



VE40 SHOWN

ELECTRIC BRAISING PANS (30 & 40 GALLON)

VE30 ML-126849

VE40 ML-126850

- NOTICE -

This Manual is prepared for the use of trained Vulcan Service Technicians and should not be used by those not properly qualified. If you have attended a Vulcan Service School for this product, you may be qualified to perform all the procedures described in this manual.

This manual is not intended to be all encompassing. If you have not attended a Vulcan 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 Vulcan Service Technician.

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GENERAL

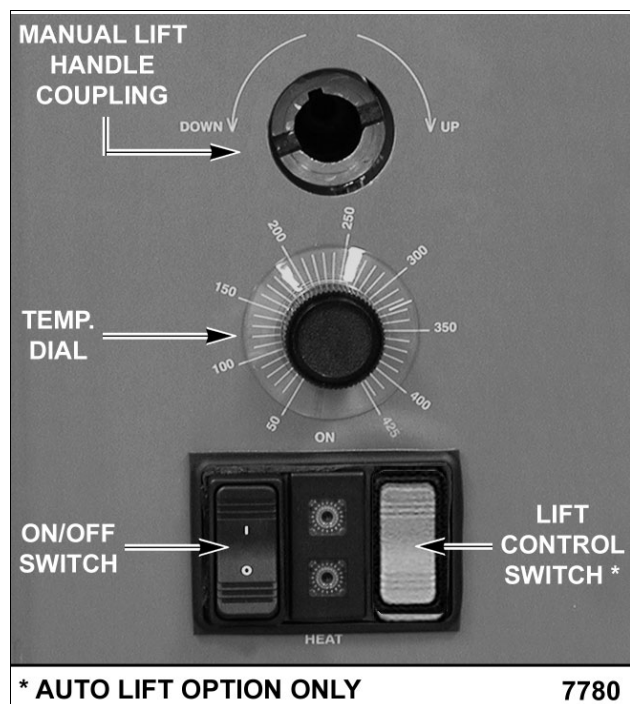
INSTALLATION, OPERATION AND CLEANING

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



Model Designations

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

TOOLS

Standard

- Standard set of hand tools.
 - VOM with an AC current tester.
- NOTE:** Any quality VOM with a sensitivity of 20,000 ohms per volt can be used.
- 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.

SPECIFICATIONS

VOLTS	PHASE	AMPERAGE PER LINE					
		VE30		VE40			
		TOTAL KW	L1-L3	TOTAL KW	L1	L2	L3
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
480	3	12	15	16	23	23	15

- NOTES:**
1. Amperage values in the table are nominal. Tolerance is +5/-10%.
 2. Voltage values are @ 60HZ.
 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 A11378.
 4. On all 208V machines, the 240V heating element is being used (total KW output is reduced).
 5. On VE40 three phase machines only, the heating elements are wired to be an unbalanced load.

REMOVAL AND REPLACEMENT OF PARTS

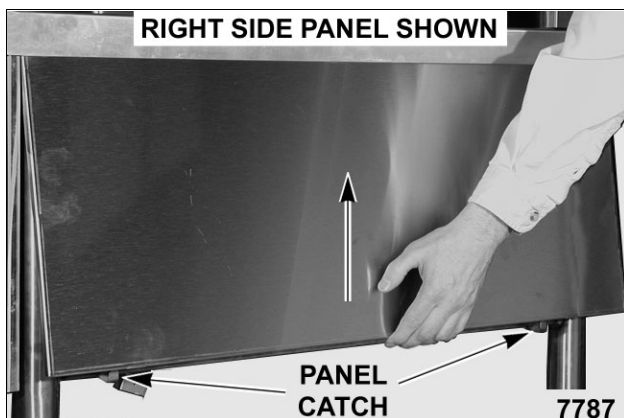
COVERS AND PANELS



WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

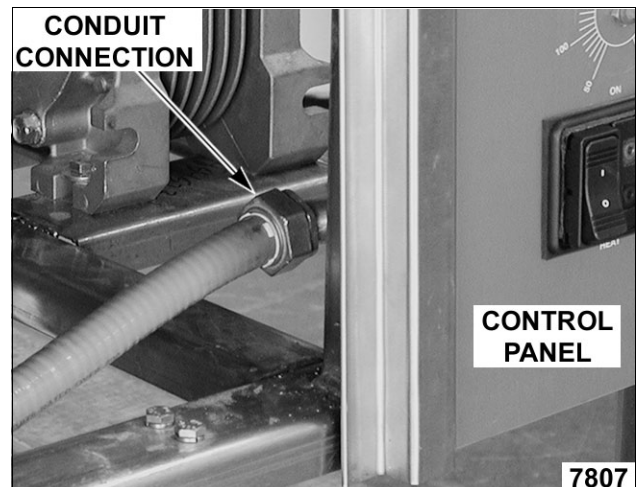
Front, Rear & Side Panels

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.

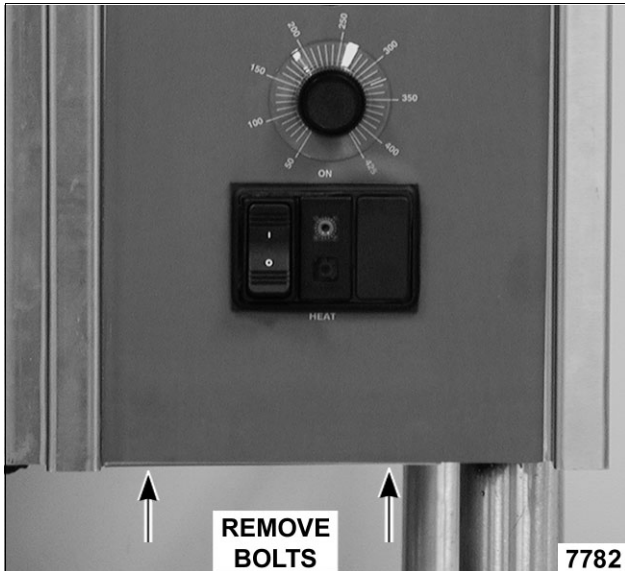


Control Panel

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



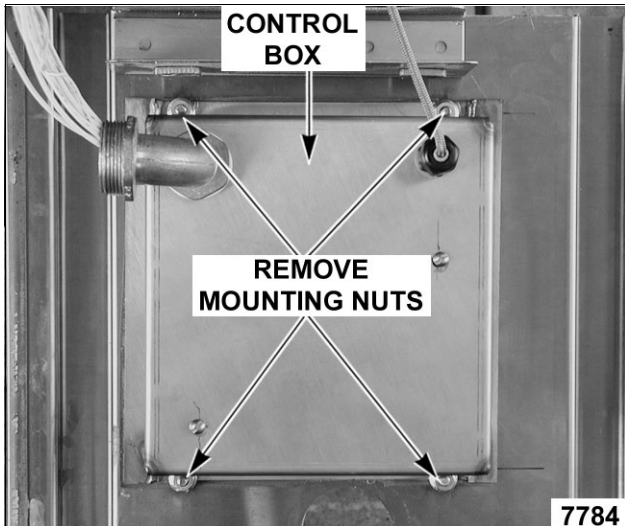
3. Remove manual lift crank handle (if installed).
4. Remove bolts securing control panel to braising pan frame. Bolts are recessed in the frame channel.



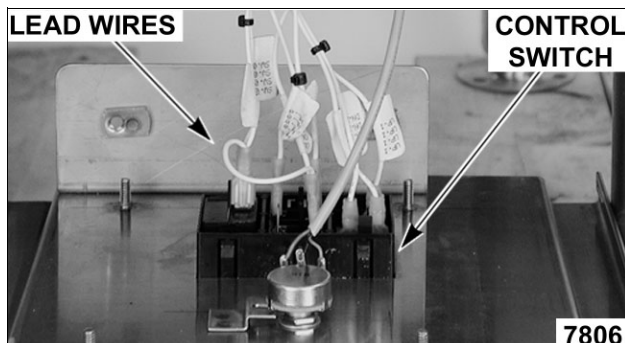
5. Tilt bottom of control panel outwards and pull down.

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

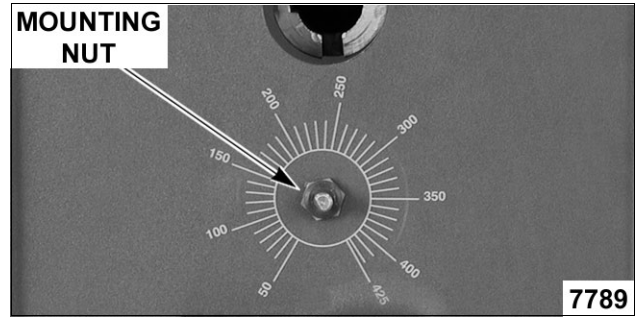
6. Remove control box from control panel.



7. Disconnect lead wires from control switch.



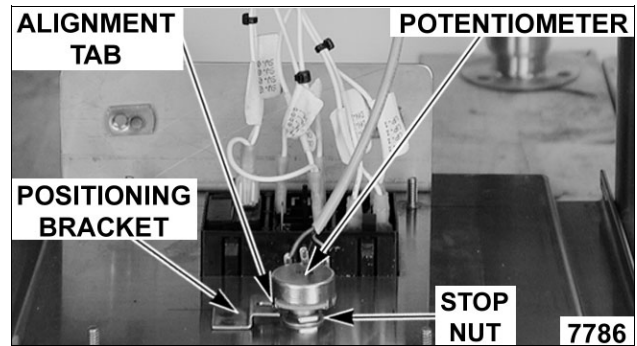
8. Pull temperature dial from potentiometer shaft and remove mounting nut.



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

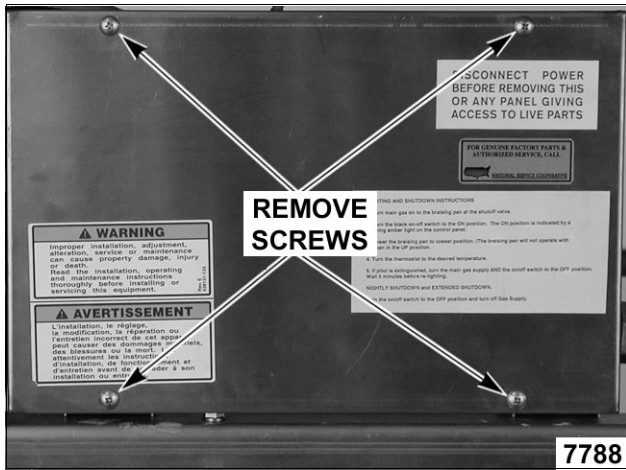


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

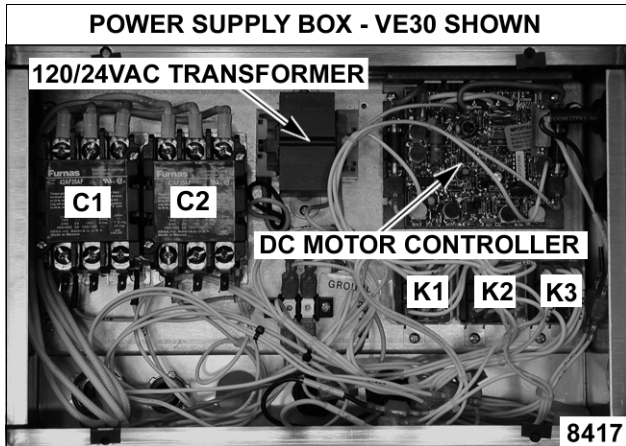
CAUTION: Certain components in this system are subject to damage by electrostatic discharge during field repairs. A field service grounding kit is available to prevent damage. The field service grounding kit must be used anytime a control board is handled.

1. Remove front panel as outlined under COVERS AND PANELS.

- Remove power supply box cover.



- Disconnect lead wires then remove the component being replaced.



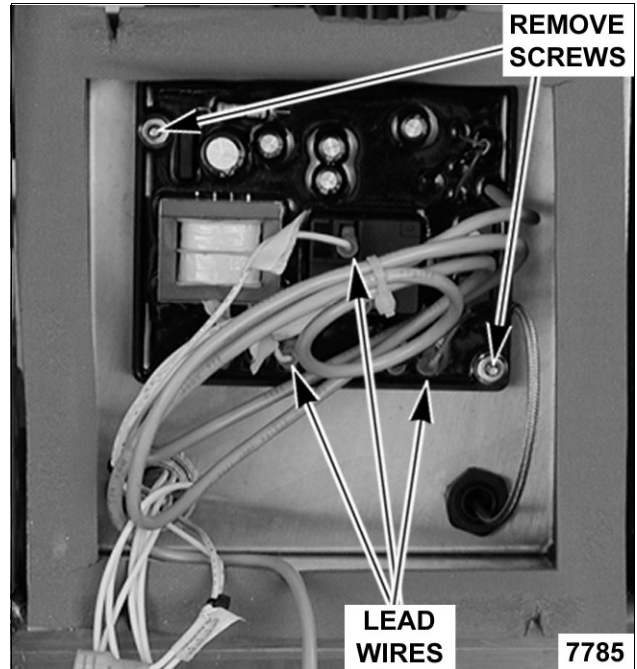
- Reverse procedure to install the replacement component.
- Check braising pan for proper operation.

TEMPERATURE CONTROLLER

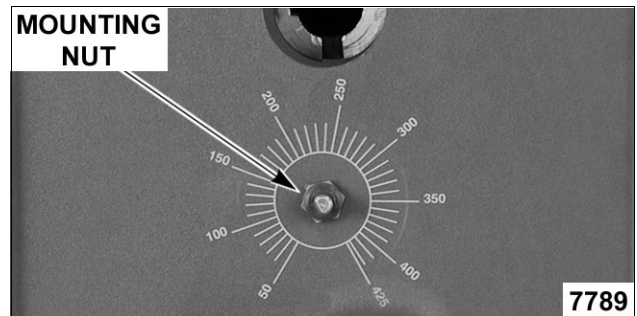


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

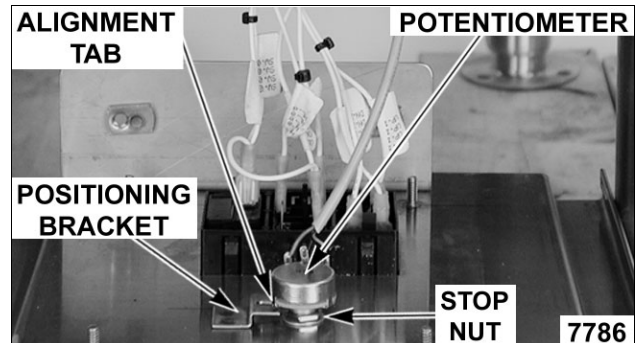
- Remove control box from the control panel as outlined under COVERS AND PANELS.
- Disconnect lead wires from temperature controller.
- Remove temperature controller from control box.



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



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



- Reverse procedure from step 3 to complete the installation.

7. Check calibration as outlined under TEMPERATURE CONTROLLER CALIBRATION.

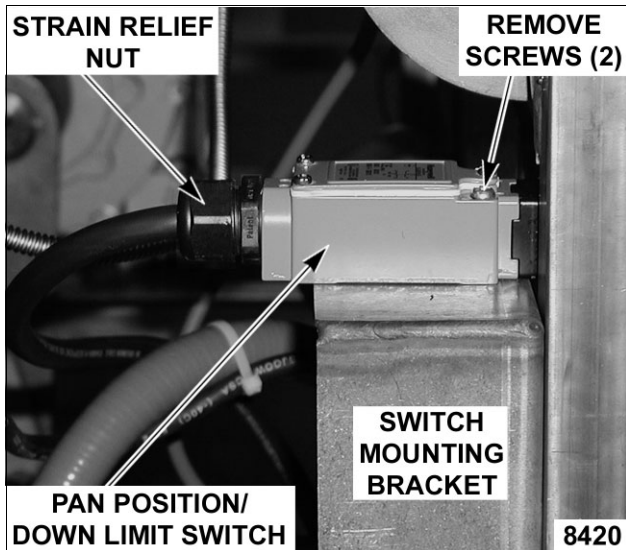
PAN POSITION/DOWN LIMIT SWITCH



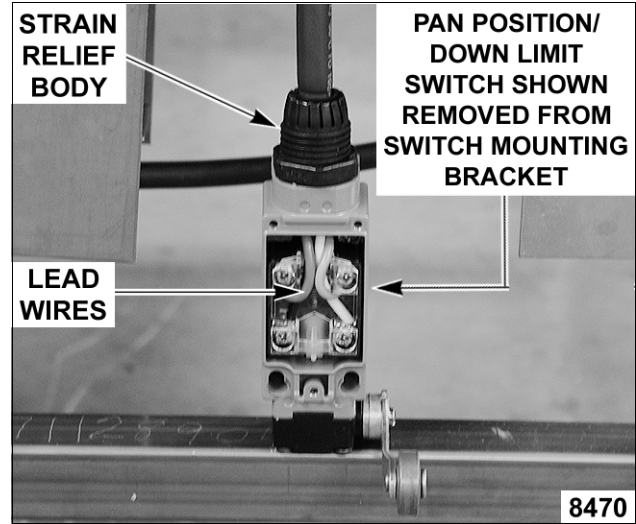
WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

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 VIEW SHOWN



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



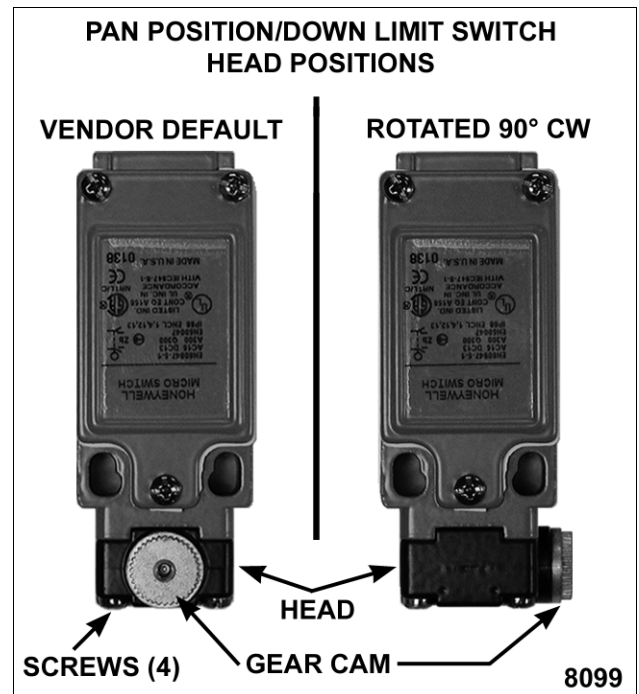
NOTE: When installing, ensure the o-ring seal is inserted into the strain relief body (around power cable) before tightening strain relief nut.

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.

TOP VIEW SHOWN

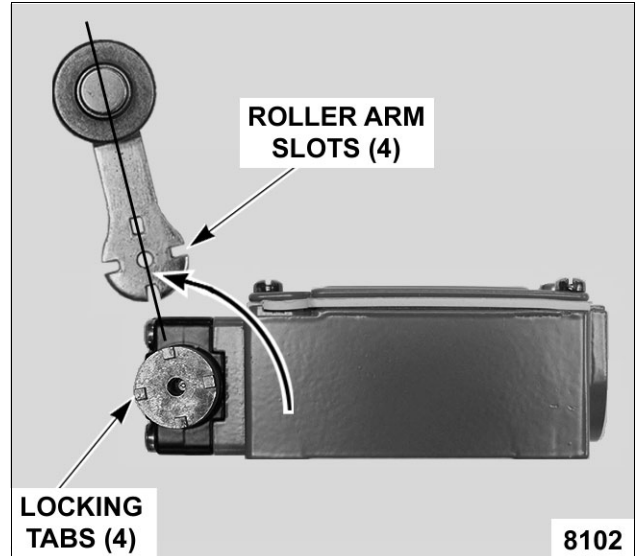
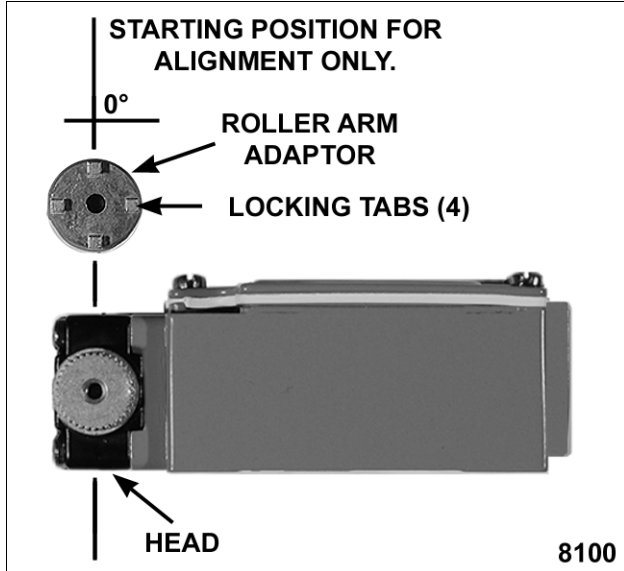


- C. Place switch on its side with the head to the left and gear cam pointing up.

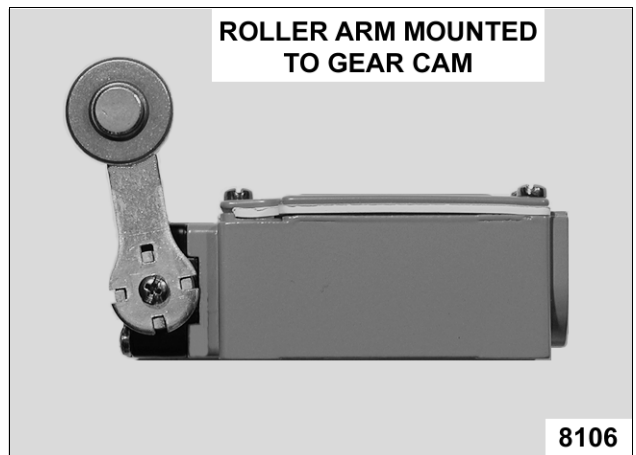
- D. Align roller arm adaptor with the four locking tabs pointing up and position one of the tabs at 0°.

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.

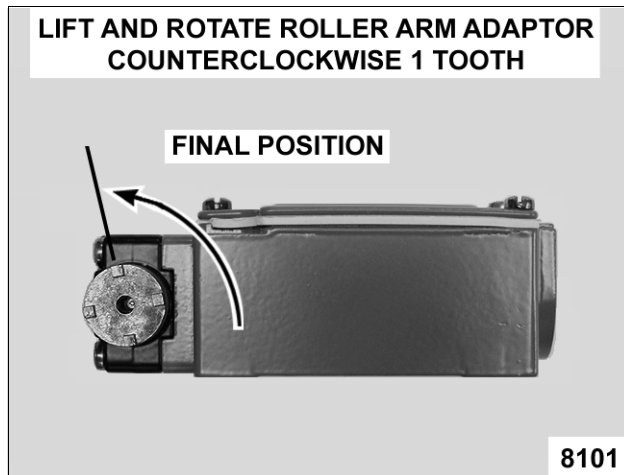
SIDE VIEW SHOWN



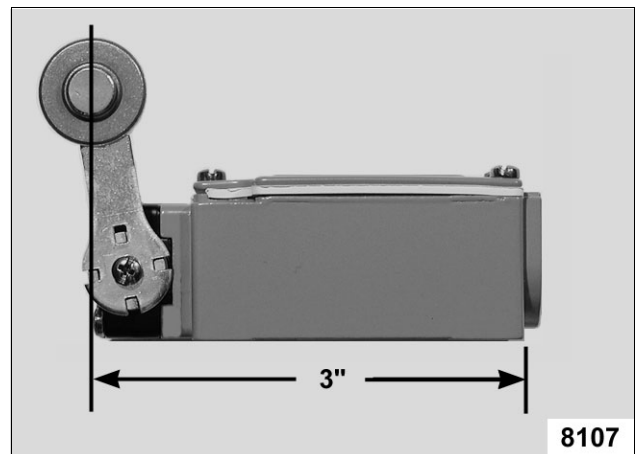
- E. Place roller arm adaptor on the gear cam to engage the teeth. Lift the adaptor until the teeth just slightly disengage from the gear cam. Rotate the roller arm adaptor counterclockwise 1 tooth, re-engage teeth and release the adaptor.



LIFT AND ROTATE ROLLER ARM ADAPTOR COUNTERCLOCKWISE 1 TOOTH



- 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".



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

- 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.

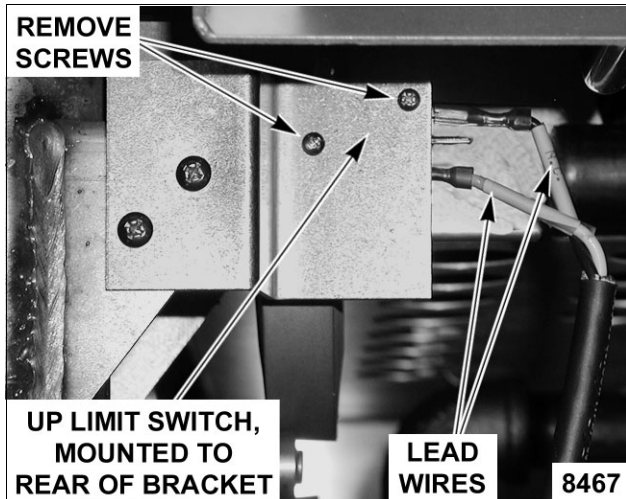
7. Reverse procedure from step 5 to complete the installation.
8. Adjust pan position/down limit switch on switch mounting bracket as outlined under PAN POSITION/DOWN LIMIT SWITCH ADJUSTMENT in SERVICE PROCEDURES AND ADJUSTMENTS.

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.



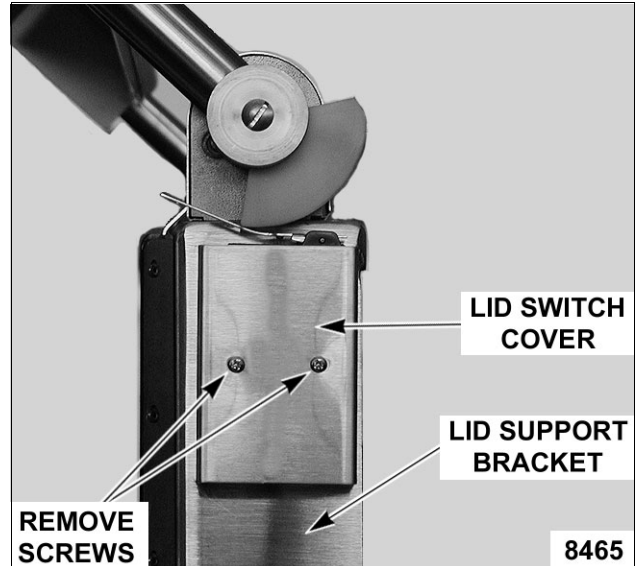
4. Reverse procedure to install and check for proper operation.

LID SWITCH

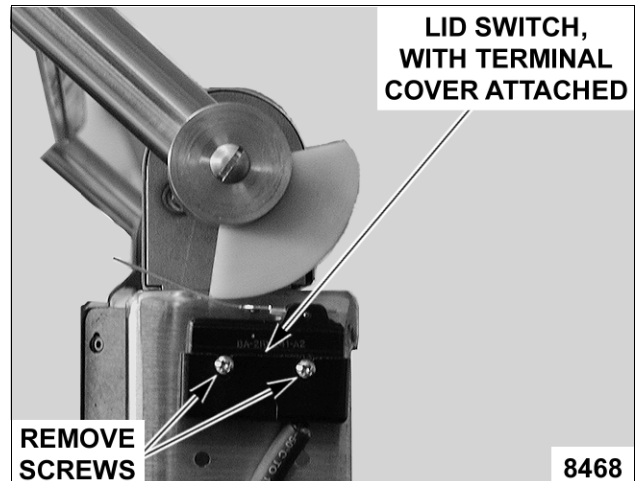


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

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



2. Remove switch from lid support bracket.



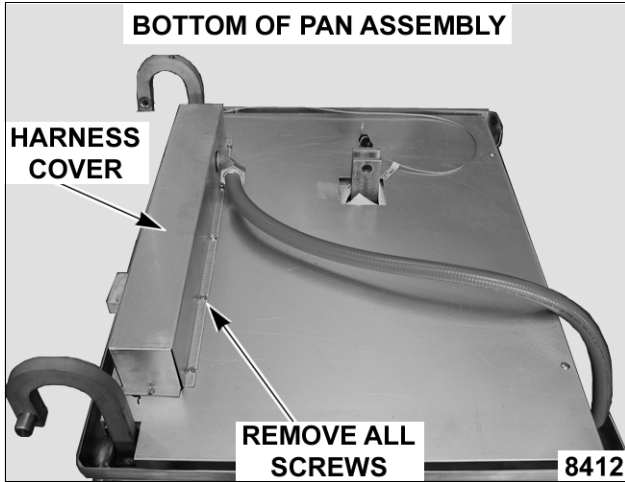
3. Lift terminal cover off switch body and disconnect lead wires.
4. Reverse procedure to install and adjust switch as outlined under LID SWITCH ADJUSTMENT in SERVICE PROCEDURES AND ADJUSTMENTS.

THERMOCOUPLE PROBE

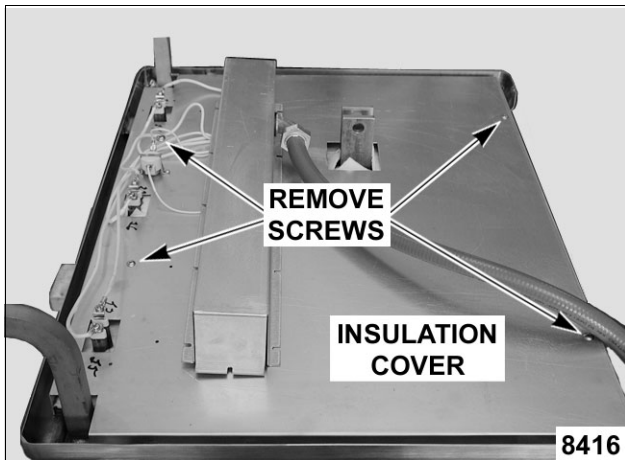


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

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 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.

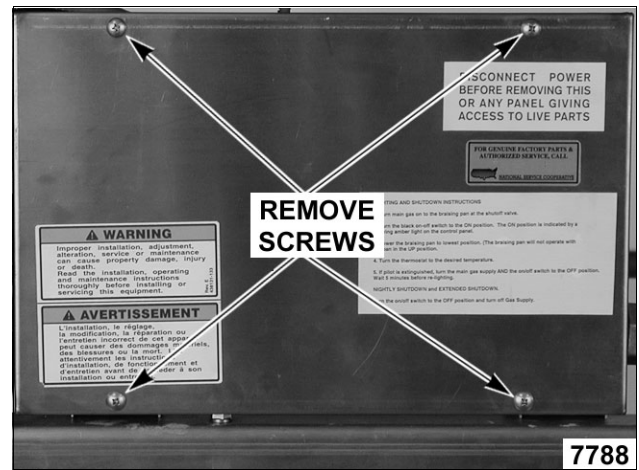
NOTE: When installing: Route thermocouple wire in the same manner thru the metal clamps on the hinge & frame. Tighten thermocouple just until it touches the pan; do not over tighten or damage to the thermocouple may occur.

DC LIFT MOTOR

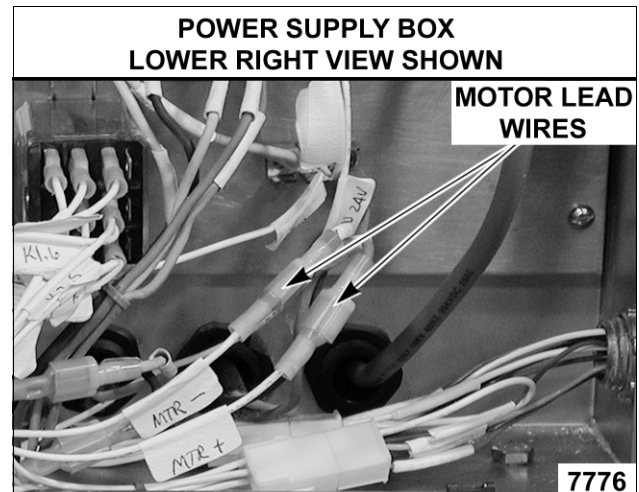


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

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



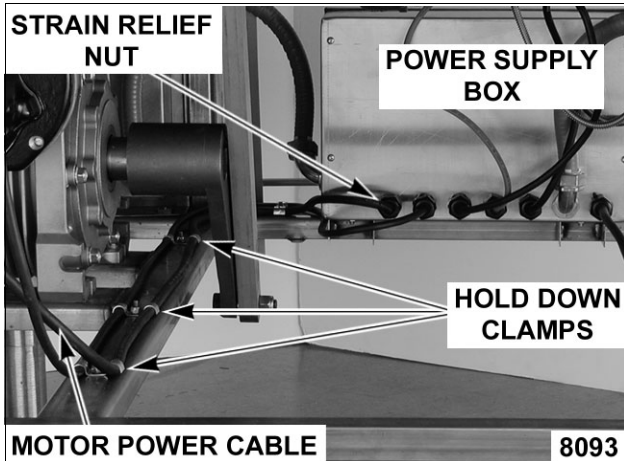
3. Disconnect DC lift motor lead wires labeled MTR+ (positive) & MTR - (negative).



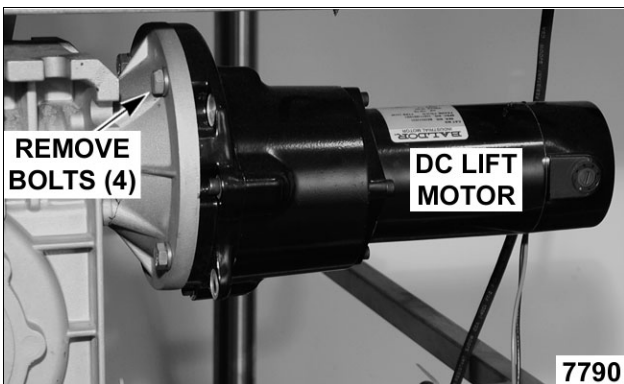
NOTE: Lead wires can be identified by label or marking on the wire.

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.

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.

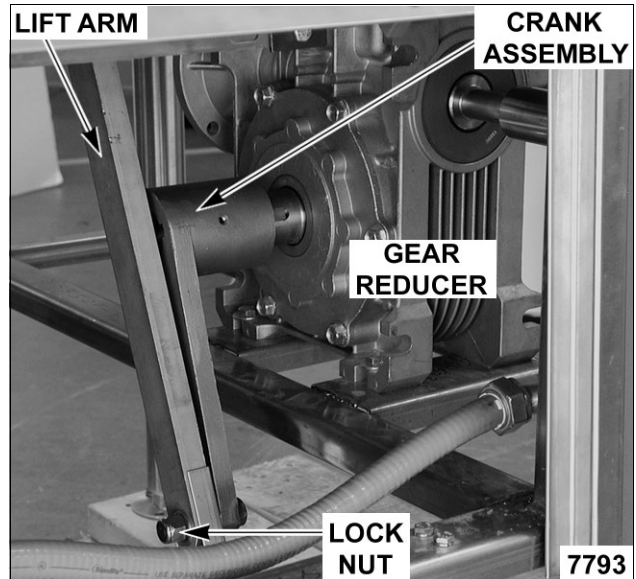
GEAR REDUCER



WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

1. Remove right side and rear panels as outlined under COVERS AND PANELS.

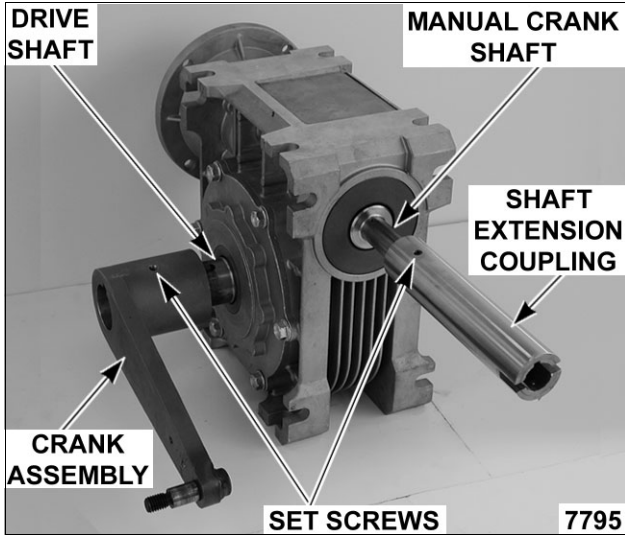
2. Lower the pan (use motorized pan lift or manual crank handle).
3. If DC lift motor is installed, remove motor as outlined under DC LIFT MOTOR.
4. Remove lock nut securing crank assembly to lift arm.



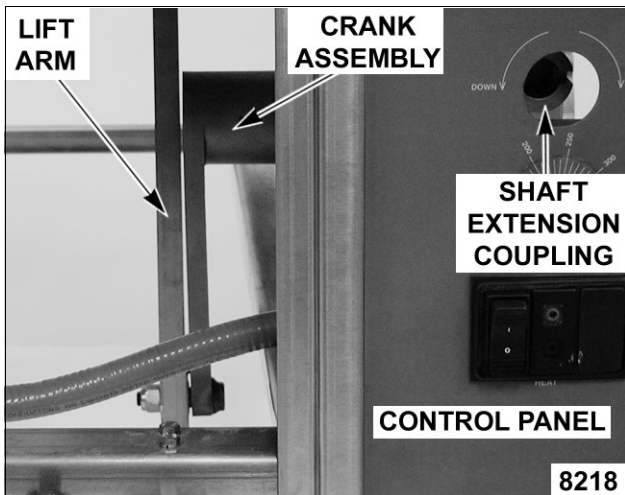
5. Remove bolts securing gear reducer to braising pan frame then remove gear reducer.



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:
- With drive key on drive shaft, install crank assembly and tighten set screw against key.
 - With drive key on manual crank shaft, install shaft extension coupling and tighten set screw against key.
 - 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.

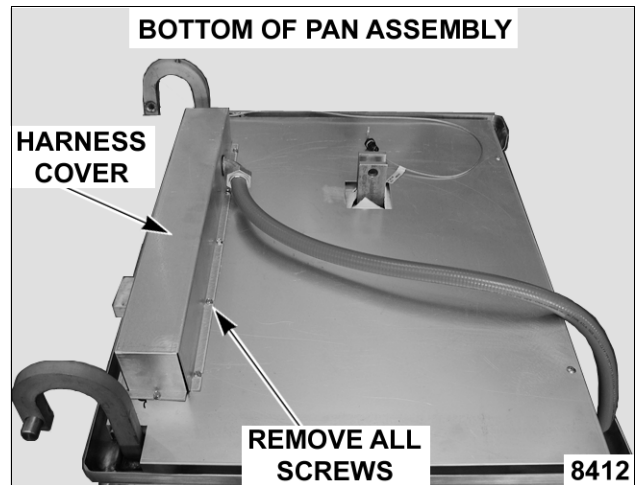
- Reverse procedure from step 5 to complete the installation.
- Check for proper operation.

HEATING ELEMENTS

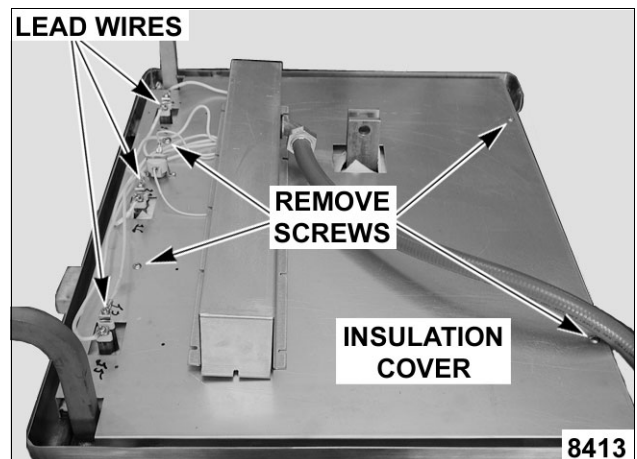


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

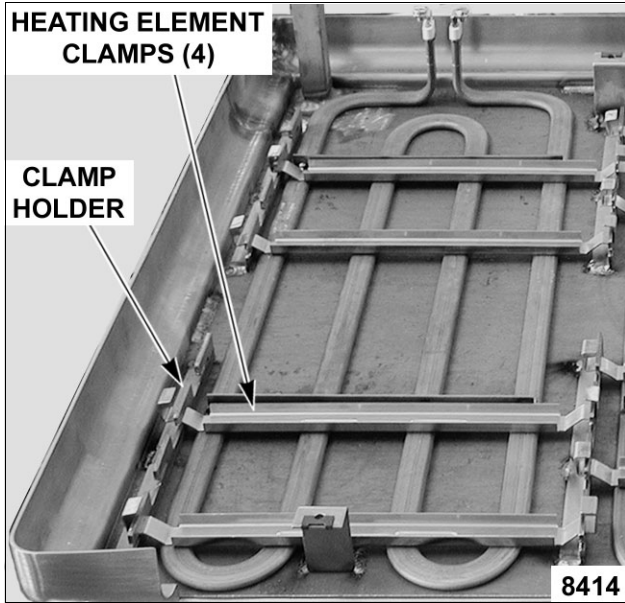
- Raise the pan to the full tilt position.
- Remove harness cover.



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



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



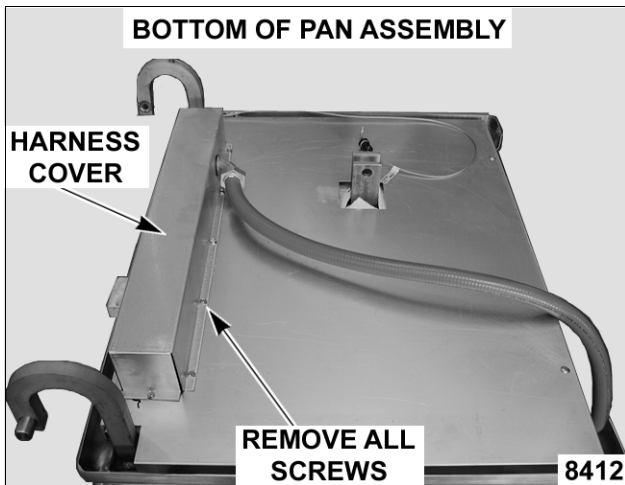
- Reverse procedure to install and check for proper operation.

HIGH LIMIT THERMOSTAT

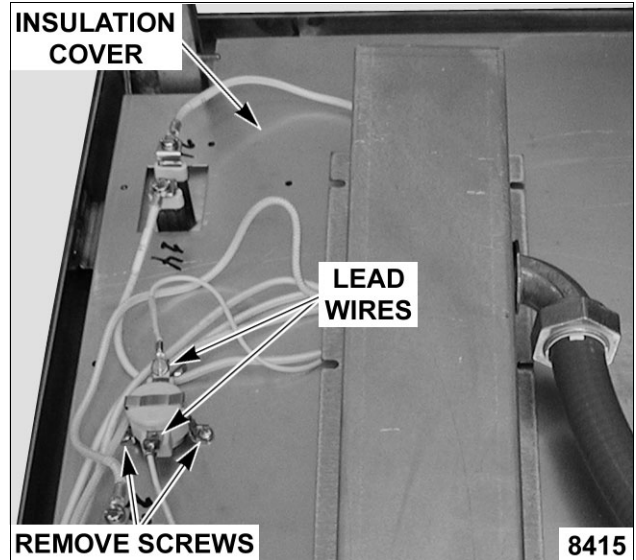


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

- 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.

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.

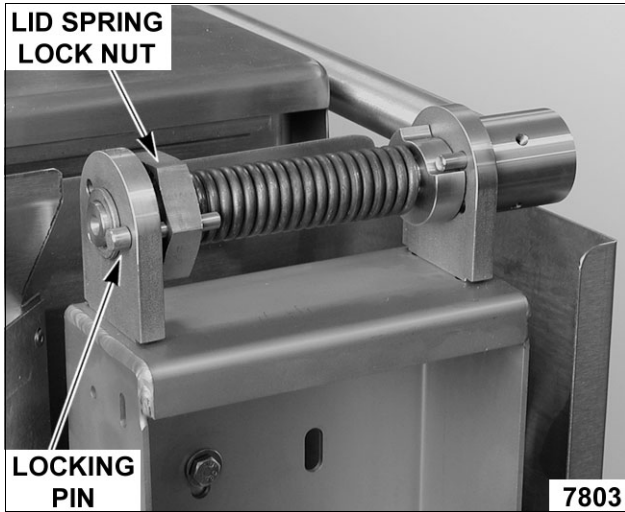
- Remove spring covers by prying up at the bottom. The covers are held in place by tabs on the bottom of cover.

RIGHT SIDE REAR VIEW SHOWN

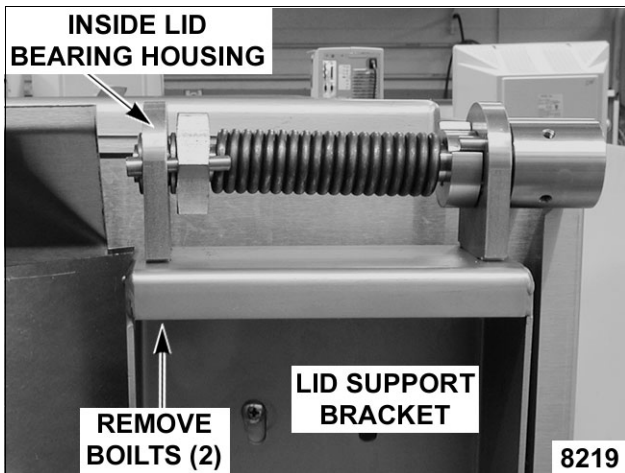


- Place a 1 5/8" wrench on the lid spring lock nut and apply a downward force until locking pin can be removed. Continue to hold lock nut in place.

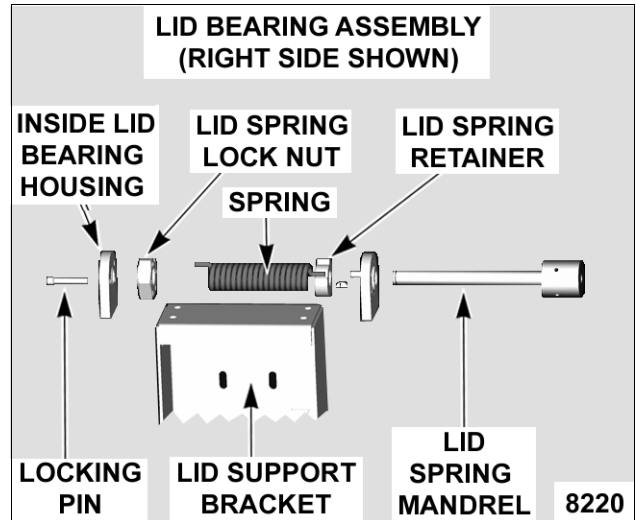
Caution: Do not release wrench while locking pin is removed or damage to the braising pan may occur.



- 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 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 TEST.

TEMPERATURE CONTROLLER CALIBRATION

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

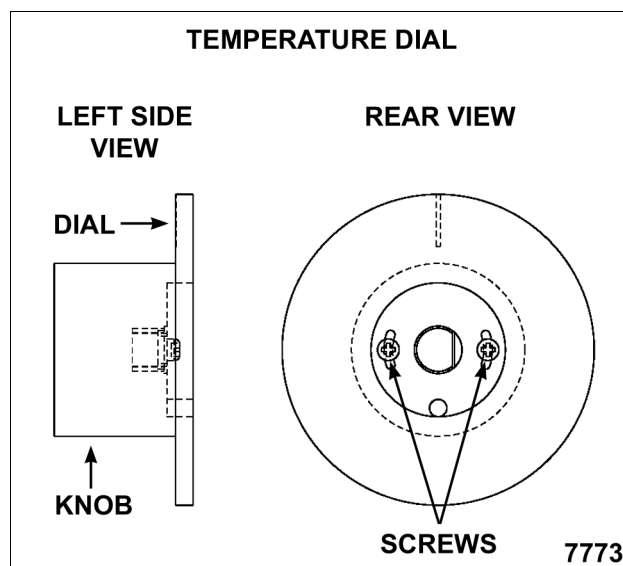
- At the geometric center on the pan cooking surface, clean an area approximately 3" inches in diameter.
- Apply a thin layer of fresh cooking oil to the cleaned area and place a temperature sensing disk on the pan cooking surface.
- Turn on/off switch on and set temperature dial to 250°F.
- Monitor 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.
 - Allow the temperature controller to cycle three times to stabilize the pan temperature.
 - Record the temperature when the temperature controller cycles off and on for the next three cycles.
- Calculate the **differential** by subtracting the 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°

- The differential calculated should be less than 20°F.
 - If the differential is less than 20°F, temperature controller is functioning properly.
 - Proceed to average temperature.
 - If the differential is more than 20°F, the temperature controller is malfunctioning.
 - Install a replacement temperature controller and check calibration.
- 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°

- If the average temperature is less than 10°F of the dial setting, temperature controller is properly calibrated.
 - If the average temperature is more than 10°F of the dial setting, temperature controller calibration must be adjusted.
- 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.
 - Remove temperature dial from shaft.
 - Loosen screws on the back of dial.
 - 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.
- NOTE:** With knob facing user, a clockwise rotation increases temperature and a counter-clockwise rotation decrease temperature.
- Hold the dial & knob together to maintain the adjusted setting and tighten screws.

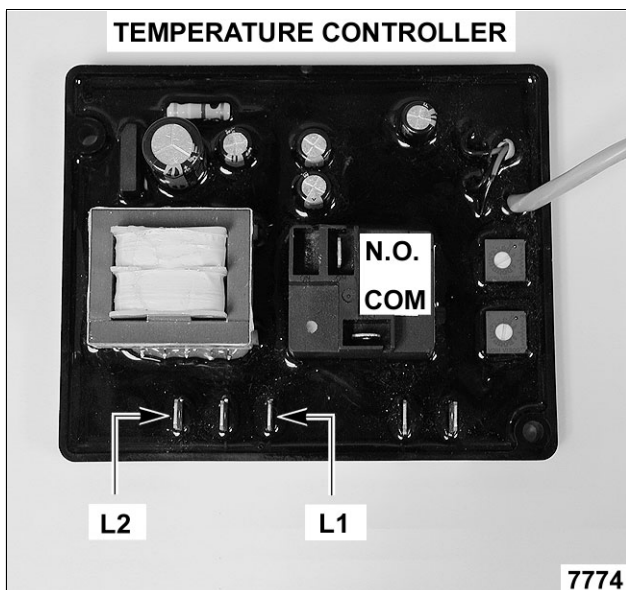


- Replace temperature dial on shaft.
- Turn the temperature dial to the lowest setting then back to 250°F.

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

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



1. Lower the pan to the full down position.
2. Access the temperature controller as outlined in REMOVAL AND REPLACEMENT OF PARTS.
3. Re-connect power to the machine.
4. Verify temperature controller is receiving 120VAC at terminals L1 & L2, polarity is correct and machine is properly grounded.
5. Turn on/off switch on and set temperature dial to 250°F.
6. 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, verify condition of thermocouple as outlined under THERMOCOUPLE TEST.

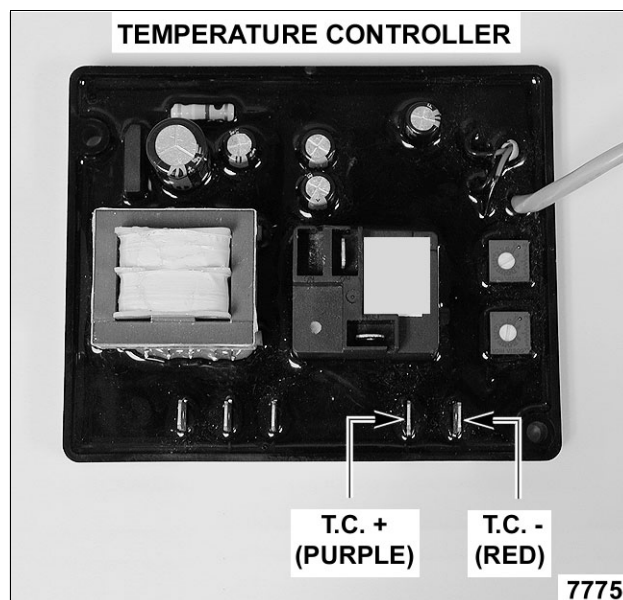
NOTE: Temperature controller will de-energize internal relay if the circuitry detects an open thermocouple.

- B. If heat light and heating elements do not energize, verify internal relay contacts are operating properly.

7. Disconnect lead wire labeled HT.0 from the COM terminal on the controller.
8. 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 9.
 - B. If incorrect, check transformer and the on/off switch for proper operation.
9. Disconnect lead wire labeled HT.1 from the N.O. terminal on the controller.
10. Verify 24VAC between N.O. terminal on the temperature controller and ground.
 - A. If correct, internal relay contacts are functioning properly. Reconnect lead wire to the N.O. terminal. See Troubleshooting.
 - B. If incorrect, install a replacement temperature controller and check for proper operation.

THERMOCOUPLE TEST

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



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.

HEATING ELEMENT TEST

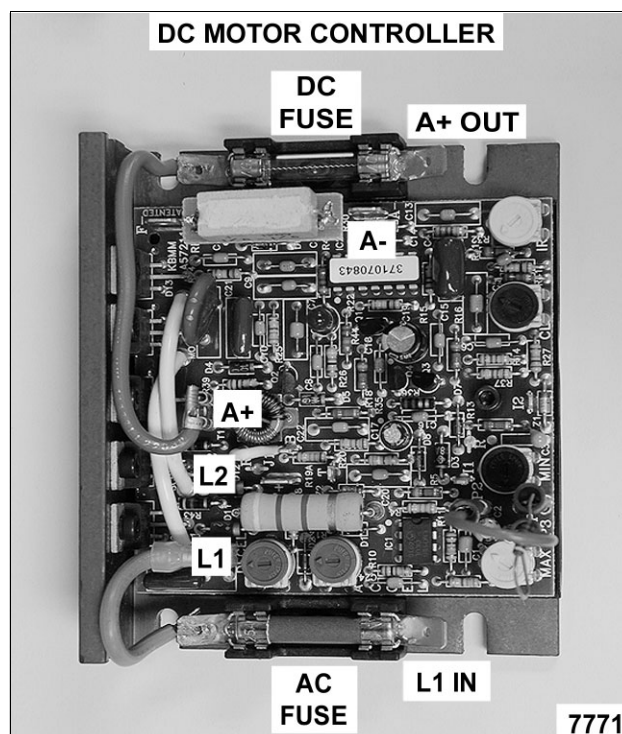
VOLTAGE	KW PER ELEMENT	AMPS PER ELEMENT	OHMS PER ELEMENT
208	4	14.3	13.7
240	4	16.7	13.7
480	4	8.7	55.5

- NOTES:**
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).

1. Access the heating elements as outlined in REMOVAL AND REPLACEMENT OF PARTS.
2. Measure voltage at heating element terminals and verify it against data plate voltage.
 - A. If voltage is incorrect, see TROUBLESHOOTING.
 - 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.
 - a. 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

1. Lower the pan to the full down position.
2. Raise the lid to the full open position.
3. Access the DC motor controller as outlined under POWER SUPPLY BOX COMPONENTS in REMOVAL AND REPLACEMENT OF PARTS.
4. Set VOM to measure AC volts and connect meter leads at L1 & L2 on the controller.
5. Turn the on/off switch to on.
6. Verify 120VAC at L1 & L2 on the controller when the lift control switch (momentary) is operated to raise & lower the 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 under TROUBLESHOOTING.
7. Disconnect power to the machine.
8. Set VOM to measure DC volts and connect VOM leads to terminals A + (positive) & A - (negative) on the controller.
9. Re-connect power to the machine.
10. Verify 90VDC (approximate) from the DC motor controller when the lift control switch (momentary) is operated to raise & lower the pan.

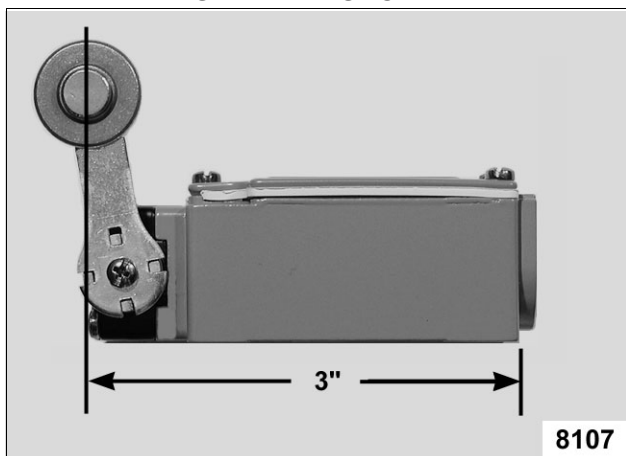
- A. If voltage is present but pan does not raise, refer to **MOTORIZED LIFT OPTION ONLY** under **TROUBLESHOOTING**.
 - B. If voltage is not present and the fuse is ok, turn the on/off switch off and disconnect power to the machine.
11. Install a replacement DC motor controller and check for proper operation.

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

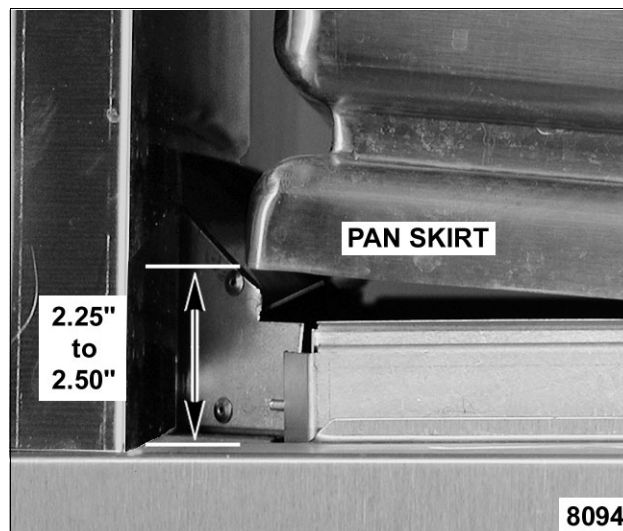


- B. If distance is ok, proceed to step 6.
 - C. If distance is not ok, position the roller arm as outlined under **PAN POSITION/DOWN LIMIT SWITCH** in **REMOVAL AND REPLACEMENT OF PARTS**.
6. Lower the pan to the full down position. The roller should make contact with the hinge and operate the switch.
 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 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 the output side of the switch, the switch is functioning properly. See **TROUBLESHOOTING**.
- 3) If voltage is not present on the output side of the 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 the pan until the heat light and heating elements de-energize 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".

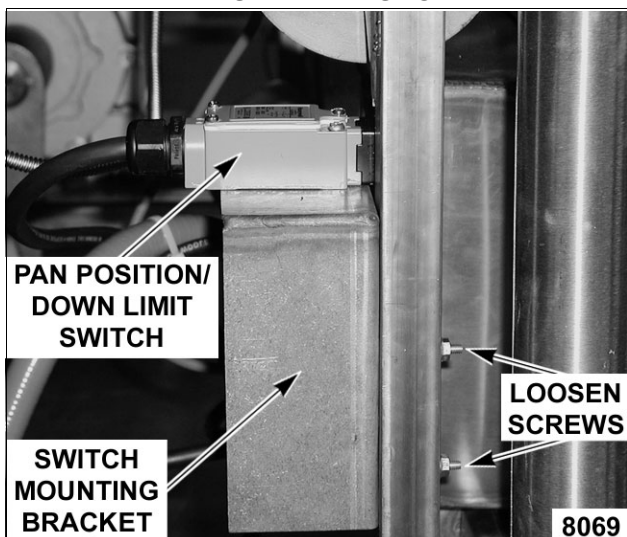
LEFT SIDE VIEW SHOWN



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

9. If heat light and heating elements de-energize; 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".

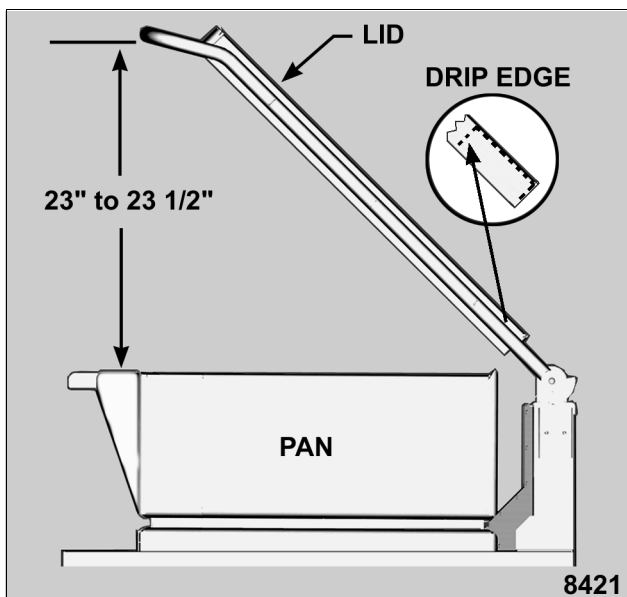
11. Repeat steps 5 thru 9 to check for proper operation.

LID SWITCH ADJUSTMENT

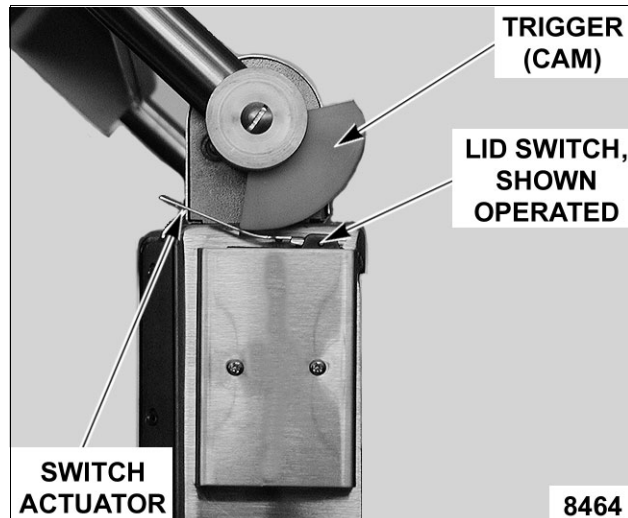
CAUTION: Lid switch should not allow pan to be raised if the lid is not opened a minimum of 23" or damage to the lid may occur.

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

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

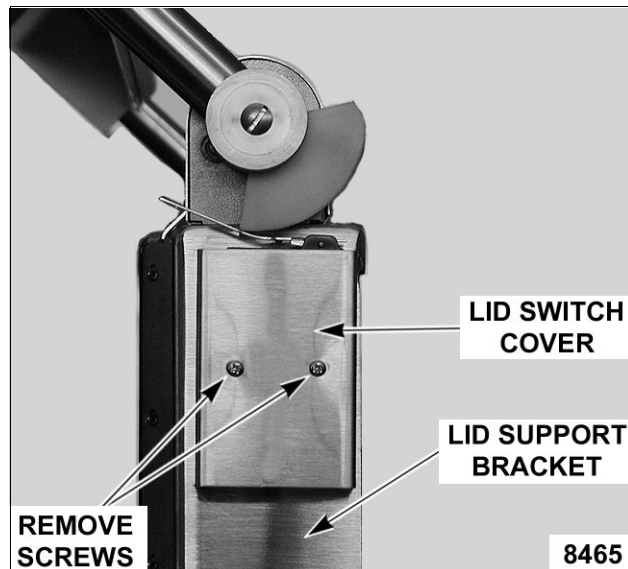


5. The lid switch actuator should make contact with the trigger (cam) and operate the lid switch.

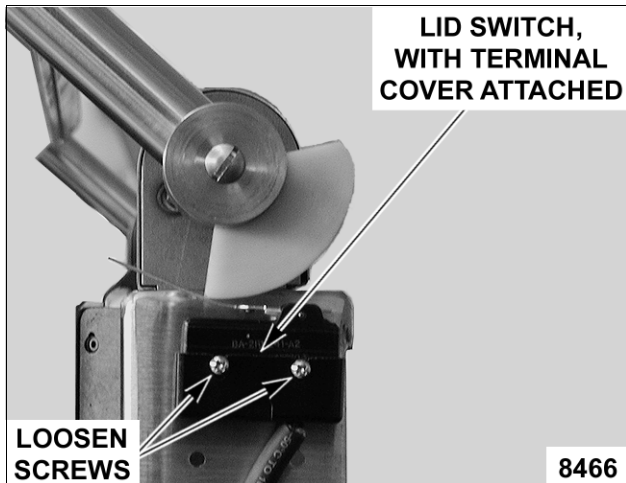


6. Operate the "lift control switch" to raise the pan.
 - A. If pan raises, the lid switch is functioning properly.
 - B. If pan does not raise, continue with procedure.

7. Remove lid switch cover from lid support bracket.



8. To adjust:
 - A. With the 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 the tip of the switch actuator to slightly bend the actuator around the mating edge of the trigger (cam).
- C. Verify pan will raise by operating lift control switch.
- D. Repeat the adjustment (as necessary) and check for proper operation.

LID SPRING TENSION ADJUSTMENT

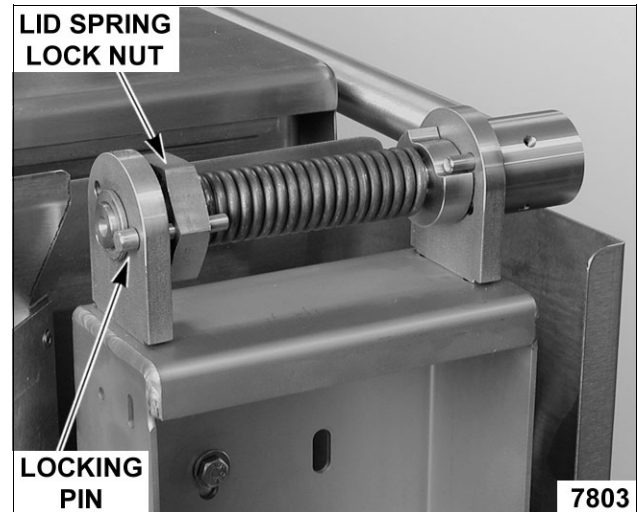
1. Raise the lid and release at several positions thru the range of travel.
 - A. If lid remains in place, no adjustment is necessary.
 - B. If lid does not remain in place (springs up or falls down), continue with procedure.
- NOTE:** For spring tension to be set correctly, each spring must be adjusted 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.

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



- 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.

ELECTRICAL OPERATION

COMPONENT FUNCTION

BRAISING PAN CONTROLS

- Temperature Controller** ... Monitors thermocouple input (type E) 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 & F2** Protects control circuit if current exceeds the rated amperage.
- K3 Heat Relay** Supplies power to contactor coils C1, C2 & 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).

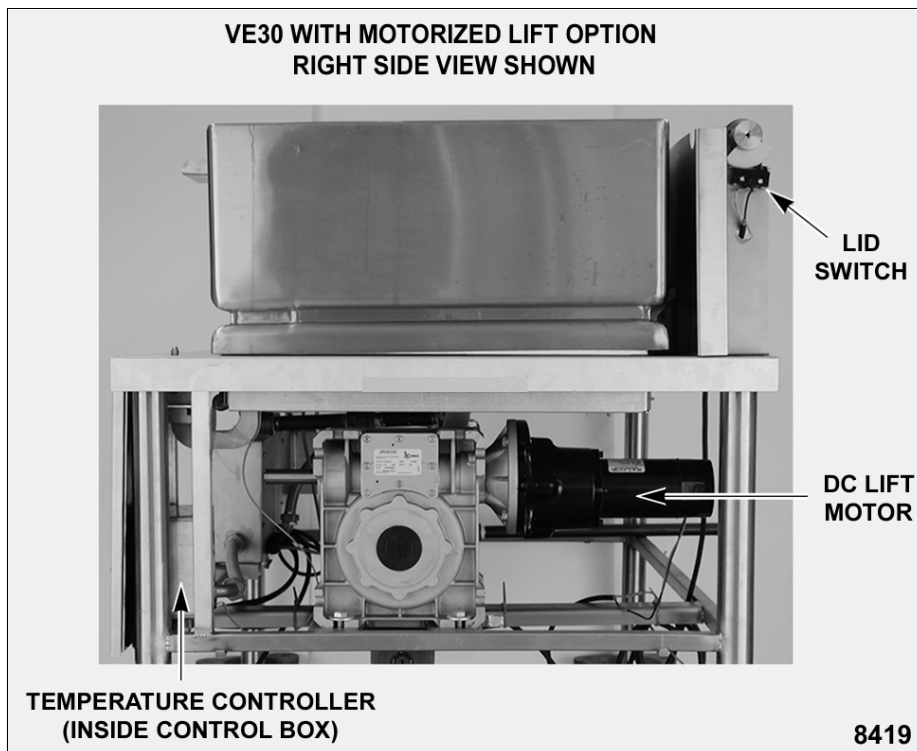
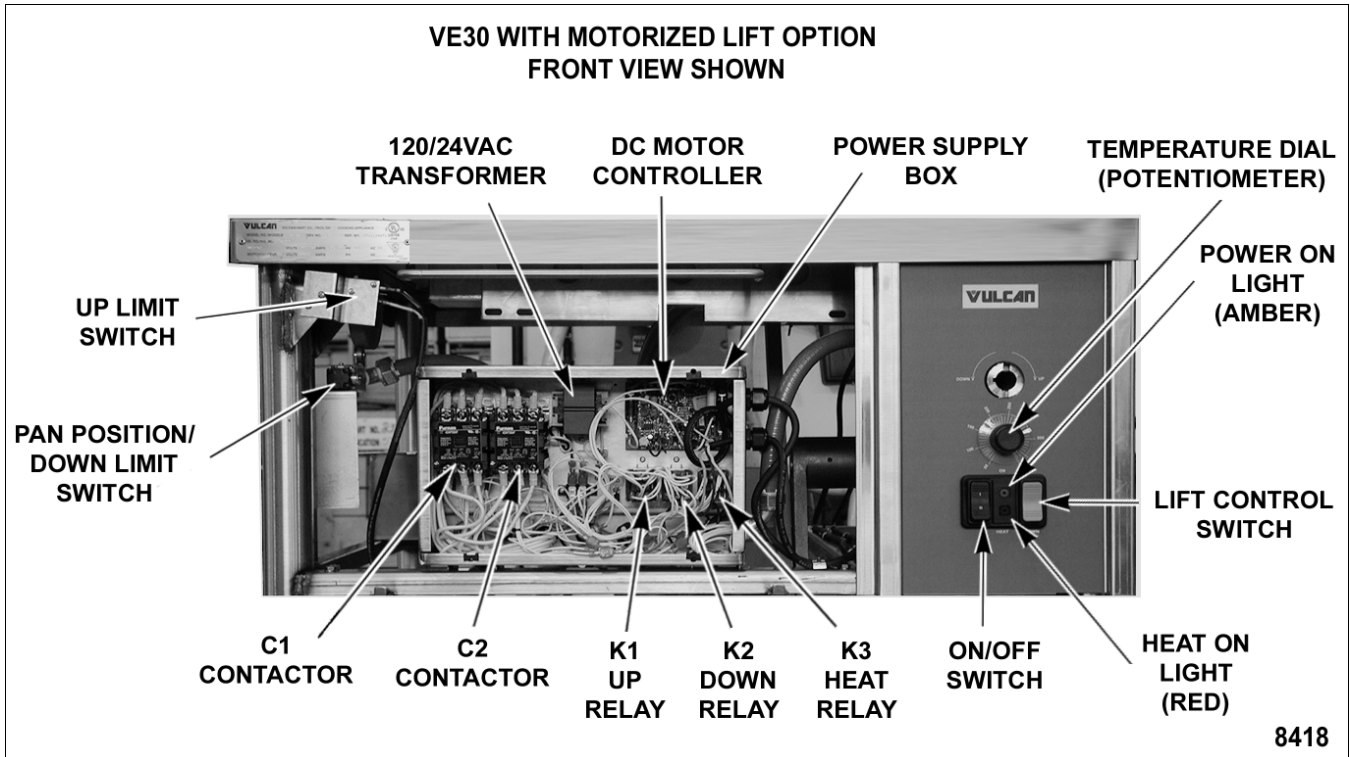
MOTORIZED PAN LIFT OPTION CONTROLS

- DC Motor Controller** 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.
- DC Lift Motor** 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.
- 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 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.
- 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 the down position (pan travel stops). The N.O. contacts are used for the pan position switch.

K1 Up Relay (3PDT) 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.

COMPONENT LOCATION



SEQUENCE OF OPERATION

Refer to schematic diagram AI1376 for the electrical sequence of operation. Manual pan lift is the standard configuration.

Heating

1. Conditions.
 - 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.
 - A. 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.
 - a. 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 the rear, pan position/down limit switch N.O. contacts will open and de-energize 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.

- a. 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 the temperature controller until the pan is raised or the on/off switch is turned off.

Motorized Pan Lift (Option)

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

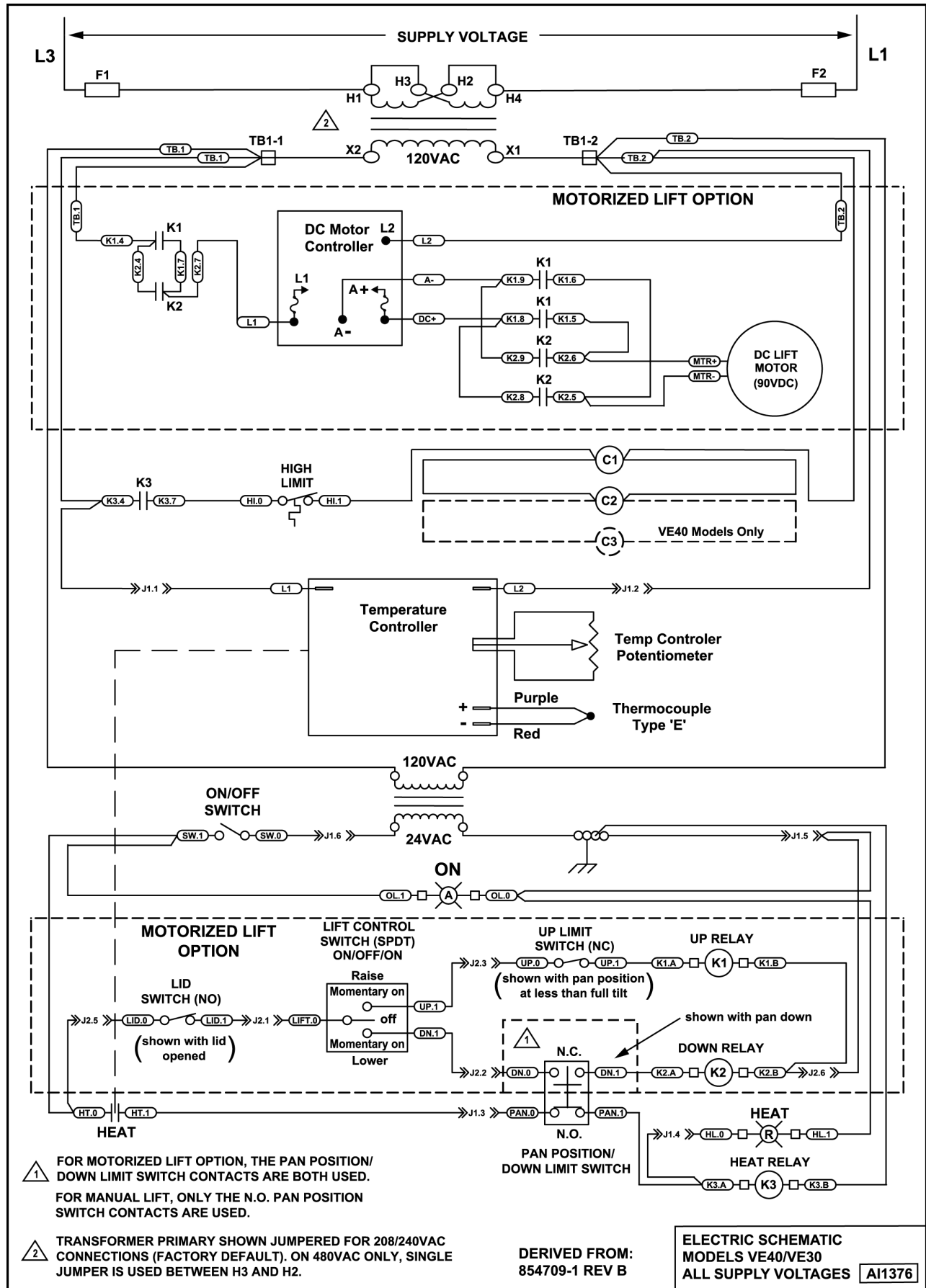
1. Conditions.
 - A. Braising pan connected to correct supply voltage and is properly grounded.
 - 1) 240-480/120VAC transformer energized.
 - 2) 120/24VAC transformer energized.
 - B. On/off switch off.
 - C. Lift control switch off (center position).
 - D. Lid switch N.O. contacts closed (lid opened).
 - 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.
 - A. Indicator light (amber) comes on.
- NOTE:** If temperature dial is set to call for heat, contactors C1, C2 and C3 (VE40 only) are energized thru 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 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 K3 heat relay coil; 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.

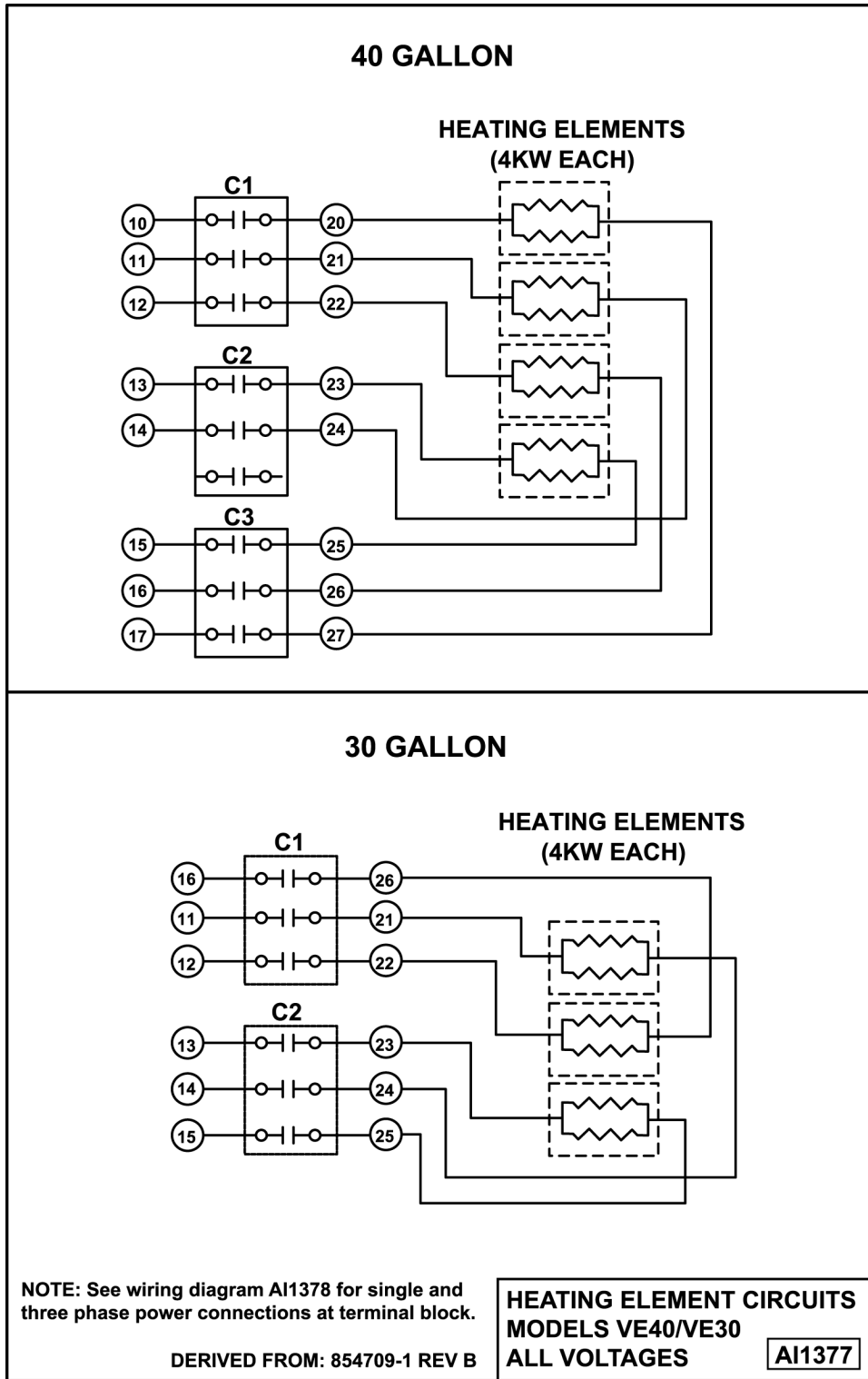
5. Pan reaches full tilt position, the up limit switch N.C. contacts open and K1 relay coil is de-energized.
- A. The three sets of K1 contacts return to N.O. position. Power is removed from the DC motor controller, the DC lift motor and pan travel stops.
6. Operate the lift control switch to lower the pan (momentary on - lower).
- A. K2 relay coil is energized thru the 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 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, pan 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

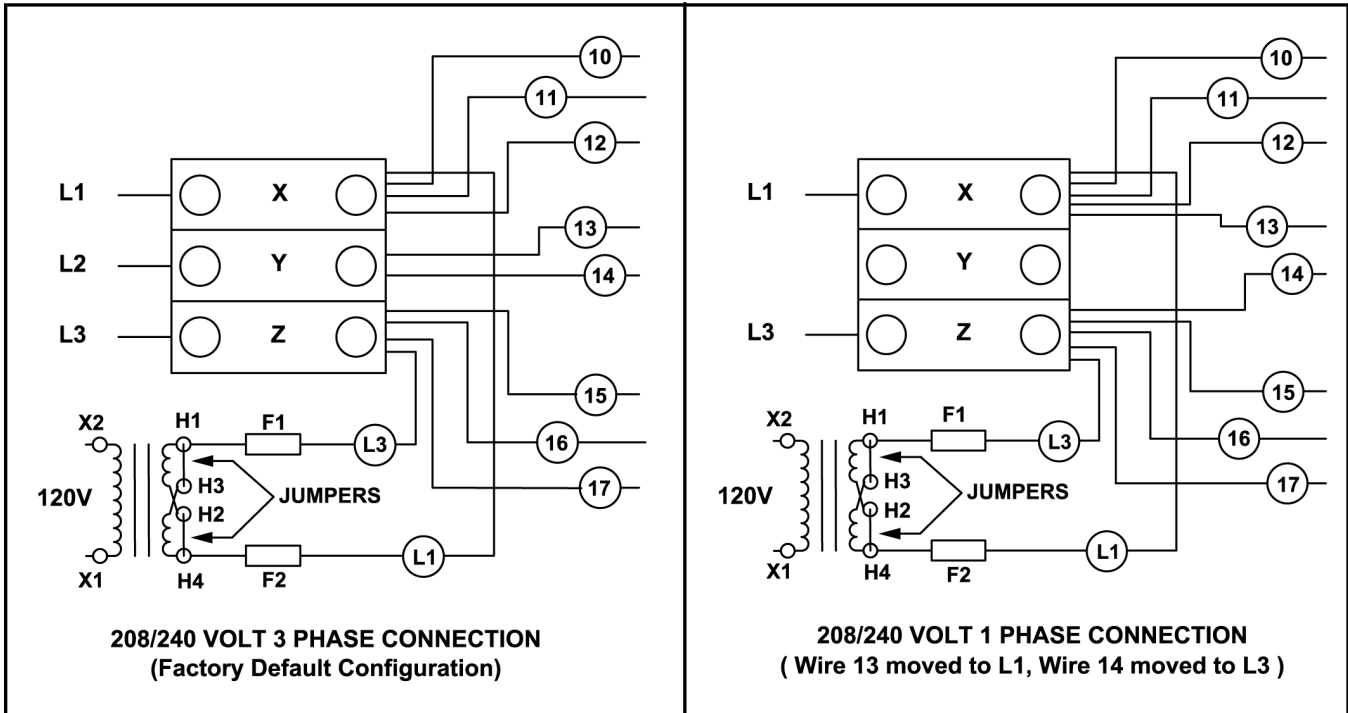


WIRING DIAGRAMS

Heating Element Circuits

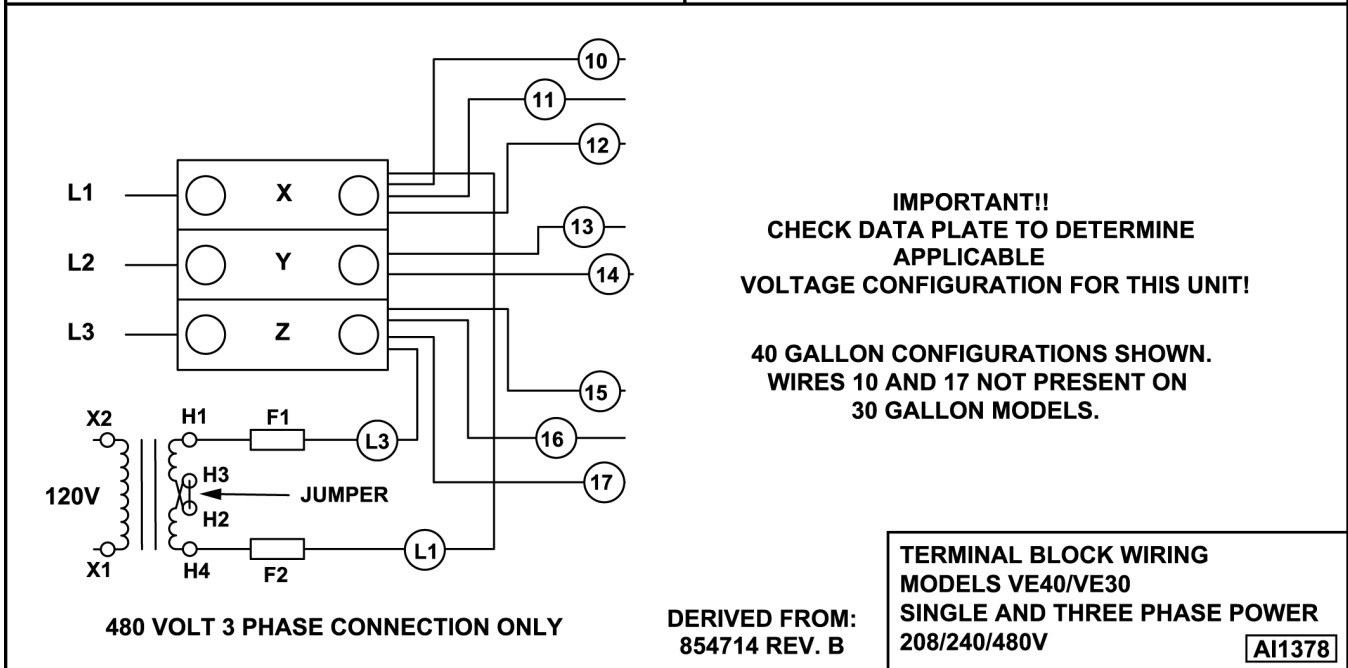


Terminal Block Wiring



208/240 VOLT 3 PHASE CONNECTION
(Factory Default Configuration)

208/240 VOLT 1 PHASE CONNECTION
(Wire 13 moved to L1, Wire 14 moved to L3)



480 VOLT 3 PHASE CONNECTION ONLY

IMPORTANT!!
CHECK DATA PLATE TO DETERMINE
APPLICABLE
VOLTAGE CONFIGURATION FOR THIS UNIT!

40 GALLON CONFIGURATIONS SHOWN.
WIRES 10 AND 17 NOT PRESENT ON
30 GALLON MODELS.

DERIVED FROM:
854714 REV. B

TERMINAL BLOCK WIRING
MODELS VE40/VE30
SINGLE AND THREE PHASE POWER
208/240/480V

AI1378

TROUBLESHOOTING

ELECTRIC HEATING (MANUAL LIFT OR MOTORIZED LIFT OPTION)

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

MOTORIZED LIFT OPTION ONLY

SYMPTOM	POSSIBLE CAUSES
Pan will not raise.	<ol style="list-style-type: none"> 1. Lid switch open (lid not opened) or malfunction. 2. 120/24VAC transformer inoperative. 3. On/off switch off or malfunction. 4. Lift control switch malfunction (momentary on - raise). 5. Up limit switch malfunction. 6. K1 relay malfunction. 7. DC motor controller - Fuses open or controller malfunction. 8. DC Lift motor inoperative. 9. Gear reducer malfunction. 10. Interconnecting wiring malfunction.
Pan will not lower.	<ol style="list-style-type: none"> 1. Lid switch open (lid not opened) or malfunction. 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. 3. 120/24VAC transformer inoperative. 4. On/off switch off or malfunction. 5. Lift control switch malfunction (momentary on - lower). 6. Down limit switch malfunction. 7. K2 relay malfunction. 8. DC motor controller - Fuses open or controller malfunction. 9. DC Lift motor inoperative. 10. Gear reducer malfunction. 11. Interconnecting wiring malfunction.

- NOTES -

- N O T E S -

CONDENSED SPARE PARTS LIST

VE30 & VE40 BRAISING PANS		
PART NUMBER	DESCRIPTION	NOTES
840115	Contactora 25 Amp	
854511-1	Element 208/240v	
854511-2	Element 480v	
854512-1	Thermocouple-Temperature Probe (E-type)	
854517-1	Switch-Pan Limit (Pan Position/Down Limit)	
854534-1	Temperature Control Board	
854537-1	Switch-Control (Manual Lift)	
854545-1	Relay-heat (24VAC)	
821762	High Limit Thermostat	
855035-1	Transformer 240-480/120 50VA (Manual Lift)	
411500-12	Transformer 120/24	

BRAISING PANS WITH MOTORIZED LIFT OPTION		
PART NUMBER	DESCRIPTION	NOTE
854495-1	Switch-Control	
854671-1	Controller-Speed	
854545-1	Relay-up & down (24VAC)	
411496-F1	Switch-Micro (Lid)	
854717-1	Switch-Micro (Up Limit)	
855036-1	Transformer 240-480/120 150VA	
854653-1	Motor-Gear	

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