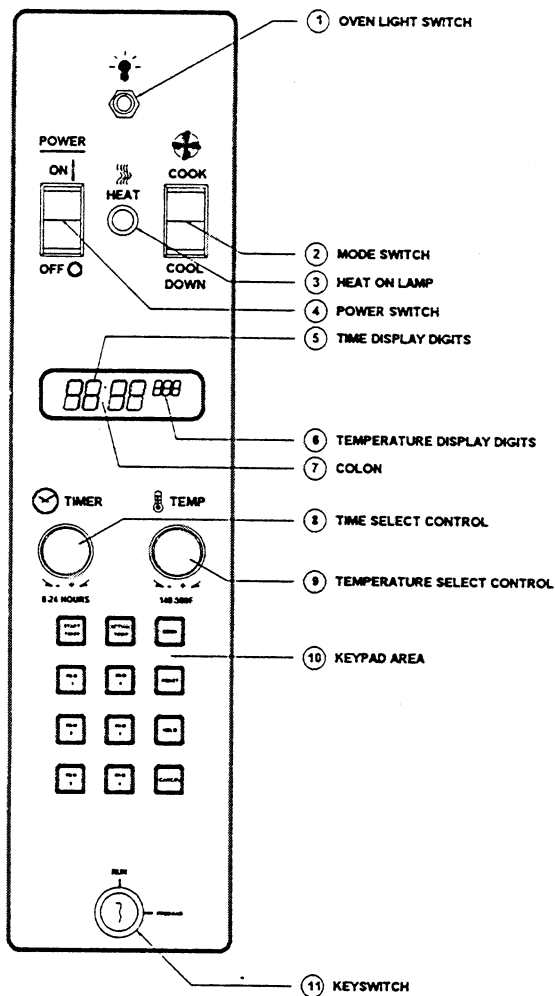
### MANUAL OPERATION

- Set power switch 4 to "ON" position. Set mode switch 2 to "COOK".

Digital displays 5 & 6 should be lit.

**NOTE:** Key switch 11 must be in "RUN" position.

- Depress key pad 10 labeled "Roast" for low fan speed or "COOK" for high fan speed.
- Rotate time select control 8 until desired temperature is displayed. Cook or roast time is indicated by the time digits (up to 24 hours).
- Rotate temperature select control 9 until desired cook or roast temperature is indicated by temperature display digits (from 140 to 500 degrees F.).
- To set "HOLD" temperature (**NOTE:** Hold is not required unless desired as part of a cook or toast process): Depress key pad 10 labeled "HOLD".
- Rotate temperature select control 9 until desired holding temperature is indicated by temperature display digits (from 104 to 250 degrees F.)
- At this point, temperature display digits 6 will flash until oven reached temperature.





7. At this point, temperature display digits 6 will flash until oven reached temperature.

When temperature digits lock in steady; load product and depress "Start Timer" keypad 10. Colon 7 will now blink indicating timer is counting down.

When the timer digits reach 00:00 a tone will sound to alert the operator. The tone is continuous and must be canceled by depressing timer cancel switch 10.

The timer does not control oven; product must be removed by operator at time - 00:00 or oven switched off manually.

**NOTE:** In the manual mode of operation, time and/or temperature may be increased or decreased by rotating time or temperature select knobs as desired.

8. To cool oven cavity down, set mode switch 2 to "COOL" position and open oven door.

#### **PRESETTING COOK or ROAST/HOLD PROGRAMS**

**NOTE:** It is easier to program keys 11 with the door open and Mode Switch in the cook position. In this set-up, neither the fan nor the burners will operate.

1. Rotate key switch 11 to "Program" position.
2. Depress keypad 11 labeled "Roast" (for low fan speed) or "Cook" (for high fan speed) and Release.
3. Depress and Hold keypad 11 labeled "Pgm 1".
4. Rotate time select control 8 until desired cook or roast time is indicated by the time display digits 5 (up to 24 hours).
5. Rotate temperature select control 9 until desired cook or toast temperature is indicated by temperature display digits 6 (from 104 to 500 degrees F.).
6. Release keypad 11 "Pgm 1."
7. To Set Hold Temperature (Note: Hold is not required unless desired as part of a cook or roast process): Depress keypad labeled 11 "HOLD" and release.
8. Depress and Hold keypad 11 label "Pgm. 1".
9. Rotate Temperature Select Control 9 until desired holding temperature is indicated by temperature display digits (from 140 to 250 degrees F.).
10. Release keypad 11 "Pgm. 1".
11. Program remaining locations Pgm. 2 through 6 in the same manner as steps "2" through "10" above.

## OPERATION OF PROGRAM MODE

NOTE: Key switch 11 must be in "RUN" position.

1. Depress desired program 10 (keypad "Pgm. 1" through "Pgm. 6").  
**Note:** Time 5, Temperature 6 and Mode Display will now indicate pre-set values as programmed in step 2. Oven will preheat to indicated temperature and temperature display digits will stop flashing. At this point, oven is ready.
2. Load product and depress keypad labeled 11 "Start Timer". Time digits will stop flashing and colon 7 will blink indicating that the timer is counting down. When the cook or roast time has been elapsed and a hold temperature has been selected, 3 beeps will sound indicating the end of the specified cook or roast time.

The temperature display digits 5 will flash indicating the oven is ramping down to the selected hold temperature. Also at this time, if the Heat On Lamp is off, the motor will turn off. In the hold mode the motor is on only when the heat is on.

If no hold temperature was selected, a tone will sound at the end of the cook or roast cycle to alert the operator. This tone is continuous and may be canceled only by depressing the keypad 11 labeled "Cancel".

## OPERATING INSTRUCTION 8 KEY CONTROL

\*\*SEE CONTROL PANEL VIEW ON NEXT PAGE\*\*

1. Set power switch 4 to "ON" position and set the mode switch 2 to "COOK" position.

Digital displays 5 & 6 should be illuminated.

## PRESETTING OF TIME/TEMPERATURE PROGRAMS

2. Rotate key switch 11 to "Program" position.
3. Depress and hold keypad labeled 10 "Pgm. 1".
4. Rotate time select control 8 until desired cook time is indicated by time display digits 5.
5. Rotate temperature select control 9 until desired cooking temperature is indicated by temperature display digits 6.
6. Release keypad 10 "Pgm. 1".
7. Program remaining locations Pgm. 2 through 5 in the same manner as above.
8. Return key switch 11 to "RUN" position.

## OPERATION OF PROGRAM MODE

1. Depress desired cooking program 10 (Pgm. 1 through 5).

**Note:** Time and temperature displays 5 & 6 will now indicate preset values as programmed in previous instructions. Oven will preheat to indicate temperature and temperature display digits will stop flashing. At this point oven is ready.

2. Load product and depress keypad labeled 10 "Start Timer". Time digits will stop flashing and colon 7 will now blink indicating that timer is counting down.

3. When cook time has elapsed, a tone will sound to alert operator.

**NOTE:** Tone is continuous and may be canceled only by depressing keypad labeled "Cancel".

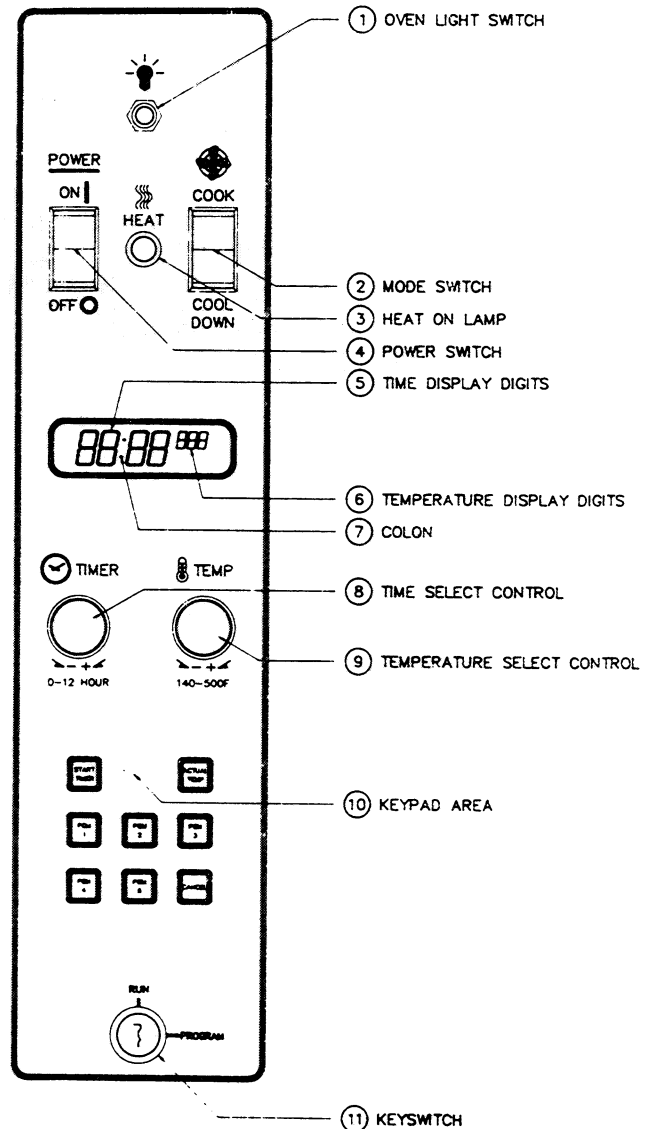
## MANUAL OPERATION OF 8 BUTTON CONTROL

**NOTE:** Key switch 11 must be in "RUN" position.

1. Select desired cooking temperature with temperature select control 9.
2. Select desired cooking time with time select control 8. At this point temperature display digits 6 will flash until oven reached temperature.
3. When temperature digits lock in steady; load product and depress "Start Timer" keypad. Colon 7 will now blink indicating timer is counting down.

4. Cancel tone with "Cancel" keypad 10.

**NOTE:** In manual mode of operation time and/or temperature may be increased "on the fly" by rotating time or temperature controls as desired.



COOL DOWN

1. To cool oven cavity, set Mode Switch 2 to cool down position and open oven door.

TO CONSERVE ENERGY

Do not waste energy by leaving controls at high temperature settings during idle periods. Lower settings will keep oven warm and ready for next use period. Reset controls as required for heavy load period.

**POWER FAILURE**

In the event of a power failure, no attempt should be made to operate this oven.

This unit is gas operated but has electrical features, motor, electric thermostat and solenoid.

**IMPORTANT**

All gas burners and pilots need sufficient air to operate and large objects should not be placed in front of this oven, which would obstruct the air flow through the font.

Objects should not be placed on main top rear of oven while in use. This could obstruct the venting system of the units flue products.

**FOR YOUR SAFETY: KEEP YOUR APPLIANCE AREA FREE FROM COMBUSTIBLES.**

## PERFORMANCE RECOMMENDATIONS

Your U.S. RANGE Convection Oven will give you the best quality product and service if you familiarize yourself with the following operation suggestions and information.

1. Preheat oven thoroughly (appx. 20 minutes) before use.
2. As a general rule, temperature should be reduced 25 to 50 degrees from that used in a standard/conventional oven. Cooking time may also be shorter, so we suggest closely checking the first batch of each product prepared. Use the cooking chart as a guide.
3. Use the chart of suggested times and temperatures as a guide. These will vary depending upon such factors as size of load, temperature and mixture of product (particularly moisture) and density of product.
4. Keep a record of the times, temperature and load sizes you establish for various products. Once you have determined these, they will be similar for succeeding loads.
5. When practical, start cooking the lowest temperature product first and gradually work up to higher temperatures.
6. If you find that your previous temperature setting is more than 10 degrees higher than needed for succeeding loads, use the cool down mode on the fan to reach the desired temperature before resetting thermostat.
7. When loading oven, work as quickly as possible to prevent loss of heat.
8. Oven will continue to heat even though the timer goes off. Product should be removed from the oven as soon as possible to avoid over cooking.
9. Center pans on racks and load each shelf evenly to allow for proper air circulation within the cavity.
10. When baking, weigh or measure the product in each pan to assure even cooking.
11. When cooking five pans, use rack positions 2,4,6,8, and 10, starting from the top.
12. Do not overload the oven. Five pans are suggested for most items, i.e., cakes, cookies, rolls, etc.: however, the maximum (10 pans) may be used for fish sticks, chicken nuggets and hamburgers. Cooking times will have to be adjusted.
13. Muffin pans should be placed in the oven back to front or with the short side of the pans facing the front. This results in the most evenly baked product.
14. When rethermalizing frozen casseroles, preheat the oven 100 degrees over the suggested temperature: return to cooking temperature when the oven is loaded. This will help ~~compensate~~ for the introduction of a large frozen mass into the cavity.

15. Use pan extenders or two inch deep 18"x26" pans for batter type products which weigh more than eight pounds, i.e., Pineapple Upside Down Cake.
16. Never place anything directly on the bottom of the oven cavity. This obstructs the air flow and will cause uneven results.

**NOTE:** Moisture will escape around the doors when baking products with heavy moisture content, such as: chicken, potatoes, and etc.

All units have a controllable vent. The vent control is located at the inner front top of the oven cavity. Movement to the left will close the vent and movement to the right will open the vent. Keep vent closed during preheat.

The desired dryness or moisture of the finished product will dictate the setting of the vent.

### PROBLEMS/SOLUTIONS

#### Problems

#### Solutions

|   |   |
|---|---|
| If cakes are dark on the sides and not done in the center ..... | Lower oven temperature.   |
| If cakes edges are too brown.....                               | Reduce number of pans or lower oven temperature.  |
| If cakes have light outer color.....                            | Raise temperature.  |
| If cake settles slightly in the center.....                     | Bake longer or raise oven temperature slightly. Do not open doors too often for long periods. |
| If cake ripples.....  | Overloading pans or batter is too thin  |
| If cakes are too coarse.....                                    | Lower oven temperature.   |
| If pies have uneven color.....                                  | Reduce number of pies per rack or eliminate use of bake pans.                                 |
| If cupcakes crack on top.....                                   | Lower oven temperature.   |
| If meats are browned and not done in center...                  | Lower temperature and roast longer.   |
| If meats are well done and browned.....                         | Raise temperature and reduce time. Limit amount of moisture.                                  |
| If meats develop hard crust.....                                | Reduce temperature or place pan of water in oven.   |
| If rolls have uneven color.....                                 | Reduce number or size of pans.  |

**USE GUIDE**

| PRODUCT                     | TEMPERATURE | TIME       |
|-----------------------------|-------------|------------|
| Sheet Cakes (5 lbs. ea.)    | 325         | 18 min.    |
| Soda Biscuits               | 400         | 6 min.     |
| Yeast Rolls                 | 325         | 20 min.    |
| Corn Bread                  | 350         | 20 min.    |
| Gingerbread                 | 300         | 18 min.    |
| Chocolate Cake              | 325         | 20 min.    |
| Chocolate Chip Cookies      | 375         | 8 min.     |
| Sugar Cookies               | 325         | 12 min.    |
| Yellow Cake                 | 325         | 15 min.    |
| Angel Food Cake             | 275         | 25 min.    |
| Brownies                    | 350         | 15 min.    |
| Apple Turnovers             | 350         | 25 min.    |
| Cream Puffs                 | 300         | 30 min.    |
| Apple Pie (fresh)           | 375         | 30 min.    |
| Pumpkin Pie                 | 275         | 35 min.    |
| Berry Pie (frozen)          | 350         | 35 min.    |
| Fruit Pie (frozen)          | 350         | 45 min.    |
| Pizza (individual frozen)   | 450         | 5 min.     |
| Macaroni and Cheese         | 350         | 30 min.    |
| Cheese Sandwiches (toasted) | 400         | 7 min.     |
| Hamburger Patties           | 400         | 8 min.     |
| Baked Potatoes (120 count)  | 400         | 55 min.    |
| Fish Sticks                 | 350         | 16 min.    |
| Stuffed Peppers             | 350         | 15 min.    |
| Chicken Parts               | 350         | 35-40 min. |
| Meatloaf                    | 325         | 40 min.    |
| Rolled Beef (20 lbs. ea.)   | 300         | 4 hrs.     |
| Prime Rib                   | 275         | 6 hrs.     |
| Stuffed Pork Chops          | 375         | 25 min.    |
| Lamb Chops (loin)           | 375         | 12 min.    |
| Veal Roast (boned)          | 300         | 3 hrs.     |

**NOTE:** THE SUGGESTED TIMES AND TEMPERATURES MAY VARY CONSIDERABLY FROM THOSE SHOWN ABOVE. THEY ARE AFFECTED BY WEIGHT OF LOAD, TEMPERATURE OF THE PRODUCT, RECIPE AND TYPE OF PAN.

**USE GUIDE****USE GUIDE - CONVECTION OVEN WITH COOK'N HOLD FEATURES**

**SET TIME (THE TIMER SETTING) FOR ROLLED BEEF  
ROAST (REFRIGERATED - NOT FROZEN)**

| ROAST<br>WT.<br>LBS. | HOURS |       |       |       |       |       |
|----------------------|-------|-------|-------|-------|-------|-------|
|                      | RARE  | MED   | RARE  | MED   | RARE  | MED   |
| DONENESS             |       |       |       |       |       |       |
| OVEN<br>TEMP.>       | 200 F | 200 F | 250 F | 250 F | 300 F | 300 F |
| 8                    | 2.50  | 3.50  | 1.50  | 2.00  | 1.25  | 1.50  |
| 9                    | 2.75  | 3.75  | 1.75  | 2.25  | 1.25  | 1.75  |
| 10                   | 3.00  | 4.25  | 2.00  | 2.50  | 1.50  | 1.75  |
| 11                   | 3.25  | 4.50  | 2.00  | 2.75  | 1.50  | 1.75  |
| 12                   | 3.50  | 5.00  | 2.25  | 3.00  | 1.50  | 2.00  |
| 13                   | 3.75  | 5.00  | 2.50  | 3.25  | 1.50  | 2.25  |
| 14                   | 4.00  | 5.75  | 2.50  | 3.50  | 1.75  | 2.50  |
| 15                   | 4.25  | 6.00  | 2.75  | 3.50  | 2.00  | 2.50  |
| 16                   | 4.50  | 6.25  | 2.75  | 3.75  | 2.00  | 2.75  |
| 17                   | 4.75  | 6.50  | 3.00  | 4.00  | 2.25  | 2.75  |
| 18                   | 4.75  | 6.75  | 3.25  | 4.25  | 2.25  | 3.00  |
| 19                   | 5.00  | 7.25  | 3.25  | 4.25  | 2.25  | 3.00  |
| 20                   | 5.25  | 7.50  | 3.50  | 4.50  | 2.50  | 3.25  |
| 21                   | 5.50  | 7.75  | 3.50  | 4.75  | 2.75  | 3.50  |
| 22                   | 5.75  | 7.75  | 3.50  | 4.75  | 2.75  | 3.50  |
| 23                   | 6.00  | 8.25  | 3.75  | 5.00  | 2.75  | 3.75  |
| 24                   | 6.00  | 8.75  | 3.75  | 5.00  | 2.75  | 3.75  |
| 25                   | 6.25  | 9.00  | 4.25  | 5.50  | 3.00  | 4.00  |
| 26                   | 6.50  | 9.25  | 4.25  | 5.50  | 3.25  | 4.25  |
| 27                   | 6.75  | 9.50  | 4.25  | 5.75  | 3.25  | 4.25  |
| 28                   | 7.00  | 9.75  | 4.50  | 6.00  | 3.25  | 4.25  |
| 29                   | 7.25  | 10.00 | 4.75  | 6.25  | 3.50  | 4.50  |
| 30                   | 7.25  | 10.25 | 4.75  | 6.25  | 3.50  | 4.50  |

**ALLOW TO THE ABOVE SET TIMES: (FLYWHEEL CYCLE)**

**1 HOUR**

**1 1/2 HOUR**

**2 HOURS**

**NOTE:** THE SUGGESTED TIMES AND TEMPERATURES MAY VARY CONSIDERABLY FROM THOSE SHOWN ABOVE. THEY ARE AFFECTED BY WEIGHT OF LOAD, TEMPERATURE OF THE PRODUCT, RECIPE AND TYPE OF PAN.



## CLEANING

**NOTE:** Disconnect line cord from power supply before cleaning or servicing.

### Break-In Period

When oven is new, operate it for one hour at 450 degrees before you begin your normal cooking operation. After cooling, wipe the interior, including the racks, with a clean damp cloth.

### Exterior Cleaning

Establish a regular schedule. Any spills should be wiped off immediately.

1. Wipe exposed, cleanable surface when cool with a mild detergent and hot water. Stubborn residue spots may be removed with a light weight non-metallic scouring pad. Dry thoroughly with a clean cloth.
2. Stainless steel should be cleaned using a mild detergent, a soft cloth and hot water. If it is necessary to use a non-metallic scouring pad, always rub in the direction of the grain in the metal to prevent scratching. Use a water based stainless cleaner (Drackett Twinkle), if you want a high shine.
3. The control panel surface is easily cleaned with hot water, soap and a soft cloth. Do not use hard abrasives, solvent type materials or metallic scouring pads since these will scratch or cloud the surface.
4. Never spray the perforated areas or control panel with steam or water as this will allow moisture into the control cavity which could damage electrical components.

### Interior Cleaning

Establish a regular cleaning schedule or wipe off on the same day when spillovers occur.

1. Cool down oven.
2. Remove oven racks.
3. Lift rack guides on either side of oven off of holders, pull the top away from the cavity wall, when it's cleared the clips push down and remove. Racks and guides may be run through dishwasher while oven cavity is being cleaned.
4. Clean with soap and water using a non-metallic scouring pad, if necessary. If dirt and grease have accumulated, a mild ammonia solution or commercial oven cleaner such as Easy-Off or Dow may be used.
5. To reinstall reverse procedure. Place the bottom of the rack guide against the cavity wall. Keeping the top pulled away from the wall lift up. Push the top of the rack guide against the wall and push down locking it into place.

**Note:** Exercise caution in cleaning around the wires connection the temperature probe. These must not be pulled out or severed. Do not remove temperature probe cover.

## OVEN INTERIOR - OPTIONAL CONTINUOUS CLEAN

- A. "Break-In Period" - When the oven is new, operate the oven for at least two hours at high heat, with the oven empty, before any normal cooking operation. Continue preheating the oven for two hours prior to use during the first week or two. During this break-in period, it is important that the oven surfaces be kept clean of any excessive soiling due to spillage.
- B. How To Put "Continuous Clean" Action To Work - Each day, after baking and roasting operations have ceased, empty the oven, turn the temperature control up to high heat. This high heat will accelerate the cleaning action and reduce the time required to effectively clean the oven. Usually the cleaning operation will take about 45 to 60 minutes. **NEVER USE OVEN CLEANERS ON CONTINUOUS CLEAN SURFACES.**
- C. Heavy Staining - When the oven appears soiled, due to heavy staining, we suggest preheating the empty oven each day for 1 or 2 hours (depending on the condition of the oven) for effective results. Also, ordinary household ammonia has proven to be effective in removing baked-on "soil" build up, and has the beneficial effect of keeping the microscopic "pores" of the coating open and free to perform its cleaning action. An occasional light swabbing with household ammonia while the oven is at room temperature will prove extremely beneficial.

Abrasives Should Not Be Used - In order to maintain continuous cleaning action, it is very important to avoid the use of abrasive materials such as steel wool scouring pads, abrasive or sharp implements which can cause permanent damage to the surface coating. In addition, oven cleaners such as Easy Off or Dow Oven Cleaners will clog the "Pores" of the special coating and will retard the cleaning action.

- D. Periodic "Tune-Up" - Although the oven appears clean, we recommend operating the oven at high heat for 2 hours approximately once each month. This will insure against build-up of solids in hard to see places and in the pores of the coating.

### MOTOR CARE

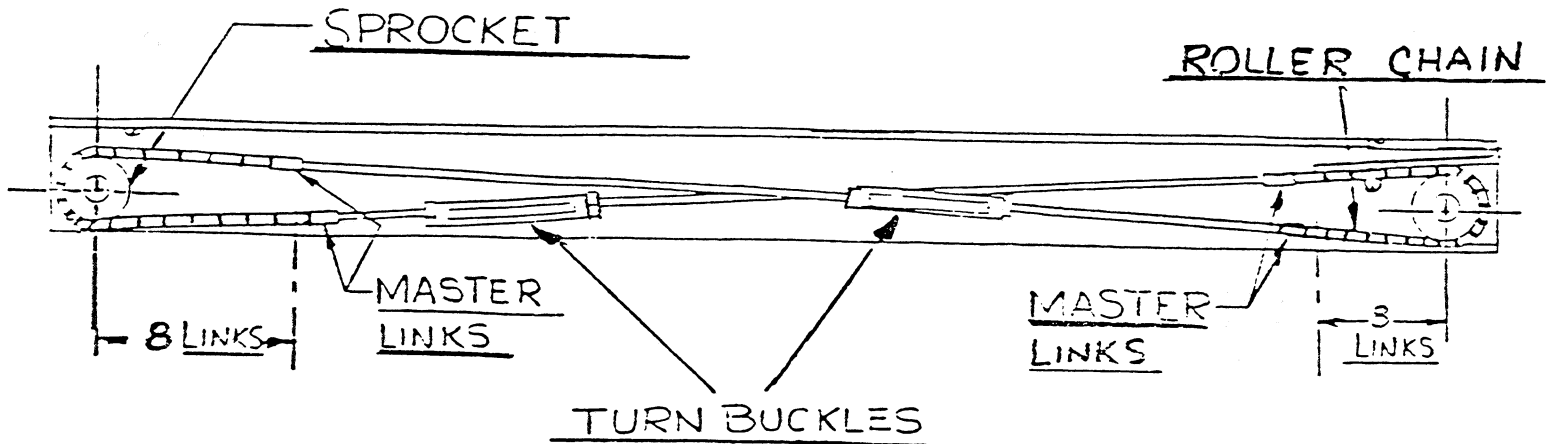
The motor on your U.S. RANGE Convection Oven is maintenance free since it is constructed with self-lubricating sealed ball bearings. It is designed to provide durable service when treated with ordinary care. We have a few suggestions to follow on the care of your motor. When the motor is operating, it cools itself internally by air entering at the rear of the motor case, provided proper clearance has been allowed.

Since the blower wheel is in the oven cavity it is at the same temperature as the oven. If the motor is stopped while the oven is hot, the heat from the blower wheel is conducted down the shaft and into the armature of the motor. This action could shorten the life of the motor.

We recommend, at the end of the bake or roasting period, when the oven will be idle for any period of time or before shutting down completely, that the doors be left open, and by use of the cool-down position of the fan switch, the fan continues to run at least five minutes. The "Fan" should never be turned "Off" when the oven is "Hot".

## ADJUSTMENTS

### INSTALLING AND ADJUSTING DOOR MECHANISM



1. Remove bottom veneer front (located under oven doors). This will expose the door mechanism.
2. Close both doors.
3. Adjust both turnbuckles by "opening equally" so the mechanism and chains can be installed over the sprockets.
4. Place the chains around the sprockets, so there are 8 regular links plus one master link on the forward side of each chain.
5. Adjust the turnbuckles so the right door closes about 1/4 to 1/2 inch ahead of the left door. The left turnbuckle adjust the right door and right turnbuckle adjust the left door.
6. Secure the turnbuckles by tightening lock nuts.

## BURNERS

All atmospheric burners use air mixed with gas to produce flames/heat.

The air mix is determined at:

1. The air shutter - The air shutter, located at the opening of the burner throat (mixer) must be wiped free of dust and grease to assure proper air mix.

Natural opening @ 3/8" (9.5 mm)

L.P opening @ 7/16" (11 mm)

2. Burner orifice - This brass tip is the device that meters/directs gas into the burner. It is generally in or in front of the burner. The opening must be free of dust and grease.

## PILOT

The free standing oven pilot must be cleaned internally periodically by a professional.

In between that service you can be extended operational time by wiping spillovers and grease/dust accumulations from those pilot areas.

## TRUBLE SHOOTING

### ELECTRONIC CONTROLS -"E"

Understanding the sequence of operation of the ignition system will make troubleshooting easier in the event of "lock out". LOCK OUT occurs when the flame sensor fails to sense pilot flame. LOCK OUT of the Johnson Ignition Module Model G770 will occur in eight (8) seconds after spark begins.

### SEQUENCE OF OPERATION

1. Turn unit ON, the display will show "00:00" in the TIME position and "000" in the temperature position.
2. Dial TEMPERATURE dial to desired temperature, (ex. 300 F).
3. At this point pin connection "E7" (see diagram) on the controller has a constant 24 Volts AC. Once the digits in the TEMPERATURE position start to flash the relay on the controller will close and 24 Volt AC will be present on pin "E6". (see diagram)
4. With 24 Volts AC present on pin "E6" it will conduct the 24 Volts to the ignition module pin connection "THS2". This will start the ignition sequence.
5. A spark will be created from the electrode to the pilot, ( a spark gap of 1/8") and there will be 24 Volt present on the Pilot Valve (P.V.1). With 24 Volts on the pilot valve coil the pilot gas valve will open allowing gas to flow to the pilot and ignition will occur.
6. Now that the pilot gas is ignited it will heat the FLAME SENSOR. Heating the FLAME SENSOR will generate micro amps. A minimum of .15 micro amp or greater is needed to prove the pilot flame.
7. Once the pilot flame has "proven", the MAIN VALVE (M.V.3) will open and ignition on the main burner will occur.
8. Once the oven has reached the set point temperature the main burner and the pilot burner will cycle OFF.

### TRUBLE SHOOTING THIS SYSTEM

\*\*Before trouble shooting check all connection are proper and tight, also check for loose crimps and frayed or pinched wires, (examine the FLAME SENSOR Wire carefully).

1. If you encounter a convection oven that is in lock out, first, reset by dialing the temperature down to zero and wait ten (10) seconds.
2. Redial the temperature to desired set-point. (ex. 300 F)

3. Check to see if there is 24 Volts present on the "THS2" pin connection of the G770 Ignition Module. If there is "NO" voltage present back track the wiring to find the cause.
4. If you have 24 Volts on the "THS2" there should be a spark generated at the pilot.

**NOTE:** There is to be a jumper between pin connection "5" and ground pin connection.

If there is a spark being generated the ignition module is likely "okay".

5. Is there 24 Volts on the modules pin connection "P.V.1" ? If there is no voltage present then the control is likely bad.

If there is voltage present (there should also be voltage on the pilot gas valve coil) and the pilot gas valve does not open, then the redundant gas valve has failed.

**NOTE:** Check ground path between pilot and ground point on the ignition module, it must be less than 1 OHM.

6. With the gas valve open and ignition of the pilot burner, does the pilot go out within eight (8) seconds? If the answer is "yes", install your meter (to check for micro amps) between (in series) the FLAME SENSOR wire and the pin connection "SENSE 4" on the ignition module. Then reset the ignition module as described in step #1.

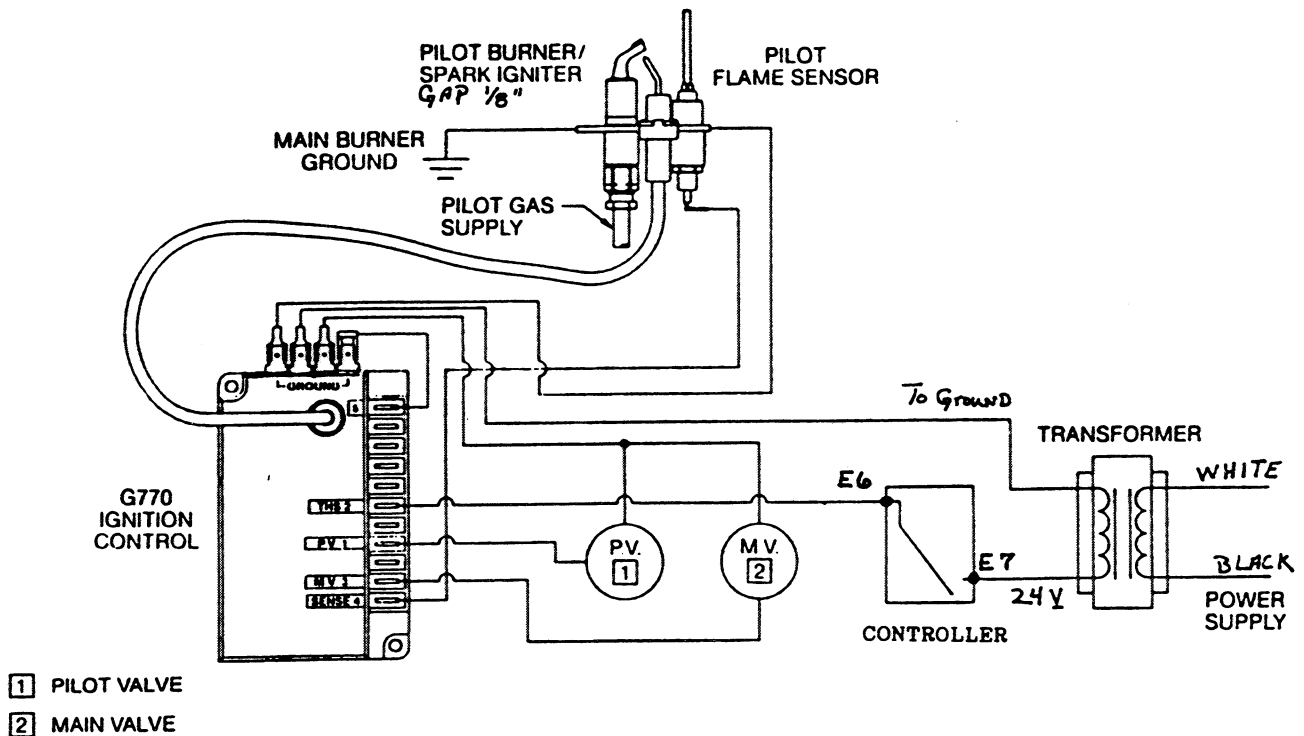
**WARNING:** Remove the wire on pin connection M.V.3 to prevent the main gas valve from possible opening, in this way you will get a TRUE micro amp reading.

7. What is your micro amp reading? If it is below the .15 micro amps, check gas pressure, orifice size and pilot location (see diagrams). If all is "okay", then replace flame sensor.
8. If the micro amp reading is higher than .15 check for voltage on pin connection M.V.3. If there is no voltage present on M.V.3 disconnect your meter from the system and install the Johnson Flame Simulator (#Y99AW-1) on pin connection "SENSE 4". Reset ignition system so the oven calls for heat. Once the a spark is being generated at the pilot ground the other side of the flame simulator. At the same time monitor voltage on pin connection M.V.3. If there is no voltage present on M.V.3 the ignition module has proven bad. If there is voltage present on M.V.3 (there should also be voltage on the main gas valve coil) and the main gas valve does not open, then the redundant gas valve has proven bad.
9. **NOTE:** When the oven reaches its set point temperature the main and pilot burner are to go out. If the pilot stays ignited the relay in the ignition module will not reset preventing the re-ignition sequence to start.

If the pilot stays ignited check for voltage either on the pin connection P.V.1 or on the pilot gas valve coils. If no voltage is present, then the redundant gas valve may be stuck in the open position. To check this turn off the gas supply to the oven. Once the pilot goes out, restart the oven. If the oven ignition systems cycles once and the pilot stays ignited then the redundant gas valve is proven bad.

10. Intermittent outage may be experienced as described as: "In the morning when the oven is first turned on the pilot lights. When the amber light is illuminated, the pilot goes out. "It will take several attempts to get the oven working...?"

Below is a ladder wire diagram illustrating simply the power supply to each of the components of the ignition system.



## THE FAILURE "-F-" CODE DISPLAY

The U.S. RANGE digital control has a self-diagnostic program. If a problem occurs within the digital controller, you may see one of the "F" code.

Below is a listing of the "F" codes with explanations:

- F1- Relay output is enabled when not cooking. If this failure code appears in the display the cook relay may be on even if the control is not cooking. The control should be replace.
- F2- Over temperature alarm. If this failure code appears in the display the control is sensing an oven temperature 50 degrees or more above the maximum set temperature (500 degrees). This failure may be caused by a faulty sensor.

Check the sensor connection for loose wires.  
Replace the sensor and check for proper operation.  
If failure continues replace the control.

- F3- Open sensor circuit. If this failure appears in the display the control is sensing an open circuit at the sensor input. This failure is most often caused by a poor connection or broken sensor.

Check sensor connection and leads for broken wires of loose connections. Replace sensor and check for proper operation. If failure continues replace control.

- F4- Shorted sensor circuit. If this failure appears in the display the control is sensing a short circuit at the sensor input. This failure is most often caused by loose wires at the connection of shorted sensor leads.

Check sensor connection and leads for loose wires. Replace sensor and check for proper operation. If failure continues replace control.

- F5- Relay outputs not enabled when cooking. If this failure appears in the display the control cannot turn the relays on even when cooking. The control should be replaced.

- F6- No 60Hz input. The control does not sense the input power. This failure mode is most often the result of a failed component in the control. However, this failure may also be the result of a very noisy power line. Look for any large electrical noise producing machinery (such as mixers, compressors, dish washers etc.). If possible turn these machines off. Reapply power to the oven. If the failure repeats replace the control. If the failure does not repeat an electronic control may not work in this application because of noise. You must isolate the supply circuit.

## RESISTANCE vs. TEMPERATURE CHART FOR INTERNAL OVEN TEMPERATURE SENSOR

The chart below will provide the Ohms at various temperatures. This will enable you to determine if the temperature probe is operable.

The chart is degrees Fahrenheit.

| TEMP | 0    | 10   | 20   | 30   | 40   | 50   | 60   | 70   | 80   | 90   |
|------|------|------|------|------|------|------|------|------|------|------|
| 0    | 932  | 953  | 974  | 995  | 1016 | 1038 | 1059 | 1080 | 1101 | 1122 |
| 100  | 1143 | 1163 | 1184 | 1205 | 1226 | 1247 | 1267 | 1288 | 1309 | 1329 |
| 200  | 1350 | 1370 | 1391 | 1411 | 1432 | 1452 | 1472 | 1493 | 1513 | 1533 |
| 300  | 1553 | 1574 | 1594 | 1614 | 1634 | 1654 | 1674 | 1694 | 1714 | 1733 |
| 400  | 1753 | 1773 | 1793 | 1813 | 1832 | 1852 | 1871 | 1981 | 1911 | 1930 |
| 500  | 1949 | 1969 | 1988 | 2008 | 2027 | 2046 | 2065 | 2085 | 2104 | 2123 |

## MANUAL CONTROLS - "M"

Understanding the sequence of operation will help in trouble-shooting this appliance. We will start with the doors closed.

### Sequence of Operation

1. Turn the power switch to the "ON" position. This will send power to door micro switch. The door micro switch is normally in the closed position.
2. The door micro switch (with doors closed) will send power to the operating thermostat.
3. Operating thermostat. Dial in a temperature, i.e. 300 degrees F. The thermostat that is a normally open switch will now close. It will send 115v to the gas solenoid.
4. The gas solenoid will now cycle with the operating thermostat. The main burners will now ignite provided that the standing pilot is burning.

### Thermostat Operation

It is normal for a hydraulic thermostat cycling with a temperature swing of 45 to 50 degrees. When checking calibration first; allow the thermostat to cycle a minimum of four (4) times, second; place your temperature sensor in the geometric center of the empty oven. When the thermostat cycles off write down that temperature, wait until the temperature cycles on and write that temperature down. Average the two readings, that average should be +/-20 degrees of the set point temperature.

Example: Thermostat set point at 300 degrees, first cycle Off at 325 degrees. Cycle back ON at 291 degrees. The average of 325 and 291 is 308 degrees. This thermostat is with the +/-20 tolerance.

If the thermostat is cycling beyond the 20 degree tolerance and the appliance is under warranty **do not re calibrate the thermostat**. Replace it under warranty. If the unit is out of warranty advise the user and allow them to decide if they want it re-calibrated or replaced.



## TROUBLE SHOOTING THE STANDING PILOT

### AUTOMATIC PILOT VALVE

The automatic pilot valve is a protective device that allows gas to flow to the oven burner only when the pilot burner is burning. (This is used on U. S. RANGE ovens and ranges to have safe lighting provisions provided by the flow interrupter that will not allow gas to flow to the oven burner while the red button is depressed.)

### THERMOCOUPLE REPLACEMENT

A thermocouple nut should be started and turned all the way in by hand. An additional quarter turn with a small wrench will then be sufficient to seat the lock washer and maintain adequate contact. A too loose or too tight connection of the thermocouple nut to the automatic pilot valve can prevent the thermocouple from activating the valve. A visual examination of the thermocouple lead should be made to make sure that there are not cracks or ruptures. Every effort has been made to insure trouble-free performance of this system with a minimum of service.

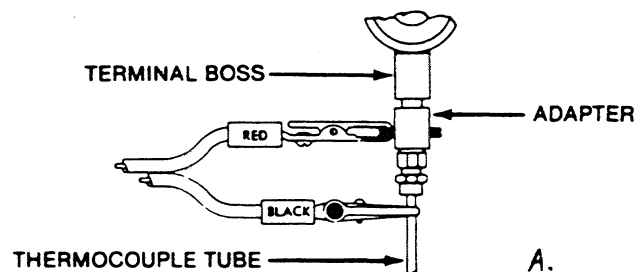
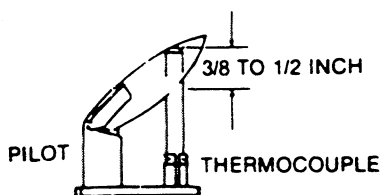
### TO TEST MAGNET ASSEMBLY AND THERMOCOUPLE FOR PROPER OPERATION

Heating the thermocouple tip by the pilot flame produces an electrical potential that is used to energize the magnet that, in turn, holds open the main and pilot valves. When the pilot is "OUT" or improperly adjusted, insufficient heat is applied to the thermocouple tip to produce adequate electrical generation that results in the control shutting itself off.

If, while following the proper lighting procedures, the magnet cannot be made to "HOLD", inspect the pilot flame for proper size and adjustment (see pilot burner adjustment.). If the magnet will still not hold, make the following checks:

#### CLOSED CIRCUIT TEST

(TO TEST MAGNET & THERMOCOUPLE AS COMPLETE UNIT)



To make the closed circuit test, remove the thermocouple lead from the magnet contact. Place an adapter (Robertshaw Part #75036) in the magnet contact and turn the thermocouple into the adapter, finger tight. Connect millivolt meter leads to adapter and thermocouple lead as shown in Figure "A".

Re-light pilot. Read meter after pilot has been burning three minutes. If pilot will not continue burning, depress and hold red button to check thermocouple output for this closed circuit check. If insufficient (normal output is 20 to 28 millivolts) millivolt output is noted, (less than 17 millivolts), replace thermocouple.

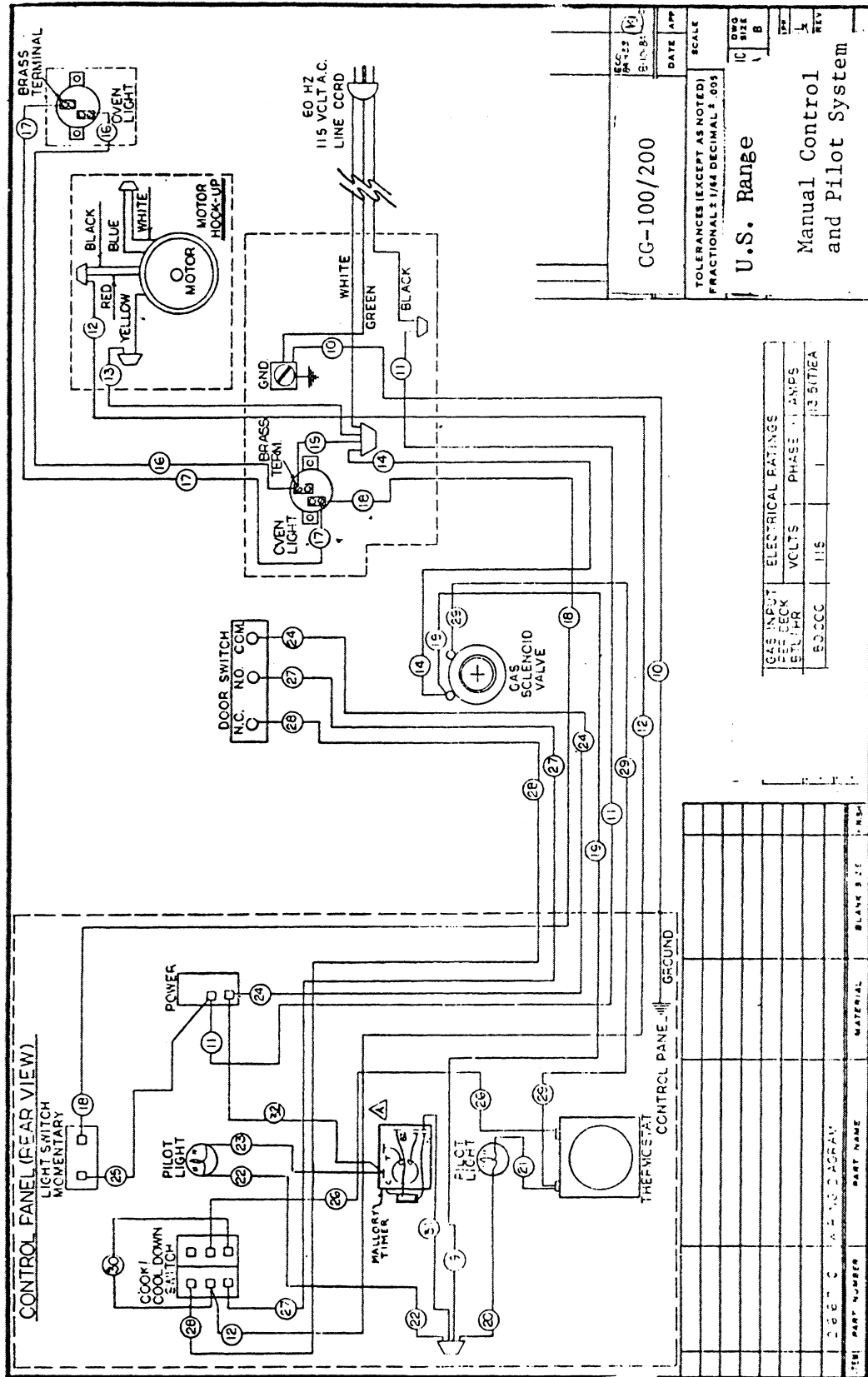
After checking the thermocouple in closed circuit, blow out the pilot flame, watching the millivolt meter. The magnet should continue to hold for a drop of at least five millivolts. If the magnet doesn't hold for a drop of five millivolts, you would have a false safety condition and frequent pilot outages. After this closed circuit check is made with the main burner off, the main burner should then be operated with the millivolt meter in position to check the effect of the main burner on the millivolt output.

#### **OPEN CIRCUIT TEST**

1. Disconnect thermocouple from safety valve.
2. Attach thermocouple to millivolt test instrument.
3. Heat sensor end of thermocouple with flame, monitoring millivolt meter.
4. If millivolt reading is below 17 millivolts, replace thermocouple.

#### **REPLACEMENT OF SAFETY VALVE**

1. Turn off gas supply to unit.
2. Remove thermocouple from magnet head. (Note position.)
3. Loosen the pilot compression fitting on pilot tubing and remove.
4. Loosen the main gas line union fittings on right sides of burner package and remove the burner package from the unit.
5. Remove the burner manifold from safety valve.
6. To reinstall the safety valve, follow directions in the opposite manner.
7. Before turning on gas supply check for leaks.

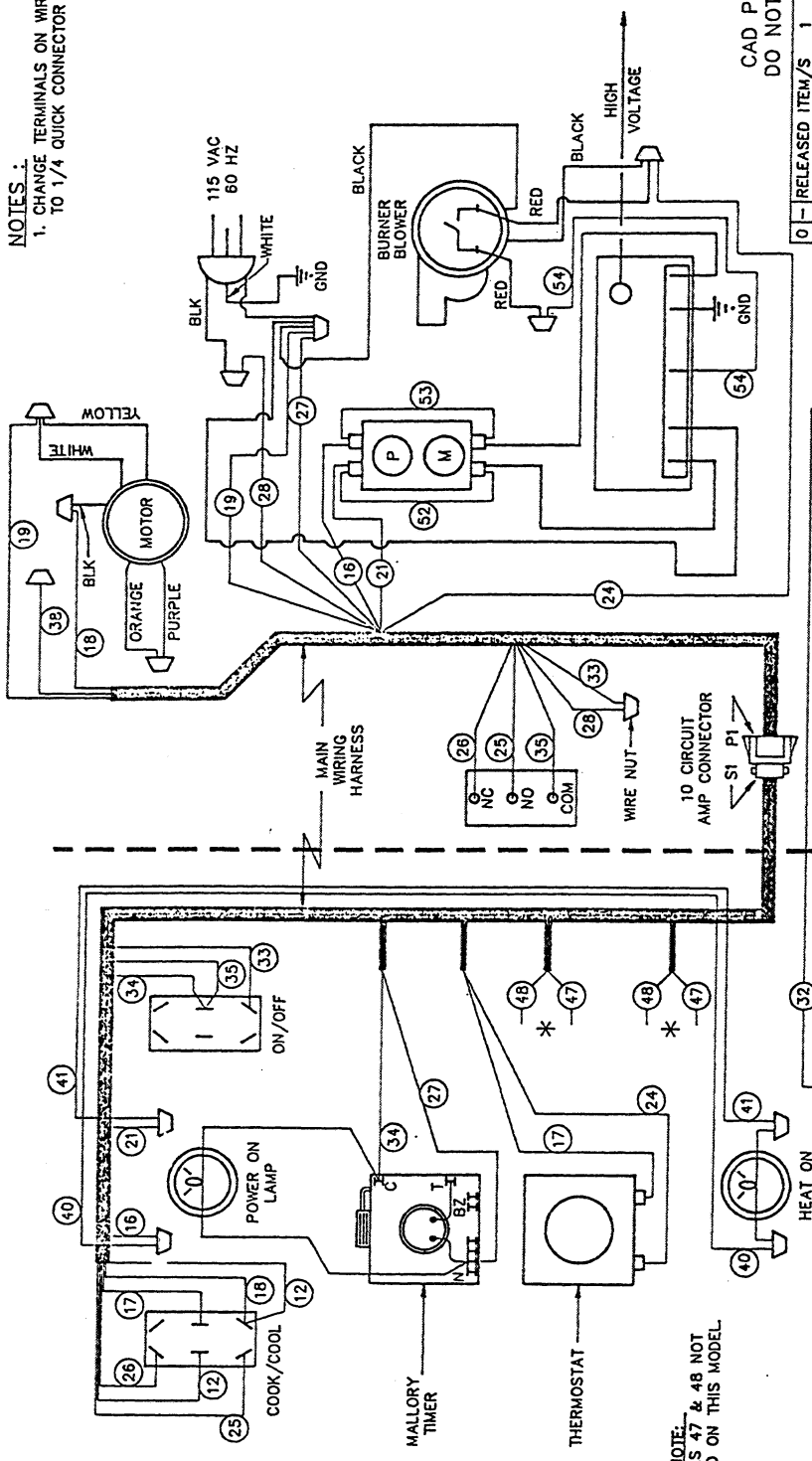


|                              |                    |                                 |       |       |
|------------------------------|--------------------|---------------------------------|-------|-------|
| CG-100/200                   |                    | DATE                            | APP   | SCALE |
| TOLERANCES (EXCEPT AS NOTED) |                    | FRACTIONAL: 1/64 DECIMAL: 0.005 |       |       |
| U.S. Range                   |                    | Manual Control and Pilot System |       |       |
| GAS INPUT                    | ELECTRICAL RATINGS | REV                             |       |       |
| COOK DOWN                    | VOLTS              | 115                             | PHASE | 1     |
| AMPLIFIER                    | AMPS               | 1.3                             | TYPE  | 1     |
| SOLENOID                     | PHASE              | 1                               | REV   | 1     |
| VALVE                        | TYPE               | 1                               | REV   | 1     |
| SOLENOID                     | TYPE               | 1                               | REV   | 1     |
| VALVE                        | TYPE               | 1                               | REV   | 1     |

|                    |     |
|--------------------|-----|
| ELECTRICAL RATINGS |     |
| VOLTS              | 115 |
| PHASE              | 1   |
| AMPS               | 1.3 |
| TYPE               | 1   |
| REV                | 1   |

| ITEM | PART NUMBER | PART NAME | MATERIAL | BLANK SIZE | QTY |
|------|-------------|-----------|----------|------------|-----|
| 1    | 100-100     | WIRE      |          |            |     |
| 2    | 100-100     | WIRE      |          |            |     |
| 3    | 100-100     | WIRE      |          |            |     |
| 4    | 100-100     | WIRE      |          |            |     |
| 5    | 100-100     | WIRE      |          |            |     |
| 6    | 100-100     | WIRE      |          |            |     |
| 7    | 100-100     | WIRE      |          |            |     |
| 8    | 100-100     | WIRE      |          |            |     |
| 9    | 100-100     | WIRE      |          |            |     |
| 10   | 100-100     | WIRE      |          |            |     |
| 11   | 100-100     | WIRE      |          |            |     |
| 12   | 100-100     | WIRE      |          |            |     |
| 13   | 100-100     | WIRE      |          |            |     |
| 14   | 100-100     | WIRE      |          |            |     |
| 15   | 100-100     | WIRE      |          |            |     |
| 16   | 100-100     | WIRE      |          |            |     |
| 17   | 100-100     | WIRE      |          |            |     |
| 18   | 100-100     | WIRE      |          |            |     |
| 19   | 100-100     | WIRE      |          |            |     |
| 20   | 100-100     | WIRE      |          |            |     |
| 21   | 100-100     | WIRE      |          |            |     |
| 22   | 100-100     | WIRE      |          |            |     |
| 23   | 100-100     | WIRE      |          |            |     |
| 24   | 100-100     | WIRE      |          |            |     |
| 25   | 100-100     | WIRE      |          |            |     |
| 26   | 100-100     | WIRE      |          |            |     |
| 27   | 100-100     | WIRE      |          |            |     |
| 28   | 100-100     | WIRE      |          |            |     |
| 29   | 100-100     | WIRE      |          |            |     |
| 30   | 100-100     | WIRE      |          |            |     |
| 31   | 100-100     | WIRE      |          |            |     |
| 32   | 100-100     | WIRE      |          |            |     |

NOTES:  
 1. CHANGE TERMINALS ON WIRES #17 & #24 TO 1/4 QUICK CONNECTOR P/N 1252602



\* NOTE: WIRES 47 & 48 NOT USED ON THIS MODEL

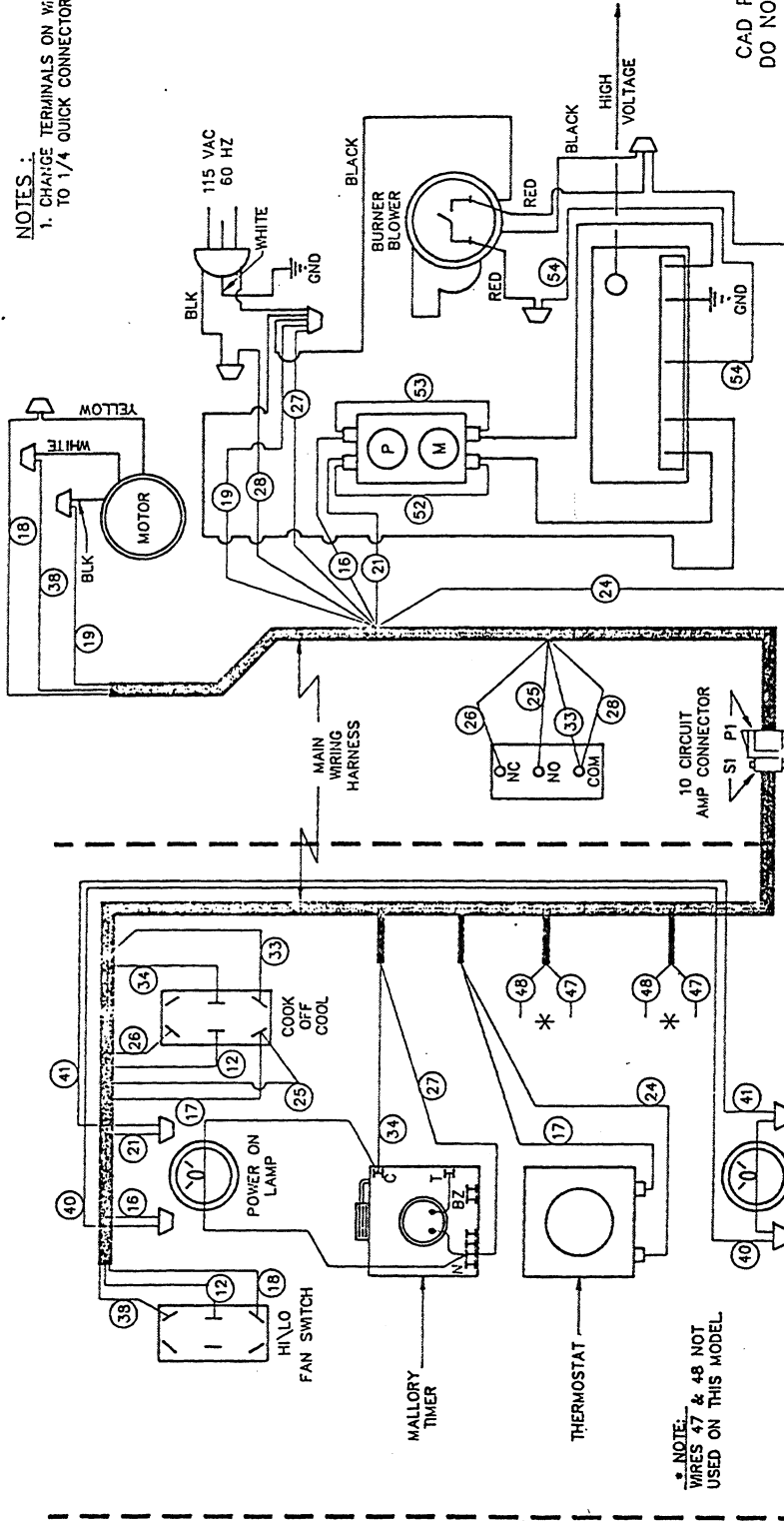
CAD PRODUCED DRAWING  
 DO NOT REVISE MANUALLY

|                             |          |                             |         |              |      |
|-----------------------------|----------|-----------------------------|---------|--------------|------|
| RELEASED ITEM/S             | 1        | 89-200                      | 11/189  | RB           | *    |
| CHANGE DESCRIPTION          |          | ECD                         | DATE    | DR           | APP  |
| U.S. Range/                 |          | FREELAND PENNSYLVANIA 18224 |         | SCALE FACTOR | SIZE |
|                             |          |                             |         | 1            | B    |
| TOLERANCE (EXCEPT AS NOTED) |          |                             |         |              |      |
| FRACTIONAL                  | ±1/64    | DECIMAL                     | ±.005   | ANGULAR      | ±1°  |
| DESCRIPTION                 | DATE     | DR. BY                      | DR. CK. | APP.         |      |
| WIRING DIAGRAM              | 11/1/89  | RB                          | RB      |              |      |
| ELECTRO-MECH                | MODEL(S) | FILE NAME                   |         |              |      |
| CONTROLS                    | CG-050   | 15907S04                    |         |              |      |
| 1 SPEED FAN                 |          |                             |         |              |      |

| ITEM | PART NUMBER | DESCRIPTION                 | MATERIAL | BLANK | SIZE | FINISH | REV |
|------|-------------|-----------------------------|----------|-------|------|--------|-----|
| 8    |             |                             |          |       |      |        |     |
| 7    |             |                             |          |       |      |        |     |
| 6    |             |                             |          |       |      |        |     |
| 5    |             |                             |          |       |      |        |     |
| 4    |             |                             |          |       |      |        |     |
| 3    |             |                             |          |       |      |        |     |
| 2    |             |                             |          |       |      |        |     |
| 1    | 1590703     | WIRING DIAGRAM ELECTRO-MECH |          |       |      |        | 0   |

GROUND TO CONTROL COMPARTMENT WALL

NOTES:  
 1. CHANGE TERMINALS ON WIRES #17 & #24 TO 1/4 QUICK CONNECTOR P/N 1252602



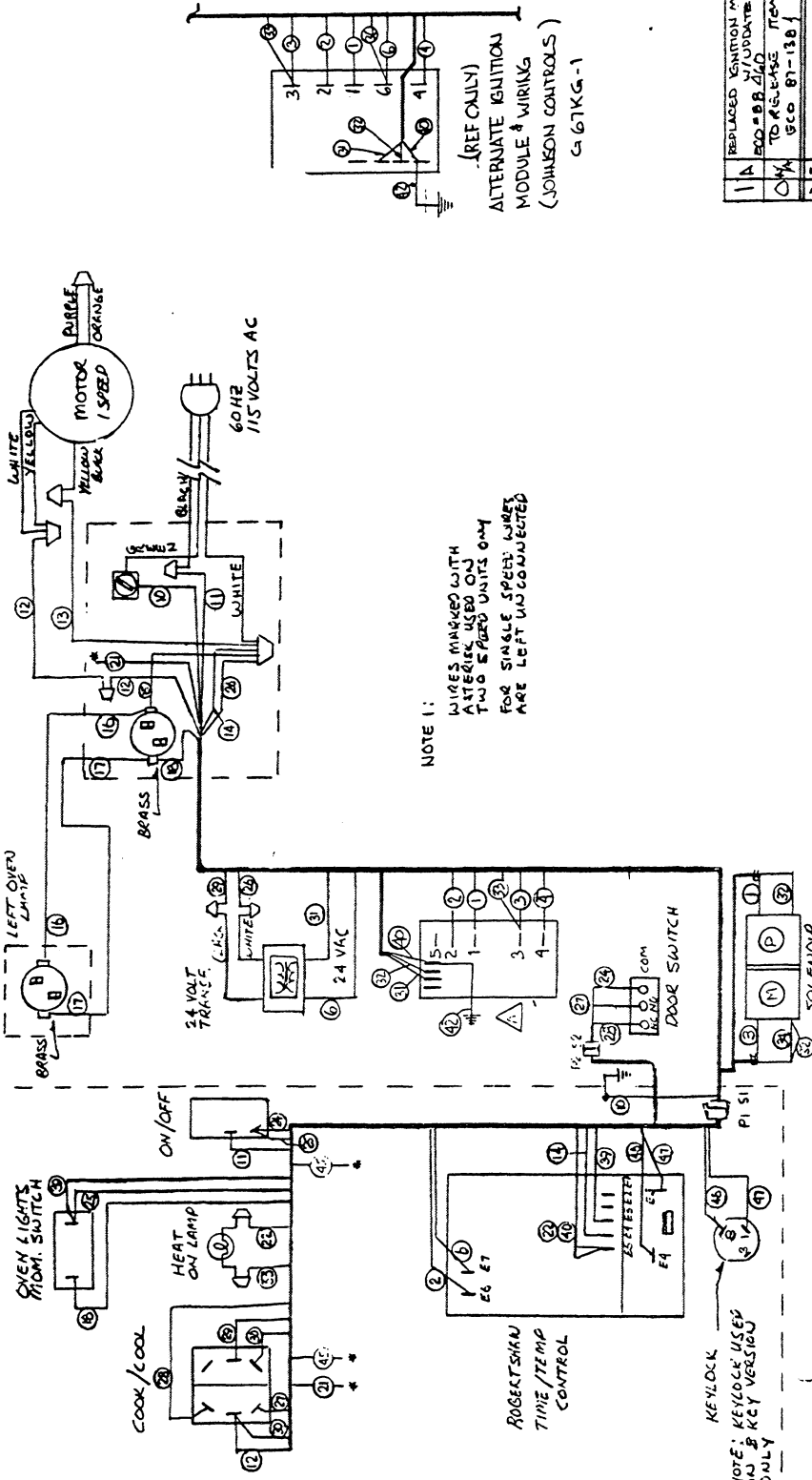
\* NOTE:  
 WIRES 47 & 48 NOT  
 USED ON THIS MODEL

CAD PRODUCED DRAWING  
 DO NOT REVISE MANUALLY

|                             |     |                    |              |             |              |              |       |
|-----------------------------|-----|--------------------|--------------|-------------|--------------|--------------|-------|
| REV                         | SYN | CHANGE DESCRIPTION | ECD          | DATE        | DR           | APP          | SIZE  |
| 0                           |     | RELEASED ITEM/S 1  | 89-          | 11/1        | RB           |              | B     |
|                             |     |                    | 200          | 89          |              |              |       |
| U.S. Range/                 |     |                    | SCALE FACTOR |             | 1            |              | B     |
| A VEVEILY Company           |     |                    | FRELAND      |             | PENNSYLVANIA |              | 18224 |
| TOLERANCE (EXCEPT AS NOTED) |     |                    |              |             |              |              |       |
| FRACTIONAL #1/64            |     | DECIMAL #.003      |              | ANGULAR #1° |              |              |       |
| DESCRIPTION                 |     | DATE               |              | DR. BY      |              | DR. CK. APP. |       |
| WIRING DIAGRAM              |     | 11/1/89            |              | RB          |              |              |       |
| ELECTRO-MECH                |     | MODEL(S)           |              | FILE NAME   |              |              |       |
| CONTROLS                    |     | CG-050             |              | 15907505    |              |              |       |
| 2 SPEED FAN                 |     |                    |              |             |              |              |       |

| ITEM | PART NUMBER | DESCRIPTION                 | MATERIAL | BLANK SIZE | FINISH | REV |
|------|-------------|-----------------------------|----------|------------|--------|-----|
| 8    |             |                             |          |            |        |     |
| 7    |             |                             |          |            |        |     |
| 6    |             |                             |          |            |        |     |
| 5    |             |                             |          |            |        |     |
| 4    |             |                             |          |            |        |     |
| 3    |             |                             |          |            |        |     |
| 2    |             |                             |          |            |        |     |
| 1    | 1590704     | WIRING DIAGRAM ELECTRO-MECH |          |            |        | 0   |

GROUND TO CONTROL  
 COMPARTMENT WALL



NOTE 1:  
 WIRES MARKED WITH  
 \* WOULD BE USED ON  
 TWO SPEED UNITS ONLY  
 FOR SINGLE SPEED WIRE  
 ARE LEFT UNCONNECTED

(REF ONLY)  
 ALTERNATE IGNITION  
 MODULE & WIRING  
 (JOHNSON CONTROLS)  
 G 67KG-1

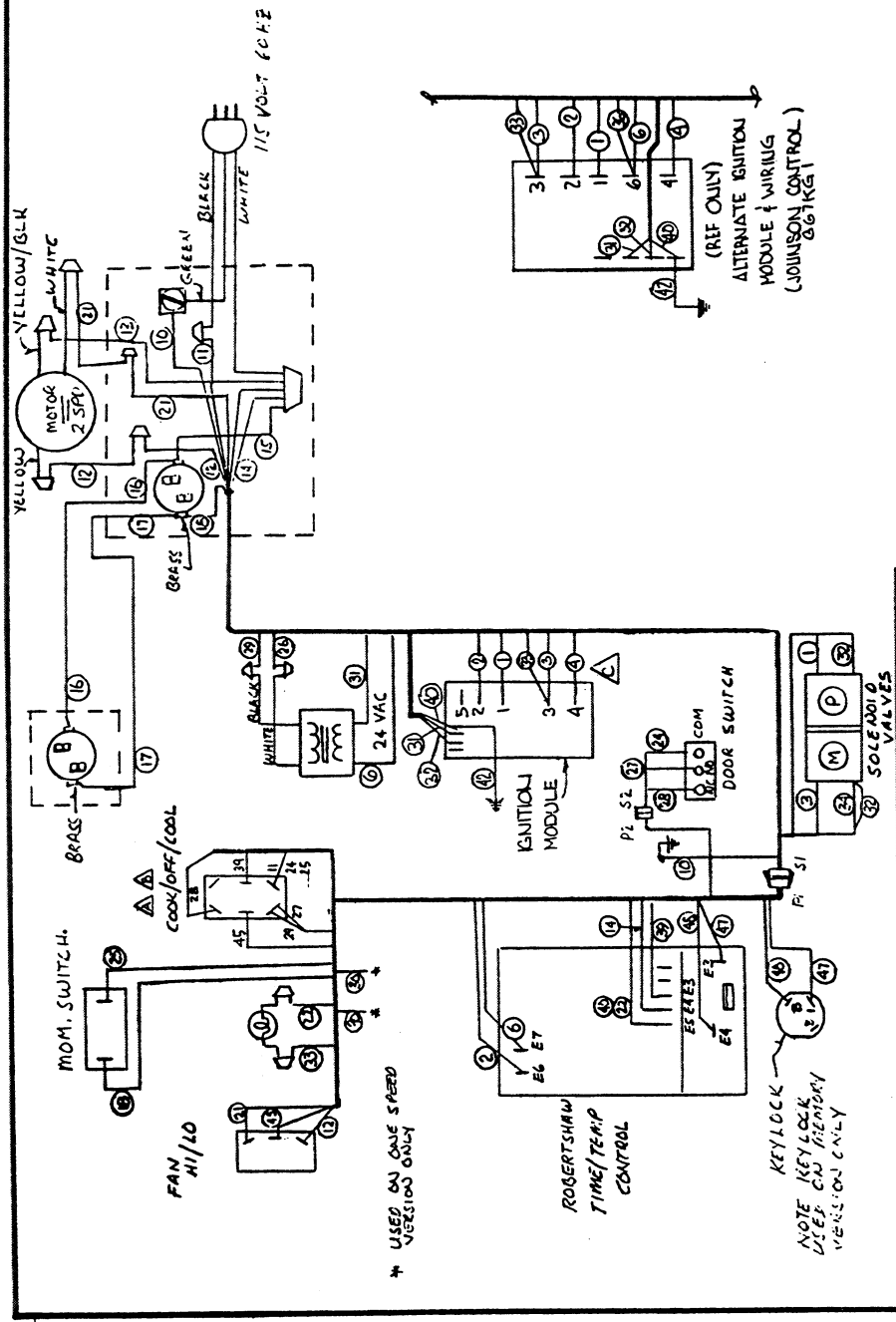
|                                  |             |      |     |
|----------------------------------|-------------|------|-----|
| REPLACED IGNITION MODULE         | 7/4/88      |      |     |
| W/UPDATED MODEL                  | BB          |      |     |
| 500-88-240                       |             |      |     |
| TORQUEBASE ITEM-1                | B 81, JL    |      |     |
| 500 87-138                       |             |      |     |
| REV                              | DESCRIPTION | DATE | APP |
| 1                                |             |      |     |
| TOLERANCES (EXCEPT AS NOTED)     |             |      |     |
| FRACTIONAL ± 1/64 DECIMAL ± .005 |             |      |     |
| SCALE                            |             |      |     |
| DWG SIZE                         |             |      |     |
| B                                |             |      |     |

U.S. RANGE

CG100E  
 ELECTRONIC CONTROLS  
 GAS 115V

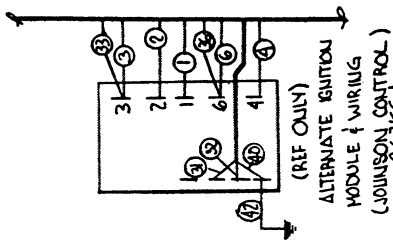
| GAS INPUT<br>PER DEC.<br>BTU'S/HQ | ELECTRICAL RATINGS |              |
|-----------------------------------|--------------------|--------------|
|                                   | VOLTS              | AMPS         |
| 80,000                            | 115                | 7.5 PER DECK |

| ITEM | PART NUMBER | PART NAME      | MATERIAL | BLANK SIZE | FINISH |
|------|-------------|----------------|----------|------------|--------|
| 8    |             |                |          |            |        |
| 7    |             |                |          |            |        |
| 6    |             |                |          |            |        |
| 5    |             |                |          |            |        |
| 4    |             |                |          |            |        |
| 3    |             |                |          |            |        |
| 2    |             |                |          |            |        |
| 1    | 1266742     | WIRING DIAGRAM |          |            |        |



\* USED ON ONE SPEED VERSION ONLY

NOTE KEY LOCK DOES NOT RETURN VERSION ONLY

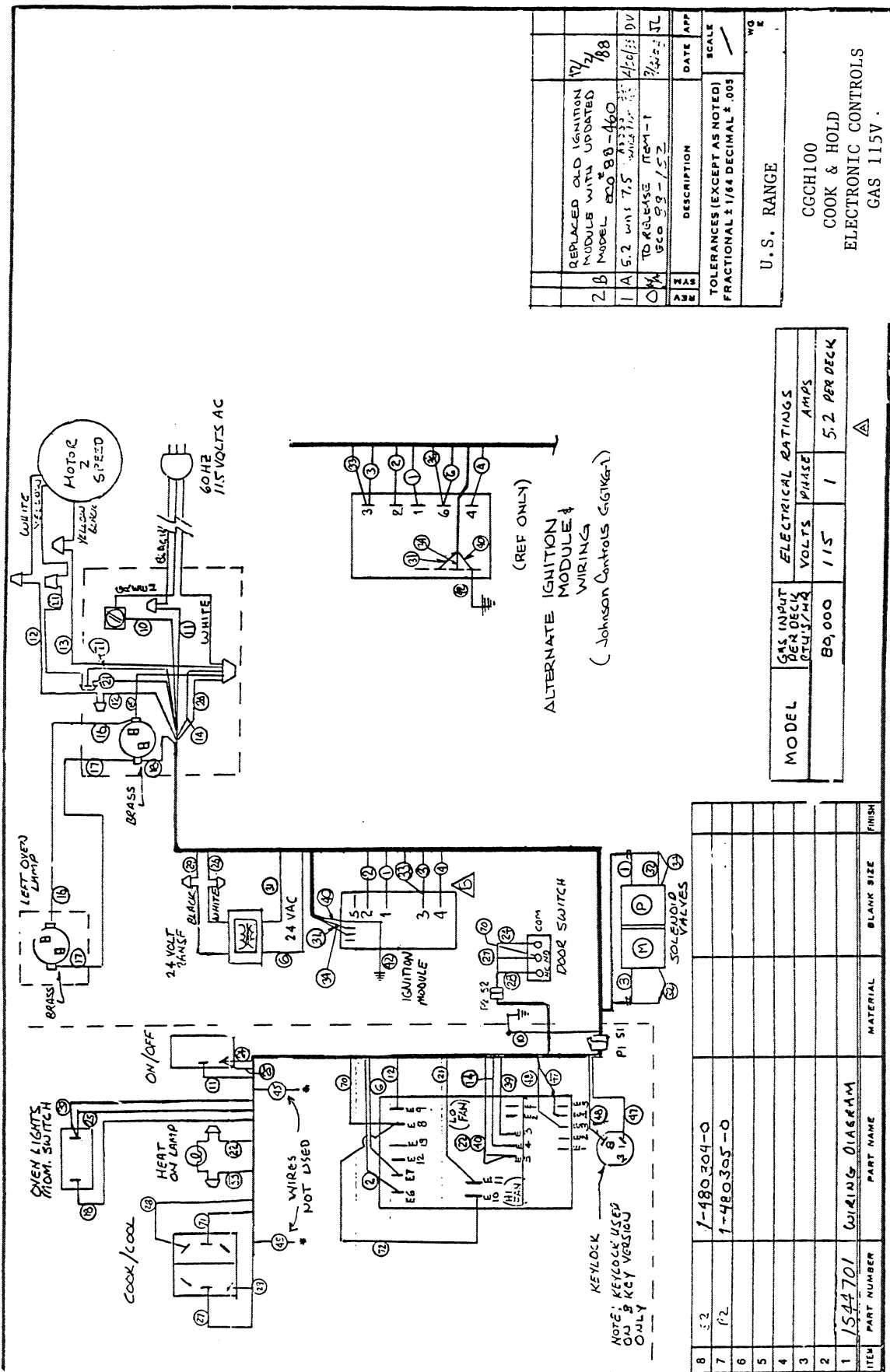


|            |   |              |
|------------|---|--------------|
| 3C         | REDUCED IGNITION MODULE                       | 12/1/88      |
| 2B         | W/UPDATED MODEL - ECO #88-460                 | 2/11/88      |
| 1A         | REVISED WIRING TO COOK/OFF/COOL SWITCH #8-057 | 1-22-08 FG   |
| 01A        | ECO #88-057 TO RO RANGE ITEM - L              | B 41, 87, JL |
| 01A        | ECO #87-128                                   |              |
| DATE       | DESCRIPTION                                   | DATE         |
| SCALE      | TOLERANCES (EXCEPT AS NOTED)                  | SCALE        |
|            | FRACTIONAL ± 1/64 DECIMAL ± .005              |              |
| U.S. RANGE |   |              |
| DWG SIZE B |   |              |

|                 |                  |              |
|-----------------|------------------|--------------|
| WIRING PER SPEC | ELECTRICAL PARTS |              |
| 60,000          | VOLTS            | 115          |
|                 | PHASE            | 1            |
|                 | AMPERE           | 7.5 FIRE BRK |

| ITEM | PART NUMBER | PART NAME | MATERIAL | BLANK SIZE | FINISH |
|------|-------------|-----------|----------|------------|--------|
| 8    |             |           |          |            |        |
| 7    |             |           |          |            |        |
| 6    |             |           |          |            |        |
| 5    |             |           |          |            |        |
| 4    |             |           |          |            |        |
| 3    |             |           |          |            |        |
| 2    | 1266742     |           |          |            |        |

CG100E - 2 SP. FAN  
ELECTRONIC CONTROLS  
GAS 115V



|                               |   |  |         |    |
|-------------------------------|---|--|---------|----|
| 2                             | B | REPLACED OLD IGNITION MODULE WITH UPDATED MODEL 800 88-460 | 10/1/88 |    |
| 1                             | A | 5.2 was 7.5  | 4/6/88  | DV |
| 0                             | M | TO RELEASE ITEM-1 800 88-152                               | 2/2/88  | JL |
| 2                             | R |  |         |    |
| 2                             | R |  |         |    |
| TOLERANCES (EXCEPT AS NOTED)  |   | DATE   | APP     |    |
| FRACTIONAL 1/64 DECIMAL ±.003 |   | SCALE  |         |    |
| U. S. RANGE                   |   |  |         |    |

CGCH100  
COOK & HOLD  
ELECTRONIC CONTROLS  
GAS 115V.

| MODEL | GAS INPUT PER DECK (BTU/HR) | ELECTRICAL RATINGS |       |              |
|-------|-----------------------------|--------------------|-------|--------------|
|       |                             | VOLTS              | PHASE | AMPS         |
|       | 80,000                      | 115                | 1     | 5.2 PER DECK |

| ITEM | PART NUMBER | PART NAME      | MATERIAL | BLANK SIZE | FINISH |
|------|-------------|----------------|----------|------------|--------|
| 8    | 1-480304-0  |                |          |            |        |
| 7    | 1-480305-0  |                |          |            |        |
| 6    |             |                |          |            |        |
| 5    |             |                |          |            |        |
| 4    |             |                |          |            |        |
| 3    |             |                |          |            |        |
| 2    | 1544701     | WIRING DIAGRAM |          |            |        |

RHUNING 4022 41020-24 CCH1002 AH