



## **VG & VE SERIES BRAISING PANS**

### **Customer Maintenance Manual**

**SPECIFICATION SHEETS**

**INSTALLATION / OPERATION MANUAL**

**ADDITIONAL RESOURCES**

**SERVICE MANUALS**

**HOBART SERVICE PARTS STORE**

**CATALOG OF REPLACEMENT PARTS**

## S T E A M

**VULCAN****VG SERIES  
MODULAR GAS TILTING BRAISING PAN**

Shown with enclosed faucet bracket



ANSI/NSF Standard #4

**SPECIFICATIONS**

Modular gas tilting braising pan. 36"/46" wide open base. Stainless steel front, sides and 12" legs with adjustable flanged feet. Stainless steel back. Front hinged polished stainless steel pan body with covered interior corners and embossed gallon markings. Pan depth is 9.75". Stainless steel cooking surface bonded to steel plate. Full width 4" return flange with formed pouring lip and removable strainer. Stainless steel spring assist cover with wrap around handle and condensate lip. Faucet mounting bracket (non-enclosed) field reversible "L" bracket either side. Drop away food receiving pan support mounts under pouring lip. Manually operated pan tilting mechanism with removable handle. Pan can be fully tilted to empty completely with approximately 30 crank revolutions. One 30,000 BTU/hr. burner for each 12" pan width. Burners shut off when pan is tilted 5°. Electronic ignition system for automatic burner light. Solid state temperature controls. Water tight controls and enclosures. Requires a 120/60/1 electrical power supply, 9.0 amps total draw. 3/4" rear gas connection and internal gas combination valve with integral regulator.

**Exterior Dimensions:**

\_\_\_\_"w x 35 1/2"d x 40 1/2"h on 12" legs.

CSA design certified. Classified by UL to NSF Std. #4.

**SPECIFY TYPE OF GAS WHEN ORDERING.****SPECIFY ALTITUDE WHEN ABOVE 2,000 FT.**

- VG30** 36" wide open base.  
 **VG40** 46" wide open base.

**STANDARD FEATURES**

- Stainless steel front, back, sides and 12" legs with adjustable flanged feet.
- Front hinged polished stainless steel pan body with covered interior corners and embossed gallon markings. Stainless steel cooking surface bonded to steel plate. Full width 4" return flange with formed pouring lip and removable strainer.
- Stainless steel spring assist cover with wrap around cool to the touch handle and condensate lip.
- Lid stops in place for vented cooking.
- Faucet mounting bracket (non-enclosed) field reversible "L" bracket either side.
- Drop away food receiving pan support mounted under pouring lip.
- Manually operated anti-jam pan tilting mechanism with removable handle. Pan can be fully tilted to empty completely with approximately 30 crank revolutions.
- One 30,000 BTU/hr. burner for each 12" pan width. Burners shut off when pan is tilted 5°. Electronic ignition system for automatic burner lighting.
- Solid state temperature controls, adjustable from 50°F to 425°F.
- Water tight controls and enclosures.
- Requires a 120/60/1 electrical power supply, 9.0 amps.
- 3/4" rear gas connection.
- One year limited parts and labor warranty.
- Combination gas valve with built-in regulator.

**OPTIONS**

- Motor driven pan lift with removable manual crank handle.
- Two inch draw-off valve – left front straight with strainer. (BPDOV-1) Pan support will be removed on VG30.
- Two inch draw-off valve – left front 90° left with strainer. (BPDOV-2) Pan support will be removed on VG30.
- Two inch draw-off valve – left side 90° front with strainer. (BPDOV-3)
- Standard security package includes:
  - Security screws and tackwelds.
    - Includes securing crank handle, pan strainer and non-door type panels.
  - Controls protected by lockable cover.
  - Perforated flue cover.
- Second year extended limited parts and labor warranty.

**ACCESSORIES (Packaged & Sold Separately)**

- Set of four casters, (two locking).
- Faucet bracket assembly (adds 3" to width) enclosed.
- (12") (18") double jointed single pantry faucet.
- (12") (18") double jointed double pantry faucet.
- Double pantry washdown hose with 16" add-on faucet with backflow preventer.
- Double pantry washdown hose with backflow preventer.
- Double pantry pot filler and backflow preventer.
- Steaming pan insert rack to hold 12" x 20" pans. (Qty. \_\_\_\_)
- 12" x 20" x 4" stainless steel drain waste pan with clear plastic hose.
- Catch can with bail handle and drain hose for draw-off valve.
- Stainless steel perforated boiling basket (12" x 20" x 6" deep) with handles.

**VULCAN**

a division of ITW Food Equipment Group LLC

P.O. Box 696 ■ Louisville, KY 40201 ■ Toll-free: 1-800-814-2028 ■ Local: 502-778-2791 ■ Quote &amp; Order Fax: 1-800-444-0602



## VG SERIES MODULAR GAS TILTING BRAISING PAN

### SERVICE CONNECTIONS:

**GAS INPUT:** 3/4" N.P.T., Nat. 7"-10.5" W.C.; Propane, 11"-13" W.C. See capacity schedule.

**ELECTRICAL CONNECTION:** Control circuit 7/8" dia. 120 volt, 1 phase, 15 amps, power cord.

### IMPORTANT:

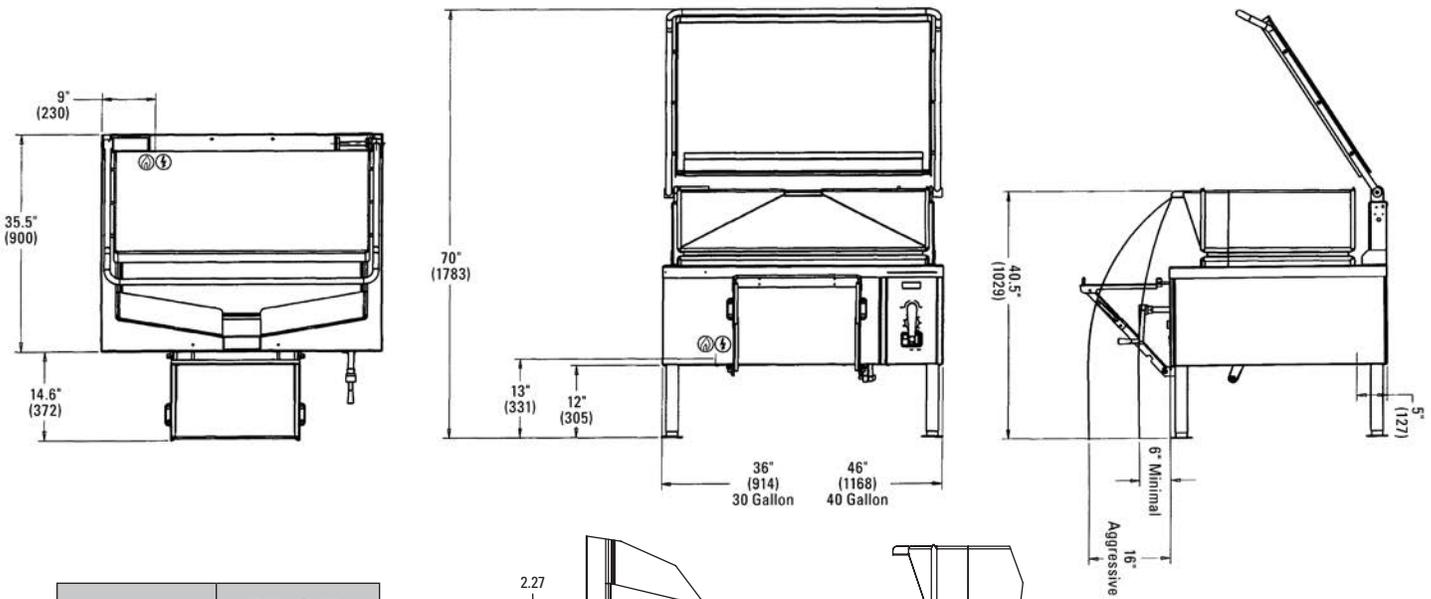
1. A pressure regulator sized for this unit is included. Natural gas 7" W.C., propane gas 11" W.C. supply pressure.
2. Gas line connecting to appliance must be 3/4" or larger. If flexible hose with quick connects are used the hose and quick connects BTU flow rate must be a minimum of 120% of the appliance data plate BTU rate.
3. An adequate ventilation system is required for commercial cooking equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02289. When writing, refer to NFPA No. 96.

4. These units are manufactured for installation in accordance with ANSZ223.1A (Latest edition), National Fuel Gas Code. Copies may be obtained from the American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209.

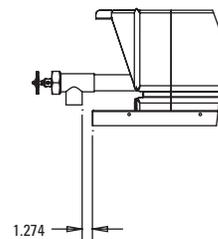
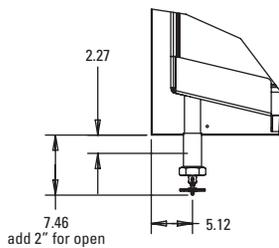
5. Clearances:	Combustible	Non-combustible
Rear	6	0
Sides	2	0

6. This appliance is manufactured for commercial installation only and is not intended for home use.

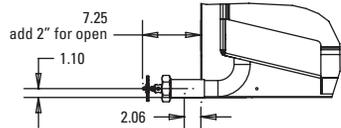
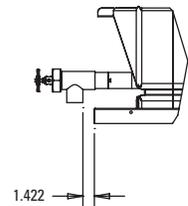
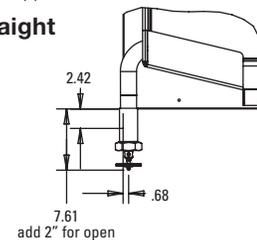
MODEL	COOKING SURFACE AREA	CAPACITY	4 OZ. PORTIONS
VG30	29" x 23"	30 gal./114 liters	960
VG40	39" x 23"	40 gal./152 liters	1280



MODEL	BTU/HR. INPUT
VG30	90,000
VG40	120,000



**2" Draw-off valve – left front straight (BPDOV-1)**



**2" Draw-off valve – left front 90° left (BPDOV-2)**

**2" Draw-off valve – left side 90° front (BPDOV-3)**



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**NOTE:** In line with its policy to continually improve its products, Vulcan reserves the right to change materials and specifications without notice.

## S T E A M

**VULCAN****VE SERIES  
ELECTRIC TILTING BRAISING PAN**

**VE40 FastBatch™ Electric Braising Pan  
with Optional Motorized Lift**

**SPECIFICATIONS**

Free-standing electric tilting braising pan in 30 or 40-gallon capacity. Partially enclosed stainless steel base includes removable stainless steel panels, fully welded frame and 12" legs with adjustable flanged feet. Dual recessed hinges mounted under stainless steel cooking pan. Pan features anti-stick finish, coved interior corners and embossed gallon and liter markings. Pan depth is 9.75". Anti-stick stainless steel clad cooking surface bonded to steel sub plate featuring FastBatch™ rapid heating technology and embedded heating elements for improved heating performance and even temperature distribution. Elements shut off when pan is lifted beyond 5°. Pitcher pour tapered front with oversized 4" front flanges. Formed pouring lip includes removable perforated strainer. Stainless steel spring assist cover with wrap-around stay cool handle. Drop away food receiving pan support mounts under pouring lip. Manually operated pan lifting mechanism with sealed gearing and removable handle. Solid state temperature control with watertight enclosure and pushbuttons. Shipped for 208/60-50/3 electrical service and can be field converted to 208/60-50/1. Can be shipped 240/60-50/3 and field converted to 240/60-50/1.

**Exterior Dimensions:**

**VE30** 36"w x 35½"d x 40½"h on 12" legs

**VE40** 46"w x 35½"d x 40½"h on 12" legs

UL Listed. UL Listed to Canadian safety standards. Classified by UL to NSF Std. #4.

- VE30** 30-Gallon true working capacity
- VE40** 40-Gallon true working capacity

**STANDARD FEATURES**

- FastBatch™ rapid heating technology and embedded heating elements for improved heating performance and even temperature distribution.
- Stainless steel front, back, sides and 12" legs with adjustable flanged feet.
- Dual recessed hinges mounted under stainless steel cooking pan featuring anti-stick finish, coved interior corners and embossed gallon and liter markings.
- Anti-stick stainless steel clad cooking surface bonded to steel sub plate.
- Pitcher pour tapered front with oversized 4" front flanges and formed pouring lip including removable perforated strainer.
- Stainless steel spring assist cover with wrap around cool to the touch handle and condensate lip.
- Lid stops in place for vented cooking.
- Faucet mounting bracket (ships loose for LH or RH side mounting if needed) adds 3" to width.
- Drop away food receiving pan support mounts under pouring lip.
- Manually operated anti-jam pan lifting mechanism with removable handle. Pan can be fully tilted to empty completely with approximately 30 crank revolutions.
- Solid state temperature controls, thermostat adjustable from 50°F to 425°F.
- Water tight controls and enclosures.
- Shipped for 208/60-50/3 electrical service. Can be field converted to 208/60-50/1.
- Can be shipped 240/60-50/3 and be field converted to 240/60-50/1.
- One year limited parts and labor warranty.

**OPTIONS**

- Motor driven pan lift with removable manual crank handle.
- Two inch draw-off valve – left front straight with strainer. (BPDOV-1) Pan support will be removed on VE30.
- Two inch draw-off valve – left front 90° left with strainer. (BPDOV-2) Pan support will be removed on VE30.
- Two inch draw-off valve – left side 90° front with strainer. (BPDOV-3)
- Standard security package includes:
  - Security screws and tackwelds.
    - Includes securing crank handle, pan strainer and non-door type panels.
  - Controls protected by lockable cover.
  - Perforated lid support cover.
- 480 volt, 60-50 Hz, 3 phase.
- Second year extended limited parts and labor warranty.

**ACCESSORIES (Packaged & Sold Separately)**

- Set of four casters, (two locking).
- (12") (18") double jointed single pantry faucet.
- (12") (18") double jointed double pantry faucet.
- Double pantry washdown hose with 16" add-on faucet with backflow preventer.
- Double pantry washdown hose with backflow preventer.
- Double pantry pot filler and backflow preventer.
- Steaming pan insert rack to hold 12" x 20" pans. (Qty. \_\_\_\_)
- 12" x 20" x 4" stainless steel drain waste pan with clear plastic hose.
- Catch can with bail handle and drain hose for draw-off valve.
- Stainless steel perforated boiling basket (12" x 20" x 6" deep) with handles.

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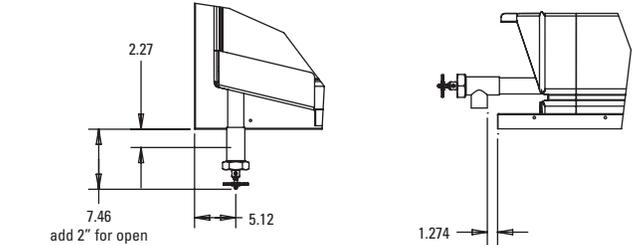
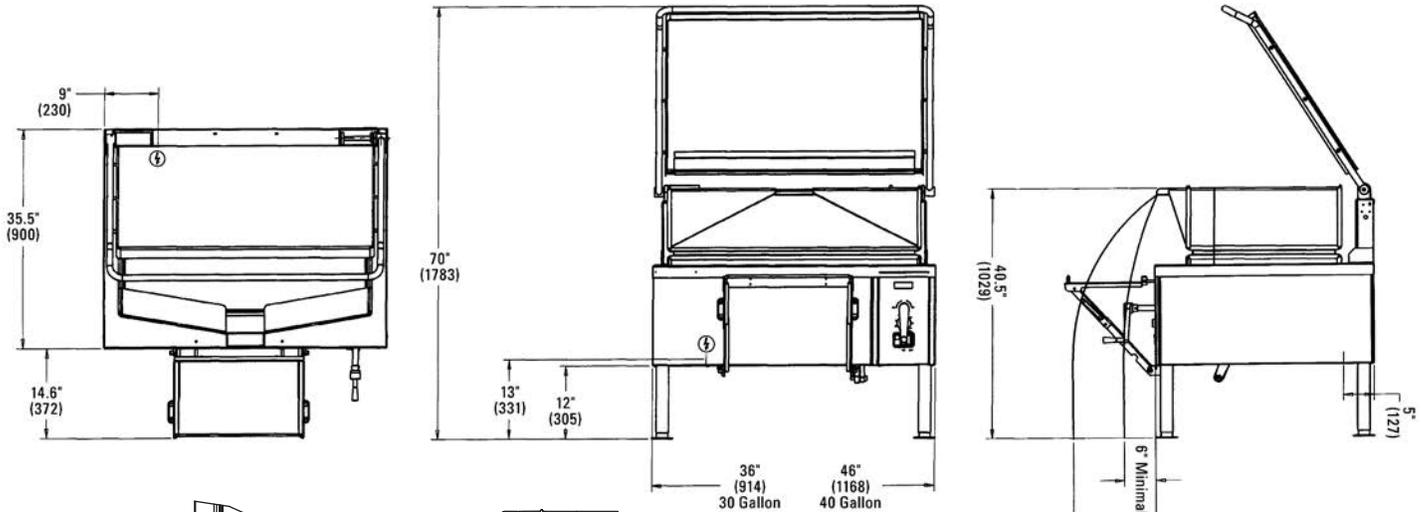


# VE SERIES ELECTRIC TILTING BRAISING PAN

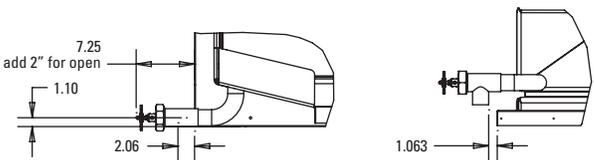
**SERVICE CONNECTIONS:**

**ELECTRICAL CONNECTION:** Heating element, control and motor power 1 3/8" dia. (1" conduit). See capacity schedule.

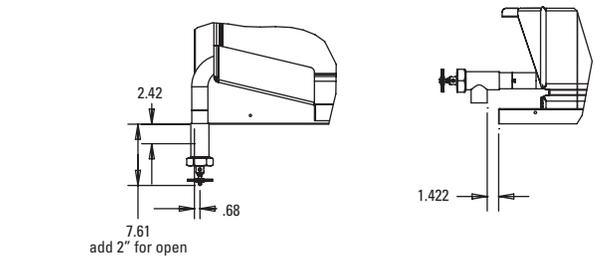
MODEL	COOKING SURFACE AREA	CAPACITY	4 OZ. PORTIONS
VE30	29" x 23"	30 gal./114 liters	960
VE40	39" x 23"	40 gal./152 liters	1280



**2" Draw-off valve – left front straight (BPD0V-1)**



**2" Draw-off valve – left front 90° left (BPD0V-2)**



**2" Draw-off valve – left side 90° front (BPD0V-3)**

MODEL VE30 ELECTRICAL									
THREE PHASE					ONE PHASE				
208		240		480		208		240	
KW	AMP	KW	AMP	KW	AMP	KW	AMP	KW	AMP
12	33	12	29	12	14	12	58	12	50

MODEL VE40 ELECTRICAL				
VOLTAGE/PHASE	KW	AMPS L1	AMPS L2	AMPS L3
208/1	16	77	77	-
240/1	16	67	67	-
208/3	16	46	46	42
240/3	16	40	40	36
480/3	16	20	20	18



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# VULCAN

## INSTALLATION & OPERATION MANUAL

### VG30, VG40, VE30 & VE40 BRAISING PANS

#### MODELS

VG30 ML-126847

VG40 ML-126848

VE30 ML-152047

VE40 ML-152048



For additional information on Vulcan or to locate an authorized parts and service provider in your area, visit our website at [www.vulcanequipment.com](http://www.vulcanequipment.com)

## IMPORTANT FOR YOUR SAFETY

THIS MANUAL HAS BEEN PREPARED FOR PERSONNEL QUALIFIED TO INSTALL GAS EQUIPMENT, WHO SHOULD PERFORM THE INITIAL FIELD START-UP AND ADJUSTMENTS OF THE EQUIPMENT COVERED BY THIS MANUAL.

POST IN A PROMINENT LOCATION THE INSTRUCTIONS TO BE FOLLOWED IN THE EVENT THE SMELL OF GAS IS DETECTED. THIS INFORMATION CAN BE OBTAINED FROM THE LOCAL GAS SUPPLIER.

### IMPORTANT

IN THE EVENT A GAS ODOR IS DETECTED, SHUT DOWN UNITS AT MAIN SHUTOFF VALVE AND CONTACT THE LOCAL GAS COMPANY OR GAS SUPPLIER FOR SERVICE.

### FOR YOUR SAFETY

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

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

IN THE EVENT OF A POWER FAILURE, DO NOT ATTEMPT TO OPERATE THIS DEVICE.

RETAIN THIS INSTRUCTION MANUAL FOR FUTURE REFERENCE

# TABLE OF CONTENTS

GENERAL.....	4
INSTALLATION.....	4
Unpacking.....	4
Location.....	4
Installation Codes and Standards.....	6
Leveling and Anchoring the Tilting Braising Pan.....	6
Service Connections.....	6
Gas Connections.....	7
Testing the Gas Supply System.....	7
Ventilation.....	7
Control Circuit Power Connection — Gas Braising Pans.....	7
Electrical Connections.....	8
Installation Diagram.....	9
OPERATION.....	10
Before First Use.....	10
Gas Heat Braising Pans.....	10
Electric Heat Braising Pans.....	12
Operation of the Lifting System.....	12
Unloading Prepared Foods.....	13
Steaming Inserts (Optional).....	14
Suggested Uses For Your Braising Pan.....	14
STAINLESS STEEL EQUIPMENT CARE AND CLEANING.....	15
CLEANING.....	17
Compression Draw-Off Valve Cleaning Instructions.....	18
COOKING GUIDELINES (Domestic Measurements).....	19
COOKING GUIDELINES (Metric Measurements).....	22
MAINTENANCE.....	25
Lubrication.....	25
Adjustments.....	25
Flue.....	25
Service and Parts Information.....	25
TROUBLESHOOTING.....	26
Gas Heat Braising Pans.....	26
Electric Heat Braising Pans.....	26

# **INSTALLATION, OPERATION AND CARE OF TILTING BRAISING PANS MODELS VG30, VG40, VE30 & VE40**

## **SAVE THESE INSTRUCTIONS FOR FUTURE USE**

### **GENERAL**

Vulcan Tilting Braising Pans are available in two sizes. Models VG30 and VE30 have a 30-gallon (114 L) capacity, and Models VG40 and VE40 have a 40-gallon (151 L) capacity.

The tilting braising pan is a versatile piece of equipment. It allows you to stew, simmer, pan fry, braise, grill or sauté, and all with a very uniform heat pattern.

Standard features on all models include thermostat, manual lift, drop-away food pan support and four flanged feet.

Optional features include automatic power lift and casters.

Your Vulcan braising pan is produced with quality workmanship and material. Proper installation, usage and maintenance will result in many years of satisfactory performance.

Vulcan suggests that you thoroughly read this entire manual and carefully follow all of the instructions provided.

### **INSTALLATION**

Before installing, verify that the electrical service and gas supply (natural or propane) agree with the specifications on the rating plate located on the left front edge of the table top.

#### **UNPACKING**

This braising pan was carefully inspected before leaving the factory. The transportation company assumes full responsibility for safe delivery upon acceptance of this shipment.

Immediately after unpacking, check for possible shipping damage. If the tilting braising pan is found to be damaged, save the packaging material and contact the carrier within 5 working days of delivery.

#### **LOCATION**

##### **For Gas-Powered Braising Pans Only**

The braising pan must be kept free and clear from combustible substances. The braising pan, when installed, must have minimum clearance from combustible construction of 2" (5 cm) from the sides and 6" (15 cm) from the rear. Minimum clearance from noncombustible construction is 0" from the sides and 6" (15 cm) from the rear.

The installation location must allow adequate clearances for servicing and proper operation. Recommended clearances are 24" (61 cm) on the sides and back (for servicing), and 36" (91 cm) on the front.

The braising pan must be installed so that the flow of combustion and ventilation air will not be obstructed. Adequate clearance for air openings into the combustion chamber must be provided. Make sure there is an adequate supply of air in the room suitable for the amount of combustion gas feeding the braising pan burners.

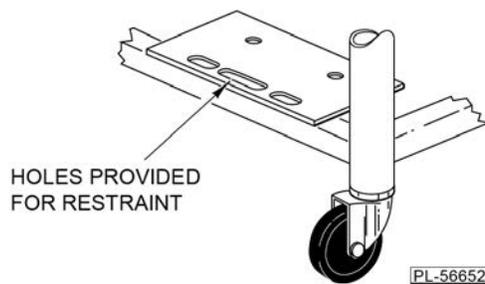
Do not permit fans to blow directly at the braising pan. Wherever possible, avoid open windows next to the braising pan. Avoid wall-type fans which create air crosscurrents within the room.

### **Gas-Powered Braising Pans Equipped with Casters (Optional)**

If casters are assembled to the braising pan, the installation must be made using:

1. A connector (not supplied by Vulcan) that complies with the Standard for *Connectors for Movable Gas Appliances*, ANSI Z21.69 (latest edition) or *Connectors for Movable Gas Appliances*, CAN/CGA-6.16 (latest edition).
2. A quick-disconnect device that complies with the Standard for *Quick-Disconnect Devices for Use With Gas Fuel*, ANSI Z21.41 or *Quick-Disconnect Devices for Use with Gas Fuel*, CAN1-6.9 (latest edition).

Adequate means must be provided to limit the movement of the appliance, without depending on the connector and/or any quick-disconnect device or its associated piping to limit braising pan movement. Attach the restraint at the rear of the braising pan (Fig. 1).



**Fig. 1**

If disconnection of the restraint is necessary, turn off the gas supply before disconnection. Reconnect this restraint prior to turning the gas supply on and prior to returning the braising pan to its originally installed position.

## **INSTALLATION CODES AND STANDARDS**

Your Vulcan tilting braising pan must be installed in accordance with:

### **In the United States:**

1. State and local codes, or in the absence of local codes, with:
2. National Fuel Gas Code ANSI-Z223.1 (latest edition), available from The American Gas Association, Inc., 1515 Wilson Boulevard, Arlington, VA 22209.
3. National Electrical Code ANSI/NFPA-70 (latest edition).
4. ANSI NFPA Standard #96 Vapor Removal from Cooking Equipment (latest edition), available from The National Fire Protection Association, Batterymarch Park, Quincy, MA 01169.

### **In Canada:**

1. Local codes.
2. CAN/CGA-B149.1 National Fuel Gas Code (latest edition), available from The Canadian Gas Association, 178 Rexdale Boulevard, Etobicoke, Ontario, Canada M9W 1R3.
3. Canadian Electrical Code Part 1 CSA-C22.1 (latest edition), available from The Canadian Standards Association, 178 Rexdale Boulevard, Etobicoke, Ontario, Canada M9W 1R3.

## **LEVELING AND ANCHORING THE TILTING BRAISING PAN**

1. Place the braising pan in the final installed position.
2. Place a carpenter's level on the braising pan table top and turn the adjustable feet to level the braising pan table top side-to-side and front-to-back. Do not attempt to level the braising pan base.
3. Mark hole locations on the floor through the anchoring holes provided in the rear, flanged adjustable feet.
4. Remove the tilting braising pan from the installation location and drill holes in the locations marked on the floor. Insert proper anchoring devices (not supplied).
5. Place the tilting braising pan back in the installation location.
6. Place a carpenter's level on top of the braising pan, and re-level side-to-side and front-to-back.
7. Bolt and anchor the tilting braising pan securely to the floor.
8. Seal bolts and flanged feet with Silicon sealant or equivalent compound.

## **SERVICE CONNECTIONS**

To access service and utility connections, remove the left side panel. To remove, hold the panel from underneath and lift it up. While holding the panel up, swing out the lower part of the panel until it clears the bottom flange and remove the panel. If required, the rear panel can also be removed using the same procedure.

The gas-powered braising pan is supplied with a 120-volt power cord.

The electrical connection for the electric braising pan can be accessed from the rear or the left panel.

## **GAS CONNECTIONS (See Fig. 2)**

All gas supply connections and any pipe joint compound used must be resistant to the action of propane gases.

Connect a  $\frac{3}{4}$ " (nominal) gas supply to the braising pan. Recommended incoming gas line pressure is 7" W.C. (Water Column) (48.3 kPa) for natural gas or 11" W.C. (75.8 kPa) for propane gas.

Make sure the pipes are clean and free of obstructions, dirt and piping compound.

Codes require that a gas shutoff valve be installed in the gas line ahead of the tilting braising pan.

Natural gas and propane gas braising pans are equipped with fixed orifices, and no adjustment is necessary. The manifold is set at 3.7 W.C. (Water Column) (25.5 kPa) for natural gas and 10" W.C. (68.9 kPa) for propane gas.

**⚠ WARNING** Prior to lighting, check all joints in the gas supply line for leaks. Use soap and water solution. Do not use an open flame.

After piping has been checked for leaks, all piping receiving gas should be fully purged to remove air.

The electrical control circuit must be connected (see CONTROL CIRCUIT POWER CONNECTION in this manual).

## **TESTING THE GAS SUPPLY SYSTEM**

When test pressures exceed  $\frac{1}{2}$  psig (3.45 kPa), the tilting braising pan and its individual shutoff valve must be disconnected from the gas supply piping system.

When test pressures are  $\frac{1}{2}$  psig (3.45 kPa) or less, the tilting braising pan must be isolated from the gas supply system by closing its individual manual shutoff valve.

## **VENTILATION**

DO NOT obstruct the flow of flue gases from the flue duct located on the rear of the tilting braising pan. It is recommended that the flue gases be ventilated to the outside of the building through a ventilation system installed by qualified personnel.

From the termination of the braising pan flue vent to the filters of the hood venting system, an 18" (46 cm) minimum clearance must be maintained. The flue is not to be directly connected to the ventilation system.

Local jurisdictions may require a ventilation system to exhaust the steam from this appliance. Clearance should be provided for the lid to be raised without interference with the hood. A ceiling that is too low may not allow for an installation of a hood to meet this requirement.

## **CONTROL CIRCUIT POWER CONNECTION — GAS BRAISING PANS (See Fig. 2)**

**⚠ WARNING** Appliances equipped with a flexible electric supply cord are provided with a three-prong grounding plug. It is imperative that this plug be connected into a properly grounded three-prong receptacle. If the receptacle is not the proper grounding type, contact an electrician. Do not remove the grounding prong from this plug.

## ELECTRICAL CONNECTIONS (SEE FIG. 2)

**⚠ WARNING** Electrical and grounding connections must comply with the national electrical code and/or other local codes.

**⚠ WARNING** Disconnect the electrical power to the machine and follow lockout/tagout procedures.

The field connection box for field wire connection of Models VE30 and VE40 is located at the back of the braising pan. A knockout hole is provided for a 1" (2.5 cm) conduit connection.

1. Remove the field connection box cover plate. Mount suitable 1" (2.5 cm) conduit fitting in the conduit opening provided on the bottom surface.
2. Connect field wire to the terminal block as indicated on the wiring diagram. The wiring diagram is located on the inside of the field box lid. Wire must be of the type suitable for 75°C service and at the suitable gauge for loads shown on the data plate.
3. After making the connections, replace the control box cover plate.
4. The braising pan must be grounded by installing a properly grounded lead to the ground lug located inside the field connection box.

### ELECTRICAL DATA CHART

Model Number	V (L-L)	Rated Line Current (A)				Rated Power (kW)
		3Ø			1Ø	
		L1	L2	L3		
VE30-FB	208	33.3	33.3	33.3	57.7	12
	240	28.9	28.9	28.9	50.0	12
	480	14.4	14.4	14.4	-	12
VE40-FB	208	45.9	41.6	45.9	76.9	16
	240	39.7	36.1	39.7	66.7	16
	480	19.9	18.0	19.9	-	16

These values are nominal ratings. Field wire connections must be capable of withstanding anticipated surges.

# INSTALLATION DIAGRAM

## SERVICE CONNECTIONS:

### 1. GAS BRAISING PAN:



**GAS INPUT:** 3/4" N.P.T., Nat.6"-14" W.C., propane gas 11" - 18" W.C., See capacity chart.

**ELECTRICAL:** Machine is supplied with 120-VAC, 1-phase, 15-amp. power cord.

### 2. ELECTRICAL BRAISING PAN:



**ELECTRICAL CONNECTION:** 1" dia. conduit, fitting to be installed by installer.

## IMPORTANT

1. A pressure regulator sized for this unit is included. Natural gas 7" W.C., propane gas 11" W.C. supply pressure.
2. Gas line connecting to appliance must be 3/4" or larger. If flexible connectors are used, the inside diameter must be at least the same as the 3/4" iron pipe.
3. An adequate ventilation system is required for commercial cooking equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02289. When writing, refer to NFPA No. 96.
4. These units are manufactured for installation in accordance with ANSZ223.1A (latest edition), National Fuel Gas Code. Copies may be obtained from the American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209.
5. Clearances:
 

	Combustible	Noncombustible
Rear	6	6
Sides	2	0
6. This appliance is manufactured for commercial installation only and is not intended for home use.

MODEL	BTU/hr. Input
VG30	90,000
VG40	120,000

MODEL	208 VAC	240 VAC	480 VAC
VE30	12 KW	12 KW	12 WK
VE40	16 KW	16 KW	16 KW

MODEL	Cooking Surface Area	Capacity	4 oz. Portions
VE/VG30	29" x 23"	30 gal./114 liters	960
VE/VG40	39" x 23"	40 gal./152 liters	1280

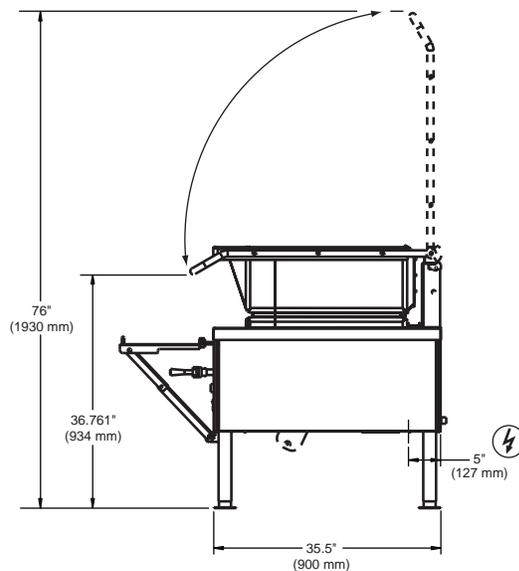
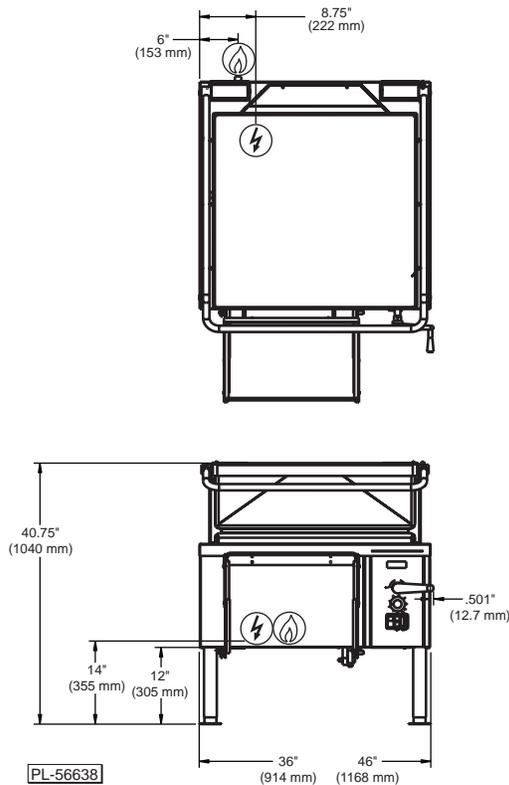


Fig. 2

# OPERATION

**⚠ WARNING** The tilting braising pan and its parts are hot. Use care when operating, cleaning or servicing the braising pan.

## BEFORE FIRST USE

Use a noncorrosive, grease-dissolving commercial cleaner to clean the protective metal oils from all surface parts and the interior of the tilting braising pan. Follow the cleaner manufacturer's directions. Rinse thoroughly and drain the pan. Wipe dry with a soft, clean cloth.

## GAS HEAT BRAISING PANS

### Controls (Fig. 3)

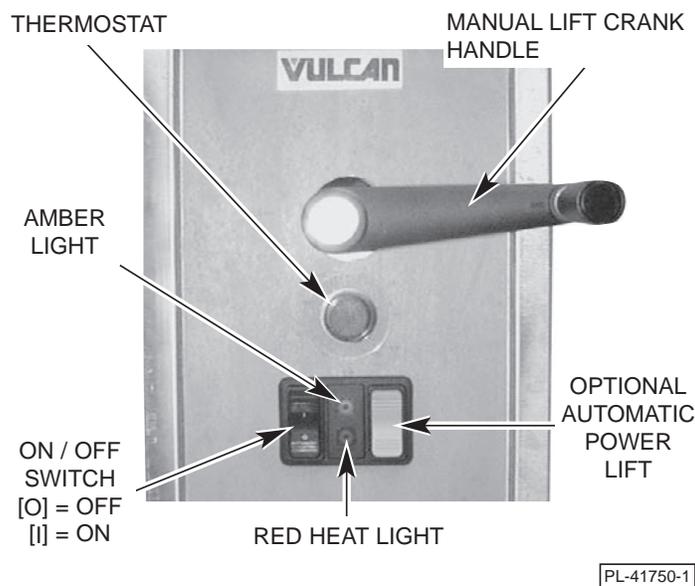


Fig. 3

Thermostat	— Sets desired cooking temperature.
On/Off Switch (Black)	— Turns the braising pan on and off.
Amber Light	— When lit, indicates the machine is turned on.
Heat Light (Red)	— When lit, indicates the thermostat is calling for heat.
Auto. Power Lift (Gray)	— (Optional). Push the upper part of the switch to raise the braising pan; push the lower part to lower the braising pan. Always remove the manual lift crank handle before operating the automatic power lift.
Manual Lift Crank Handle	— Use to manually raise and lower the braising pan.

## Lighting and Shutdown of Pilot

Lighting instructions are also located on the front panel.

1. Turn main gas supply to the braising pan to the ON position at the shutoff valve.
2. Lower the braising pan (see OPERATION OF LIFTING SYSTEM in this manual). The braising pan will not operate with the pan in the UP position (5 degrees or higher from horizontal).
3. Turn the black on/off switch to the ON position. The ON position is indicated by a glowing amber light on the control panel.
4. Turn the thermostat to the desired cooking temperature.
5. If pilot is extinguished, turn the gas supply and the on/off switch to the OFF position. Wait 5 minutes before relighting.

## Nightly Shutdown

Turn the on/off switch to the OFF position.

## Extended Shutdown

Turn the on/off switch to the OFF position and turn off the gas supply.

## Operating the Gas Braising Pan

The braising pan does not require any adjustments before startup.

The entire flue duct opening (located across the rear of the braising pan) must be left uncovered.

Turn the on/off switch to the ON position and turn the thermostat to the desired temperature to put the braising pan into operation.

To prevent discoloration of the stainless steel cooking surface, do not turn the heat on unless the braising pan is covered with a fluid, a thin layer of cooking oil or food to be cooked.

DO NOT use the braising pan as a **deep fat fryer**; use it only for shallow pan frying (cooking oil film not more than 1/8" [0.3 cm] thick). Its use for deep frying could result in a fire hazard. See SUGGESTED USES FOR YOUR BRAISING PAN in this manual for additional information.

Do not overheat the clad stainless steel plate by setting the temperature well above recommended temperatures or by operating the braising pan without any fluid inside the pan to absorb heat. Overheating the plate may cause warping and will carbonize any cooking oil on the plate and cause sticking.

In case of a power failure, there will be no flames because the combination control valve will shut off the gas flow. In the event of a power failure, immediately turn the on/off switch to the OFF position. Once power is restored, turn the on/off switch to the ON position to resume cooking.

The lid is spring-loaded and will stay in any position at which it is placed. After some time, the springs may need to be tightened. Call your local Vulcan-authorized servicer to make these adjustments.

## ELECTRIC HEAT BRAISING PANS

### Controls (see Fig. 3)

Thermostat	—	Sets desired cooking temperature.
On/Off Switch (Black)	—	Turns the braising pan on and off.
Amber Light	—	When lit, indicates the machine is turned on.
Heat Light (Red)	—	When lit, indicates the thermostat is calling for heat.
Auto. Power Lift (Gray)	—	(Optional). Push the upper part of the switch to raise the braising pan; push the lower part to lower the braising pan. Always remove the manual lift crank handle before operating the automatic power lift.
Manual Lift Crank Handle	—	Use to manually raise and lower the braising pan.

### Operating the Electric Braising Pan

The braising pans do not require any adjustments before startup.

Turn the black on/off switch to the ON position.

Lower the braising pan (see OPERATION OF LIFTING SYSTEM in this manual). The braising pan will not operate with the pan in the UP position (5 degrees or higher from horizontal).

Turn the thermostat to the desired cooking temperature.

To prevent discoloration of the stainless steel cooking surface, do not turn the heat on unless the braising pan surface is covered with a fluid, a thin layer of cooking oil or food to be cooked.

DO NOT use the braising pan as a **deep fat fryer**; use it only for shallow pan frying (cooking oil film not more than 1/8" [0.3 cm] thick). Its use for deep frying could result in a fire hazard. See SUGGESTED USES FOR YOUR BRAISING PAN in this manual for additional information.

Do not overheat the clad stainless steel plate by setting the temperature well above recommended temperatures or by operating the braising pan without any fluid inside the pan to absorb heat. Overheating the plate may cause warping and will carbonize any cooking oil on the plate and cause sticking.

The lid is spring-loaded and will stay in any position at which it is placed. After some time, the springs may need to be tightened. Call your local Vulcan-authorized servicer to make these adjustments.

### OPERATION OF THE LIFTING SYSTEM

Keep the area underneath and around the braising pan clear of your hands or any other objects when operating the lifting system.

Do not obstruct any of the moving parts of the lift system located underneath the table top on the right and/or left side of the braising pan. This area must be kept clear of any objects or obstructions at all times.

Do not leave the braising pan in the UP position for extended periods (e.g., overnight or during a shutdown period between cooking times).

### **Braising Pans with Manual Lift (Standard)**

1. The crank for the manual lift system is shipped separately.
2. There are two pins on one end of the crank. Insert the crank through the hole on the control panel so that the two pins engage in the slots of the speed reducer coupling located behind the panel.
3. Turn the crank handle clockwise to lift the braising pan and counterclockwise to lower the braising pan.
4. This lift system is not affected by a power failure and can be operated during a power failure.
5. Refer to the MAINTENANCE section of this manual for lubrication and maintenance instructions.

### **Braising Pans with Automatic Power Lift (Optional)**

1. The automatic lift cannot raise the braising pan unless the lid is fully opened.
2. The pan lift is controlled by the gray rocker switch located on the control panel (see Fig. 3).
3. Always remove the manual crank handle before operating the automatic power lift.
4. Press the upper half of the gray rocker switch to raise the braising pan and the lower half of the gray rocker switch to lower the braising pan. The switch must be held for continuous raising or lowering of the braising pan.
5. In case of a power failure, use the hand crank (shipped separately) to lower or raise the pan (same as the braising pans with manual lift).

### **UNLOADING PREPARED FOODS**

All braising pans are provided with a frame support (Fig. 4) for holding a food receiving pan when unloading prepared foods.

Pull the frame support out and up until it locks. The support will accept food receiving pans of 12" x 20" (30 cm x 50 cm) up to 6" (15 cm) deep.

When lowering the frame support, push in on the hinges until they bend, then lower the support.



**Fig. 4**

## STEAMING INSERTS (Optional)

Your tilting braising pan can be used for steaming frozen and fresh foods. The 30-gallon (114 L) pans (Models VE30 or VG30) can be loaded with a maximum of two 12" x 20" x 4" (30 cm x 50.8 cm x 10 cm) deep steaming pans. The 40-gallon (151 L) pan (Models VE40 or VG40) will accept up to three steam pans of this same size.

To use the braising pan for steaming, fill the pan with 6 to 7 gallons (23 to 26 L) of water (approximately 2" [5 cm] deep) for 30-gallon (114 L) models and 8 to 9 gallons (30 to 34 L) of water (approximately 2" [5 cm] deep) for 40-gallon (151 L) models.

Turn the braising pan ON. Set the thermostat at 212°F (100°C). Allow the water to come to a boil. Then change the thermostat setting to 250°F (121°C) and carefully place the steaming inserts into the pan as shown in Fig. 5. Place the pan with product into the steaming insert. Close the lid and allow steaming for the desired time.

Periodically inspect the water level inside the braising pan. Add water if the water level is less than 1/2" (1 cm) deep.

To use the braising pan as a food warmer or bain marie, follow the same procedure as for steaming, but increase the depth of the water to allow the bottom and part of the sides of the steaming inserts to be immersed in water. Set the thermostat for the holding or warming temperature desired.

The steaming inserts can be ordered from your dealer.

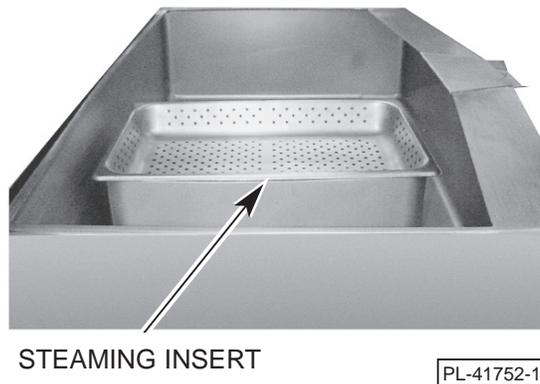


Fig. 5

## SUGGESTED USES FOR YOUR BRAISING PAN

DO NOT use the braising pan for **deep fat frying**. Restrict frying activity to shallow pan frying (oil film not more than 1/8" [0.3 cm] thick) or sautéing.

A tilting braising pan is quite versatile. It can be used for roasting, simmering, boiling, sautéing, searing, frying, warming, holding, proofing, thawing, browning, steaming, braising, griddling or stewing. It can be used as an oversized skillet, as a bain marie, as a proofing oven, as a stock pot, as a kettle or as an even-heat range top. It can be used for cooking breakfasts, lunches and dinners.

Your Vulcan tilting braising pan is a multi-purpose unit that can be used for virtually any type of cooking, except deep fat frying, with great speed, in large volume and with considerable savings in labor and energy.

# STAINLESS STEEL EQUIPMENT CARE AND CLEANING

(Supplied courtesy of NAFEM. For more information, visit their web site at [www.nafem.org](http://www.nafem.org))

## **Contrary to popular belief, stainless steels ARE susceptible to rusting.**

Corrosion on metals is everywhere. It is recognized quickly on iron and steel as unsightly yellow/orange rust. Such metals are called “active” because they actively corrode in a natural environment when their atoms combine with oxygen to form rust.

Stainless steels are passive metals because they contain other metals, like chromium, nickel and manganese that stabilize the atoms. 400 series stainless steels are called ferritic, contain chromium, and are magnetic; 300 series stainless steels are called austenitic, contain chromium and nickel; and 200 series stainless, also austenitic, contains manganese, nitrogen and carbon. Austenitic types of stainless are not magnetic, and generally provide greater resistance to corrosion than ferritic types.

With 12-30 percent chromium, an invisible passive film covers the steel’s surface acting as a shield against corrosion. As long as the film is intact and not broken or contaminated, the metal is passive and stainless. If the passive film of stainless steel has been broken, equipment starts to corrode. At its end, it rusts.

## **Enemies of Stainless Steel**

There are three basic things which can break down stainless steel’s passivity layer and allow corrosion to occur.

1. Mechanical abrasion
2. Deposits and water
3. Chlorides

**Mechanical abrasion** means those things that will scratch a steel surface. Steel pads, wire brushes and scrapers are prime examples.

**Water** comes out of the faucet in varying degrees of hardness. Depending on what part of the country you live in, you may have hard or soft water. Hard water will leave spots, and when heated leave deposits behind that if left to sit, will break down the passive layer and rust stainless steel. Other deposits from food preparation and service must be properly removed.

**Chlorides** are found nearly everywhere. They are in water, food and table salt. One of the worst chloride perpetrators can come from household and industrial cleaners.

## **So what does all this mean? Don’t Despair!**

Here are a few steps that can help prevent stainless steel rust.

### **1. Use the proper tools.**

When cleaning stainless steel products, use non-abrasive tools. Soft cloths and plastic scouring pads will not harm steel’s passive layer. Stainless steel pads also can be used but the scrubbing motion must be in the direction of the manufacturers’ polishing marks.

### **2. Clean with the polish lines.**

Some stainless steel comes with visible polishing lines or “grain.” When visible lines are present, always scrub in a motion parallel to the lines. When the grain cannot be seen, play it safe and use a soft cloth or plastic scouring pad.

### **3. Use alkaline, alkaline chlorinated or non-chloride containing cleaners.**

While many traditional cleaners are loaded with chlorides, the industry is providing an ever-increasing choice of non-chloride cleaners. If you are not sure of chloride content in the cleaner used, contact your cleaner supplier. If your present cleaner contains chlorides, ask your supplier if they have an alternative. Avoid cleaners containing quaternary salts; it also can attack stainless steel and cause pitting and rusting.

#### 4. Treat your water.

Though this is not always practical, softening hard water can do much to reduce deposits. There are certain filters that can be installed to remove distasteful and corrosive elements. To insure proper water treatment, call a treatment specialist.

#### 5. Keep your food equipment clean.

Use alkaline, alkaline chlorinated or non-chloride cleaners at recommended strength. Clean frequently to avoid build-up of hard, stubborn stains. If you boil water in stainless steel equipment, remember the single most likely cause of damage is chlorides in the water. Heating cleaners that contain chlorides have a similar effect.

#### 6. Rinse, rinse, rinse.

If chlorinated cleaners are used, rinse and wipe equipment and supplies dry immediately. The sooner you wipe off standing water, especially when it contains cleaning agents, the better. After wiping equipment down, allow it to air dry; oxygen helps maintain the stainless steel's passivity film.

#### 7. Never use hydrochloric acid (muriatic acid) on stainless steel.

#### 8. Regularly restore/passivate stainless steel.

Job	Cleaning Agent	Comments
Routine cleaning	Soap, ammonia, detergent, Medallion	Apply with soft cloth or sponge.
Fingerprints and smears	Arcal 20, Lac-O-Nu Ecoshine	Provides barrier film
Stubborn stains and discoloration	Cameo, Talc, Zud, First Impression	Rub in direction of polish lines.
Grease and fatty acids, blood, burnt-on foods	Easy-off, DeGrease It Oven Aid	Excellent removal on all finishes
Grease and Oil	Any good commercial detergent	Apply with soft cloth or sponge.
Restoration/Passivation	Benefit, Super Sheen, Wichinox	

#### Review

1. Stainless steels rust when passivity (film-shield) breaks down as a result of scrapes, scratches, deposits and chlorides.
2. Stainless steel rust starts with pits and cracks.
3. Use the proper tools. Do not use steel pads, wire brushes or scrapers to clean stainless steel.
4. Use non-chlorinated cleaners at recommended concentrations. Use only chloride-free cleaners.
5. Soften your water. Use filters and softeners whenever possible.
6. Wipe off cleaning agent(s) and standing water as soon as possible. Prolonged contact causes eventual problems.

To learn more about chloride-stress corrosion and how to prevent it, contact the equipment manufacturer or cleaning materials supplier.

Developed by Packer Engineering, Naperville, Ill., an independent testing laboratory.

# CLEANING

**⚠ WARNING** Disconnect the electrical power to the machine and follow lockout / tagout procedures before cleaning.

Clean your braising pan regularly. Keep the plate surface clean. To produce evenly cooked, perfectly braised products, keep the pan surface free from carbonized grease. Carbonized grease on the surface hinders the transfer of heat from the pan surface to the food. This results in spotty browning and loss of cooking efficiency. Worst of all, carbonized grease tends to cling to the foods, giving them a highly unsatisfactory and unappetizing appearance.

## After Each Use

Clean the pan surface with a brush or flexible spatula.

Remove the strainer (Fig. 6) at the pouring lip of the braising pan by pulling it toward the back of the pan. Clean the strainer in a sink. Rinse thoroughly and dry with a soft, clean cloth. Replace strainer (Fig 6).

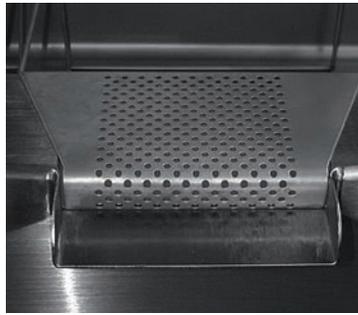


Fig. 6

## Once A Day:

Thoroughly clean the back, sides and front of the pan. Also clean the inside and outside surfaces of the lid.

## Once A Week:

Clean the pan surface thoroughly. If necessary, use a griddle stone or brush on the surface. A detergent may be used on the pan surface to help clean it, but be sure the detergent is thoroughly removed.

Clean other stainless steel surfaces with a damp cloth and polish with a soft, dry cloth. To remove discolorations, use a nonabrasive cleaner. If the braising pan usage is very high, consider going through the weekly cleaning procedures more often than once a week.

When cleaning the braising pan, it is helpful to fill the pan with approximately 10 gallons (38 L) of warm water and add detergent. After cleaning, raise the braising pan to drain all water (place a bucket or container under the pouring lip). Then repeat the procedures for rinsing with clean water.

## COMPRESSION DRAW-OFF VALVE CLEANING INSTRUCTIONS

### Daily After Use

Remove draw-off valve stem assembly for cleaning (Fig. 7).

1. Turn the valve handle counterclockwise until it stops.
2. Pull the valve handle back until it stops.
3. Turn large hex nut counterclockwise until the valve stem assembly is loose.
4. Pull the assembly straight out of the valve body.
5. Remove wing nut and handle. Unscrew valve stem from bonnet.
6. Wash valve body and stem assembly with mild soap and water, and then rinse. Make sure all food residue is removed from inside valve body.
7. Leave assembly apart to air dry.

Install draw-off valve assembly:

1. Apply Petrol-Gel lubricant to valve stem threads, O-Ring, rubber plug face and large hex nut threads.
2. Thread the valve stem into bonnet till valve stem can be pulled through bonnet.
3. Insert valve stem into valve body.
4. Install large hex nut hand tight.
5. Install valve handle, lock washer and wing nut onto the valve stem.
6. Turn valve handle clockwise until closed. Do not overtighten.

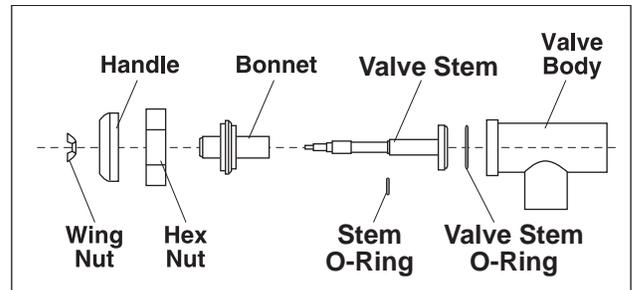


Fig. 7

### PROPER STRAINER INSTALLATION FOR DRAW-OFF VALVE

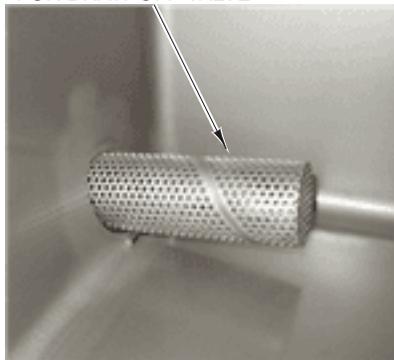


Fig. 8

# COOKING GUIDELINES (Domestic Measurements)

The guidelines given below are suggested quantities, temperature settings and estimated numbers of orders per load and per hour. When two temperatures are given, the first is to start the product and the second is to finish the product.

The following temperatures should be used:

	Temperature (°F)
Simmering	200 Max.
Sautéing	225 to 275
Searing	300 to 350
Frying	325 to 375
Grilling	350 to 425

ITEM	PORTION SIZE	TEMP. (°F)	BATCHES PER HOUR	VG30/VE30		VG40/VE40	
				QTY.	PORTIONS	QTY.	PORTIONS
<b>BREAKFASTFOODS</b>							
Bacon	3 Slices	350	12	2 lb.	10	3 lb.	15
Eggs							
–Boiled-Hard	1 egg	225	5	50 eggs	50	75 eggs	75
–Boiled-Soft	1 egg	225	8	50 eggs	50	75 eggs	75
–Fried	1 egg	400	4	30 eggs	30	45 eggs	45
–Poached	1 egg	225	5	36 eggs	36	60 eggs	60
–Scrambled	1½ eggs	300 – 200	1	18 gal.	720	28 gal.	1100
French Toast	3 slices	425	7	35 slices	12	50 slices	17
Regular Oatmeal	½ cup	250	2	20 lb (100 cups)	500	40 lb (200 cups)	1000
Pancakes	2 each	400	10	30 ea.	15	50 ea.	25
<b>FISH</b>							
Clams	1 pt.	400	10	10 qts.	20	15 qts.	30
Fish Cakes	2 to 3 oz.	400	5	70 – 3 oz.	35	110 – 3 oz.	55
Haddock Fillet	4 oz.	400	4	60 – 4 oz.	60	90 – 4 oz.	90
Halibut Steak	5 oz.	425	3	60 – 4 oz.	60	90 – 4 oz.	90
Lobster	1 – 1 lb.	350	4	20 – 1 lb.	20	30 – 1 lb.	30
Swordfish	5 oz.	425	3	50 – 5 oz.	50	75 – 5 oz.	75
<b>SAUCES, GRAVIES, SOUPS</b>							
Brown Gravy	1 oz.	350 – 200	2	30 gal.	3840	40 gal.	5120
Cream Sauce	2 oz.	250 – 175	1	30 gal.	1920	40 gal.	2560
Cream Soup	6 oz.	200	1	30 gal.	640	40 gal.	853
French Onion Soup	6 oz.	225	1	30 gal.	640	40 gal.	853
Meat Sauce	4 oz.	350 – 200	1	30 gal.	960	40 gal.	1280

ITEM	PORTION SIZE	TEMP. (°F)	BATCHES PER HOUR	VG30/VE30		VG40/VE40	
				QTY.	PER LOAD PORTIONS	QTY.	PER LOAD PORTIONS
<b>VEGETABLES</b>							
<b>CANNED</b>	3 oz.	400	6	30 lb.	125	45 lb.	200
<b>FRESH</b>							
Beans, Wax, Green	3 oz.	400	3	25 lb.	125	50 lb.	250
Beets	3 oz.	400	1	30 lb.	125	60 lb.	300
Broccoli	3 oz.	400	3	25 lb.	125	40 lb.	200
Cabbage	3 oz.	400	5	20 lb.	80	30 lb.	125
Carrots	3 oz.	400	2	35 lb.	150	70 lb.	300
Cauliflower	3 oz.	250	5	15 lb.	75	25 lb.	125
Corn	1 Ear	400	8	50 ears	50	75 ears	75
Potatoes	3 oz.	400	2	40 lb.	200	60 lb.	300
Spinach	4 oz.	250	10	6 lb.	25	9 lb.	35
Turnips	4 oz.	400	2	20 lb.	100	30 lb.	150
<b>FROZEN</b>							
Beans, French Green	3 oz.	400	6	15 lb.	60	22½ lb.	90
Lima Beans	3 oz.	250	4	15 lb.	60	22½ lb.	90
Broccoli	3 oz.	400	8	12 lb.	50	18 lb.	75
Sliced Carrots	3 oz.	250	6	15 lb.	60	22½ lb.	90
Small Whole Carrots	3 oz.	250	3	15 lb.	50	22½ lb.	90
Corn	3 oz.	250	18	15 lb.	50	22½ lb.	90
Small Whole Onions	3 oz.	250	7	15 lb.	50	22½ lb.	90
Peas	3 oz.	400	10	15 lb.	75	22½ lb.	110
Spinach	3 oz.	400	3	15 lb.	75	22½ lb.	110
<b>DESSERTS, PUDDINGS, SWEET SAUCES</b>							
Butterscotch Sauce	1 oz.	200	1	30 gal.	3840	40 gal.	5120
Cherry Cobbler	3 oz.	200	1	30 gal.	1280	40 gal.	1707
Chocolate Sauce	1 oz.	200	1	30 gal.	3840	40 gal.	5120
Cornstarch Pudding	4 oz.	200	1	30 gal.	960	40 gal.	1280
Fruit Gelatin	3 oz.	250	2	30 gal.	1280	40 gal.	1707
<b>MEAT – POULTRY</b>							
Bacon	3 Slices	350	12	2 lb.	10	3 lb.	15
<b>BEEF</b>							
Amer. Chop Suey	6 oz.	400 – 225	2	30 gal.	640	40 gal.	853
Beef Stew	8 oz.	300	—	30 gal.	480	40 gal.	640
Corned Beef Hash	5 oz.	400	5	20 lb.	60	30 lb.	90
Cheeseburger	3 oz.	300	12	7 lb.	35	10 lb.	50
Hamburger	3 oz.	300	15	7 lb.	35	10 lb.	50
Meatballs	1 oz.	400 – 225	3	12½ lb.	65	18 lb.	100
Pot Roast	2 oz.	350 – 200		120 lb.	500	180 lb.	750
Salisbury Steak	5 oz.	400	3	16 lb.	50	24 lb.	75
Sirloin Steak	6 oz.	400	5	15 lb.	40	22½ lb.	60
Swiss Steak	4 oz.	300 – 200	1	25 lb.	110	40 lb.	160

ITEM	PORTION SIZE	TEMP. (°F)	BATCHES PER HOUR	VG30/VE30 PER LOAD		VG40/VE40 PER LOAD	
				QTY.	PORTIONS	QTY.	PORTIONS
<b>CHICKEN</b>							
Pan Fried	2 – 1/4's	350	3	50 pieces	25	80 pieces	40
Whole	2 oz.	350 – 200		16 – 5 lb.	200	24 – 5 lb.	265
<b>FRANKFURTERS</b>							
Grilled	2 oz.	300	8	22 lb.	176	33 lb.	264
Boiled	2 oz.	250	12	16 lb.	128	25 lb.	200
<b>PORK</b>							
Ham Steak	3 oz.	400	8	10 lb.	50	15 lb.	75
Pork Chops	5 oz.	350	4	15 lb.	50	25 lb.	75
Sausage Links	3 links	350	7	30 lb.	120	45 lb.	180
<b>TURKEY</b>							
Off Carcass	2 oz.	400 – 200	—	3–26 to 30 lb.	200	4–26 to 30 lb.	275
On Carcass	2 oz.	400 – 200	—	4–16 to 20 lb.	175	6–16 to 20 lb.	265
<b>MISCELLANEOUS</b>							
Grilled Cheese Sandwich	1 sand.	400	8	40 sand.	40	50 sand.	50
Macaroni & Cheese	8 oz.	200	2	30 gal.	480	40 gal.	640
Rice	4 oz.	350 – 225	1	20 lb. raw	320	40 lb. raw	650
Spaghetti	4 oz.	350 – 225	2	8 lb. raw	200	12 lb. raw	300

# COOKING GUIDELINES (Metric Measurements)

The guidelines given below are suggested quantities, temperature settings and estimated numbers of orders per load and per hour. When two temperatures are given, the first is to start the product and the second is to finish the product.

The following temperatures should be used:

	Temperature (°C)
Simmering	93.3 Max.
Sautéing	107 to 135
Searing	149 to 177
Frying	163 to 191
Grilling	177 to 218

ITEM	PORTION SIZE	TEMP. (°C)	BATCHES PER HOUR	VG30/VE30 PER LOAD		VG40/VE40 PER LOAD	
				QTY.	PORTIONS	QTY.	PORTIONS
<b>BREAKFAST FOODS</b>							
Bacon	3 Slices	177	12	0.9 kg	10	1.4 kg	15
Eggs							
–Boiled-Hard	1 egg	107	5	50 eggs	50	75 eggs	75
–Boiled-Soft	1 egg	107	8	50 eggs	50	75 eggs	75
–Fried	1 egg	204	4	30 eggs	30	45 eggs	45
–Poached	1 egg	107	5	36 eggs	36	60 eggs	60
–Scrambled	1½ eggs	149 – 93	1	68 L	720	106 L	1100
French Toast	3 slices	218	7	35 slices	12	50 slices	17
Regular Oatmeal	118 mL	121	2	9 kg	500	18 kg	1000
Pancakes	2 each	204	10	30 ea.	15	50 ea.	25
<b>FISH</b>							
Clams	473 mL	204	10	9 L	20	14 L	30
Fish Cakes	57 to 85 g	204	5	70 – 85 g	35	110 – 85 g	55
Haddock Fillet	113 g	204	4	60 – 113 g	60	90 – 113 g	90
Halibut Steak	142 g	218	3	60 – 113 g	60	90 – 113 g	90
Lobster	1 – 0.5 kg	177	4	20 – 0.5 kg	20	30 – 0.5 kg	30
Swordfish	142 g	218	3	50 – 142 g.	50	75 – 142 g	75
<b>SAUCES, GRAVIES, SOUPS</b>							
Brown Gravy	28 g	177 – 93	2	114 L	3840	151 L	5120
Cream Sauce	57 g	121 – 79	1	114 L	1920	151 L	2560
Cream Soup	170 g	93	1	114 L	640	151 L	853
French Onion Soup	170 g	107	1	114 L	640	151 L	853
Meat Sauce	113 g	177 – 93	1	114 L	960	151 L	1280

ITEM	PORTION SIZE	TEMP. (°C)	BATCHES PER HOUR	VG30/VE30		VG40/VE40	
				QTY.	PORTIONS	QTY.	PORTIONS
<b>VEGETABLES</b>							
<b>CANNED</b>	85 g	204	6	14 kg	125	20 kg	200
<b>FRESH</b>							
Beans, Wax, Green	85 g	204	3	11 kg	125	23 kg	250
Beets	85 g	204	1	14 kg	125	27 kg	300
Broccoli	85 g	204	3	11 kg	125	18 kg	200
Cabbage	85 g	204	5	9 kg	80	14 kg	125
Carrots	85 g	204	2	16 kg	150	32 kg	300
Cauliflower	85 g	121	5	7 kg	75	11 kg	125
Corn	1 Ear	204	8	50 ears	50	75 ears	75
Potatoes	85 g	204	2	18 kg	200	27 kg	300
Spinach	113 g	121	10	3 kg	25	4 kg	35
Turnips	113 g	204	2	9 kg	100	14 kg	150
<b>FROZEN</b>							
Beans, French Green	85 g	204	6	7 kg	60	10 kg	90
Lima Beans	85 g	121	4	7 kg	60	10 kg	90
Broccoli	85 g	204	8	5 kg	50	8 kg	75
Sliced Carrots	85 g	121	6	7 kg	60	10 kg	90
Small Whole Carrots	85 g	121	3	7 kg	50	10 kg	90
Corn	85 g	121	18	7 kg	50	10 kg	90
Small Whole Onions	85 g	121	7	7 kg	50	10 kg	90
Peas	85 g	204	10	7 kg	75	10 kg	110
Spinach	85 g	204	3	7 kg	75	10 kg	110
<b>DESSERTS, PUDDINGS, SWEET SAUCES</b>							
Butterscotch Sauce	28 g	93	1	114 L	3840	151 L	5120
Cherry Cobbler	85 g	93	1	114 L	1280	151 L	1707
Chocolate Sauce	28 g	93	1	114 L	3840	151 L	5120
Cornstarch Pudding	113 g	93	1	114 L	960	151 L	1280
Fruit Gelatin	85 g	121	2	114 L	1280	151 L	1707
<b>MEAT – POULTRY</b>							
Bacon	3 Slices	177	12	0.9 kg	10	1 kg	15
<b>BEEF</b>							
Amer. Chop Suey	170 g	204 – 107	2	114 L	640	151 L	853
Beef Stew	0.2 kg	149	—	114 L	480	151 L	640
Corned Beef Hash	142 g	204	5	9 kg	60	14 kg	90
Cheeseburger	85 g	149	12	3 kg	35	5 kg	50
Hamburger	85 g	149	15	3 kg	35	5 kg	50
Meatballs	28 g	204 – 107	3	6 kg	65	8 kg	100
Pot Roast	57 g	177 – 93		54 kg	500	82 kg	750
Salisbury Steak	142 g	204	3	7 kg	50	11 kg	75
Sirloin Steak	170 g	204	5	7 kg	40	10 kg	60
Swiss Steak	113 g	149 – 93	1	11 kg	110	18 kg	160

ITEM	PORTION SIZE	TEMP. (°C)	BATCHES PER HOUR	VG30/VE30 PER LOAD		VG40/VE40 PER LOAD	
				QTY.	PORTIONS	QTY.	PORTIONS
<b>CHICKEN</b>							
Pan Fried	2 – 1/4's	177	3	50 pieces	25	80 pieces	40
Whole	57 g	177 – 93		16 – 2 kg	200	24 – 2 kg	265
<b>FRANKFURTERS</b>							
Grilled	57 g	149	8	10 kg	176	15 kg	264
Boiled	57 g	121	12	7 kg	128	11 kg	200
<b>PORK</b>							
Ham Steak	85 g	204	8	5 kg	50	7 kg	75
Pork Chops	142 g	177	4	7 kg	50	11 kg	75
Sausage Links	3 links	177	7	14 kg	120	10 kg	180
<b>TURKEY</b>							
Off Carcass	57 g	204 – 93	—	3 – 12 to 14 kg	200	4 – 12 to 14 kg	275
On Carcass	57 g	204 – 93	—	4 – 7 to 9 kg	175	6 – 7 to 9 kg	265
<b>MISCELLANEOUS</b>							
Grilled Cheese Sandwich	1 sand.	204	8	40 sand.	40	50 sand.	50
Macaroni & Cheese	0.2 kg	93	2	114 L	480	151 L	640
Rice	113 g	177 – 107	1	9 kg raw	320	18 kg raw	650
Spaghetti	113 g	177 – 107	2	4 kg raw	200	5 kg raw	300

# MAINTENANCE

**⚠ WARNING** The tilting braising pan and its parts are hot. Use care when operating, cleaning or servicing the braising pan.

**⚠ WARNING** Disconnect the electrical power to the machine and follow lockout/tagout procedures before performing any maintenance.

## LUBRICATION

### Lid Mechanism

1. The lid lift mechanism and tension spring are located behind the backsplash (sheet metal panel behind the braising pan) on both the left and right rear corners of the braising pan.
2. Take the cover off by prying and lifting up (Fig. 9).
3. For smooth operation of the lid, lubricate these mechanisms with 8 to 10 drops of lubricating machine oil every 6 months. Place a few drops of oil between the lid arm and stationary block, and a few drops on the shaft around which the spring is coiled.
4. Replace the cover to maintain smooth operation.

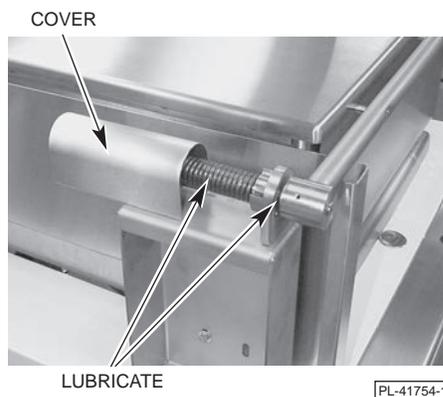


Fig. 9

## ADJUSTMENTS

At least twice a year, have a Vulcan authorized service person clean and adjust the tilting braising pan for maximum performance.

## FLUE

When cool, annually check the flue. Clean the flue of any grease buildup or other obstructions that can affect the flow of the flue gases from the braising pan.

## SERVICE AND PARTS INFORMATION

To obtain service and parts information concerning the tilting braising pan, contact the Vulcan service agency in your area (refer to listing supplied with the braising pan) or Vulcan service department at the address or phone number shown on the front cover of this manual.

# TROUBLESHOOTING

## GAS HEAT BRAISING PANS

<b>Problem</b>	<b>Possible Cause</b>
Burners do not come on.	<ol style="list-style-type: none"><li>1. The power supply is off.</li><li>2. The gas supply to the braising pan is off.</li><li>3. The thermostat is not turned on.</li><li>4. The gas valve is off.</li><li>5. The pan is not in the lowest position.</li><li>6. Problem with the gas control system. Contact your Vulcan authorized servicer.</li></ol>
Burners produce carbon deposits.	<ol style="list-style-type: none"><li>1. Braising pan frame is not level.</li><li>2. Wrong size orifices.</li><li>3. Burner air is not adjusted properly.</li><li>4. Wrong gas supply</li><li>5. Incorrect pressure at supply.</li></ol>

## ELECTRIC HEAT BRAISING PANS

<b>Problem</b>	<b>Possible Cause</b>
Heating elements do not come on.	<ol style="list-style-type: none"><li>1. The power supply is off.</li><li>2. The thermostat is not turned on.</li><li>3. Blown fuse in field electrical box.</li><li>4. Pan is not in the lowest position.</li><li>5. Problem with the control circuits. Contact your Vulcan authorized servicer.</li></ol>



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To ensure new Vulcan and Wolf equipment has been properly installed and is operating correctly, an authorized service technician will:

- Verify that the proper gas type (LP or natural) has been connected to the equipment
- Verify that the proper voltage and electrical connections have been made
- Verify that proper pressure regulators have been installed and adjusted, when applicable
- Verify that gas supply size and pressure are adequate
- Verify that proper water, steam, drain supplies and connections have been made
- Check to ensure the ventilation system is operating correctly
- Check pilot and burner adjustments
- Verify thermostat operation, including calibration, when required
- Check functional parts of operation, for example: doors, lids, valves, etc.
- Advise on preventive maintenance procedures
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— NOTES —



Following you will find instructions on how to shut down your Vulcan cooking equipment for an extended period, and how to safely restart equipment after idle.

Always refer to the procedures as instructed in the Installation & Operation manual for your specific model. Manuals may be found by visiting the Vulcan website and clicking on RESOURCES at the top right of the home page.

Always remember that cooking equipment and its parts are hot. Use care when operating, cleaning or performing maintenance.

For additional product resources, please visit <https://www.vulcanequipment.com/>.

## STEAM EQUIPMENT

### EXTENDED SHUTDOWN PROCEDURE

#### All Equipment:

1. Be sure the unit is turned off.
2. Disconnect or turn off utilities such as gas, electric, water, and steam.

#### Steamers:

1. De-lime steam generator per Installation & Operation manual.
  - a. We recommend scale release P/N 854893-13. 1 Bag for Counter Steamers and 2 for Floor Steamers.
2. Clean steamer per NAFEM cleaning instruction found in the Installation & Operation manual.
3. Leave the door cracked open

#### Fully Jacketed Steam Kettles:

1. Drain kettle vessel water. Drain plug located below and behind draw off valve.
2. Clean kettle per NAFEM cleaning instructions found in Installation & Operation manual.

#### Direct Steam Kettles, Braising Pans, and Direct Steam Steamers:

1. Clean unit per NAFEM cleaning instruction found in Installation & Operation manual.

#### 2/3 Electric and Gas Kettles:

1. Clean unit per NAFEM cleaning instructions found in Installation & Operation manual.
2. If corrosion is present clean affected area with Scotch Brite.
3. If the pressure gauge is not reading 25 to 30 IN/Hg of vacuum, then reestablish vacuum per instructions on control panel overlay or in the Installation & Operation manual.



Model C24EO3  
Shown with optional stand



## **STEAM EQUIPMENT (CONTINUED)**

### **RESTART FROM EXTENDED SHUTDOWN**

#### **All Equipment:**

1. Turn on the ventilation hood and check operation.
2. Make sure the equipment's utilities such as gas, electric, water, and steam are turned back on.
3. If power to electric or gas steamers was disconnected, allow the steamer to sit for 15 minutes before turning on the steamer's power switch.

#### **Steamers:**

1. Change water filtration system cartridge.
2. Delime steam generator per Installation & Operation manual.
3. Clean steamer per NAFEM cleaning instruction found in the Installation & Operation manual.
4. If corrosion is present, clean affected area with Scotch Brite.

#### **Fully Jacketed Steam Kettles:**

1. Drain kettle vessel water. Drain plug located below and behind draw off valve
2. Refill with only distilled water.
3. Add 2 oz. of rust inhibitor P/N 00-833651.
4. Clean steamer per NAFEM cleaning instruction found in Installation & Operation manual.
5. If corrosion is present clean affected area with Scotch Brite.

#### **Direct Steam Kettles, Braising Pans, and Direct Steam Steamers:**

1. Clean unit per NAFEM cleaning instruction found in Installation & Operation manual.
2. If corrosion is present, clean affected area with Scotch Brite.

#### **2/3 Electric and Gas Kettles:**

1. Clean unit per NAFEM cleaning instruction found in Installation & Operation manual.
2. If corrosion is present clean affected area with Scotch Brite.
3. If the pressure gauge is not reading 25 to 30 IN/Hg of vacuum, then reestablish vacuum per instructions on control panel overlay or in the Installation & Operation manual.



Model K6ETT  
*Shown with optional stand and faucet*



VG40 Shown

### VG GAS BRAISING PANS (30 & 40 GALLON)

VG30  
VG40

ML-126847  
ML-126848

#### - NOTICE -

This Manual is prepared for the use of trained Hobart Service Technicians and should not be used by those not properly qualified.

This manual is not intended to be all encompassing. If you have not attended a Hobart Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Hobart Service Technician.

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# TABLE OF CONTENTS

SERVICE UPDATES .....	4
SERVICE UPDATES .....	4
GENERAL .....	5
INSTALLATION, OPERATION AND CLEANING .....	5
INTRODUCTION .....	5
TOOLS .....	5
SPECIFICATIONS .....	5
REMOVAL AND REPLACEMENT OF PARTS .....	7
COVERS AND PANELS .....	7
FRONT, REAR & SIDE PANELS .....	7
CONTROL PANEL .....	7
POWER SUPPLY BOX COMPONENTS .....	8
TEMPERATURE CONTROLLER .....	9
PAN POSITION / DOWN LIMIT SWITCH .....	10
THERMOCOUPLE PROBE .....	12
DC LIFT MOTOR .....	12
GEAR REDUCER .....	14
ACCESSING BRAISING PAN ACTUATOR FROM TOP OF UNIT .....	18
GAS COMBINATION VALVE .....	20
PILOT BURNER .....	20
RUNNER TUBE .....	22
MAIN BURNERS .....	22
LID SPRINGS .....	23
SERVICE PROCEDURES AND ADJUSTMENTS .....	25
TEMPERATURE CONTROLLER CALIBRATION .....	25
TEMPERATURE CONTROLLER TEST - 1ST GENERATION ENDING AT SN 46-3030591 .....	26
TEMPERATURE CONTROLLER TEST - 2ND GENERATION STARTING AT SN 46-303592 .....	28
POTENTIOMETER TEST - 2ND GENERATION STARTING AT SN 46-303592 .....	29
THERMOCOUPLE TEST - 1ST GENERATION ENDING AT SN 46-3030591 .....	30
THERMOCOUPLE TEST - 2ND GENERATION STARTING AT SN 46-303592 .....	30
SPARK IGNITION TEST .....	31
PILOT BURNER FLAME ADJUSTMENT .....	33
FLAME SENSE CURRENT TEST .....	34
IGNITION CONTROL MODULE TEST .....	34
GAS MANIFOLD PRESSURE ADJUSTMENT .....	35
MAIN BURNERS .....	36
INSPECTION .....	36
AIR SHUTTER ADJUSTMENT .....	36
PAN POSITION / DOWN LIMIT SWITCH ADJUSTMENT .....	37
LID SPRING TENSION ADJUSTMENT .....	38
DC MOTOR CONTROLLER TEST .....	39
SETTING RESISTOR ON CONTROLLER SPEED BOARD .....	40
ELECTRICAL OPERATION .....	41
COMPONENT FUNCTION - BRAISING PAN CONTROLS .....	41
COMPONENT FUNCTION - MOTORIZED PAN LIFT OPTION CONTROLS .....	41
COMPONENT LOCATION .....	42
IGNITION CONTROL MODULE .....	43
SEQUENCE OF OPERATION - HEATING .....	44
SEQUENCE OF OPERATION - MOTORIZED PAN LIFT (OPTION) .....	45
SCHEMATIC DIAGRAM .....	46
TROUBLESHOOTING .....	50
GAS HEATING (MANUAL LIFT OR MOTORIZED LIFT OPTION) .....	50

MOTORIZED LIFT OPTION ONLY ..... 51

# SERVICE UPDATES

## SERVICE UPDATES

### September 2020

- Updated TOOLS.
- Updated TEMPERATURE CONTROLLER.
- Updated THERMOCOUPLE PROBE.
- Updated GEAR REDUCER.
- Updated PILOT BURNER.
- Updated TEMPERATURE CONTROLLER CALIBRATION.
- Updated TEMPERATURE CONTROLLER TEST - 1ST GENERATION ENDING AT SN 46-3030591.
- Added TEMPERATURE CONTROLLER TEST - 2ND GENERATION STARTING AT SN 46-303592.
- Updated SPARK IGNITION TEST.
- Updated IGNITION CONTROL MODULE TEST.
- Updated DC MOTOR CONTROLLER TEST.
- Updated COMPONENT FUNCTION - BRAISING PAN CONTROLS.
- Updated IGNITION CONTROL MODULE.
- Updated SCHEMATIC DIAGRAM.
- Updated GAS HEATING (MANUAL LIFT OR MOTORIZED LIFT OPTION).
- Added ACCESSING BRAISING PAN ACTUATOR FROM TOP OF UNIT.

### August 2019

- Updated TEMPERATURE CONTROLLER TEST - 1ST GENERATION ENDING AT SN 46-3030591.

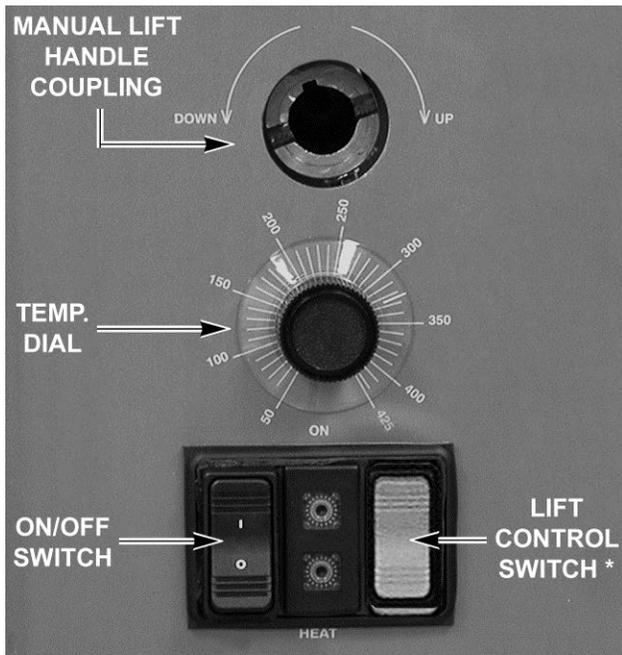
# GENERAL

## INSTALLATION, OPERATION AND CLEANING

Refer to the Installation & Operation Manual (F31227A VG30, VG40, VE30 & VE40 Braising Pans I & O Manual) for specific instructions.

## INTRODUCTION

The tilting braising pan (skillet) is a versatile piece of cooking equipment. It can be used to stew, simmer, steam, sear, pan fry, grill or saute food products over an evenly distributed heating surface. Once the product is fully cooked, the pan can be tilted for ease of product removal.



\* AUTO LIFT OPTION ONLY 7780  
Control Panel

### Model Designations

- VG30 - 30 gallon capacity
- VG40 - 40 gallon capacity

## TOOLS

### Standard

- Standard set of hand tools.
- VOM with an AC current tester and DC micro amp current tester capable of measuring 0-10 micro amps.

**NOTE:** Any quality VOM with a sensitivity of 20,000 ohms per volt can be used.

- U-Tube Manometer.
- Temperature tester (thermocouple type) with surface probe.

### Special

- 1 5/8" open end wrench. Used for removing lid springs and adjusting lid spring tension.
- Field service grounding kit P/N TL- 84919.
- RTV sealant Dow Corning 732 or equivalent. Used for sealing the slot in top cover for the gas combination valve.
- Pipe thread sealant suitable for natural and propane gases. (Petrol Gel, Dow Corning 340 thermal compound)

## SPECIFICATIONS

MODEL	INPUT BTU/HR		MANIFOLD PRESSURE (INCHES W.C.)		LINE PRESSURE (INCHES W.C.)					AMPS (MAX) @ 120V/ 60HZ
	NAT.	PROP.	NAT.	PROP.	NATURAL		PROPANE			
					RECOMMEND	MIN	RECOMMEND	MIN	MAX	
VG30	90,000	90,000	3.7	10.0	7.0	5.0	11.0	11.0	14.0	3.0
VG40	120,000	120,000	3.7	10.0	7.0	5.0	11.0	11.0	14.0	



# REMOVAL AND REPLACEMENT OF PARTS

## COVERS AND PANELS

### Front, Rear & Side Panels

1. Lift up on the bottom edge of panel until it clears the catch.
2. Tilt outwards and allow the panel to drop down.
3. Reverse procedure to install.

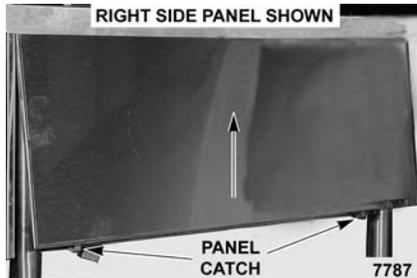


Fig. 2

### Control Panel

1. Remove front panel.
2. Disconnect conduit from control box.

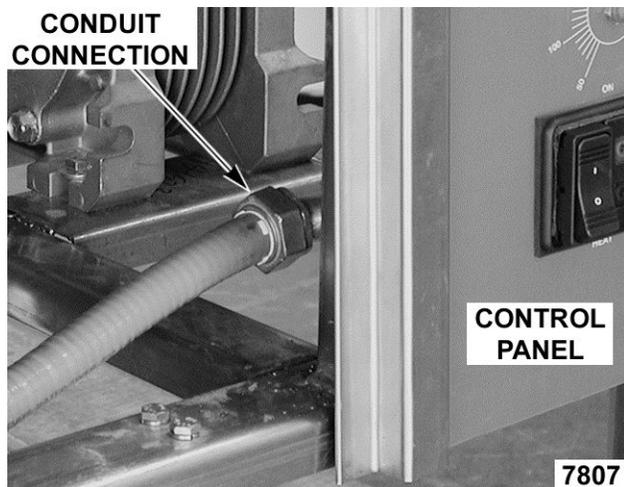


Fig. 3

3. Remove manual lift crank handle (if installed).
4. Remove bolts securing control panel to braising pan frame. Bolts are recessed in the frame channel.

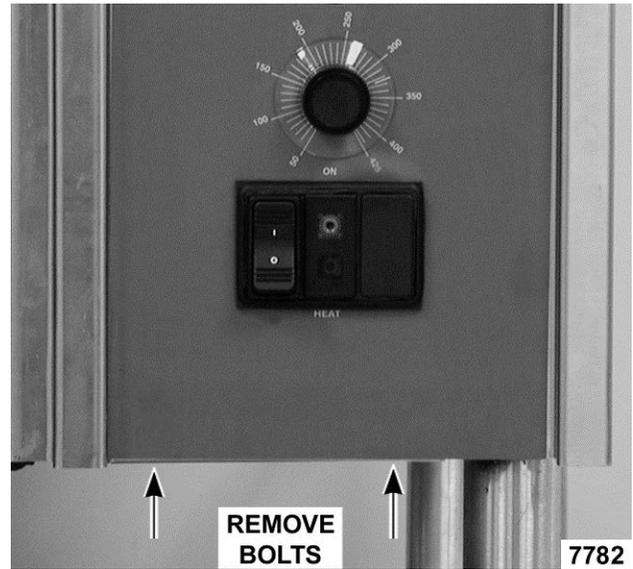


Fig. 4

5. Tilt bottom of control panel outwards and pull down.

**NOTE:** The control panel should be supported to remove lead wire strain.

6. Remove control box from control panel.

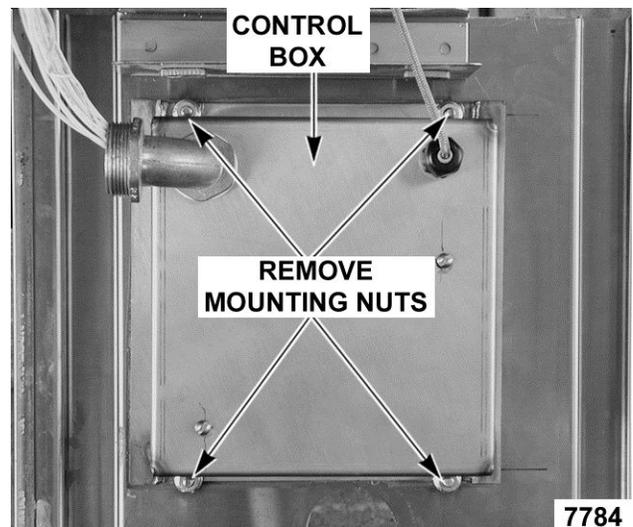


Fig. 5

7. Disconnect lead wires from control switch.

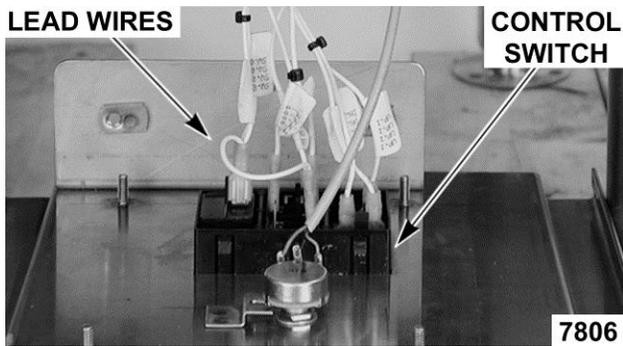


Fig. 6

8. Pull temperature dial from potentiometer shaft and remove mounting nut.

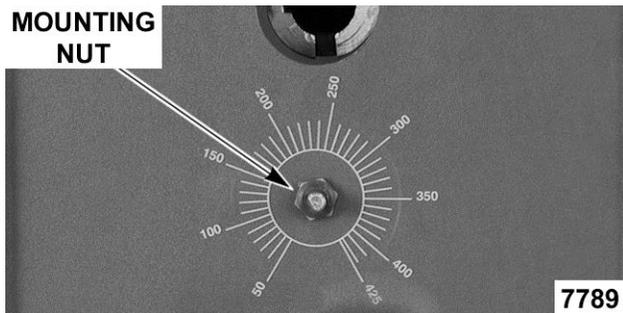


Fig. 7

9. Control panel is removed.
10. To install:
  - A. Align tab on potentiometer with positioning bracket on panel.
  - B. Install mounting nut and tighten.
  - C. Adjust stop nut on potentiometer body (as necessary) to ensure a water tight seal on mounting nut.
  - D. Attach temperature dial.

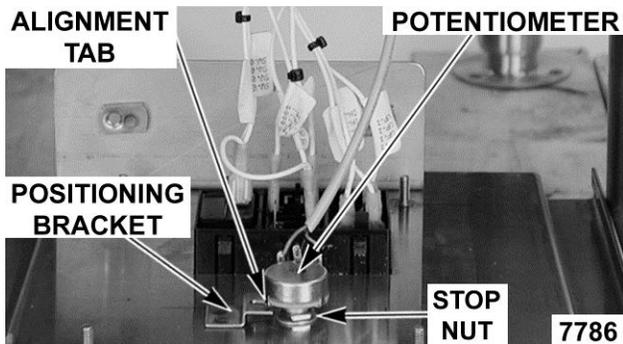


Fig. 8

11. Reverse procedure from step 6 to complete the installation.
12. Check calibration as outlined under TEMPERATURE CONTROLLER CALIBRATION.

## POWER SUPPLY BOX COMPONENTS



### WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

### NOTICE

Certain components in this system are subject to damage by electrostatic discharge (ESD) during field repairs. An ESD kit is required to prevent damage. The ESD kit must be used anytime the circuit board is handled.

1. Remove front panel as outlined under COVERS AND PANELS.
2. Remove power supply box cover.



Fig. 9

3. Remove the component being replaced.
4. Reverse procedure to install the replacement component then check for proper operation.

## POWER SUPPLY BOX

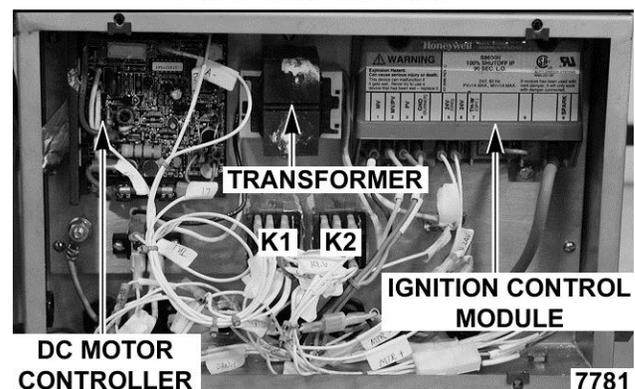


Fig. 10

## TEMPERATURE CONTROLLER



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove control box from CONTROL PANEL.
2. Note and disconnect lead wires from temperature controller.
3. Remove temperature controller from control box.

### 1ST GENERATION TEMPERATURE CONTROLLER SHOWN IN Fig. 11

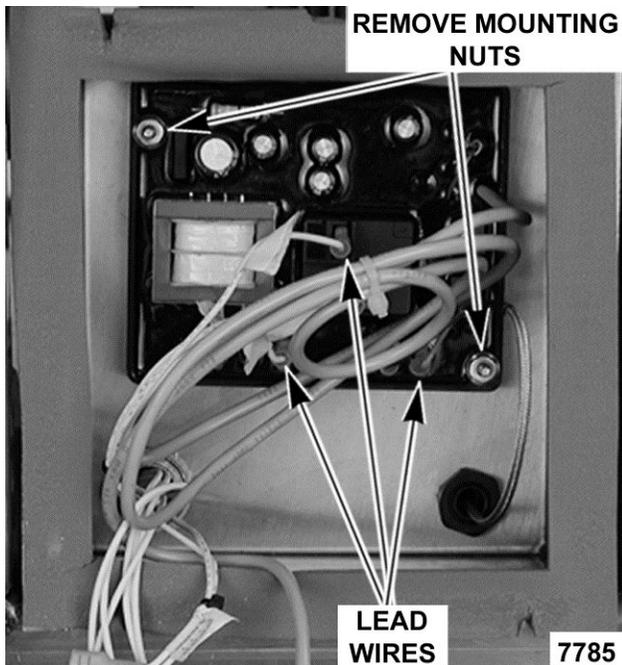


Fig. 11

### 2ND GENERATION TEMPERATURE CONTROLLER SHOWN IN Fig. 12

- Item 1 shown in Fig. 12 is J1 jumper. REMOVE J1 jumper when installing a second generation temperature controller.

### NOTICE

If J1 jumper is not removed, maximum temperature will only reach 300 degrees.

- Item 2 shown in Fig. 12 connection is both wires going to T1 and T2 equals L1 (HOT).
- Item 3 shown in Fig. 12 connection is both wires going to T3 and T4 equals L2 (NEUTRAL).

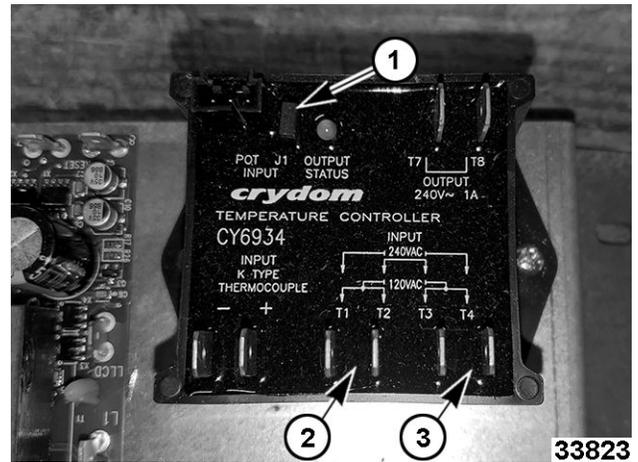


Fig. 12

4. Pull temperature dial from potentiometer shaft and remove mounting nut.

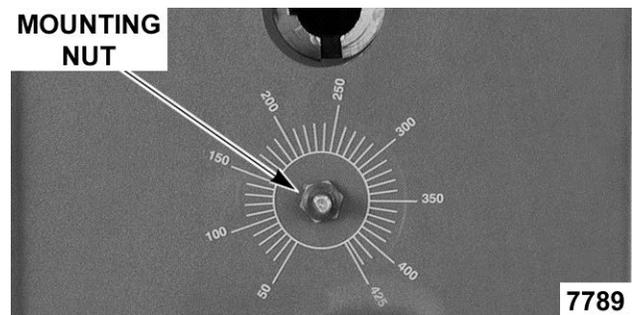


Fig. 13

5. To install:
  - A. Align tab on potentiometer with positioning bracket on panel.
  - B. Install mounting nut and tighten.
  - C. Adjust stop nut on potentiometer body (as necessary) to ensure a water tight seal on mounting nut.
  - D. Attach temperature dial.

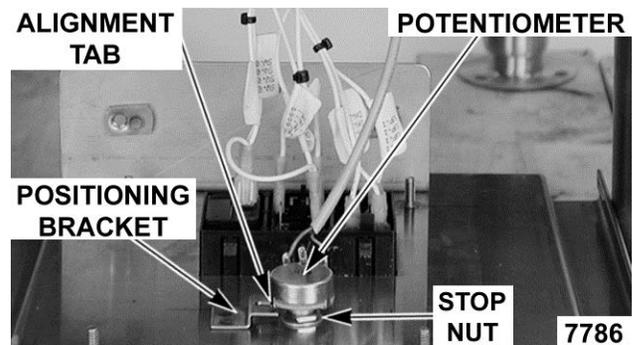


Fig. 14

6. Reverse procedure from Step 3 to complete installation.

**NOTICE**

Do not connect J1 jumper. Temperature will not reach above 300°F if J1 jumper is connected.

7. Check calibration. Refer to: TEMPERATURE CONTROLLER CALIBRATION.

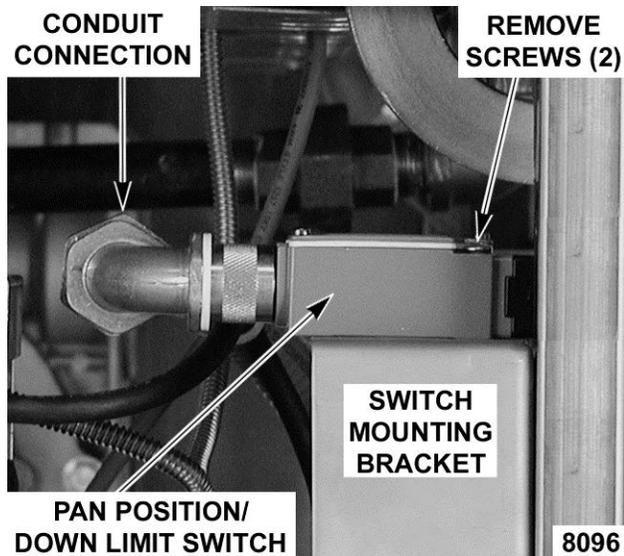
**PAN POSITION / DOWN LIMIT SWITCH**



**WARNING**

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove front and left side panels as outlined under COVERS AND PANELS.
2. Disconnect conduit and remove pan position/ down limit switch from switch mounting bracket.



Left Side View Shown

3. Remove cover from switch.
4. Disconnect lead wires and pull wires thru conduit elbow assembly.
5. Remove conduit elbow assembly from switch.

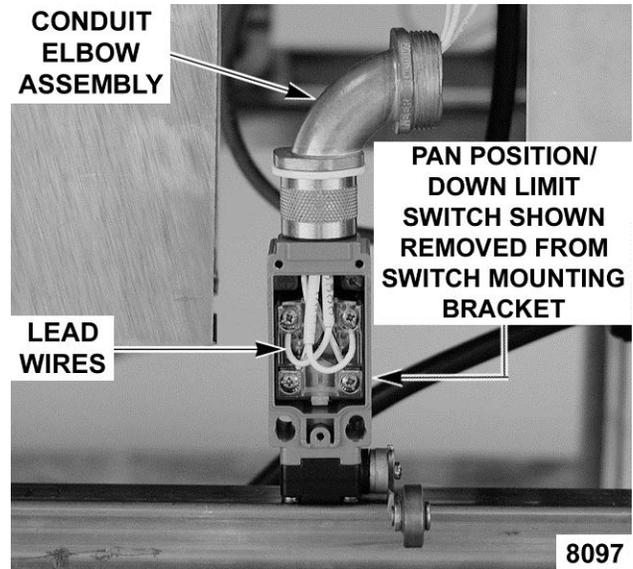


Fig. 16

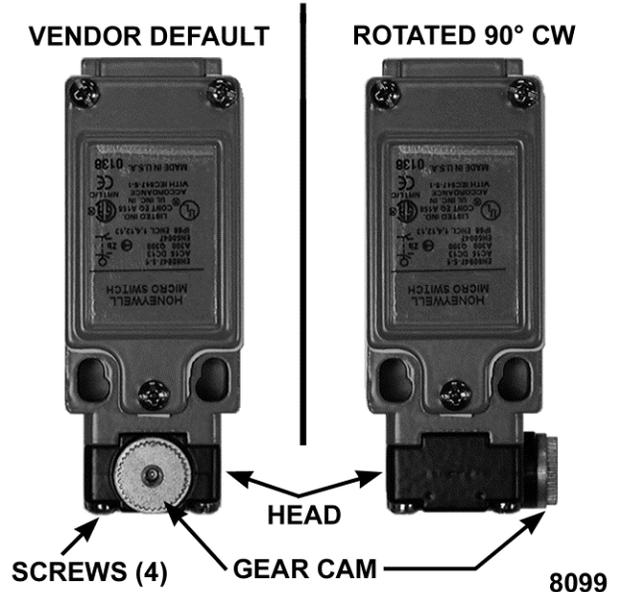
**NOTE:** When installing, replace the o-ring seal (provided) inside the brass fitting and re-use conduit elbow assembly.

6. To install:
  - A. Position the switch with the head pointing toward installer and gear cam pointing up.

**NOTE:** The plunger on the head is spring loaded and will push the head away from switch body when the last screw is removed.

- B. Remove screws securing the head to switch body, rotate 90° clockwise and tighten screws to secure.

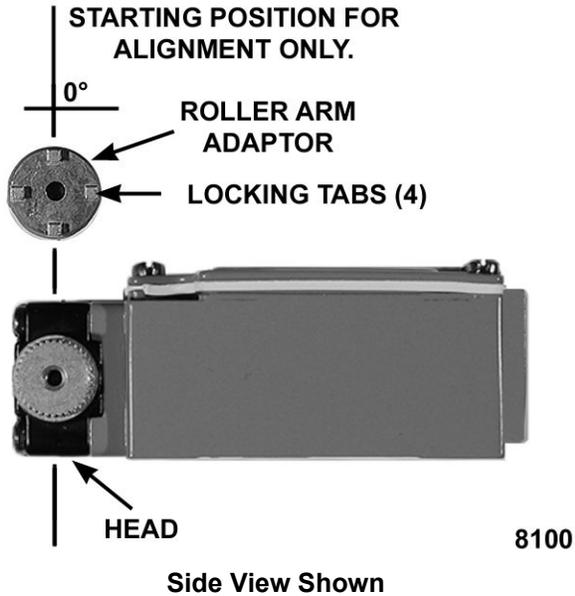
**PAN POSITION/DOWN LIMIT SWITCH HEAD POSITIONS**



Top View Shown

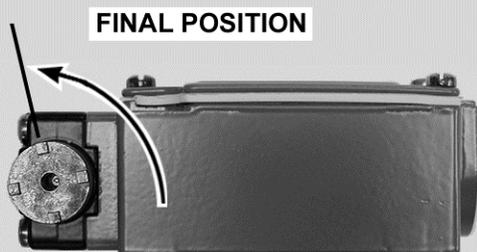
- C. Place switch on its side with the head to the left and gear cam pointing up.
- D. Align roller arm adaptor with the four locking tabs pointing up and position one of the tabs at 0°.

**NOTE:** The 0° position of the roller arm locking tab is the starting point for alignment only. The locking tab cannot remain at the 0° position.



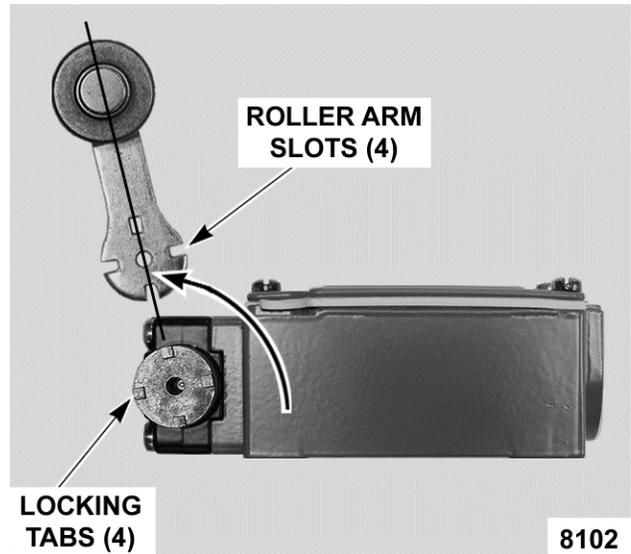
- E. Place roller arm adaptor on the gear cam to engage the teeth. Lift the adaptor until the teeth just slightly disengage from the gear cam. Rotate the roller arm adaptor counterclockwise 1 tooth, re-engage teeth and release the adaptor.

**LIFT AND ROTATE ROLLER ARM ADAPTOR COUNTERCLOCKWISE 1 TOOTH**

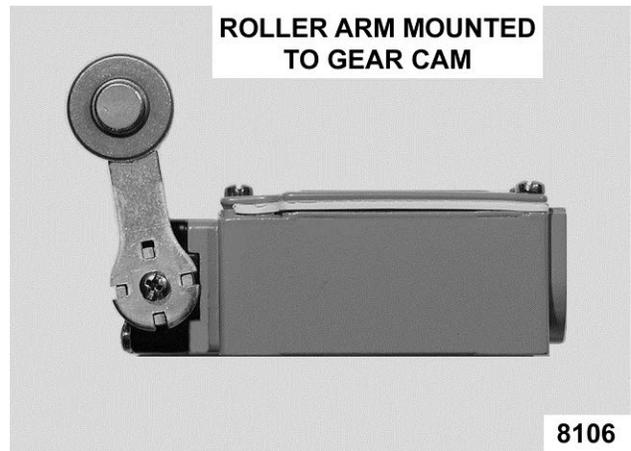


**Fig. 19**

- F. Align the roller arm slots with the four locking tabs on the roller arm adaptor and tighten mounting screw to secure.

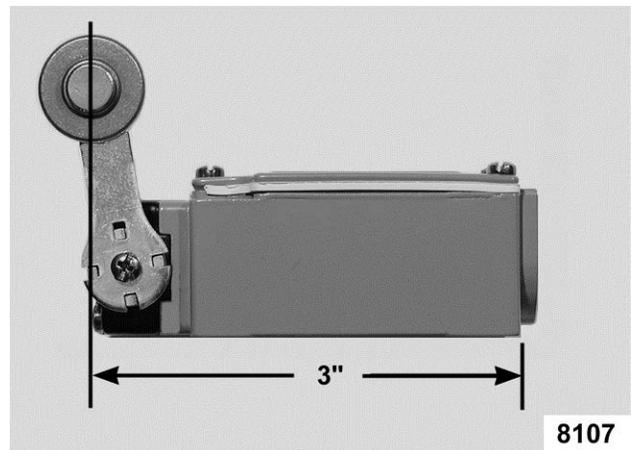


**Fig. 20**



**Fig. 21**

- G. Verify roller arm position on switch.
  - 1) Measure the distance from the rear of the switch body to the center of the roller. The distance should be 3".



**Fig. 22**

- H. If distance is ok, proceed to Step 7.

- I. If distance is not ok, adjust the roller arm position (as necessary) to obtain the 3" roller arm dimension.
7. Reverse procedure from Step 5 to complete the installation.
8. Adjust pan position/down limit switch on switch mounting bracket as outlined under PAN POSITION / DOWN LIMIT SWITCH ADJUSTMENT in SERVICE PROCEDURES AND ADJUSTMENTS.

## THERMOCOUPLE PROBE



### **WARNING**

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Access temperature controller as outlined under TEMPERATURE CONTROLLER .
2. Disconnect thermocouple lead wires.
3. Raise the pan to the full tilt position.
4. Remove insulation cover bracket.

### **NOTICE**

When removing insulation cover brackets, ensure probe insulation is present.

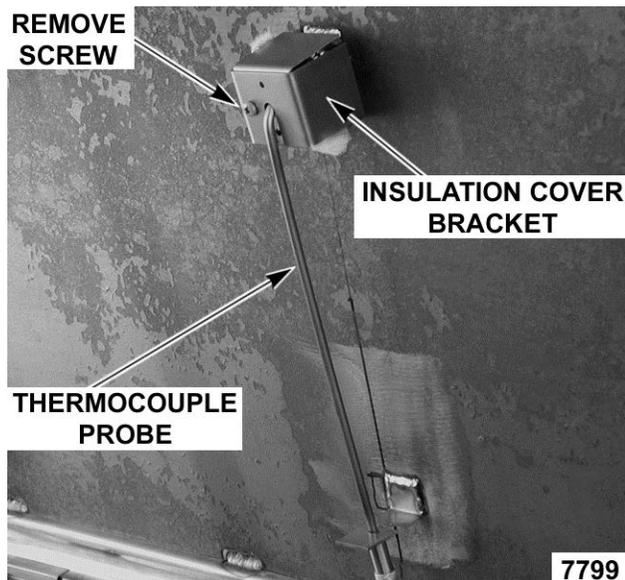


Fig. 23

5. Loosen lock nut and remove threaded probe from pan.



Fig. 24

6. Reverse procedure to install and check for proper operation.

**NOTE:** When installing: Prior to inserting the tip of the probe into the bottom of the pan, place a bead of thermal grease in the hole. Route thermocouple wire in the same manner thru the metal clamps on the hinge & frame. Tighten thermocouple just until it touches the pan, do not over tighten or damage to the thermocouple may occur.

## DC LIFT MOTOR



### **WARNING**

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove FRONT, REAR AND RIGHT SIDE PANELS .
2. Remove power supply box cover.

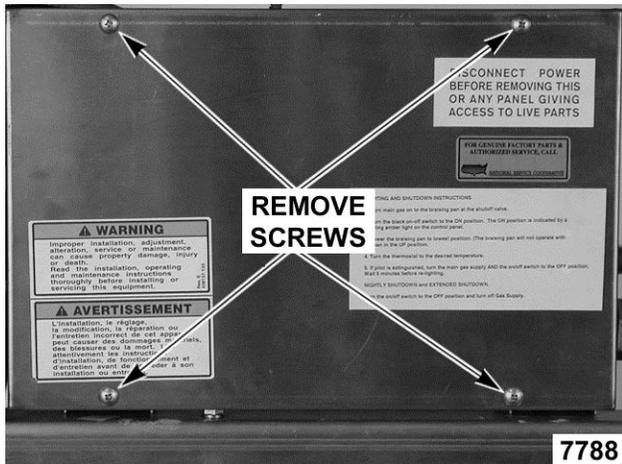


Fig. 25

3. Disconnect DC lift motor lead wires labeled MTR + (positive) & MTR - (negative).

**POWER SUPPLY BOX  
LOWER RIGHT VIEW SHOWN**

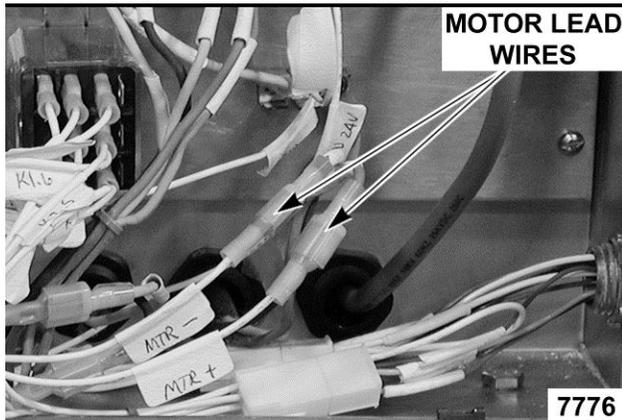
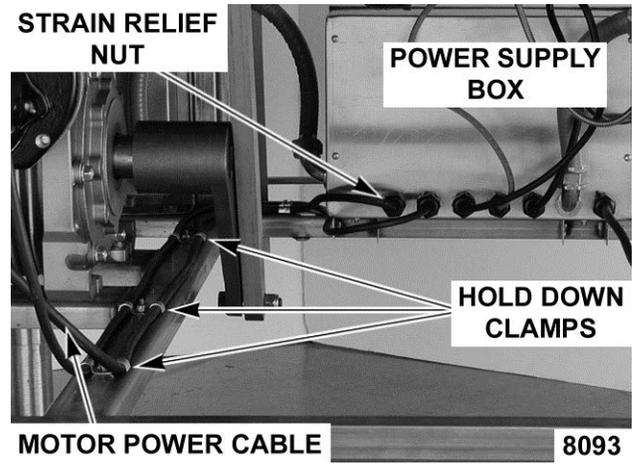


Fig. 26

**NOTE:** Lead wires can be identified by label or marking on the wire.

4. Loosen the strain relief nut and the hold down clamps for the motors' power cable. Pull the cable thru the strain relief opening and remove the cable form underneath the clamps.



VG30 REAR VIEW SHOWN

5. Remove motor mounting bolts from gear reducer flange.
6. Remove motor from gear reducer.

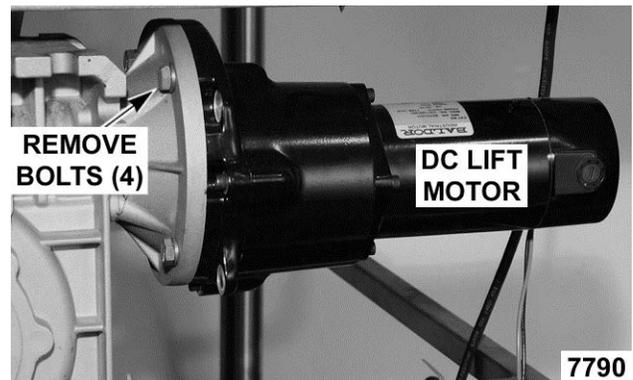


Fig. 28

7. To install:
  - A. With drive key on shaft, install motor to gear reducer.
  - B. Route and secure the motors' power cable and re-connect motor lead wires.
  - C. Replace power supply box cover and side panels.
8. Check for proper operation.

## GEAR REDUCER



**⚠ WARNING**

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

**⚠ WARNING**

If only accessible from the top, perform **ACCESSING BRAISING PAN ACTUATOR FROM TOP OF UNIT**

1. Raise or lift the braising pan approximately 45 degrees from horizontal.

**⚠ WARNING**

If motor will not operate to raise braising pan, assistance will be needed to raise pan to insert safety blocking.

**⚠ WARNING**

Do not disassemble any parts of the lift system unless braising pan is supported with two, 26 inch long wood (2" x 4") blocks, and one 48 inch long wood (2" x 4") block.

2. Before disconnecting pan lift pin, set-up safety blocking.
  - A. Block braising pan (1, Fig. 29) with two 25" long wood blocks (2" x 4") (2, Fig. 29), one at each end.
  - B. Place 2"x4" wood block, 36 inches long for VG30 models, 44" for VG40 models , (3, Fig. 29) across front of braising as shown.

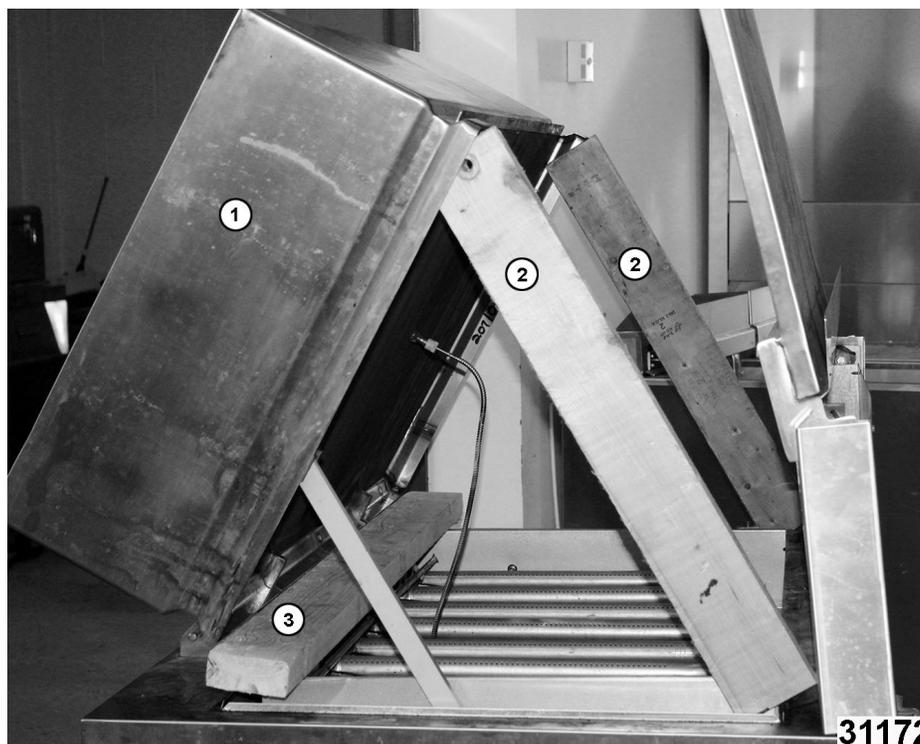


Fig. 29

3. Remove cover panels to access gear reducer.
4. Continue with GEAR REDUCER REMOVAL.

### GEAR REDUCER REMOVAL

1. Remove RIGHT AND REAR PANELS.
2. Lower the pan (use motorized pan lift or manual crank).

#### **NOTICE**

There is not a stop on the pan when raising or lowering. The directions will reverse (opposite of direction / down is up and up is down).

3. If DC lift motor is installed, remove motor. Refer to: DC MOTOR LIFT.
4. Remove lock nut securing crank assembly to lift arm.

#### **NOTICE**

If the lift arm is not installed correctly it will be difficult to turn handle to raise the braising pan.

**NOTE:** Position of lift arm is shown in up position in both generation photos. When servicing, if lift arm is not in position shown, it will be difficult to move in the up position. Use manual hand crank on front of unit to get into up position. Manual lift unit is shown.

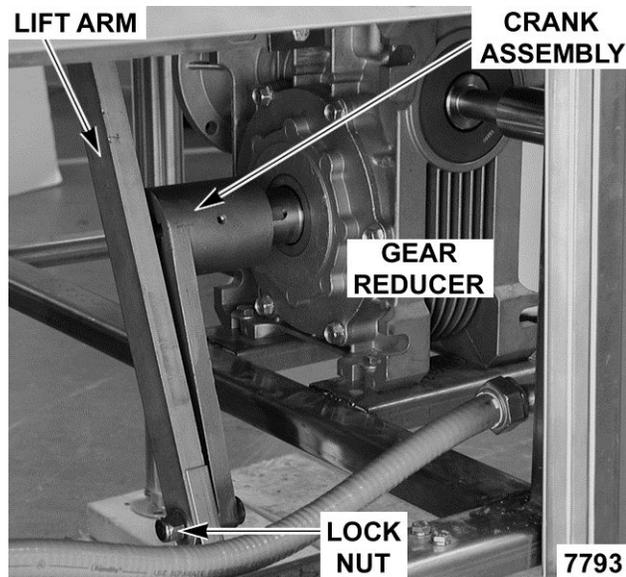


Fig. 30

- Item 1 in Fig. 31 is lift arm shown in up position.
- Item 2 in Fig. 31 is the gear reducer.

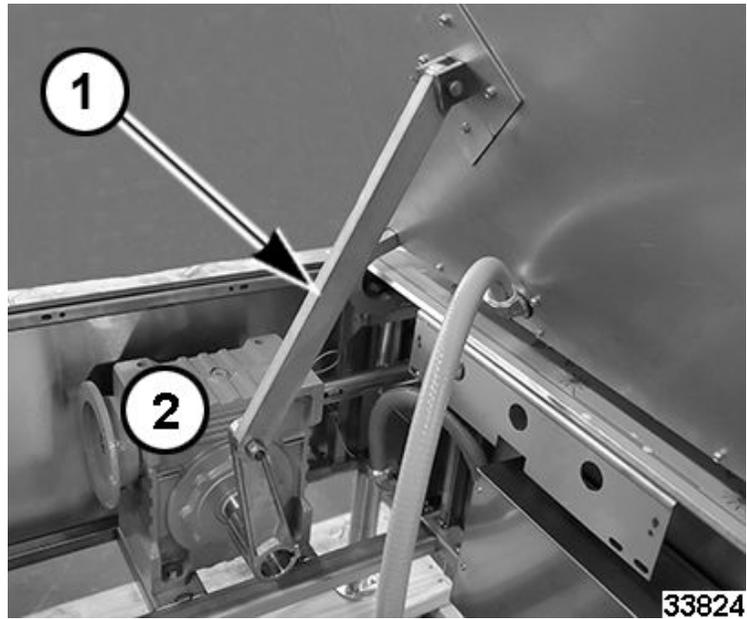


Fig. 31

5. Remove bolts securing gear reducer to braising pan frame then remove gear reducer.

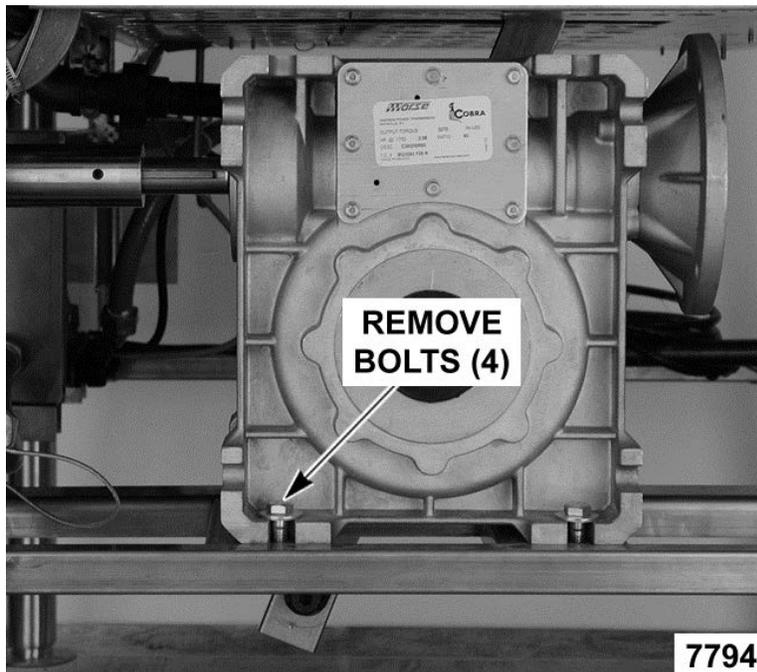


Fig. 32

6. Loosen set screw on crank assembly and remove the assembly from drive shaft.
7. Loosen set screw on shaft extension coupling and remove the coupling from manual crank shaft.

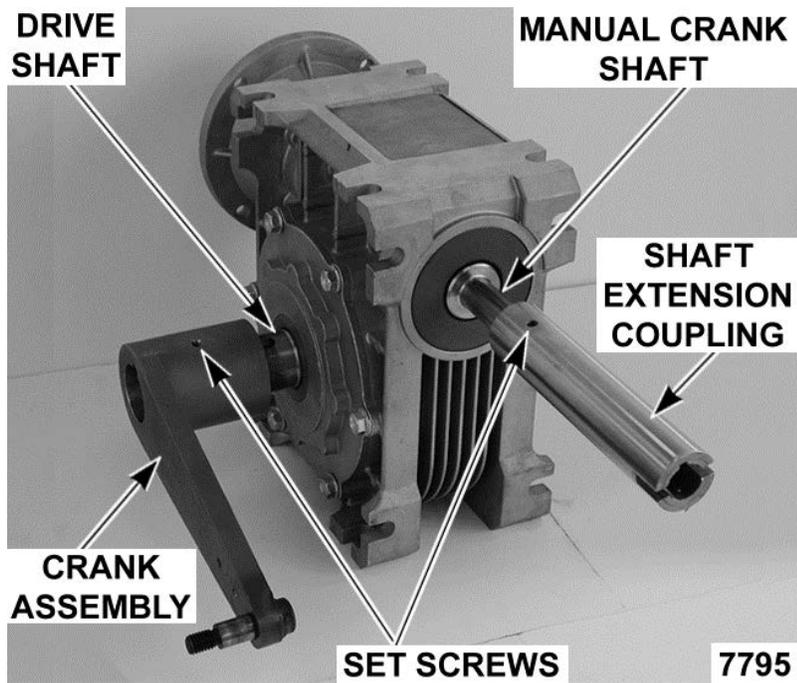


Fig. 33

8. To install:
  - A. With drive key on drive shaft, install crank assembly and tighten set screw against key.
  - B. With drive key on manual crank shaft, install shaft extension coupling and tighten set screw against key.
  - C. Place gear reducer in its mounting location on frame. Position gear reducer so the shaft extension coupling is aligned with the opening in control panel; and the lift arm is vertical and parallel to the crank assembly when connected.

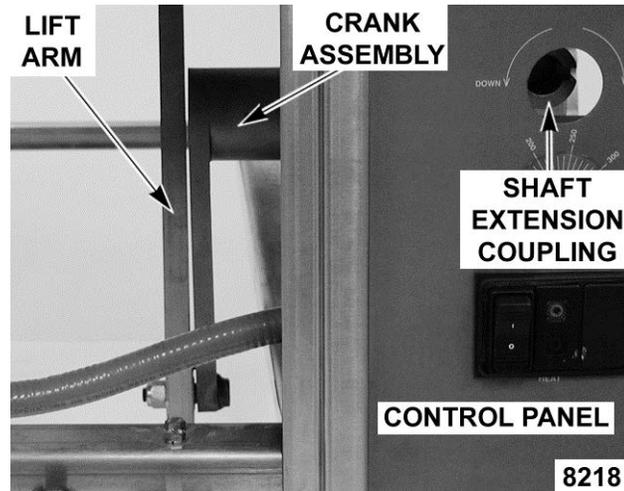


Fig. 34

**NOTE:** On the bottom lift arm bushing, the bushing head **must** be positioned between the lift arm and the crank assembly to create approximately 1/32" spacing.

9. Reverse procedure from STEP 5 to complete the installation.
10. Check for proper operation.

## ACCESSING BRAISING PAN ACTUATOR FROM TOP OF UNIT

1. Raise or lift the braising pan approximately 45 degrees from horizontal.

**⚠ WARNING**

If motor will not operate to raise braising pan, assistance will be needed to raise pan to insert safety blocking.

**⚠ WARNING**

Do not disassemble any parts of the lift system unless braising pan is supported with two, 26 inch long wood (2" x 4") blocks, and one 48 inch long wood (2" x 4") block.

2. Before disconnecting pan lift pin, set-up safety blocking.
  - A. Block braising pan (1, Fig. 35) with two 25" long wood blocks (2" x 4") (2, Fig. 35), one at each end.
  - B. Place 2"x4" wood block, 36 inches long for VG30 models, 44" for VG40 models , (3, Fig. 35) across front of braising as shown.



Fig. 35

3. Remove cover panels to access gear reducer.
4. Reverse procedure to install and verify operation.

## GAS COMBINATION VALVE



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.



### ⚠ WARNING

Shut off the gas before servicing the unit and follow lockout / tagout procedures.

### ⚠ WARNING

All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.

1. Remove front, rear and left side panels as outlined under COVERS AND PANELS.
2. Remove screw from the top cover of gas combination valve box.
3. Remove silicone sealant around the gas pipe and the slot in top cover then remove the cover.

**NOTE:** When installing, clean the areas and apply silicone sealant.

4. Remove U-bolt securing gas valve box to gas pipe then remove box.

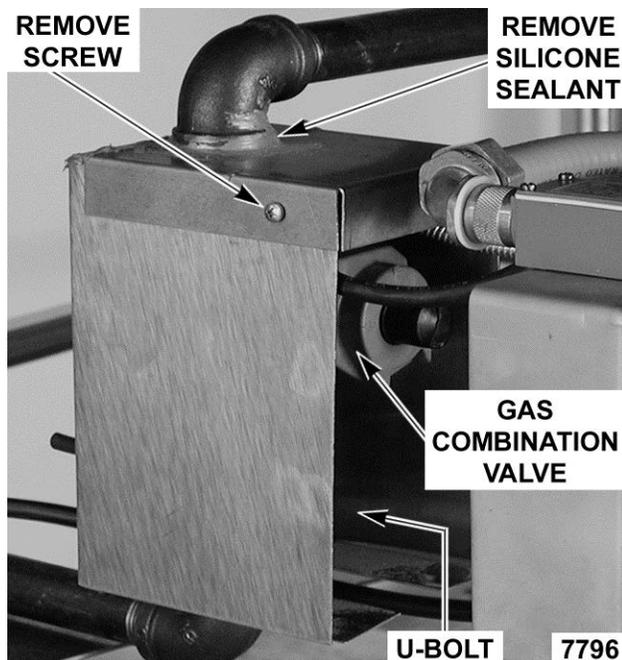


Fig. 36

5. Disconnect lead wires from gas combination valve.
6. Disconnect pilot tube from gas combination valve.

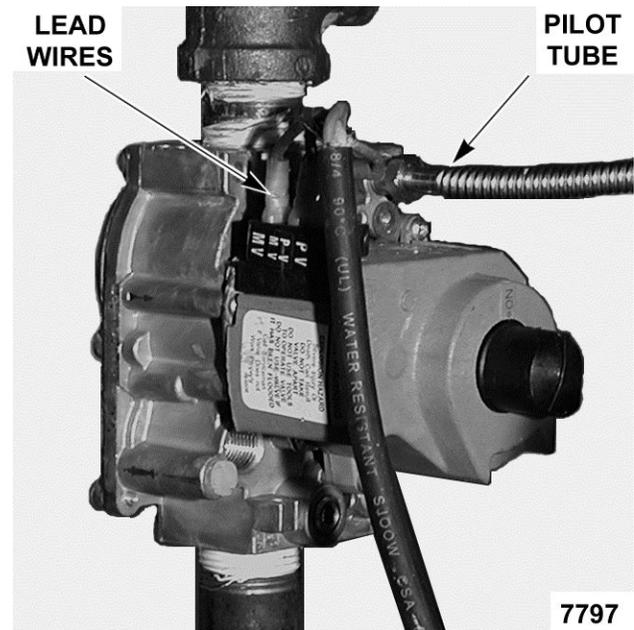


Fig. 37

7. Separate gas pipe union (near manifold), remove U-bolt securing gas pipe to braising pan frame (at rear of pan) then remove the gas combination valve and piping assembly.
8. Remove pipe from gas combination valve.
9. Reverse procedure to install.

**NOTE:** When installing, clean gas pipe threads and apply pipe joint compound to threads. Any pipe joint compound used **must** be resistant to the action of propane gases.

10. Check for proper operation.

## PILOT BURNER



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

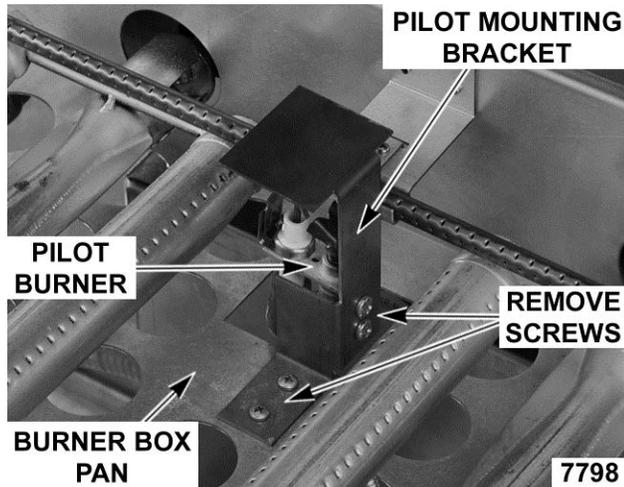
### ⚠ WARNING

All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.

1. Raise pan to full tilt position.

2. Remove pilot burner mounting bracket from burner box pan.
3. Disconnect ignitor cable from ignitor/flame sense electrode on pilot burner.
4. Remove pilot burner from pilot mounting bracket.
5. Disconnect pilot tube from pilot burner.

**NOTE:** Ground wire is located on pilot mounting screws.



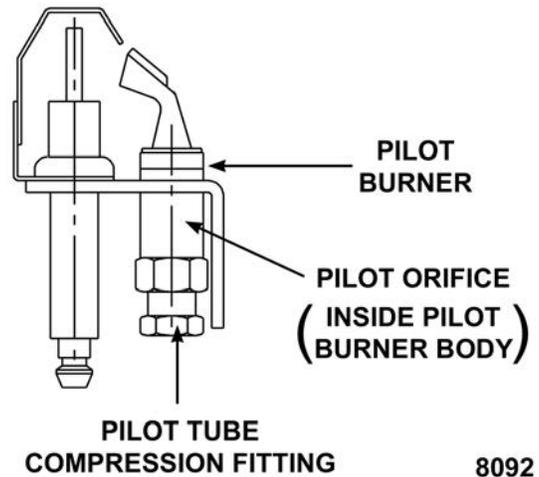
**Fig. 38**

6. To remove gas orifice from pilot burner for inspection or cleaning, disconnect the pilot tube compression fitting from pilot burner body.
  - A. The gas orifice is inserted into pilot burner body and should drop out when compression fitting is removed. If necessary, lightly tap on pilot burner body to free the gas orifice.

**NOTICE**

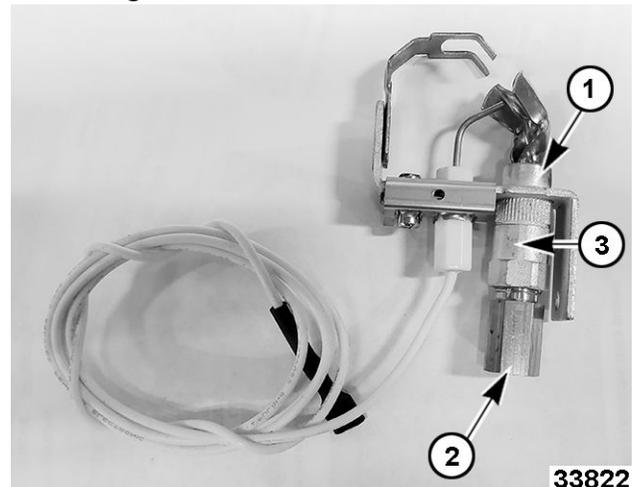
If orifice is clogged with debris, clean with air or non-flammable liquid only.

**1ST GENERATION PILOT BURNER SHOWN IN Fig. 39**



**Fig. 39**

**2ND GENERATION PILOT BURNER SHOWN IN Fig. 40**



**Fig. 40**

- Item 1 in Fig. 40, pilot burner.
- Item 2 in Fig. 40, pilot orifice.
- Item 3 in Fig. 40, pilot tube compression fitting.

**NOTE:** Ignition wire comes with the 2nd generation pilot assy.

7. Reverse procedure to install and check for proper operation.

## RUNNER TUBE



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

### ⚠ WARNING

All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.

1. Raise the pan to the full tilt position.
2. Loosen screw on each runner tube clamp and rotate the clamp away from runner tube.

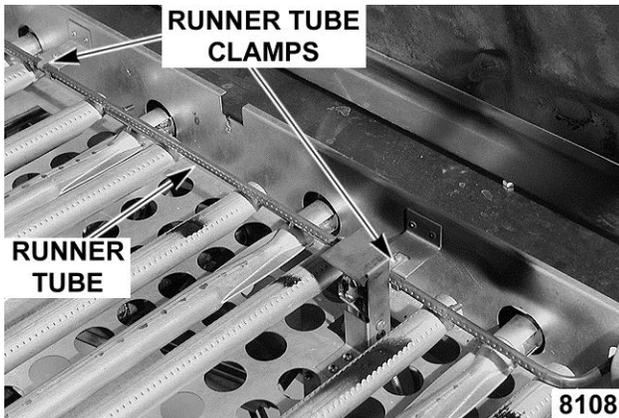


Fig. 41

3. Lift runner tube from mounting bracket and off of the gas orifice.

**NOTE:** Runner tube slides onto the gas orifice. When installing, ensure runner tube is fully seated onto gas orifice.

4. To remove gas orifice for inspection or cleaning, disconnect the gas supply tube compression fitting at the manifold.
5. Remove gas orifice from elbow fitting.

## NOTICE

If orifice is clogged with debris, clean with air or non-flammable liquid only.

### GAS ORIFICE

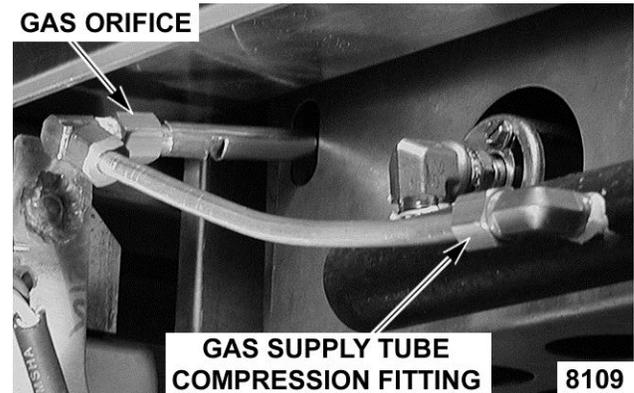


Fig. 42

6. Reverse procedure to install and check for proper operation.

## MAIN BURNERS



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

### ⚠ WARNING

All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.

1. Raise the pan to the full tilt position.
2. Remove the hold down wire from main burner.

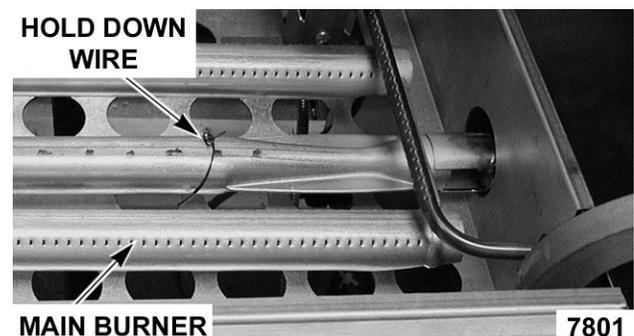


Fig. 43

3. Lift burner at rear to clear the locating pin hole and slide burner toward the rear of burner box pan to clear the orifice.
4. To remove gas orifice for inspection or cleaning, remove the gas orifice from the elbow fitting.

**NOTICE**

If orifice is clogged with debris, clean with air or non-flammable liquid only.

- Reverse procedure to install and adjust air shutter as outlined under MAIN BURNERS in SERVICE PROCEDURES AND ADJUSTMENTS.

**NOTE:** When installing, ensure locating pin is in the hole for proper positioning and hold down wire is reattached.

**LID SPRINGS**



**WARNING**

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- Lower the lid to the full down position.

**NOTE:** For spring tension to be set correctly, both the left and right side springs must be replaced.

- Remove spring covers by prying up at the bottom. The covers are held in place by tabs on the bottom of cover.



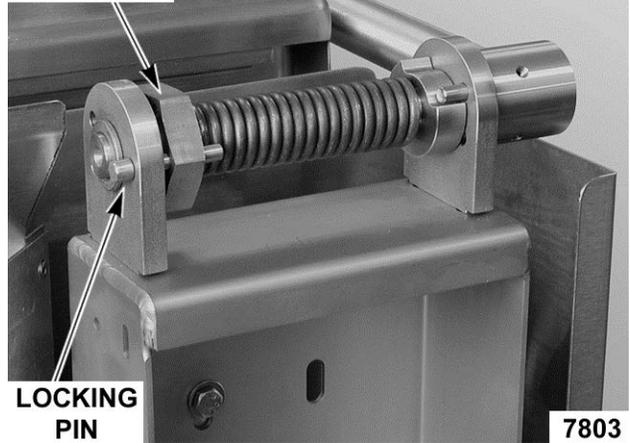
**RIGHT SIDE REAR VIEW SHOWN**

- Place a 1 5/8" wrench on the lid spring lock nut and apply a downward force until locking pin can be removed. Continue to hold lock nut in place.

**NOTICE**

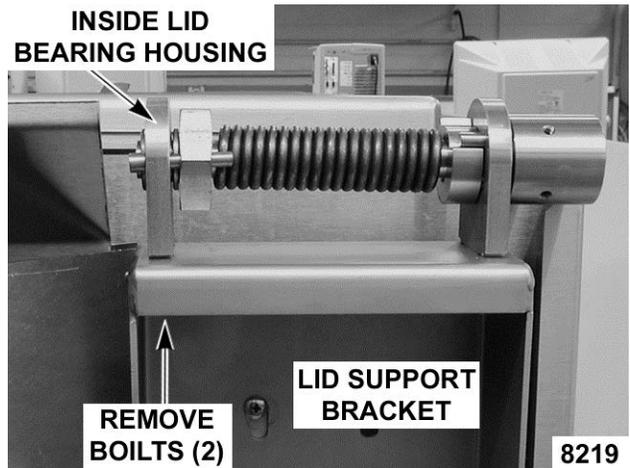
Do not release wrench while locking pin is removed or damage to the braising pan may occur.

**LID SPRING LOCK NUT**



**Fig. 45**

- Slowly release downwards force to remove spring tension.
- Rotate lid spring lock nut to the next hole position then replace locking pin. Continue until all spring tension is removed, one position at a time.
- Remove bolts securing the inside lid bearing housing to the lid support bracket.



**Fig. 46**

- Remove lid bearing housing, lid spring lock nut and the spring, from spring mandrel.

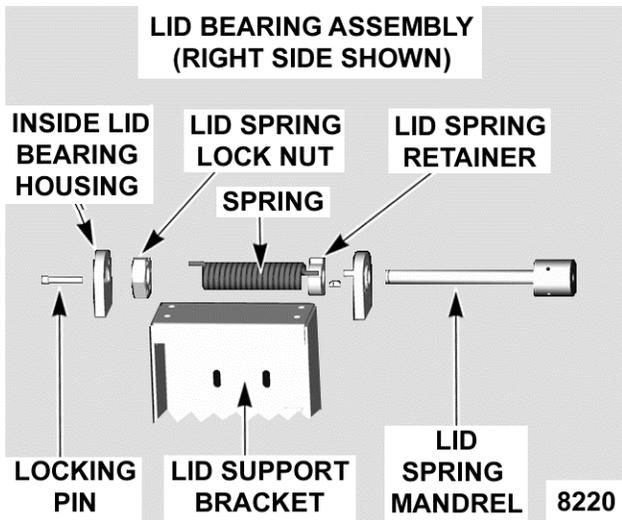


Fig. 47

4. To install:
  - A. Slide the spring onto the lid spring mandrel. Insert spring into locator hole on the lid spring retainer.
  - B. Slide the lid spring lock nut onto the lid spring mandrel. Insert spring into locator hole on the lid spring lock nut.
  - C. Replace lid bearing housing.
5. Replace spring on the opposite side.
6. Adjust spring tension as outlined under LID SPRING TENSION ADJUSTMENT in SERVICE PROCEDURES AND ADJUSTMENTS.

# SERVICE PROCEDURES AND ADJUSTMENTS

## **⚠ WARNING**

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power and follow lockout / tagout procedures, attach test equipment and reapply power to the test.

## **⚠ WARNING**

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power and follow lockout / tagout procedures, attach test equipment and reapply power to the test.

## TEMPERATURE CONTROLLER CALIBRATION

**NOTE:** Verify condition of thermocouple as outlined under THERMOCOUPLE TEST - 1ST GENERATION ENDING AT SN 46-3030591 before proceeding.

1. At the geometric center on the pan cooking surface, clean an area approximately 3" inches in diameter.
2. Apply a thin layer of fresh cooking oil to the cleaned area and place a temperature sensing disk on the pan cooking surface.
3. Turn on/off switch on and set temperature dial to 250°F.
4. Monitor the heat light (red) on the control panel. When temperature controller is calling for heat, light will be on. If temperature controller is satisfied, light will be off.
  - A. Allow the temperature controller to cycle three times to stabilize the pan temperature.
  - B. Record the temperature when the temperature controller cycles off and on for the next three cycles.

*Differential = Heat light OFF - Heat light ON*

*Example: 260° (light off) - 240° (light on) = 20°*

- A. The differential calculated should be less than 20°F.
  - 1) If the differential is **less** than 20°F, temperature controller is functioning properly.
    - a. Proceed to average temperature.

- 2) If the differential is **more** than 20°F, the temperature controller is malfunctioning.
  - a. Install a replacement temperature controller and check calibration.
6. Calculate the **average** temperature by adding the temperature indicated when the heat lamp goes out to the temperature indicated when the heat lamp comes on & divide this answer by 2.
 

*[Temp. (light off) + Temp. (light on)] ÷ 2 = Average Temp.*

*Example: 260° + 240° ÷ 2 = 250°*

  - A. If the average temperature is **less** than 10°F of the dial setting, temperature controller is properly calibrated.
  - B. If the average temperature is **more** than 10°F of the dial setting, temperature controller calibration **must** be adjusted.
7. Using the temperature scale on the overlay as a guide, align the edge on a short piece of tape to the temperature calculated in Step 6 and apply tape to knob as a reference point.
8. Remove temperature dial from shaft.
9. Loosen screws on the back of dial.
  - A. Hold the knob and rotate dial to the edge of the tape used for reference. This adjustment offsets the indicated temperature on the dial to the actual temperature measured.
  - B. Hold the dial & knob together to maintain the adjusted setting and tighten screws.

**NOTE:** With knob facing user, a clockwise rotation increases temperature and a counterclockwise rotation decrease temperature.

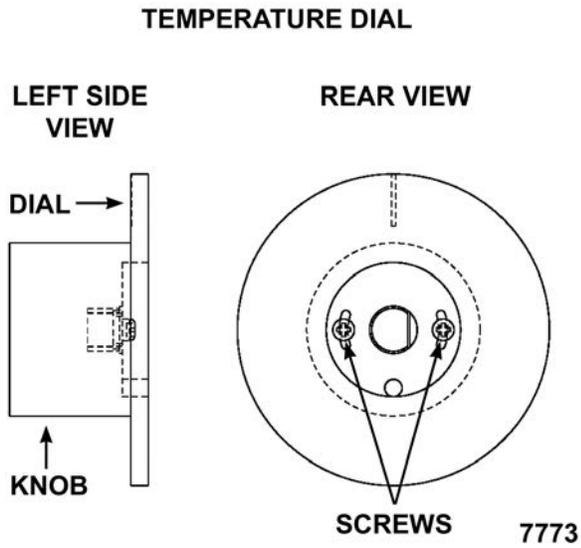


Fig. 48

10. Replace temperature dial on shaft.
11. Turn the temperature dial to the lowest setting then back to 250°F.
12. Repeat the average temperature calculation for up to three attempts. Allow the pan to cycle at least two times between adjustments before performing the calculation.
13. If calibration is unsuccessful, the controller may be malfunctioning and cannot be adjusted properly. Install a replacement temperature controller and check calibration.

**TEMPERATURE CONTROLLER TEST - 1ST GENERATION ENDING AT SN 46-3030591**

**NOTICE**

Temperature probe changes with the generation of controller being used in machine.



**WARNING**

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

**NOTE:** The controller is powered whenever supply power is connected to the machine.

**Watlow Temp Controller**

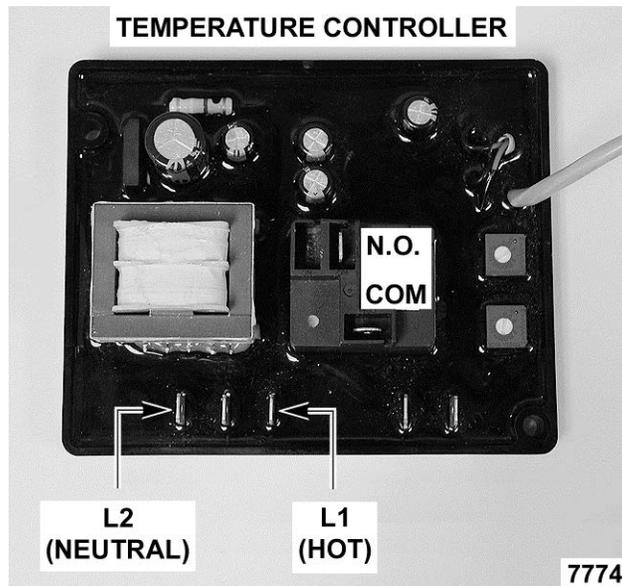


Fig. 49

**Crydom Temp Controller**

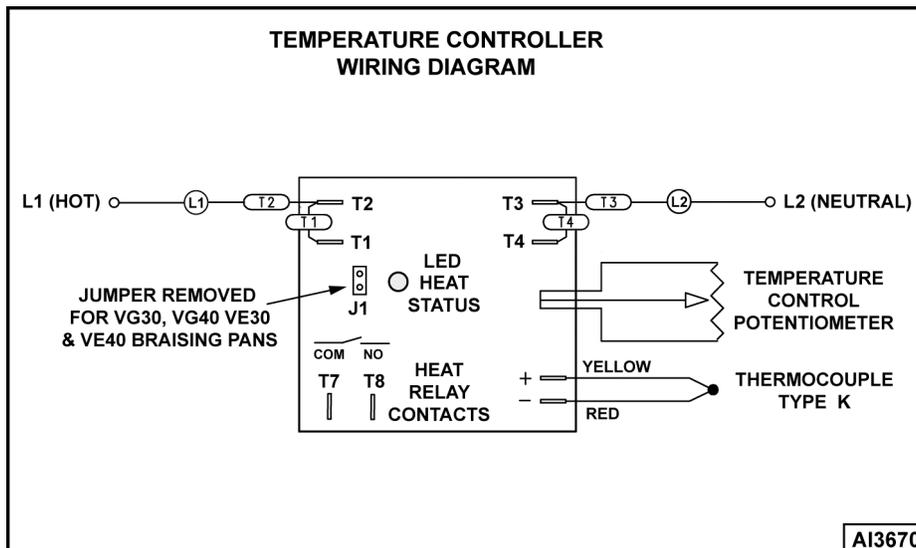


Fig. 50

1. Lower pan to full down position.

2. Disconnect supply power.
3. Access TEMPERATURE CONTROLLER.
4. Re-connect power to machine.
5. Verify temperature controller is receiving 120VAC at terminals L1 & L2, polarity is correct and machine is properly grounded.
6. Turn on/off switch on and set temperature dial to 250°F.
7. Verify heat light (red) comes on and main burners light.
  - A. If heat light and main burners come on but turn off within 10 seconds, verify condition of thermocouple, refer to THERMOCOUPLE TEST - 1ST GENERATION ENDING AT SN 46-3030591.

**NOTE:** Temperature controller will de-energize internal relay if the circuitry detects an open thermocouple.

  - B. If heat light and main burners do **not** come on, verify internal relay "HEAT" contacts are operating properly.
8. Disconnect lead wire labeled "HT.0" from the COM terminal on controller.
9. Verify 24VAC between the disconnected "HT.0" lead wire and ground.
  - A. If correct, re-connect lead wire to COM terminal and proceed to Step 10.
  - B. If incorrect, check transformer and the on/off switch for proper operation.
10. Disconnect lead wire labeled "HT.1" from the N.O. terminal on controller.
11. Verify 24VAC between N.O. terminal on the temperature controller and ground.
  - A. If correct, internal relay "HEAT" contacts are functioning properly. Reconnect lead wire to N.O. terminal.
  - B. If incorrect, install a replacement temperature controller and check for proper operation.

**TEMPERATURE CONTROLLER  
TEST - 2ND GENERATION  
STARTING AT SN 46-303592**

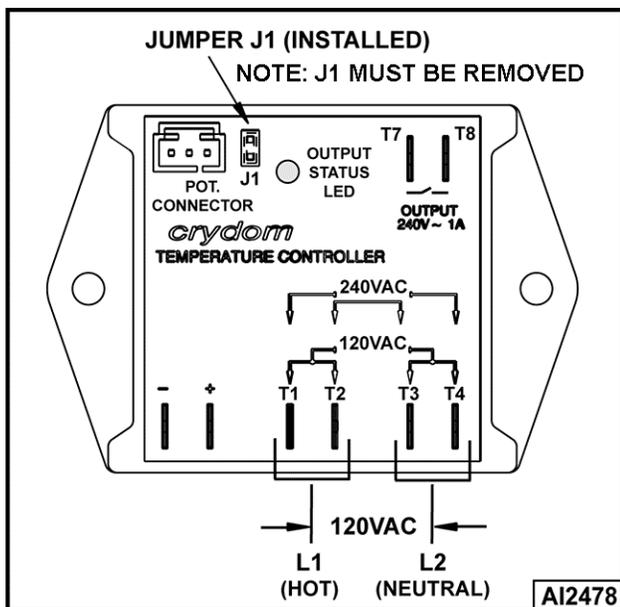


Fig. 51

1. Place kettle in full upright position (tilting models only).
2. Set temperature dial to lowest setting. Kettle must be below 110°F before verifying potentiometer output to the controller is good over the full range of temperature dial travel.
3. Access the temperature controller. Refer to: COVERS AND PANELS.
4. **REMOVE** J1 jumper from temperature controller.

**NOTICE**

If J1 jumper is not removed, temperature will not reach above 300°F.

5. Check all lead wires for secure connections to controller terminals. Wiring harness lead wires must be connected to T1-T2 and T3-T4 for proper input to controller.
6. Re-connect power to machine.
7. Turn power switch on.
8. Verify temperature controller is receiving 120VAC at terminals T1-T3 and T2-T4 and machine is properly grounded.

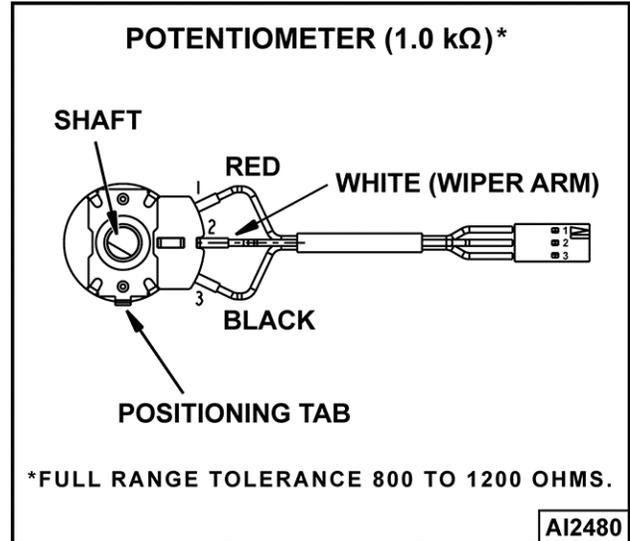
9. Slowly turn temperature dial to the highest setting and monitor heat light over the full range of travel.
  - A. Verify heat light (amber) comes on, blower motor comes on and transformer is powered (120VAC).
  - B. If components listed above are functioning properly, then output from T8 on controller should be present. As long as transformer output voltage is correct (24VAC), heat circuit is powered and the ignition sequence to light the burner will start.
  - C. If heat light does not remain on or flashes momentarily as temperature setting is slowly increased, verify condition of potentiometer. Refer to: POTENTIOMETER TEST - 2ND GENERATION STARTING AT SN 46-303592.
  - D. If heat light or blower motor is not coming on; or transformer is not powered.
    - 1) Verify condition of thermocouple. Refer to: .

**NOTE:** Temperature controller will de-energize internal relay and turn off the output status LED if the circuitry detects an open thermocouple. LED will begin to flash 3 times, pause, then repeat the flash sequence to indicate the open thermocouple condition.

- 2) Check lead wire connections at the component that is not functioning (heat light, blower motor or transformer).
  - 3) Verify power at the component that is not functioning. If power is present, determine if the component is malfunctioning. If power is not present at any of the components, continue with procedure.
10. Disconnect lead wire from terminal T7 on the controller.
  - A. Verify 120VAC between lead wire from T7 and ground. If correct, re-connect lead wire to terminal T7 and continue with procedure.
  - B. If incorrect, check pressure switch (1PS) and water level controller (WLC LLCO).
11. Disconnect lead wire from terminal T8 on the controller.
  - A. Verify 120VAC between T8 and ground. If correct, output from controller is functioning properly.

- B. If incorrect, install a replacement temperature controller and check for proper operation.

**POTENTIOMETER TEST - 2ND GENERATION STARTING AT SN 46-303592**



**Fig. 52**

1. Access control panel potentiometer. Refer to: COVERS AND PANELS.
2. Turn potentiometer shaft fully counterclockwise to lowest setting.
3. Set VOM to measure resistance.
4. Connect meter leads to white and black lead wires on potentiometer terminals.
  - A. Resistance should measure approximately zero ohms.
5. Slowly turn potentiometer shaft clockwise over the full range of travel and monitor resistance change on meter.
  - A. Resistance should measure 800 to 1200 ohms with shaft turned fully clockwise.
  - B. If resistance value increased smoothly without sudden drops or spikes, and full travel resistance value is within tolerance then potentiometer is functioning properly.
  - C. If resistance value did not increase smoothly, but had drops or spikes over full travel range then potentiometer is not functioning properly. Install a replacement potentiometer and check for proper operation.

### THERMOCOUPLE TEST - 1ST GENERATION ENDING AT SN 46-3030591

1. Access the TEMPERATURE CONTROLLER as outlined in REMOVAL AND REPLACEMENT OF PARTS.
2. Remove thermocouple lead wires from temperature controller.

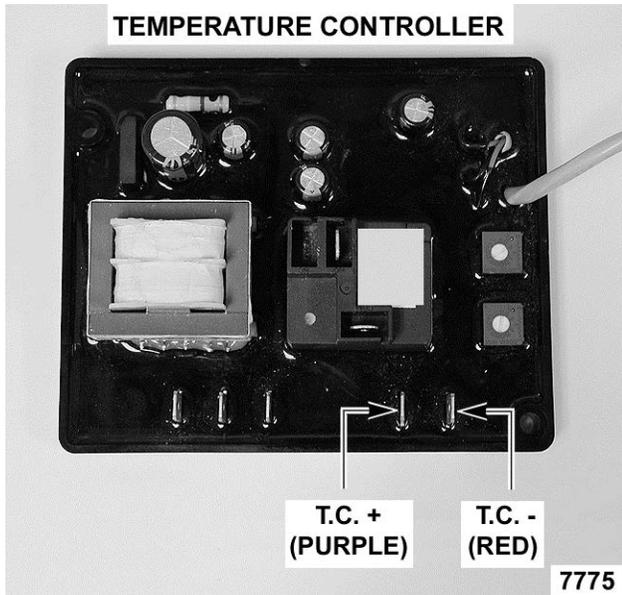


Fig. 53

3. Check the thermocouple for resistance.
  - A. If meter reads an overload (OL) condition (open), or zero ohms (short) replace the thermocouple and check temperature controller for proper operation.
4. If resistance is measured, thermocouple is good.

### THERMOCOUPLE TEST - 2ND GENERATION STARTING AT SN 46-303592

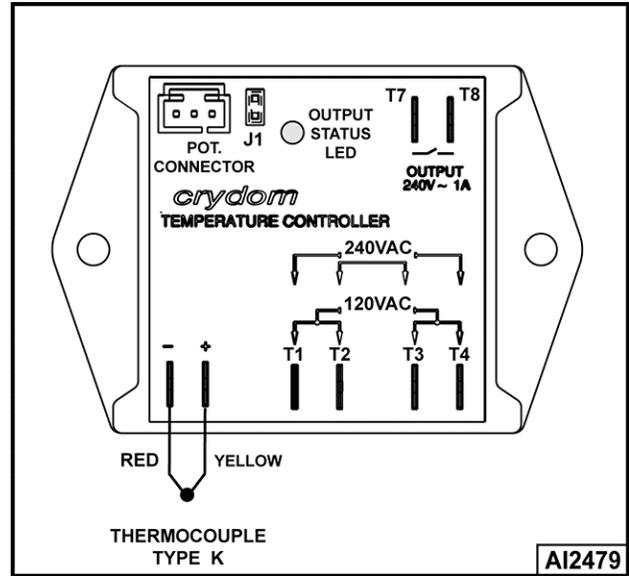


Fig. 54

1. Access temperature controller. Refer to: COVERS AND PANELS
2. **REMOVE** thermocouple lead wires from temperature controller.

**NOTE:** REMOVE J1 jumper when installing a second generation temperature controller.

**NOTICE**

If J1 jumper is not removed, maximum temperature will only reach 300 degrees.

3. Check the thermocouple for a measurable resistance (approximately 5 to 10 ohms at room temperature). If meter reads an overload (OL) condition (open), or zero ohms (short) replace the thermocouple and check temperature controller for proper operation.

TYPE K THERMOCOUPLE PROBE AND MILLIVOLT CHART	
TEMPERATURE	MILLIVOLT
100° F	1.521
150° F	2.667
200° F	3.820
250° F	4.925
300° F	6.094
350° F	7.207

TYPE K THERMOCOUPLE PROBE AND MILLIVOLT CHART	
TEMPERATURE	MILLIVOLT
400° F	8.316

## SPARK IGNITION TEST



### ⚠ WARNING

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

If ignition control module is not generating a spark or the spark is not sufficient to light pilot burner, perform the following test.

**NOTE:** Honeywell was first generation ignition control module brand and ended at SN 46-3030591. Fenwal ignition module brand started in production with SN 46-3030592.

### 1ST GENERATION SHOWN IN Fig. 55

#### IGNITION CONTROL MODULE

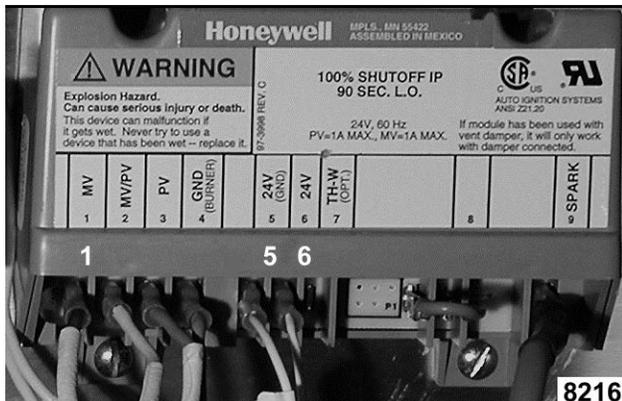


Fig. 55

### 2ND GENERATION SHOWN IN Fig. 56

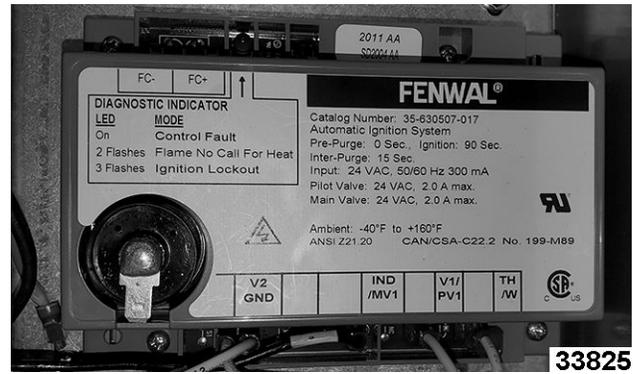


Fig. 56

1. Lower pan to full down position, turn the on/off switch on and set temperature dial to call for heat.
2. Verify ignition control module is receiving 24VAC between terminals 5 & 6.
  - A. If voltage is present, turn the on/off switch off and proceed to Step 3.
  - B. If voltage is not present, see SCHEMATIC DIAGRAM.
3. Disconnect power to the machine.



### ⚠ WARNING

**Shut off the gas before servicing the unit and follow lockout / tagout procedures.**

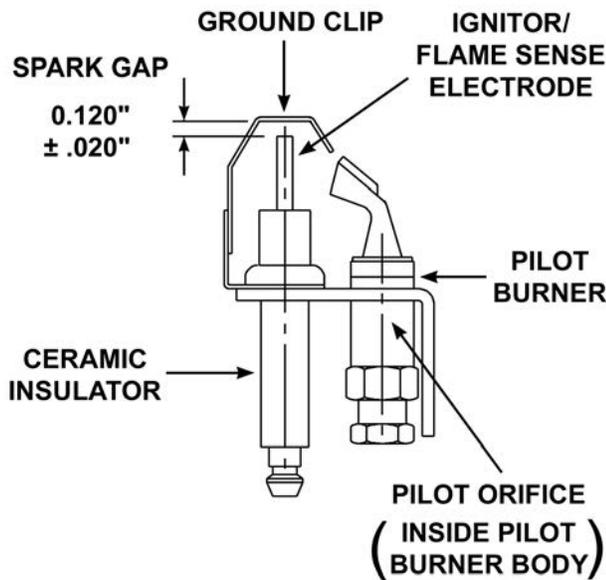
### ⚠ WARNING

**All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.**

4. Verify all electrical connections (including ground) on the ignition control module are secure.
5. Access PILOT BURNER.
6. Verify ground connection on pilot burner mounting bracket is clean and secure. The pilot burner should have good metal to metal contact to pilot mounting bracket.
7. Remove pilot burner and check the following:
  - A. Inspect ceramic insulator on the ignitor/ flame sense electrode for cracks or evidence of exposure to extreme heat, which can permit leakage to ground. If either of these conditions exist, then install a replacement pilot burner.

- B. Inspect ignitor electrode and ground clip for contaminants, or corrosion. Clean those surfaces as necessary.
- C. Spark gap between the ignitor/flame sense electrode and the ground clip should be 0.120" ± 0.020". If the gap is outside of this dimension, bend the ground clip as necessary, to make adjustment.

1ST GENERATION SHOWN IN Fig. 57



8091

Fig. 57

2ND GENERATION SHOWN IN Fig. 58

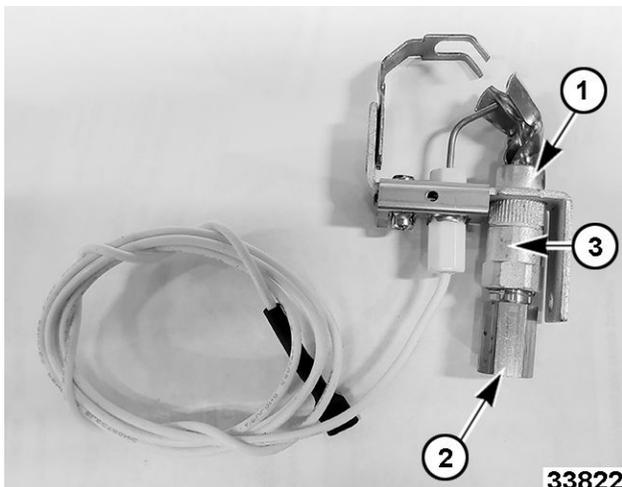


Fig. 58

- Item 1 in Fig. 58, pilot burner.
- Item 2 in Fig. 58, pilot orifice.
- Item 3 in Fig. 58, pilot tube compression fitting.

**NOTE:** Ignition wire comes with the 2nd generation pilot assy.

- D. Check ignitor cable connection for tightness and damaged insulation. If ignitor cable appears to be damaged, then install a replacement ignitor cable.
8. Install pilot burner and connect ignitor cable.
  9. Disconnect main valve (MV) lead wire from terminal 1 on ignition control module.

1ST GENERATION SHOWN IN Fig. 59

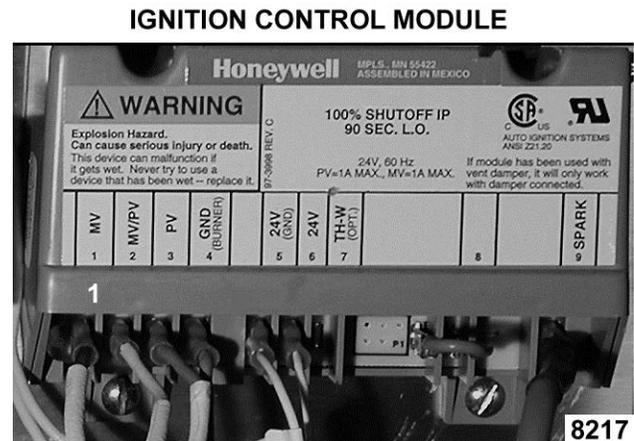


Fig. 59

2ND GENERATION SHOWN IN Fig. 60

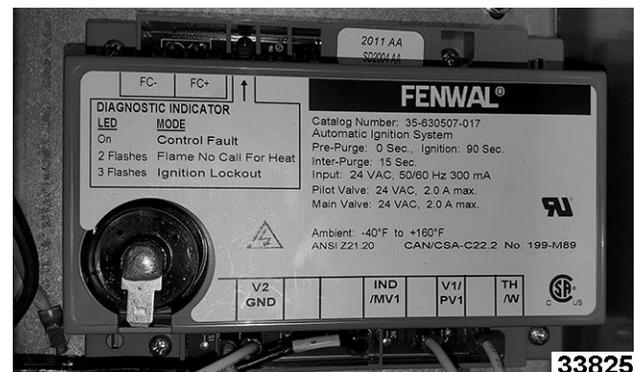
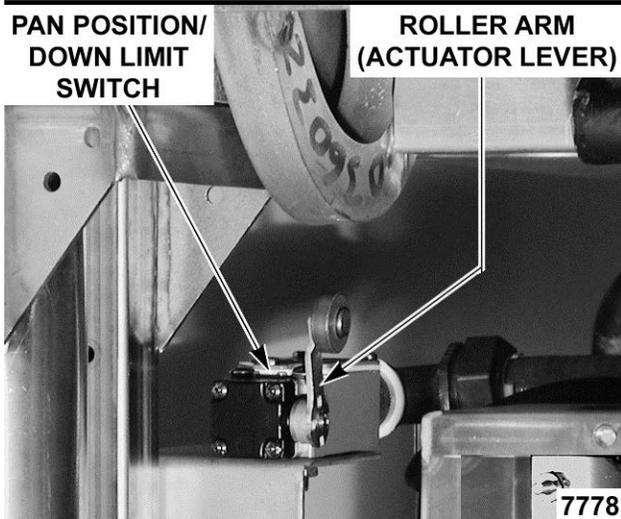


Fig. 60

**NOTE:** Removal of lead wire prevents main burners from lighting with pan raised and the pan position/down limit switch manually operated.

10. Reconnect power to machine and turn gas supply on.
11. Turn on/off switch on and set temperature dial to call for heat.
12. Manually operate pan position/down limit switch and observe spark from ignitor.

**FRONT UPPER LEFT VIEW SHOWN**



**Fig. 61**

- A. If spark from ignitor is present and lights the gas for pilot burner, and pilot burner remains lit, then system is working properly.
- B. If pilot burner lights but does not maintain an adequate flame during the trial for ignition (90 seconds):
  - 1) Check pilot burner orifice for clogging.

**NOTICE**

If orifice is clogged with debris, clean with air or non-flammable liquid only.

- 2) Check PILOT BURNER FLAME ADJUSTMENT.
- C. If spark from ignitor is present but does not light the pilot gas before ignition control module locks out, there may not be enough gas in the supply line for ignition.

Release the pan position/down limit switch to remove power and re-set the module. Wait 5 minutes between ignition tries for unburned gas to vent.

Manually operate pan position/down limit switch and sparking should resume. The module may need to be re-set several times before ignition takes place.

- 1) If pilot burner ignition is successful, release the pan position/down limit switch, turn the on/off switch to off and re-connect main valve (MV) lead wire on ignition control module.
- D. If ignitor is still not sparking, turn the on/off switch off, disconnect power to machine and turn gas supply off.

- 13. Install a replacement ignition control module and check for proper operation.

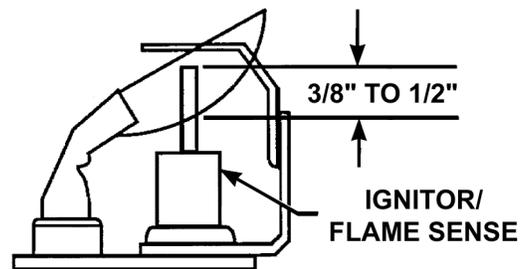
**PILOT BURNER FLAME ADJUSTMENT**

- 1. Turn the on/off switch off.
- 2. Raise the pan to the full tilt position.
- 3. Remove left side panel as outlined under COVERS AND PANELS.
- 4. Access the ignition control module as outlined under POWER SUPPLY BOX COMPONENTS in REMOVAL AND REPLACEMENT OF PARTS.
- 5. Disconnect main valve (MV) lead wire from terminal 1 on the ignition control module.

**NOTE:** Removal of lead wire prevents main burners from lighting with the pan raised and the pan position/down limit switch manually operated.

- 6. Reconnect power to the machine.
- 7. Turn on/off switch on and set the temperature dial to call for heat.
- 8. Manually operate pan position/down limit switch and observe pilot burner flame.

**PILOT BURNER FLAME ADJUSTMENT**



**8103**

**Fig. 62**

- A. If flame envelops 3/8" to 1/2" of the ignitor/flame sense electrode, pilot burner is adjusted properly.
- B. If flame is outside of the specified range, release the pan position/down limit switch and continue with procedure.
- 9. Remove adjustment screw cap to access the pilot burner flame adjustment screw.

**GAS COMBINATION VALVE**



**Fig. 63**

10. Manually operate pan position/down limit switch and observe pilot burner flame.
  - A. To increase pilot flame, turn the screw *counterclockwise*. To decrease pilot flame, turn the screw *clockwise*.
11. Once the pilot flame has been adjusted correctly, release the pan position/down limit switch, turn the on/off switch off and replace the adjustment screw cap.
12. Re-connect main valve (MV) lead wire from terminal 1 on the ignition control module.
13. Lower the pan to the full down position and check for proper operation.

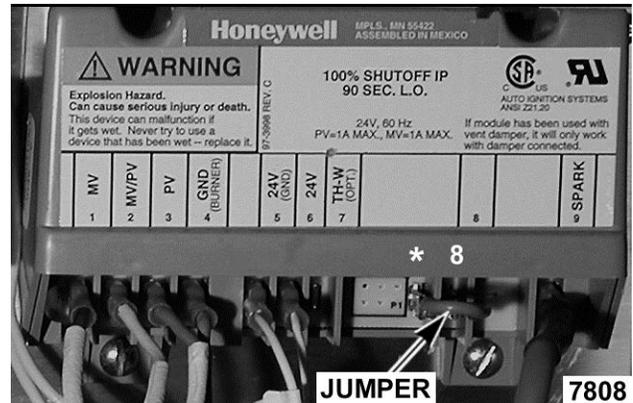
**FLAME SENSE CURRENT TEST**

**NOTE:** You must complete the SPARK IGNITION TEST prior to checking flame sense current.

If pilot burner lights but will not maintain flame, perform the following test.

1. Turn the on/off switch off.
2. Access the ignition control module as outlined under POWER SUPPLY BOX COMPONENTS in REMOVAL AND REPLACEMENT OF PARTS.
3. Remove jumper wire between terminals marked with an asterisk (\*) & 8 (shown in figure 7808).

**IGNITION CONTROL MODULE**



**Fig. 64**

4. Set VOM to micro amp scale (DC) and connect the black meter lead (-) to the asterisk (\*) terminal and red meter lead (+) to terminal 8.
5. Turn on/off switch on and set the temperature dial to call for heat.
6. With pilot burner lit, meter reading should be above 1.0 micro amp (minimum) and steady.
  - A. If reading is greater than or equal to 1.0 micro amp then flame sense current is within tolerance.
    - 1) Turn on/off switch off and replace jumper wire.
  - B. If reading is less than 1.0 micro amp and the condition of the ignitor/flame sense has been verified as good, turn on/off switch off.
7. Install a replacement ignition control module and check for proper operation.

**IGNITION CONTROL MODULE TEST**

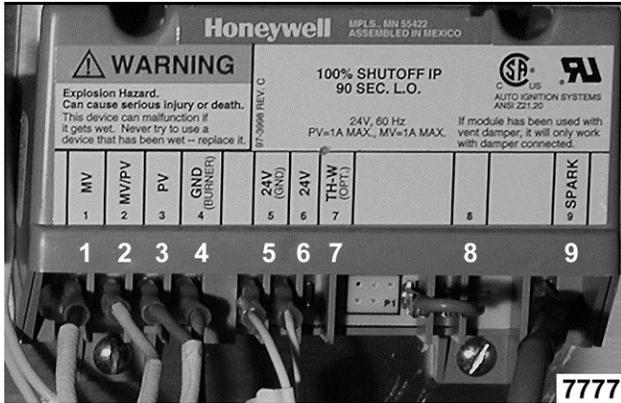


**WARNING**

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

**1ST GENERATION IGNITION CONTROL MODULE SHOWN IN Fig. 65**

**IGNITION CONTROL MODULE**



**Fig. 65**

**NOTE:** Refer to WIRING DIAGRAM for 2nd generation ignition control module connections.

1. Lower pan to full down position. Turn on/off switch on and set temperature dial to call for heat.
2. Ignition control module is energized and trial for ignition starts (90 seconds).
  - A. Verify 24VAC between terminals 5 & 6.
    - 1) If voltage is not present, see schematic diagram AI1341.
3. Pilot valve (PV) contacts close to energize the pilot valve coil, allowing gas flow to pilot burner.
  - A. Verify 24VAC between terminals 2 & 3.
    - 1) If voltage is not present, replace ignition control module and check for proper operation.
4. At the same time, spark voltage is sent from terminal 9 to the ignitor/flame sense electrode and sparking begins.
 

The pilot burner lights, pilot flame is sensed, spark voltage from terminal 9 is removed and sparking stops. Main valve (MV) contacts close to energize main valve coil, allowing gas flow to the runner tube and main burners.

  - A. Verify 24VAC between terminals 1 and 2.
    - 1) If voltage is not present, replace ignition control module and check for proper operation.
5. With pilot burner lit, the runner tube lights and main burners light.

**NOTE:** As long as temperature controller is calling for heat and the ignition control module is sensing a sufficient flame sense current, the pilot valve (PV) and main valve (MV) contacts will remain closed.

**NOTE:** If pilot burner does not immediately light, the ignition control module continues sparking for 90 seconds, then locks out power to the gas combination valve (pilot valve and main valve remain closed). The module remains locked out until the on/off switch is cycled to reset the system re-start the ignition trial cycle.

**GAS MANIFOLD PRESSURE ADJUSTMENT**



**WARNING**

**Shut off the gas before servicing the unit and follow lockout / tagout procedures.**

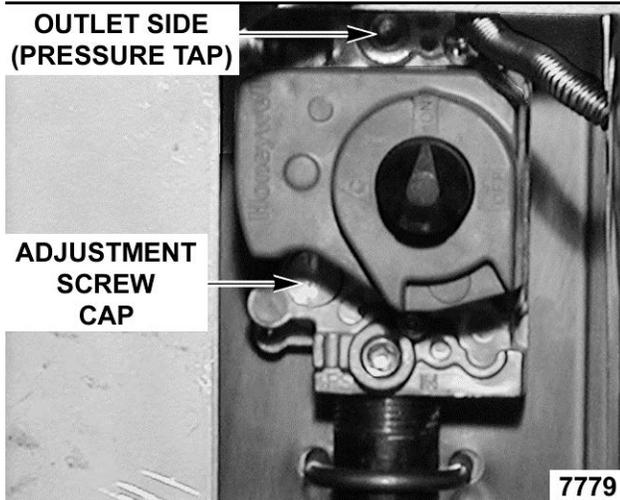
GAS PRESSURE (INCHES W.C.)				
Gas Type	Manifold	Line		
		Recommended	Min	Max
Natural	3.7	7.0	5.0	14.0
Propane	10.0	11.0	11.0	14.0

**NOTE:** If the incoming line pressure is **less** than the minimum stated, then the manifold pressure cannot be set correctly.

1. Lower the pan to the full down position.
2. Remove front panel as outlined under COVERS AND PANELS in REMOVAL AND REPLACEMENT OF PARTS.
3. Access the gas combination valve as outlined in REMOVAL AND REPLACEMENT OF PARTS.
4. Remove 1/8" NPT pipe plug on the outlet side of the gas valve (manifold pressure tap).
5. Install a hose barb adaptor at the port and attach a manometer.
6. Turn gas supply, gas combination valve and on/off switch to on.
  - A. Set the temperature dial to call for heat.
  - B. Verify main burners light.
7. Observe manometer pressure reading and compare to the gas pressure table.
  - A. If other appliances are connected to the same gas line, turn them all on and check manometer pressure reading again. If a pressure drop of 1/2" W.C. or more is observed, then the gas supply needs to be checked by the gas line installer or the local gas company for adequate sizing.

- B. If adjustment is necessary, continue with procedure.
- 8. Remove adjustment screw cap to access the pressure adjustment screw.
  - A. To increase pressure, turn the screw *clockwise*. To decrease pressure, turn the screw *counterclockwise*.

**GAS COMBINATION VALVE**



**Fig. 66**

**NOTE:** Accurate gas pressure adjustments can only be made with the gas on and the main burners lit.

- 9. Set pressure as listed in gas pressure table.
- 10. Once the correct pressure has been set, turn the on/off switch off, replace the adjustment screw cap and pipe plug.
- 11. Check for proper operation.

**MAIN BURNERS**

**Inspection**

- 1. Access the main burners as outlined in REMOVAL AND REPLACEMENT OF PARTS.
- 2. Inspect burners for clogged ports or obstructions around air shutter. Clean the burner (as necessary) using a soft bristle brush.
- 3. Inspect gas orifice for clogging. If clogs are found, remove the orifice and clean with air or non-flammable liquid only.

**NOTE:** If the orifice was removed, be sure to install the orifice in the same location. The outside burners use a slightly larger orifice than the center burner(s).

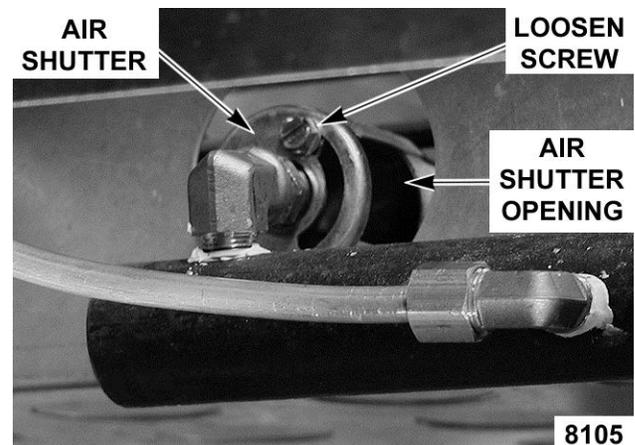
**Air Shutter Adjustment**

- 1. Verify the gas manifold pressure as outlined under GAS MANIFOLD PRESSURE ADJUSTMENT.
- 2. Turn the on/off switch off.
- 3. Remove the control panel as outlined in REMOVAL AND REPLACEMENT OF PARTS to gain viewing access to the right side burner.
- 4. Turn the on/off switch on and set the temperature dial to call for heat.

**NOTICE**

To prevent discoloration of the cooking surface, and possible pan warpage at temperature settings above 250°F, do not operate the braising pan unless the cooking surface is covered with water or a thin layer of cooking oil.

- 5. Allow burners to remain lit for at least five minutes.
- 6. Observe each burners' flame thru the opening in the front of the burner box.
  - A. If the flame is blue, air shutter is adjusted properly. A slight tinge of orange in the flame is acceptable.
  - B. If the flame is yellow tipping, this indicates too little primary air (oxygen) for proper combustion. The heating efficiency is reduced, and the amount of soot (carbon) generated as a by-product is increased. Continue with procedure to adjust.
- 7. Loosen screw on the air shutter for the burner being adjusted. Closing the air shutter will *decrease* primary air to the burner and opening the shutter will *increase* primary air the burner.



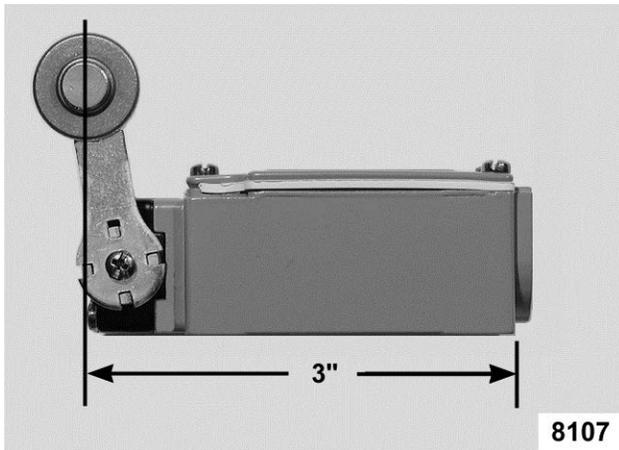
**FRONT VIEW OF BURNER AIR SHUTTER SHOWN**

8. Monitor the burner flame and set the air shutter opening as follows:
  - A. Adjust the air shutter (as necessary) to obtain a blue flame. A slight tinge of orange in the flame is acceptable.
  - B. After the air shutter adjustment is made, tighten the set screw.
9. Adjust the remaining burners as necessary.

### PAN POSITION / DOWN LIMIT SWITCH ADJUSTMENT

**NOTE:** Do not use the motorized lift (if installed) for this procedure.

1. Turn the on/off switch off.
2. Remove front and left side panels as outlined under COVERS AND PANELS.
3. Insert the manual crank handle.
4. Raise the pan to the full tilt position.
5. Verify roller arm position on switch.
  - A. Measure the distance from the rear of the switch body to the center of the roller. The distance should be 3".

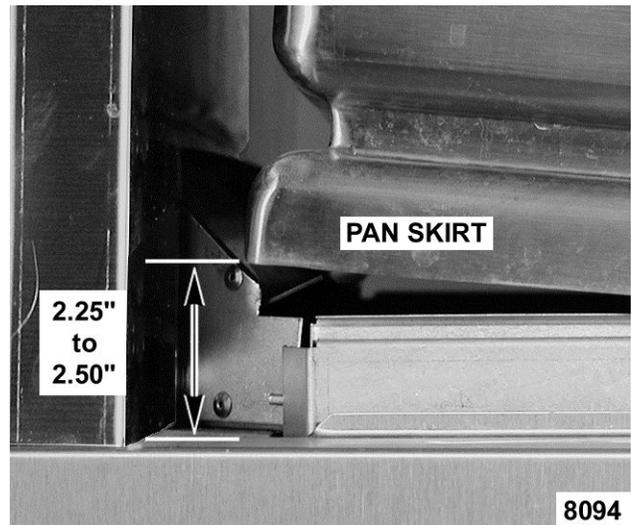


**SIDE VIEW SHOWN**

- B. If distance is ok, proceed to Step 6.
  - C. If distance is not ok, position the roller arm as outlined under PAN POSITION / DOWN LIMIT SWITCH in REMOVAL AND REPLACEMENT OF PARTS.
6. Lower the pan to the full down position. The roller should make contact with the hinge and operate the switch.
7. Verify pan position/down limit switch N.O. contacts are closing.

- A. Turn the on/off switch on and set the temperature dial to call for heat.
- B. Heat light (red) comes on and main burners light.
  - 1) If main burners do not light, verify 24VAC input to the switch, and that the voltage is output from the switch.
  - 2) If voltage is present on the output side of the switch, the switch is functioning properly.
  - 3) If voltage is not present, install a replacement pan position/down limit switch and repeat this procedure to adjust.

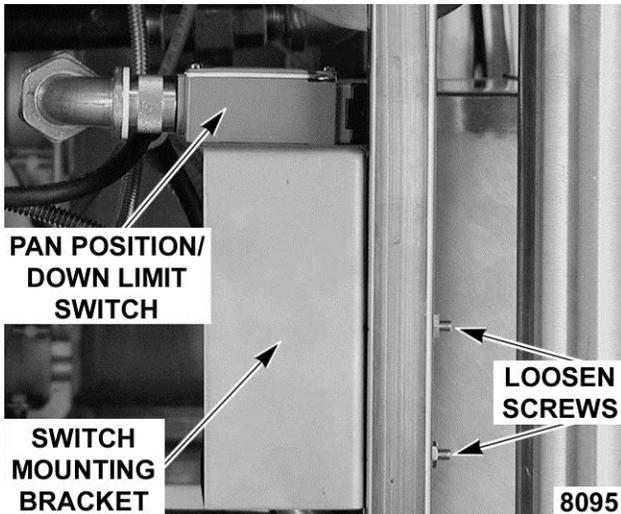
8. Verify pan position/down limit switch N.O. contacts are opening.
  - A. Slowly raise the pan until the heat light and burners go out then stop.
  - B. At the rear of the pan, measure the distance from the bottom of the pan skirt to the flat surface covering the frame.
    - 1) Distance should be 2.25" to 2.50".



**LEFT SIDE VIEW SHOWN**

**NOTE:** For reference, this is approximately 5 angular degrees.

9. If heat light and main burners go out and the measured distance is within the acceptable range, switch is adjusted properly. If both conditions are not satisfied, adjustment is necessary.
10. To Adjust:
  - A. Loosen screws on the mounting switch bracket.



LEFT SIDE VIEW SHOWN

- B. Adjust mounting switch bracket up or down (as necessary) to obtain the rear pan dimension of 2.25" to 2.50".
11. Repeat steps 5 thru 9 to check for proper operation.

### LID SPRING TENSION ADJUSTMENT

1. Raise the lid and release at several positions thru the range of travel.
  - A. If lid remains in place, no adjustment is necessary.
  - B. If lid does not remain in place (springs up or falls down), continue with procedure.

**NOTE:** For spring tension to be set correctly, each spring must be adjusted the same amount.

2. Remove spring covers by prying up at the bottom. The covers are held in place by tabs on the bottom of cover.



RIGHT SIDE REAR VIEW SHOWN

3. To adjust:
  - A. Place a 1 5/8" wrench on the lid spring lock nut and apply a downward force until locking pin can be removed. Continue to hold lock nut in place.

#### NOTICE

Do not release wrench while locking pin is removed or damage to the braising pan may occur.

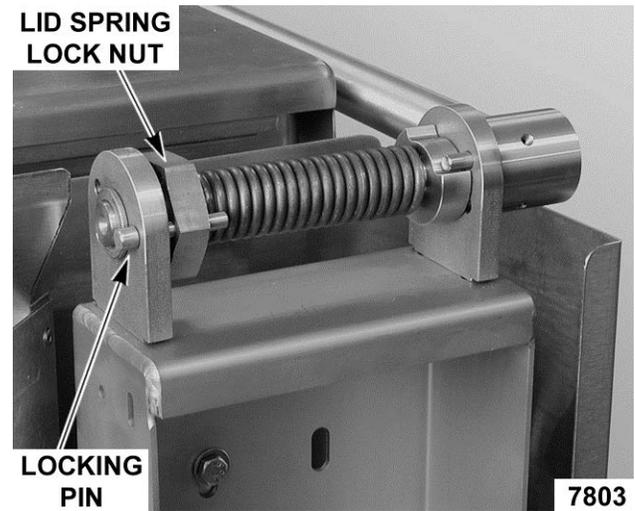


Fig. 72

- B. Apply additional downward force to *increase* spring tension; or slowly release downwards force to *decrease* spring tension.
  - C. Rotate lid spring lock nut to the next hole position then replace locking pin. Adjust the spring tension, one position at a time.
  - D. Repeat tension adjustment on the opposite spring.
4. Repeat Step 1 to verify adjustment. Make additional adjustments as necessary.

## DC MOTOR CONTROLLER TEST



### ⚠ WARNING

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

### 1ST GENERATION CONTROLLER BOARD SHOWN IN Fig. 73

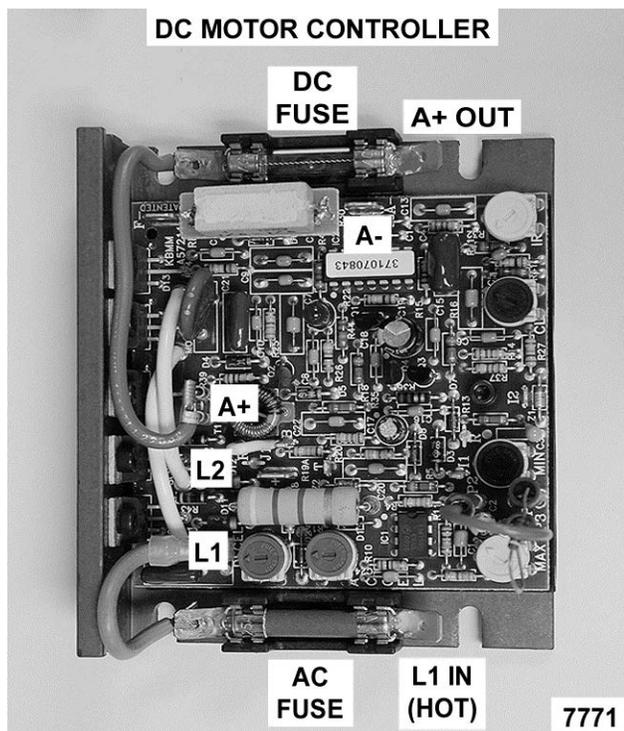


Fig. 73

### 2ND GENERATION CONTROLLER BOARD SHOWN IN Fig. 74

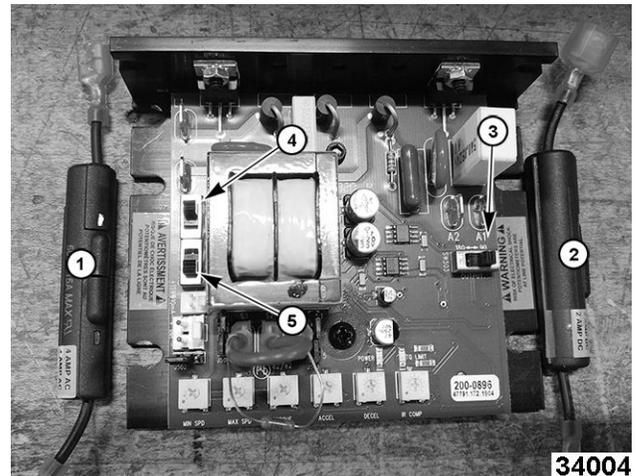


Fig. 74

- Fuse - 1, Fig. 74, 4 amp AC.
- Fuse - 2, Fig. 74, 2 amp DC.
- Switches
  - 4 and 5 switches shown in Fig. 74 are both set at 115V.
  - 3 switch shown in Fig. 74 should be set at 90.

### Trimpots 2nd Generation Controller Board in Fig. 75

- 1) MIN SPD set to 5 o'clock.
- 2) MAX SPD set to 5 o'clock.
- 3) TORQUE set to 5 o'clock.
- 4) ACCEL set to 12 o'clock.
- 5) DECEL set to 12 o'clock.
- 6) IR COMP set to 12 o'clock.



Fig. 75

1. Lower the pan to full down position.

2. Raise lid to full open position.
3. Access DC motor controller. Refer to: POWER SUPPLY BOX COMPONENTS
4. Set VOM to measure AC volts and connect meter leads at L1 & L2 on controller.
5. Turn on/off switch to on.
6. Verify 120VAC at L1 & L2 on controller when the lift control switch (momentary) is operated to raise & lower pan.
  - A. If voltage is present but pan does not raise & lower, proceed to Step 7.
  - B. If voltage is not present refer to MOTORIZED LIFT OPTION ONLY.
7. Disconnect power to machine.
8. Set VOM to measure DC volts and connect VOM leads to terminals A + (positive) & A - (negative) on controller.
9. Re-connect power to machine.
10. Verify 90VDC (approximate) from DC motor controller when the lift control switch (momentary) is operated to raise & lower pan.
  - A. If voltage is present but pan does not raise, refer to MOTORIZED LIFT OPTION ONLY.
  - B. If voltage is not present and fuse is ok, turn on/off switch off and disconnect power to machine.
11. Install a replacement DC motor controller and check for proper operation.

- 5) DECEL set to 12 o'clock.
- 6) IR COMP set to 12 o'clock.

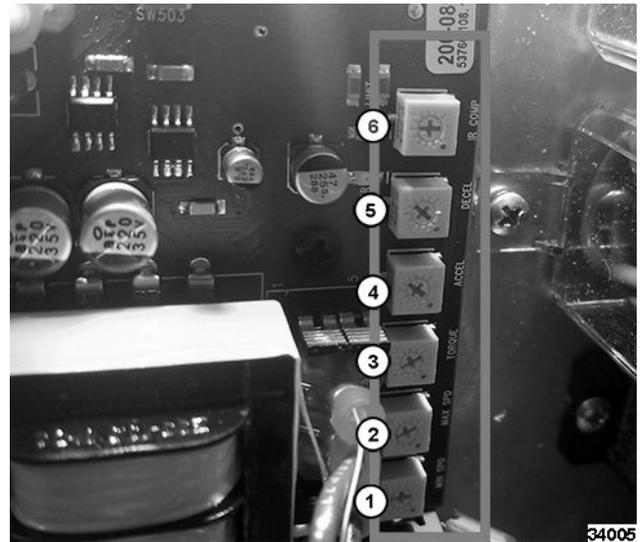


Fig. 76

## SETTING RESISTOR ON CONTROLLER SPEED BOARD



### **⚠ WARNING**

**Disconnect the electrical power to the machine and follow lockout / tagout procedures.**

### Dial in Resistor

1. Turn all dial settings (white squares) on board all the way to the left.
2. Dial in all settings (Fig. 76).
  - 1) MIN SPD set to 5 o'clock.
  - 2) MAX SPD set to 5 o'clock.
  - 3) TORQUE set to 5 o'clock.
  - 4) ACCEL set to 12 o'clock.

# ELECTRICAL OPERATION

## COMPONENT FUNCTION - BRAISING PAN CONTROLS

<b>Temperature Controller</b> .....	Monitors thermocouple input and regulates braising pan temperature. An external set point potentiometer is used for temperature adjustments.
<b>Transformer</b> .....	Supplies 24VAC for heating circuit. If motorized pan lift option is installed, supplies 24VAC for lift control circuit.
<b>ON/OFF Switch</b> .....	Controls 24VAC to the gas heating circuit. If motorized pan lift option is installed, controls power to lift circuit.
<b>Power On Light (Amber)</b> .....	Indicates on/off switch is turned on.
<b>Heat Light (Red)</b> .....	Indicates temperature controller is calling for heat and pan is down.
<b>Pan Position / Down Limit Switch</b> .....	N.O. contacts function as pan position switch to power the gas heating circuit when pan is down. Removes power from gas heating circuit when pan is raised. The N.C. contacts are used for the down limit switch (motorized lift option only).
<b>Ignition Control Module</b> .....	Controls and monitors gas heating. Energizes pilot valve coil to supply gas to pilot, generates spark to light gas at the pilot, monitors the presence of flame and energizes the main valve coil upon a call for heat.
<b>Ignitor / Flame Sense Electrode</b> .....	Ignites pilot burner and senses the presence of a flame. The Igniter / Flame Sense is a component of the pilot burner.
<b>Gas Combination Valve</b> .....	Allows gas flow to the pilot burner when pilot valve coil is energized; and gas flow to the runner tube & main burners when main valve coil is energized. Also, regulates gas manifold pressure.

## COMPONENT FUNCTION - MOTORIZED PAN LIFT OPTION CONTROLS

<b>DC Motor Controller</b> .....	Controls DC lift motor operation for raising & lowering of the pan, and provides motor acceleration control each time the controller is powered. The controller outputs approximately 90VDC to power the motor.
<b>DC Lift Motor</b> .....	Operates gear reducer to raise or lower the pan. When the correct voltage polarity is applied thru K1 contacts, motor rotates CW to raise pan. When reverse voltage polarity is applied thru K2 contacts, motor rotates CCW to lower the pan.
<b>Lid Switch</b> .....	Supplies 24VAC power to lift control switch. Used to ensure lid is open before pan can be raised.
<b>Lift Control Switch (Momentary On/Off/On)</b> .....	Energizes K1 relay coil thru up limit switch contacts (N.C.) to raise the pan. Energizes K2 relay coil thru down limit switch contacts (N.C.) to lower the pan. The switch positions are: Center neutral (starting) position off; Momentary on - lower pan; Momentary on - raise pan.
<b>Up Limit Switch</b> .....	Removes power from K1 relay coil when pan reaches full tilt (pan travel stops).
<b>Pan Position / Down Limit Switch</b> .....	N.C. contacts function as down limit switch to remove power from K2 relay coil when pan is lowered to the down position (pan travel stops). The N.O. contacts are used for the pan position switch.
<b>K1 "Up" Relay (3PDT)</b> .....	Supplies power to motorized lift circuit to raise the pan when 24VAC coil is energized.

**K2 "Down" Relay (3PDT)** ..... Supplies power to motorized lift circuit to lower the pan when 24VAC coil is energized by the lift control switch. The voltage polarity to the DC motor is reversed thru K2 contacts to turn motor CCW and lower the pan.

**COMPONENT LOCATION**

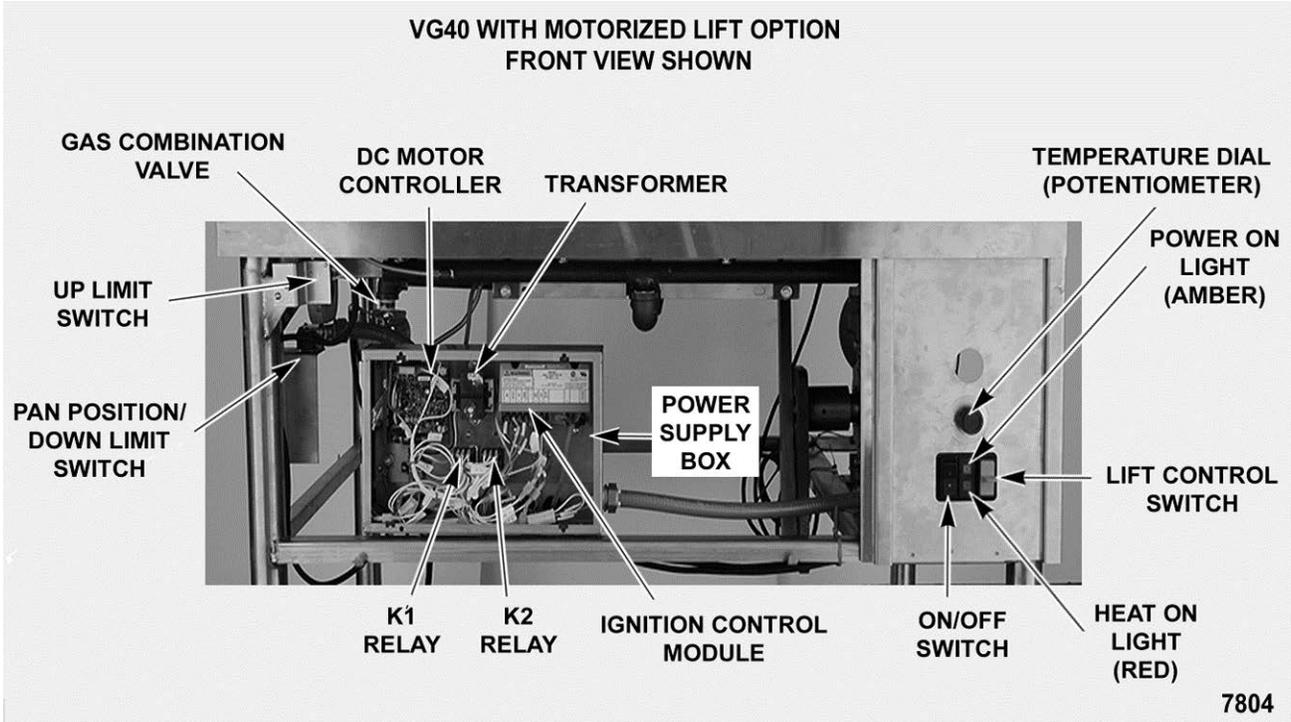


Fig. 77

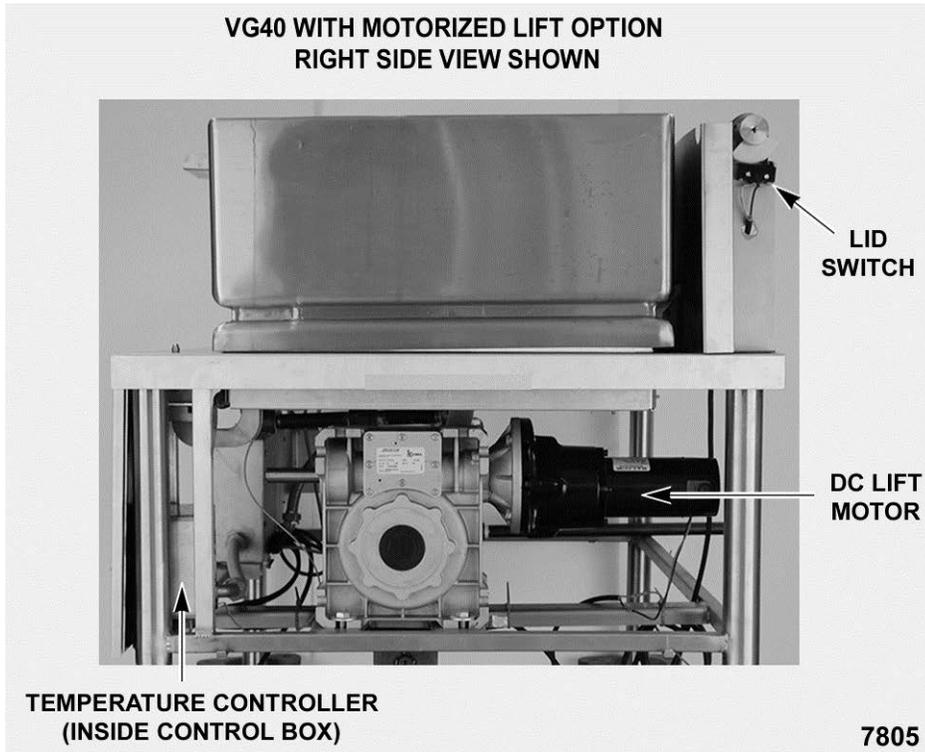


Fig. 78

## IGNITION CONTROL MODULE

The ignition control module is energized when 24 volts is applied between terminals 5 & 6.

The module outputs 24 volts from terminals 2 & 3 to the pilot valve coil (PV) on the gas combination valve, allowing gas flow to the pilot burner.

At the same time, the module generates a spark voltage output of approximately 13K at terminal 9 to begin sparking at the ignitor/flame sense electrode.

The sparking will continue until an adequate pilot flame sense current is sensed by the module or for a maximum of 90 seconds.

**NOTE:** If pilot is not established within the 90 second ignition trial time, the ignition module locks out by removing power to the gas combination valve. The system remains locked out until the on/off switch is cycled to reset the system and re-start the ignition trial cycle.

With the pilot burner lit, a flame sense current in DC micro amps is rectified thru the ignitor cable back to terminal 9.

When the module senses a sufficient pilot flame current, the module outputs 24 volts from terminal 1 & 2 to energize the main valve coil (MV) on the gas combination valve, allowing gas flow to the runner tube and main burners.

When power to the ignition control module is removed, the output voltages are also removed. The pilot valve coil (PV) and the main valve coil (MV) on the gas combination valve are de-energized and close. Gas flow to the pilot burner, runner tube and main burners stop and all burners go out.

**NOTE:** 1st generation shown in [Fig. 79](#). Refer to [WIRING DIAGRAMS](#) for 2nd generation wiring connections.

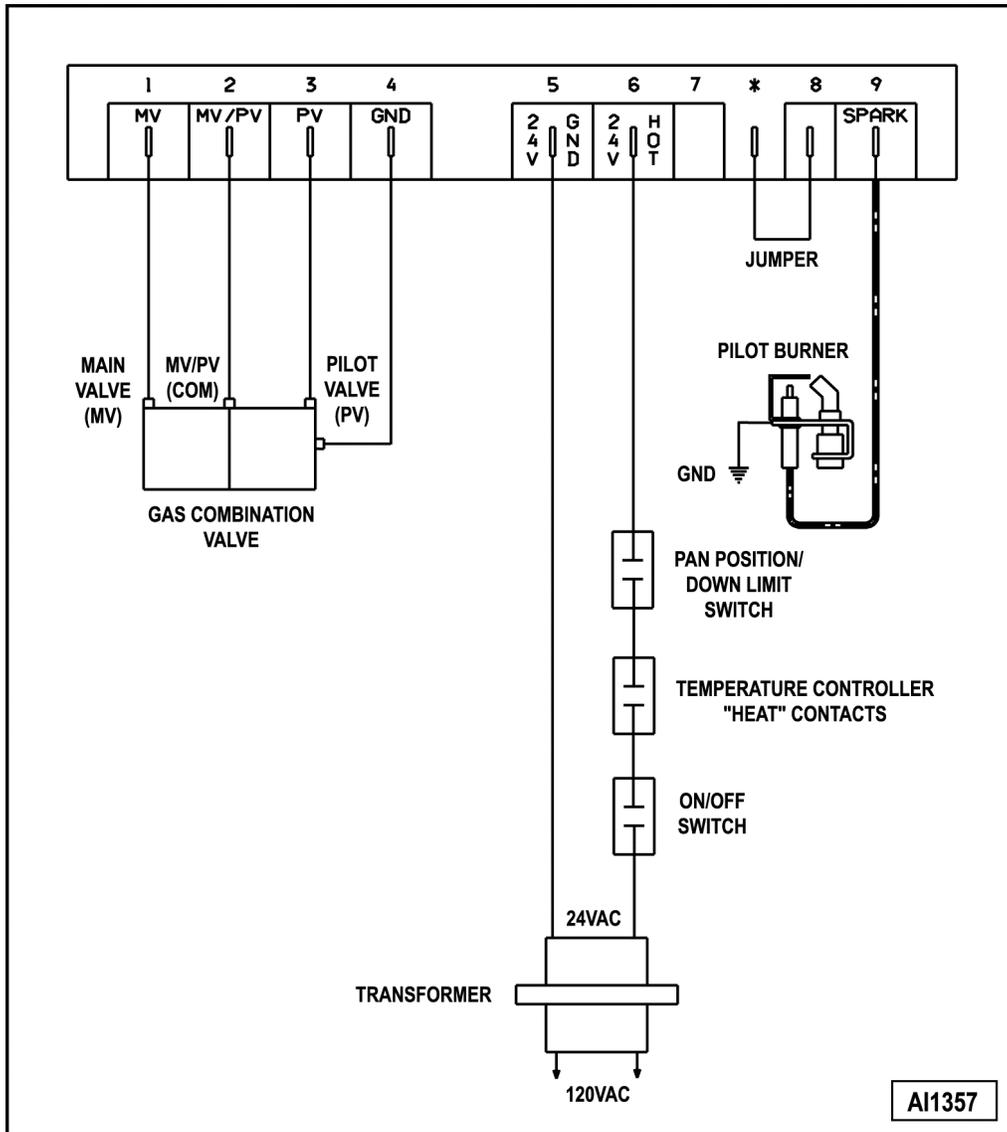


Fig. 79

## SEQUENCE OF OPERATION - HEATING

Refer to schematic diagram [A11341](#) for the electrical sequence of operation. Manual pan lift is the standard configuration.

1. Conditions.

- A. 120VAC to braising pan, polarity is correct, and is properly grounded.
  - 1) Temperature controller energized.
  - 2) 24VAC transformer energized.
- B. Temperature dial at lowest setting (potentiometer fully CCW).

**NOTE:** Temperature controller internal relay "HEAT" contacts remain open (N.O.).

C. Pan temperature is below 200°F.

D. On/off switch off.

E. Pan position/down limit switch N.O. contacts closed (pan down).

F. Gas supply on.

G. Gas combination control valve on.

2. Turn on/off switch on.

A. Indicator light (amber) comes on.

3. Set the temperature dial to call for heat.

A. Internal relay on temperature controller is energized and the "HEAT" contacts close (N.O.).

1) Heat light (red) comes on.

2) Ignition control module.

**NOTE:** If pan is raised 2.25" to 2.50" at the rear, pan position/down limit switch N.O. contacts will open and de-energize the heating circuit.

4. Refer to IGNITION CONTROL MODULE TEST.
5. Braising pan reaches set point temperature.
  - A. Internal relay on temperature controller is de-energized and the "HEAT" contacts open (N.O.).
    - 1) Heat light (red) goes out.
    - 2) Power is removed from the ignition control module.
6. Braising pan will continue to cycle with the temperature controller until the pan is raised or the on/off switch is turned off.

### SEQUENCE OF OPERATION - MOTORIZED PAN LIFT (Option)

Refer to the dashed line sections labeled "MOTORIZED LIFT OPTION" on the schematic diagram AI1341 for the integration of the motorized pan lift components into the sequence of operation.

1. Conditions.
  - A. 120VAC to braising pan, polarity is correct, and is properly grounded.
  - B. 24VAC transformer energized.
  - C. On/off switch off.
  - D. Lift control switch off (center position).
  - E. Lid switch N.O. contacts closed (lid opened).
  - F. Up limit switch N.C. contacts closed (pan position is less than full tilt).
  - G. Pan position/down limit switch N.O. contacts closed; and N.C. contacts open (pan down).

**NOTE:** The pan position/down limit switch are contained in the same switch body. Both sets of DPST contacts are utilized.

2. Turn on/off switch on.
  - A. Indicator light (amber) comes on.

**NOTE:** If the temperature dial is set to call for heat, the ignition trial starts and module begins sparking.

3. Operate the lift control switch to raise the pan (momentary on - raise).
  - A. K1 relay coil is energized thru the up limit switch N.C contacts.

- 1) K1 4/7 N.O. contacts close.
- 2) K1 9/6 N.O. contacts close.
- 3) K1 8/5 N.O. contacts close.

- B. 120VAC to DC motor controller thru K1 4/7 N.O. contacts.
  - 1) 90VDC output is activated at terminals A + (positive) and A - (negative). DC lift motor powered thru K1 9/6 N.O. contacts, K1 8/5 N.O. contacts and pan raises.

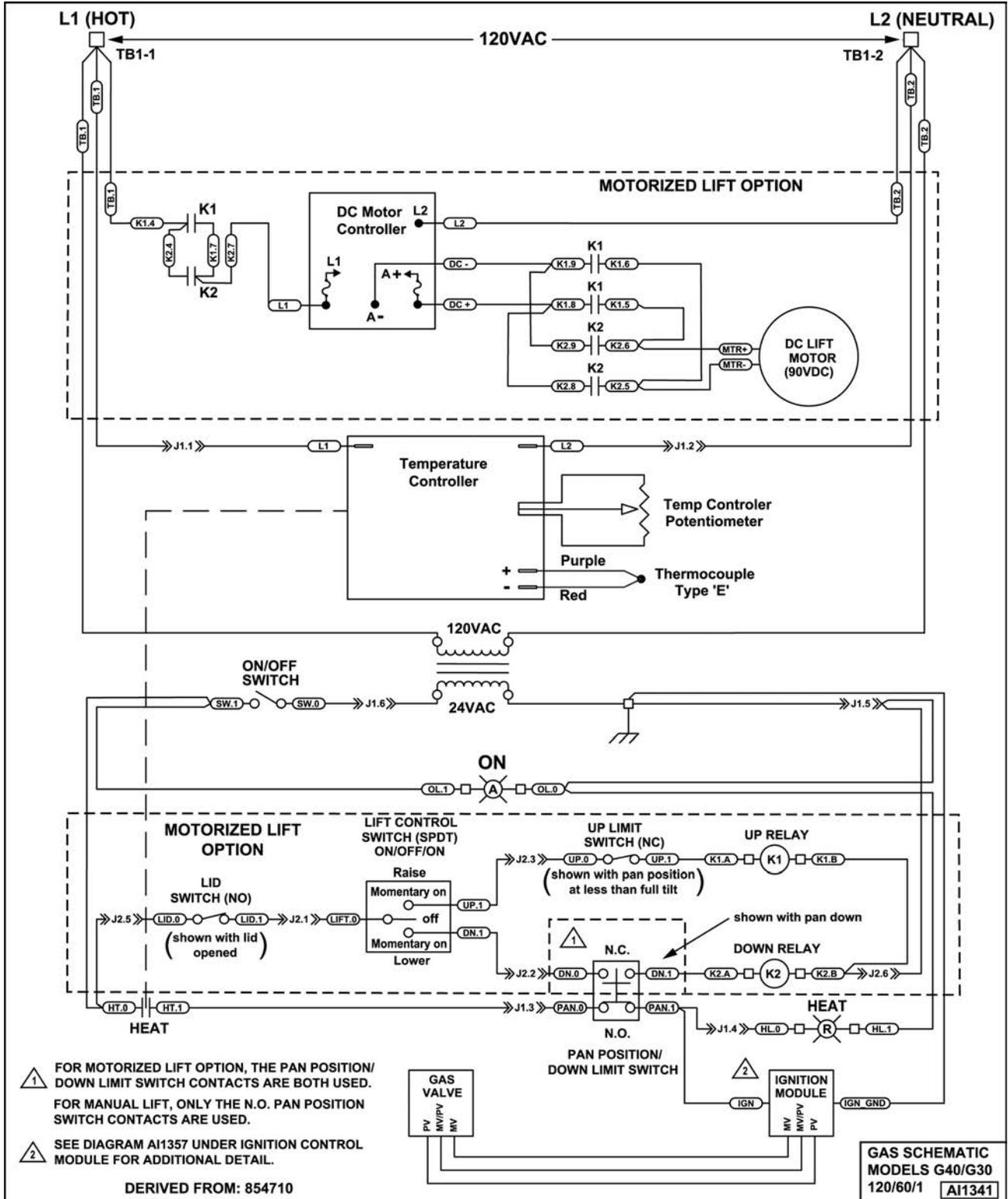
4. When the pan is raised 2.25" to 2.50" at the rear, pan position/down limit switch contacts change state. The N.O contacts open to remove power from the heating circuit; and the N.C contacts close. Power is then available for K2 relay coil thru the N.C. set of contacts.

The pan can still be raised or lowered thru its travel range by operating the lift control switch. Release switch to stop pan travel.

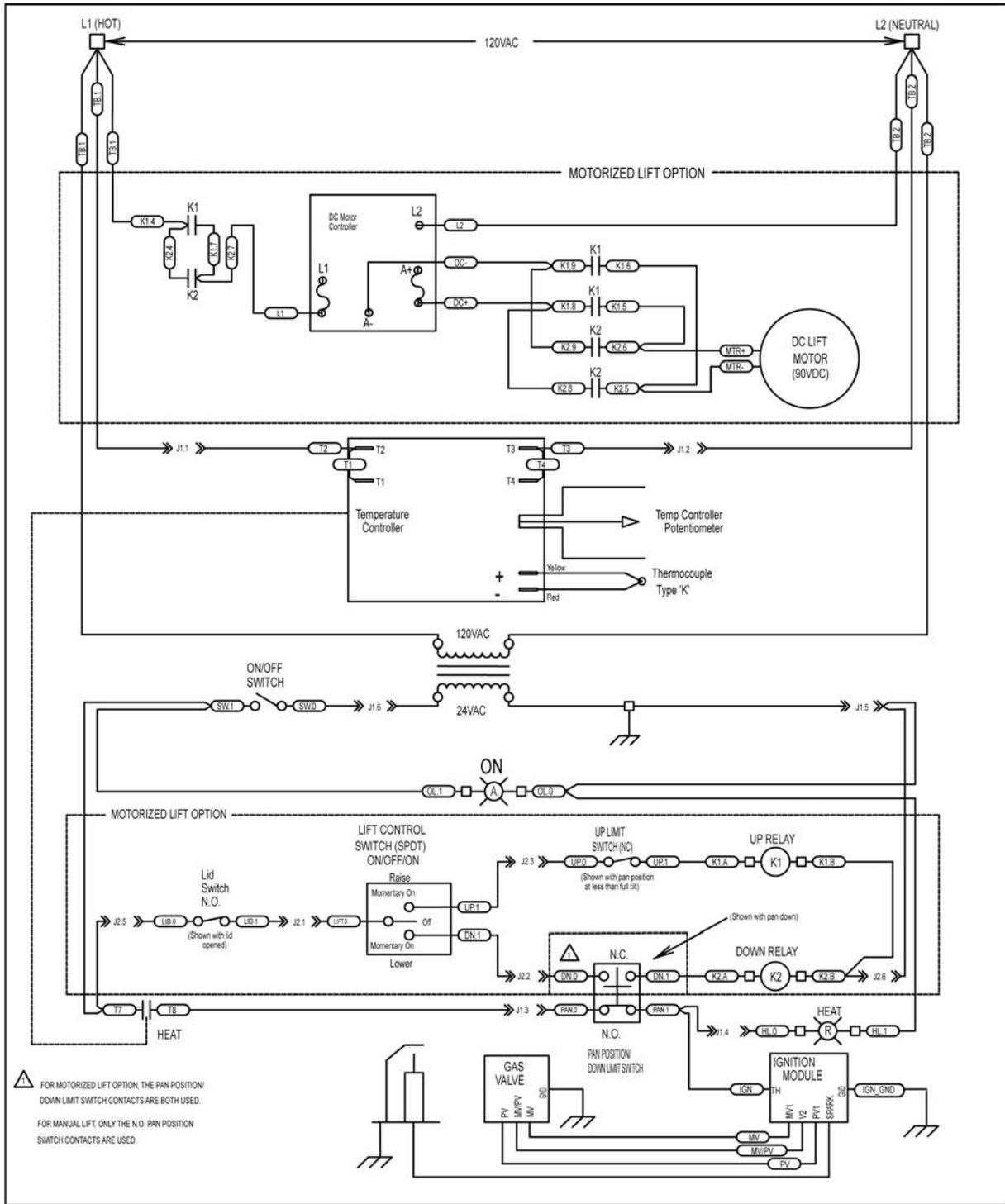
5. Pan reaches full tilt position, the up limit switch N.C. contacts open and K1 relay coil is deenergized.
  - A. The three sets of K1 contacts return to N.O. position. Power is removed from the DC motor controller, the DC lift motor and pan travel stops.
6. Operate the lift control switch to lower the pan (momentary on - lower).
  - A. K2 relay coil is energized thru the down limit switch N.C contacts.
    - 1) K2 4/7 N.O. contacts close.
    - 2) K2 9/6 N.O. contacts close.
    - 3) K2 8/5 N.O. contacts close.
  - B. 120VAC to DC motor controller thru K2 4/7 N.O. contacts.
    - 1) 90VDC output is activated at terminals A + (positive) and A - (negative). DC lift motor powered thru K2 9/6 N.O. contacts, K2 8/5 N.O. contacts and pan lowers.
7. After the pan leaves the full tilt position, the up limit switch N.C. contacts close. The direction of pan travel can then be reversed by un-operating the switch (pan travel stops) then operating the switch to raise the pan.
8. Pan reaches full down position, down limit switch N.C. contacts open and K2 relay coil is de-energized.

- A. The three sets of K2 contacts return to N.O. position. Power is removed from the DC motor controller, the DC lift motor and pan travel stops.

**SCHEMATIC DIAGRAM**



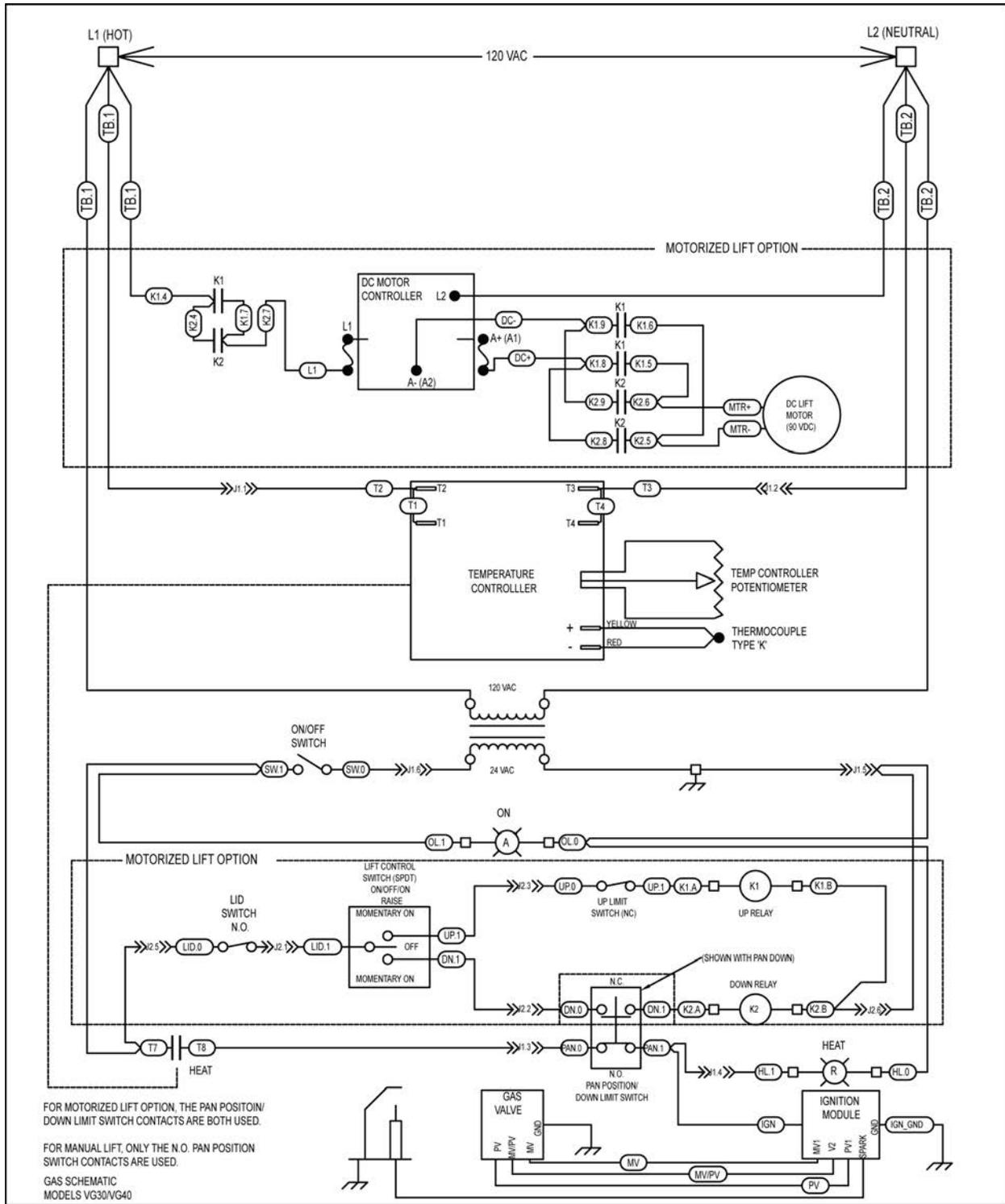
**1ST GENERATION WATLOW TEMPERATURE CONTROLLER - HONEYWELL IGNITION CONTROL MODULE**



DERIVED FROM 00-854710-00001 REV H

AI4983

**2ND GENERATION CYRDOM TEMPERATURE CONTROLLER - HONEYWELL IGNITION CONTROL MODULE**



DERIVED FROM 00-854710-0001 REV I

AI4981

**2ND GENERATION CYRDOMTEMPERATURE CONTROLLER - FENWELL IGNITION CONTROL MODULE**

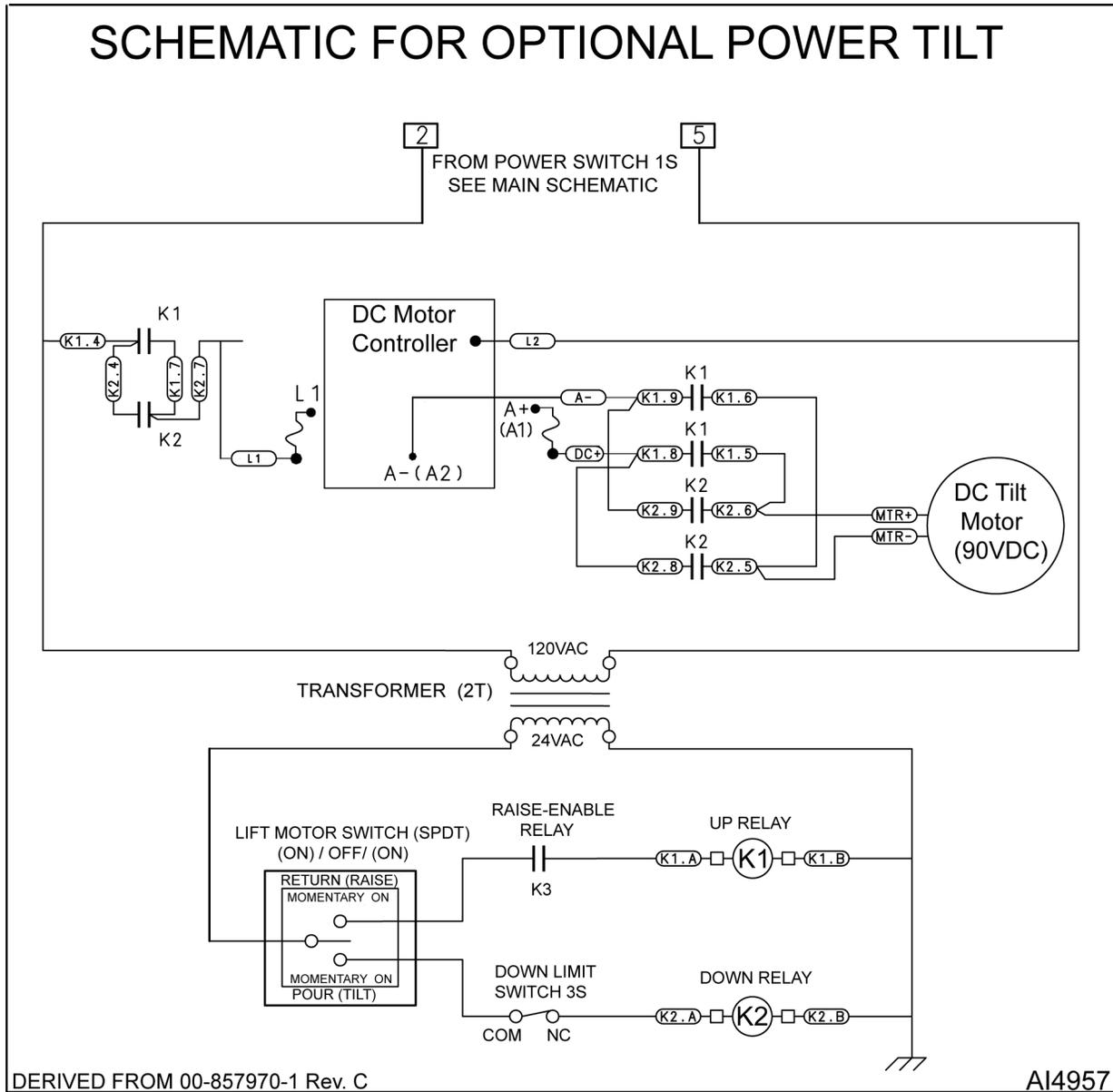


Fig. 83

# TROUBLESHOOTING

## GAS HEATING (MANUAL LIFT OR MOTORIZED LIFT OPTION)

SYMPTOMS	POSSIBLE CAUSES
No spark to ignite pilot burner gas, power on light is lit.	<ol style="list-style-type: none"> <li>1. Pan not fully lowered or pan position/down limit switch malfunction.</li> <li>2. Temperature dial not set to call for heat or temperature controller malfunction.</li> <li>3. Verify ground wire attached to pilot mounting bracket.</li> <li>4. Ignitor cable open or grounded (short).</li> <li>5. Ignitor spark gap distance incorrect.</li> <li>6. Shorted electrode or an improper ground on ignitor/flame sense.</li> <li>7. Ignition module not grounded or inoperative.</li> </ol>
Spark at ignitor but pilot burner does not light.	<ol style="list-style-type: none"> <li>1. Gas combination valve off or inoperative.</li> <li>2. Gas supply off or insufficient gas pressure.</li> <li>3. Ignitor spark gap distance incorrect.</li> <li>4. Pilot burner orifice obstructed.</li> <li>5. Ignition Module malfunction.</li> </ol>
Pilot burner lights but will not maintain flame.	<ol style="list-style-type: none"> <li>1. Ignitor/flame sense lead wire connections malfunction.</li> <li>2. Improper ground on pilot burner or ignitor/flame sense; or ignitor/flame sense malfunction.</li> <li>3. Pilot burner misaligned or Ignitor/flame sense malfunction.</li> <li>4. Gas pressure not within specified range.</li> <li>5. Incorrect polarity from transformer to Ignition module.</li> <li>6. Ignition Module malfunction.</li> </ol>
Main burner(s) do not light or will not maintain flame.	<ol style="list-style-type: none"> <li>1. Gas pressure incorrect.</li> <li>2. Altitude issue. Verify orifice is correct size.</li> <li>3. Runner tube - gas orifice obstructed or malfunction.</li> <li>4. Main burner - gas orifice obstructed or malfunction.</li> <li>5. Main Burner(s) incorrect air shutter position or burner malfunction.</li> <li>6. Gas combination valve malfunction.</li> </ol>
Braising pan does not heat, power on light is lit.	<ol style="list-style-type: none"> <li>1. Temperature controller malfunction.</li> <li>2. Pan position/down limit switch malfunction.</li> <li>3. Ignition module malfunction.</li> <li>4. Gas combination valve malfunction.</li> <li>5. Interconnecting wiring malfunction.</li> </ol>

SYMPTOMS	POSSIBLE CAUSES
Braising pan does not heat, power on light is not lit.	<ol style="list-style-type: none"> <li>1. Main circuit breaker off or power not connected.</li> <li>2. On/off switch off or malfunction.</li> <li>3. Transformer inoperative.</li> <li>4. Interconnecting wiring malfunction.</li> </ol>
Excessive or low heat.	<ol style="list-style-type: none"> <li>1. Temperature probe malfunction.</li> <li>2. Temperature controller malfunction.</li> <li>3. Gas pressure incorrect.</li> <li>4. Gas orifice obstructed or incorrect.</li> </ol>
Pilot valve lights fine initially but intermittently will not light even though it is sparking.	<ol style="list-style-type: none"> <li>1. If voltage is present at gas valve MV/PV (common) and PV connections then the gas valve may not be opening.</li> <li>2. If there is no voltage present at the MV/PV and PV connections check the ignition module.</li> </ol>

**MOTORIZED LIFT OPTION ONLY**

SYMPTOM	POSSIBLE CAUSES
Pan will not raise.	<ol style="list-style-type: none"> <li>1. Lid switch open (lid not opened) or malfunction.</li> <li>2. Transformer inoperative.</li> <li>3. On/off switch off or malfunction.</li> <li>4. Lift control switch malfunction (momentary on - raise).</li> <li>5. Up limit switch malfunction.</li> <li>6. K1 relay malfunction.</li> <li>7. DC motor controller - Fuses open or controller malfunction.</li> <li>8. DC Lift motor inoperative.</li> <li>9. Gear reducer malfunction.</li> </ol>
Pan will not lower.	<ol style="list-style-type: none"> <li>1. Lid switch open (lid not opened) or malfunction.</li> <li>2. Pan position is below 2.25" to 2.50" at the rear. Raise pan to return pan position/down limit switch N.C. contacts to closed position.</li> <li>3. Transformer inoperative.</li> <li>4. On/off switch off or malfunction.</li> <li>5. Lift control switch malfunction (momentary on - lower).</li> <li>6. Down limit switch malfunction.</li> <li>7. K2 relay malfunction.</li> <li>8. DC motor controller - Fuses open or controller malfunction.</li> <li>9. DC Lift motor inoperative.</li> <li>10. Gear reducer malfunction.</li> </ol>



VE40 SHOWN

## VE30 / VE40 Electric Braising Pan

VE30	ML-126849
VE40	ML-126850
VE30 FAST BATCH	ML-152047
VE40 FAST BATCH	ML-152048

### - NOTICE -

This Manual is prepared for the use of trained Hobart Service Technicians and should not be used by those not properly qualified.

This manual is not intended to be all encompassing. If you have not attended a Hobart Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Hobart Service Technician.

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# TABLE OF CONTENTS

SERVICE UPDATES .....	3
SERVICE UPDATES .....	3
GENERAL .....	4
INSTALLATION, OPERATION, AND CLEANING .....	4
INTRODUCTION .....	4
TOOLS .....	4
SPECIFICATIONS .....	4
REMOVAL AND REPLACEMENT OF PARTS .....	6
COVERS AND PANELS .....	6
POWER SUPPLY BOX COMPONENTS .....	7
TEMPERATURE CONTROLLER .....	8
PAN POSITION / DOWN LIMIT SWITCH .....	9
UP LIMIT SWITCH .....	11
LID SWITCH .....	11
THERMOCOUPLE PROBE .....	11
THERMOCOUPLE PROBE - FAST BATCH MODELS .....	12
DC LIFT MOTOR .....	13
GEAR REDUCER .....	14
ACCESSING BRAISING PAN ACTUATOR FROM TOP .....	19
HEATING ELEMENTS .....	21
HEATING ELEMENTS - FAST BATCH MODELS .....	21
HIGH LIMIT THERMOSTAT .....	22
HIGH LIMIT THERMOSTAT - FAST BATCH MODELS .....	22
LID SPRINGS .....	23
SERVICE PROCEDURES AND ADJUSTMENTS .....	25
TEMPERATURE CONTROLLER CALIBRATION .....	25
TEMPERATURE CONTROLLER TEST - 1ST GENERATION .....	26
TEMPERATURE CONTROLLER TEST - 2ND GENERATION STARTING AT SN 46-303592 .....	28
THERMOCOUPLE TEST .....	29
THERMOCOUPLE TEST - 2ND GENERATION STARTING AT SN 46-303592 .....	30
HEATING ELEMENT TEST .....	30
DC MOTOR CONTROLLER TEST .....	31
PAN POSITION / DOWN LIMIT SWITCH ADJUSTMENT .....	32
LID SWITCH ADJUSTMENT .....	33
LID SPRING TENSION ADJUSTMENT .....	35
SETTING RESISTOR ON CONTROLLER SPEED BOARD .....	35
ELECTRICAL OPERATION .....	37
COMPONENT FUNCTION .....	37
COMPONENT LOCATION .....	38
SEQUENCE OF OPERATION .....	39
SCHEMATIC DIAGRAM .....	41
WIRING DIAGRAMS .....	44
TROUBLESHOOTING .....	47
ELECTRIC LIFTING - MANUAL OR MOTORIZED LIFT OPTIONS .....	47
MOTORIZED LIFT OPTION ONLY .....	47

# SERVICE UPDATES

## SERVICE UPDATES

### August 2020

- SPECIFICATIONS
- THERMOCOUPLE PROBE - FAST BATCH MODELS
- HEATING ELEMENTS - FAST BATCH MODELS
- THERMOCOUPLE TEST - 2ND GENERATION STARTING AT SN 46-303592
- DC MOTOR CONTROLLER TEST
- COMPONENT FUNCTION
- SCHEMATIC DIAGRAM
- WIRING DIAGRAMS

# GENERAL

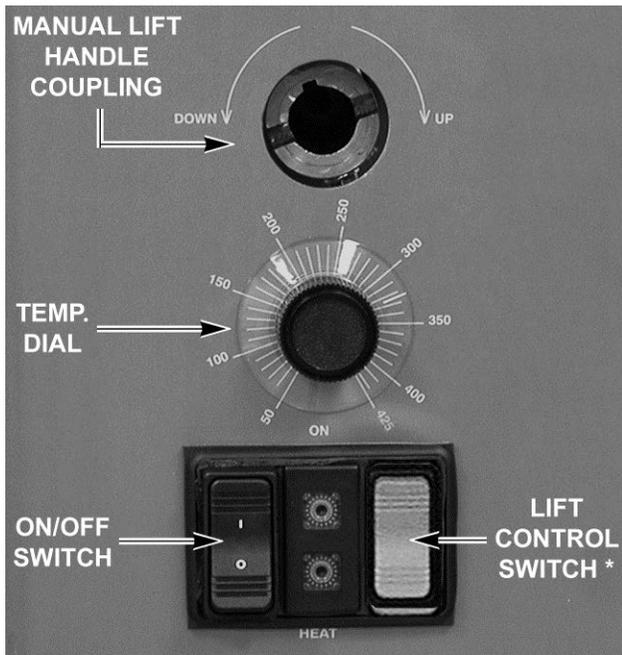
## INSTALLATION, OPERATION, AND CLEANING

Refer to the Installation & Operation Manual for specific instructions.

## INTRODUCTION

The tilting braising pan (skillet) is a versatile piece of cooking equipment. It can be used to stew, simmer, steam, sear, pan fry, grill or saute food products over an evenly distributed heating surface. Once the product is fully cooked, the pan can be tilted for ease of product removal.

### Control Panel



\* AUTO LIFT OPTION ONLY

7780

### Model Designations

- VE30 - 30 gallon capacity
- VE40 - 40 gallons capacity

## TOOLS

### Standard

- Standard set of hand tools.
- VOM with minimum of NFPA-70E CATIII 600V, UL/CSA/TUV listed. Sensitivity of at least 20,000 ohms per volt and the ability to measure DC micro amps. Meter leads must also be rated at CAT III 600V.
- Temperature tester (thermocouple type) with surface probe.
- 1 5/8" open end wrench. Used for removing lid springs and adjusting lid spring tension.
- Field service grounding kit P/N TL- 84919.

### Special

- 1 5/8" open end wrench. Used for removing lid springs and adjusting lid spring tension.
- Field service grounding kit P/N TL- 84919.

## SPECIFICATIONS

VOLTS	PHASE	AMPERAGE PER LINE					
		VE30		VE40			
		TOTAL KW	L1-L3	TOTAL KW	L1	L2	L1
208	1	9	43	12	58	58	
240	1	12	50	16	67	67	
208	3	9	25	12	39	39	25
240	3	12	29	16	46	46	29

VOLTS	PHASE	AMPERAGE PER LINE					
		VE30		VE40			
		TOTAL KW	L1-L3	TOTAL KW	L1	L2	L1
480	3	12	15	16	23	23	15
NOTES:	<ol style="list-style-type: none"> <li>1. Amperage values in the table are nominal. Tolerance is +5/-10%.</li> <li>2. Voltage values are @ 60HZ.</li> <li>3. All models are shipped for 208/240V three phase connections. If a 208/240V single phase connection is needed, the machine is field convertible at the terminal block. See wiring diagram AI1378.</li> <li>4. On all 208V machines, the 240V heating element is being used (total KW output is reduced).</li> <li>5. On VE40 three phase machines only, the heating elements are wired to be an unbalanced load.</li> </ol>						

FAST BATCH MODELS						
MODEL NUMBER	VOLTAGE (L-L)	RATED LINE CURRENT (A)				RATED POWER (kW)
		3 PHASE			1 PHASE	
		L1	L2	L3		
VE30-FB	208	33.3	33.3	33.3	57.7	12
	240	28.9	28.9	28.9	50.0	12
	480	14.4	14.4	14.4	-	12
VE40-FB	208	45.9	41.6	45.9	76.9	16
	240	39.7	36.1	39.7	66.7	16
	480	19.9	18.0	19.9	-	16

# REMOVAL AND REPLACEMENT OF PARTS

## COVERS AND PANELS

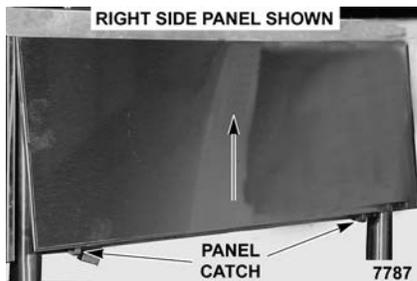


### **WARNING**

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

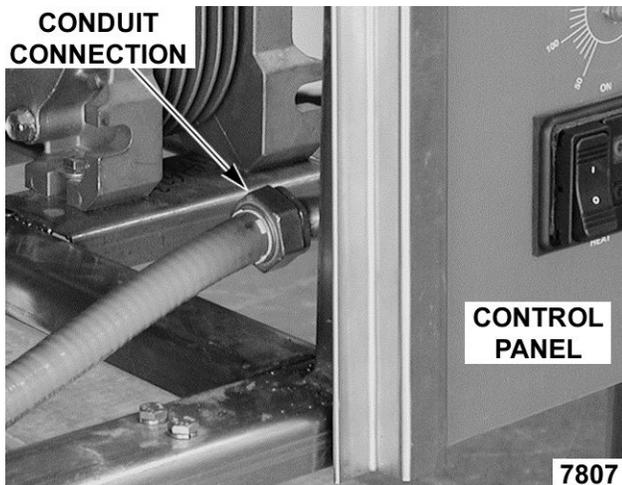
### Front, Rear, and Side Panels

1. Lift up on the bottom edge of panel until it clears the catch.
2. Tilt outwards and allow the panel to drop down.
3. Reverse procedure to install.

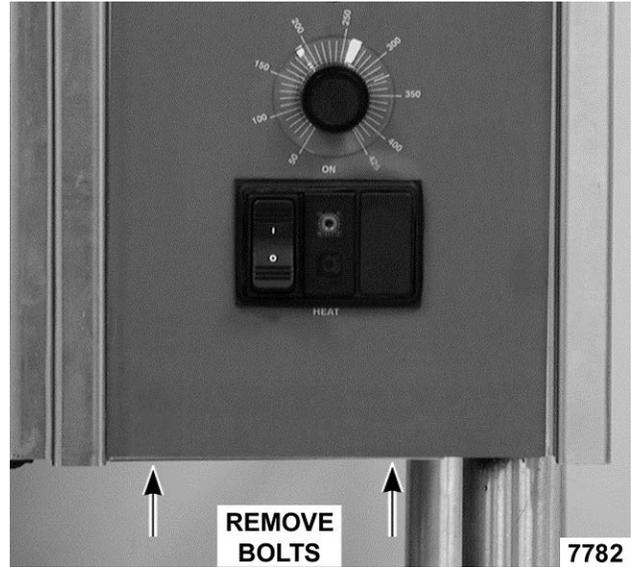


### Control Panel

1. Remove front panel.
2. Disconnect conduit from control box.



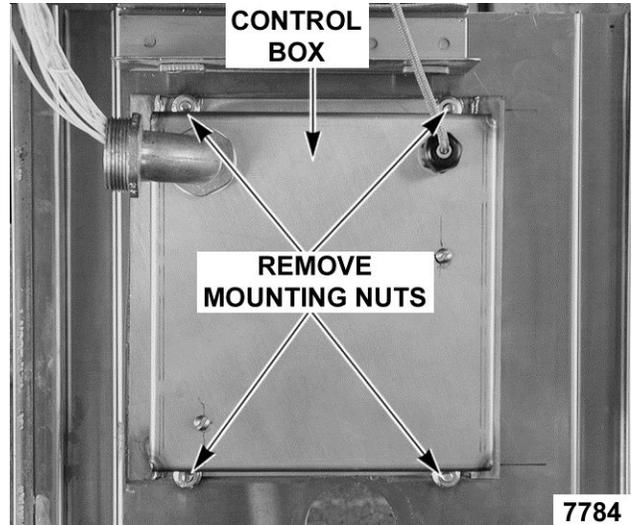
3. Remove manual lift crank handle (if installed).
4. Remove bolts securing control panel to braising pan frame. Bolts are recessed in the frame channel.



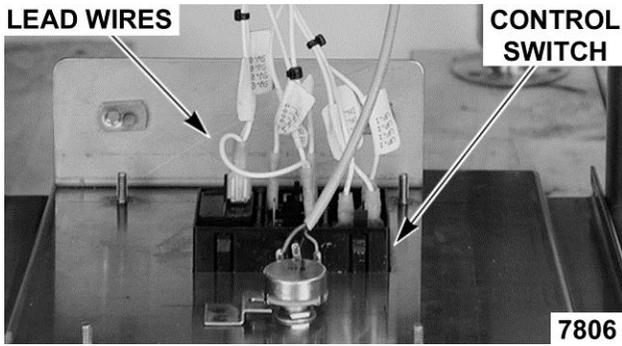
5. Tilt bottom of control panel outwards and pull down.

**NOTE:** The control panel should be supported to remove lead wire strain.

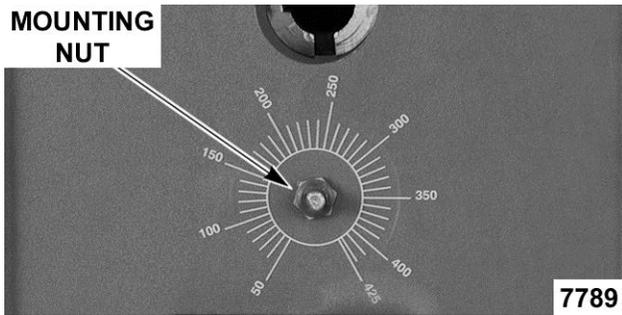
6. Remove control box from control panel.



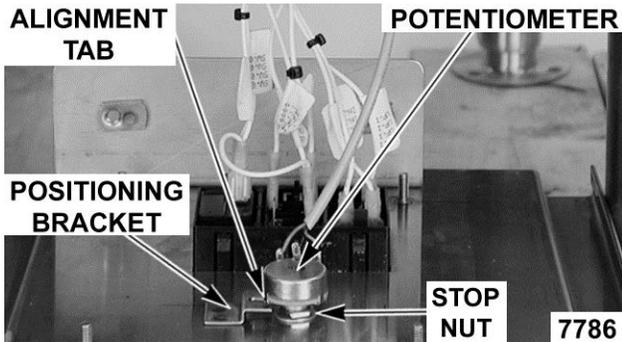
7. Disconnect lead wires from control switch.



8. Pull temperature dial from potentiometer shaft and remove mounting nut.



9. Control panel is removed.
10. To install.
  - A. Align tab on potentiometer with positioning bracket on panel.
  - B. Install mounting nut and tighten.
  - C. Adjust stop nut on potentiometer body (as necessary) to ensure a water tight seal on mounting nut.
  - D. Attach temperature dial.



11. Reverse procedure from Step 6 to complete the installation.
12. Check calibration as outlined under TEMPERATURE CONTROLLER CALIBRATION.

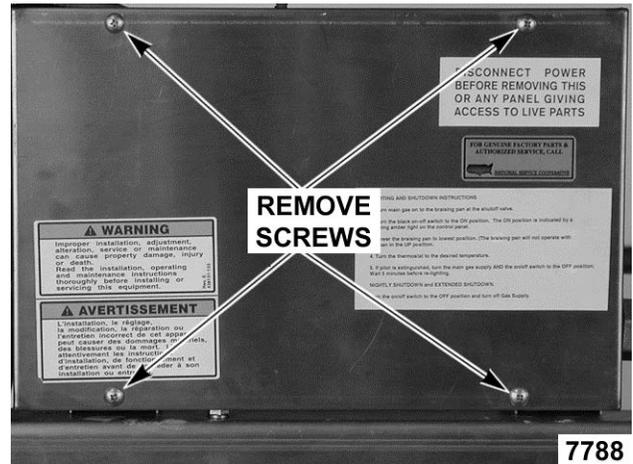
## POWER SUPPLY BOX COMPONENTS



### ⚠ WARNING

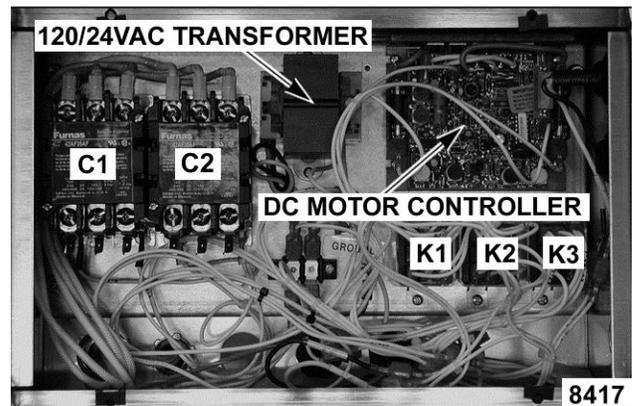
Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove front panel as outlined under COVERS AND PANELS.
2. Remove power supply box cover.



3. Disconnect lead wires then remove the component being replaced.

### POWER SUPPLY BOX - VE30 SHOWN



4. Reverse procedure to install the replacement component.
5. Check braising pan for proper operation.

## TEMPERATURE CONTROLLER



### WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove control box from CONTROL PANEL.
2. Note and disconnect lead wires from temperature controller.
3. Remove temperature controller from control box.

### 1ST GENERATION TEMPERATURE CONTROLLER SHOWN IN Fig. 11

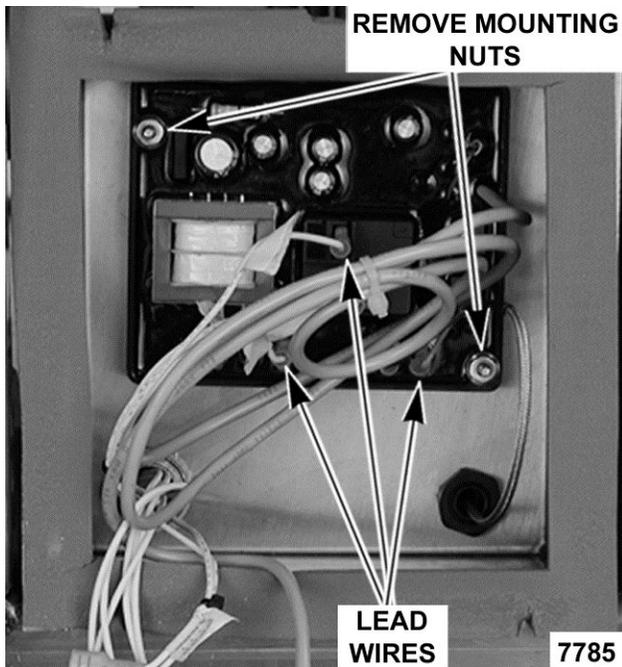


Fig. 11

- Item 1 shown in Fig. 12 is J1 jumper. **REMOVE** J1 jumper when installing a second generation temperature controller.

### NOTICE

If J1 jumper is not removed, maximum temperature will only reach 300 degrees.

- Item 2 shown in Fig. 12 connection is both wires going to T1 and T2 equals L1 (HOT).
- Item 3 shown in Fig. 12 connection is both wires going to T3 and T4 equals L2 (NEUTRAL).

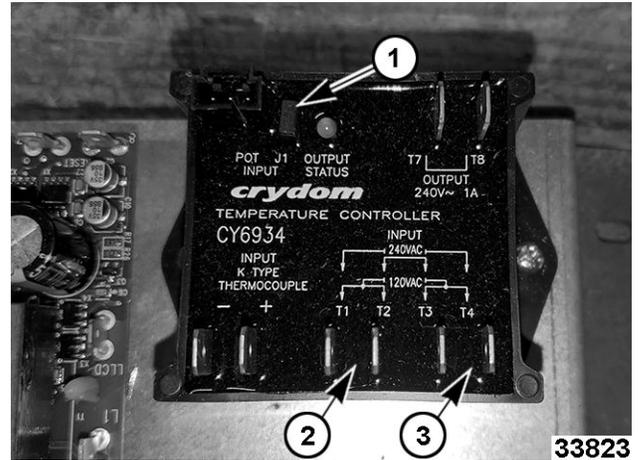
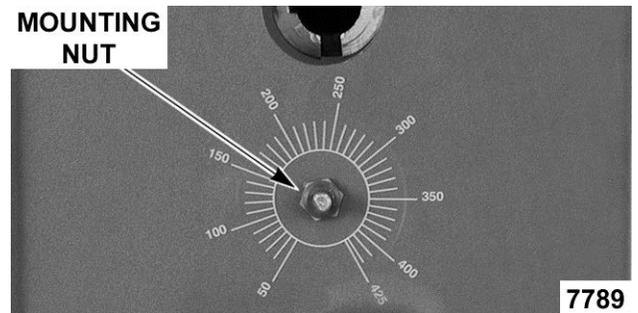
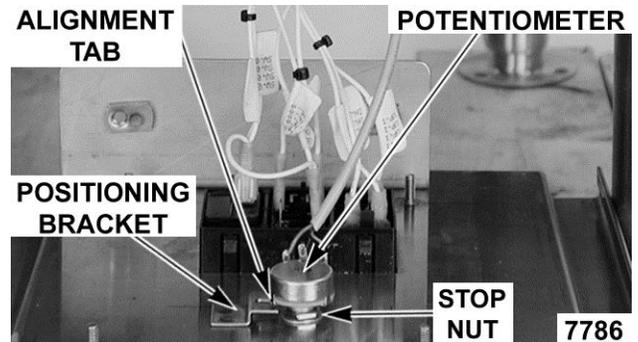


Fig. 12

4. Pull temperature dial from potentiometer shaft and remove mounting nut.



5. To install:
  - A. Align tab on potentiometer with positioning bracket on panel.
  - B. Install mounting nut and tighten.
  - C. Adjust stop nut on potentiometer body (as necessary) to ensure a water tight seal on mounting nut.
  - D. Attach temperature dial.



6. Reverse procedure from Step 3 to complete installation.
7. Check calibration. Refer to: TEMPERATURE CONTROLLER CALIBRATION.

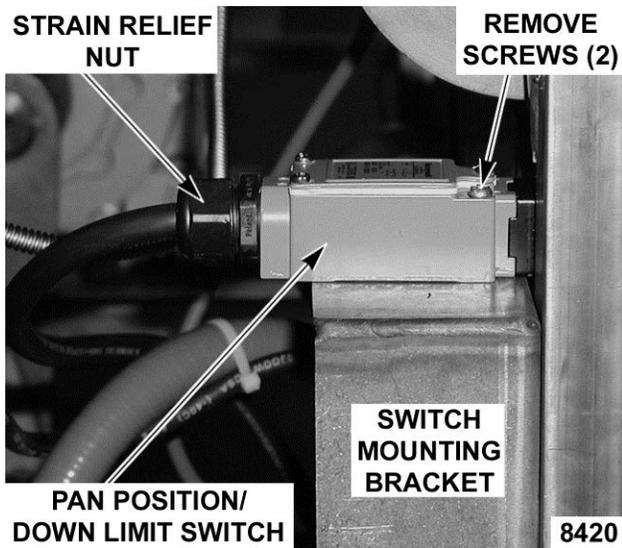
## PAN POSITION / DOWN LIMIT SWITCH



### ⚠ WARNING

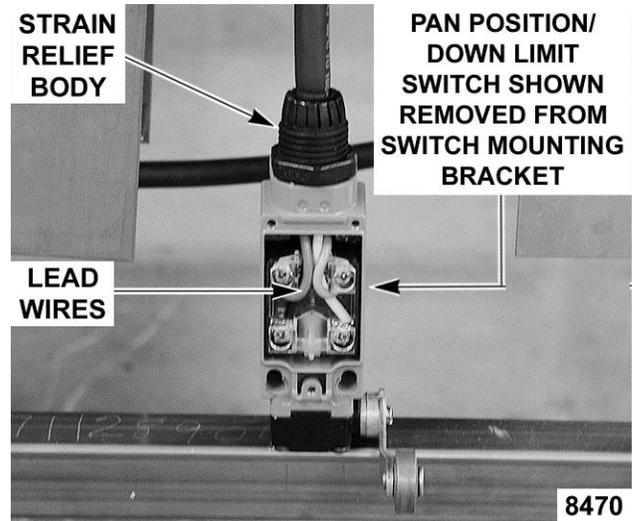
Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove front and left side panels as outlined under COVERS AND PANELS.
2. Remove strain relief nut from end of strain relief body and remove pan position/down limit switch from switch mounting bracket.



Left Side Shown

3. Remove cover from switch.
4. Disconnect lead wires and pull wires thru strain relief body.
5. Remove strain relief body from switch.



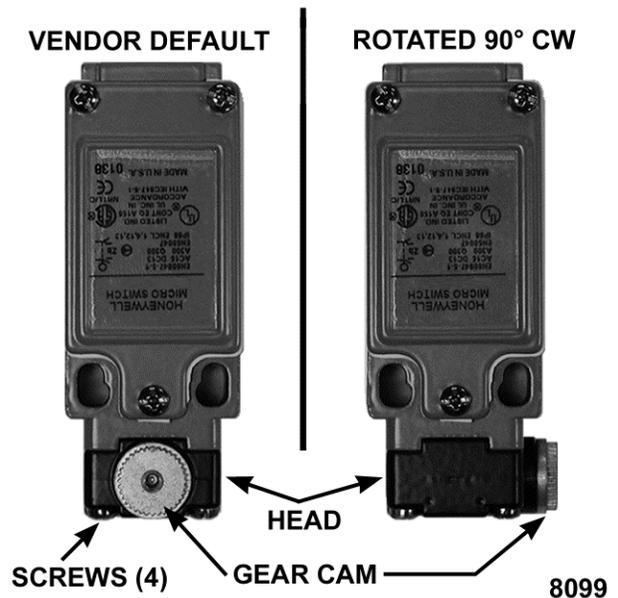
**NOTE:** When installing, ensure the o-ring seal is inserted into the strain relief body (around power cable) before tightening strain relief nut.

6. To install:
  - A. Position the switch with the head pointing toward installer and gear cam pointing up.

**NOTE:** The plunger on the head is spring loaded and will push the head away from switch body when the last screw is removed.

- B. Remove screws securing the head to switch body, rotate 90° clockwise and tighten screws to secure.

### PAN POSITION/DOWN LIMIT SWITCH HEAD POSITIONS

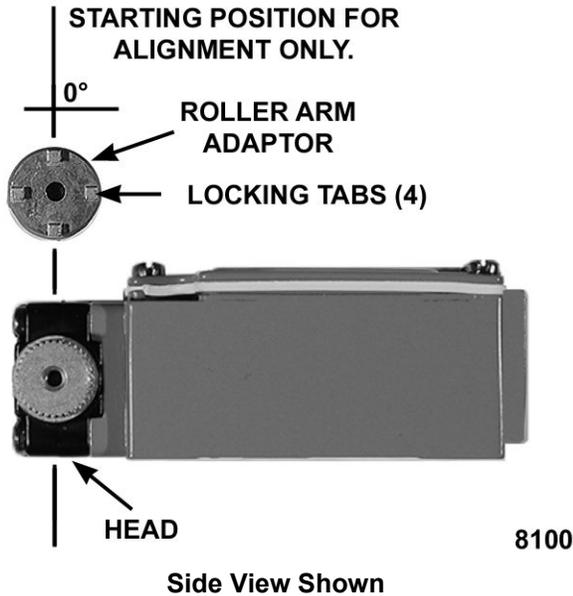


Top View Shown

- C. Place switch on its side with the head to the left and gear cam pointing up.

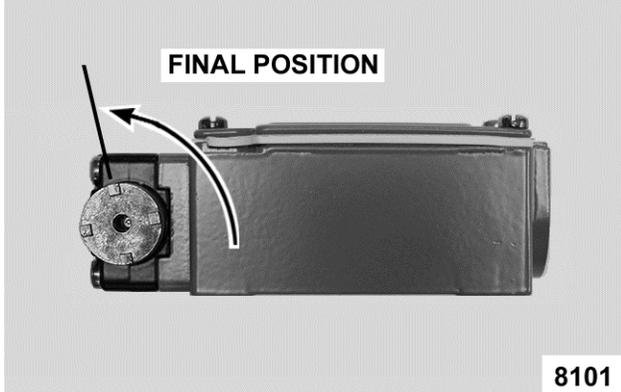
- D. Align roller arm adaptor with the four locking tabs pointing up and position one of the tabs at 0°

**NOTE:** The 0° position of the roller arm locking tab is the starting point for alignment only. The locking tab cannot remain at the 0° position

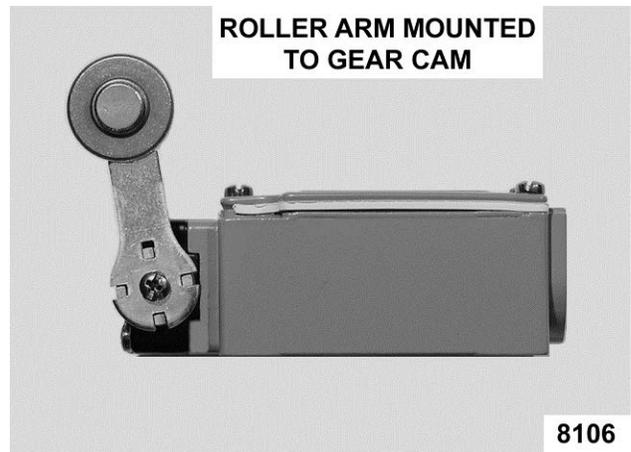
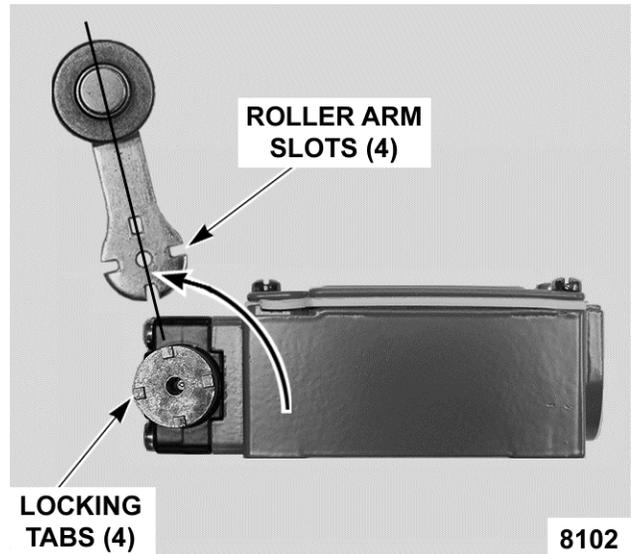


- E. Place roller arm adaptor on the gear cam to engage the teeth. Lift the adaptor until the teeth just slightly disengage from the gear cam. Rotate the roller arm adaptor counterclockwise 1 tooth, re-engage teeth and release the adaptor.

**LIFT AND ROTATE ROLLER ARM ADAPTOR COUNTERCLOCKWISE 1 TOOTH**

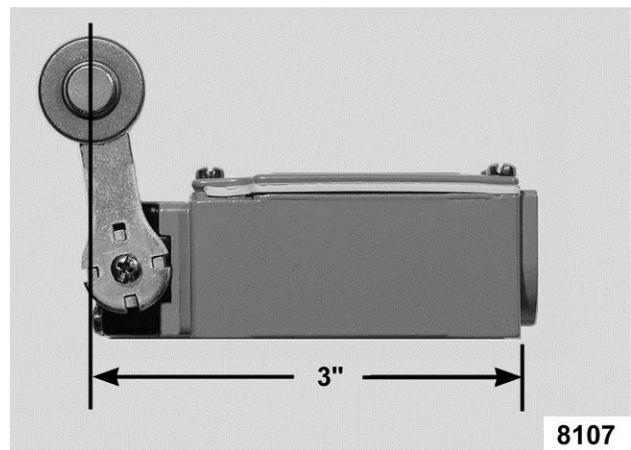


- F. Align the roller arm slots with the four locking tabs on the roller arm adaptor and tighten mounting screw to secure.



- G. Verify roller arm position on switch.

- 1) Measure the distance from the rear of the switch body to the center of the roller. The distance should be 3".



- H. If distance is ok, proceed to Step 7.

- I. If distance is not ok, adjust the roller arm position (as necessary) to obtain the 3" roller arm dimension.
7. Reverse procedure from Step 5 to complete the installation.
8. Adjust pan position/down limit switch on switch mounting bracket as outlined under PAN POSITION / DOWN LIMIT SWITCH ADJUSTMENT.

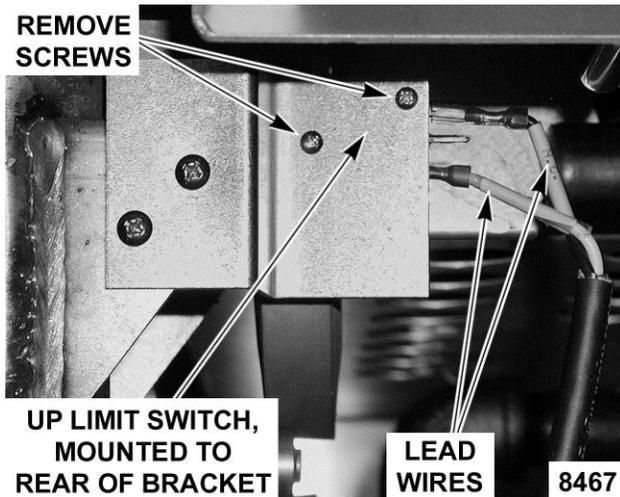
## UP LIMIT SWITCH



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove front panel as outlined under COVERS AND PANELS.
2. Disconnect lead wires from switch.
3. Remove switch from mounting bracket.



4. Reverse procedure to install and check for proper operation.

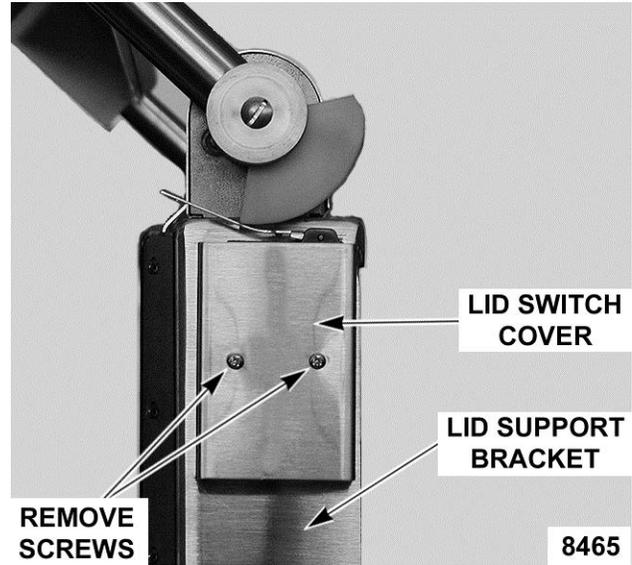
## LID SWITCH



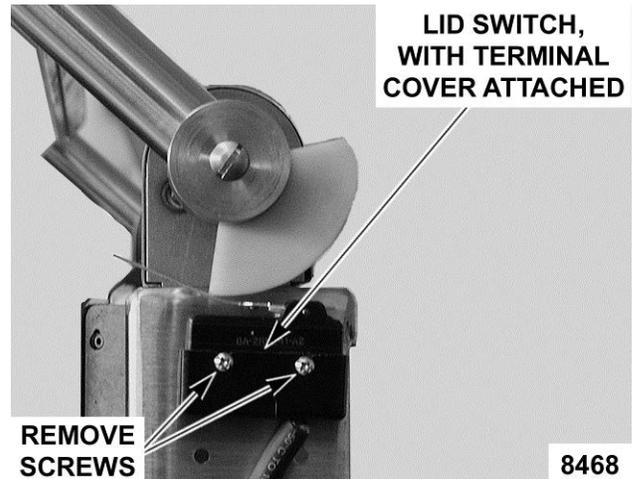
### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove lid switch cover from lid switch support bracket.



2. Remove switch from lid support bracket.



3. Lift terminal cover off switch body and disconnect lead wires.
4. Reverse procedure to install and adjust switch as outlined under LID SWITCH ADJUSTMENT

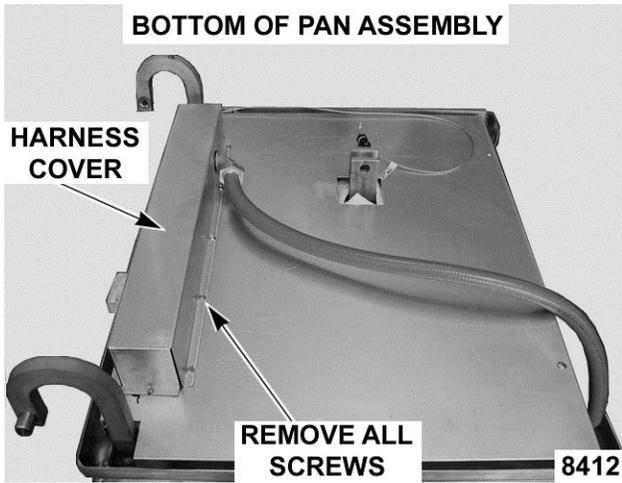
## THERMOCOUPLE PROBE



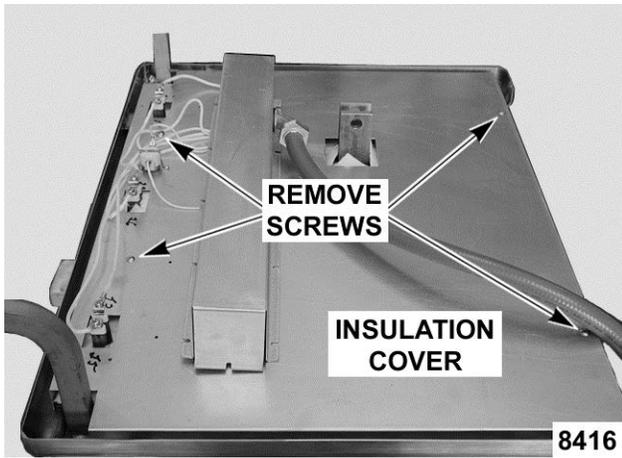
### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Access temperature controller as outlined under .
2. Disconnect thermocouple lead wires.
3. Raise the pan to the full tilt position.
4. Remove harness cover.



5. Remove the insulation cover.



6. Loosen lock nut and remove threaded probe from pan.



7. Reverse procedure to install and check braising pan for proper operation.

## THERMOCOUPLE PROBE - FAST BATCH MODELS



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Disconnect supply power.
2. Remove bottom panel.
  - A. Remove lift arm (1, Fig. 29).
  - B. Remove hose (2, Fig. 29) connection.
  - C. Remove bottom panel mounting screws (3, Fig. 29).

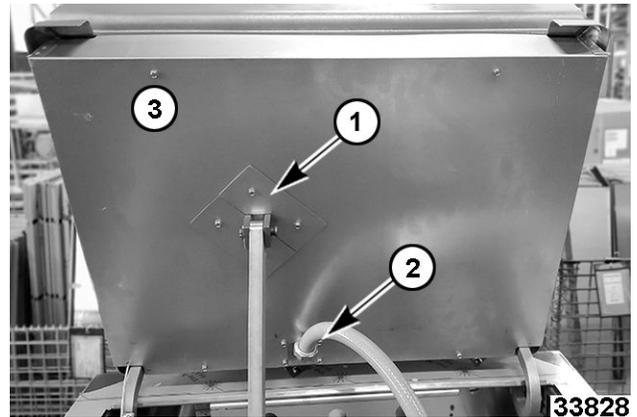


Fig. 29

3. Remove temperature probe/high limit access panel.
4. Carefully move insulation (1, Fig. 30) to access probe mounting bolt.

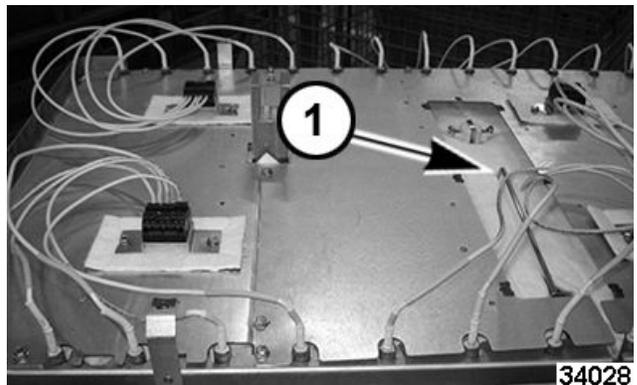


Fig. 30

5. Remove mounting bolt (1, Fig. 31).

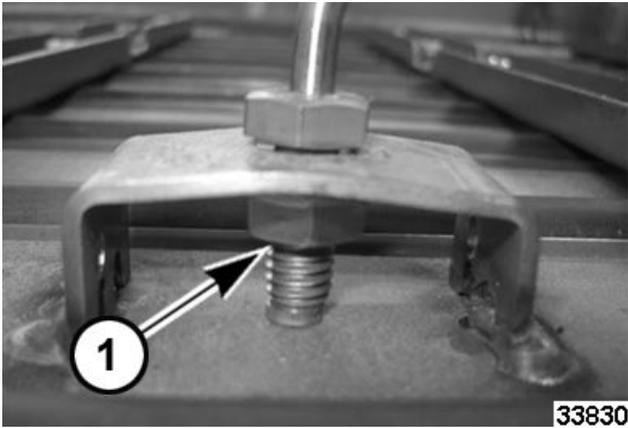


Fig. 31

6. Reverse procedure to install.
7. Verify proper operation.

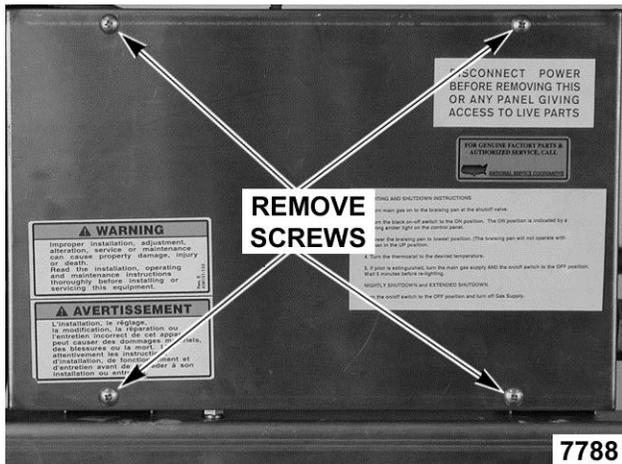
### DC LIFT MOTOR



#### ⚠ WARNING

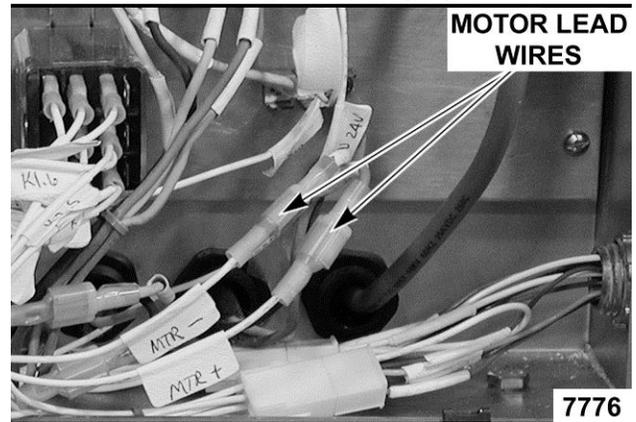
Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove front, rear and right side panels as outlined under COVERS AND PANELS.
2. Remove power supply box cover.



3. Disconnect DC lift motor lead wires labeled MTR + (positive) & MTR - (negative).

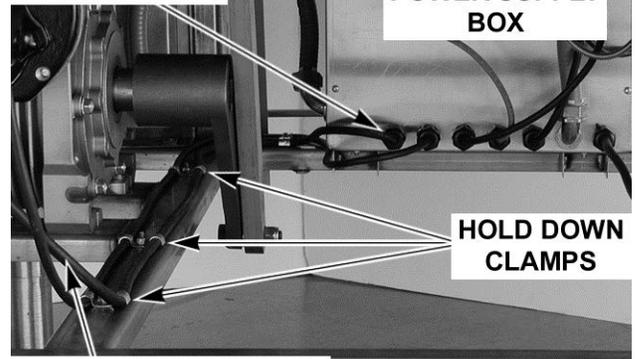
### POWER SUPPLY BOX LOWER RIGHT VIEW SHOWN



**NOTE:** Lead wires can be identified by label or marking on the wire.

4. Loosen the strain relief nut and the hold down clamps for the motors' power cable. Pull the cable thru the strain relief opening and remove the cable from underneath the clamps.

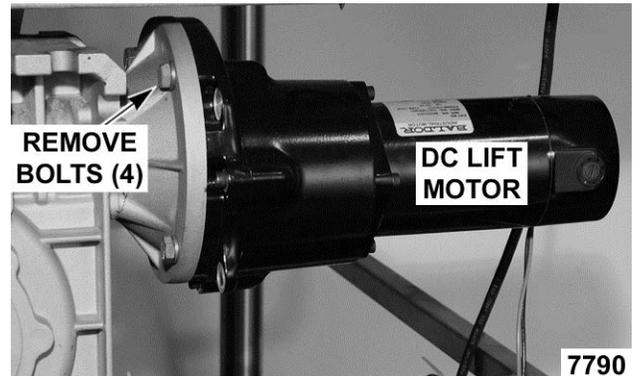
### STRAIN RELIEF NUT



### MOTOR POWER CABLE

### VE30 Rear View Shown

5. Remove motor mounting bolts from gear reducer flange.
6. Remove motor from gear reducer.



7. To install:

- A. With drive key on shaft, install motor to gear reducer.
  - B. Route and secure the motors' power cable and re-connect motor lead wires.
  - C. Replace power supply box cover and side panels.
- 8. Check for proper operation.

## GEAR REDUCER



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

### ⚠ WARNING

If only accessible from the top, perform **ACCESSING BRAISING PAN ACTUATOR FROM TOP**.

#### ACCESSING BRAISING PAN ACTUATOR FROM TOP

1. Raise or lift the braising pan approximately 45 degrees from horizontal.

### ⚠ WARNING

If motor will not operate to raise braising pan, assistance will be needed to raise pan to insert safety blocking.

### ⚠ WARNING

Do not disassemble any parts of the lift system unless braising pan is supported with two, 26 inch long wood (2" x 4") blocks, and one 48 inch long wood (2" x 4") block.

2. Before disconnecting pan lift pin, set-up safety blocking.
  - A. Block braising pan (1, Fig. 36) with two 26" long wood blocks (2" x 4") (2, Fig. 36), one at each end.
  - B. Place 2"x4" wood block, 48 inches long, (3, Fig. 36) across front of braising as shown.

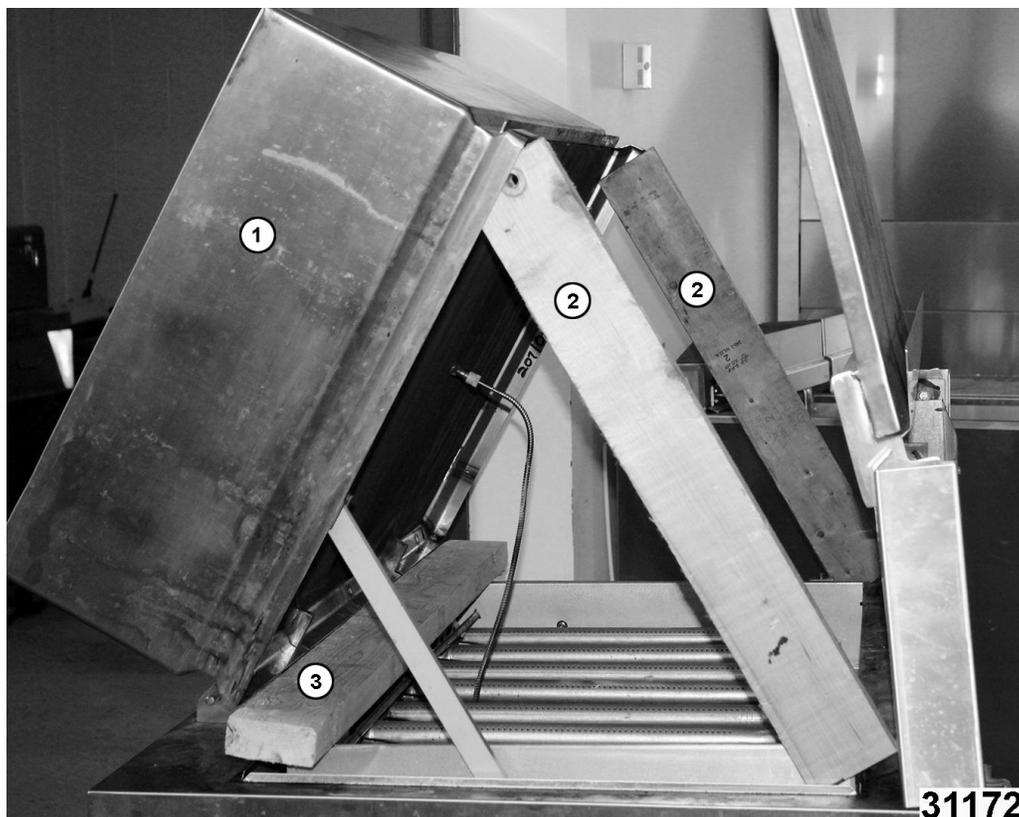


Fig. 36

3. Remove cover panels to access gear reducer.
4. Continue with GEAR REDUCER REMOVAL.

### GEAR REDUCER REMOVAL

1. Remove RIGHT SIDE AND REAR PANELS.
2. Lower pan (use motorized pan lift or manual crank handle).
3. If DC lift motor is installed, remove motor. Refer to: DC LIFT MOTOR.
4. Remove lock nut securing crank assembly to lift arm.

#### **NOTICE**

If the lift arm is not installed correctly it will be difficult to turn handle to raise braising pan.

**NOTE:** Position of lift arm is shown in up position in both generation photos. When servicing, if lift arm is not in position shown, it will be difficult to move in the up position. Use manual hand crank on front of unit to get into up position. Manual lift unit is shown

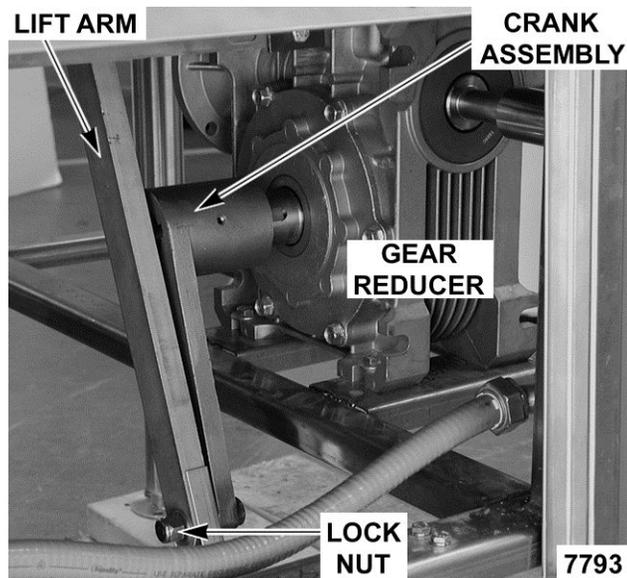


Fig. 37

- Item 1 in Fig. 38 is lift arm shown in up position.
- Item 2 in Fig. 38 is the gear reducer.

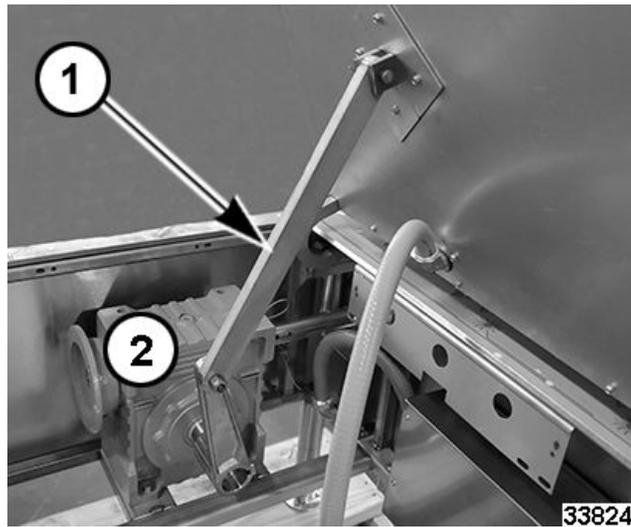
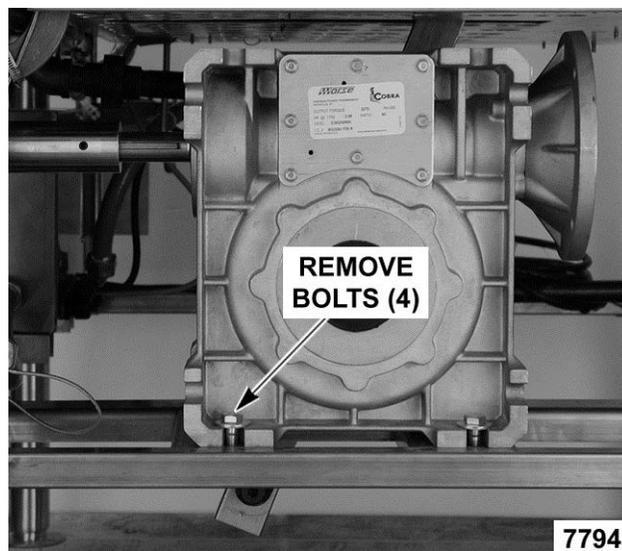
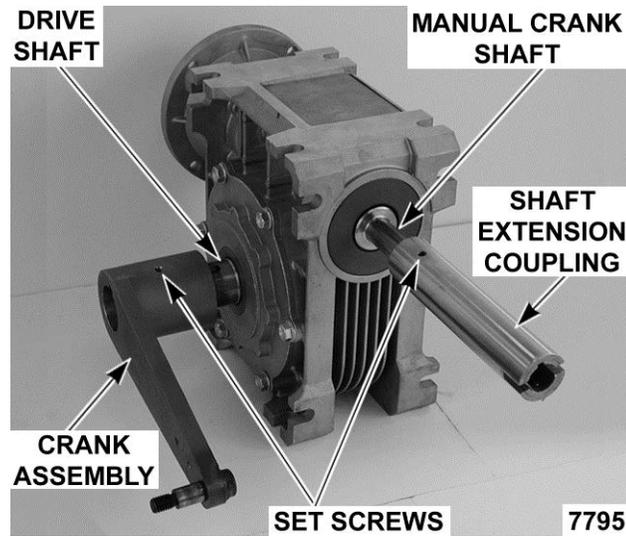


Fig. 38

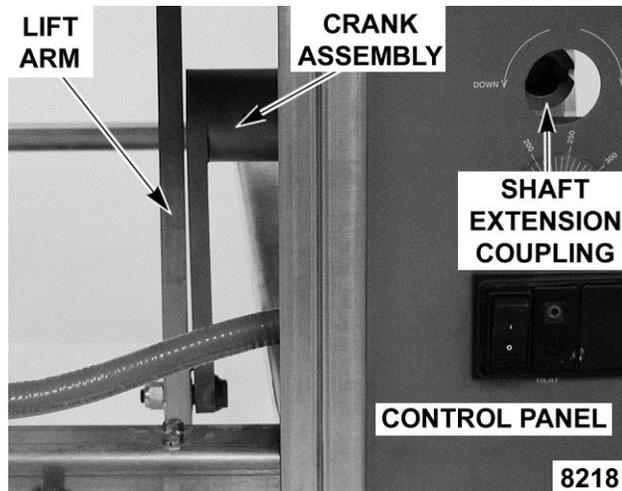
5. Remove bolts securing gear reducer to braising pan frame then remove gear reducer.



6. Loosen set screw on crank assembly and remove the assembly from drive shaft.
7. Loosen set screw on shaft extension coupling and remove the coupling from manual crank shaft.



8. To install:
  - A. With drive key on drive shaft, install crank assembly and tighten set screw against key.
  - B. With drive key on manual crank shaft, install shaft extension coupling and tighten set screw against key.
  - C. Place gear reducer in its mounting location on frame. Position gear reducer so the shaft extension coupling is aligned with the opening in control panel; and the lift arm is vertical and parallel to the crank assembly when connected.



**NOTE:** On the bottom lift arm bushing, the bushing head must be positioned between the lift arm and the crank assembly to create approximately 1/32" spacing.

9. Reverse procedure from STEP 5 to complete the installation.
10. Check for proper operation.



**ACCESSING BRAISING PAN ACTUATOR FROM TOP**

1. Raise or lift the braising pan approximately 45 degrees from horizontal.

**⚠ WARNING**

If motor will not operate to raise braising pan, assistance will be needed to raise pan to insert safety blocking.

**⚠ WARNING**

Do not disassemble any parts of the lift system unless braising pan is supported with two, 26 inch long wood (2" x 4") blocks, and one 48 inch long wood (2" x 4") block.

2. Before disconnecting pan lift pin, set-up safety blocking.
  - A. Block braising pan (1, Fig. 42) with two 26" long wood blocks (2" x 4") (2, Fig. 42), one at each end.
  - B. Place 2"x4" wood block, 48 inches long , (3, Fig. 42) across front of braising as shown.



Fig. 42

3. Remove cover panels to access gear reducer.
4. Reverse procedure to install and verify operation.

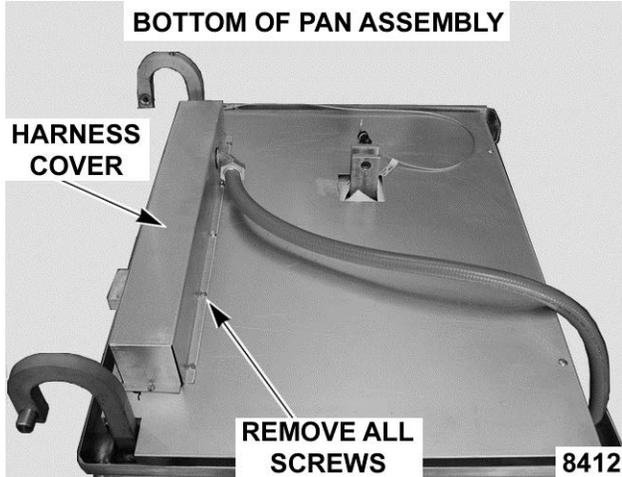
## HEATING ELEMENTS



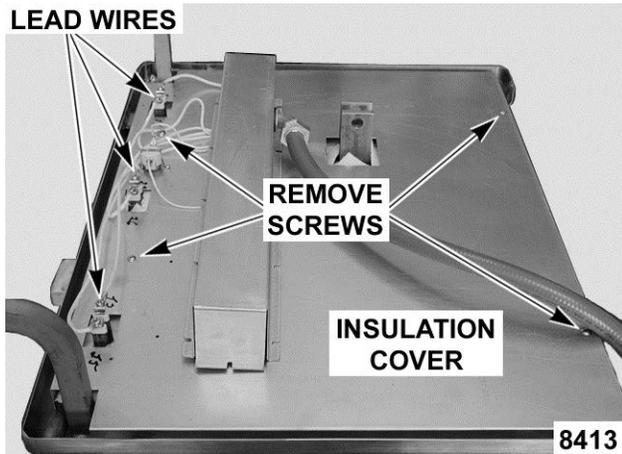
### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Raise the pan to the full tilt position.
2. Remove harness cover.

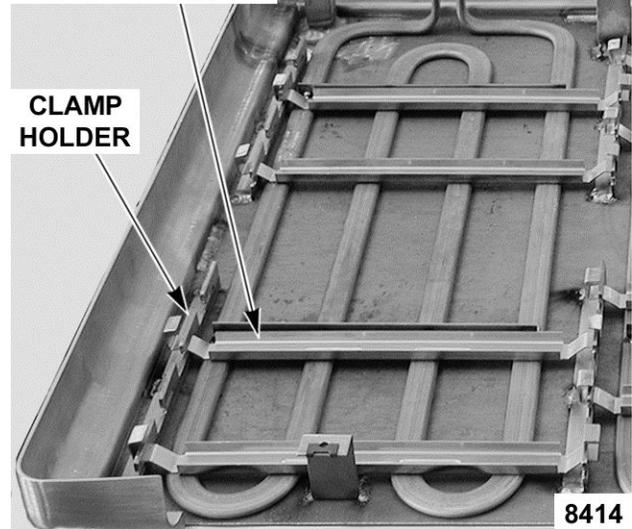


3. Disconnect lead wires from the heating element being replaced.
4. Remove the insulation cover.



5. Remove heating element clamps (spring loaded) from the clamp holder then remove heating element.

### HEATING ELEMENT CLAMPS (4)



6. Reverse procedure to install and check for proper operation.

## HEATING ELEMENTS - FAST BATCH MODELS



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Disconnect supply power.
2. Remove bottom panel.
  - A. Remove lift arm (1, Fig. 46).
  - B. Remove conduit (2, Fig. 46) connection.
  - C. Remove bottom panel mounting screws (3, Fig. 46).

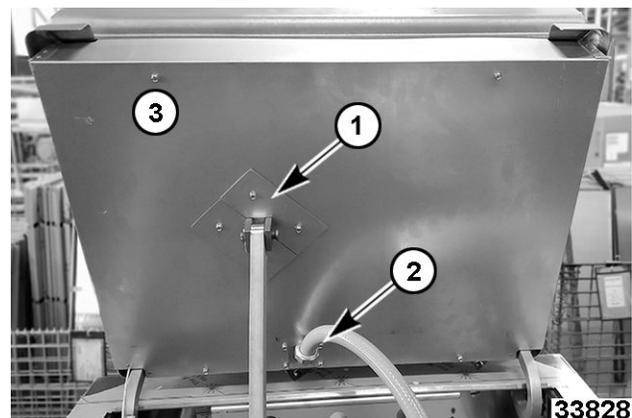


Fig. 46

- Remove access panel (1, Fig. 47) for heating element to be serviced.

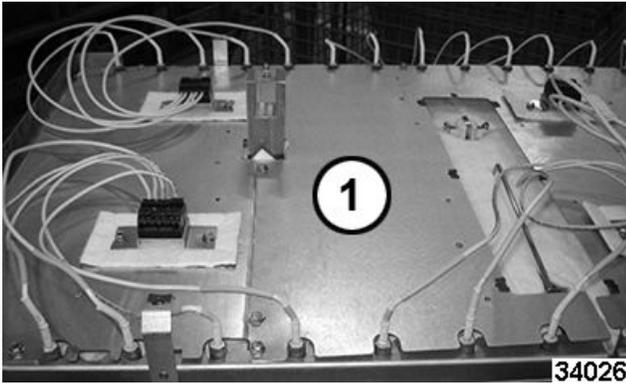


Fig. 47

- Carefully remove insulation.
- Remove bracket (1, Fig. 48) for heating element to be serviced.

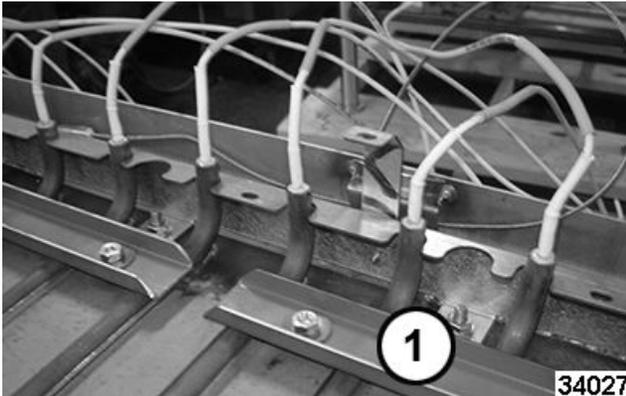


Fig. 48

- Reverse procedure to install.
- Verify proper operation.

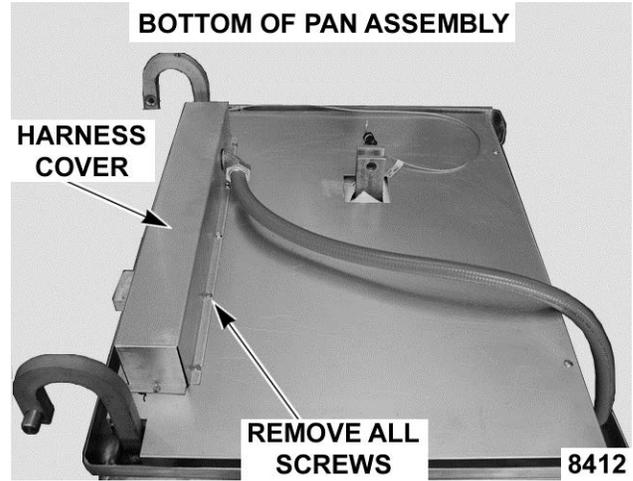
## HIGH LIMIT THERMOSTAT



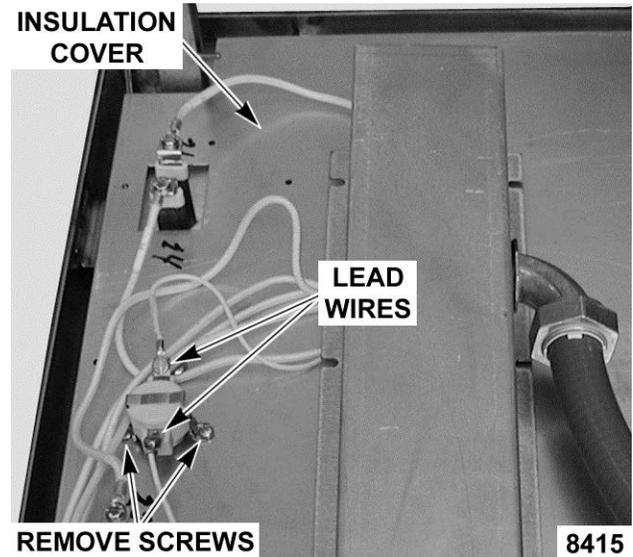
### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- Raise the pan to the full tilt position.



- Remove the harness cover.
- Disconnect lead wires from the high limit thermostat.
- Remove thermostat from insulation cover.



- Reverse procedure to install and check braising pan for proper operation.

## HIGH LIMIT THERMOSTAT - FAST BATCH MODELS



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- Disconnect supply power.
- Remove bottom panel.
  - Remove lift arm (1, Fig. 51).

- B. Remove hose (2, Fig. 51) connection.
- C. Remove bottom panel mounting screws (3, Fig. 51).

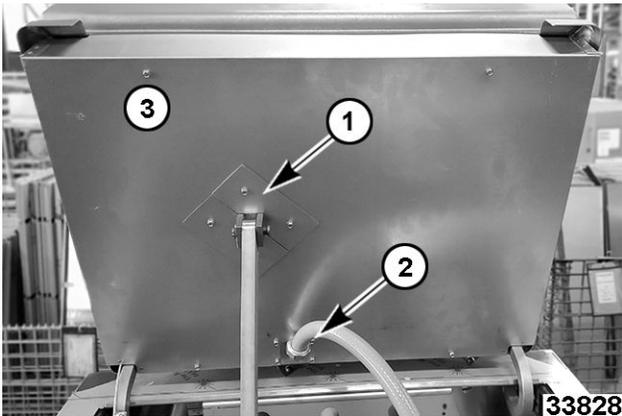


Fig. 51

- 3. Remove panel to access high limit thermostat (1, Fig. 52).

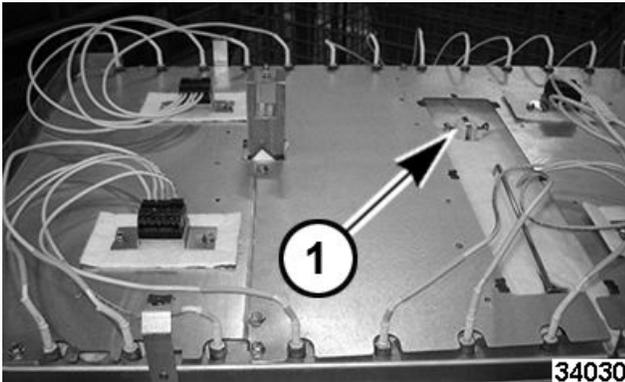


Fig. 52

- 4. Note and disconnect high limit wiring (1, Fig. 53).

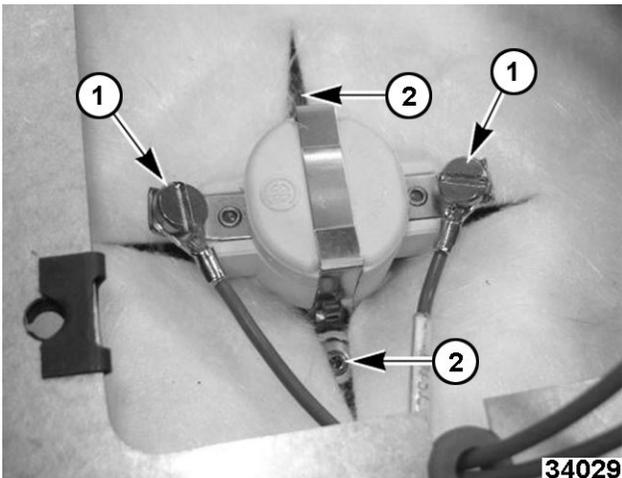


Fig. 53

- 5. Carefully move insulation (2, Fig. 53) to access high limit mounting screws.

- 6. Reverse procedure to install.
- 7. Verify proper operation.

## LID SPRINGS



### ⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- 1. Lower the lid to the full down position.

**NOTE:** For spring tension to be set correctly, both the left and right side springs must be replaced.

- 2. Remove spring covers by prying up at the bottom. The covers are held in place by tabs on the bottom of cover.

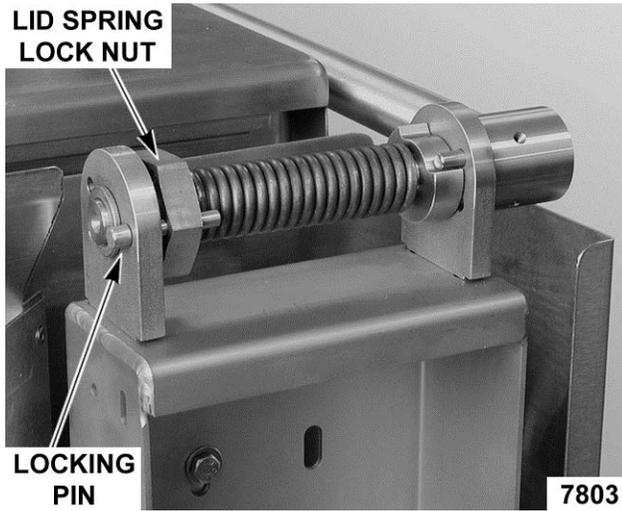


Right Side Rear View Shown

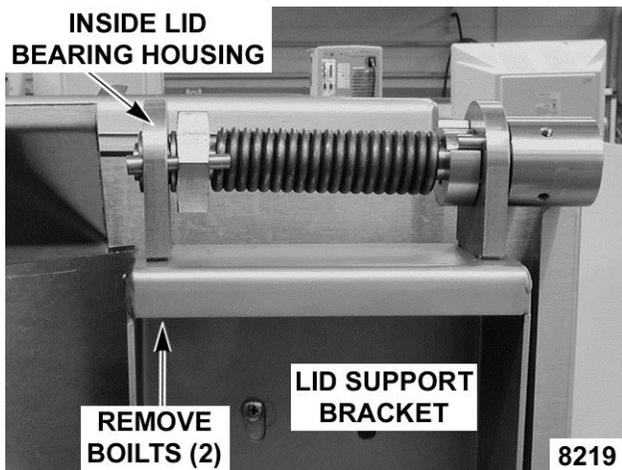
- 3. Place a 1 5/8" wrench on the lid spring lock nut and apply a downward force until locking pin can be removed. Continue to hold lock nut in place.

**NOTICE**

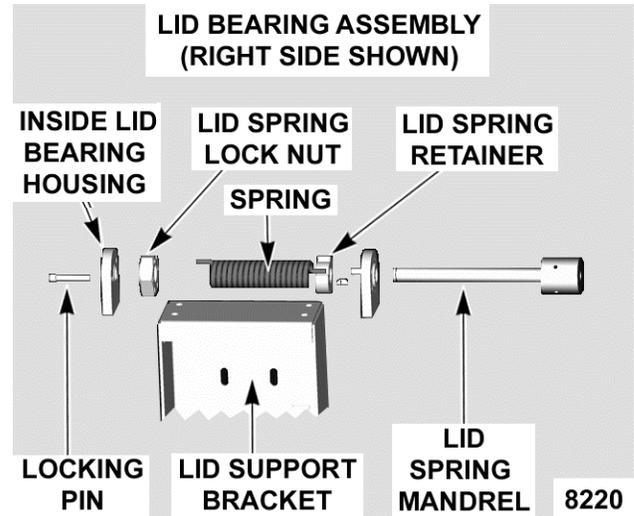
Do not release wrench while locking pin is removed or damage to the braising pan may occur.



- A. Slowly release downwards force to remove spring tension.
- B. Rotate lid spring lock nut to the next hole position then replace locking pin. Continue until all spring tension is removed, one position at a time.
- C. Remove bolts securing the inside lid bearing housing to the lid support bracket.



- D. Remove lid bearing housing, lid spring lock nut and the spring, from spring mandrel.



4. To install:
  - A. Slide the spring onto the lid spring mandrel. Insert spring into locator hole on the lid spring retainer.
  - B. Slide the lid spring lock nut onto the lid spring mandrel. Insert spring into locator hole on the lid spring lock nut.
  - C. Replace lid bearing housing.
5. Replace spring on the opposite side.
6. Adjust spring tension as outlined under LID SPRING TENSION ADJUSTMENT.

# SERVICE PROCEDURES AND ADJUSTMENTS

## **⚠ WARNING**

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power and follow lockout / tagout procedures, attach test equipment and reapply power to the test.

## **⚠ WARNING**

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power and follow lockout / tagout procedures, attach test equipment and reapply power to the test.

## TEMPERATURE CONTROLLER CALIBRATION

**NOTE:** Verify condition of thermocouple as outlined under THERMOCOUPLE TEST before proceeding.

1. At geometric center on the pan cooking surface, clean an area approximately 3" inches in diameter.
  2. Apply a thin layer of fresh cooking oil to cleaned area and place a temperature sensing disk on pan cooking surface.
  3. Turn on/off switch on and set temperature dial to 250°F.
  4. Monitor control panel heat light (red). When temperature controller is calling for heat, light will be on. If temperature controller is satisfied, light will be off.
    - A. Allow temperature controller to cycle three times to stabilize pan temperature.
    - B. Record temperature when temperature controller cycles off and on for next three cycles.
  5. Calculate the **differential** by subtracting temperature indicated when heat light goes out from temperature indicated when heat light comes on.
 

*Differential = Heat Light OFF - Heat Light ON.*

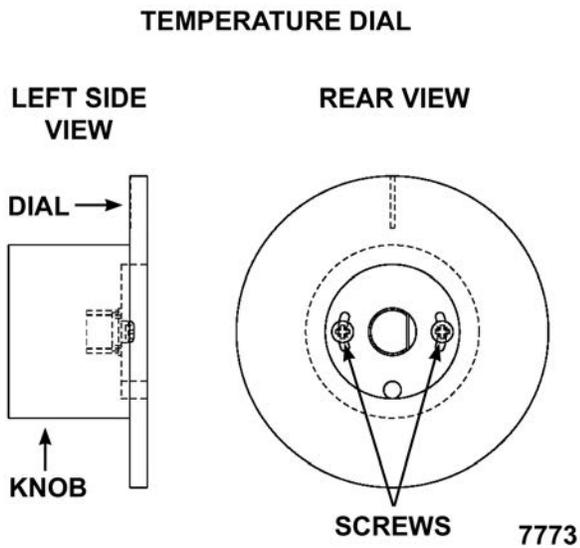
*EXAMPLE: 260° (light off) - 240° (light on) = 20°*

    - A. Calculated differential should be less than 20°F.
      - 1) If differential is **less** than 20°F, temperature controller is functioning properly.
        - Proceed to average temperature.
      - 2) If differential is **more** than 20°F, temperature controller is malfunctioning.
        - Install a replacement temperature controller and check calibration.
  6. Calculate **average** temperature by adding temperature indicated when heat lamp goes out to temperature indicated when heat lamp comes on and divide this answer by 2.
 

*[Temp. (light off) + Temp (light on)] ÷ 2 = Average Temp.*

*EXAMPLE: 260° + 240° ÷ 2 = 250°*

    - A. A. If average temperature is **less** than 10°F of dial setting, temperature controller is properly calibrated.
    - B. B. If average temperature is **more** than 10°F of dial setting, temperature controller calibration **must** be adjusted.
  7. Using temperature scale on overlay as a guide, align edge on a short piece of tape to temperature calculated in Step 6 and apply tape to knob as a reference point.
  8. Remove temperature dial from shaft.
  9. Loosen screws on back of dial.
    - A. Hold knob and rotate dial to edge of tape used for reference. This adjustment offsets indicated temperature on dial to actual temperature measured.
- NOTE:** With knob facing user, a clockwise rotation increases temperature and a counterclockwise rotation decrease temperature.
- B. Hold dial and knob together to maintain adjusted setting and tighten screws.



10. Replace temperature dial on shaft.
11. Turn temperature dial to lowest setting then back to 250°F.
12. Repeat average temperature calculation for up to three attempts. Allow pan to cycle at least two times between adjustments before performing calculation.
13. If calibration is unsuccessful, controller may be malfunctioning and cannot be adjusted properly. Install a replacement temperature controller and check calibration.

## TEMPERATURE CONTROLLER TEST - 1ST GENERATION



**⚠ WARNING**

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

**NOTE:** The controller is powered whenever supply power is connected to the machine.

**Watlow Temp Controller**

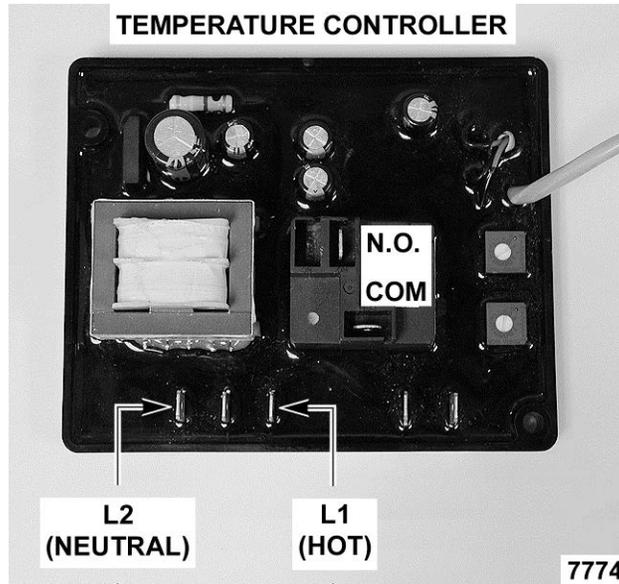


Fig. 59

**Crydom Temp Controller**

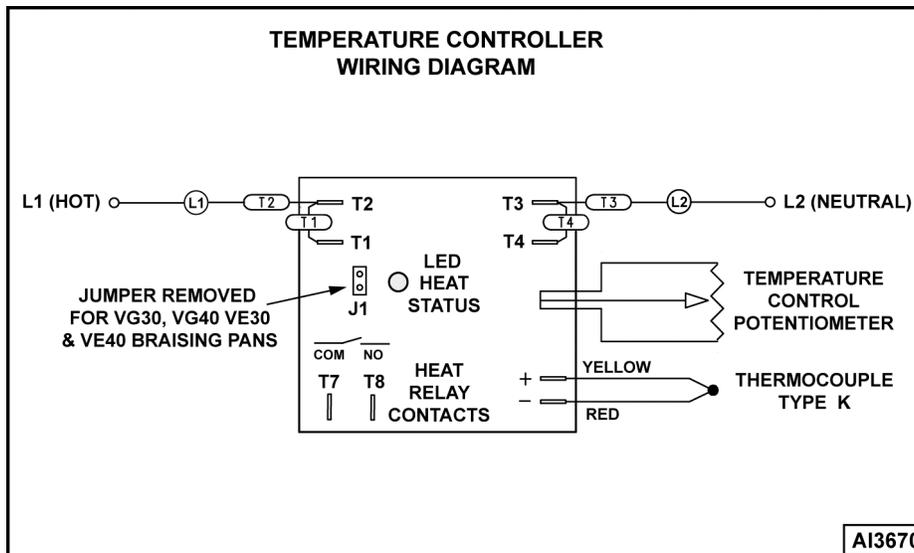


Fig. 60

1. Lower pan to full down position.
2. Disconnect supply power.
3. Access TEMPERATURE CONTROLLER.
4. Re-connect power to machine.

5. Verify temperature controller is receiving 120VAC at terminals L1 & L2, polarity is correct and machine is properly grounded.
6. Turn on/off switch on and set temperature dial to 250°F.
7. Verify heat light (red) comes on and all heating elements are energized.
  - A. If heat light and heating elements energize but turn off within 10 seconds, refer to THERMOCOUPLE TEST.

**NOTE:** Temperature controller will de-energize internal relay if the circuitry detects an open thermocouple.

  - B. If heat light and heating elements do not energize, verify internal relay contacts are operating properly.
8. Disconnect lead wire labeled HT.0 from controller COM terminal.
9. Verify 24VAC between the disconnected HT.0 lead wire and ground.
  - A. If correct, re-connect lead wire to COM terminal and proceed to Step 10.
  - B. If incorrect, check transformer and the on/off switch for proper operation.
10. Disconnect lead wire labeled HT.1 from controller N.O. terminal.
11. Verify 24VAC between temperature controller N.O. terminal and ground.
  - A. If correct, internal relay contacts are functioning properly. Reconnect lead wire to N.O. terminal. See ELECTRIC LIFTING - MANUAL OR MOTORIZED LIFT OPTIONS or MOTORIZED LIFT OPTION ONLY.
  - B. If incorrect, install a replacement temperature controller and check for proper operation.

**TEMPERATURE CONTROLLER TEST - 2ND GENERATION STARTING AT SN 46-303592**

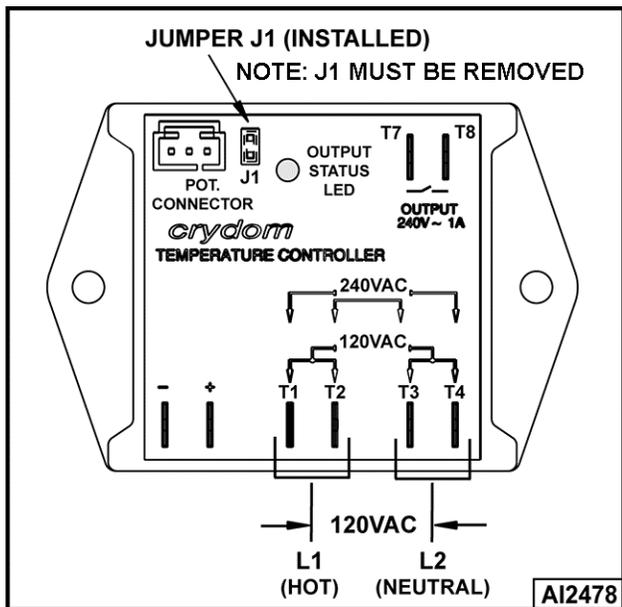


Fig. 61

1. Place kettle in full upright position (tilting models only).

2. Set temperature dial to lowest setting. Kettle must be below 110°F before verifying potentiometer output to the controller is good over the full range of temperature dial travel.
3. Access the temperature controller. Refer to :
4. **REMOVE** J1 jumper from temperature controller.

**NOTICE**

If J1 jumper is not removed, temperature will not reach above 300°F.

5. Check all lead wires for secure connections to controller terminals. Wiring harness lead wires must be connected to T1-T2 and T3-T4 for proper input to controller.
6. Re-connect power to machine.
7. Turn power switch on.
8. Verify temperature controller is receiving 120VAC at terminals T1-T3 and T2-T4 and machine is properly grounded.
9. Slowly turn temperature dial to the highest setting and monitor heat light over the full range of travel.
  - A. Verify heat light (amber) comes on, blower motor comes on and transformer is powered (120VAC).

- B. If components listed above are functioning properly, then output from T8 on controller should be present. As long as transformer output voltage is correct (24VAC), heat circuit is powered and the ignition sequence to light the burner will start.
- C. If heat light does not remain on or flashes momentarily as temperature setting is slowly increased, verify condition of potentiometer.
- D. If heat light or blower motor is not coming on; or transformer is not powered.
- 1) Verify condition of thermocouple. Refer to: THERMOCOUPLE TEST - 2ND GENERATION.

**NOTE:** Temperature controller will de-energize internal relay and turn off the output status LED if the circuitry detects an open thermocouple. LED will begin to flash 3 times, pause, then repeat the flash sequence to indicate the open thermocouple condition.

- 2) Check lead wire connections at the component that is not functioning (heat light, blower motor or transformer).
  - 3) Verify power at the component that is not functioning. If power is present, determine if the component is malfunctioning. If power is not present at any of the components, continue with procedure.
10. Disconnect lead wire from terminal T7 on the controller.
- A. Verify 120VAC between lead wire from T7 and ground. If correct, re-connect lead wire to terminal T7 and continue with procedure.
  - B. If incorrect, check pressure switch (1PS) and water level controller (WLC LLCO).
11. Disconnect lead wire from terminal T8 on the controller.
- A. Verify 120VAC between T8 and ground. If correct, output from controller is functioning properly.
  - B. If incorrect, install a replacement temperature controller and check for proper operation.

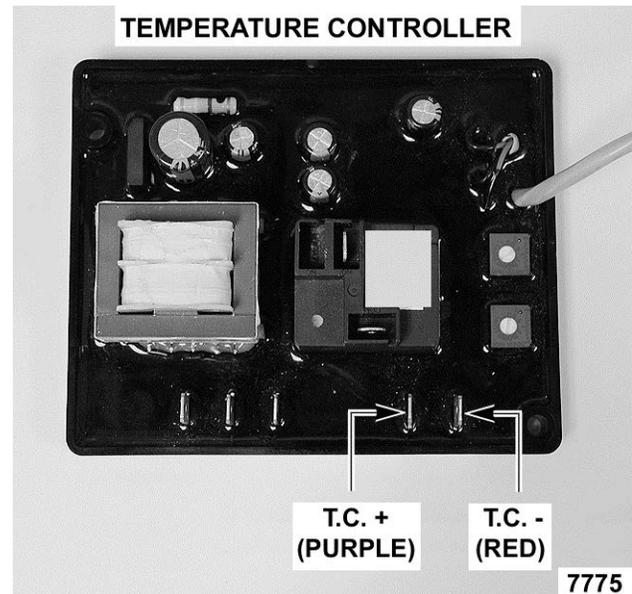
## THERMOCOUPLE TEST



### ⚠ WARNING

**Disconnect the electrical power to the machine and follow lockout / tagout procedures.**

1. Access temperature controller as outlined in TEMPERATURE CONTROLLER.
2. Remove thermocouple lead wires from temperature controller.



3. Check thermocouple for resistance.
  - If meter reads an overload (OL) condition (open), or zero ohms (short) replace thermocouple and check temperature controller for proper operation.
4. If resistance is measured, thermocouple is good.

**THERMOCOUPLE TEST - 2ND GENERATION STARTING AT SN 46-303592**



**WARNING**

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

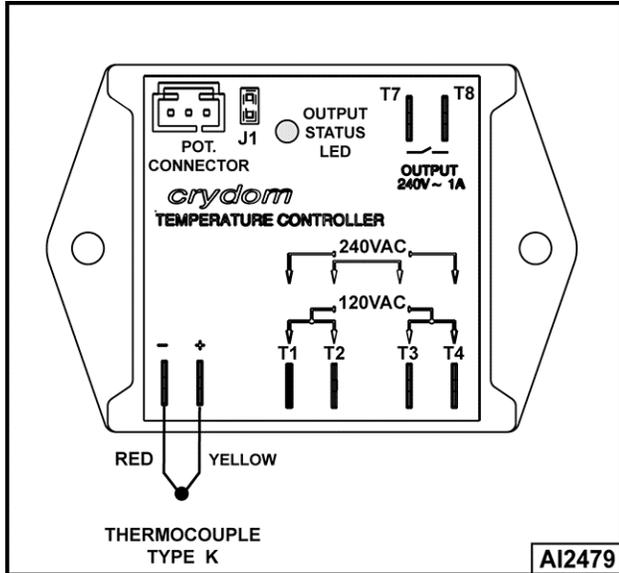


Fig. 63

1. Access temperature controller. Refer to: COVERS AND PANELS
2. Remove thermocouple lead wires from temperature controller.

**NOTE:** REMOVE J1 jumper when installing a second generation temperature controller.

**NOTICE**

If J1 jumper is not removed, maximum temperature will only reach 300 degrees.

3. Check the thermocouple for a measurable resistance (approximately 5 to 10 ohms at room temperature). If meter reads an overload (OL) condition (open), or zero ohms (short) replace the thermocouple and check temperature controller for proper operation.

TYPE K THERMOCOUPLE PROBE AND MILLIVOLT CHART	
TEMPERATURE	MILLIVOLT
100° F	1.521
150° F	2.667

TYPE K THERMOCOUPLE PROBE AND MILLIVOLT CHART	
TEMPERATURE	MILLIVOLT
200° F	3.820
250° F	4.925
300° F	6.094
350° F	7.207
400° F	8.316

**HEATING ELEMENT TEST**

VE30 and VE40 Models			
VOLTAGE	KW PER ELEMENT	AMPS PER ELEMENT	OHMS PER ELEMENT
208	4	14.3	13.7
240	4	16.7	13.7
480	4	8.7	55.5

1. Values in the table are nominal. Tolerance is +5/-10%.
2. Voltage values are @ 60Hz.
3. Resistance values (ohms) are @ room temperature.
4. On all 208V machines, the 240V heating element is being used (KW output is reduced).

VE30 and VE40 Fast Batch Models			
ELEMENT	KW PER ELEMENT	AMPS PER ELEMENT	OHMS PER ELEMENT
208V (YELLOW)	1000 W	18.75	43.79
240V (RED)	1000 W	9.375	57.52
480V (BLUE)	1000 W	2.2	218.20

1. Access the heating elements as outlined in HEATING ELEMENTS.
2. Measure voltage at heating element terminals and verify it against data plate voltage.
  - A. If voltage is **incorrect**, see ELECTRIC LIFTING - MANUAL OR MOTORIZED LIFT OPTIONS or MOTORIZED LIFT OPTION ONLY.
  - B. If voltage is **correct**, check current draw (amps) through the heating element lead wires.

**NOTE:** This method is preferred over a resistance check when a clamp on type amp meter is available.

- 1) If current draw is correct then heating element is functioning properly. See table for proper values.
  - 2) If current draw is **not** correct, turn on/off switch to OFF and disconnect the electrical supply.
    - Replace heating element then proceed to Step 3.
- C. If unable to check current draw, a resistance check may indicate a malfunctioning element.
- 1) Turn the on/off switch off and disconnect power to the machine.
  - 2) Remove the lead wires from the heating element and check resistance (ohms). See table for proper values.
3. Check for proper operation.

## DC MOTOR CONTROLLER TEST



### **WARNING**

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

### 1ST GENERATION CONTROLLER BOARD SHOWN IN Fig. 64

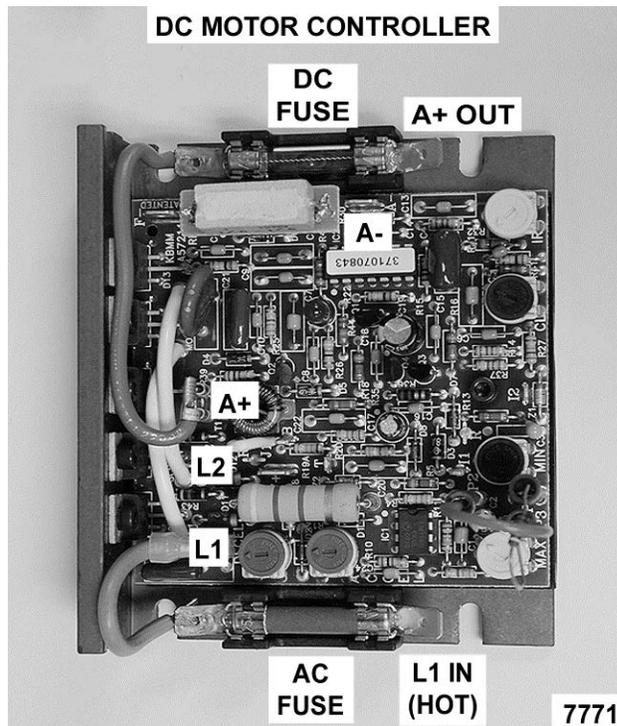


Fig. 64

### 2ND GENERATION CONTROLLER BOARD SHOWN IN Fig. 65

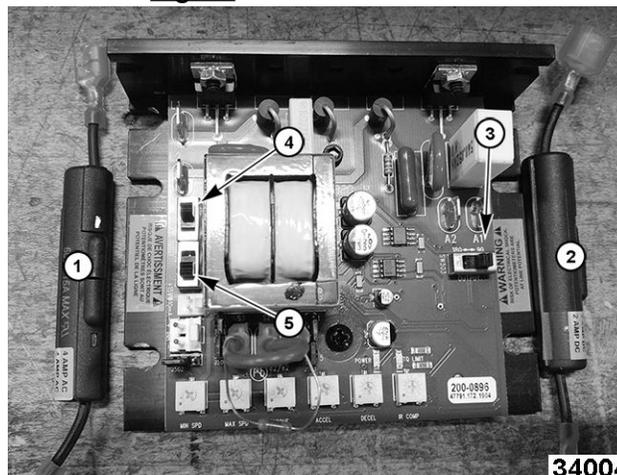


Fig. 65

- Fuse - 1, Fig. 65, 4 amp AC.
- Fuse - 2, Fig. 65, 2 amp DC.
- Switches
  - 4 and 5 switches shown in Fig. 65 are both set at 115V.
  - 3 switch shown in Fig. 65 should be set at 90.

### Trimpts 2nd Generation Controller Board In Fig. 66

- 1) MIN SPD set to 5 o'clock.

- 2) MAX SPD set to 5 o'clock.
- 3) TORQUE set to 5 o'clock.
- 4) ACCEL set to 12 o'clock.
- 5) DECEL set to 12 o'clock.
- 6) IR COMP set to 12 o'clock.

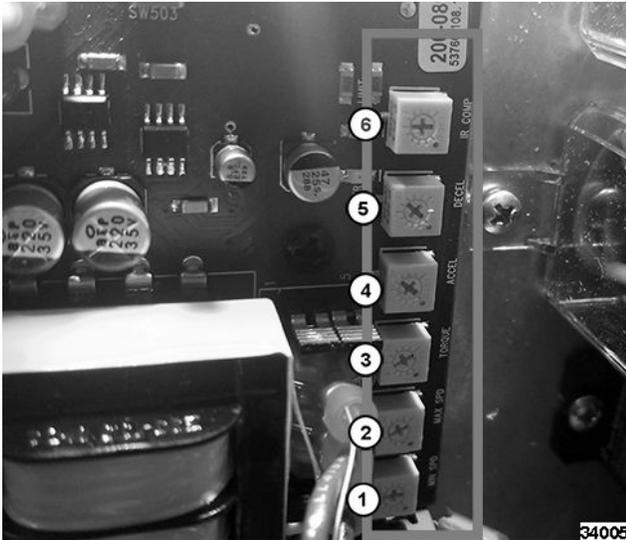


Fig. 66

1. Lower pan to full down position.
2. Raise the lid to full open position.
3. Access DC motor controller. Refer to: POWER SUPPLY BOX COMPONENTS and DC LIFT MOTOR
4. Set VOM to measure AC volts and connect meter leads at L1 and L2 on controller.
5. Turn the on/off switch to on.
6. Verify 120VAC at L1 and L2 on controller when lift control switch (momentary) is operated to raise and lower pan.
  - A. If voltage is present but pan does not raise and lower, proceed to Step 7.
  - B. If voltage is not present refer to MOTORIZED LIFT OPTION ONLY.
7. Disconnect power to machine.
8. Set VOM to measure DC volts and connect VOM leads to terminals A + (positive) and A - (negative) on controller.
9. Reconnect power to machine.
10. Verify 90VDC (approximate) from DC motor controller when lift control switch (momentary) is operated to raise and lower pan.

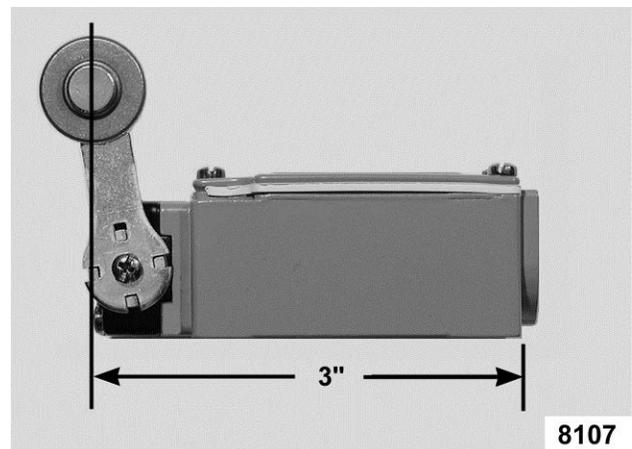
- A. If voltage is present but pan does not raise, refer to MOTORIZED LIFT OPTION ONLY
- B. If voltage is not present and fuse is OK, turn on/off switch off and disconnect power to machine.

11. Install a replacement DC motor controller and check for proper operation.

## PAN POSITION / DOWN LIMIT SWITCH ADJUSTMENT

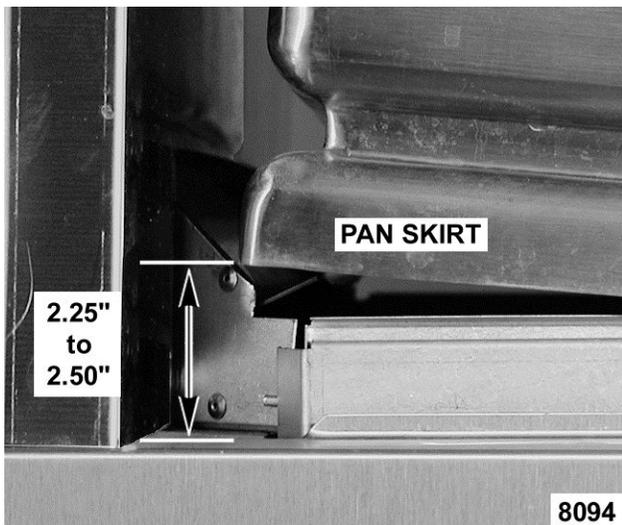
**NOTE:** Do not use motorized lift (if installed) for this procedure.

1. Turn on/off switch off.
2. Remove front and left side panels as outlined under COVERS AND PANELS.
3. Insert manual crank handle.
4. Raise pan to full tilt position.
5. Verify roller arm position on switch.
  - A. Measure distance from rear of switch body to the center of the roller. Distance should be 3".
  - B. If distance is ok, proceed to Step 6.
  - C. If distance is not ok, position roller arm as outlined under PAN POSITION / DOWN LIMIT SWITCH.
6. Lower pan to full down position. Roller should make contact with hinge and operate switch.
7. Verify pan position/down limit switch N.O. contacts are closing.
  - A. Turn on/off switch on and set temperature dial to call for heat.



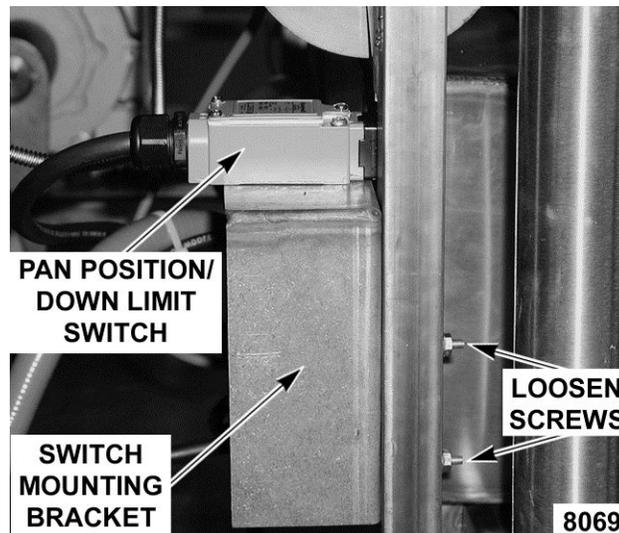
- B. Heat light (red) comes on and all heating elements are energized.

- 1) If heating elements do not energize: Verify 24VAC input to the switch and 24VAC is output from the switch.
  - 2) If voltage is present on output side of switch, the switch is functioning properly. See ELECTRIC LIFTING - MANUAL OR MOTORIZED LIFT OPTIONS or MOTORIZED LIFT OPTION ONLY.
  - 3) If voltage is not present on output side of switch, install a replacement pan position/down limit switch and repeat this procedure to adjust.
8. Verify pan position/down limit switch N.O. contacts are opening.
- A. Slowly raise pan until the heat light and heating elements de-energize then stop.
  - B. At rear of the pan, measure distance from bottom of the pan skirt to lat surface covering the frame.
    - Distance should be 2.25" to 2.50".



**NOTE:** For reference, this is approximately 5 angular degrees.

9. If heat light and heating elements de-energize; and measured distance is within acceptable range, switch is adjusted properly. If both conditions are not satisfied, adjustment is necessary.
10. To adjust:
  - A. Loosen mounting switch bracket screws.



- B. Adjust mounting switch bracket up or down (as necessary) to obtain rear pan dimension of 2.25" to 2.50".
11. Repeat Step 5 through Step 9 to check for proper operation.

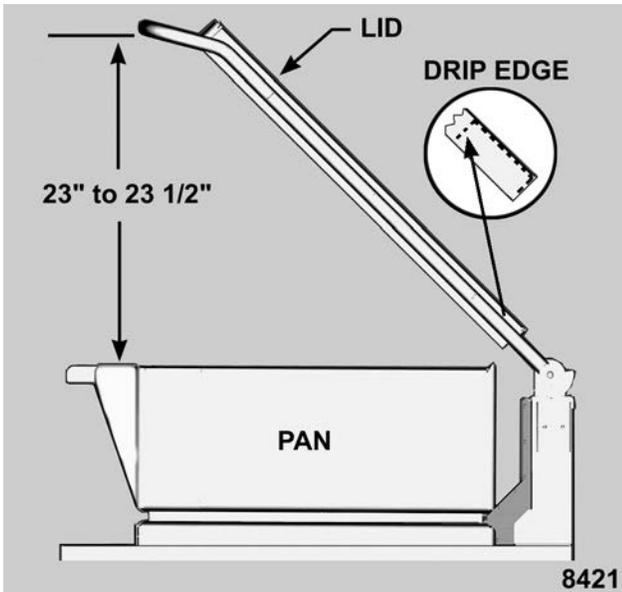
### LID SWITCH ADJUSTMENT

**NOTICE**

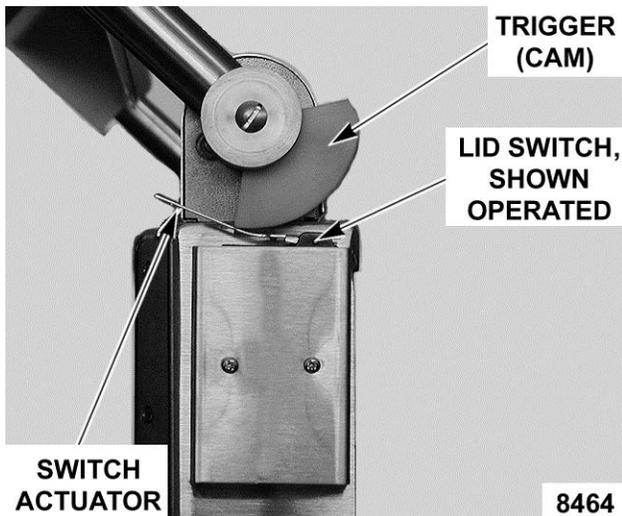
Lid switch should not allow pan to be raised if the lid is not opened a minimum of 23" or damage to the lid may occur.

1. Turn on/off switch on.
2. Raise lid to full open position.
3. Lower pan to full down position.
4. Lower lid to an open height dimension of 23" to 23 1/2" (minimum is 23").

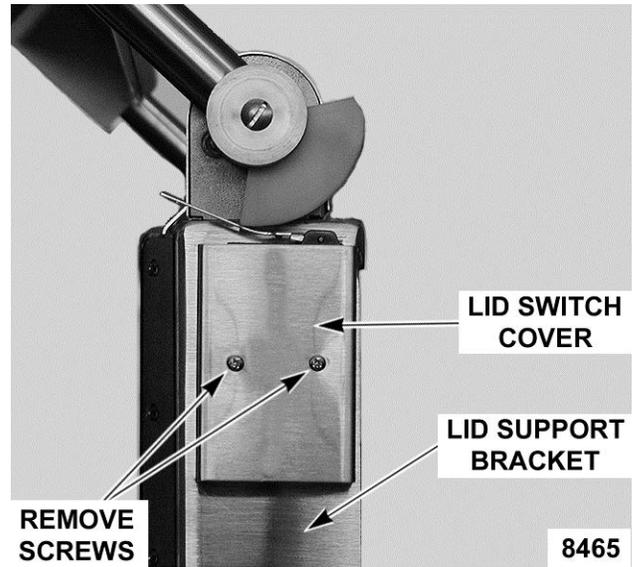
**NOTE:** For reference, this is approximately 45 angular degrees.



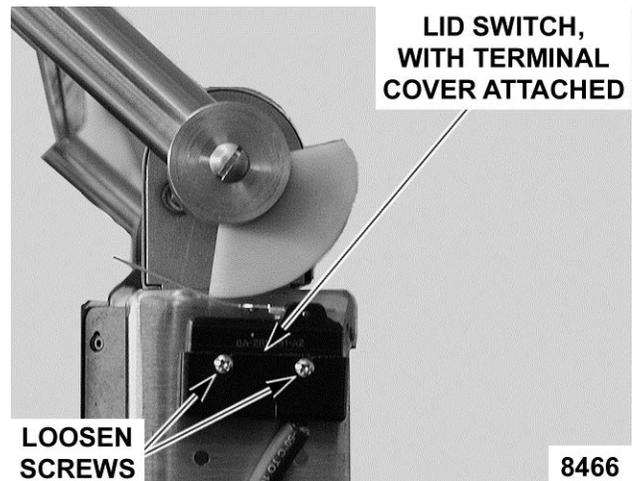
5. Lid switch actuator should make contact with trigger (cam) and operate lid switch.



6. Operate "lift control switch" to raise pan.



- A. If pan raises, lid switch is functioning properly.
  - B. If pan does not raise, continue with procedure.
7. Remove lid switch cover from lid support bracket.
  8. To adjust:
    - A. With lid raised to an open height dimension of 23" to 23 1/2" (minimum is 23"), loosen lid switch mounting screws and adjust switch position to operate the switch. Re-tighten screws.
    - B. If additional adjustment is necessary, push up on tip of switch actuator to slightly bend actuator around mating edge of trigger (cam).



- C. Verify pan will raise by operating lift control switch.
- D. Repeat adjustment (as necessary) and check for proper operation.

## LID SPRING TENSION ADJUSTMENT

1. Raise lid and release at several positions through range of travel.
  - A. If lid remains in place, no adjustment is necessary.
  - B. If lid does not remain in place (springs up or falls down), continue with procedure.

**NOTE:** For spring tension to be set correctly, each spring must be adjusted same amount.

2. Remove spring covers by prying up at bottom. Covers are held in place by tabs on the bottom of cover.

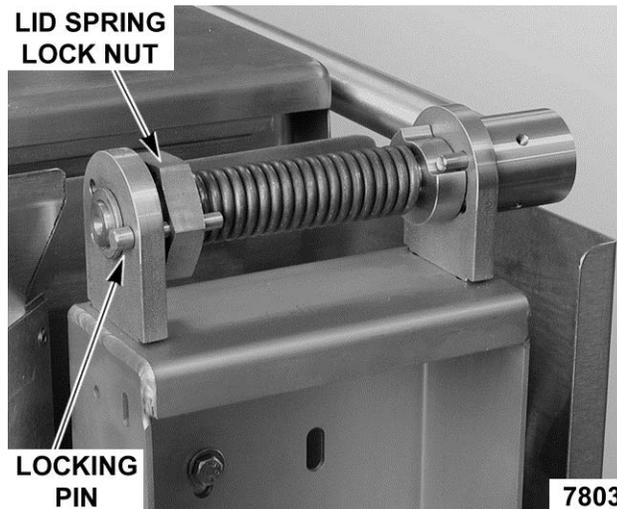


3. To adjust:
  - A. Place a 1 5/8" wrench on the lid spring lock nut and apply a downward force until locking pin can be removed. Continue to hold lock nut in place.

### NOTICE

Do not release wrench while locking pin is removed or damage to the braising pan may occur.

### LID SPRING LOCK NUT



- B. Apply additional downward force to increase spring tension; or slowly release downwards force to decrease spring tension.
  - C. Rotate lid spring lock nut to the next hole position then replace locking pin. Adjust the spring tension, one position at a time.
  - D. Repeat tension adjustment on the opposite spring.
4. Repeat Step 1 to verify adjustment. Make additional adjustments as necessary.

## SETTING RESISTOR ON CONTROLLER SPEED BOARD



### **⚠ WARNING**

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

#### Dial in Resistor

1. Turn all dial settings (white squares) on board all the way to the left.
2. Dial in all settings (Fig. 76).
  - 1) MIN SPD set to 5 o'clock.
  - 2) MAX SPD set to 5 o'clock.
  - 3) TORQUE set to 5 o'clock.
  - 4) ACCEL set to 12 o'clock.
  - 5) DECEL set to 12 o'clock.
  - 6) IR COMP set to 12 o'clock.

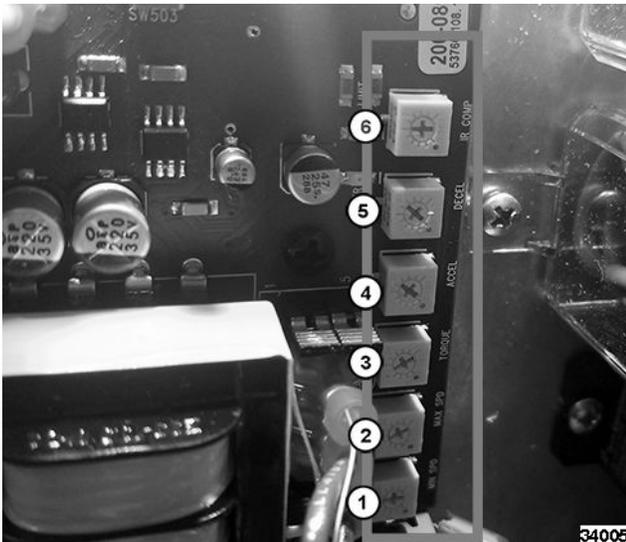


Fig. 76

# ELECTRICAL OPERATION

## COMPONENT FUNCTION

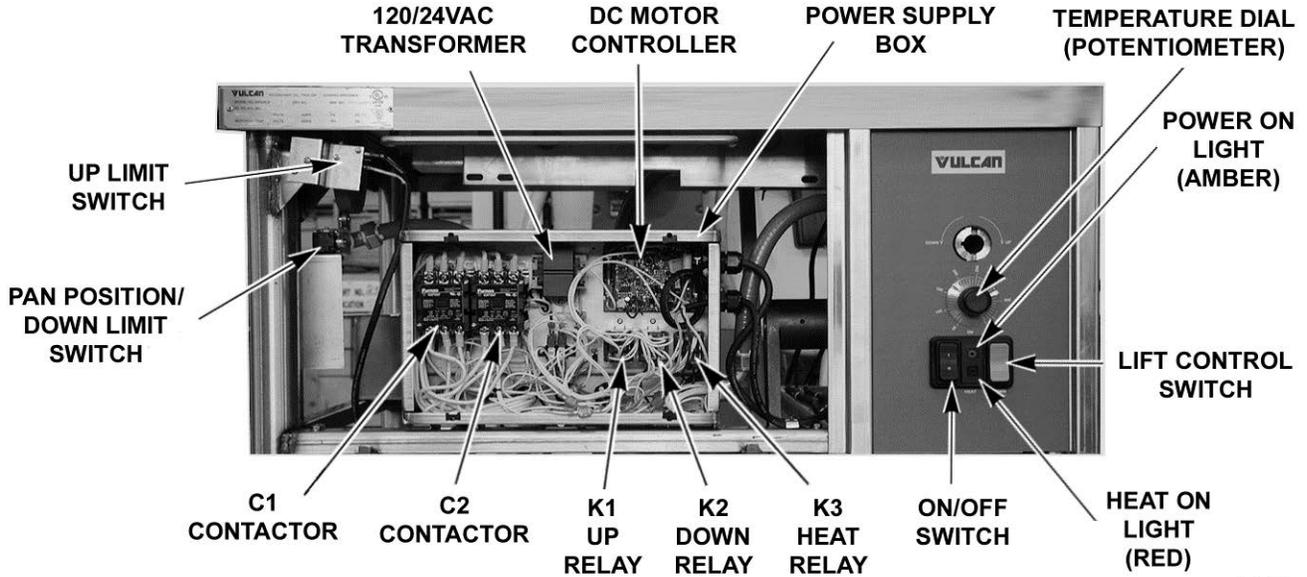
<b>BRAISING PAN CONTROLS</b>	
Temperature Controller	Monitors thermocouple input and regulates braising pan temperature. An external set point potentiometer is used for temperature adjustments.
120/24VAC Transformer	Supplies 24VAC for heating control circuit. If motorized pan lift option is installed, supplies 24VAC for lift control circuit.
240-480/120VAC Transformer	Supplies 120VAC for control circuit.
ON/OFF Switch	Controls 24VAC to the heating control circuit. If motorized pan lift option is installed, controls power to the lift control circuit.
Power On Light (Amber)	Indicates on/off switch is turned on.
Heat Light (Red)	Indicates temperature controller is calling for heat and pan is down.
Pan Position/ Down Limit Switch	N.O. contacts function as pan position switch to power the heating circuit when pan is down. Removes power from heating circuit when pan is raised. The N.C. contacts are used for the down limit switch (motorized lift option only).
Fuses F1 and F2	Protects control circuit if current exceeds the rated amperage.
K3 Heat Relay	Supplies power to contactor coils C1, C2, and C3.
Contactors C1, C2, C3	Supplies line voltage to heating elements.
Heating Elements	Produces heat for the braising pan cooking surface.
High Limit Thermostat	Prevents braising pan from reaching excessive temperatures by removing power to contactors. Monitors surface temperature of the insulation cover and not the pan. Open at 400°F; close at 360°F (auto reset).

<b>MOTORIZED PAN LIFT OPTION CONTROLS</b>	
DC Motor Controller	Controls DC lift motor operation for raising and lowering of pan, and provides motor acceleration control each time controller is powered. Controller outputs approximately 90VDC to power motor.
DC Lift Motor	Operates gear reducer to raise or lower the pan. When correct voltage polarity is applied through K1 contacts, motor rotates CW to raise pan. When reverse voltage polarity is applied through K2 contacts, motor rotates CCW to lower pan.
Lid Switch	Controls 24VAC power to lift control switch. Used to ensure lid is open before pan can be raised.
Lift Control Switch (Momentary On/Off/On)	Energizes K1 relay coil through up limit switch contacts (N.C.) to raise pan. Energizes K2 relay coil through down limit switch contacts (N.C.) to lower pan. The switch positions are: Center neutral (starting) position off; Momentary on - lower pan; Momentary on - raise pan.
Up Limit Switch	Removes power from K1 relay coil when pan reaches full tilt (pan travel stops).
Pan Position/ Down Limit Switch	N.C. contacts function as down limit switch to remove power from K2 relay coil when pan is lowered to down position (pan travel stops). N.O. contacts are used for pan position switch.
K1 Up Relay (3PDT)	Supplies power to motorized lift circuit to raise pan when 24VAC coil is energized.

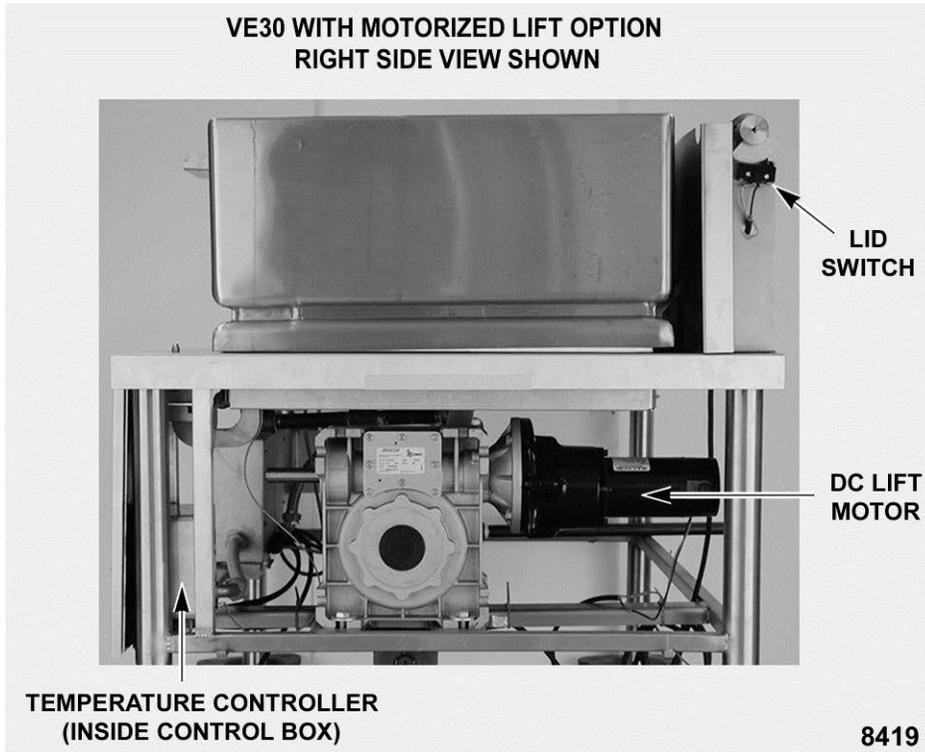
MOTORIZED PAN LIFT OPTION CONTROLS	
K2 Down Relay (3PDT)	Supplies power to motorized lift circuit to lower pan when 24VAC coil is energized by lift control switch.

## COMPONENT LOCATION

**VE30 WITH MOTORIZED LIFT OPTION  
FRONT VIEW SHOWN**



**VE30 WITH MOTORIZED LIFT OPTION  
RIGHT SIDE VIEW SHOWN**



## SEQUENCE OF OPERATION

Refer to SCHEMATIC DIAGRAM for the electrical sequence of operation. Manual pan lift is the standard configuration.

### Heating

1. 1. Conditions.
  - A. A. Braising pan connected to correct supply voltage and is properly grounded.
    - 1) 240-480/120VAC transformer energized.
    - 2) Temperature controller energized.
    - 3) 120/24VAC transformer energized.
  - B. Temperature dial at lowest setting (potentiometer fully CCW).

**NOTE:** Temperature controller internal relay contacts remain open (N.O.).

- C. Pan temperature is below 200°F.
  - D. On/off switch off.
  - E. Pan position/down limit switch N.O. contacts closed (pan down).
  - F. High limit thermostat closed.
2. Turn on/off switch on.
    - Indicator light (amber) comes on.
  3. Set the temperature dial to call for heat.
    - A. Internal relay on temperature controller is energized and HT.0/HT.1 N.O. contacts close.
      - 1) Heat light (red) comes on.
      - 2) K3 heat relay coil energized and K3 4/7 N.O. contacts close.
        - Contactor coils C1, C2, and C3 (VE40 only) energized and heating elements are powered.

**NOTE:** If pan is raised 2.25" to 2.50" at rear, pan position/down limit switch N.O. contacts will open and deenergize K3 heat relay coil.

4. Braising pan reaches set point temperature.
  - A. Internal relay on temperature controller is de-energized and HT.0/HT.1 N.O. contacts open.
    - 1) Heat light (red) goes out.
    - 2) K3 heat relay coil de-energized and K3 4/7 N.O. contacts open.

- Contactor coils C1, C2, and C3 (VE40 only) are de-energized and power is removed from heating elements.

5. Braising pan will continue to cycle with temperature controller until pan is raised or the on/off switch is turned off.

**Motorized Pan Lift (Option)** . Refer to dashed line sections labeled **MOTORIZED LIFT OPTION** on SCHEMATIC DIAGRAM for the integration of motorized pan lift components into the sequence of operation.

1. Conditions.
  - A. Braising pan connected to correct supply voltage and is properly grounded.
    - 1) 240-480/120VAC transformer energized.
    - 2) 120/24VAC transformer energized.
  - B. On/off switch off.
  - C. Lift control switch off (center position).
  - D. Lid switch N.O. contacts closed (lid opened).
  - E. Up limit switch N.C. contacts closed (pan position is less than full tilt).
  - F. Pan position/down limit switch N.O. contacts closed; and N.C. contacts open (pan down).

**NOTE:** The pan position/down limit switch are contained in the same switch body. Both sets of DPST contacts are utilized.

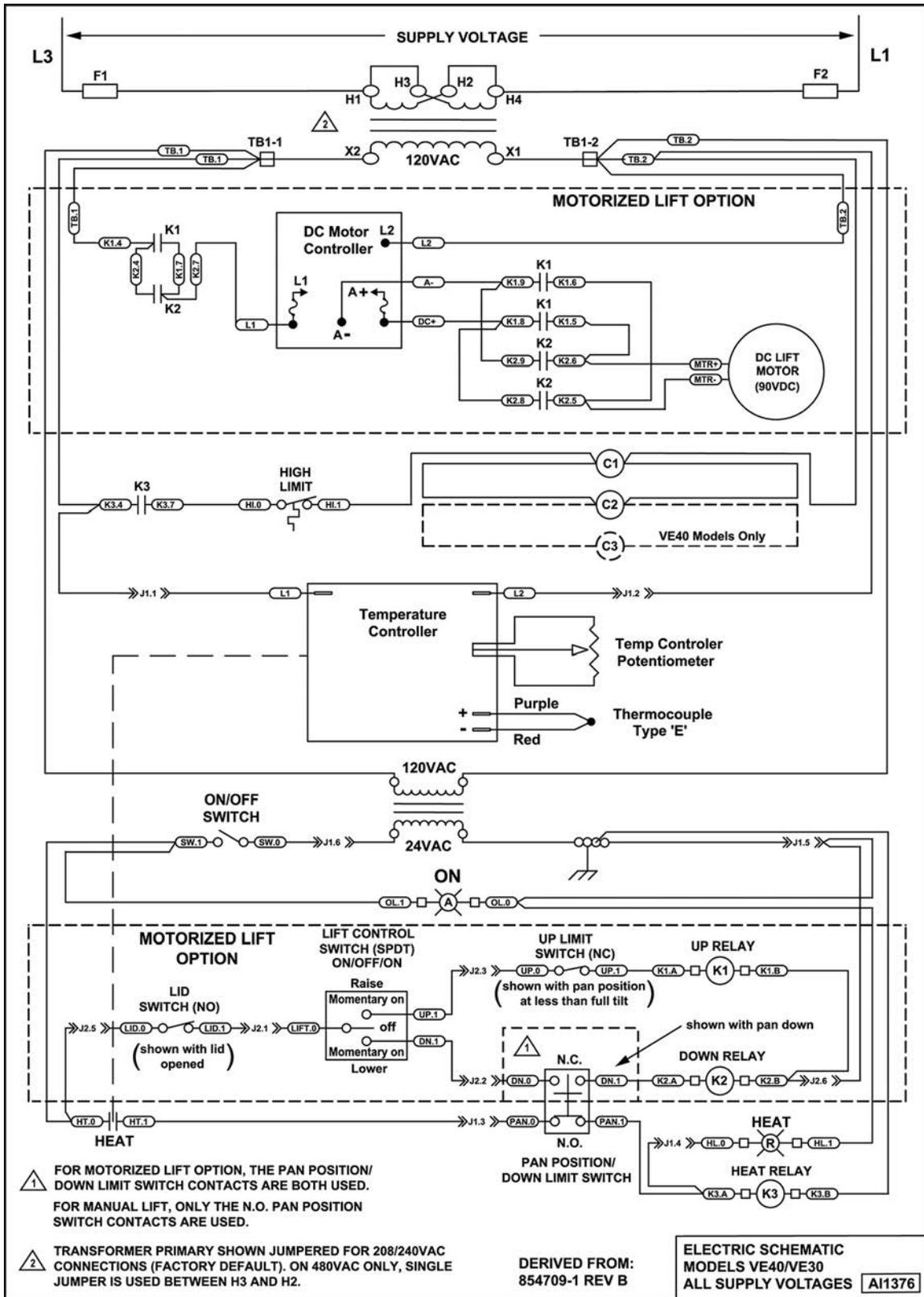
2. Turn on/off switch on.
  - Indicator light (amber) comes on.

**NOTE:** If temperature dial is set to call for heat, contactors C1, C2, and C3 (VE40 only) are energized through heat relay K3 4/7 N.O. contacts.

3. Operate the lift control switch to raise the pan (momentary on - raise).
  - A. K1 relay coil is energized through the up limit switch N.C contacts.
    - 1) K1 4/7 N.O. contacts close.
    - 2) K1 9/6 N.O. contacts close.
    - 3) K1 8/5 N.O. contacts close.
  - B. 120VAC to DC motor controller through K1 4/7 N.O. contacts.

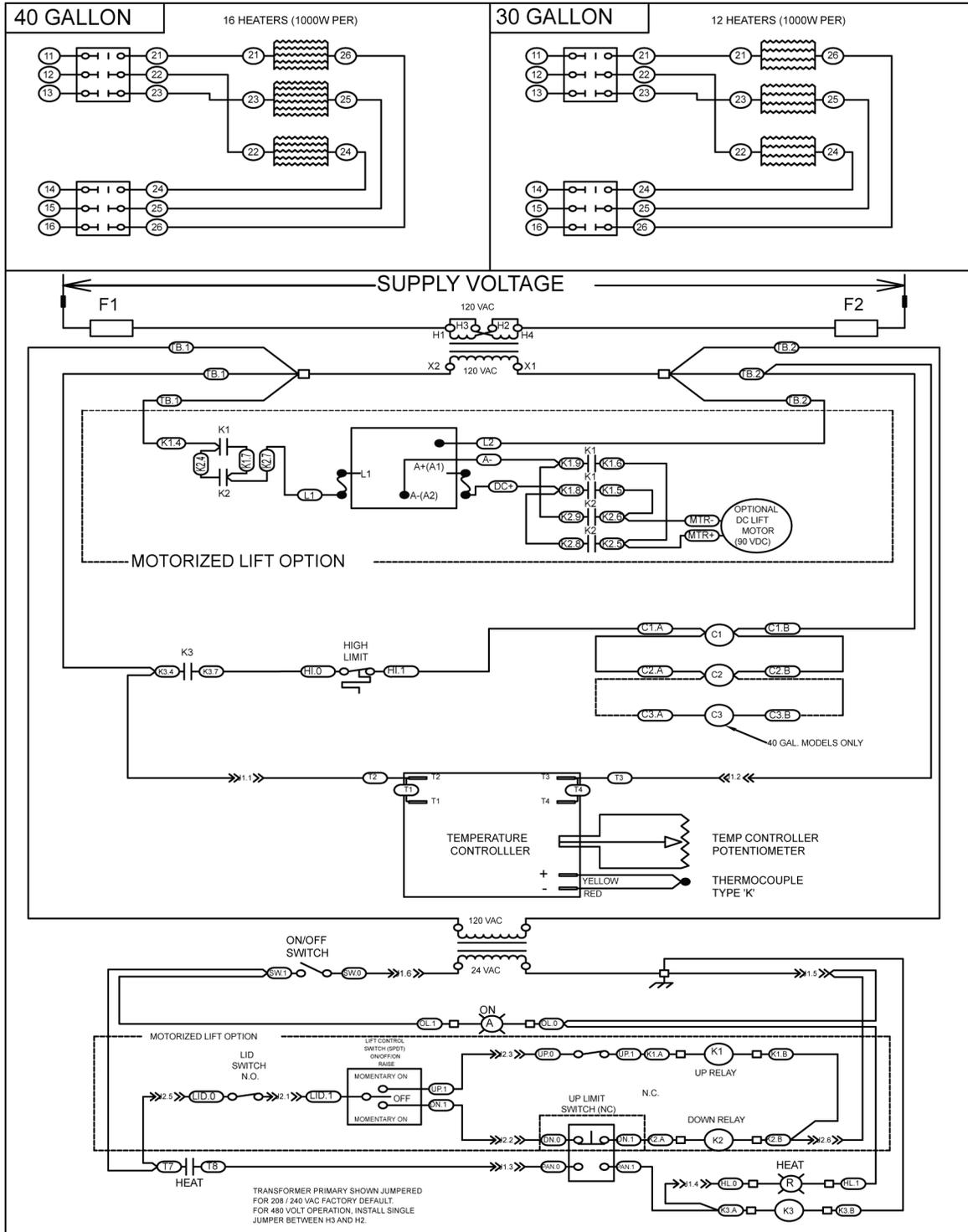
- 90VDC output is activated at terminals A + (positive) and A - (negative). DC lift motor powered through K1 9/6 N.O. contacts, K1 8/5 N.O. contacts and pan raises. When the pan is raised 2.25" to 2.50" at rear, pan position/down limit switch contacts change state. N.O contacts open to remove power from K3 heat relay coil; and N.C contacts close. Power is then available for K2 relay coil through N.C. set of contacts. The pan can still be raised or lowered through its travel range by operating lift control switch. Release switch to stop pan travel.
4. When pan is raised 2.25" to 2.50" at rear, pan position/down limit switch contacts change state. The N.O contacts open to remove power from K3 heat relay coil; and N.C contacts close. Power is then available for K2 relay coil through N.C. set of contacts. Pan can still be raised or lowered through its travel range by operating lift control switch. Release switch to stop pan travel.
  5. Pan reaches full tilt position, up limit switch N.C. contacts open and K1 relay coil is deenergized.
    - Three sets of K1 contacts return to N.O. position. Power is removed from the DC motor controller, the DC lift motor and pan travel stops.
  6. Operate lift control switch to lower pan (momentary on - lower).
    - A. K2 relay coil is energized through pan position/down limit switch N.C contacts.
      - 1) K2 4/7 N.O. contacts close.
      - 2) K2 9/6 N.O. contacts close.
      - 3) K2 8/5 N.O. contacts close.
    - B. 120VAC to DC motor controller through K2 4/7 N.O. contacts.
      - 90VDC output is activated at terminals A + (positive) and A - (negative). DC lift motor powered through K2 9/6 N.O. contacts, K2 8/5 N.O. contacts and pan lowers.
  7. After pan leaves the full tilt position, up limit switch N.C. contacts close. Direction of pan travel can then be reversed by un-operating switch (pan travel stops) then operating the switch to raise the pan.
  8. Pan reaches full down position, pan position/down limit switch N.C. contacts open and K2 relay coil is de-energized.
    - Three sets of K2 contacts return to N.O. position. Power is removed from DC motor controller, DC lift motor and pan travel stops.

**SCHEMATIC DIAGRAM**



**1ST GENERATION TEMPERATURE CONTROLLER**

BRAISING PANS WITH MOTORIZED LIFT OPTION



DERIVED FROM 00-854709-1 REV E

AI4989

VE - FAST BATCH MODELS 2ND GENERATION TEMPERATURE CONTROLLER

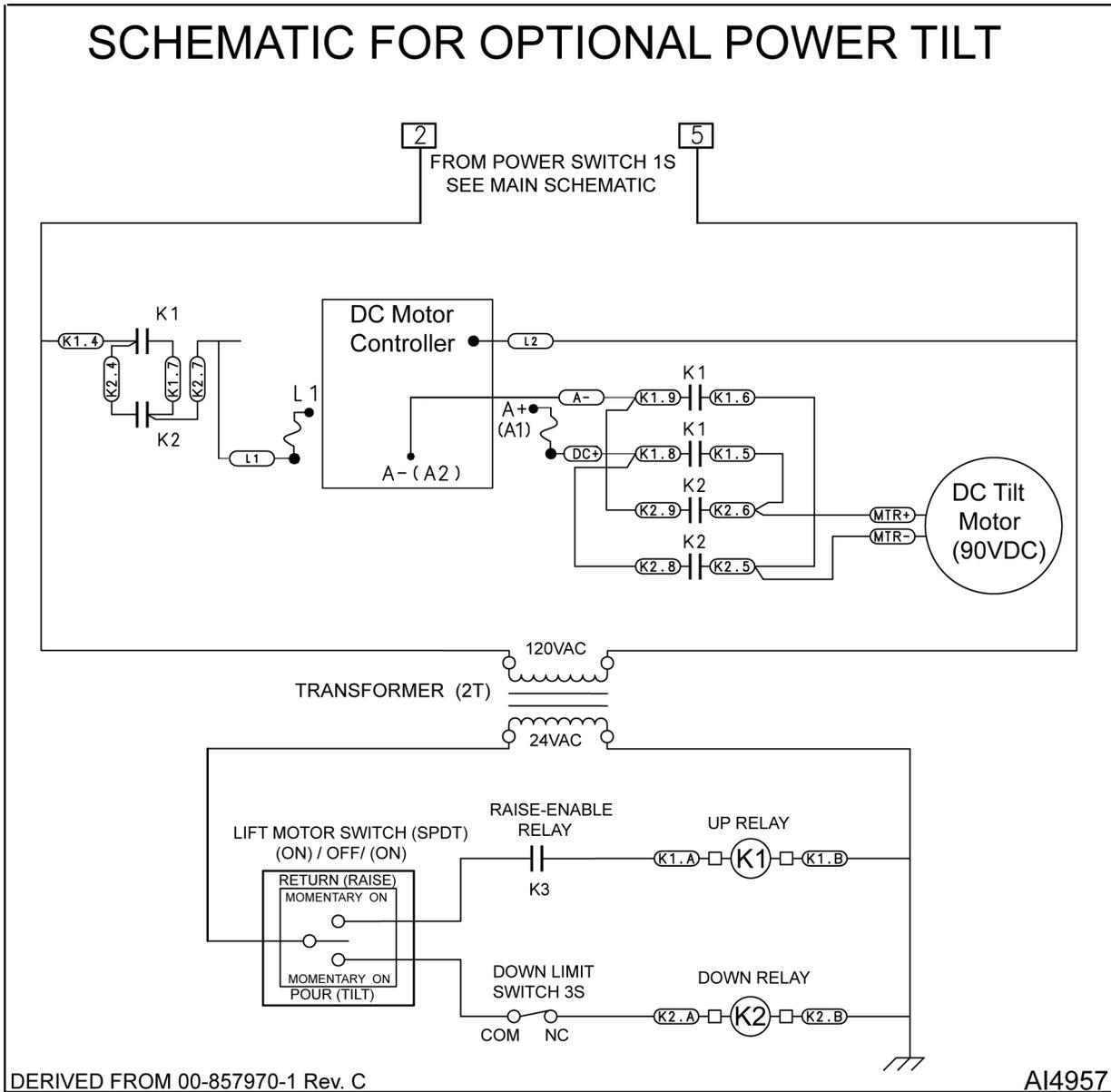
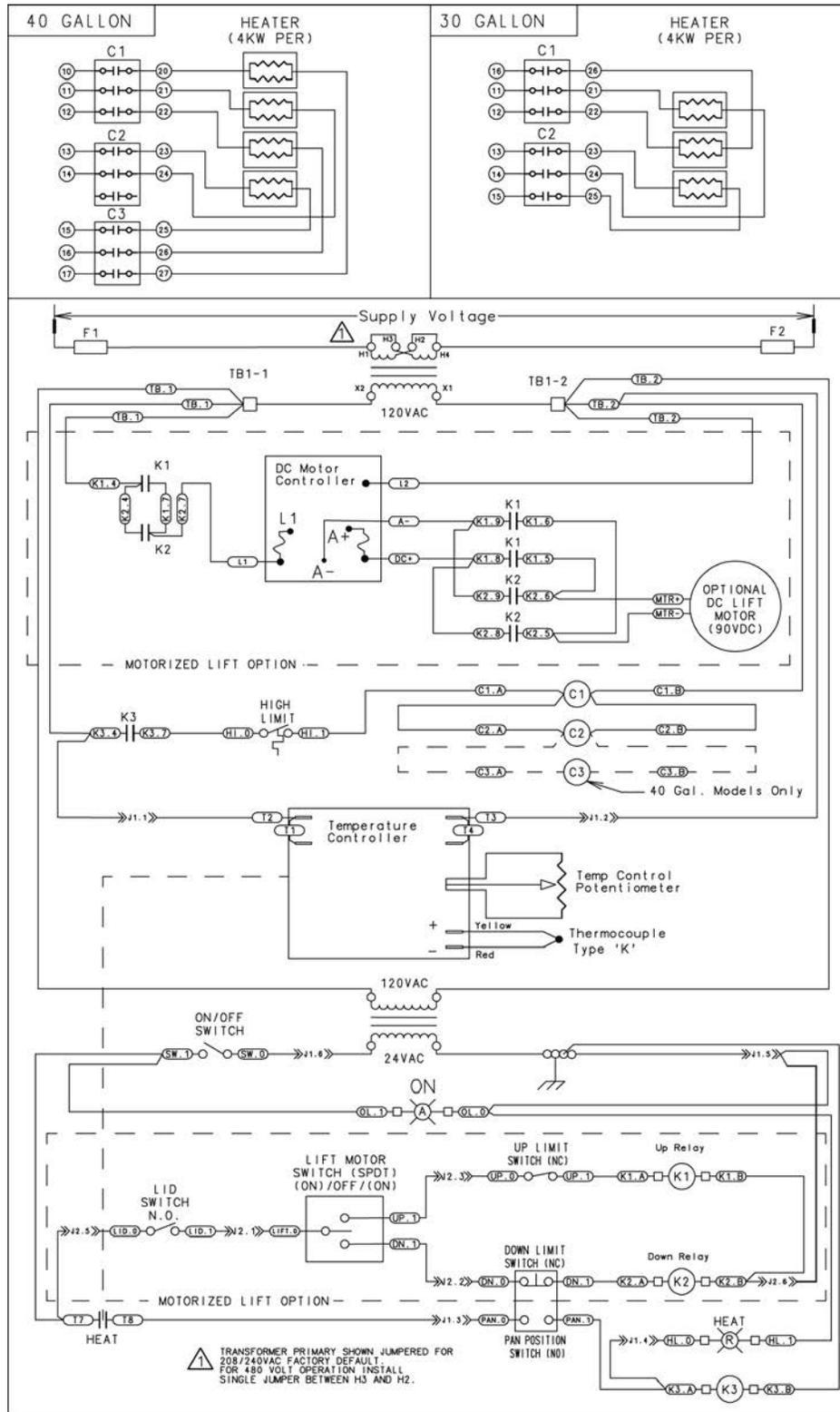


Fig. 81

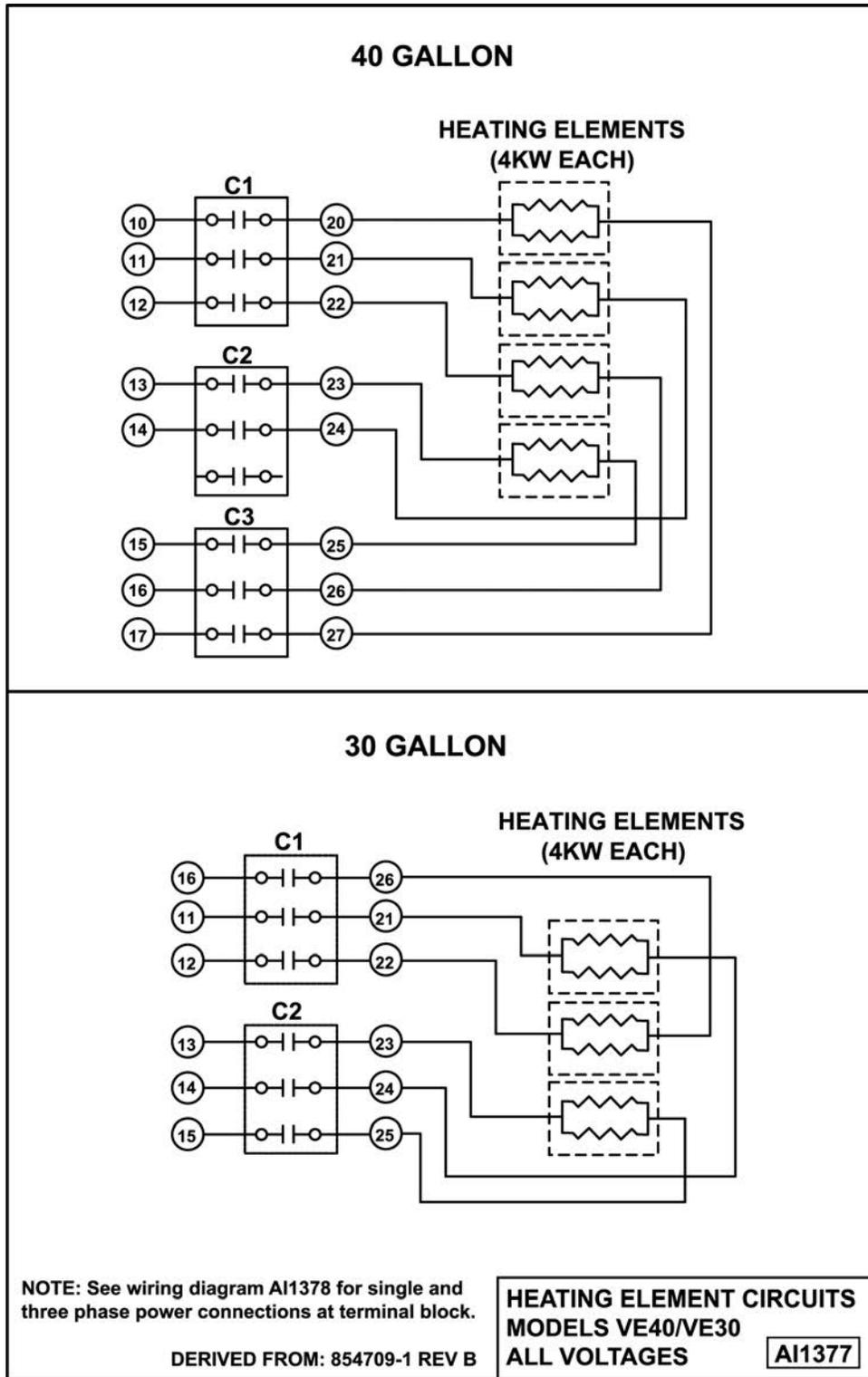
**WIRING DIAGRAMS**



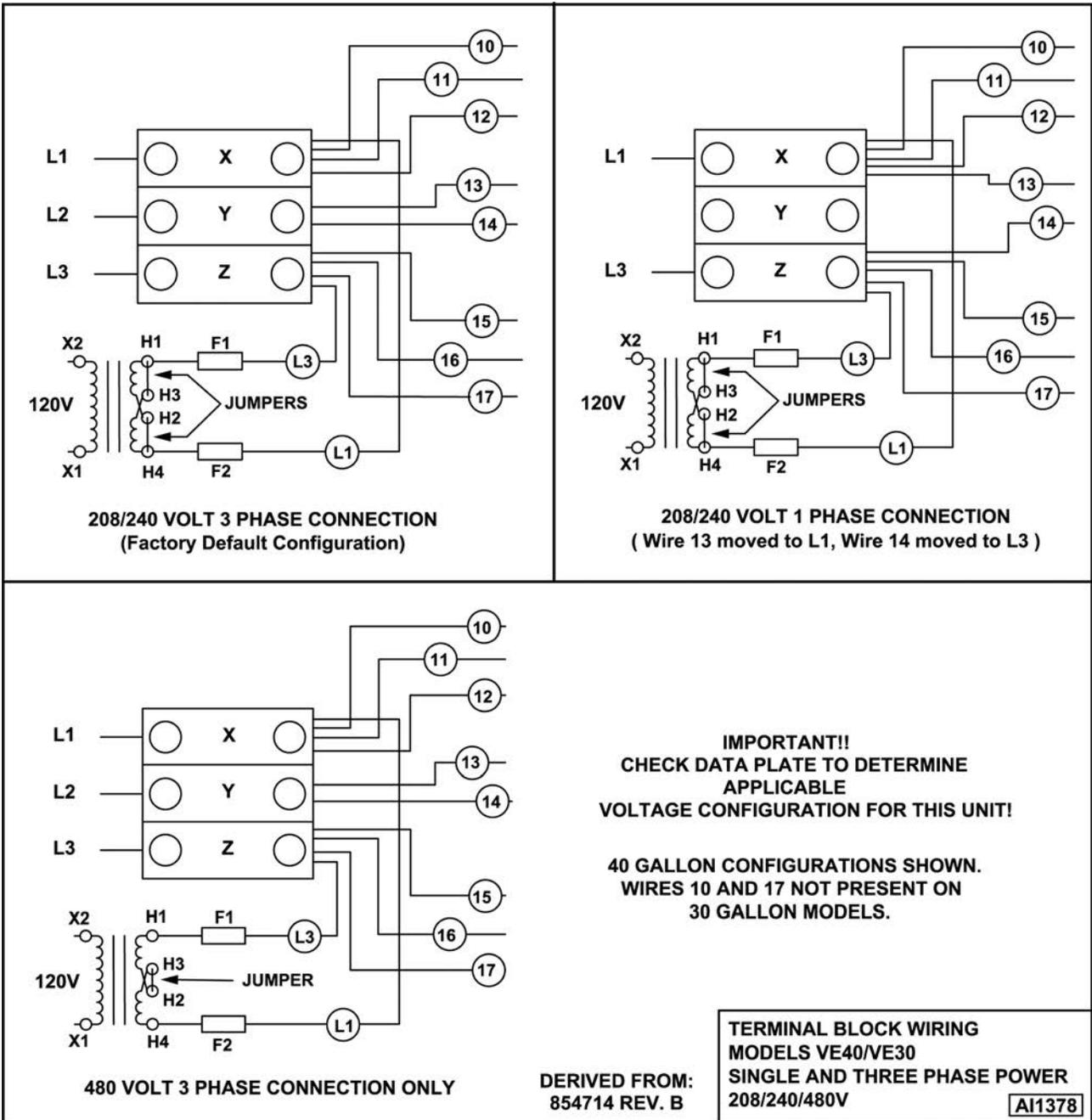
Derived from 00-854709-1 Rev D

A14991

**1ST GENERATION VE**



Heating Element Circuits



Terminal Block Wiring

# TROUBLESHOOTING

## ELECTRIC LIFTING - MANUAL OR MOTORIZED LIFT OPTIONS

SYMPTOMS	POSSIBLE CAUSES
Braising pan does not heat, power on light is lit and heat light is lit.	<ol style="list-style-type: none"> <li>1. K3 heat relay malfunction.</li> <li>2. High limit thermostat open.</li> <li>3. Contactor(s) malfunction.</li> <li>4. Heating element(s) malfunction.</li> </ol>
Braising pan does not heat, power on light is lit but heat light is not lit.	<ol style="list-style-type: none"> <li>1. Pan not fully lowered; pan position/down limit switch out of adjustment; or pan position/down limit switch malfunction.</li> <li>2. Temperature dial not set to call for heat; temperature probe malfunction; or temperature controller malfunction.</li> <li>3. Interconnecting wiring malfunction.</li> </ol>
Braising pan does not heat, power on light is not lit.	<ol style="list-style-type: none"> <li>1. Main circuit breaker off; or control circuit fuse F1 or F2 open.</li> <li>2. Supply voltage incorrect.</li> <li>3. 240-480/120VAC transformer - Missing or incorrect jumper location; or transformer inoperative.</li> <li>4. On/off switch off or malfunction.</li> <li>5. 120/24VAC transformer inoperative.</li> <li>6. Interconnecting wiring malfunction.</li> </ol>
Excessive or low heat on cooking surface (no uneven cooking).	<ol style="list-style-type: none"> <li>1. Supply voltage incorrect.</li> <li>2. Temperature probe not properly mounted.</li> <li>3. Temperature controller calibration.</li> <li>4. Temperature probe malfunction; or temperature controller malfunction.</li> </ol>
Hot or cold zones on cooking surface (uneven cooking).	<ol style="list-style-type: none"> <li>1. Supply voltage incorrect.</li> <li>2. Heating element(s) not properly mounted.</li> <li>3. Contactor(s) malfunction.</li> <li>4. Heating element(s) malfunction.</li> </ol>

## MOTORIZED LIFT OPTION ONLY

SYMPTOMS	POSSIBLE CAUSES
Pan will not raise.	<ol style="list-style-type: none"> <li>1. Lid switch open (lid not opened) or malfunction.</li> <li>2. 120/24VAC transformer inoperative.</li> <li>3. On/off switch off or malfunction.</li> <li>4. Lift control switch malfunction (momentary on - raise).</li> <li>5. Up limit switch malfunction.</li> <li>6. K1 relay malfunction.</li> <li>7. DC motor controller - Fuses open or controller malfunction.</li> <li>8. DC Lift motor inoperative.</li> <li>9. Gear reducer malfunction.</li> <li>10. Interconnecting wiring malfunction.</li> </ol>
Pan will not lower.	<ol style="list-style-type: none"> <li>1. Lid switch open (lid not opened) or malfunction.</li> <li>2. Pan position is below 2.25" to 2.50" at the rear. Raise pan to return pan position/down limit switch N.C. contacts to closed position.</li> <li>3. 120/24VAC transformer inoperative.</li> <li>4. On/off switch off or malfunction.</li> <li>5. Lift control switch malfunction (momentary on - lower).</li> <li>6. Down limit switch malfunction.</li> <li>7. K2 relay malfunction.</li> <li>8. DC motor controller - Fuses open or controller malfunction.</li> <li>9. DC Lift motor inoperative.</li> <li>10. Gear reducer malfunction.</li> <li>11. Interconnecting wiring malfunction.</li> </ol>

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# CATALOG OF REPLACEMENT PARTS



## ELECTRIC AND GAS BRAISING PANS

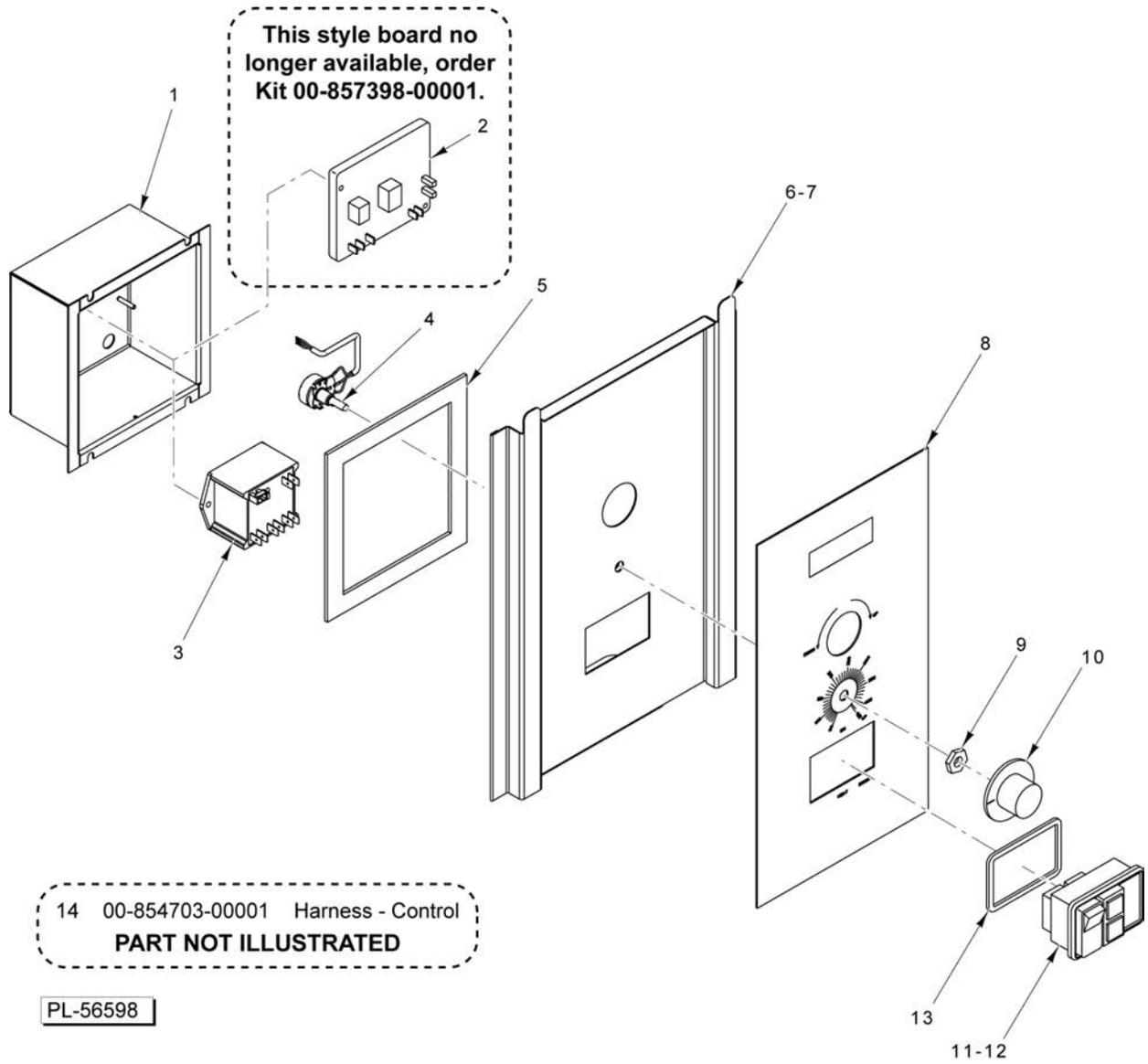
ML-126847  
ML-126848  
ML-126849  
ML-126850  
ML-152047  
ML-152048

VG30  
VG40  
VE30  
VE40  
VE30 Fast Batch  
VE40 Fast Batch



**Table of Contents**

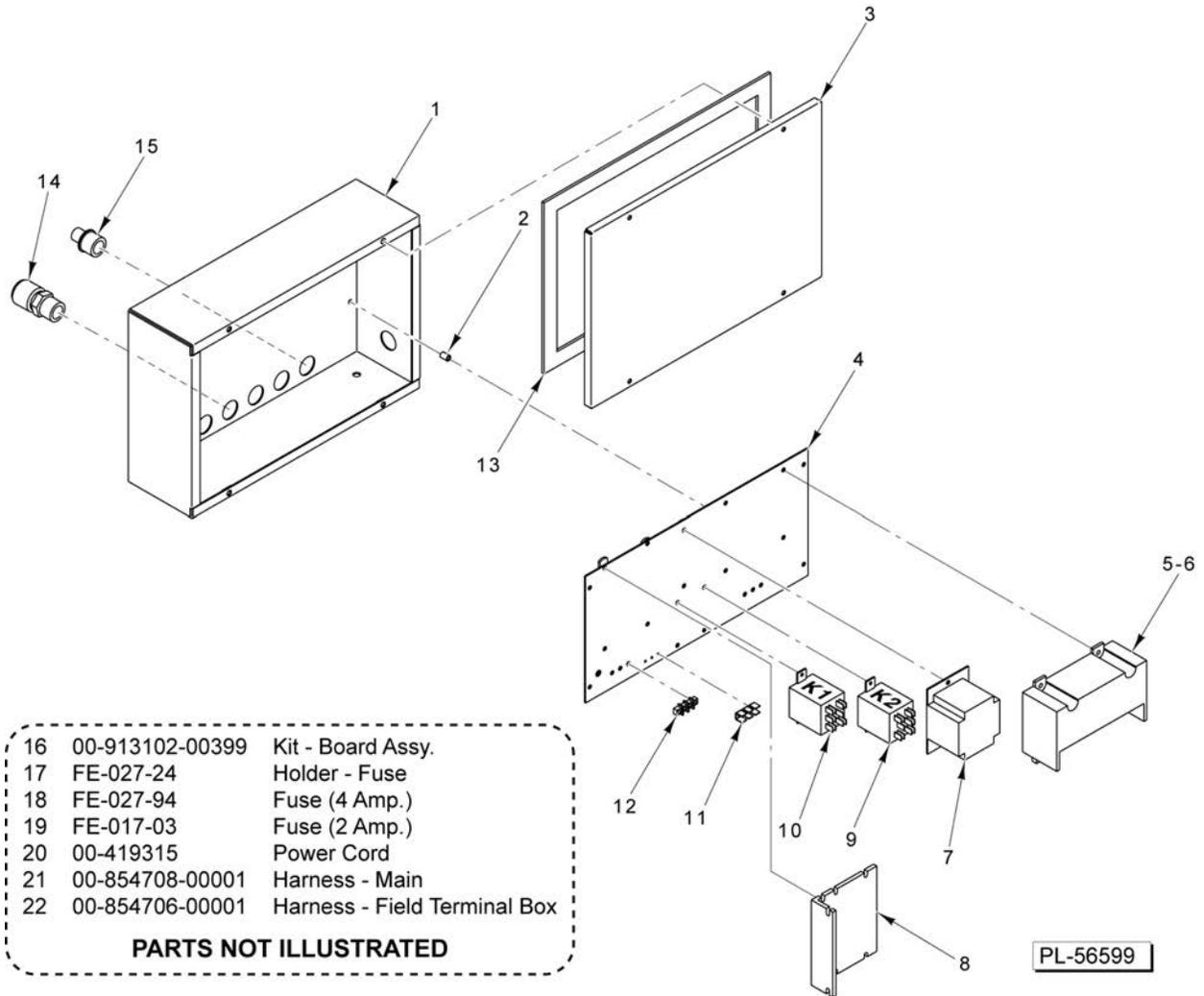
5 CONTROL PANEL  
7 POWER BOX - GAS (ML-126847 & ML-126848)  
9 POWER BOXES - ELECTRIC (ML-126849, ML-126850, ML-152047, & ML-152048)  
11 LID ASSEMBLY  
13 PANELS  
15 PAN AND LIFT UNIT  
17 BRAISING PANS  
19 HEATING ELEMENTS (ML-126849 & ML-126850)  
21 HEATING ELEMENTS (ML-152047 & ML-152048)  
23 GAS BURNERS (ML-126847 & ML-126848)  
25 GAS PIPING (ML-126847 & ML-126848)  
27 DRAW-OFF VALVE ASSEMBLY



### CONTROL PANEL

**CONTROL PANEL**

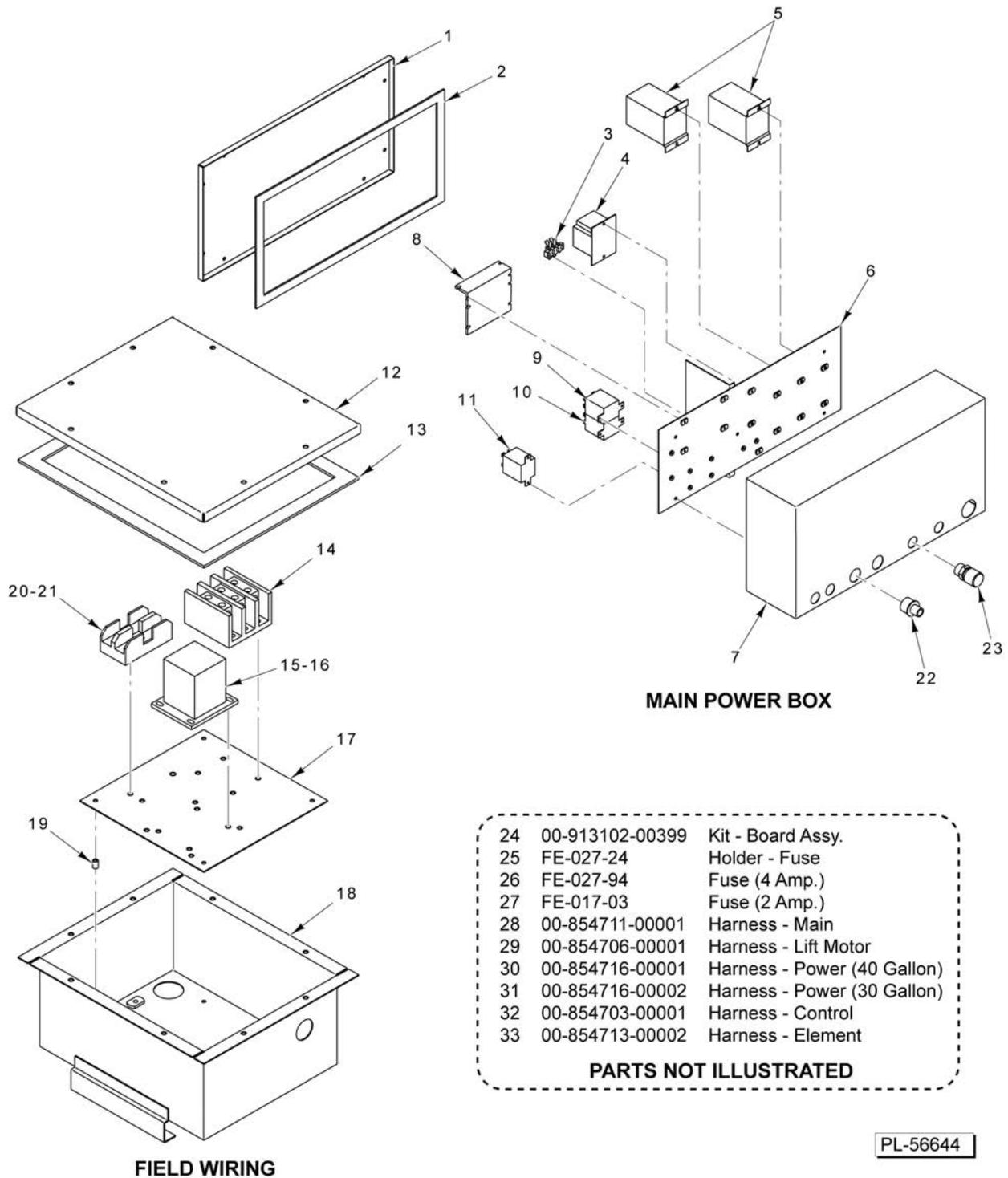
<b>ILLUS.</b>	<b>PART NO.</b>	<b>NAME OF PART</b>	<b>AMT.</b>
1	00-854817-00001	Box - Control.....	1
2	00-857398-00001	Kit - Temperature Control Board (Used to replace board used prior to 12-31-07) (Incls. Items 3, 4, & Thermocouple).....	1
3	00-857112-00001	Controller - Temperature (Used after 12-31-07 and with Item 4).....	1
4	00-857389-00001	Potentiometer (Used after 12-31-07 and with Item 3).....	1
5	00-854664-0000U	Gasket.....	AR
6	00-854814-00001	Panel - Control Weldment (15 In.).....	1
7	00-854814-00002	Panel - Control Weldment (21 In.).....	1
8	00-854661-00002	Overlay.....	1
9	00-854693-00001	Seal Nut - Rotary Switch.....	1
10	00-854647-00001	Knob - Control.....	1
11	00-854537-00001	Switch - Control (Manual).....	1
12	00-854495-00001	Switch - Control (Automatic).....	1
13	00-854696-00001	Gasket - Switch.....	1
14	00-854703-00001	Harness - Control.....	1



**POWER BOX - GAS  
(ML-126847 & ML-126848)**

**POWER BOX - GAS  
(ML-126847 & ML-126848)**

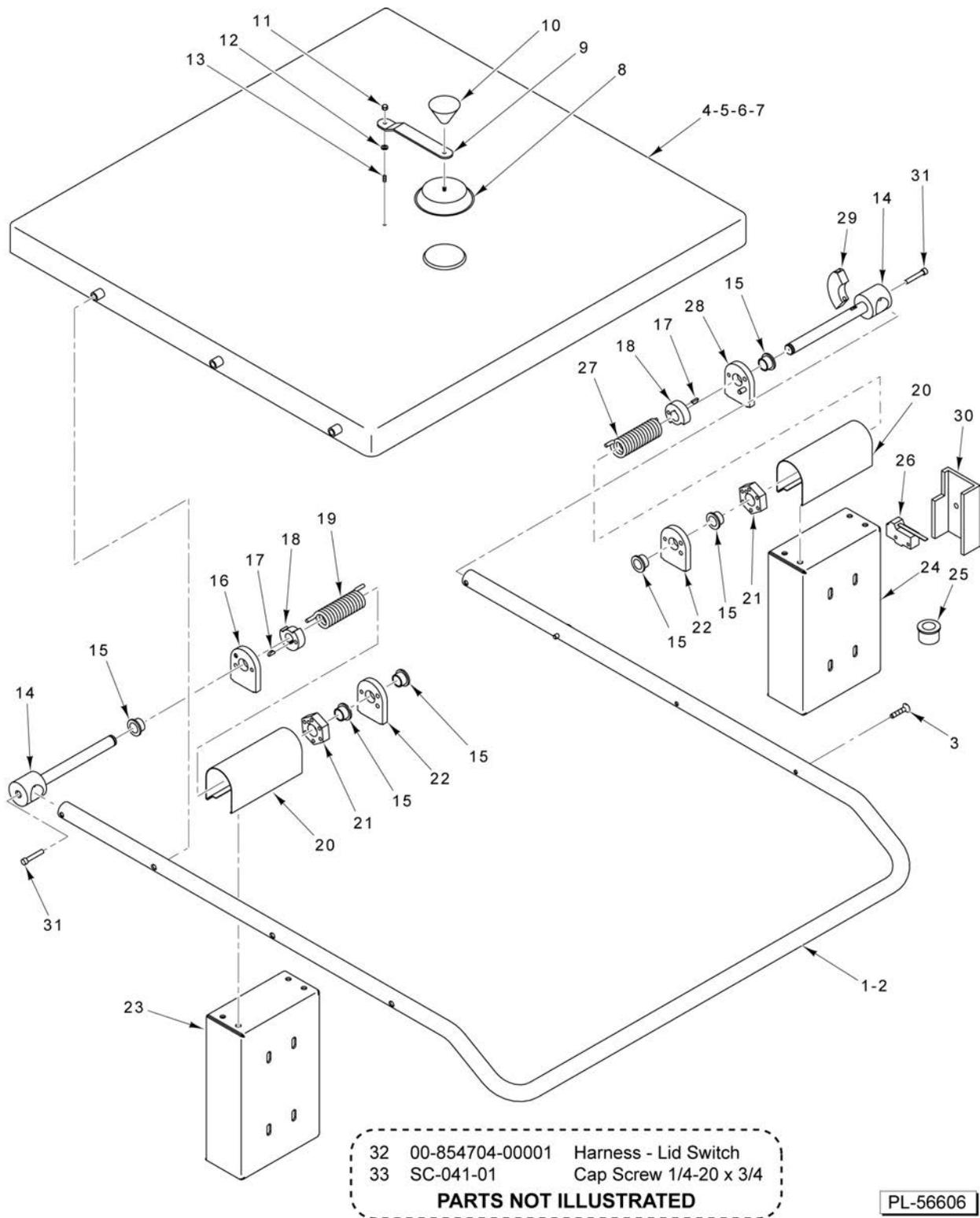
ILLUS. PL-56599	PART NO.	NAME OF PART	AMT.
1	00-854633-00001	Box - Weldment (Power).....	1
2	00-853781-00001	Standoff (Power Box).....	4
3	00-854637-00001	Cover - Box.....	1
4	00-854635-00001	Panel - Component (Before S/N 463030592).....	1
5	00-857207-00001	Module - Ignition (Honeywell) (Before S/N 463021794).....	1
6	00-858480-00001	Module - Ignition (Fenwal) (S/N 463021794 thru S/N 463030592).....	1
7	00-411500-00012	Transformer (120 VAC, 24 V., 40 VA) (Before S/N 463030592).....	1
8	00-854671-00001	Controller - Speed (Auto-Lift) (Before S/N 463030592).....	1
9	00-854545-00001	Relay (Up) (Auto-Lift) (Before S/N 463030592).....	1
10	00-854545-00001	Relay (Down) (Auto-Lift) (Before S/N 463030592).....	1
11	00-419317	Terminal - Stationary (Male) (Before S/N 463030592).....	1
12	00-854707-00002	Block - Terminal (2-Pole) (Before S/N 463030592).....	1
13	00-854664-0000U	Gasket.....	AR
14	00-854761-00002	Relief - Strain 1/2 Electrical.....	1
15	00-854764-00001	Plug - Strain Relief.....	1
16	00-913102-00399	Kit - Board Assy. (Incls. Items 17 thru 19) (Starting S/N 463030592).....	AR
17	FE-027-24	Holder - Fuse (Starting S/N 463030592).....	AR
18	FE-024-94	Fuse (4 Amp.) (Starting S/N 463030592).....	AR
19	FE-017-03	Fuse (2 Amp.) (Starting S/N 463030592).....	AR
20	00-419315	Power Cord.....	1
21	00-854708-00001	Harness - Field Terminal Box (Gas).....	1
22	00-854706-00001	Harness - Lift Motor (Optional).....	1



**POWER BOXES - ELECTRIC**  
**(ML-126849, ML-126850, ML-152047, & ML-152048)**

**POWER BOXES - ELECTRIC**  
**(ML-126849, ML-126850, ML-152047, & ML-152048)**

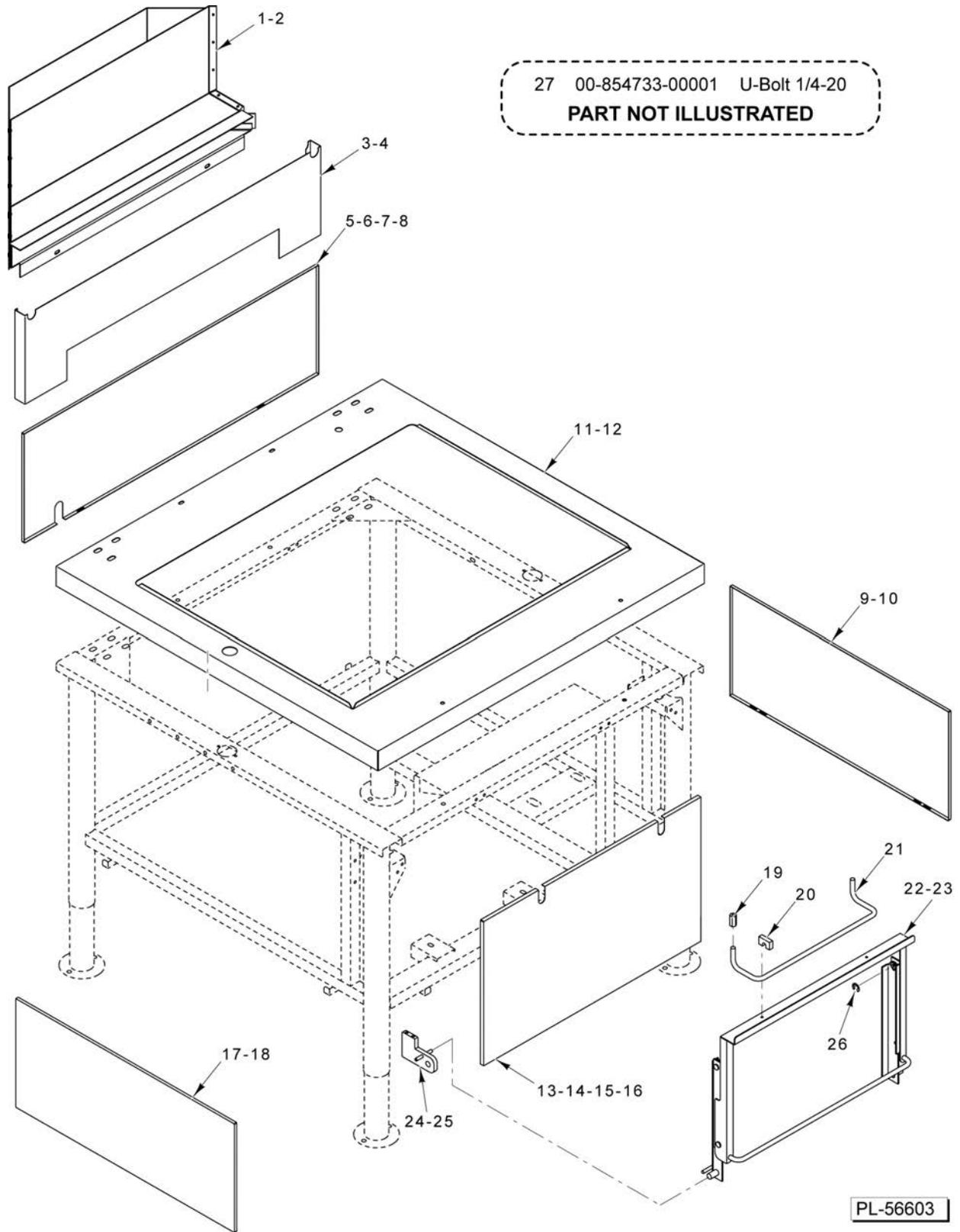
ILLUS. PL-56644	PART NO.	NAME OF PART	AMT.
1	00-854609-00001	Lid - Box (Main).....	1
2	00-854664-0000U	Gasket.....	AR
3	00-854707-00002	Block - Terminal (2-Pole) (Before S/N 463030592).....	1
4	00-411500-00012	Transformer (120 VAC, 24 V., 40 VA) (Before S/N 463030592).....	1
5	00-840115	Contactora (25 Amp.) (Before S/N 463030592).....	AR
6	00-854554-00001	Panel - Component (Main) (Before S/N 463030592).....	1
7	00-854607-00001	Box - Power (Main).....	1
8	00-854671-00001	Controller - Speed (Auto-Lift) (Before S/N 463030592).....	1
9	00-854545-00001	Relay (Up) (Auto-Lift) (Before S/N 463030592).....	1
10	00-854545-00001	Relay (Down) (Auto-Lift) (Before S/N 463030592).....	1
11	00-854545-00001	Relay (Before S/N 463030592).....	1
12	00-855037-00001	Lid - Box (Field Wiring).....	1
13	00-854664-0000U	Gasket.....	AR
14	00-410472-00008	Block - Terminal (3-Pole).....	1
15	00-855036-00001	Transformer (240 V.).....	1
16	00-855035-00001	Transformer (240 V.) (Auto-Lift).....	1
17	00-855033-00001	Panel - Component (Field Wiring).....	1
18	00-855031-00001	Box - Power (Field Wiring).....	1
19	00-853781-00001	Standoff.....	4
20	00-855028-00001	Block - Fuse.....	1
21	00-423986-00001	Fuse (KTK-R-3).....	2
22	00-854764-00001	Plug - Strain Relief.....	AR
23	00-854761-00001	Relief - Strain (1/4 In.).....	6
24	00-913102-00399	Kit - Board Assy. (Incls. Items 25 thru 27) (Starting S/N 463030592).....	AR
25	FE-027-24	Holder - Fuse (Starting S/N 463030592).....	AR
26	FE-024-94	Fuse (4 Amp.) (Starting S/N 463030592).....	AR
27	FE-017-03	Fuse (2 Amp.) (Starting S/N 463030592).....	AR
28	00-854711-00001	Harness - Main (Electric).....	1
29	00-854706-00001	Harness - Lift Motor (Optional).....	1
30	00-854716-00001	Harness - Power (40 Gallon).....	1
31	00-854716-00002	Harness - Power (30 Gallon).....	1
32	00-854703-00001	Harness - Control.....	1
33	00-854713-00002	Harness - Element.....	1



**LID ASSEMBLY**

## LID ASSEMBLY

ILLUS.	PART NO.	NAME OF PART	AMT.
PL-56606			
1	00-854573-00001	Handle - Lid (30 Gallon).....	1
2	00-854573-00002	Handle - Lid (40 Gallon).....	1
3	SC-023-23	Mach. Screw 1/4-20 x 1-1/4 Slotted Oval Hd. (SST).....	6
4	00-854578-00001	Lid (Without Vent) (30 Gallon).....	1
5	00-854578-00002	Lid (With Vent) (30 Gallon).....	1
6	00-854579-00001	Lid (Without Vent) (40 Gallon).....	1
7	00-854579-00002	Lid (With Vent) (40 Gallon).....	1
8	00-358004-00001	Cover - Vent (Optional).....	1
9	00-358005	Spring - Vent Cover (Optional).....	1
10	00-120054-00002	Knob - Vent (Optional).....	1
11	NS-025-04	Crown Nut 1/4-20 (SST).....	1
12	WS-022-06	Washer (SST).....	4
13	00-911035-00004	Stud 1/4-20 x 1/2.....	1
14	00-854561-00001	Mandrel - Lid Spring.....	2
15	00-854567-00001	Bearing - Lid.....	6
16	00-854639-00001	Housing Assy. - Lid Bearing (LH).....	1
17	KW-003-04	Key 1/8 x 1/2.....	2
18	00-854564-00001	Retainer - Lid Spring.....	2
19	00-854569-00001	Spring - Torsion (LH).....	1
20	00-854558-00001	Lid - Bearing Cover.....	2
21	00-854565-00001	Lock Nut - Lid Spring.....	2
22	00-854562-00001	Housing - Lid Bearing.....	2
23	00-854559-00001	Bracket - Lid Support (LH).....	AR
24	00-854559-00002	Bracket - Lid Support (RH).....	1
25	00-854765-00001	Bushing - Snap (Auto-Lift).....	1
26	00-411496-000F1	Switch - Micro (Auto-Lift).....	1
27	00-854569-00002	Spring - Torsion (RH).....	1
28	00-854639-00002	Housing Assy. - Lid Bearing (RH).....	1
29	00-854804-00001	Trigger - Lid Switch (Auto-Lift).....	1
30	00-854589-00001	Cover - Lid Switch.....	1
31	00-854678-00001	Lock Pin.....	2
32	00-854704-00001	Harness - Lid Switch.....	1
33	SC-041-01	Cap Screw 1/4-20 x 3/4 Hex Hd. (SST).....	8



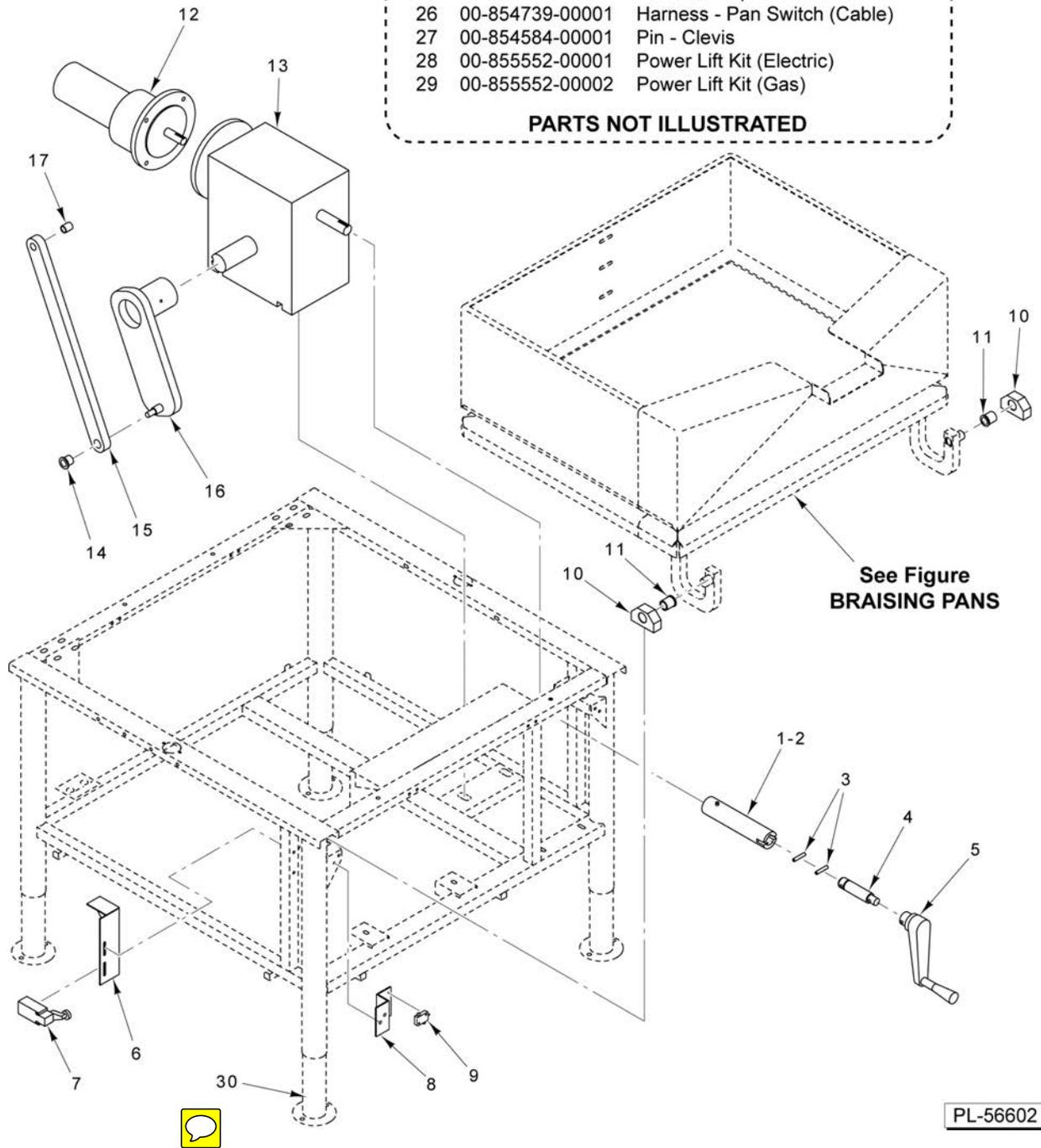
**PANELS**

## PANELS

ILLUS. PL-56603	PART NO.	NAME OF PART	AMT.
1	00-854550-00001	Flue Assy. (30 Gallon) (ML-126847).....	1
2	00-854555-00001	Flue Assy. (40 Gallon) (ML-126848).....	1
3	00-854546-00001	Back Splash Assy. (30 Gallon).....	1
4	00-854547-00001	Back Splash Assy. (40 Gallon).....	1
5	00-854585-00002	Panel - Back (30 Gallon).....	1
6	00-854585-00003	Panel - Back (40 Gallon).....	1
7	00-854881-00003	Panel - Back (30 Gallon) (Modular).....	1
8	00-854881-00004	Panel - Back (40 Gallon) (Modular).....	1
9	00-854585-00001	Panel - Side (15 In.).....	1
10	00-854881-00005	Panel - Side (Modular) (21 In.).....	1
11	00-854508-00001	Table - Top (30 Gallon).....	1
12	00-854506-00001	Table - Top (40 Gallon).....	1
13	00-854587-00001	Panel - Front (30 Gallon).....	1
14	00-854587-00002	Panel - Front (40 Gallon).....	1
15	00-854881-00001	Panel - Front (30 Gallon) (Modular).....	1
16	00-854881-00002	Panel - Front (40 Gallon) (Modular).....	1
17	00-854585-00001	Panel - Side (15 In.).....	1
18	00-854881-00005	Panel - Side (Modular) (21 In.).....	1
19	00-854752-00001	Nut - Reducing.....	2
20	00-854684-00001	Clamp - Pan Hanger.....	2
21	00-854689-00001	Hanger - Pan.....	1
22	00-854720-00001	Hanger - Pan Assy. (Before S/N 463017108).....	1
23	00-858151-00001	Hanger - Pan Assy. (Starting S/N 463017108).....	1
24	00-854697-00001	Support - Pan Hanger (Before S/N 463017108).....	2
25	00-858140-00001	Support - Pan Hanger (Starting S/N 463017108).....	2
26	RR-010-12	Retaining Ring.....	2
27	00-854733-00001	U-Bolt 1/4-20 (Gas Only).....	2

18	00-854666-00001	Strainer - Pour Lip
19	00-854751-00001	Cover - Thermocouple Insulation
20	00-854674-00001	Clamp - Holder
21	00-854619-00001	Clip - Thermocouple
22	00-854614-00001	Support - Thermocouple
23	00-854613-00001	Bracket - Thermocouple
24	00-854543-00001	Bracket - Insulation Cover
25	00-854705-00001	Harness - Up Limit Switch
26	00-854739-00001	Harness - Pan Switch (Cable)
27	00-854584-00001	Pin - Clevis
28	00-855552-00001	Power Lift Kit (Electric)
29	00-855552-00002	Power Lift Kit (Gas)

**PARTS NOT ILLUSTRATED**



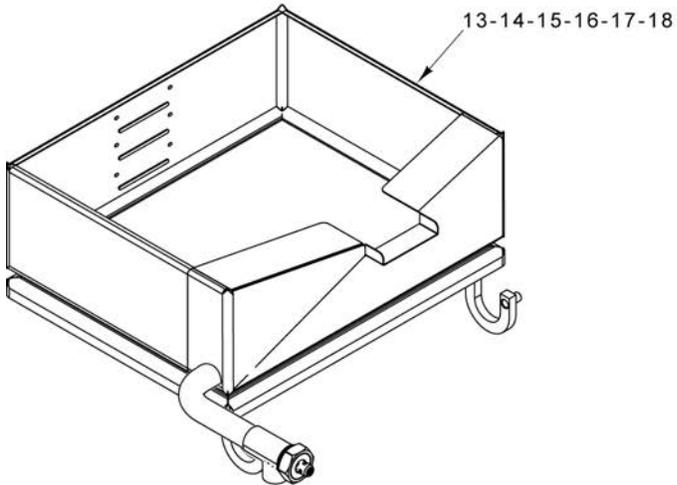
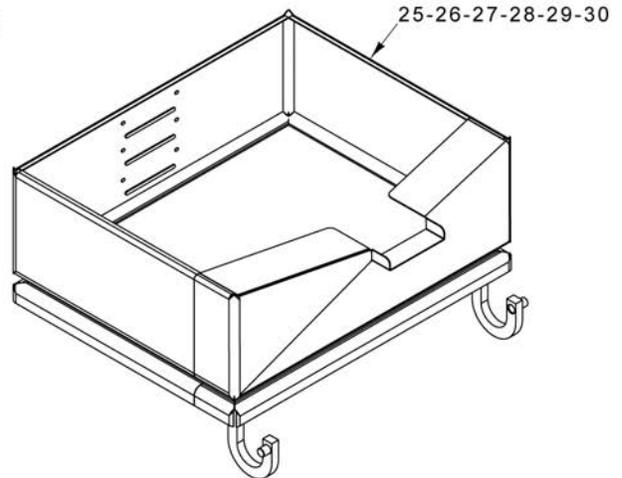
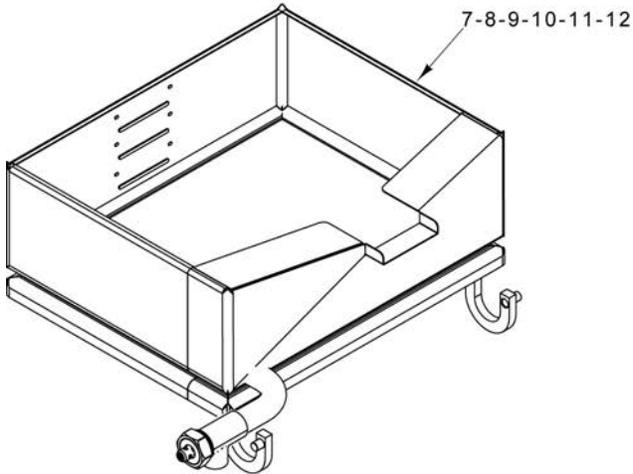
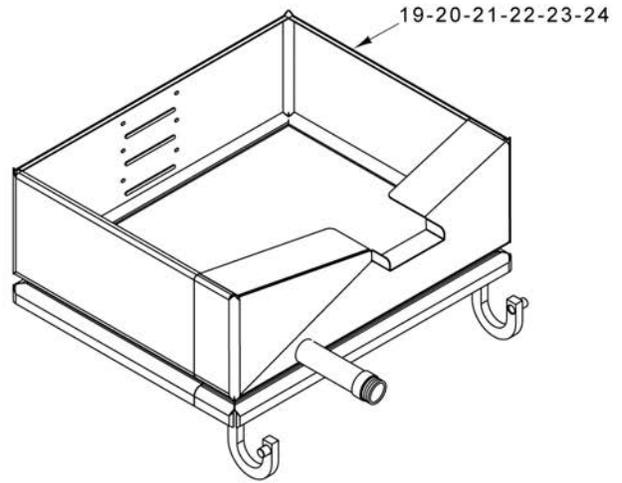
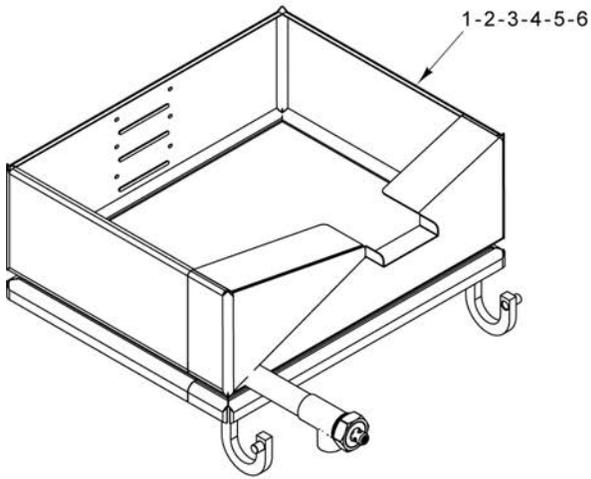
**PAN AND LIFT UNIT**

## PAN AND LIFT UNIT

ILLUS.	PART NO.	NAME OF PART	AMT.
PL-56602			
1	00-854648-00001	Extension - Shaft (Gear Reducer) (Before 12-01-03).....	1
2	00-854644-00001	Extension - Shaft (Gear Reducer) (Starting 12-01-03).....	1
3	RP-002-46	Pin - Roll.....	2
4	00-854652-00001	Shaft - Handle.....	1
5	00-854651-00001	Handle - Crank.....	1
6	00-858047-00001	Bracket - Limit Switch.....	1
7	00-854517-00001	Switch - Limit.....	1
8	00-854611-00001	Bracket - Up Switch (Auto-Lift).....	1
9	00-411496-000F3	Microswitch (Auto-Lift).....	1
10	00-854507-00001	Block - Bearing.....	2
11	00-854617-00001	Bearing.....	2
*12	00-854653-00001	Motor - Gear (Auto-Lift).....	1
13	00-857770-00001	Gear - Reducer.....	1
14	00-854654-00001	Bearing - Lift Arm.....	1
15	00-854514-00001	Arm - Lift.....	1
16	00-854580-00001	Crank Assy.....	1
17	00-854655-00001	Bearing - Lift Arm (Pan Side).....	1
18	00-854666-00001	Strainer - Pour Lip.....	1
19	00-854751-00001	Cover - Thermocouple Insulation.....	2
20	00-854674-00001	Clamp - Holder.....	AR
21	00-854619-00001	Clip - Thermocouple.....	1
22	00-854614-00001	Support - Thermocouple.....	1
23	00-854613-00001	Bracket - Thermocouple.....	1
24	00-854543-00001	Bracket - Insulation Cover.....	4
25	00-854705-00001	Harness - Up Limit Switch (Auto-Lift) (Optional).....	1
26	00-854739-00001	Harness - Pan Switch (Cable).....	1
27	00-854584-00001	Pin - Clevis 1/2 x 2 In. (Lift Arm to Pan).....	1
28	00-855552-00001	Power Lift Kit (Electric).....	1
**29	00-855552-00002	Power Lift Kit (Gas).....	1
30	00-854645-00002	Leg (includes adjustable leg and flanged foot).....	AR

\* Use Kit 00-913102-00399 replacing motor

\*\* No Longer Available



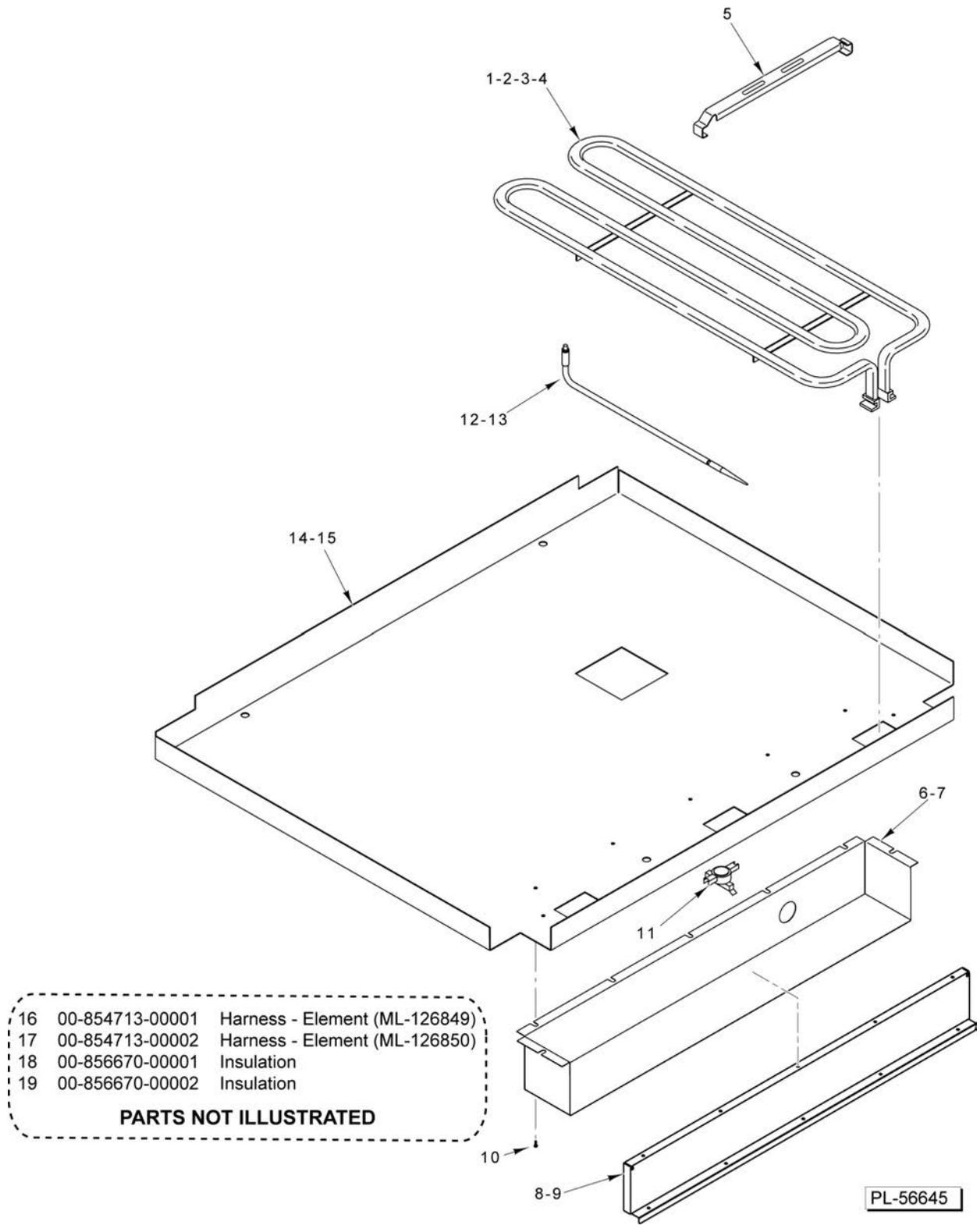
PL-60936

**BRAISING PANS**

## BRAISING PANS

ILLUS.	PART NO.	NAME OF PART	AMT.
PL-60936			
*1	00-854745-00001	Pan - Braising (2 In. Draw-Off Valve) (Left Front Straight) (ML-126849) (VE30).....	1
**2	00-854742-00001	Pan - Braising (2 In. Draw-Off Valve) (Left Front Straight) (ML-126850) (VE40).....	1
***3	00-854745-00002	Pan - Braising (2 In. Draw-Off Valve) (Left Front Straight) (ML-126847) (VG30).....	1
****4	00-854742-00002	Pan - Braising (2 In. Draw-Off Valve) (Left Front Straight) (ML-126848) (VG40).....	1
*5	00-858602-00002	Pan - Braising (2 In. Draw-Off Valve) (Left Front Straight) (ML-152047) (VE30 Fast Batch).....	1
**6	00-858615-00002	Pan - Braising (2 In. Draw-Off Valve) (Left Front Straight) (ML-152048) (VE40 Fast Batch).....	1
*7	00-854745-00003	Pan - Braising (2 In. Draw-Off Valve) (Left Front 90 Deg. Left) (ML-126849) (VE30) .....	1
**8	00-854742-00003	Pan - Braising (2 In. Draw-Off Valve) (Left Front 90 Deg. Left) (ML-126850) (VE40) .....	1
***9	00-854745-00004	Pan - Braising (2 In. Draw-Off Valve) (Left Front 90 Deg. Left) (ML-126847) (VG30) .....	1
****10	00-854742-00004	Pan - Braising (2 In. Draw-Off Valve) (Left Front 90 Deg. Left) (ML-126848) (VG40) .....	1
*11	00-858602-00003	Pan - Braising (2 In. Draw-Off Valve) (Left Front 90 Deg. Left) (ML-152047) (VE30 Fast Batch).....	1
**12	00-858615-00003	Pan - Braising (2 In. Draw-Off Valve) (Left Front 90 Deg. Left) (ML-152048) (VE40 Fast Batch).....	1
*13	00-854745-00005	Pan - Braising (2 In. Draw-Off Valve) (Left Side 90 Deg. Front) (ML-126849) (VE30) .....	1
**14	00-854742-00005	Pan - Braising (2 In. Draw-Off Valve) (Left Side 90 Deg. Front) (ML-126850) (VE40) .....	1
***15	00-854745-00006	Pan - Braising (2 In. Draw-Off Valve) (Left Side 90 Deg. Front) (ML-126847) (VG30) .....	1
****16	00-854742-00006	Pan - Braising (2 In. Draw-Off Valve) (Left Side 90 Deg. Front) (ML-126848) (VG40) .....	1
*17	00-858602-00004	Pan - Braising (2 In. Draw-Off Valve) (Left Side 90 Deg. Front) (ML-152047) (VE30 Fast Batch).....	1
**18	00-858615-00004	Pan - Braising (2 In. Draw-Off Valve) (Left Side 90 Deg. Front) (ML-152048) (VE40 Fast Batch).....	1
*19	00-854745-00007	Pan - Braising (SEF Draw-Off Valve) (ML-126849) (VE30).....	1
**20	00-854742-00007	Pan - Braising (SEF Draw-Off Valve) (ML-126850) (VE40).....	1
***21	00-854745-00008	Pan - Braising (SEF Draw-Off Valve) (ML-126847) (VG30).....	1
****22	00-854742-00008	Pan - Braising (SEF Draw-Off Valve) (ML-126848) (VG40).....	1
*23	00-858602-00005	Pan - Braising (SEF Draw-Off Valve) (ML-152047) (VE30 Fast Batch).....	1
**24	00-858615-00005	Pan - Braising (SEF Draw-Off Valve) (ML-152048) (VE40 Fast Batch).....	1
*25	00-854600-00001	Pan - Braising (No Draw-Off Valve) (ML-126849) (VE30).....	1
**26	00-854641-00001	Pan - Braising (No Draw-Off Valve) (ML-126850) (VE40).....	1
***27	00-854600-00002	Pan - Braising (No Draw-Off Valve) (ML-126847) (VG30).....	1
****28	00-854641-00002	Pan - Braising (No Draw-Off Valve) (ML-126848) (VG40).....	1
*29	00-858602-00001	Pan - Braising (No Draw-Off Valve) (ML-152047) (VE30 Fast Batch).....	1
**30	00-858615-00001	Pan - Braising (No Draw-Off Valve) (ML-152048) (VE40 Fast Batch).....	1

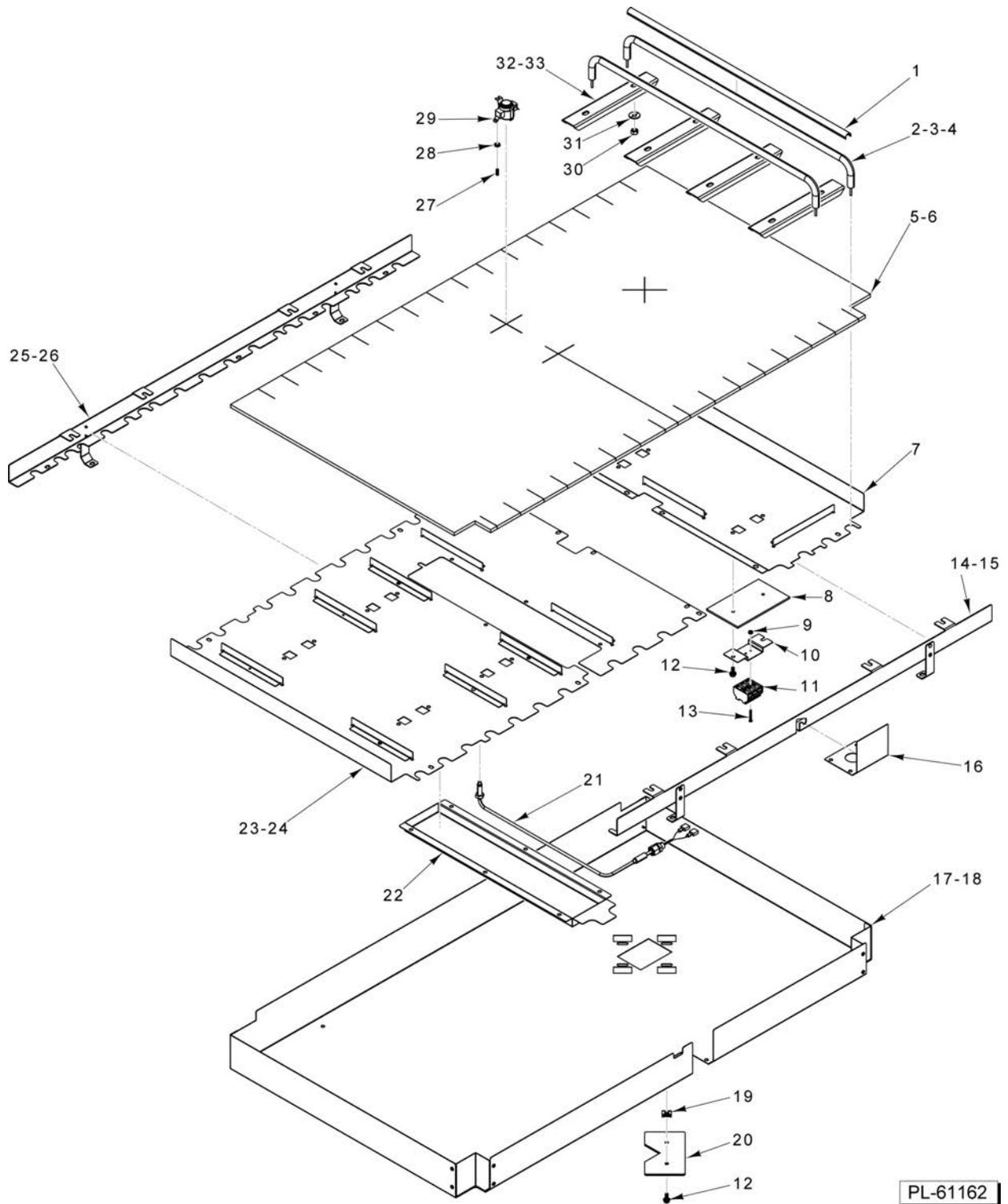
\* Electric, 30 Gallon  
\*\* Electric, 40 Gallon  
\*\*\* Gas, 30 Gallon  
\*\*\*\* Gas, 40 Gallon



**HEATING ELEMENTS  
 (ML-126849 & ML-126850)**

**HEATING ELEMENTS  
(ML-126849 & ML-126850)**

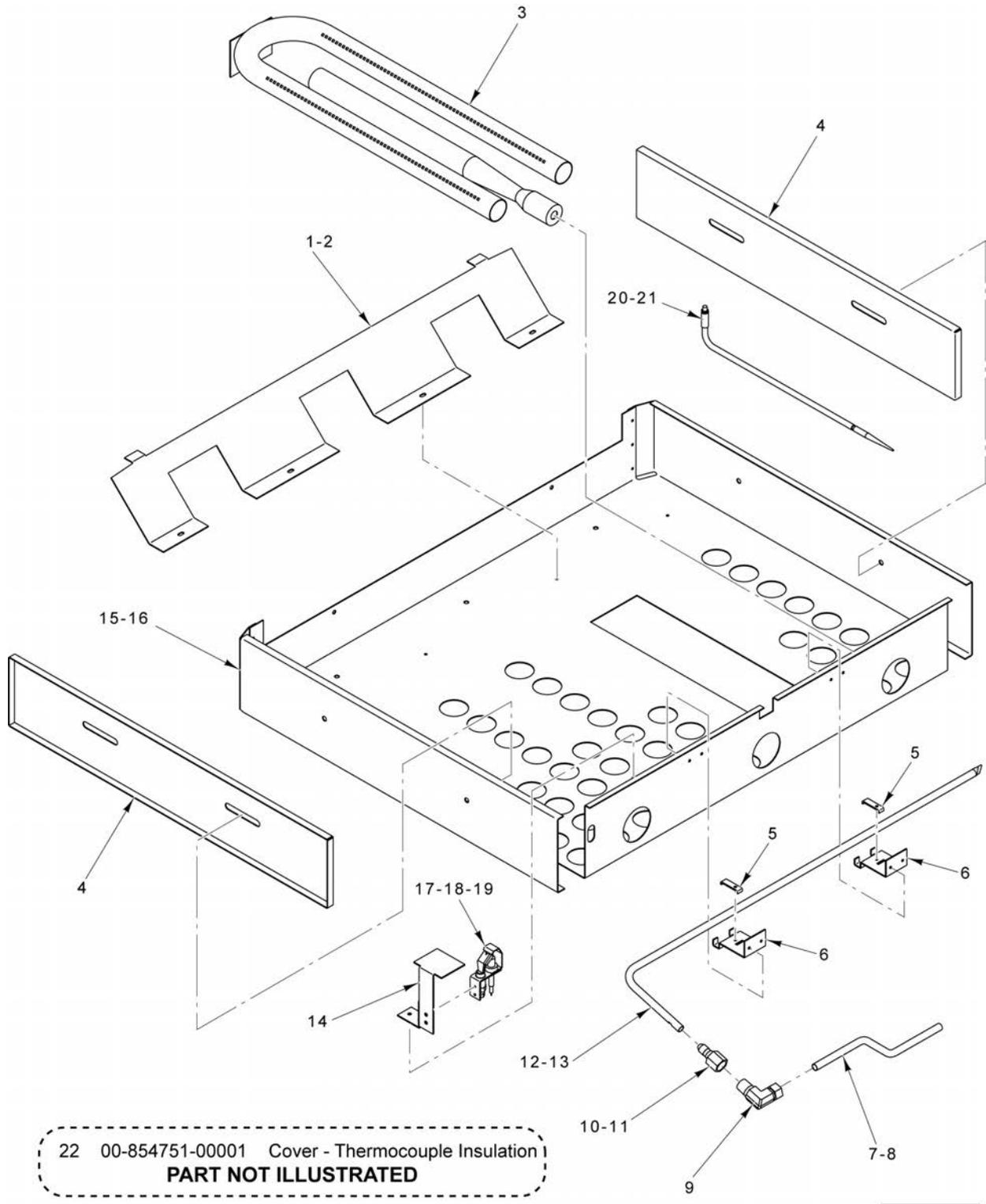
ILLUS. PL-56645	PART NO.	NAME OF PART	AMT.
1	00-854511-00001	Element - Heating (240 V.) (ML-126849 = 3; ML-126850 = 4).....	AR
2	00-857500-00001	Kit - Heating Element (480 V.) (ML-126849) (Before S/N 271177780).....	3
3	00-857500-00002	Kit - Heating Element (480 V.) (ML-126850) (Before S/N 271177780).....	4
4	00-855529-00001	Element - Heating (480 V.) (ML-126849 = 3; ML-126850 = 4) (Starting S/N 271177780) .....	AR
5	00-854509-00001	Clamp - Heater (ML-126849 = 12; ML-126850 = 16).....	AR
6	00-854544-00001	Cover - Harness (ML-126849).....	1
7	00-854544-00002	Cover - Harness (ML-126850).....	1
8	00-854549-00001	Cover - Harness (ML-126849).....	1
9	00-854549-00002	Cover - Harness (ML-126850).....	1
10	SD-034-21	Self-Tapping Screw 10-16 x 1/2 Hex Washer Hd., Type AB.....	AR
11	00-821762	Thermostat - Hi-Limit.....	1
12	00-854646-00001	Thermocouple (E-Type) (Before 12-31-07) (Used with Watlow Temperature controller.).....	1
13	00-857388-00001	Thermocouple (K-Type) (Starting 12-31-07) (Used with Crydom Temperature control.) .....	1
14	00-854542-00001	Cover - Insulation (ML-126849).....	1
15	00-854542-00002	Cover - Insulation (ML-126850).....	1
16	00-854713-00001	Harness - Element (ML-126849).....	1
17	00-854713-00002	Harness - Element (ML-126850).....	1
18	00-856670-00001	Insulation.....	AR
19	00-856670-00002	Insulation.....	AR



**HEATING ELEMENTS  
(ML-152047 & ML-152048)**

## HEATING ELEMENTS (ML-152047 & ML-152048)

ILLUS. PL-61162	PART NO.	NAME OF PART	AMT.
1	00-858619-00001	Heat Conductor, Copper (ML-152047 = 12; ML-152048 = 16).....	AR
2	00-858597-00001	Heater, BP (208 V.) (ML-152047 = 12; ML-152048 = 16).....	AR
3	00-858597-00002	Heater, BP (240 V.) (ML-152047 = 12; ML-152048 = 16).....	AR
4	00-858597-00003	Heater, BP (480 V.) (ML-152047 = 12; ML-152048 = 16).....	AR
5	00-858626-00001	Insulation (ML-152047).....	1
6	00-858627-00001	Insulation (ML-152048).....	1
7	00-858609-00001	Shield - Insulation.....	1
8	00-858574-00001	Shield - Insulation.....	6
9	NS-049-47	Lock Nut 4-40.....	12
10	00-858563-00001	Bracket - Terminal Block.....	6
11	00-858564-00001	Terminal Block, 3-Pole.....	6
12	SC-132-38	Screw - Hex Serrated 10/24 x 1/2.....	12
13	SC-113-19	Mach. Screw 4-40 x 7/8 Phil Pan Hd.....	12
14	00-858604-00001	Retainer - Element (ML-152047).....	1
15	00-858618-00001	Support - Heater (ML-152048).....	1
16	00-858622-00001	Plate - Cover.....	1
17	00-858616-00001	Cover - Insulation (ML-152047).....	1
18	00-858624-00001	Cover - Insulation (ML-152048).....	1
19	NS-049-49	Nut #10 Clip-On (Panel).....	AR
20	00-858532-00001	Cover - Pan Pivot.....	2
21	00-857388-00001	Thermocouple (K-Type) Used with Crydom Temperature control).....	1
22	00-858612-00001	Cover - Probe.....	1
23	00-858610-00001	Shield - Insulation (ML-152047).....	1
24	00-858621-00001	Shield - Insulation (ML-152048).....	1
25	00-858604-00002	Retainer - Element (ML-152047).....	1
26	00-858618-00002	Support - Heater (ML-152048).....	1
27	SC-075-33	Set Screw 8-32 x 1/2 Hex Hdls., Cup Pt.....	2
28	NS-010-11	Nut 8-32 Hex (Brass).....	2
29	00-821762-00002	Thermostat - High Temp. Limit.....	1
30	NS-014-01	Nut 1/4-20 Hex (Brass).....	AR
31	SL-005-21	Spring - Loading.....	AR
32	00-858611-00001	Mount - Heater (ML-152047).....	16
33	00-858631-00001	Mount - Heater (ML-152048).....	16



PL-56600

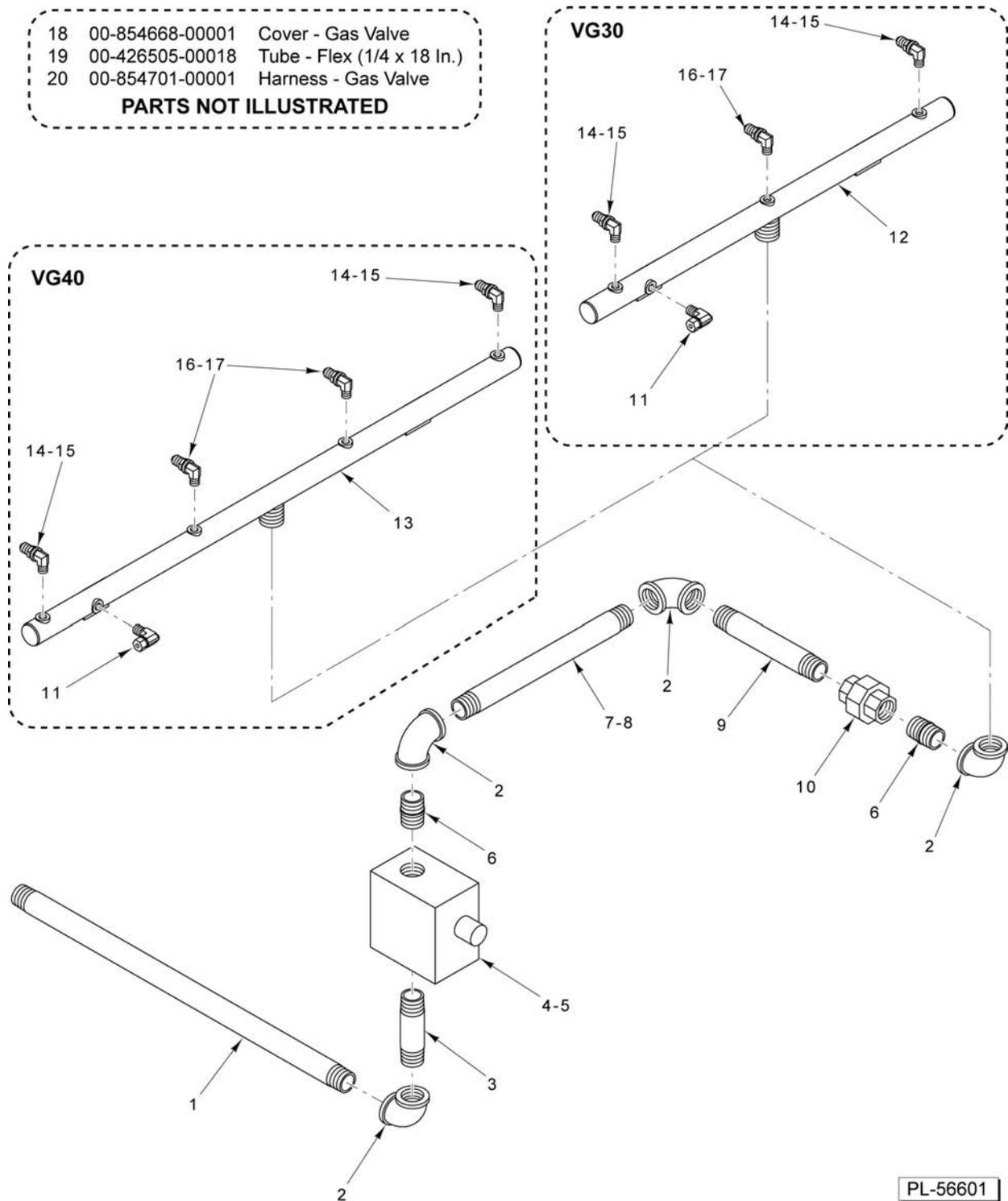
**GAS BURNERS  
(ML-126847 & ML-126848)**

**GAS BURNERS  
(ML-126847 & ML-126848)**

ILLUS. PL-56600	PART NO.	NAME OF PART	AMT.
1	00-854592-00001	Flue - Transition Plate (ML-126847).....	1
2	00-854627-00001	Flue - Transition Plate (ML-126848).....	1
3	00-840144	Burner & Air Shuttle Assy. (ML-126847 = 3; ML-126848 = 4).....	AR
4	00-854593-00001	Cover - Insulation.....	2
5	00-854830-00001	Clamp - Runner Tube.....	2
6	00-854594-00001	Bracket - Runner Tube.....	2
7	00-854665-00001	Tube - Gas Supply (ML-126847).....	1
8	00-854665-00002	Tube - Gas Supply (ML-126848).....	1
9	FP-012-21	Elbow 90 Deg. (1/8 Male Pipe x 1/4 Tube).....	1
10	00-920186-00014	Orifice - Spud (NAT).....	1
11	00-920186-00012	Orifice - Spud (LP).....	1
12	00-854626-00001	Tube - Runner (ML-126847).....	1
13	00-854626-00002	Tube - Runner (ML-126848).....	1
14	00-854595-00001	Bracket - Pilot.....	1
15	00-854591-00001	Box - Burner (ML-126847).....	1
16	00-854625-00001	Box - Burner (ML-126848).....	1
17	00-856615-00001	Pilot - Burner (Electronic Ignition) (NAT) (Incls. Ignition Cable).....	1
18	00-856615-00002	Pilot - Burner (Electronic Ignition) (LP) (Incls. Ignition Cable).....	1
19	00-856616-00001	Kit - Pilot Burner (For units built before S/N 271152844).....	1
20	00-854646-00001	Thermocouple (E-Type) (Before 12-31-07) (Used with Watlow Temperature controller.).....	1
21	00-857388-00001	Thermocouple (K-Type) (Starting 12-31-07) (Used with Crydom Temperature control.).....	1
22	00-854751-00001	Cover - Thermocouple Insulation.....	2

- 18 00-854668-00001 Cover - Gas Valve
- 19 00-426505-00018 Tube - Flex (1/4 x 18 In.)
- 20 00-854701-00001 Harness - Gas Valve

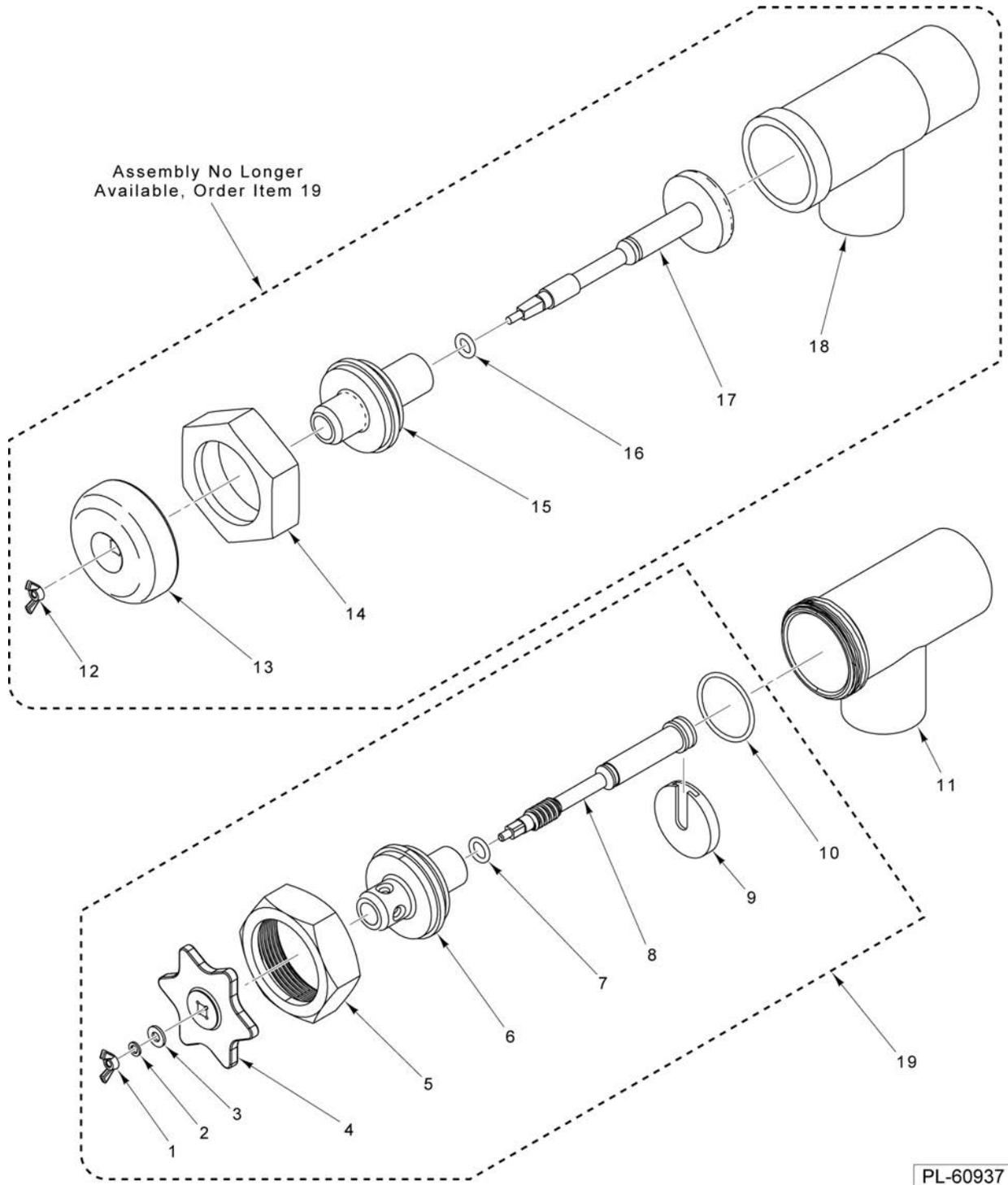
**PARTS NOT ILLUSTRATED**



**GAS PIPING  
(ML-126847 & ML-126848)**

**GAS PIPING  
(ML-126847 & ML-126848)**

ILLUS. PL-56601	PART NO.	NAME OF PART	AMT.
1	FP-077-47	Pipe 3/4 x 20-1/4 TBE.....	1
2	FP-013-22	Elbow Pipe 3/4 x 90 Deg.....	4
3	FP-036-06	Pipe 3/4 x 3-1/2 TBE.....	1
4	00-844133-00001	Valve - Combination (NAT).....	1
5	00-844133-00002	Valve - Combination (LP).....	1
6	FP-036-92	Pipe 3/4 x 1-3/8 TBE (Black).....	2
7	FP-036-98	Pipe 3/4 x 10-1/4 TBE (ML-126847).....	1
8	FP-083-52	Pipe 3/4 x 16 TBE (ML-126848).....	1
9	FP-059-65	Pipe 3/4 x 6 TBE.....	1
10	FP-022-17	Union 3/4 (Grd. Seat).....	1
11	FP-012-21	Elbow 90 Deg. (1/8 Male Pipe x 1/4 Tube).....	1
12	00-854597-00001	Manifold Assy. (ML-126847).....	1
13	00-854630-00001	Manifold Assy. (ML-126848).....	1
14	00-840096-00037	Fitting - Burner (#37).....	AR
15	00-840096-00022	Fitting - Burner (#52).....	AR
16	00-840096-00039	Fitting - Burner (#39).....	AR
17	00-840096-00050	Fitting - Burner (#50).....	AR
18	00-854668-00001	Cover - Gas Valve.....	1
19	00-426505-00018	Tube - Flex (1/4 x 18 In.).....	1
20	00-854701-00001	Harness - Gas Valve.....	1



**DRAW-OFF VALVE ASSEMBLY**

**DRAW-OFF VALVE ASSEMBLY**

ILLUS.	PART NO.	NAME OF PART	AMT.
PL-60937			
1	00-857918-00007	Wingnut.....	1
2	00-857918-00008	Lockwasher.....	1
3	00-857918-00009	Flatwasher.....	1
4	00-857918-00006	Handle.....	1
5	00-857976-00004	Nut - Hex.....	1
6	00-857976-00003	Retainer.....	1
7	00-857918-00005	O-Ring.....	1
8	00-857918-00001	Assy. - 2 In. Stem Plunger.....	1
9	00-857918-00004	O-Ring - Nylon.....	1
10	00-857918-00003	Seal - Nylon (2 In.).....	1
11	00-857976-00002	Valve Body (2 In.).....	1
12	00-854605-00008	Wingnut.....	1
13	00-854605-00007	Handle.....	1
14	00-854605-00006	Nut - Hex.....	1
15	00-854605-00005	Bonnet.....	1
16	00-854605-00003	O-Ring.....	1
17	00-854605-00004	Disc & Stem Assy.....	1
18	00-854605-00002	Valve Body (2 In.).....	1
19	00-856213-00001	Draw-Off Valve Assy. (2 In.) (Incls. Items 1 thru 10).....	1

