This document contains the installation and operating instructions for:

MODEL: FR24BG AUTOBROIL™ (BC5)

FOR YOUR SAFETY

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

INSTRUCTIONS TO PURCHASER:

1. ANSI Z83.11 STANDARDS REQUIRE THAT YOU POST IN A PROMINENT LOCATION THE PROCEDURES TO FOLLOW IN THE EVENT THE USER SMELLS GAS. THIS INFORMATION SHALL BE OBTAINED FROM THE LOCAL GAS SUPPLIER.
2. THIS MANUAL NEEDS TO BE RETAINED FOR FUTURE REFERENCE.

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

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MODEL FR24BG

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ILLUSTRATIONS

MODEL FR24BG

I. MACHINE SETTINGS

AUTOBROIL™

MODEL: FR24BG

SERIAL NUMBER: _____

TYPE OF GAS: _____

ELECTRICAL SUPPLY: _____

BROILER HIGH/LOW TEMPERATURE SETTING: _____

GAS PRESSURE: HIGH _____ LOW _____

BROILER SPEED SELECTOR SETTING: _____

START-UP TECHNICAIN: _____

START-UP DATE: _____

COMMENTS: _____

_____

_____

_____

II. MACHINE INSTALLATION

PRE-INSTALLATION

1. After uncrating the Autobroil™ unit, inspect for shipping damage. Check that all control knobs are intact on the electrical cabinet front. Contact the factory if there are obvious problems. Set the unit in place and leave the plastic wrapping on to protect it from the debris and trash of building construction. DO NOT remove plug from gas inlet pipe. Leave this for the Qualified Service Company. Check that machine has not been dented or damaged by the carrier. Notify your freight carrier immediately to file a concealed damage claim, following the instructions attached to the outside of the shipping crate. Your warranty will not cover freight damage.

2. Installation must be performed by a Qualified Service Company. The term "Qualified Service Company" means any individual, firm, corporation or company which is either engaged in and is responsible for the installation or replacement of gas piping on the outlet side of the meter, or the service regulator when a meter is not provided, or the connection, installation or repair of gas appliances, who is experienced in such work, familiar with all precautions required, and has complied with all the requirements of the authority having jurisdiction.

3. A remote gas shut-off valve must be provided and interlocked to the exhaust fire protection system.

   A gas shut-off control is located on the top of the gas safety valve (behind the right side panel) for emergency shut-off of gas supply to this appliance.

4. Because this unit is power fan exhausted, it is necessary to provide adequate make up air equal to the amount removed. In addition to this, any other exhausts, flues, or air removal systems must be taken into consideration. Examples of this are heat removal fans or hot water heater flues.

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

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

APPLIANCE LOCATION

WARNING: IF NOT INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS, THIS PRODUCT COULD EXPOSE YOU TO SUBSTANCES IN FUEL OR FROM FUEL COMBUSTION WHICH CAN CAUSE DEATH OR SERIOUS ILLNESS AND WHICH ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

1. Position Autobroil™ to properly align with exhaust hood (refer to equipment plan).

2. The hood/ventilator for the appliance should be located in accordance with the National Fire Protection Association Standard #96, "Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment" and any local applicable requirements.

3. For proper installation, the minimum clearance from combustible construction is 0" from sides and 18" from food loading end and food delivery end.

4. Adequate clearance should be maintained to allow easy access to loading and unloading areas of the machine.

5. For servicing, unit must be moved two feet clear from all construction.

CAUTION: KEEP THE APPLIANCE AREA FREE AND CLEAR FROM COMBUSTIBLES.

ELECTRICAL INFORMATION

1. The domestic appliance is furnished with a cord and plug; and requires a 120 volt, A.C., 60 HZ, Single Phase, 3 wire (including ground), 20 AMP circuit. Appliance must be electrically grounded in accordance with local codes, or in the absence of local codes, with the National Electrical code ANSI/NFPA No. 70-latest edition.

2. The international appliance requires 220 volt or 240 volt, A.C., 50 Hz, Single Phase and is furnished with a cord only - no plug.
3. There is a Wiring Diagram located in the Owner's Manual and under the right side skin. **GAS**

PIPING TO APPLIANCE

1. Installation of this appliance must conform with local codes, or in the absence of local codes, with the National Fuel Gas Code, ANSI Z-223.1 -latest edition.

2. In Canada, this appliance is to be installed in accordance with Standard CGA B149.1 or B149.2 Installation Codes for gas burning appliances and equipment and any local applicable requirements.

3. The appliance is supplied with a 3/4" female pipe thread. The installer must make the pipe connection to the unit in accordance with the "National Fuel Gas Code," ANSI Z-223.1-latest edition. The gas line connected to the 3/4" female pipe thread cannot be less than a 3/4" pipe. The gas pressure and gas volume required by this appliance is shown on Page 7. Gas piping from source to broiler must be adequate to satisfy these requirements when all other gas appliances in the restaurant are operating at maximum demand.

4. A flexible AGA approved gas line is available. Instructions are (1) the installation shall be made with a connector that complies with the Standard for Connectors for Movable Gas Appliances, ANSI Z21.699-latest edition, and Addenda, Z21.69a-latest edition, and a quick-disconnect device that complies with the Standard for Quick-Disconnect Devices for Use With Gas Fuel, ANSI Z21.41-latest edition, and Addenda, Z21.41a-latest edition and Z21.41b-latest edition, and (2) adequate means must be provided to limit the movement of the appliance without depending on the connector and the quick-disconnect device or its associated piping to limit the appliance movement. See Figure 8 for details.

5. See Page 3, Items 5 and 6, for instructions on gas supply line pressure testing.

CAUTION: DO NOT OBSTRUCT THE FLOW OF COMBUSTION AND VENTILATION AIR.

PRE-OPERATION CHECK

Before lighting and operating your Autobroil™, make a quick check of critical items as follows:

1. Remove both side panels and check to see that all parts are in place and that none are damaged. Particularly make sure all burners are in place and that the shields are in position on the bottom burners.

2. Start conveyor chains and check for proper operation. The conveyor chains should run free and not be catching on anything.

3. The speed of the conveyor chains should be modulated from low to high, and back again without the chain stopping.

4. Before first use, and after any special cleaning, it is necessary to "season" the broiler chain. This is done by bringing the broiler to operating temperature and then (with burners still lit) applying liquid shortening from a saturated cloth over the full width of the broiler chain while the chain makes 5 or 6 complete revolutions.

5. Check that gas pressure at appliance is correct (see Performance Criteria on Page 7).

6. Check that broiler grease tray is in place under burners (Figure 2).

LIGHTING INSTRUCTIONS FOR ELECTRONIC IGNITION SYSTEM

1. Turn exhaust system on. (Some hoods are so powerful that the broiler must be lit before the exhaust is turned on).

2. Make sure filters are in place in the hood.

3. Turn conveyor chain on and set speed at approximate mid-point.

4. Remove right side cover. (Same Side As Controls).

5. Turn gas control switch on top of Honeywell gas safety valve to "ON".

6. Turn on the broiler heat switch on the control panel and verify all burners have ignited. Ignition is electronic (does not require manual lighting of pilot). Set broiler temperature controller on right side of the broiler (behind the side panel) to 400°F (204°C) (see Item 3 of setting temperature controller on Page 9).

7. If pilot flame or burners fail to light turn heat switch off and wait five minutes before attempting to relight.

SHUT-OFF INSTRUCTIONS

1. Turn heat switch off.

2. Wait 30 minutes.

3. Turn conveyor switch off.

4. Turn exhaust system off.

PERFORMANCE CRITERIA

1. The manifold pressure for each burner and appliance inlet pressure and gas amount is listed below:

Type of Gas	-	Natural or Propane
Pressure at the Appliance	-	6.0-10.0 IWC for Natural
	-	11.0-14.0 IWC for Propane
Manifold Pressure		**LOW 4.0 IWC W/O CATALYST; LOW 3.0 IWC W/CATALYST;** High 5.0 IWC W/O Catalyst; High 5.0 IWC W/Catalyst for Natural
	-	Low 8.0 IWC; High 10.0 IWC for Propane
	-	Low 9.5 IWC; High 11.0 IWC for Propane **(LP Catalyst Only)**
Total Gas Amount	-	97,000 BTUH @ 100% High Fire

Manifold pressure is measured by a pressure gauge on the outlet side of the Honeywell gas valve. With the unit on for at least twenty minutes and the broiler temperature controller set at 400°F (204°C) (see Item 3 on Page 9), the pressure should be at 4.0 IWC w/o Catalyst; 3.0 IWC w/Catalyst (8.0 IWC for propane); (9.5 IWC for LP Catalyst Only). With the broiler temperature controller set for 800°F (427°C) the high fire pressure is 5.0 IWC (10.0 IWC for propane). High pressure is adjusted using the regulator in the top of the Honeywell gas safety valve. Low fire is adjusted using the gas pressure regulator. See Figure 5 for gas system layout.

2. The burners in the appliance are a special infrared type. All of the air for combustion must be injected through the Venturis. This makes orifice design and alignment very critical. The orifice design, in combination with the correct natural or propane gas pressure will result in adequate air aspiration and mixing. There are no air shutters. No air adjustment is needed. The proper orifice part numbers are found in Section VII - Replacement Parts.

CAUTION: DO NOT STACK BOXES OR IN ANY WAY BLOCK AREA IN IMMEDIATE VICINITY OF VENTURIS OR IN ANY OTHER WAY OBSTRUCT FLOW OF COMBUSTION AIR.

3. Ignitor - sensor - pilot burner flame is adjustable with a small screwdriver. The cap screw behind the 1/4" gas line exiting the valve should be removed. See Figure 5. The small adjusting screw is under the cap screw. Turning the small adjusting screw inward (clockwise) will reduce the flame to the pilot. The pilot flame should be uniform and just large enough to make a flame envelope around the end of the sensor and ignitor.

4. All burners will be bright orange when burning properly. If a dull red is observed after 30 minutes of warm-up with a blue flame above the burner face, the orifice may be dirty or damaged. "Popping," or burning back at the orifice of the burner, is a result of the burner screen being loose or a faulty gasket under the burner screen. LP machines may exhibit a light "popping" sound when the unit is turned off; this is normal.

NOTE: IF BURNER SCREEN IS TORN OR HAS A HOLE, OR IF A GASKET IS LEAKING, THE BURNER MUST BE REPAIRED. See Figure 10**.**

III. OPERATING INSTRUCTIONS

BROILER ADJUSTMENT- DAILY

LIGHTING INSTRUCTIONS FOR ELECTRONIC IGNITION SYSTEM

1. Turn exhaust system on.(Some hoods are so powerful that the broiler must be lit before the exhaust is turned on.)
2. Make sure filters are in place in the hood.
3. Turn conveyor chain on and set speed at approximate mid-point.
4. Remove right side cover.
5. Turn gas control switch on top of Honeywell gas safety valve to "ON".
6. Turn on the broiler heat switch on the control panel and verify all of the burners have ignited. Ignition is electronic. Set broiler temperature controller on right side of control cabinet to 400°F (204°C) (see Item 3 of setting temperature controller on Page 9).
7. If pilot flame or burners fail to light turn heat switch off and wait five minutes before attempting to relight.

SHUT-OFF INSTRUCTIONS

1. Turn heat switch off.
2. Wait 30 minutes.
3. Turn conveyor switch off.
4. Turn exhaust system off.

SETTING TEMPERATURE CONTROLLER FOR PROPER HIGH/LOW OPERATION - WEEKLY (This Control Is Located Under The Right Broiler Side Cover)

1. Follow the procedure in Step 3 below in order to set temperature control for 400°F (204°C). After doing this, turn on the burners.
2. Allow the broiler burners and conveyor chain to warm up for 60 minutes (with the chain at approximately the correct speed).
3. Observe the temperature displayed: push "SET" and release to view the "SET POINT." To change set point push "SET" and, within three (3) seconds, use the arrows to select a new set point. When setting the High/Low for proper operation, make the set point THE SAME as the observed temperature made after the sixty (60) minute warming period. Broiler High/Low control is now set. The setting should be approximately 700°F (371 °C). If not at least 650°F (343°C), the high and low gas pressures, as discussed on Page 7 under Performance Criteria, may require adjustment or the hood exhaust may be excessive. The broiler will work but will cook slower.
4. The temperature displayed by the control at all times is the ACTUAL temperature, except for a few seconds after depressing SET.

5. Place one meat patty on the broiler chain. Based on the appearance of the broiled patty, reset the Digital Speed Control for the desired broiling quality. (Note: this single patty should be cooked to the maximum degree of the Minimum/Maximum doneness tolerance.)

NOTE: THE NUMBERS DISPLAYED BY THE SPEED CONTROL ARE RELATIVE TO ONE ANOTHER. THE LARGER THE NUMBER, THE FASTER THE CONVEYOR.

SETTING HOLDING TEMPERATURE - WEEKLY

1. The temperature controller on the front of the unit has been preset at 190°F (87°C). Push and release the "SET" button to observe the set point. If this setting has been inadvertently changed, it is necessary to reset the proper value. This may be done using the arrows on the control within three seconds of pushing and releasing the "SET" button. Afterwards, the actual temperature is displayed.

IV. SCHEDULED MAINTENANCE

DAILY CLEANING PROCEDURES

CAUTION: Do not touch the broiler section immediately after appliance shut-down. The temperature inside enclosures is in excess of 500°F (260°C), which eliminates the need to clean any parts inside the enclosures for sanitary purposes. Any grease that may build up on the exterior of the enclosures should be cleaned off with a damp cloth and a minimum amount of detergent. **Never use a large amount of water on the enclosure or allow burner faces to get wet as this could cause premature burner or gasket failure. Disconnect the power supply to the appliance before cleaning or servicing.**

CAUTION: Under no circumstances should oven cleaner be used on this appliance. IT WILL EAT HOLES IN THE ALUMINUM GAS VALVES, GAS LINES, AND THE LOWER PLATEN (HOLDING AREA). CAUSTIC FUMES CAUSE ELECTRICAL COMPONENT DAMAGE, AND WILL CAUSE MANY OTHER PROBLEMS IF USED TO CLEAN THIS BROILER.

CAUTION: KEEP THE APPLIANCE AREA FREE AND CLEAR FROM COMBUSTIBLES.

1. Allow broiler burners and chain to operate for 30 minutes after cooking last patty to burn off excess grease on broiler components. Then turn the unit off and allow to cool. (This applies every time a meat chain is turned off - regardless of what time of day meat chain is shut down - and regardless of how few patties were broiled in the last 30 minutes, last hour, etc.) This will clean some parts of the cooking chamber. Failure to perform this procedure daily will result in poor cooking times.

2. Remove all exterior panels except those which are attached with screws. Be careful not to touch any hot internal broiler components.

3. Remove burners from left side of unit and shake all debris off burners after they cool. Both top and bottom burners may be slid out through the side of the machine. **DO NOT WASH BURNER AS IT WILL DESTROY GASKET.** Brush surface of burner mesh with soft brush.

4. Remove lower burners and shields. Brush or scrape residue off shield.

WARNING: THE BURNER AND REVERBERATING SCREENS (LOCATED UNDER THE TOP BURNERS), ARE MADE FROM INCONEL METAL MESH. THIS MATERIAL DETERIORATES WITH USE. INSPECT THESE SCREENS DAILY AND REPLACE IF SCREEN IS SEVERELY CORRODED. FAILURE TO DO SO CAN RESULT IN METAL PARTICLES BEING SERVED TO YOUR CUSTOMERS.

5. Remove the following items and wash with hot soapy water.

	Front Tunnel Guard	Figure 2
	Tunnel Closure	Figure 2
	Tunnel Fillers	Figure 2
	Drip Tray (Broiler Arm)	Figure 2
	Lower Discharge Tent	Figure 3
*	Broiler Grease Tray	Figure 2
*	Platen Lid	Figure 2
	Meat Stripper	Figure 3
*	Catch Pan & Insert	Figure 2
*	Product Slide Ramp & Teflon Sheet	Figure 2
*	Broiler Spatula	Figure 2
* NOTE: these items may be removed during the 30 minute period.		

6. With the conveyor switch **ON** and heat switch **OFF,** wire brush the broiler conveyor and, as it cools, wipe with damp cloth.

7. Scrape deposits from the axles with the axle scraping tool, furnished with each machine as shown in Figure 7. * **THIS IS IMPORTANT TO PREVENT GREASE FIRES AT THE REAR OF THE BROILER.**

8. Remove grease and meat residue from any part of remaining broiler structure where visible. Use a damp cloth with detergent and a putty knife for best results. * **DO NOT SCRAPE THE LOWER PLATEN (HOLDING AREA).**
9. After cleaning all removable parts as noted, allow to dry and reassemble.

MONTHLY CLEANING PROCEDURES

1. Turn off gas switch on top of the safety valve and disconnect electricity.

2. Remove upper burners, reverberating screens, lower burners, and shields to check for wear. These parts are illustrated in Figure 3.

3. If the conveyor chain has been removed, make certain it is not on backward and **CLOSE** open links to match other links. (Figure 7)

4. Using a damp cloth, wipe the inside of each burner venturi.

5. Reinstall burner screens, lower burner shields, and burners.

6. Remove spark guard and wipe out. (Figure 2)

7. PROCEDURE FOR CLEANING OPTIONAL MARSHALL CHARBROILER CATALYSTS:

Marshall recommends that the restaurant soak the catalyst in a solution of commercial degreaser and warm water for twenty minutes once a month. It is important to note that the catalyst may flake off the metal honeycomb substrate if it is impacted by a high-pressure water stream. Therefore, we recommend that the restaurant personnel first prepare the degreaser-and-water bath, and then place the catalyst in the bath. We want to emphasize that the cleaning procedure involves a soak, rather than a scrubbing or hosing procedure. After soaking for twenty minutes, rinse the catalyst either by soaking again in cold water or by rinsing in a gentle stream of cold water. Following the rinse, shake the catalyst to remove all excess water, and allow to dry at room temperature before returning it to service. A large fan may be used to move room air more quickly over the catalyst to expedite the drying step.

QUARTERLY CLEANING PROCEDURES & PREVENTIVE MAINTENANCE

1. If required, remove conveyor and soak in hot soapy water overnight. The chain is removed by lifting axle up to produce slack and separating as described in Figure 7. When replacing chain, make certain the conveyor is installed properly. **PLACING CHAIN ON BACKWARD WILL CAUSE SEVERE BINDING PROBLEMS. CLOSE** open links to match other links. (Figure 7)

2. If required, spread conveyor links open with screwdriver or chain pliers (part #500033). Lift front axle up to make slack in the conveyor belt, unhook conveyor chain and remove to gain access to lower cooking chamber for cleaning side walls. Make reference to the orientation of the conveyor links and the conveyor direction for reassembly. (Figure 7)

3. Lubricate the roller (drive) chain with a few drops of any grade motor or machine oil.

4. Remove and inspect all motor brushes and replace if less than 1/4" is left.

5. Do not remove internal gas lines for cleaning.

6. Clean gas orifices:

    - Orifices are passageways directing gas flow into burner. Uneven gas flow or air to gas ratio is caused by dirty or damaged orifices.
    - Orifices are made of brass. Use special care in cleaning-don't gouge or make gas holes bigger.
    - To reach orifices, remove burners.
    - Use a pipe cleaner dipped in rubbing alcohol to clean orifices. Swab until clean; free of carbon build-up. Do not use drill bit; this will damage the orifices.

7. Blow out all six (6) burners through the venturi opening with a tow pressure air source. **CAUTION: Do not drop burners or get wet as this may break gasket or add to premature Burner failure.**

8. INVENTORY THE SPARE PARTS KIT AND ORDER MISSING PARTS AS NEEDED. KEEP A COMPLETE SET OF PARTS ON HAND AT ALL TIMES.

V. TROUBLESHOOTING

This section contains a list of possible problems with the Autobroil™ unit. ALL ELECTRICAL TROUBLE SHOOTING INVOLVING ACCESS INTO THE MOTORS OR ELECTRICAL ENCLOSURES MUST BE PERFORMED BY A QUALIFIED ELECTRICIAN. All items marked with asterisks (*) should be performed by service agency qualified to perform service on gas fired appliances.

1. PROBLEM: BURNER BACKFIRES. Flashback, blue flame at entrance to burner makes motor-boating sound like a blow torch. IMPORTANT: If burner backfires, turn it off. Continued operation will cause damage to the entire burner.

POSSIBLE CAUSE:

* A) Burner screen failure (hole) or burner gasket. **SOLUTION:** Replace burner screen or gasket.

* B) Burner over-fired - manifold pressure too high. **SOLUTION:** Check and reset gas control regulator to give rating plate value for manifold pressure (shown under Performance Criteria on Page 7). Wait 5 minutes & relight. Flashback will not occur immediately unless a large opening in or around the burner screen is evident. Wait an hour after relighting to check that problem is solved. Figure 5 illustrates which regulator sets high and low gas pressures.

C) Check to ensure all screws holding the burner screen in place are snug. See Figure 10.

2. PROBLEM: FLAMES VISIBLE AT EXHAUST STACK OR IN CHAMBER.

POSSIBLE CAUSE:

* A) Low gas pressure. **SOLUTION:** Check and reset gas control regulator to give rating value for manifold pressure (shown under Performance Criteria on Page 7. Figure 5 illustrates which regulator sets high and low pressures.

3. PROBLEM: PILOT FLAME GOES OUT (STUDY FIGURE 11 & 12 FOR PILOT OPERATION).

POSSIBLE CAUSE:

* A) Pilot assembly dirty or bent. **SOLUTION:** Check for bent pilot gas line and/or dislodge debris.

* B) Low gas pressure. **SOLUTION:** Increase gas pressure to appliance (see Figure 5).

* C) Pilot orifice clogged. **SOLUTION:** Dislodge debris or replace orifice.

D) Wires from pilot assembly loose. **SOLUTION:** Trace wires to where they plug into gas valve and check connection. (Figure 6)

*** INSTRUCTIONS MARKED WITH ASTERISKS SHOULD BE PERFORMED BY AUTHORIZED SERVICE PERSONNEL.**

4. PROBLEM: BURNER WILL NOT LIGHT AT ALL.

POSSIBLE CAUSE:

A) Hot Surface Ignition. **SOLUTION:** Recycle heat switch. See Figure 11 and 12.

* B) Orifice. **SOLUTION:** Check that orifice is not plugged. (If it is necessary to change the orifices, new ones must be ordered from the factory.)

C) Check that flame runner is fully lit (Figure 6). **SOLUTION:** If not, clean flame runner orifice or remove and clean flame runner.

D) Pilot. **SOLUTION:** Pilot must light and stay lit in order for burner to light. Check pilot problem list (see Item 3 on Page 13).

* E) Gas Solenoid. **SOLUTION:** Check that solenoid valve on main gas valve is working.

F) Pilot Solenoid. **SOLUTION:** Check that solenoid valve #501698 on Figure 5 is functioning. It opens for 120 seconds during the ignition cycle and then closes with a delay-on-break timer in the control cabinet.

G) Pilot Jumpers. **SOLUTION:** Check the short and long pilots shown at the top of Figure 6 to make certain they are not plugged. They turn off after 120 seconds from activating heat switch.

5. PROBLEM: CONVEYOR CHAIN WILL NOT MOVE.

POSSIBLE CAUSE:

A) Check for object caught in conveyor, causing a jam. **SOLUTION:** Remove object.

* B) Check 1.5 amp fuse on top of the control cabinet (Figure 6) **SOLUTION:** Replace if blown and recycle ON/OFF switch.

C) Check 10 amp fuse. **SOLUTION:** Replace if blown.

D) Check to see if motor shaft is moving. **SOLUTION:** Sprocket needs to be tightened.

* E) Check switch to make sure power is flowing through it. **SOLUTION:** Replace switch.

* F) Connect motor control leads to an operating motor speed control board. **SOLUTION:** If motor runs, replace motor control board. If motor still does not run, replace motor.

6. PROBLEM: CONVEYOR RUNS BUT SPEED IS CONSTANT

POSSIBLE CAUSE:

* A) There are four parts to the motor system. They are the motor, the circuit board, the digital speed control and the fuse mounted on the top of the control cabinet. The most likely problem would be a blown fuse. **SOLUTION:** Using spare parts, replace one part at a time until the trouble spot is identified.

*** INSTRUCTIONS MARKED WITH ASTERISKS SHOULD BE PERFORMED BY AUTHORIZED SERVICE PERSONNEL.**

7. PROBLEM: REPEATED MECHANICAL BINDING.

POSSIBLE CAUSE:

A) Check to see that chain is not on backward. **SOLUTION:** See proper chain installation on Figure 7.

B) Inspect chain closely for bent or warped links that may be snagging and causing a binding condition. Also check that the chain links are not climbing out of the sprockets as the conveyor rotates. **SOLUTION:** Straighten or replace bad links.

C) Make sure the axle assembly is clean and free of grease and food residue to allow smooth movement of the conveyor. **SOLUTION:** Clean axle. See Figure 7.

D) Check the axle assembly to make certain all set collars, bearings, etc. are properly positioned and secure.

E) Disassemble conveyor axle assembly and check condition of bushings and bearings for excessive wear. **SOLUTION:** Replace if worn or damaged.

F) Visually inspect the motor drive chain assembly for smooth rotation of chain. **SOLUTION:** Make certain there are no binding or worn components.

G) Make sure conveyor is not catching on meat stripper. **SOLUTION:** Straighten bent stripper.

8. PROBLEM: HIGH/LOW CONTROL DOES NOT WORK.

POSSIBLE CAUSE:

* A) Determine gas pressure by checking gas pressure gauge. **SOLUTION:** Adjust per instructions on Page 7.

B) If unit stays in high or low, check that control is properly set for about 700°F (371 °C). **SOLUTION:** Reset to proper temperature as shown in Item 3 on Page 9.

C) If control flashes "EEE" or "999", then inspect thermocouple for continuity. **SOLUTION: Check to be sure thermocouple leads are securely fastened to temperature controller. If so, then replace thermocouple.**

*** INSTRUCTIONS MARKED WITH ASTERISKS SHOULD BE PERFORMED BY AUTHORIZED SERVICE PERSONNEL.**

9. PROBLEM: HOLDING TEMPERATURE WILL NOT REACH 190°F.

POSSIBLE CAUSE:

* A) Check that overhead ThermoGlo™ is hot. **SOLUTION:** Replace element after making sure element is receiving power.

* B) Check element connections on bottom heating element.

* C) Using a surface thermometer on top of platen, check that temperature controller is allowing platens to heat to the desired temperature.

* D) The temperature sensor attached to the bottom heated plate has failed. This condition causes the controller to flash "EEE" or "999". **SOLUTION:** Check to be sure sensor leads are securely fastened to temperature controller. If so, then replace sensor.

10. PROBLEM: HAMBURGERS WILL NOT FALL CORRECTLY.

POSSIBLE CAUSE:

A) Meat stripper is dirty or adjusted too far from conveyor. **SOLUTION:** Clean and reposition near chain by moving brackets that hold stripper. See illustration on Figure 3.

*** INSTRUCTIONS MARKED WITH ASTERISKS SHOULD BE PERFORMED BY A QUALIFIED SERVICE COMPANY.**

VI. ASSEMBLY & DISASSEMBLY INSTRUCTIONS

1. The burner screen (Figure 10) may be replaced by removing all the screws from the burner housing and frame. The assembly will then lift off. Remove all old gasketing and replace. Compress the new assembly into the burner housing with hand pressure all around the outside of the burner housing.

2. Insert new screws and snug the screws in a staggered sequence. Do not over tighten screws. These screws will keep the frame tight against the gasket.

3. The restraining device is a separate line and should be anchored no less than 6" away from the gas connector and in a parallel position to the flexible line. The following instructions refer to Figure 8. By using the adjusting clips (1) alter the length of the cable (2) so that the overall length (3) is 3" to 6" shorter than the length of the flexible gas line including the fitting. Then attach staple (4) to an existing wall or other structurally sound surface. Attach scissor hook (5) to staple and secure with cotter pin. Finally attach spring hook (6) to gas appliance as shown in Figure 8. Make certain that the overall length of the restraining line is shorter than the gas line so no strain is placed on the gas line or piping when moving the unit.

4. When replacing the thermocouple which attaches to the hi/low temperature controller, make certain it is inserted through side wall of machine into cooking chamber exactly one inch (1").

5. To remove and clean lower burner shields - remove left side skin and lower burner end cover (Figure 3), slide burners out thru opening and lift off shields from burner pins. Scrape and wire brush shields.

6. To properly set the clearance between the meat stripper and the conveyor chain, the machine must be HOT. Loosen the bolts holding the brackets to the sides of the unit and adjust their position until the top edge of the stripper is within 1/16" of the hot conveyor. See Figure 3.

WARNING: THIS APPLIANCE IS NOT CAPABLE OF BEING SAFELY PLACED INTO OPERATION DURING A POWER FAILURE AND NO ATTEMPT TO OPERATE IT SHOULD BE MADE.

VII. REPLACEMENT PARTS - FR24BG

When ordering parts, make sure to specify the machine model number, type of gas and serial number as shown by the label attached to the right side cover.

PART#	DESCRIPTION	QTY PER UNIT	FIGURE
100367	Scraper Axle	1	7
101357	Bearing, Teflon .750" Outer	2	4
110042	Fan	1	6,Schematic
115665	Burner, 24"	6 or 3*	3
115695	Broiler Spatula	1	2
115816	Top Burner End Cover	1	3
115856	Screen Mounting Clip	9	3
115857	Reverberating Screen	3	3
116084	Conveyor Support Tube	4	3
116126	Thermocouple Fitting	1	4

- On LP units with catalyst the 3 upper burners are #131087. See Figure 15 & 16.

117213	Lower Burner End Cover	1	3
117228	Control Guard	1	4
117244	Meat Stripper	1	3
118040	Drive Axle	1	4
118425	Spark Guard	1	2
118532	Tunnel Closure	1	2
118537	Venturi Manifold Assembly	2	5
118538	Distribution Manifold Assembly	1	5
118548	Drip Tray (Broiler Arms)	1	2
118701	Front Tunnel Guard	1	2
118709	Burner Shield - Bottom	3	3
118930	Temperature Control (High/Low Gas)	1	3
119512	Burner, Lower 24"	3	3
119521	Lighter Arm Assembly	1	6
119530	Meat Stripper Hanger (Right)	1	3
119531	Meat Stripper Hanger (Left)	1	3
119538	Tunnel Filler	2	2
119539	Lower Discharge Tent	1	3
120029	Support Pin	4	4
120030	Conveyor Shaft (Idler)	1	4
120048	Wiper Blade	1	3
121696	Conveyor Wiper Assembly	1	3
122551	Idler	2	4
122639	Ignitor -Sensor -Pilot (LP)	1	6
122671	Insert Front Catch Pan	1	2
123145	Burner Gasket	N/A	10
123702	Broiler Grease Tray	1	2
123710	Product Slide Ramp	1	2
123711	Cloth Mount	1	2
123713	Temp. Control (BC5INTL)	1	Schematic
123714	Temp. Control (BC5INTL)	1	Schematic

123717	Spare Parts Kit FR24BG	1	N/A
123718	Owner's Manual	1	N/A
123721	Temperature Control	1	4
123722	Temperature Control	1	6
123725	Platen Lid (Hold-up Latch)	2	3
123763	Platen Lid Assembly	1	2
123764	Catch Pan Assembly	1	2
123782	ThermoGlo™ Assembly 13" x 24.750"	1	Schematic
123832	Heat Guard Shield	1	2
123865	Burner Track, Open End	3	3
123866	Burner Track, Stop End	3	3
123867	Burner Track, Rails (Long)	3	3
124578	Broiler .500" Bearing Assembly	2	4
124596	Burner Track Rail (Short)	3	3
124630	Burner Screen Kit	6	10
124649	Heated Holding Assy -120V	1	17
124652	Burner Housing	6	10
124657	Burner Shield Mounting Kit	3	3
124724	24" Conveyor Cut Link (Per Link)	1	7
127359	Gas Valve (LP)	1	5
130203	Tglo Assembly 13" x 24.750" (240V)	1	Schematic
130657	Kit, Motor Reversing	1	N/A
130780	Kit, Patty Lid Latch Assembly	1	3
131396	Side Skin Assembly	2	2
131452	Lower Burner Support Assy	3	14
133570	Heated Holding Assy -240V	1	17
500027	24" Conveyor Belt SS (Per Foot)	62" (3" Arms) 82" (9" Arms)	7
500033	Pliers Chain Conveyor	1	7
500035	Roller Chain #35 Riveted (Per Link)	35"	4
500040	Sprocket #3510 X .500" (Motor)	1	4
500061	Fuse 1.5 amp	2	6,Schematic

500063	Fuse 10 Amp	2	Schematic
500067	Fuse Block	1	Schematic
500070	Gas Gauge	1	5
500083	Link Half (Drive Chain)	1	4
500092	Link Master (Drive Chain)	1	4
500118	Set Collar 3/4"	4	3,4
500174	Gas Line Flex 36" With Restraint	1	8
500186	Gas Regulator VR-48 (Natural)	1	5
500187	Gas Regulator VR-48 (LP)	1	5
500336	Gas Line Restraining Device RD-36	1	8
500340	Terminal Strip 3 Pole	1	Schematic
50041.7	Nipple 1/2" x 1.500"	1	5
500419	Nipple 1/2" x 2.500"	1	5
500518	Collar, Set 1/4" ID Plated	1	3
500657	Bell Reducer 3/4"-1/2"	1	5
500811	Tool Box	1	N/A
500940	Drive Motor	1	4
500941	Motor Brushes for Motor "SPEC 29894G"	2	N/A
501012	Thumb Screw, 1/4"-20 x 3/4"	2	2
501163	Ell 90°	1	5
501624	Circuit Board #MM23011C SPEC #185B	1	Schematic
501698	Solenoid Valve 120 Volt Coil (Pilots)	1	5
501747	Transformer 120V-24V	1	Schematic
501748	Thumb Screw	2	Schematic
501864	Switch	2	4,Schematic
502197	Thermocouple Type K (Broiler Tunnel)	1	4
502248	Transformer 120V-12V	2	Schematic
502211	Cord 14/3 w/plug (9 foot)	1	6
502395	Sprocket #5010 x 3/4"	2	4
502450	Pilot, Long 2.250" Long	2	6
502451	Pilot, Short 1.500" Long	5	6

502531	Spring 1.250" x.375" Dia	1	3
502550	Ignitor -Sensor -Pilot (Natural)	1	6
502579	Timer 120 Sec. Delay Brake	1	Schematic
502611	Solenoid Valve 120 Volt Coil (High-Low Pressure)	1	5,Schematic
502631	Pipe Corrugated X 12" (5/8" DIA.)	4	5
502647	Kep Nuts	N/A	10
502839	Sprocket #3524 X .750" (Broiler Drive)	1	4
502868	Gas Valve (Natural)	1	5
502892	Potentiometer - Rotary	1	9, Schematic
502906	Potentiometer - Knob	1	4
502978	Heater 450W-120V	1	3
502949	Teflon Sheet	1	2
502991	Burner Screw	N/A	10
503081	Potentiometer Knob Lock	2	4
503287	Brush Motor for Motor "Type 24Y2FETM-D4"	2	N/A
503413	Kit, Control Temp. Faceplate REF: 132574	1	N/A
503503	Kit, Control Temp. Faceplate REF: 132575	1	N/A
NATURAL GAS ORIFICES			
121668	Long & Short Pilot Orifice #68	7	6
502915	Orifice #BCR 18X (Ignitor-Sensor- Pilot Burner)	1	6
501718	Orifice #70 (Lighter Arm)	1	6
502713	Orifice #49 Button (Burners)	6	6
LP GAS ORIFICES			
122640	Long & Short Pilot Orifice .018" (Upper)	4	6
500487	Long & Short Pilot Orifice .011" (Lower)	3	6
502924	Orifice .010" (Ignitor-Sensor Pilot Burner)	1	6
502766	Orifice #79 (Lighter Arm)	1	6
502863	Orifice #56 Button (Burners)	6	6
INTERNATIONAL PARTS (50 Hz)			
125713	Temp. Control (High/Low Gas)	1	Schematic

125714	Temp. Control (Holding)	1	Schematic
502168	Transformer 240V to 12V, 6VA	2	Schematic
502409	Transformer 240V to 120V, 30 VA	1	Schematic
502575	Gas Solenoid	1	Schematic
502868	Gas Valve	1	Schematic
502916	Transformer 240V to 24V, 56VA	1	Schematic
502978	Heater 400W-240V	1	Schematic
OPTIONAL CATALYTIC CONVERTER			
123734	Broiler arms drip tray	1	13
123832	Heat Guard	1	13
125690	"V" Baffle insert, mount Assembly	1	13
502944	Catalyst	1	13
127554	Cover, Rear Catalyst	1	13
OPTIONAL CATALYTIC CONVERTER (LP ONLY)			
127554	Cover, Rear Catalyst	1	15
131093	Burner Flame Deflector	1	15
131094	Catalyst Extension Assy	1	15
125702	Extended Arm Catalyst Cover(9.5" Arms)	1	15
131365	"SPL" Top Burners	1	15
123734	Broiler Arms Drip Tray (3" Arms)	1	16
OPTIONAL SPL ORIFICES FOR 6,000 FT ELEVATION			
500927	Orifice, Flame Runner #80	1	N/A
502243	Orifice, Burner #62 Button	6	N/A

BROILER LIMITED WARRANTY

MARSHALL AIR SYSTEMS, INC., ("Marshall") warrants to the first purchaser ("Purchaser") all new equipment of its manufacture to be free of defects in material and factory workmanship for a period of one year* from date of shipment provided that (i) the equipment is installed in the Continental United States, Canada or Hawaii and operated according to the Owner's Manual while located at the original address of installation, (ii) the warranty registration card has been completed and returned to the factory within fifteen (15) days after installation, and (iii) a post-installation start-up has been performed by an authorized service representative (portable equipment not applicable). Marshall's obligation under this warranty is limited to the repair or replacement at its option of any defective part. Under certain circumstances, Marshall will reimburse Purchaser for limited labor costs in replacing parts during a period of not more than ninety (90) days after date of shipment, provided that Labor Reimbursement instructions are followed and items i, ii, and iii above are completed. See special provision for portable equipment. It is understood that Marshall's obligation with respect to equipment located outside the Continental United States, Canada or Hawaii is limited to replacement parts only.

*The following broiler parts have a six month part warranty:

- Burner Shields and Screens
- Burner Grids
- Burner Gaskets
- Electric Broiler Elements
- Flame Runners

Because Marshall does not and cannot control Purchaser's installation, use, and maintenance of equipment manufactured by Marshall, this warranty DOES NOT COVER:

Any equipment calibration;

Any component disassembled in the field;

Damage due to improper cleaning and/or abuse, i.e. burner rotation, grease accumulation in electrical components or plugs (hosing or "watering down" equipment will cause electrical failures not covered by warranty);

Blown fuses or bulbs, motor brushes and Teflon components;

Any replacement parts used on the equipment which are not purchased from Marshall;

Accessory components not installed or manufactured by Marshall.

Shipping damage must *be* reported to the carrier and is not covered under this warranty. Marshall will not ba liable for damage as a result of improper installation, misuse, abuse, alteration of original design, incorrect voltage, unauthorized service, breakage of fragile items, or any other damage caused by an act out of Marshall's control.

The effect of corrosion, fire, and normal wear on the equipment or component parts is not covered by this warranty. This warranty does not cover cooking performance, smoke capture or holding temperatures which is a function of food types, textures, temperatures, equipment line ups and other variables chosen by the Purchaser and over which Marshall has no control. This warranty does not apply to damage caused by accident or to damage caused by the negligence of Purchaser or the employees of Purchaser or to damage caused by lightning generated electrical current or any other Act of God whatsoever. This warranty does not apply to any equipment bearing a serial number which has been tampered with or altered. Marshall reserves the right to accept or reject any such claim in whole or in part. Marshall will not accept the return of any product without prior written approval from Marshall, and all such approved returns shall be made at Purchaser's sole expense.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, OR PATENT OR OTHER INTELLECTUAL PROPERTY RIGHT INFRINGEMENT, AND EXCEPT FOR THE EXPRESS WARRANTY CONTAINED HEREIN, THE EQUIPMENT IS SOLD "AS IS." REMEDIES UNDER THIS WARRANTY AND UNDER ANY WARRANTY THAT MAY SURVIVE THE DISCLAIMER OF WARRANTIES ARE LIMITED EXCLUSIVELY TO THOSE REMEDIES DESCRIBED ABOVE. NO OTHER REMEDY IS AVAILABLE UNDER THIS WARRANTY OR ANY OTHER WARRANTY. NEITHER THIS WARRANTY NOR ANY OTHER WARRANTY COVERS, AND MARSHALL WILL NOT BE RESPONSIBLE FOR, ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO THE COST OF DISASSEMBLY AND SHIPMENT OF THE EQUIPMENT, PRODUCTION OR PRODUCT LOSSES, INJURY TO OTHER PROPERTY, OR LOST PROFITS RESULTING FROM THE USE OF OR INABILITY TO USE THE PRODUCTS OR FROM THE PRODUCTS BEING INCORPORATED IN OR BECOMING A COMPONENT OF ANY OTHER PRODUCT OR GOODS, OR OTHER LOSSES. WHERE, DUE TO OPERATION OF LAW, CONSEQUENTIAL AND INCIDENTAL DAMAGES CANNOT BE EXCLUDED, THEY ARE EXPRESSLY LIMITED IN AMOUNT TO THE PURCHASE PRICE OF THE EQUIPMENT.

FOR INTERNATIONAL INSTALLATIONS -- PLEASE CONTACT YOUR LOCAL MARSHALL AIR SYSTEMS RECOGNIZED DISTRIBUTOR.

BROILER WARRANTY PROCEDURES

RETURN GOODS AUTHORIZATION FOR PARTS - FACTORY DIRECT

For prompt warranty parts replacement and RGA processing, please call Marshall's Customer Service Department at 800-722-3474 or 704-525-6230 for assistance. In all cases, a Return Goods Authorization (RGA) number must be issued by Marshall Air Systems, Inc. Unauthorized returns will not be processed.

Option #1: Purchaser to return part prepaid to Factory, Marshall to repair or replace at own expense if defective, and ship part back to Purchaser prepaid.

Option #2: Marshall to furnish replacement part freight prepaid with or without requesting return of the defective part.

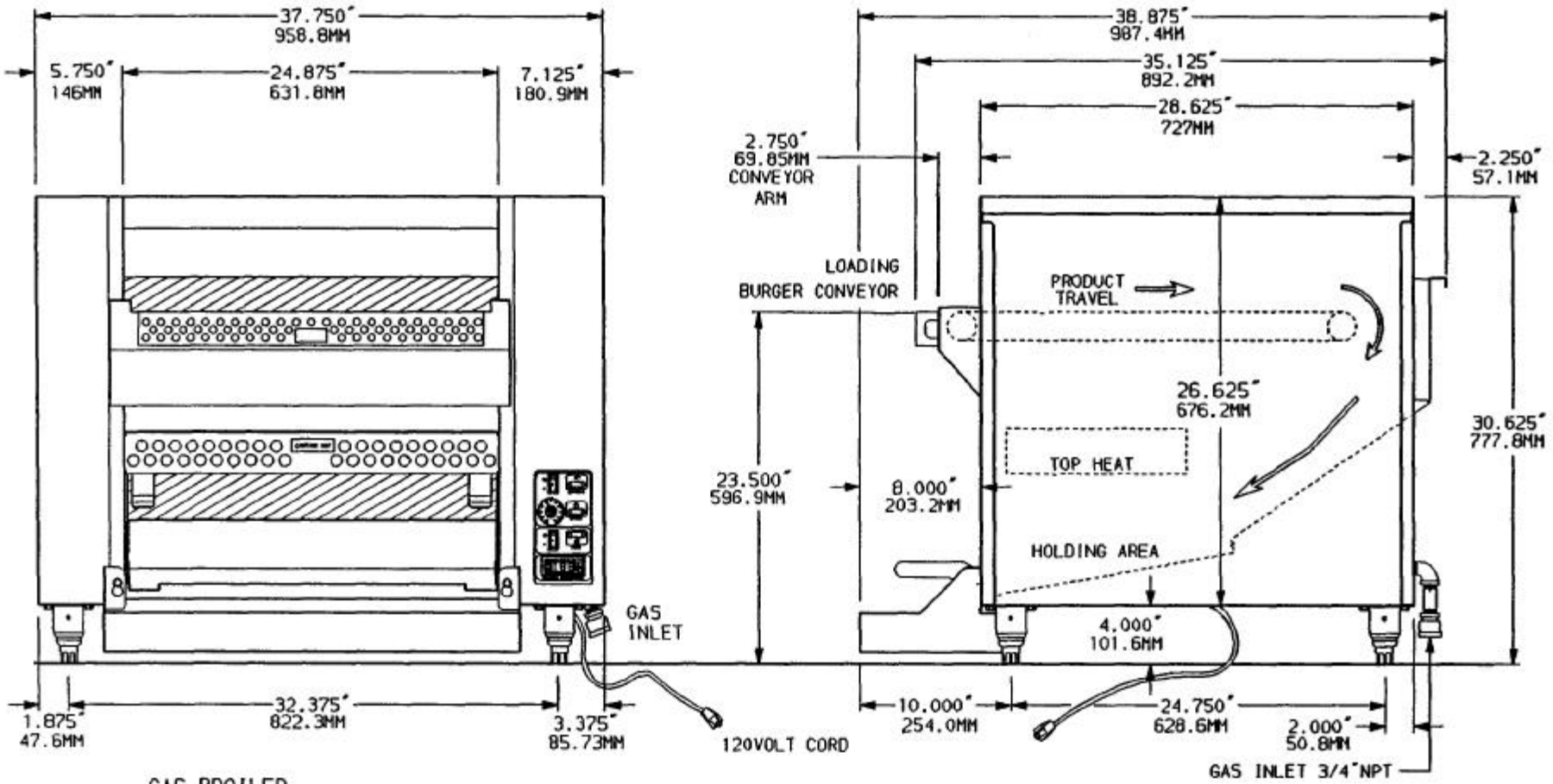
WARRANTY LABOR REIMBURSEMENT AND/OR PARTS REPLACEMENT THROUGH RECOGNIZED MAINTENANCE & REPAIR CENTERS

Normally, labor will be covered under the start up fee. In the unlikely event this does not apply, consult Marshall Air Systems, Inc. To be reimbursed for warranty labor costs, authorization must be given by Marshall Air Systems, Inc, Unauthorized work will not be reimbursed. Work must be performed by a Marshall Air Systems Recognized Service Agency within the service time allowance guidelines and must be submitted along with failed parts (if applicable) to Marshall Air Systems (freight prepaid) within 30 days of the work being performed. Travel is covered, but must not exceed 50 miles or 1 hour, whichever is greater. Call Marshall's Service Department at 800-722-3474 or 704-525-6230 with any questions. Service is to be performed by recognized service agencies during normal working hours. Owner to pay for all other charges including excessive travel or overtime charges. DIAGNOSTIC LABOR CHARGES ARE INCLUDED IN SERVICE TIME ALLOWANCE GUIDELINES. All portable equipment (under 90 pounds) shall be delivered by Purchaser, at his/her expense, to the nearest authorized service agency for in-shop repair or at purchaser's discretion he/she will pay all travel time and mileage expenses for portable equipment.

NON-WARRANTY RETURNS:

All items returned for customer convenience are subject to a 20% restocking fee. In the event of an error by Marshall Air Systems, Inc., a Returned Goods Authorization will be issued for full credit.

FOR INTERNATIONAL INSTALLATIONS - PLEASE CONTACT YOUR LOCAL MARSHALL AIR SYSTEMS RECOGNIZED DISTRIBUTOR.



GAS BROILER

NATURAL GAS BTUH:97,000 MANIFOLD PRESSURE: 5"HIGH 4"LOW

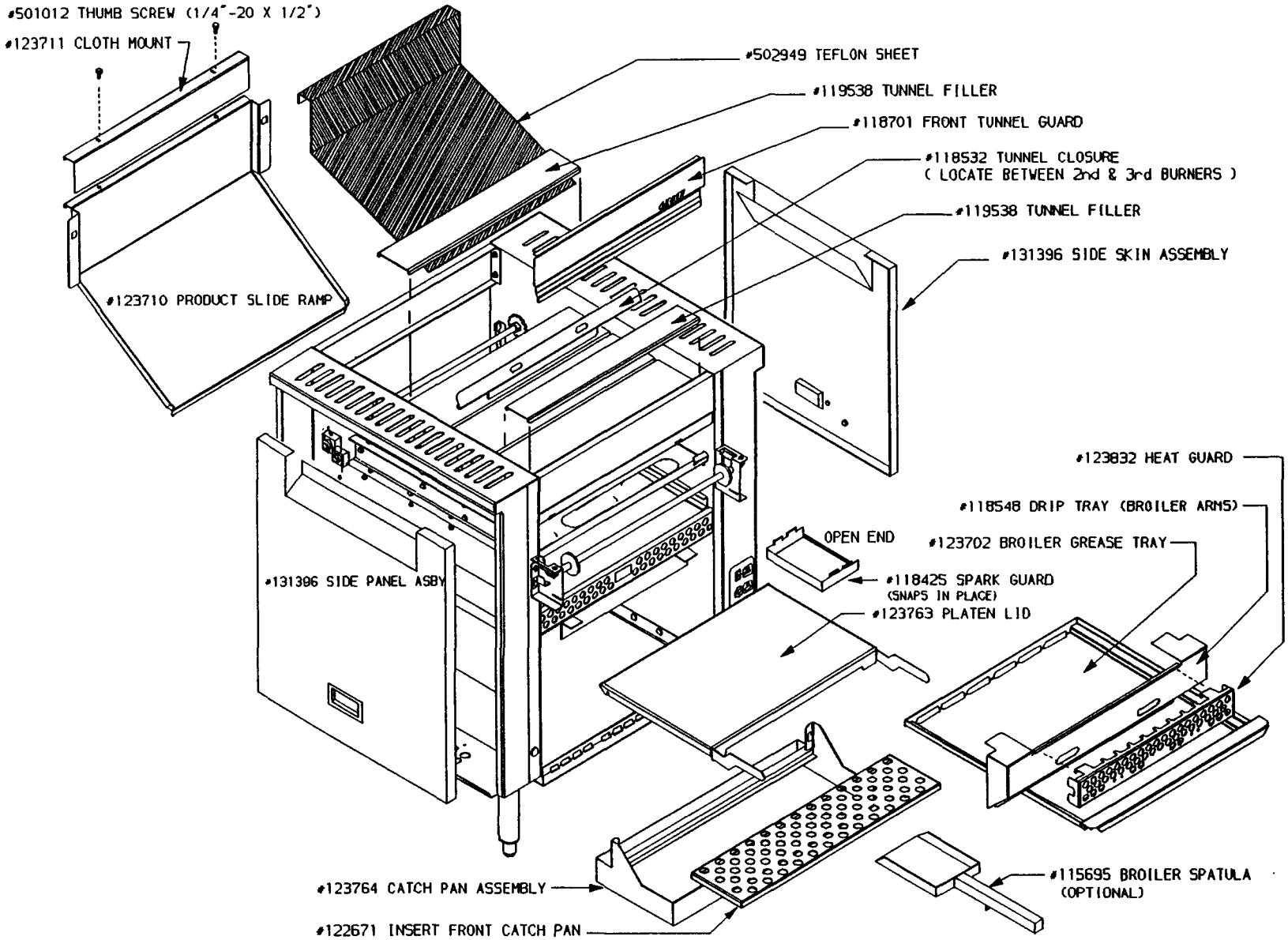
PROPANE GAS BTUH:97,000 MANIFOLD PRESSURE: 10"HIGH 8"LOW

ELECTRICAL: 120 VOLTS, 1 PHASE, 60 HZ, 13 AMPS

OVERALL DIMENSIONS

FIGURE 1

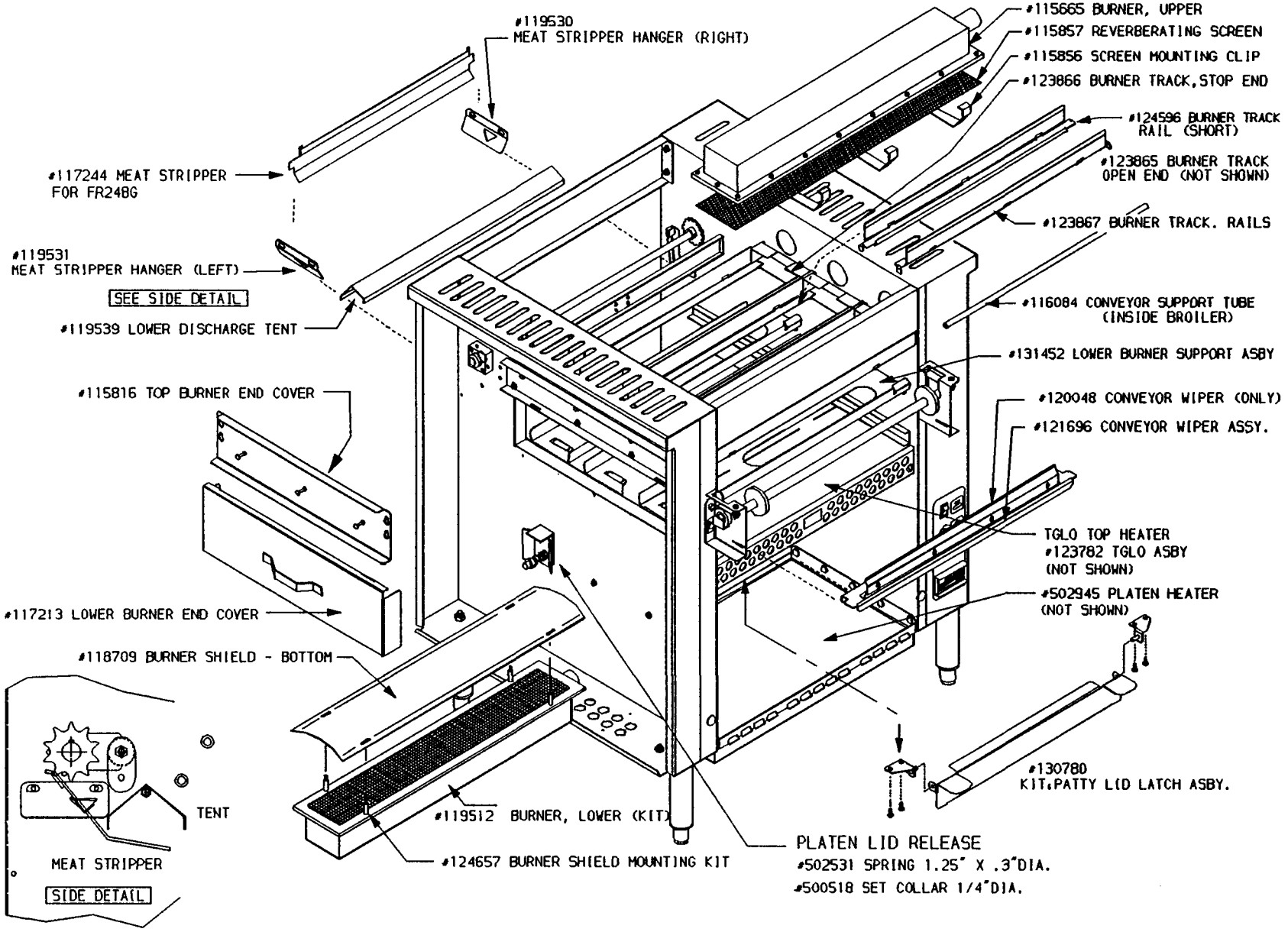
123718FIG1
RV101498



EXPLODED VIEW - REMOVEABLE PARTS

FIGURE 2

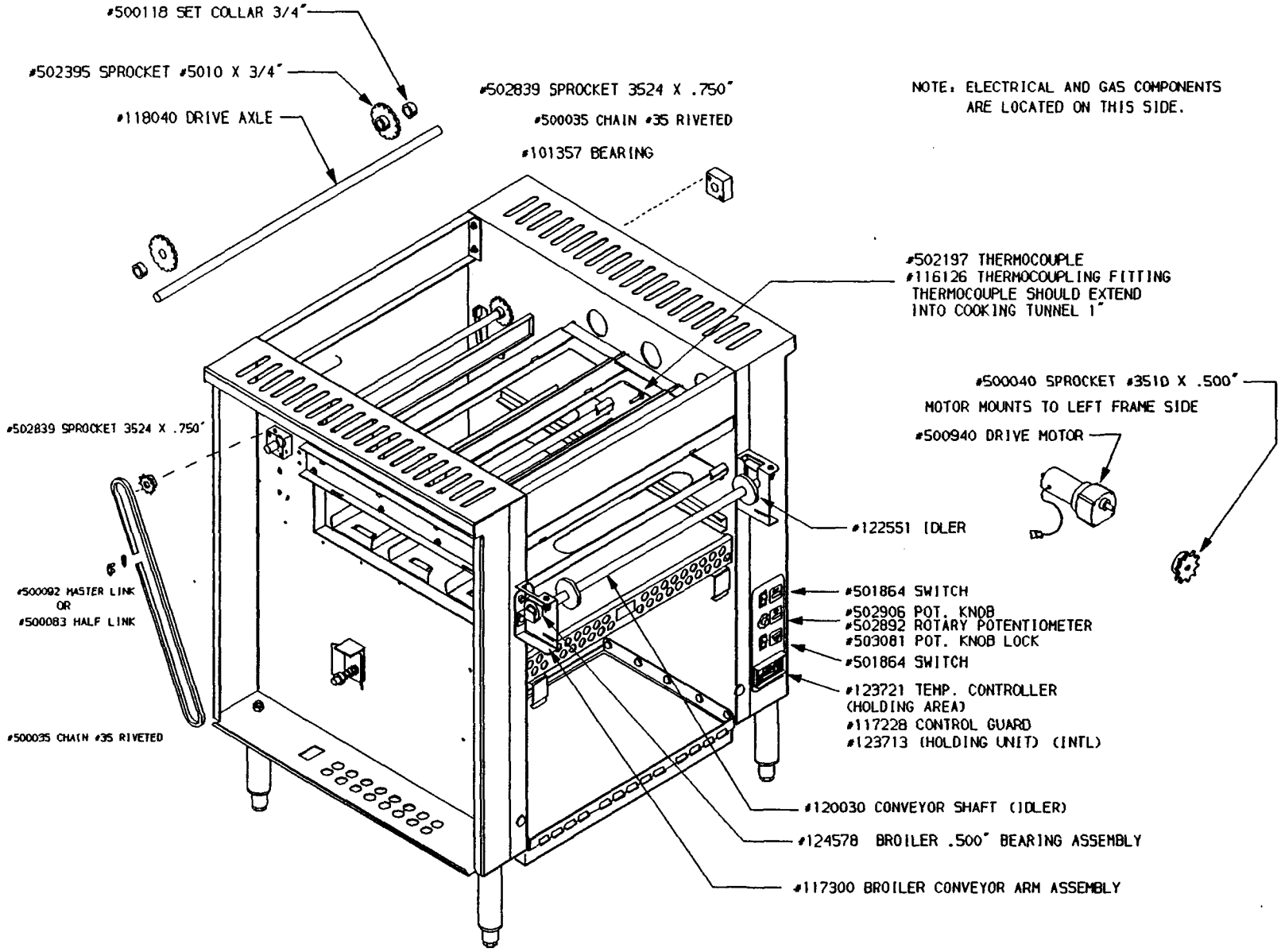
123718FIG2
RV050797



EXPLODED VIEW - INTERNAL PARTS

FIGURE 3

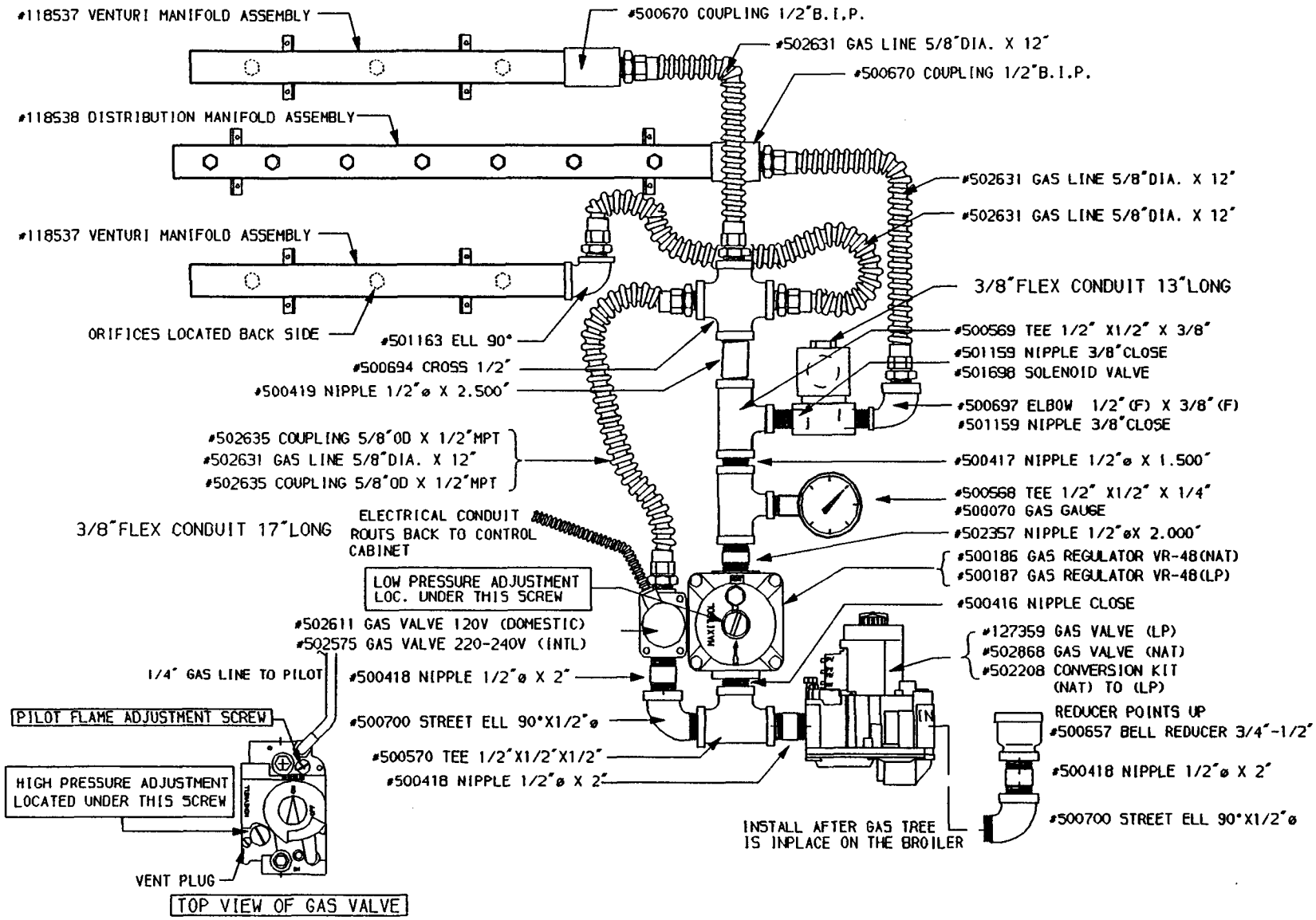
123718FIG3
RV082697



EXPLODED VIEW - DRIVE SYSTEM

FIGURE 4

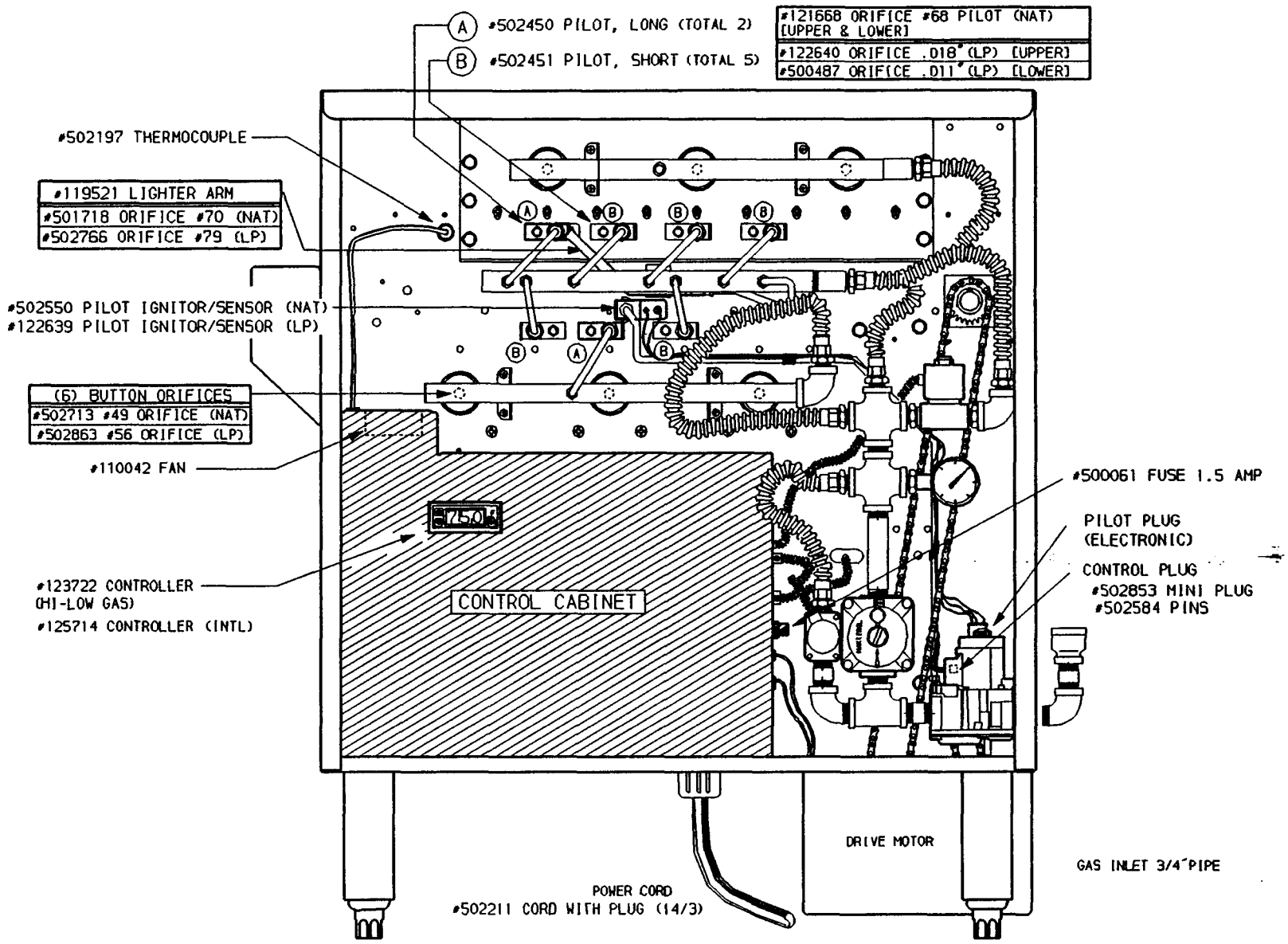
123718FIG4
RV112597



GAS DISTRIBUTION SYSTEM

FIGURE 5

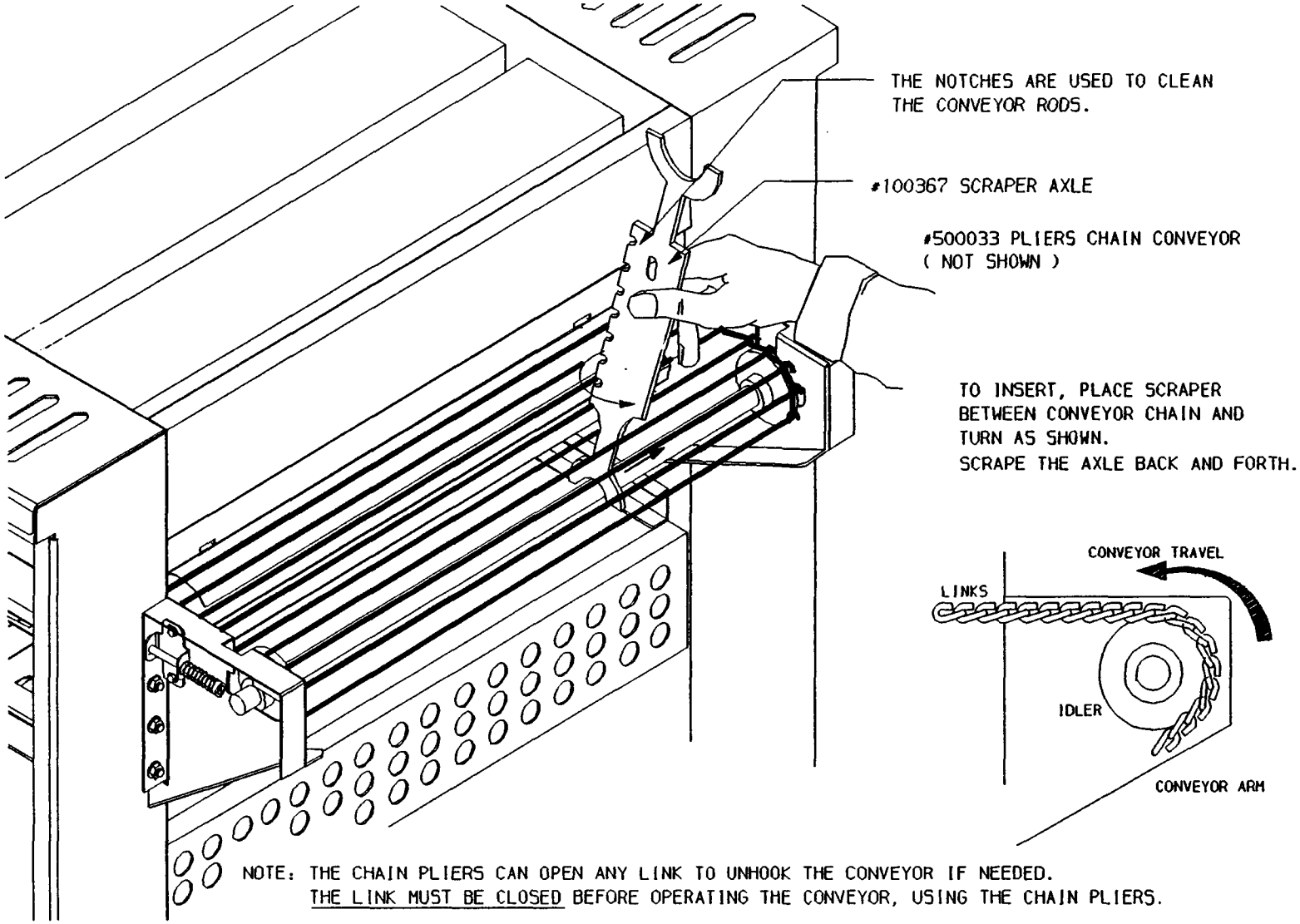
123718FIGS
RV112597



PILOT SYSTEM

FIGURE 6

123718FIG6
RV070199



CONVEYOR - AXLE SCRAPER

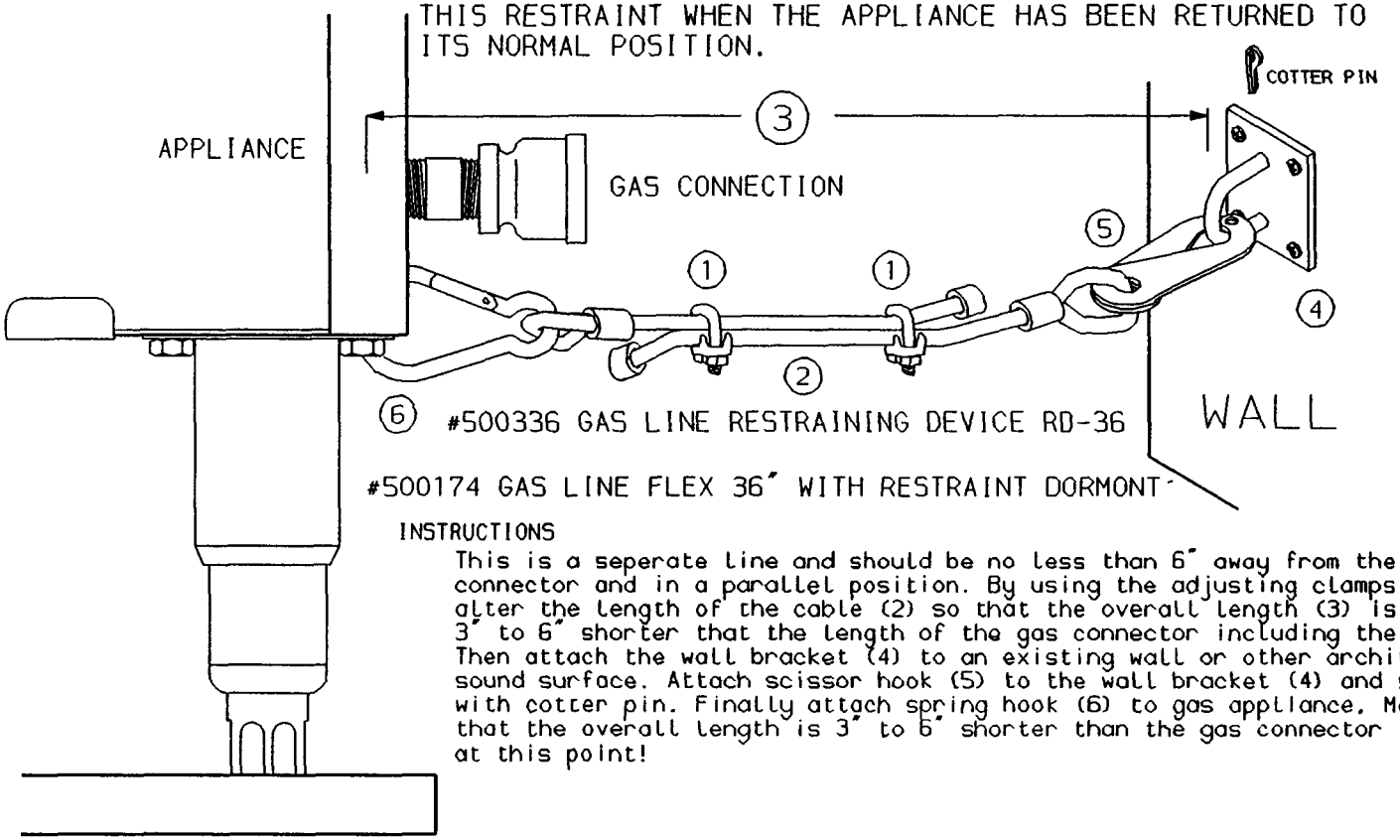
FIGURE 7

123718FIG7
RV101498

(FOR USE WITH MOVABLE GAS APPLIANCES)
Per ANSI Regulations Under:

Z-21.69-1979 & Z-21.69a-1983 (CONNECTORS)
Z-21.41b-1983 (QUICK DISCONNECT DEVICES)
With current revisions.

NOTE: THIS RESTRAINING DEVICE MUST ALWAYS BE CONNECTED WHEN THE APPLIANCE IS IN SERVICE. DISCONNECT FOR MOVEMENT SUCH AS SERVICING OR CLEANING. THEN RECONNECT THIS RESTRAINT WHEN THE APPLIANCE HAS BEEN RETURNED TO ITS NORMAL POSITION.



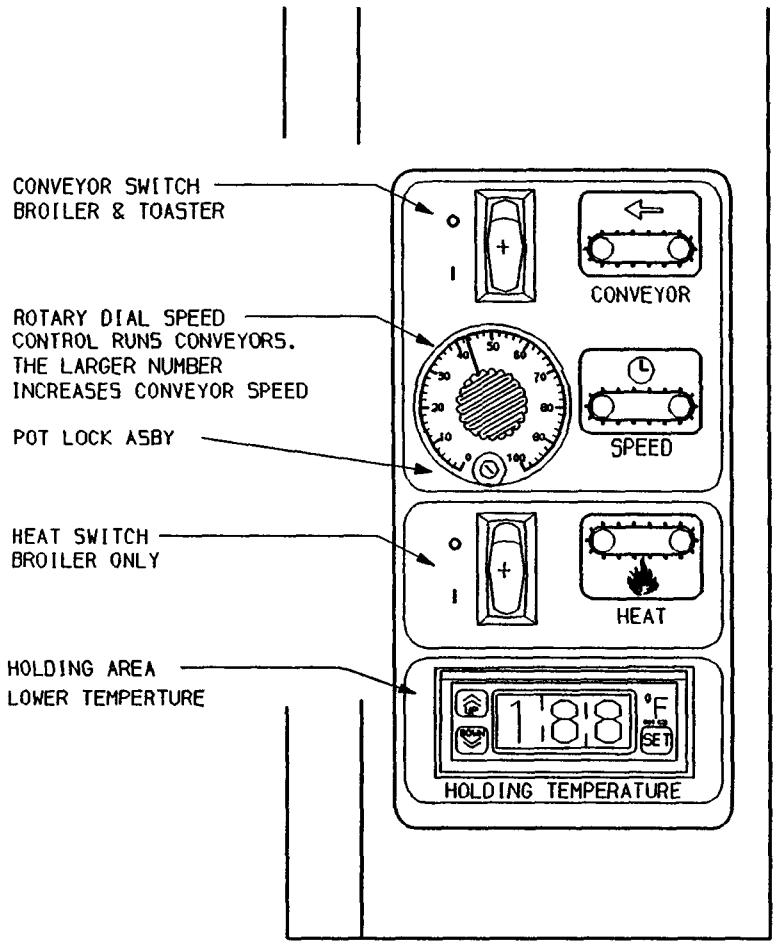
INSTRUCTIONS

This is a seperate line and should be no less than 6" away from the gas connector and in a parallel position. By using the adjusting clamps (1) alter the length of the cable (2) so that the overall length (3) is 3" to 6" shorter that the length of the gas connector including the fittings. Then attach the wall bracket (4) to an existing wall or other architecturally sound surface. Attach scissor hook (5) to the wall bracket (4) and secure with cotter pin. Finally attach spring hook (6) to gas appliance. Make certain that the overall length is 3" to 6" shorter than the gas connector at this point!

RESTRAINING DEVICE

FIGURE 8

123718FIG8
RV101498

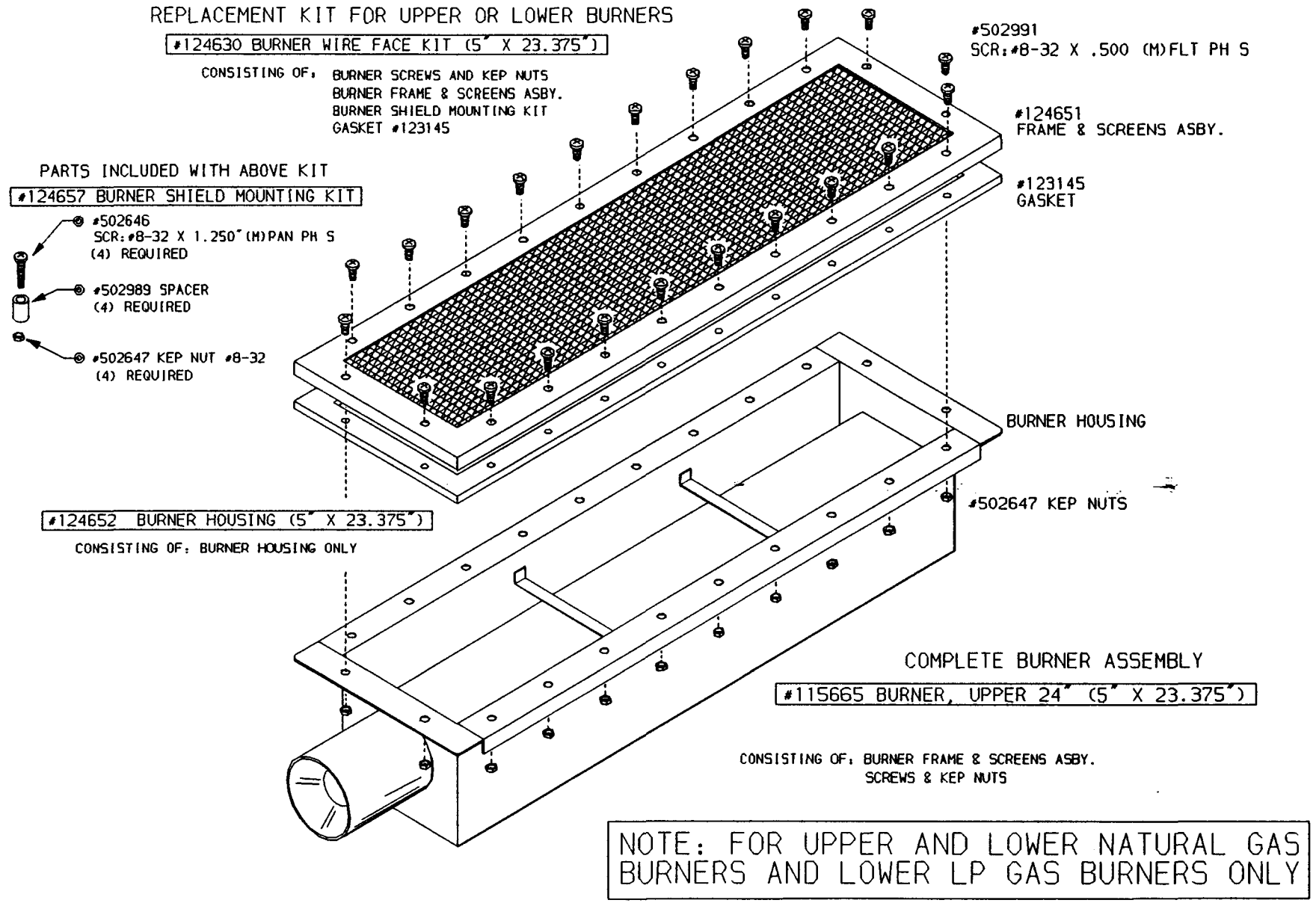


* DOMESTIC SHOWN ON DISPLAY, DEG C FOR INTERNATIONAL UNITS ONLY*

CONTROL PANEL

FIGURE 9

123718FIG9
RV101498



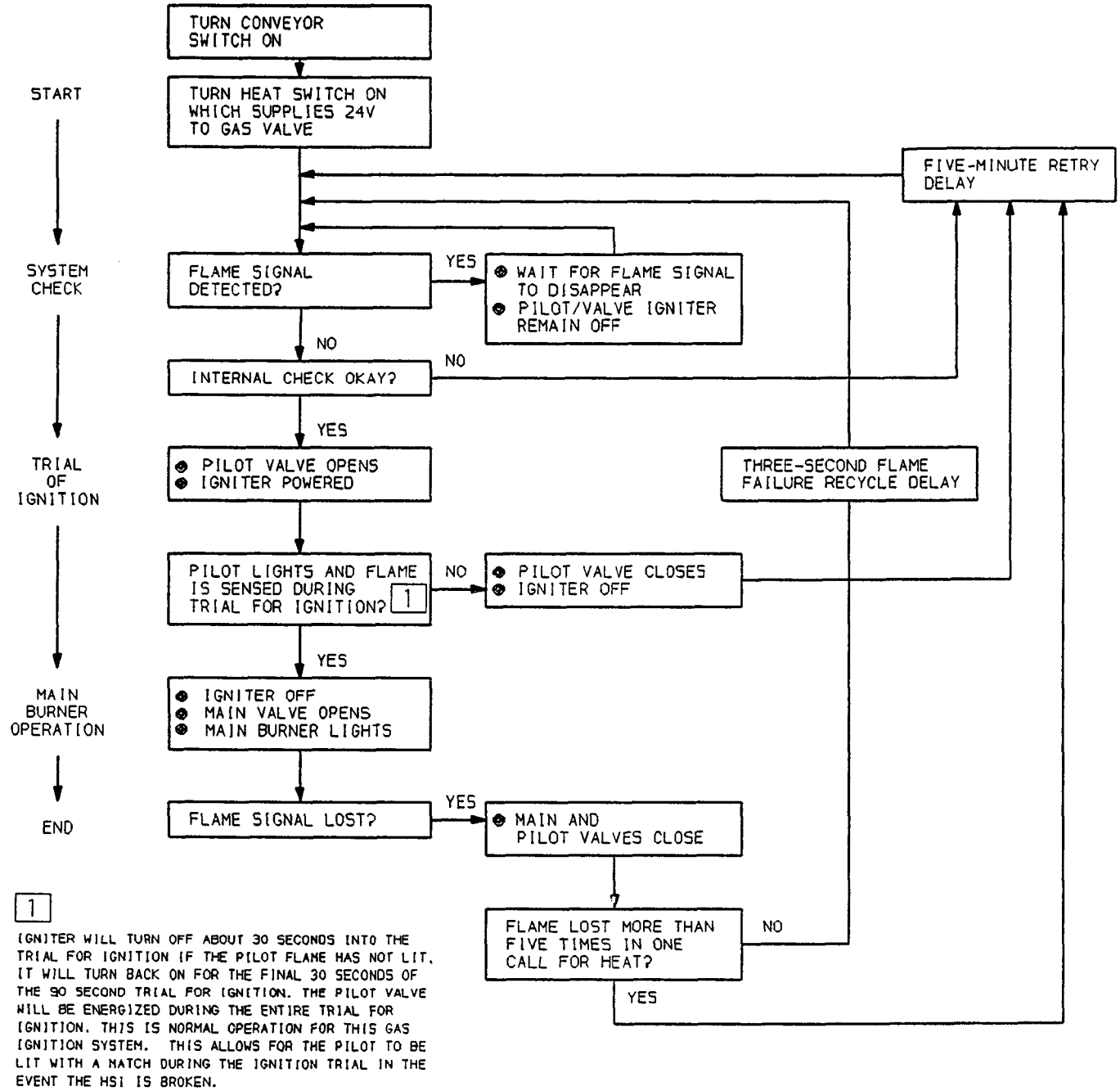
LOWER BURNER ASSEMBLY

FIGURE 10

HOT SURFACE (HSI) PILOT SYSTEM
SEQUENCE OF OPERATION

123718FIG11

THE HONEYWELL HOT SURFACE PILOT IGNITION SYSTEM USES BOTH PROVEN HOT SURFACE IGNITION (HSI) TECHNOLOGY AND FLAME RECTIFICATION TECHNOLOGY TO ACHIEVE A NEW LEVEL OF SAFTEY IN GAS BURNER CONTROL. THE CONCEPT OF A PROVEN HOT SURFACE IGNITER HAS BEEN USED FOR YEARS IN GAS RANGES AND CLOTHES DRYERS; FLAME RECTIFICATION IS THE STANDARD FLAME PROVING METHOD IN DOMESTIC WARM AIR FURNACES AND BOILERS. IN THE SV9501 SYSTEM, A PROVEN HOT SURFACE IGNITER IS USED TO LIGHT A SMALL PILOT, NOT THE MAIN BURNER AS IN A DOMESTIC OVEN. IF THE HSI IS MISSING OR BROKEN, THE PILOT VALVE WILL STILL OPEN DURING THE 90 SECOND IGNITION TRIAL WHICH ALLOWS LIGHTING THE PILOT WITH A MATCH. WHEN, THROUGH FLAME RECTIFICATION, THE FLAME ROD SENSES PILOT FLAME, THE MAIN VALVE OPENS AND THE PILOT LIGHTS THE MAIN BURNER. IF THE PILOT IS NOT PROVED, THE MAIN GAS VALVE WILL NOT OPEN.



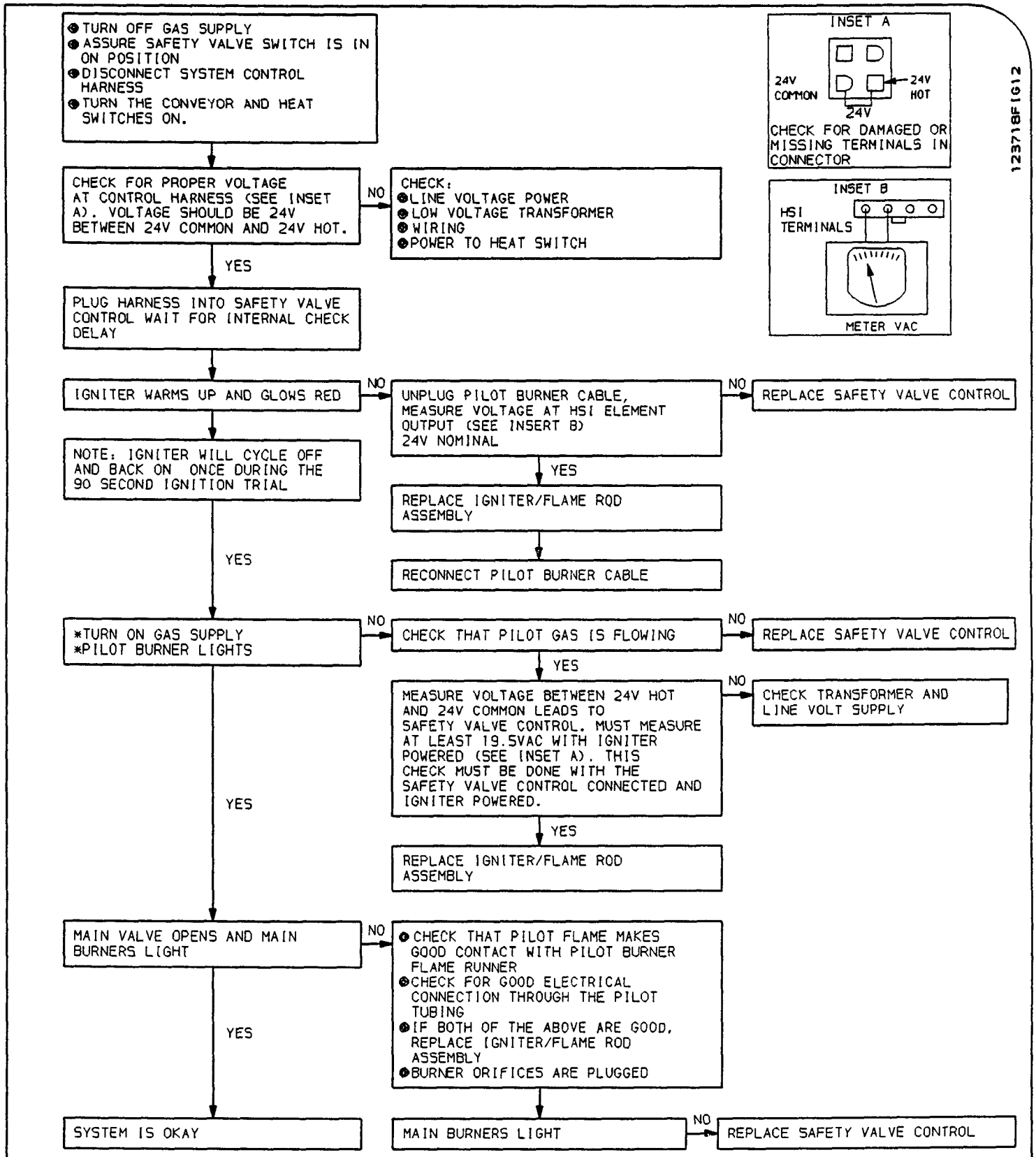
1

IGNITER WILL TURN OFF ABOUT 30 SECONDS INTO THE TRIAL FOR IGNITION IF THE PILOT FLAME HAS NOT LIT. IT WILL TURN BACK ON FOR THE FINAL 30 SECONDS OF THE 90 SECOND TRIAL FOR IGNITION. THE PILOT VALVE WILL BE ENERGIZED DURING THE ENTIRE TRIAL FOR IGNITION. THIS IS NORMAL OPERATION FOR THIS GAS IGNITION SYSTEM. THIS ALLOWS FOR THE PILOT TO BE LIT WITH A MATCH DURING THE IGNITION TRIAL IN THE EVENT THE HSI IS BROKEN.

HOT SURFACE PILOT OPERATION

FIGURE 11

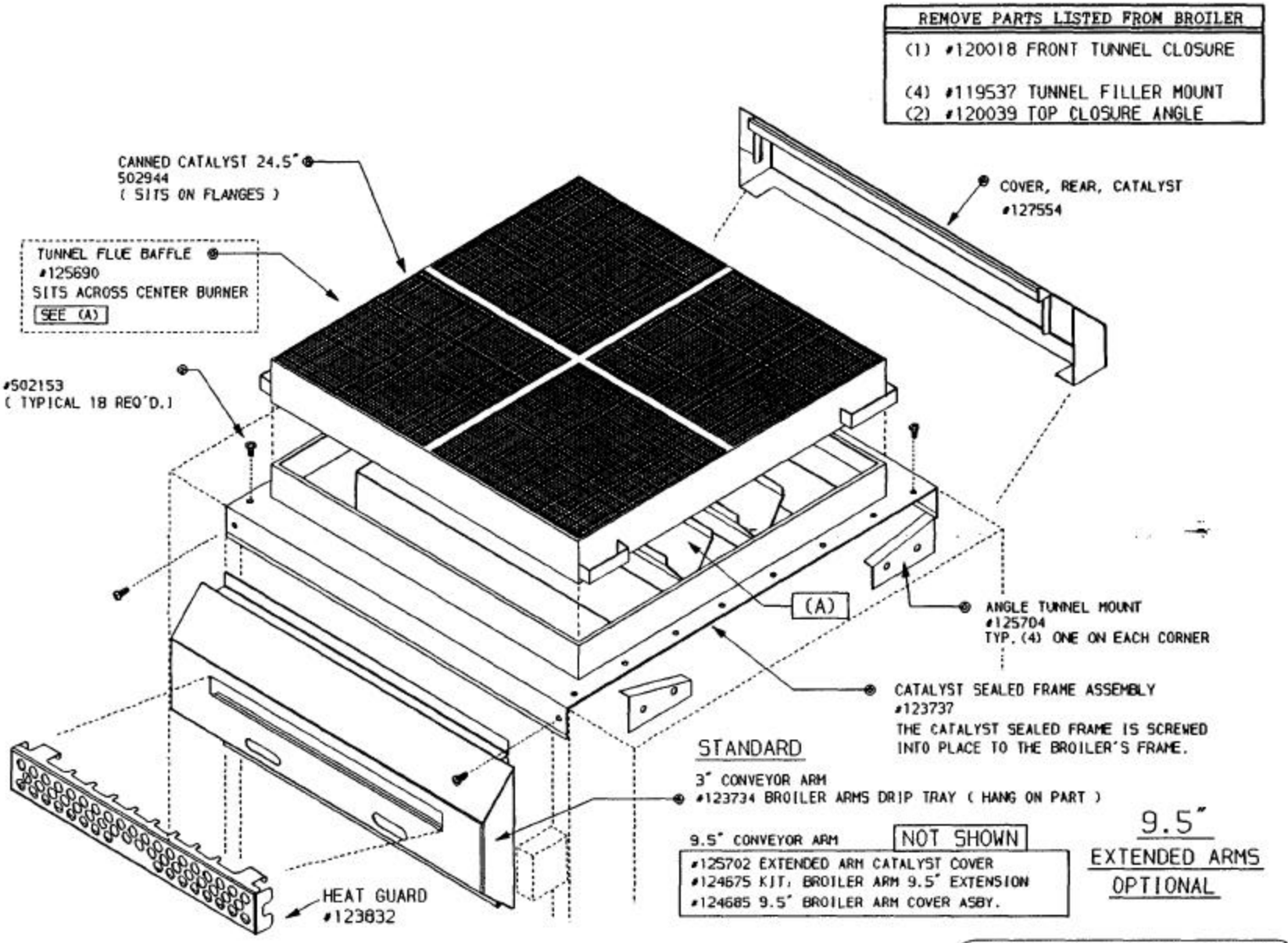
RV102198



HOT SURFACE PILOT TROUBLE SHOOTING

FIGURE 12

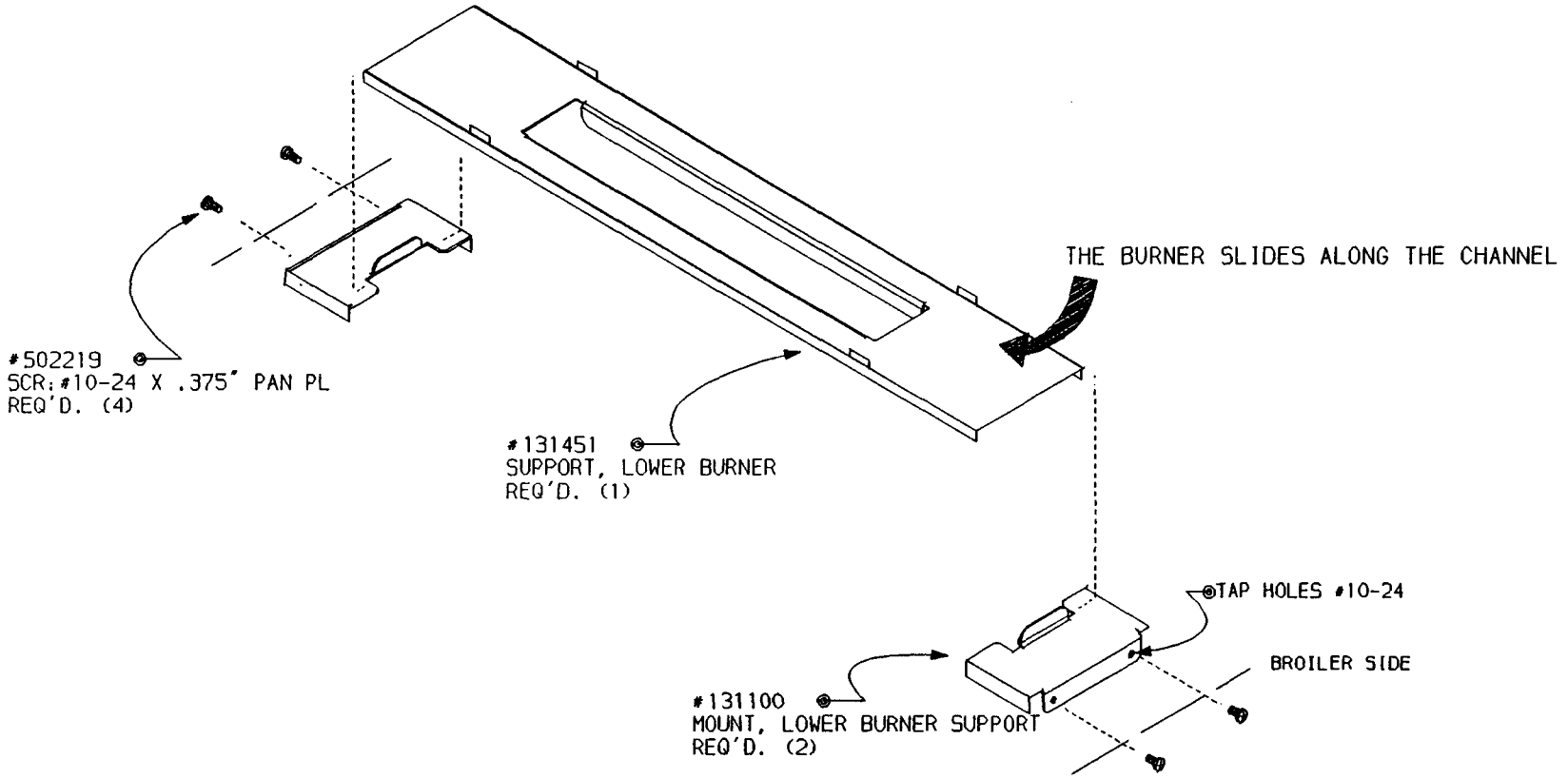
RV102198



TM
AUTOCAT CATALYTIC CONVERTER

FIGURE 13

123718FIG13
RV070199

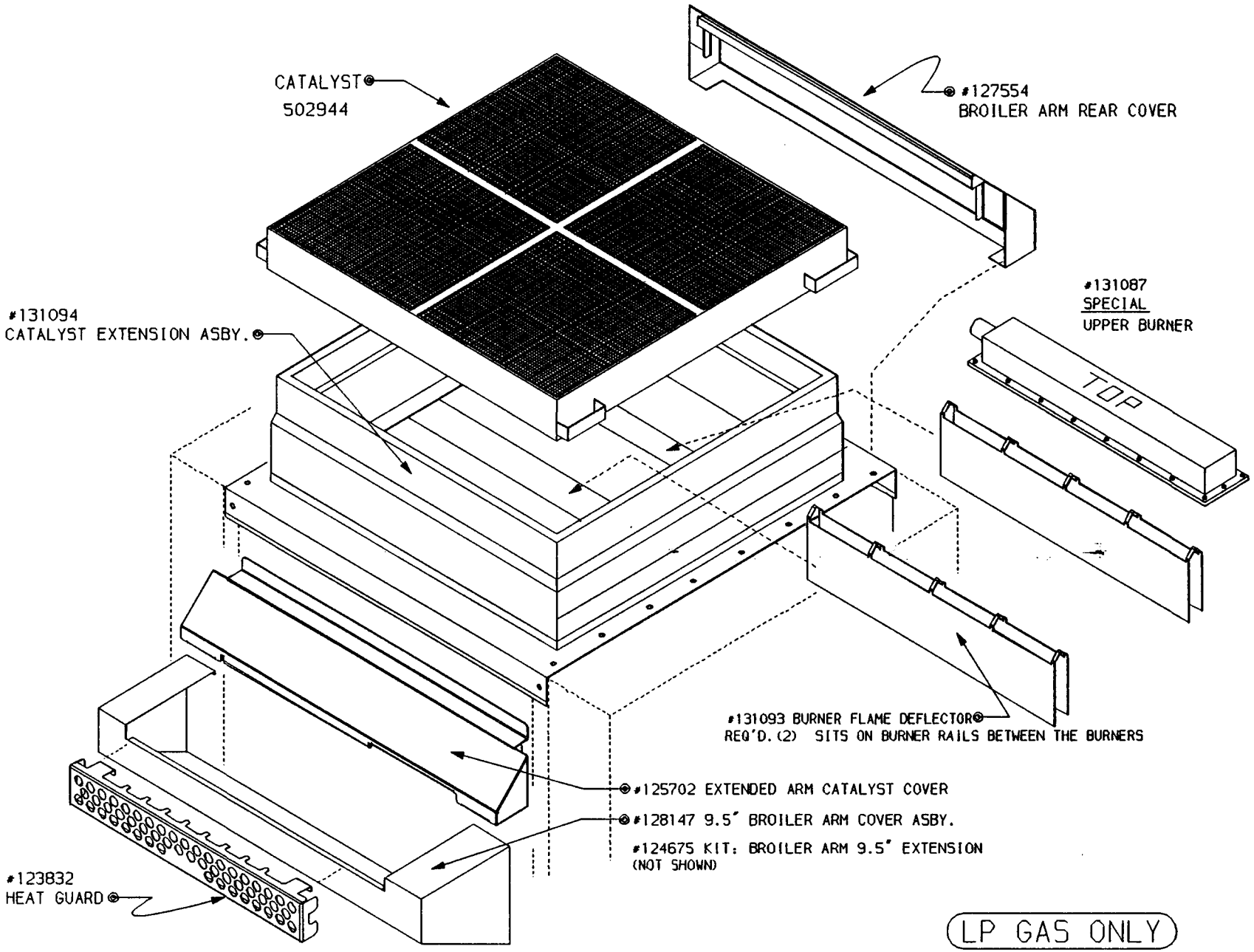


FOR BURNERS MANUFACTURED AFTER APRIL 1997

LOWER BURNER SUPPORT ASBY

FIGURE 14

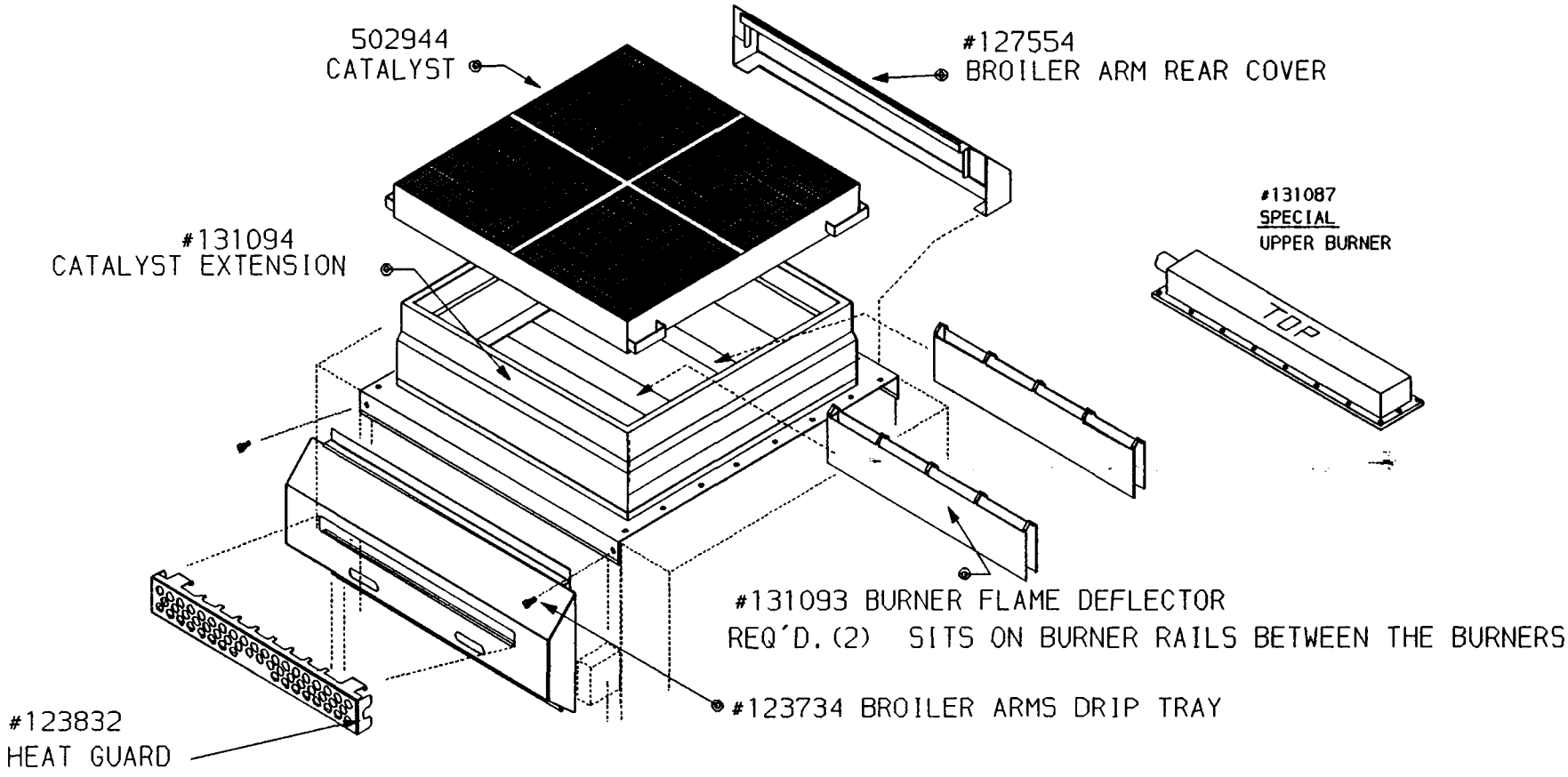
123718FIG14
RV061797



AUTOCAT CATALYTIC CONVERTER, 9.5" ARMS

FIGURE 15

123718FIG15
RV070199

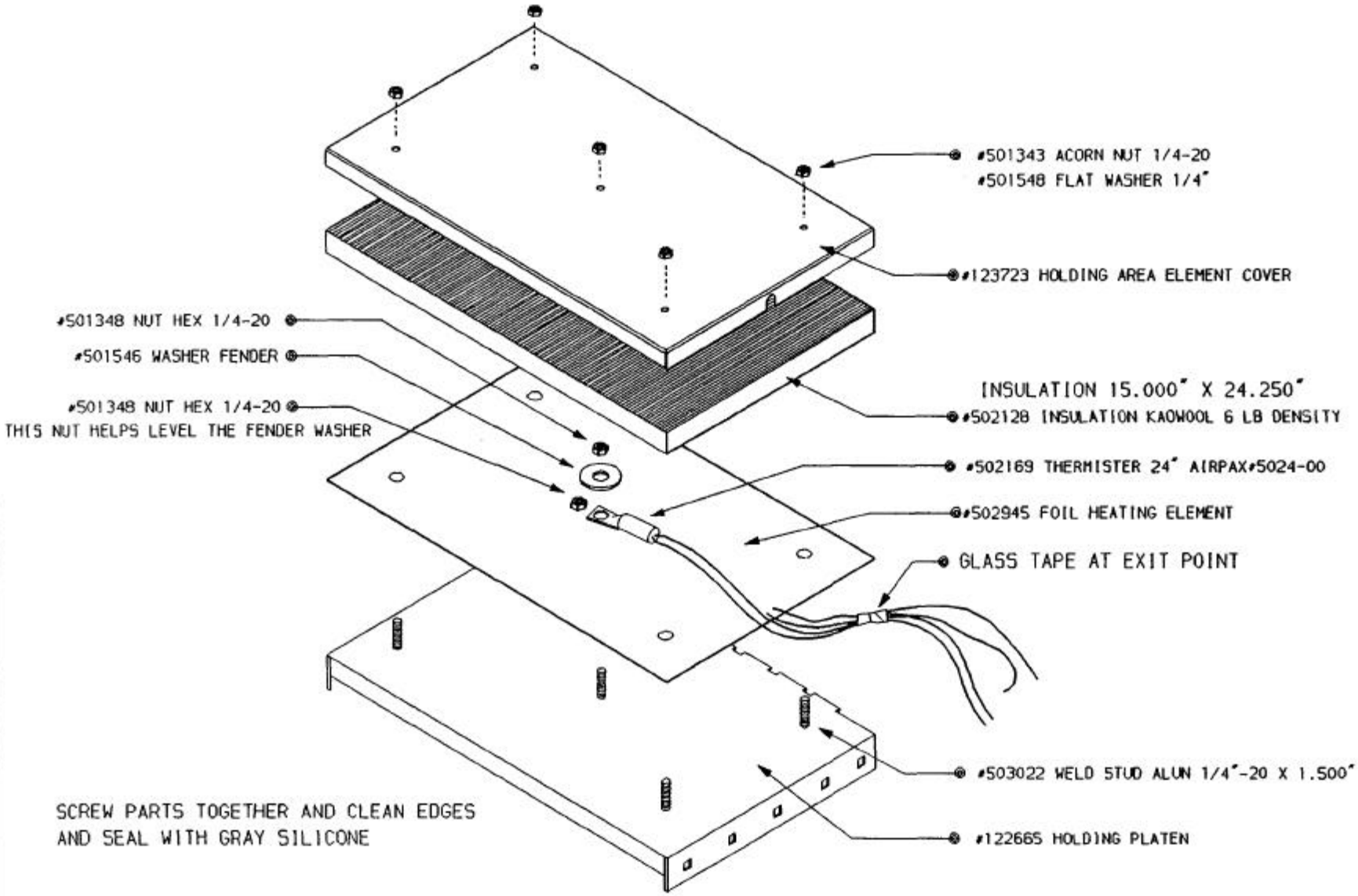


LP GAS ONLY

AUTOCAT CATALYTIC CONVERTER, 3" ARMS

FIGURE 16

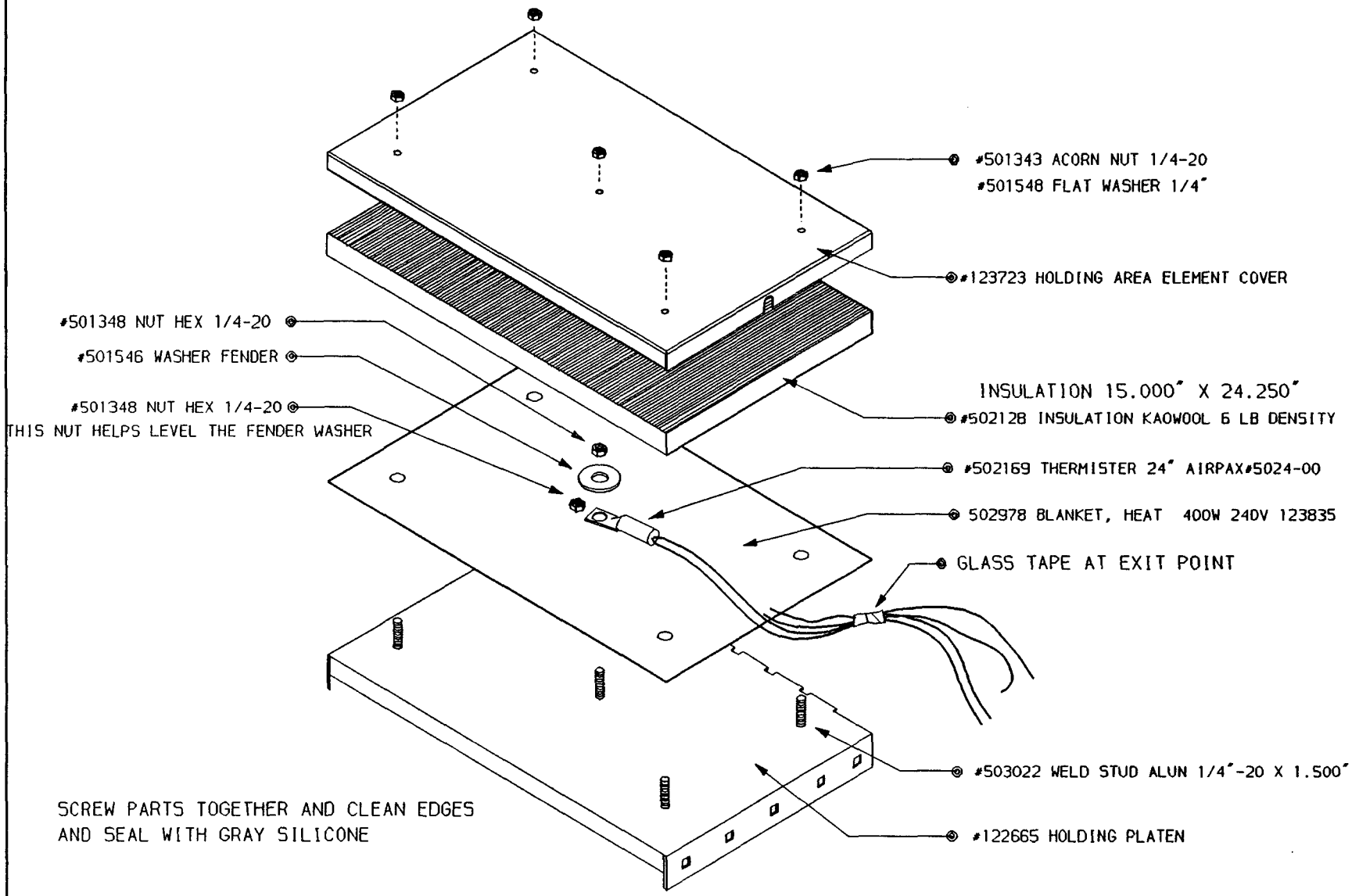
123718FIG16
RV070199



HEATED HOLDING ASBY - 120V

FIGURE 17

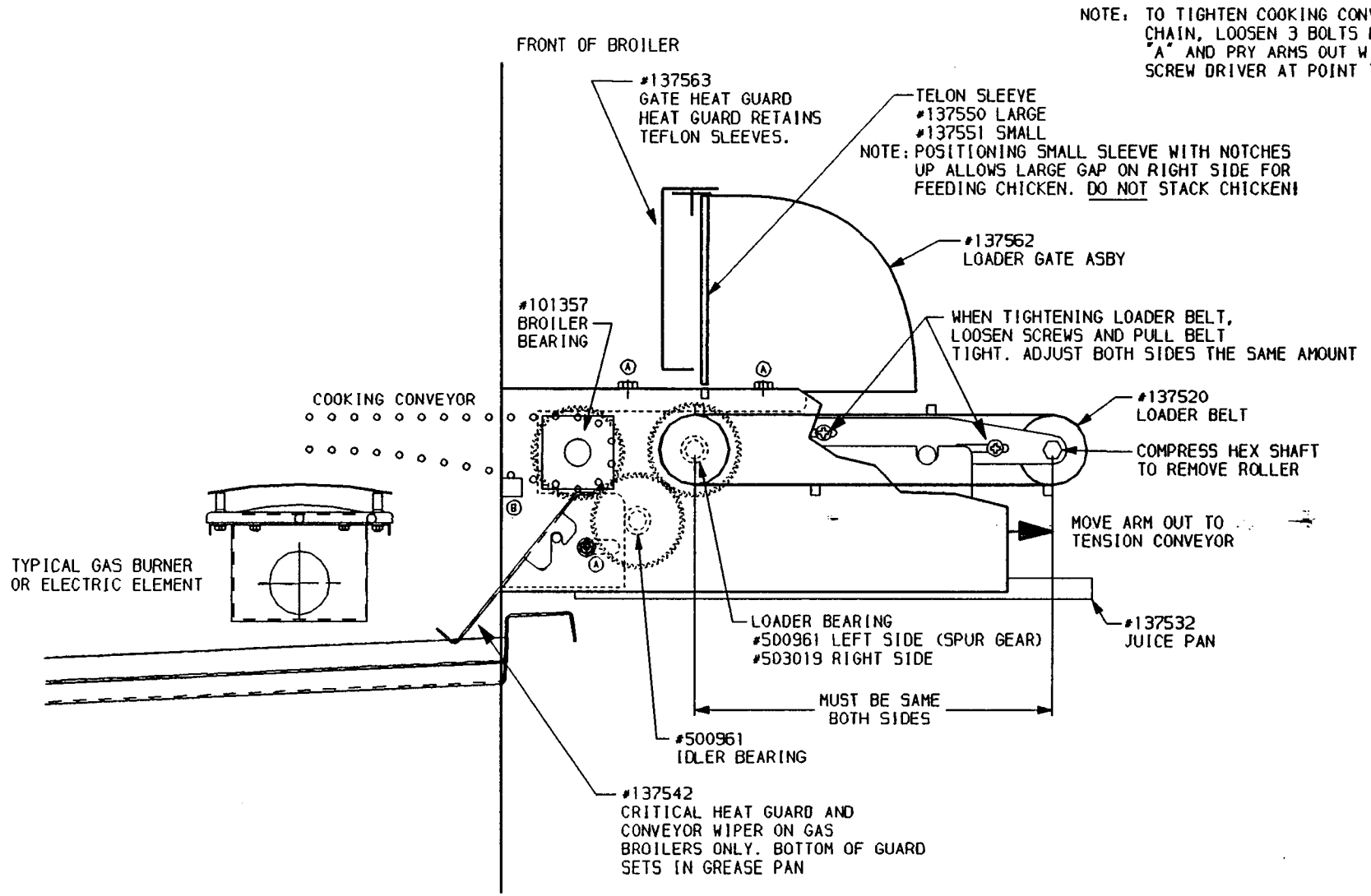
123718FIG17
RV021698



HEATED HOLDING ASBY - 140V

FIGURE 18

123718FIG18
RV021698

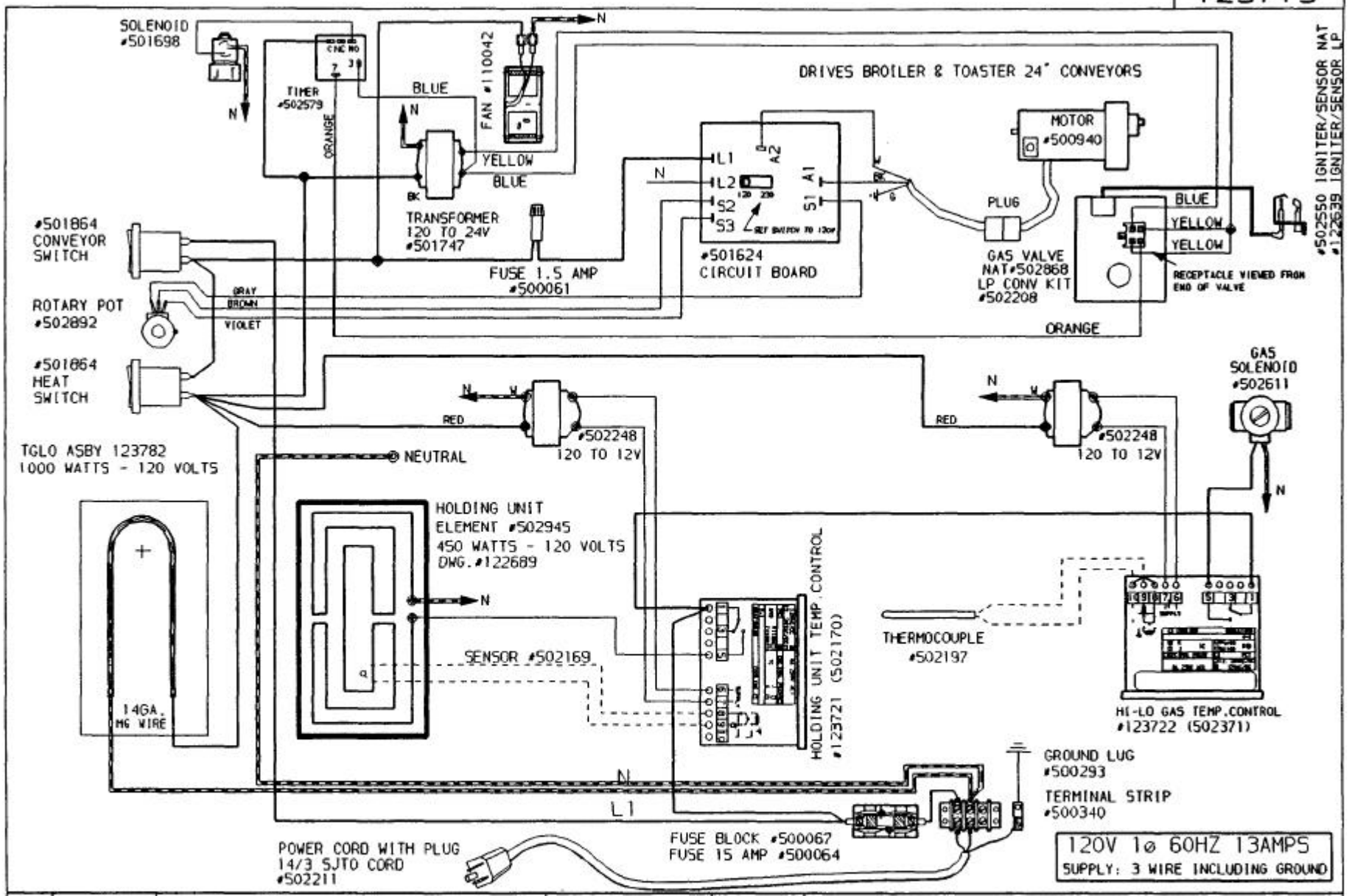


AUTOLOADER PARTS

FIGURE 19

123718F1019 RV070199

123713



REV	DATE	DESCRIPTION
1	23-FEB-95	ADDED LP IGNITER/SENSOR
2	03-JAN-95	HOLDING ELEMENT WATTAGE WAS 300.
3	06-APR-95	CHANGE PART# ON TIMER (JR)
4	25-JUL-95	CH. WIRES ON POT.& REMOVE WIRE COLORS.(MC,JR)
5	14-JAN-97	TGLO ASBY 123782 WAS 502946 (CP)
6	19-AUG-97	#502868 WAS #502549 (TS)

R.S. 09-DEC-9

REFERENCE

MARSHALL AIR SYSTEMS, INC.

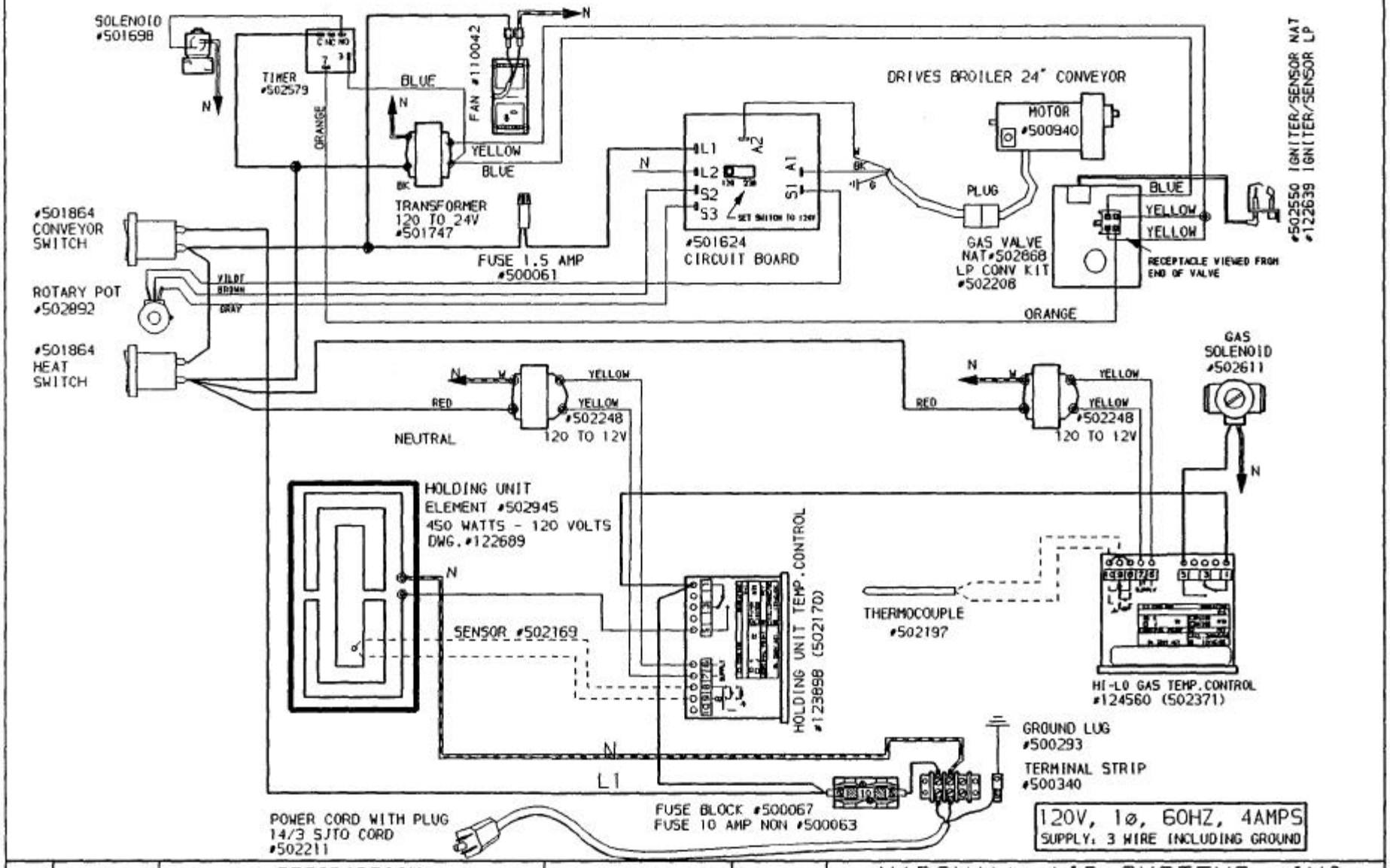
SCHEMATIC, FR24BG W/HOLDING 120V 1PH

SIZE	PROJ.	DWG NO.	REV
A		123713	6

SCALE IMAGE MAY BE REDUCED 1:1 NTS

CODE: BCS

124557



REV	DATE	DESCRIPTION	J.R.	03-APR-95
1	22-AUG-97	#502868 WAS #502549 [TS]		

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, FR24BG 120V, 1PH, 60Hz, 4A
W/O TGLO, ROTARY SPEED CONTROL

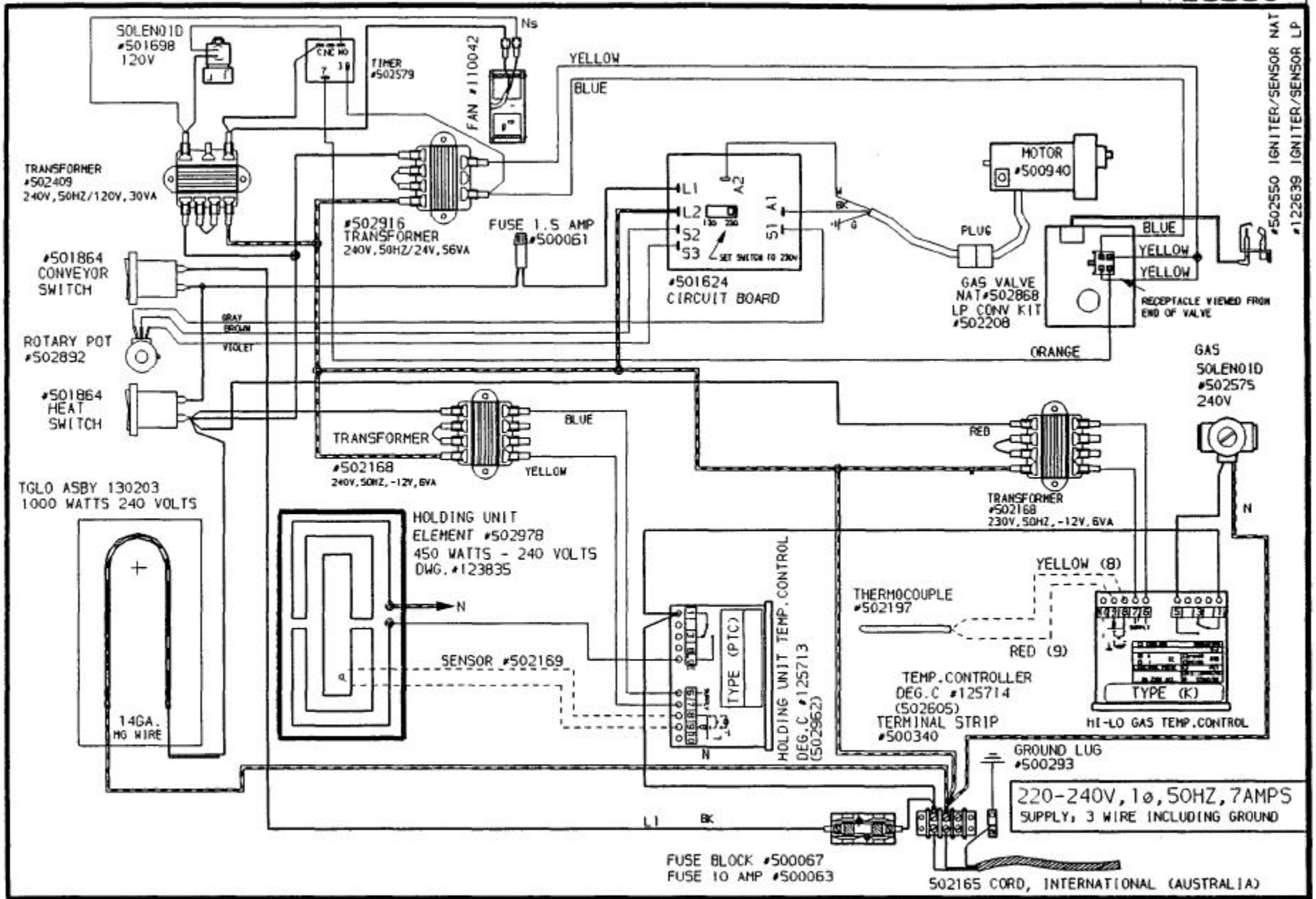
REFERENCE

SIZE	PROJ.	DWG NO.	REV
A		124557	1

SCALE 1:1 IMAGE MAY BE REDUCED NTS

CODE: BC5A

123830



REV	DATE	DESCRIPTION
1	05-SEP-95	CH.CONTROLLERS TO SHOW DEG.C FACEPLATE
2	22-JAN-97	TGLO ASBY 130203 WAS 502977 (TS)
3	29-MAY-97	UPDATE TEMP CONT TCOUPLE CONNECTION, POT CONNECTIONS (CP)
4	30-JUL-97	ADDED VOLTAGE RATINGS TO GAS SOLENOIDS (CP)

RMS 23-FEB-95

REFERENCE

"X"

SCHEMATIC, FR24BG 220-240V, 1 PH, 50 HZ

SIZE	PROJ. CODE:	DWG NO.	REV
A		123830	4

SCALE 1:1 NTS IMAGE MAY BE REDUCED BC5BKINTL BC5INTLA

PLOTTED 21-NOV-97 BY C. P.