Commercial Kitchen Equipment Parts

# VULCAN HART VE30

## Service Manual

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# SERVICE MANUAL



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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# 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

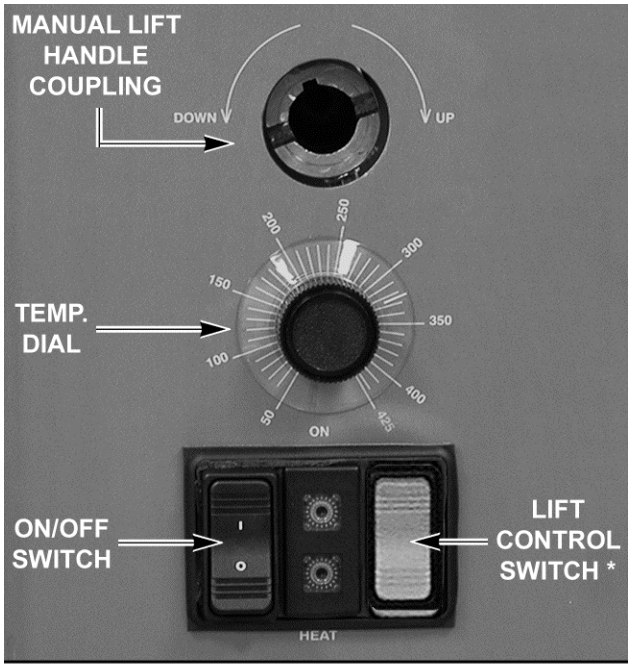
## INSTALLATION, OPERATION, AND CLEANING

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

| 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 REPLACMENT OF PARTS

## COVERS AND PANELS

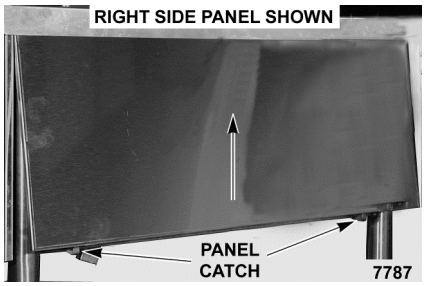



**⚠ WARNING**

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

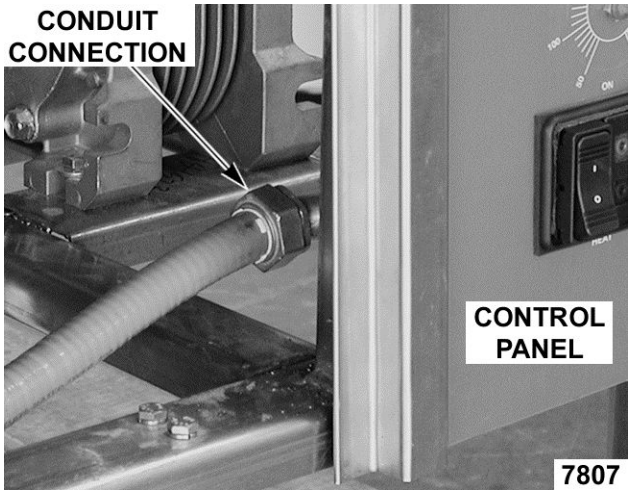
**Front, Rear, and Side Panels**

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.

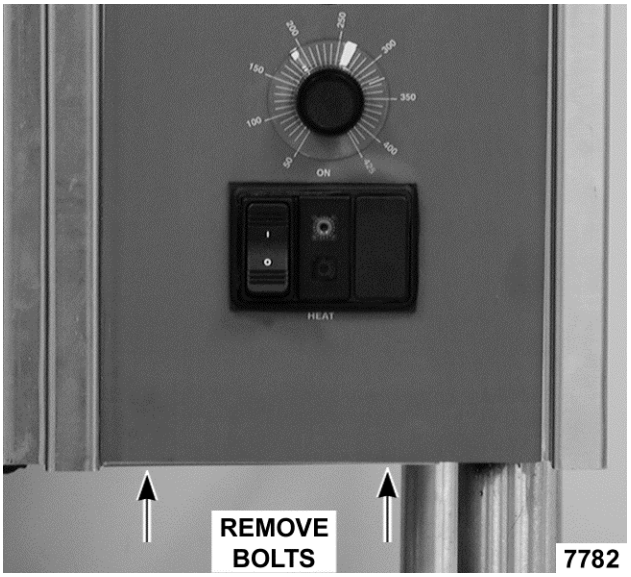



**Control Panel**

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



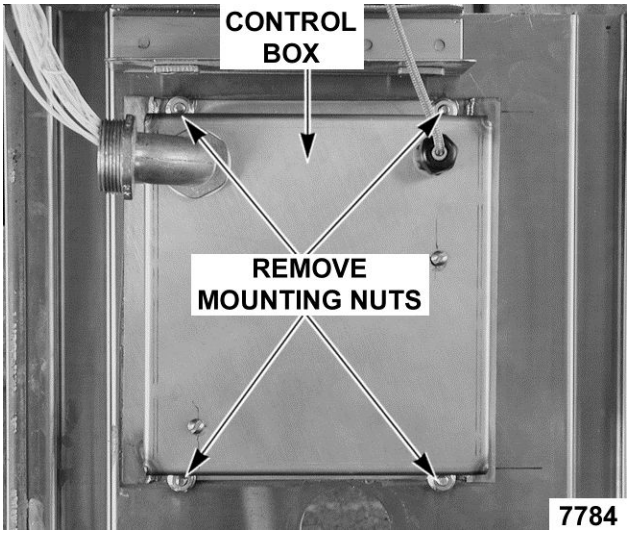

3. Remove manual lift crank handle (if installed).
4. Remove bolts securing control panel to braising pan frame. Bolts are recessed in the frame channel.



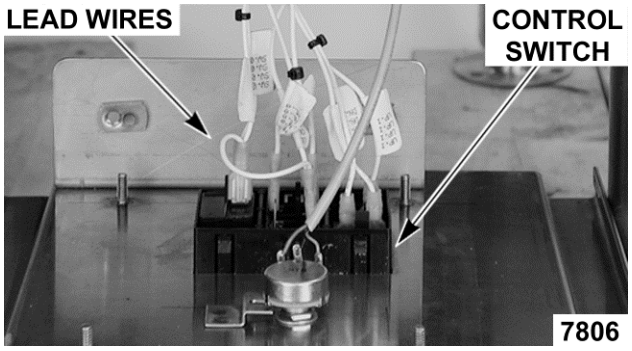

5. Tilt bottom of control panel outwards and pull down.

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

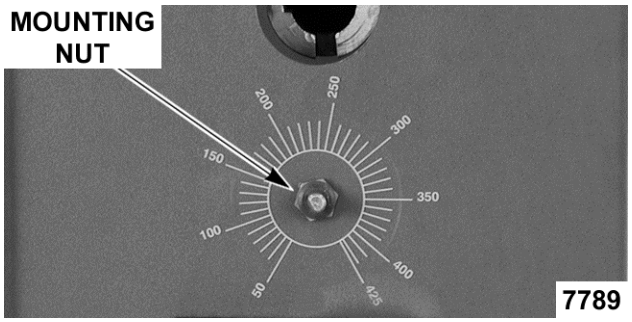
6. Remove control box from control panel.



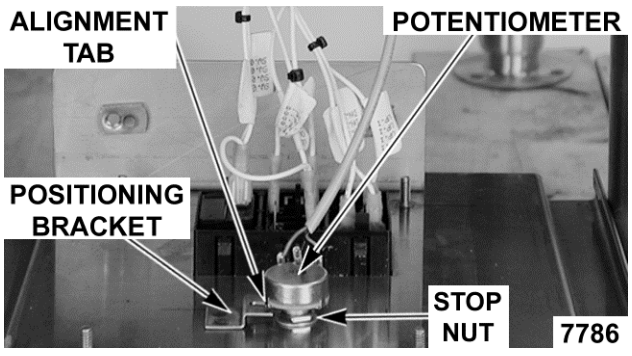

7. Disconnect lead wires from control switch.




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**

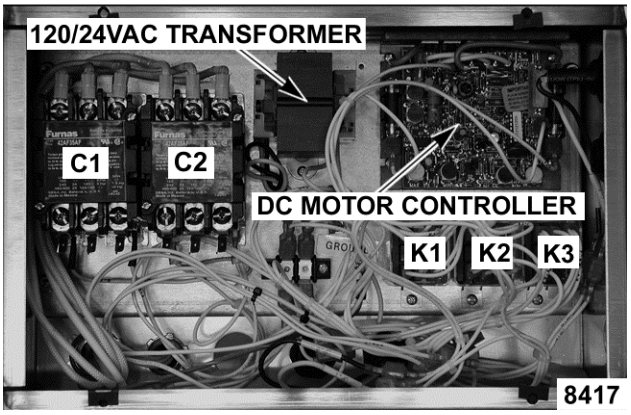
**Disconnect the electrical power to the machine and follow lockout / tagout procedures.**

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**

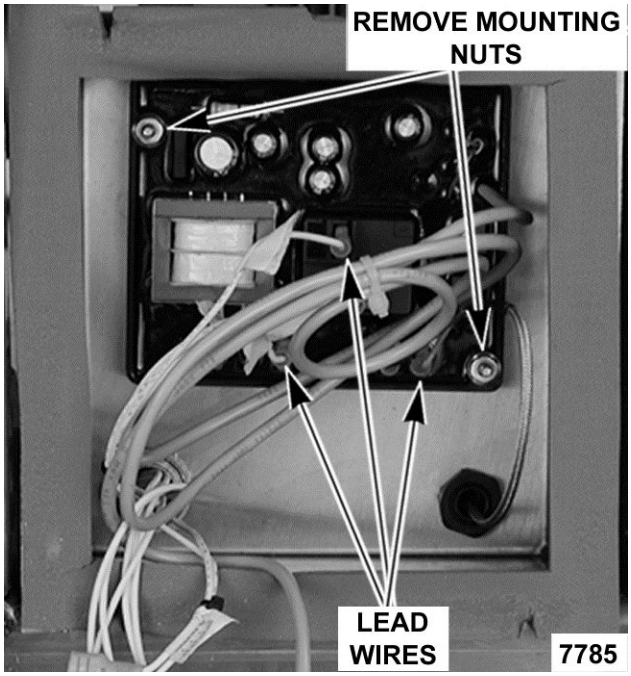



**Fig. 11**

- 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).

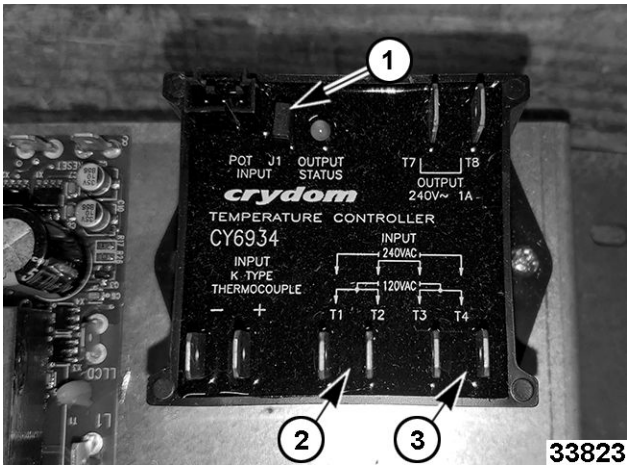
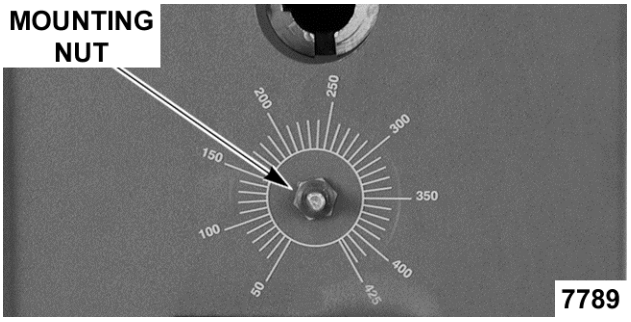
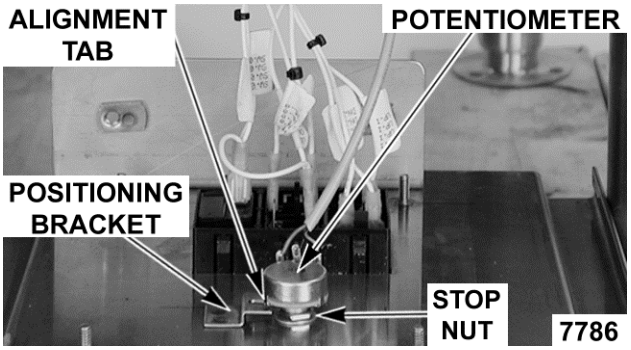



**Fig. 12**

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.

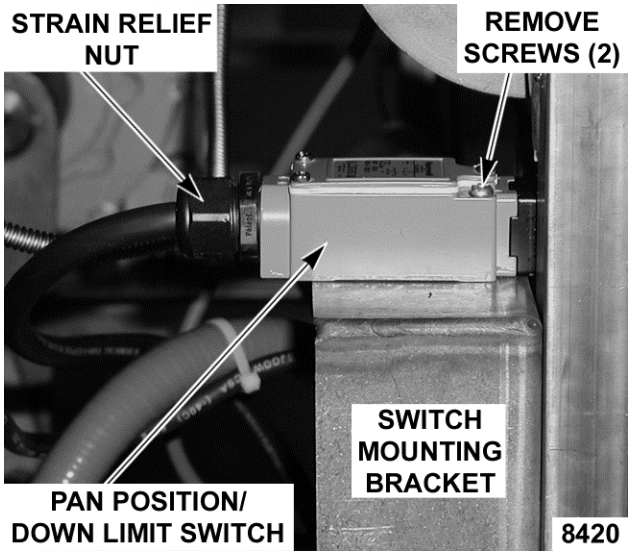
# PAN POSITION / DOWN LIMIT SWITCH




**⚠ WARNING**

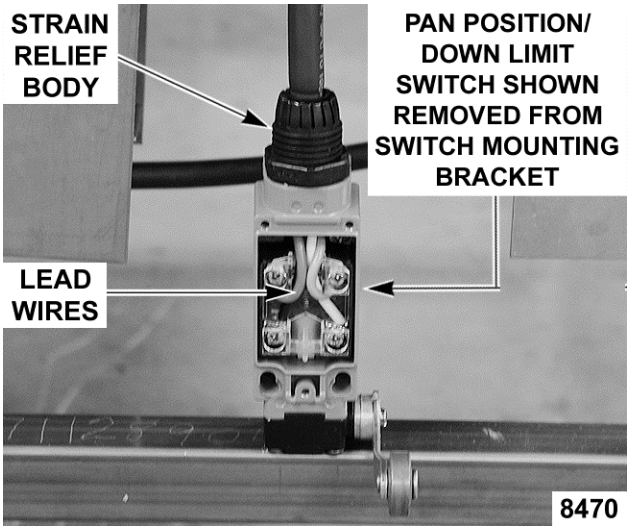
**Disconnect the electrical power to the machine and follow lockout / tagout procedures.**

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.

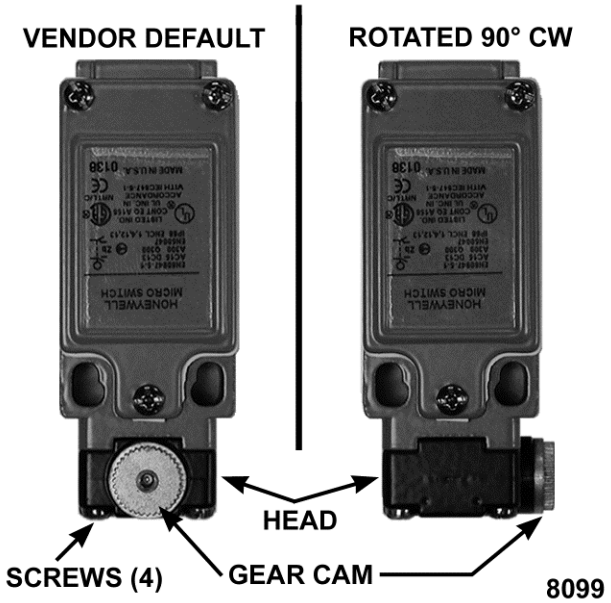
6. To install:

   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**

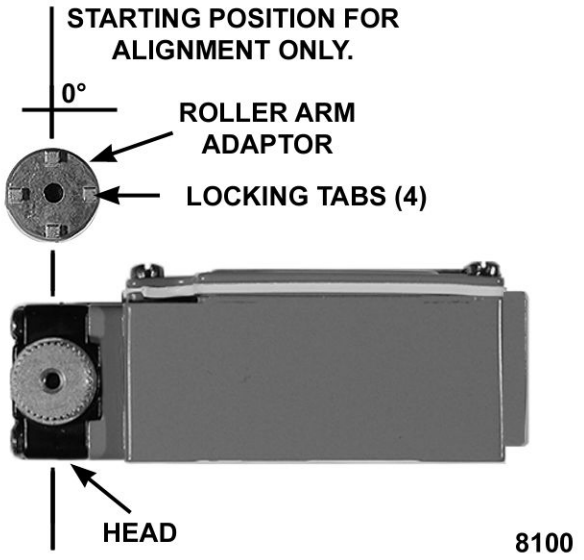



**Top View Shown**

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

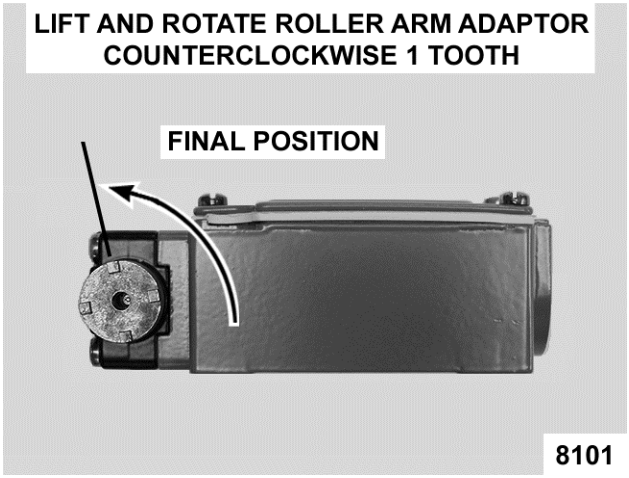
D. Align roller arm adaptor with the four locking tabs pointing up and position one of the tabs at 0°

**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

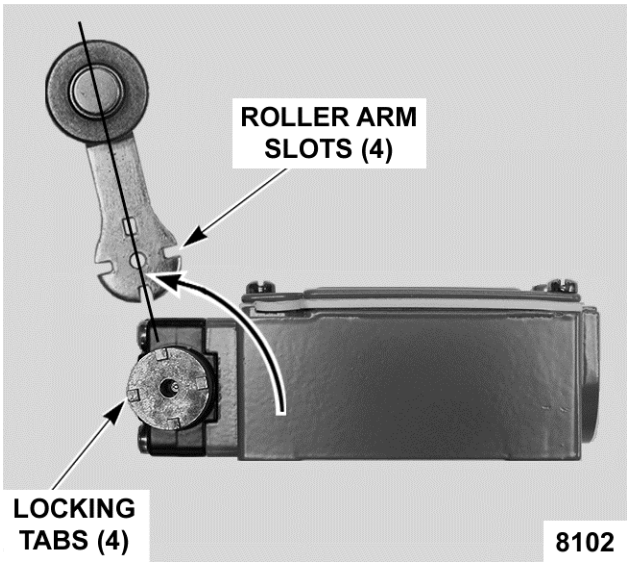


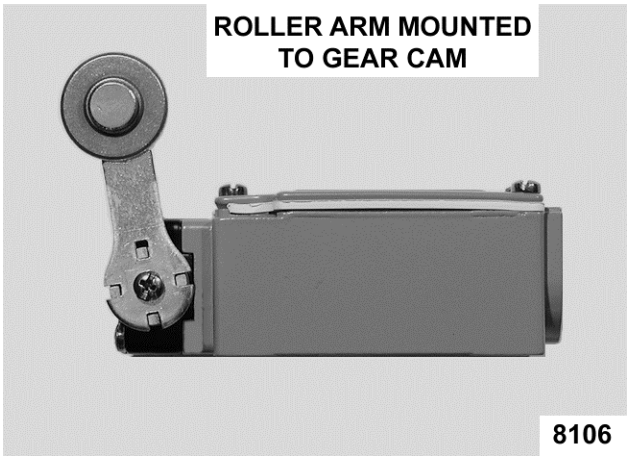

**Side View Shown**

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.



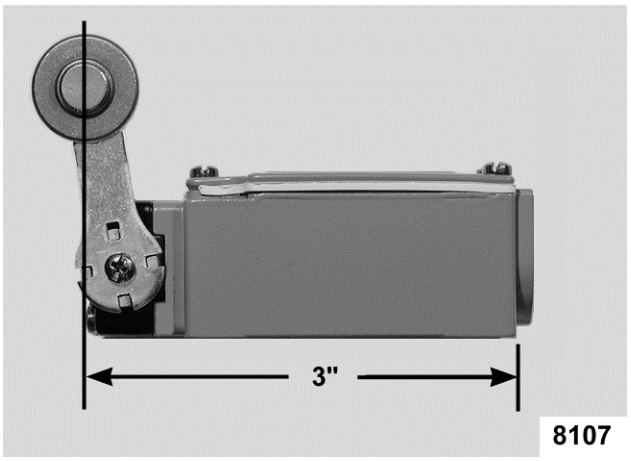

F. Align the roller arm slots with the four locking tabs on the roller arm adaptor and tighten mounting screw to secure.




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.

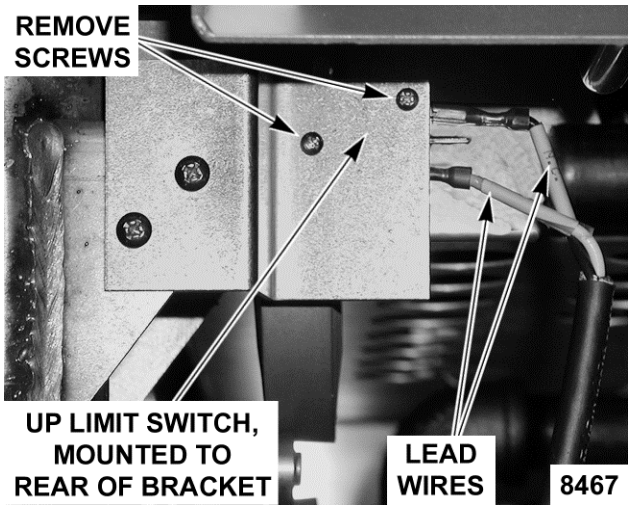
## UP LIMIT SWITCH




**⚠ 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.

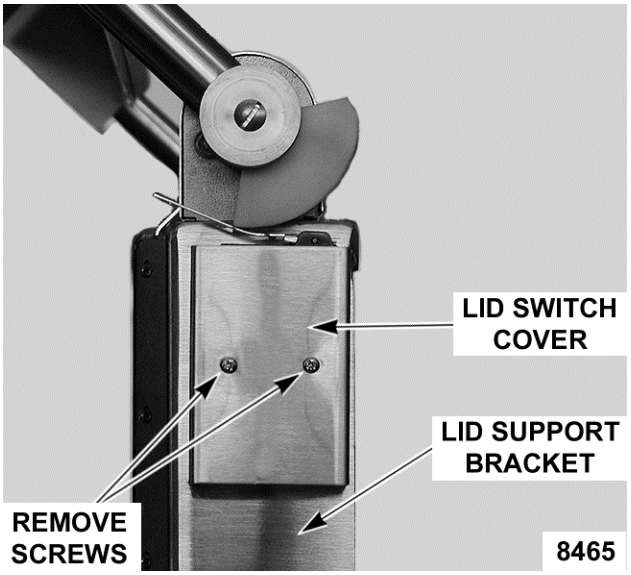
## LID SWITCH



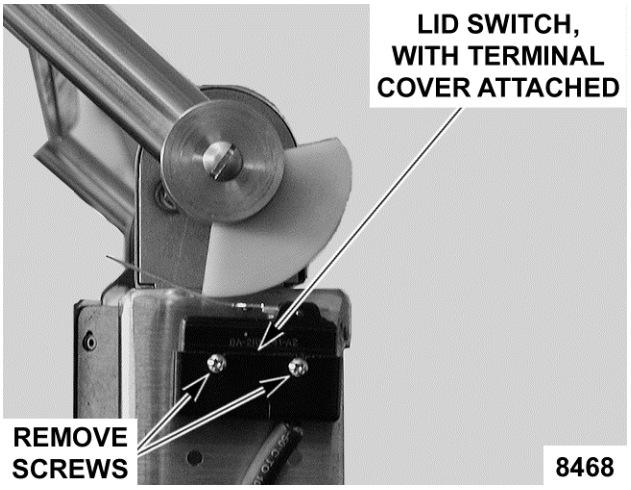

**⚠ WARNING**

**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

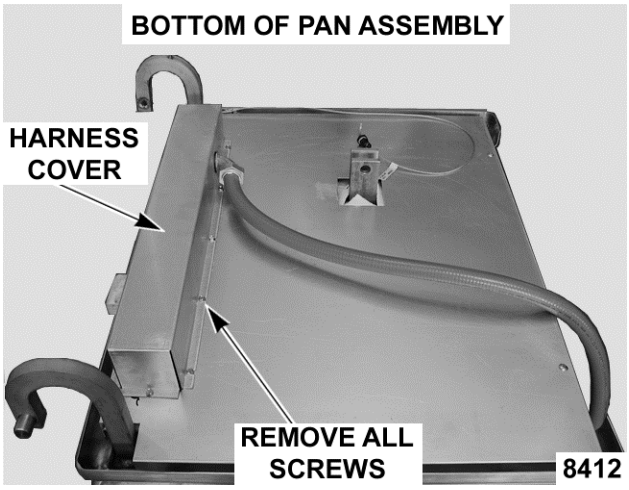
## THERMOCOUPLE PROBE



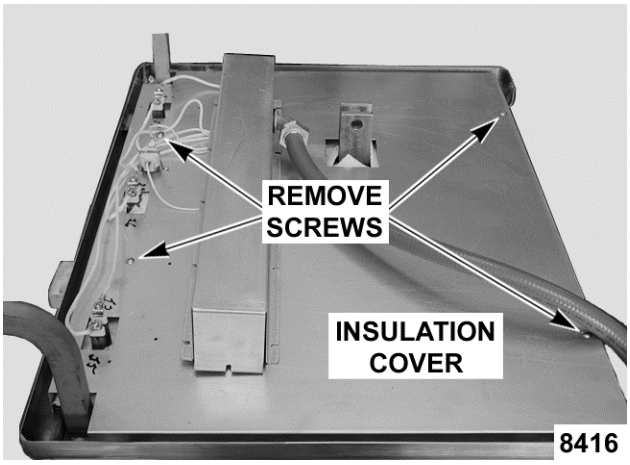

**⚠ WARNING**

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

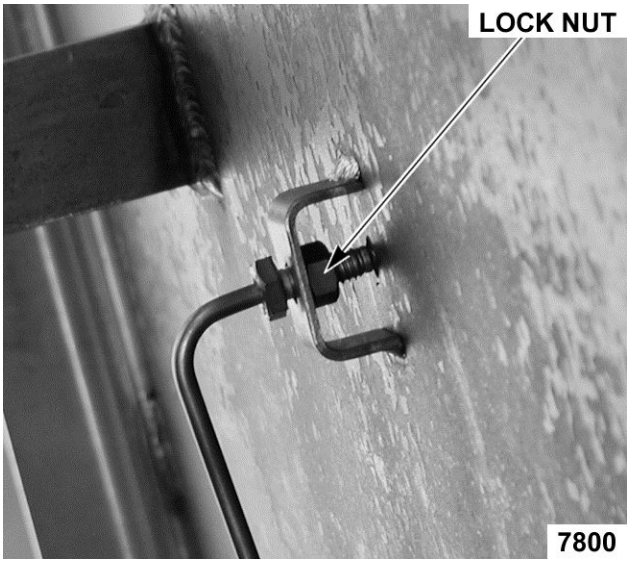
1. Access temperature controller as outlined under .
2. Disconnect thermocouple lead wires.
3. Raise the pan to the full tilt position.
4. Remove harness cover.




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).

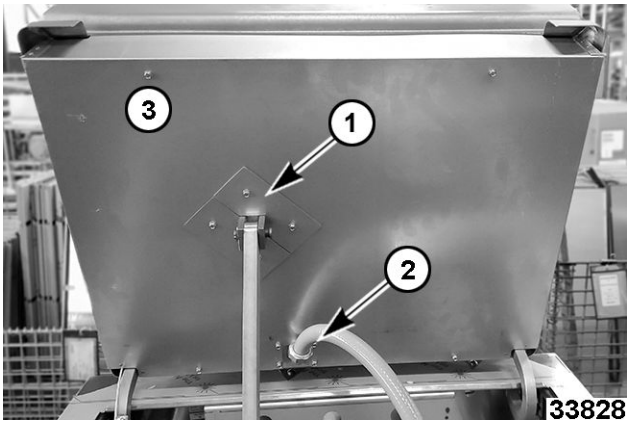



**Fig. 29**

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

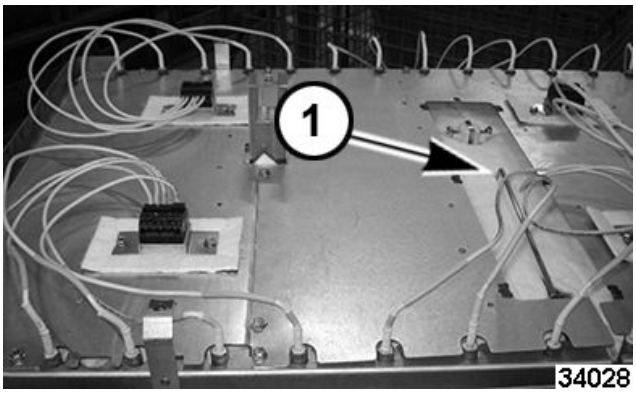



**Fig. 30**

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

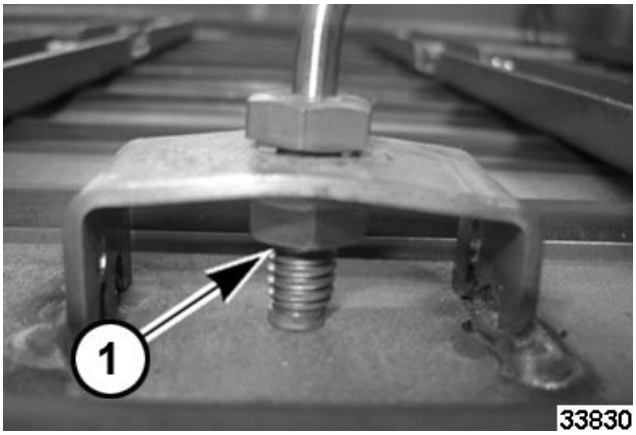



**Fig. 31**

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

## DC LIFT MOTOR




**⚠ WARNING**

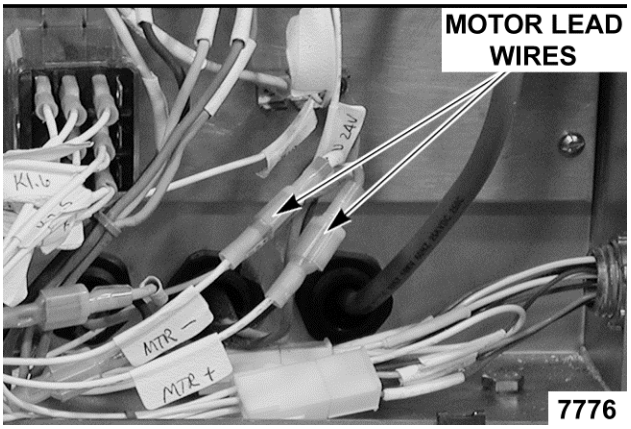
**Disconnect the electrical power to the machine and follow lockout / tagout procedures.**

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



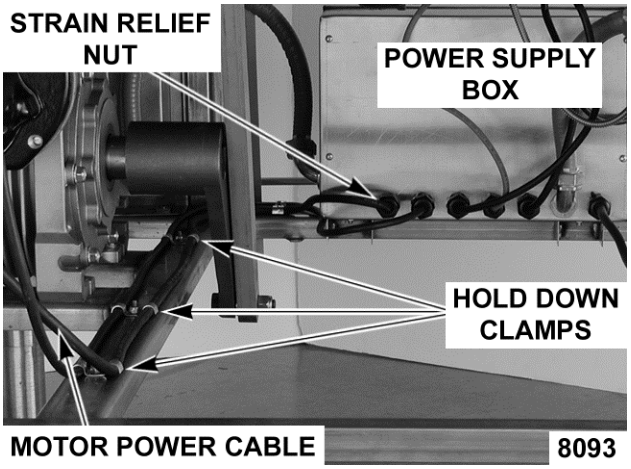

3. Disconnect DC lift motor lead wires labeled MTR + (positive) & MTR - (negative).

**POWER SUPPLY BOX**
**LOWER RIGHT VIEW SHOWN**



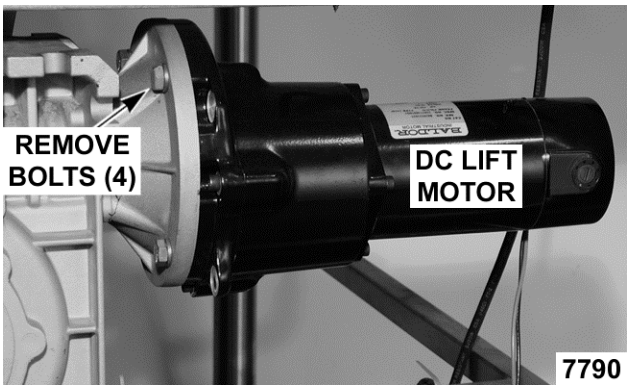

**NOTE:** Lead wires can be identified by label or marking on the wire.

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.




**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.

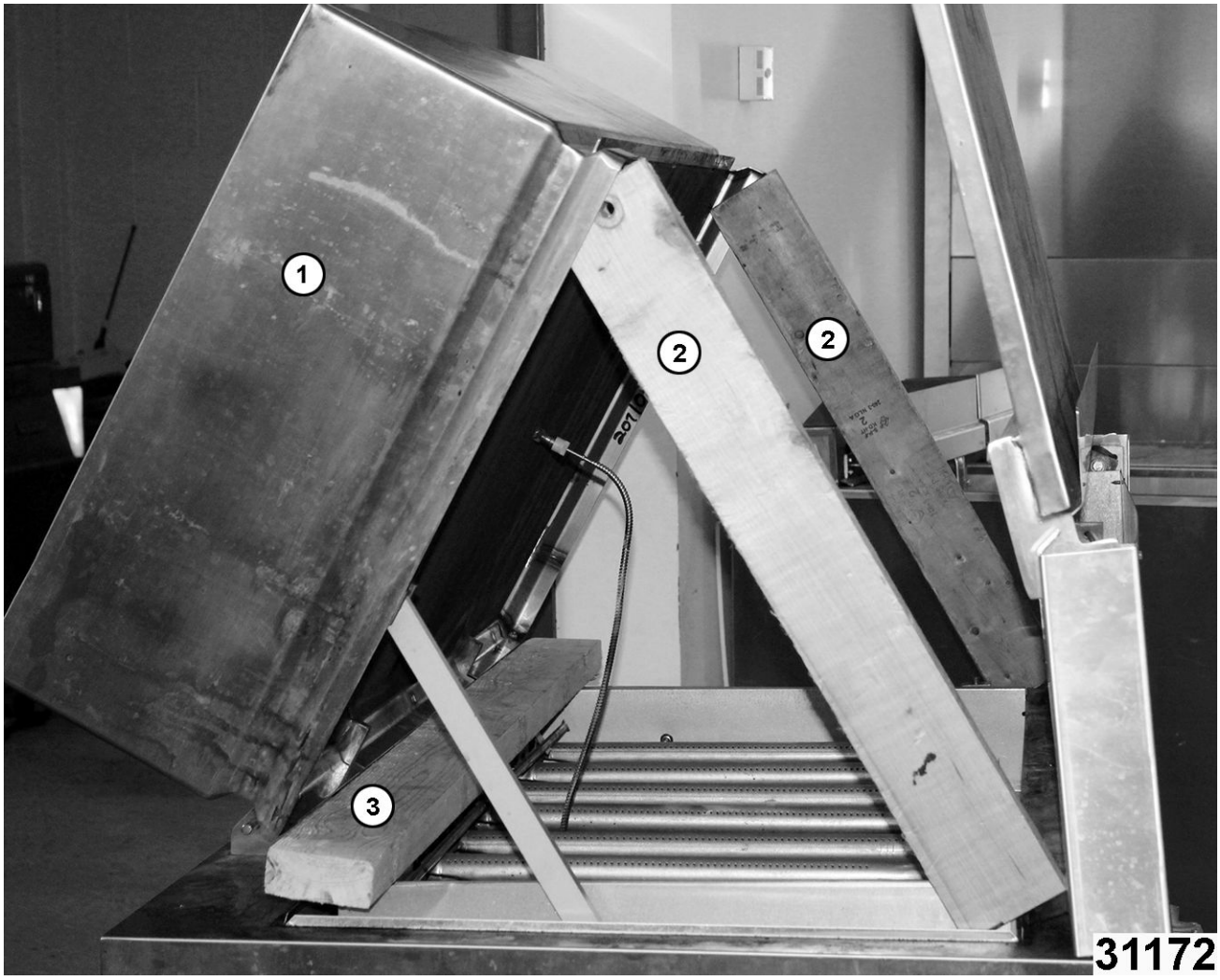



**Fig. 36**

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

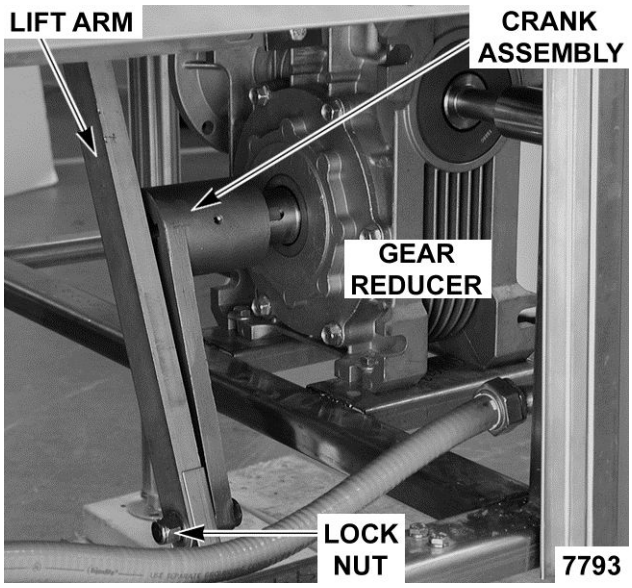



**Fig. 37**

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

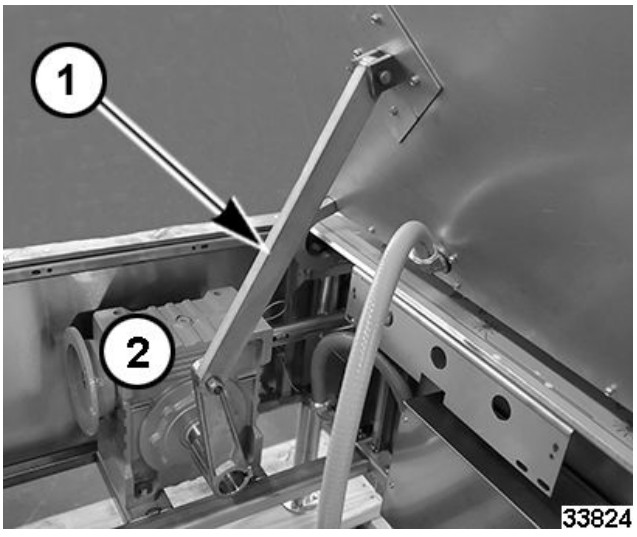
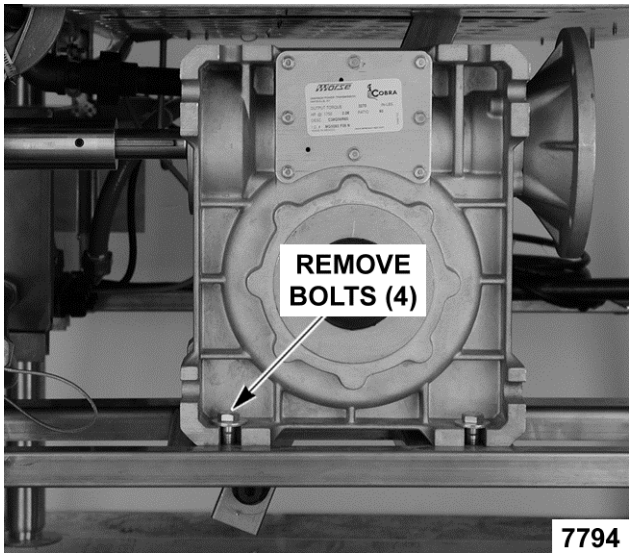
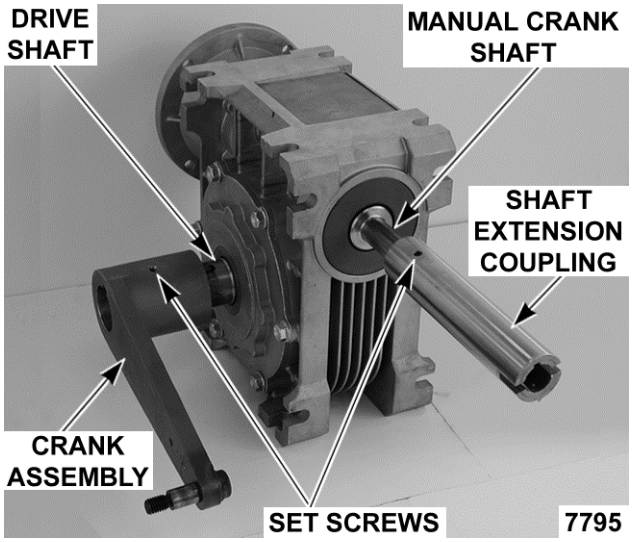



**Fig. 38**

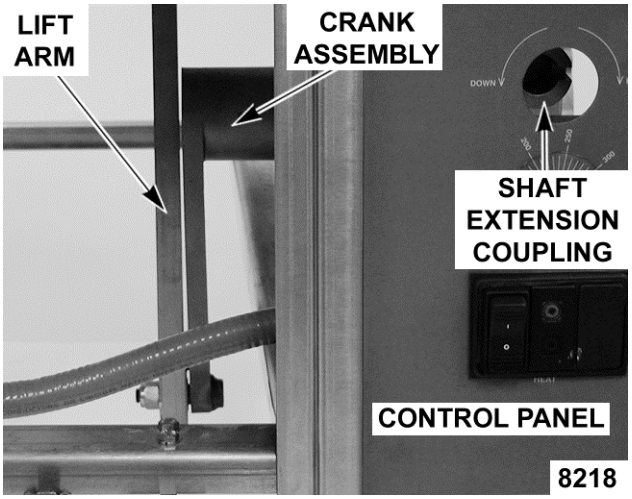
5. Remove bolts securing gear reducer to braising pan frame then remove gear reducer.




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.

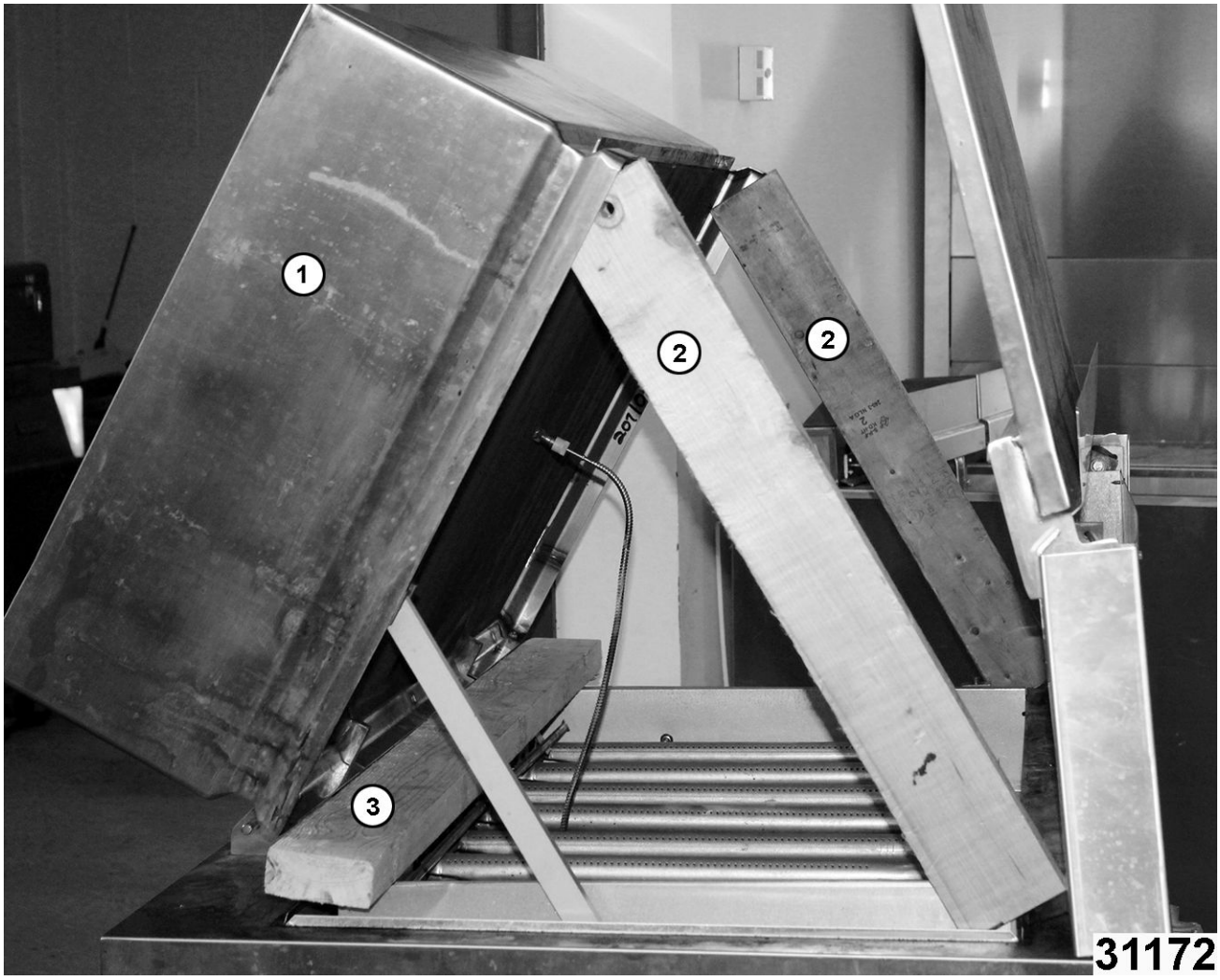



**Fig. 42**

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

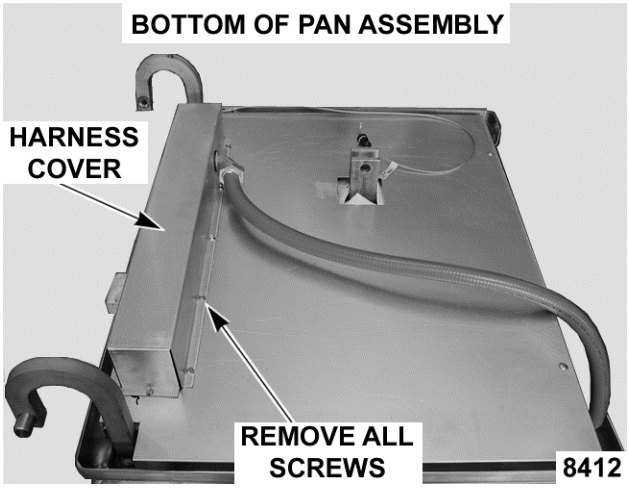
## HEATING ELEMENTS



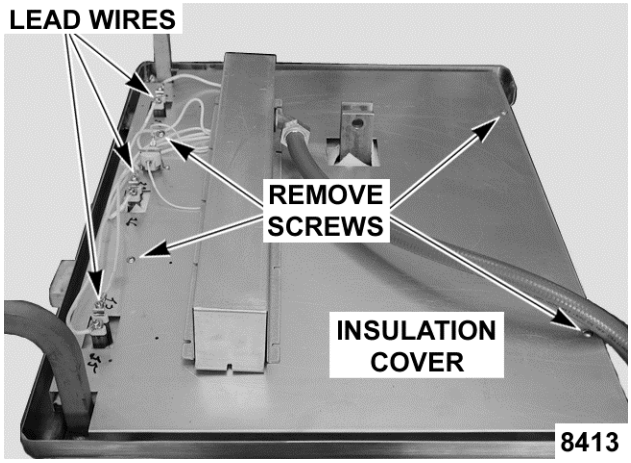

**⚠ WARNING**

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

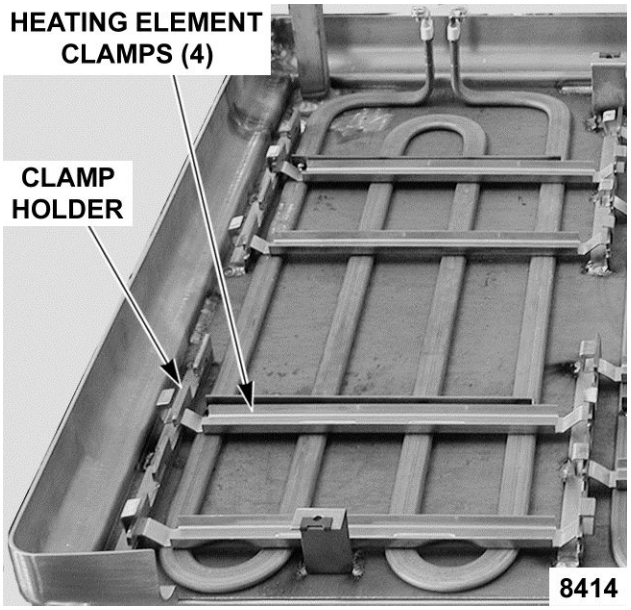
1. Raise the pan to the full tilt position.
2. Remove harness cover.




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.




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).

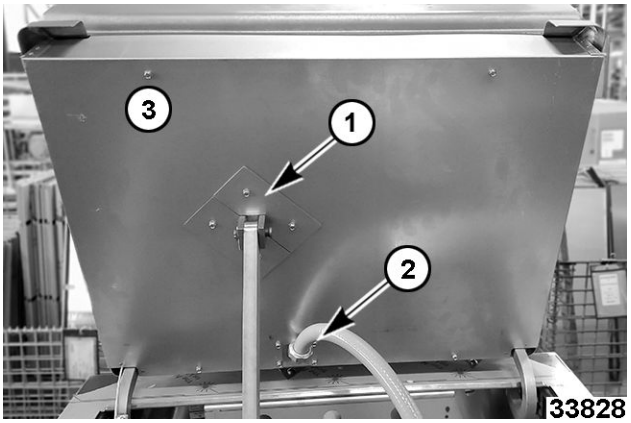



**Fig. 46**

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

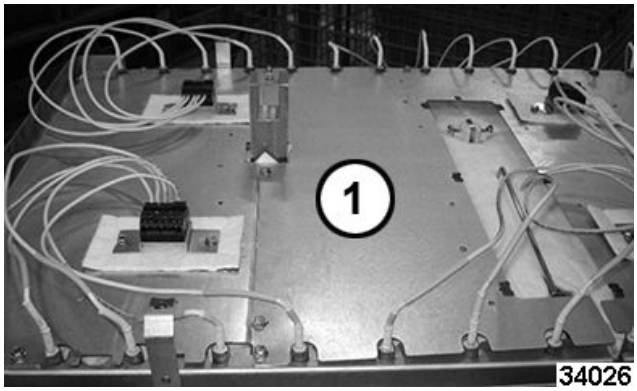



**Fig. 47**

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

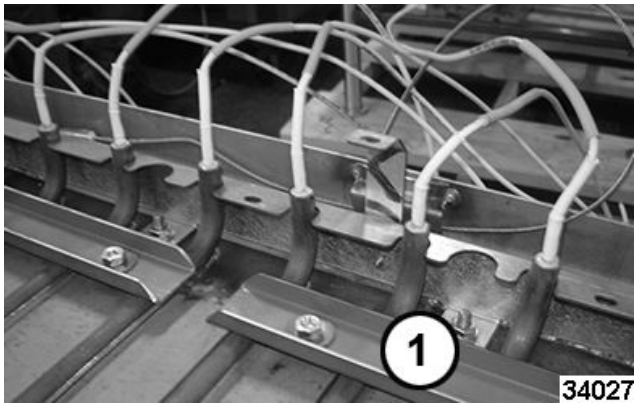



**Fig. 48**

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

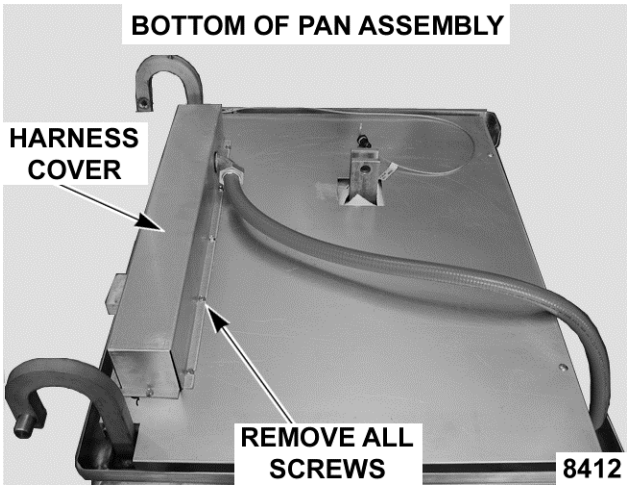
## HIGH LIMIT THERMOSTAT



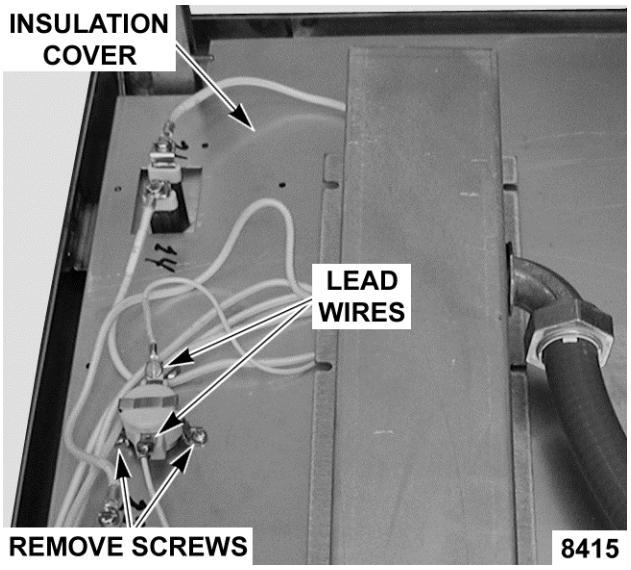

**⚠ WARNING**

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

1. Raise the pan to the full tilt position.




2. Remove the harness cover.
3. Disconnect lead wires from the high limit thermostat.
4. Remove thermostat from insulation cover.




5. 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.**

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

B. Remove hose (2, Fig. 51) connection.

C. Remove bottom panel mounting screws (3, Fig. 51).

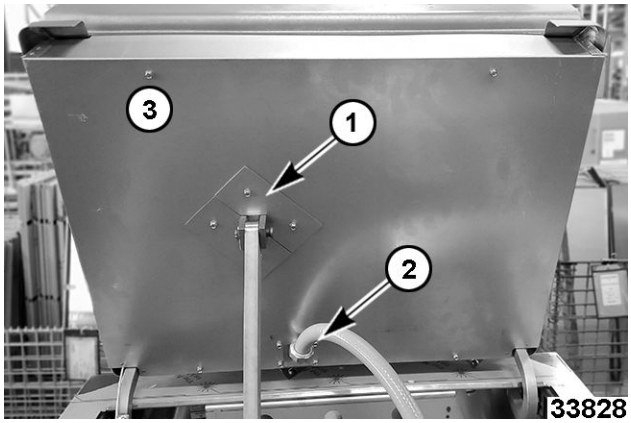



**Fig. 51**

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

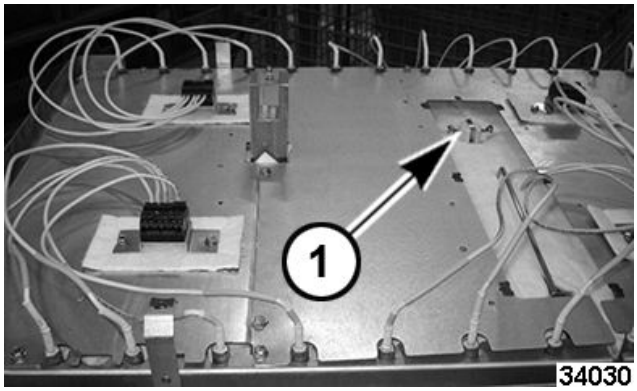



**Fig. 52**

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

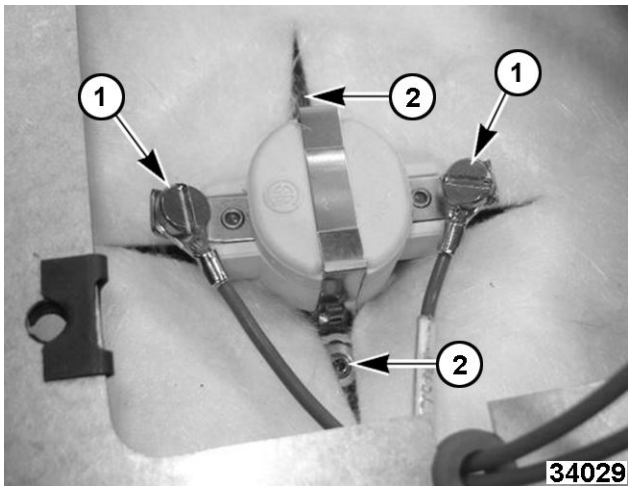



**Fig. 53**

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.

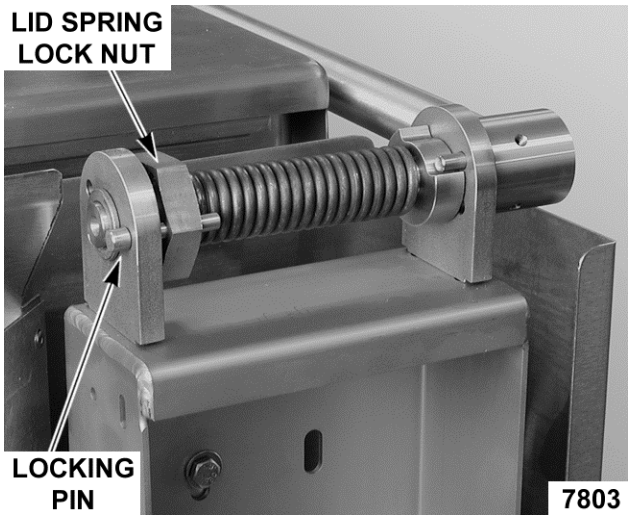



**Right Side Rear View Shown**

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**

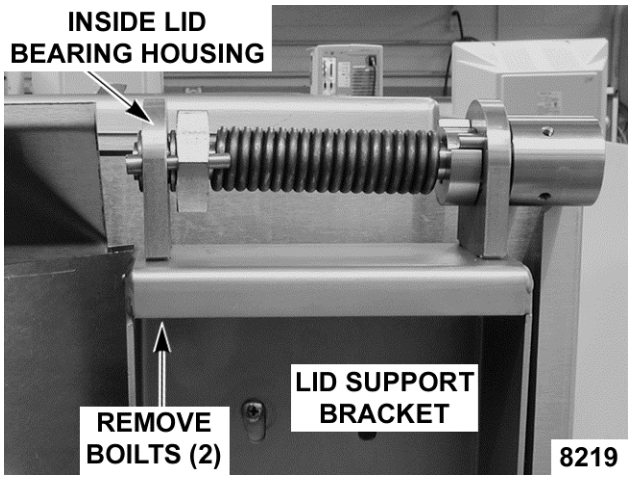
Do not release wrench while locking pin is removed or damage to the braising pan may occur.



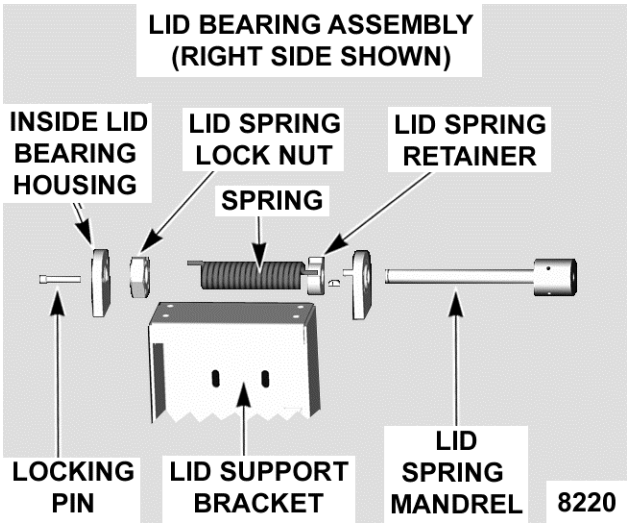

A. Slowly release downwards force to remove spring tension.

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.

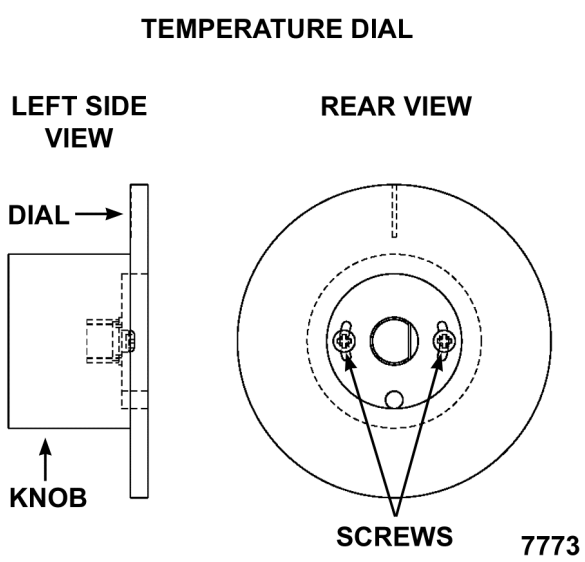
   *[Temp. (light off) + Temp (light on)] ÷ 2 = Average Temp.*

   *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**

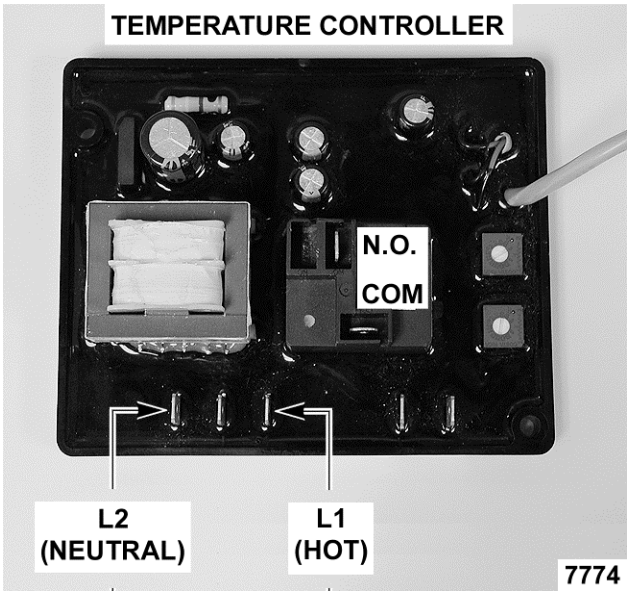



**Fig. 59**

**Crydom Temp Controller**

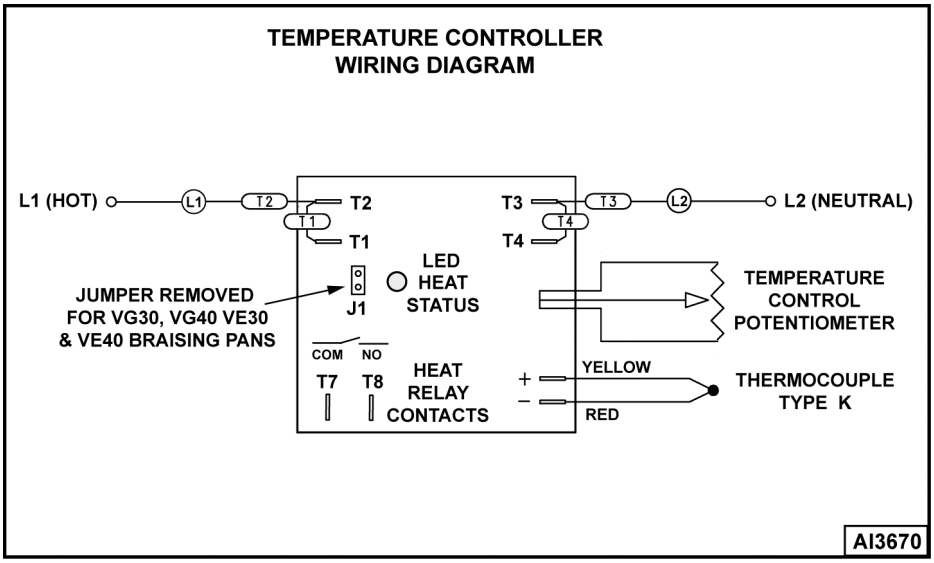



**Fig. 60**

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

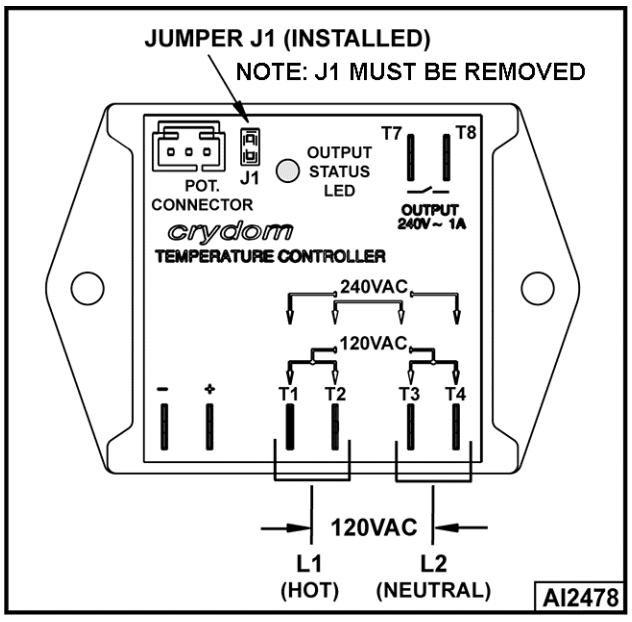



**Fig. 61**

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.

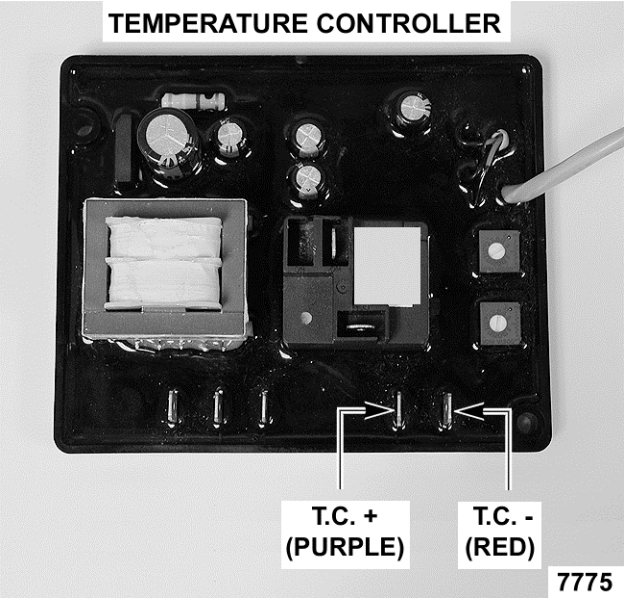
## THERMOCOUPLE TEST




**⚠ 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.**

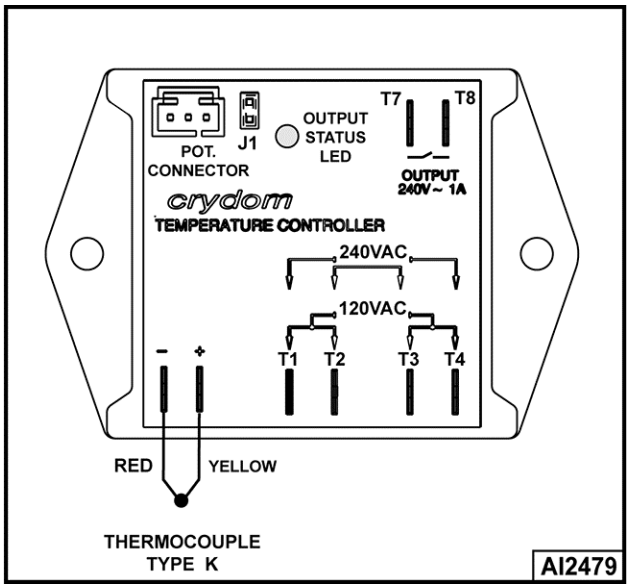



**Fig. 63**

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 |
| 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**

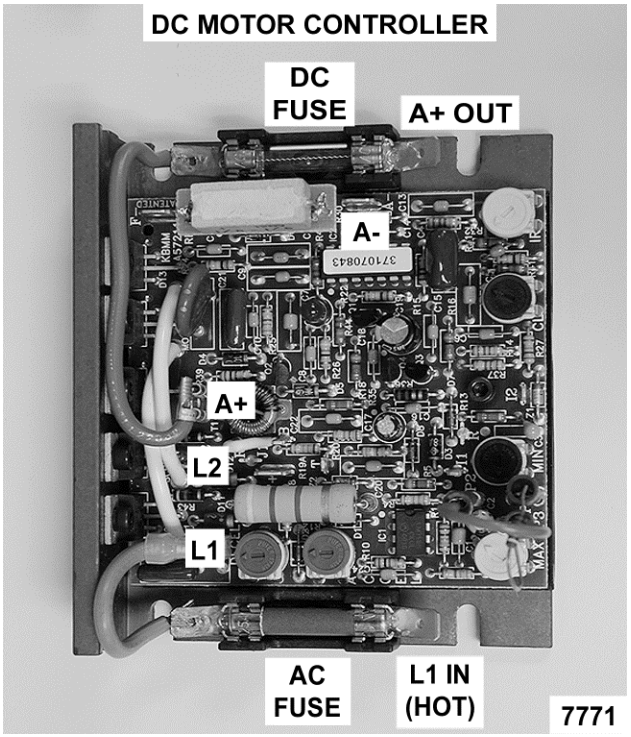



**Fig. 64**

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

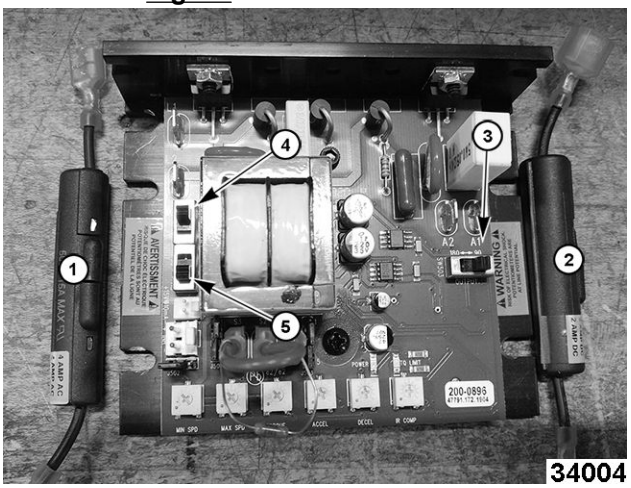



**Fig. 65**

- 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.

**Trimpots 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.

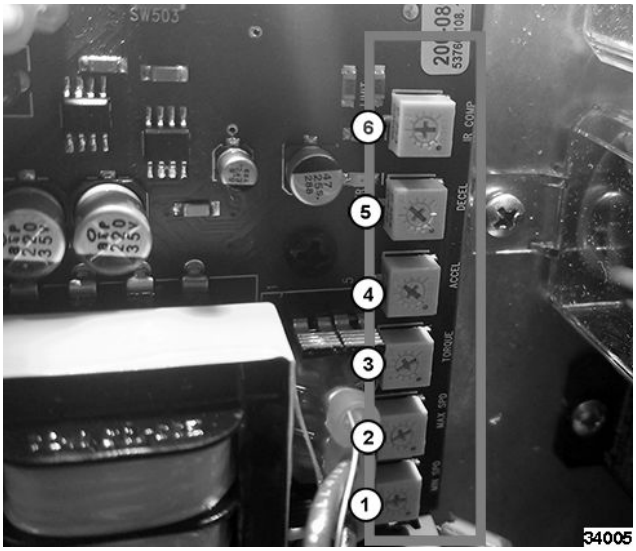


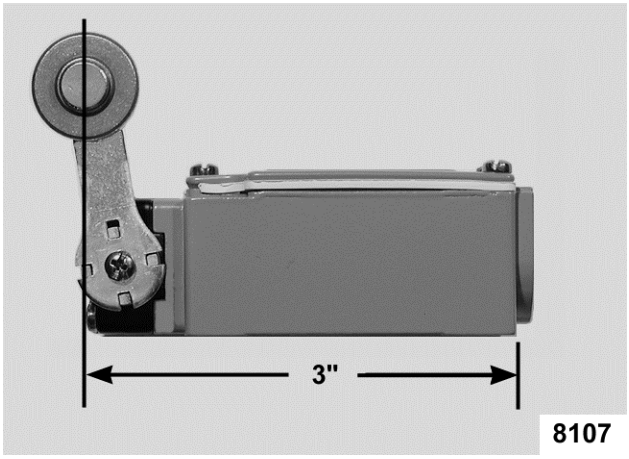

**Fig. 66**

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.

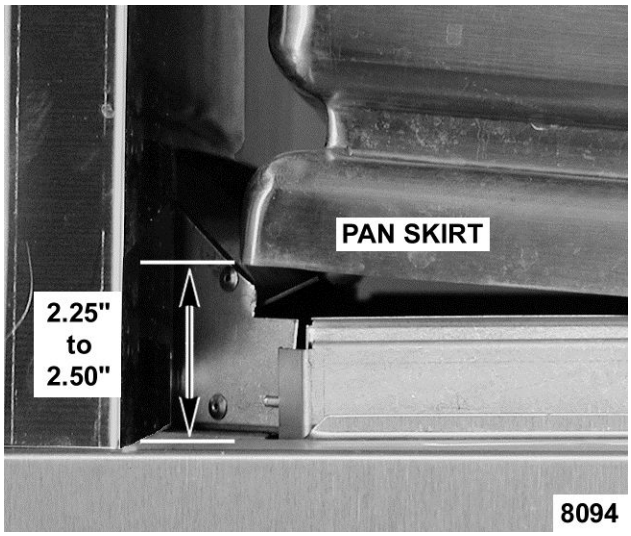
3) If voltage is not present on output side of switch, install a replacement pan position/down limit switch and repeat this procedure to adjust.

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".

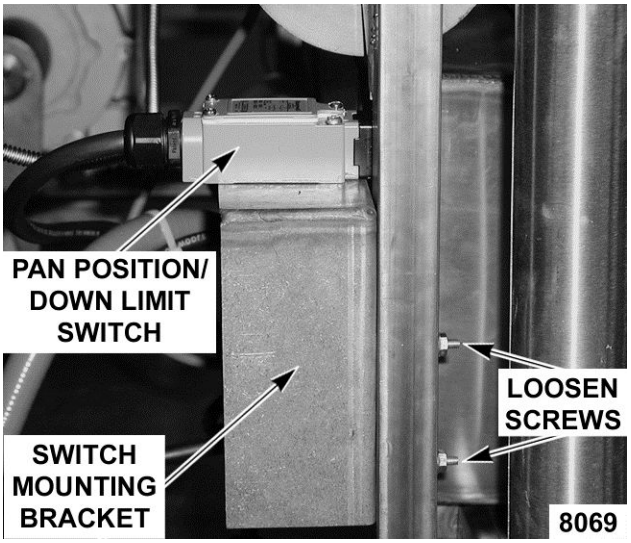



**NOTE:** For reference, this is approximately 5 angular degrees.

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.

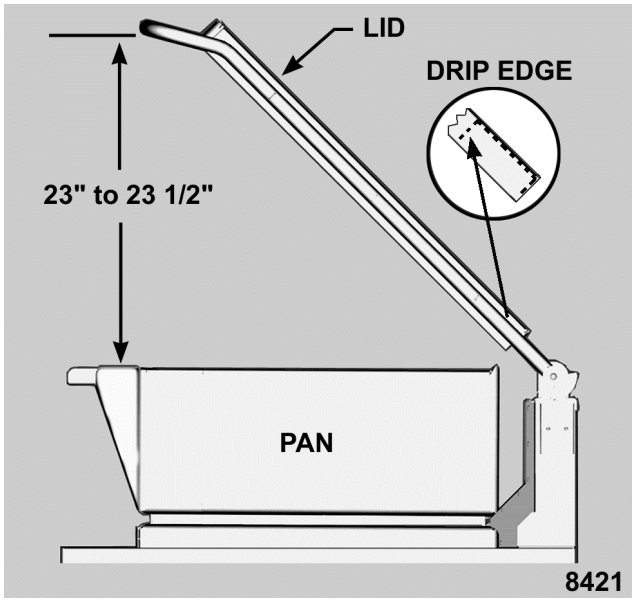
## LID SWITCH ADJUSTMENT

**NOTICE**

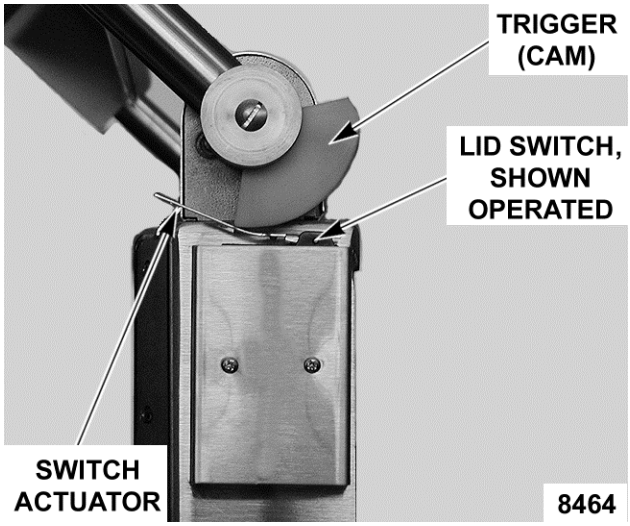
Lid switch should not allow pan to be raised if the lid is not opened a minimum of 23" or damage to the lid may occur.

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").

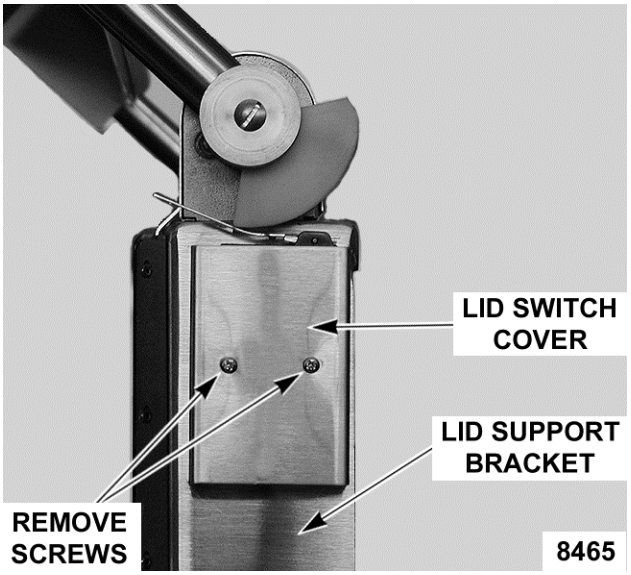
**NOTE:** For reference, this is approximately 45 angular degrees.




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.

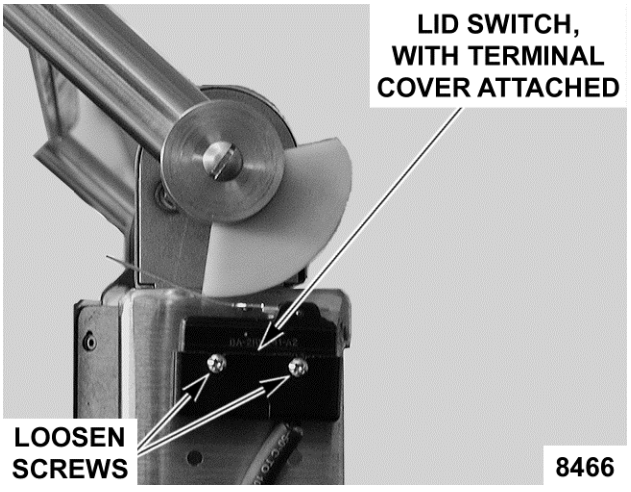
   B. If pan does not raise, continue with procedure.

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.

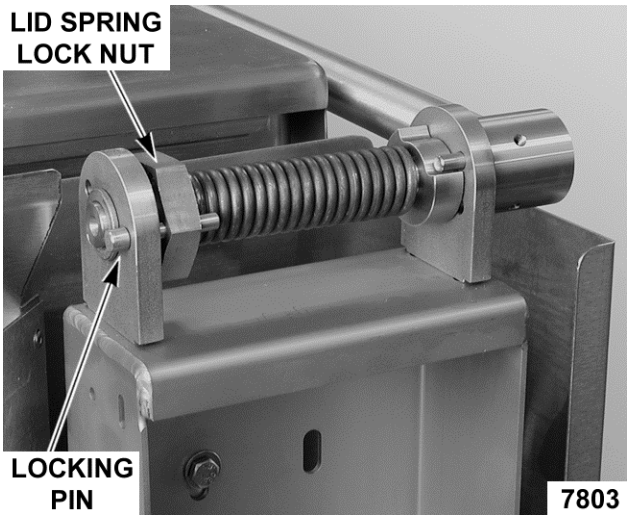
2. Remove spring covers by prying up at bottom. Covers are held in place by tabs on the bottom of cover.




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.




   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.

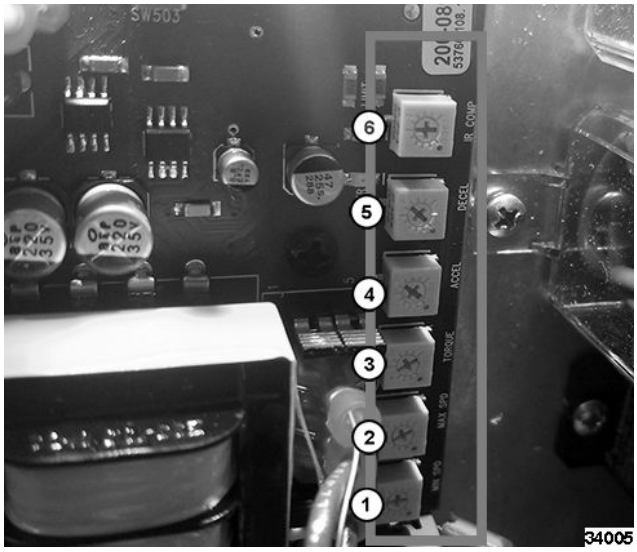



**Fig. 76**

# ELECTRICAL OPERATION

## COMPONENT FUNCTION

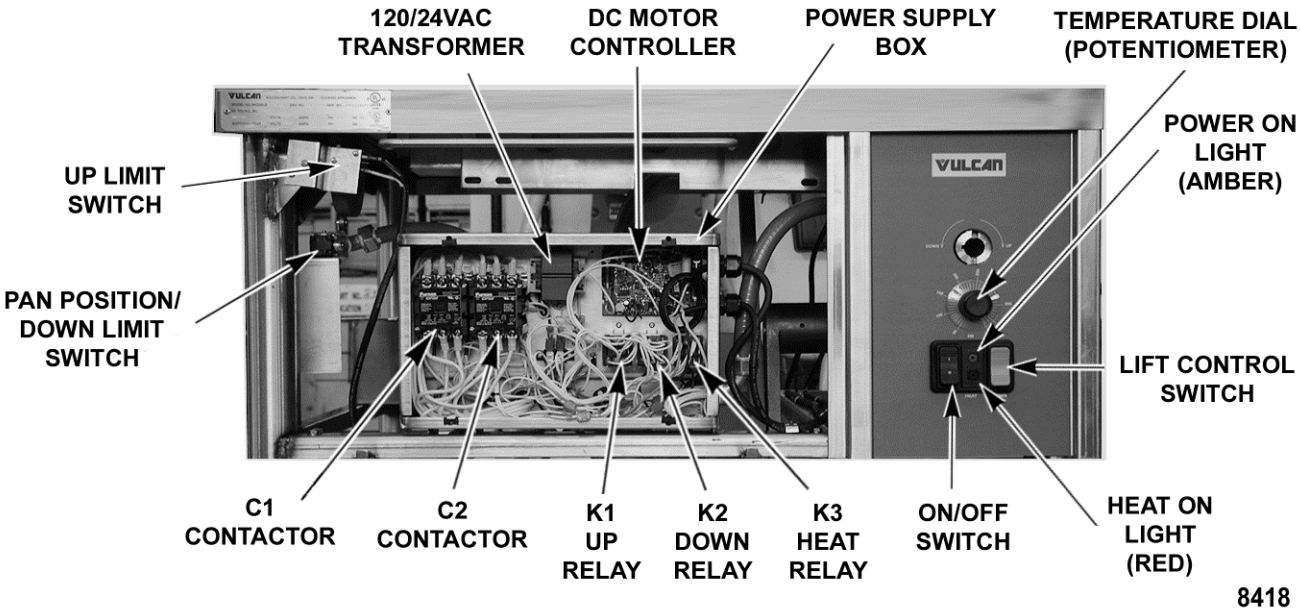
| BRAISING PAN CONTROLS | |
|---|---|
| Temperature Controller | Monitors thermocouple input and regulates braising pan temperature. An external set point potentiometer is used for temperature adjustments. |
| 120/24VAC Transformer | Supplies 24VAC for heating control circuit. If motorized pan lift option 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). |

| MOTORIZED PAN LIFT OPTION CONTROLS | |
|---|---|
| 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 orrect voltage polarity is applied though K1 contacts, motor rotates CW to raise pan. When reverse voltage polarity is applied thru 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 thru up limit switch contacts (N.C.) to raise pan. Energizes K2 relay coil thru 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. |

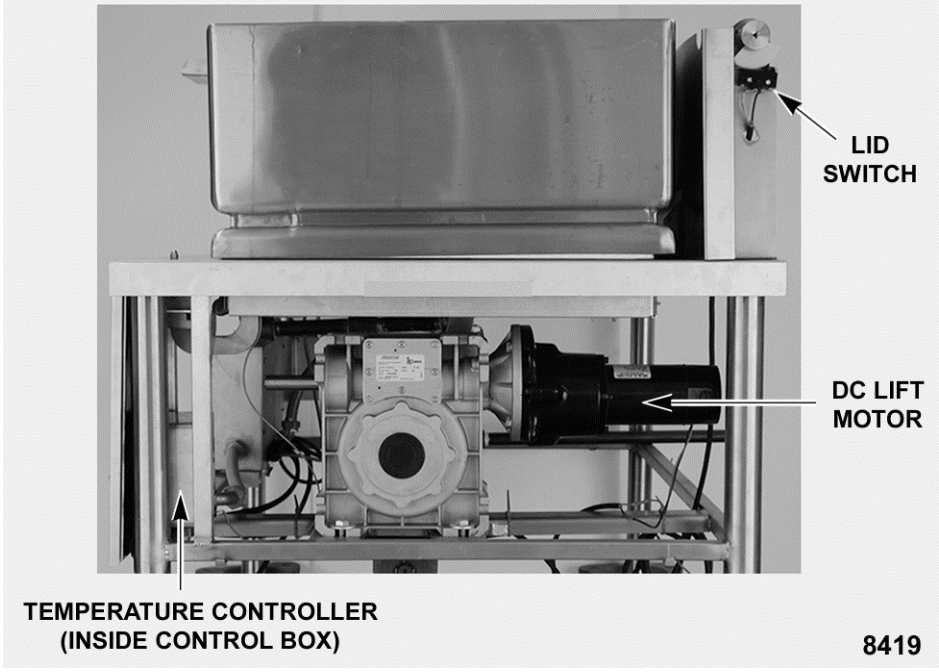
| MOTORIZED PAN LIFT OPTION CONTROLS | |
|---|---|
| K2 Down Relay (3PDT) | Supplies power to motorized lift circuit to lower pan when 24VAC coil is energized by lift control switch. |

## 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.

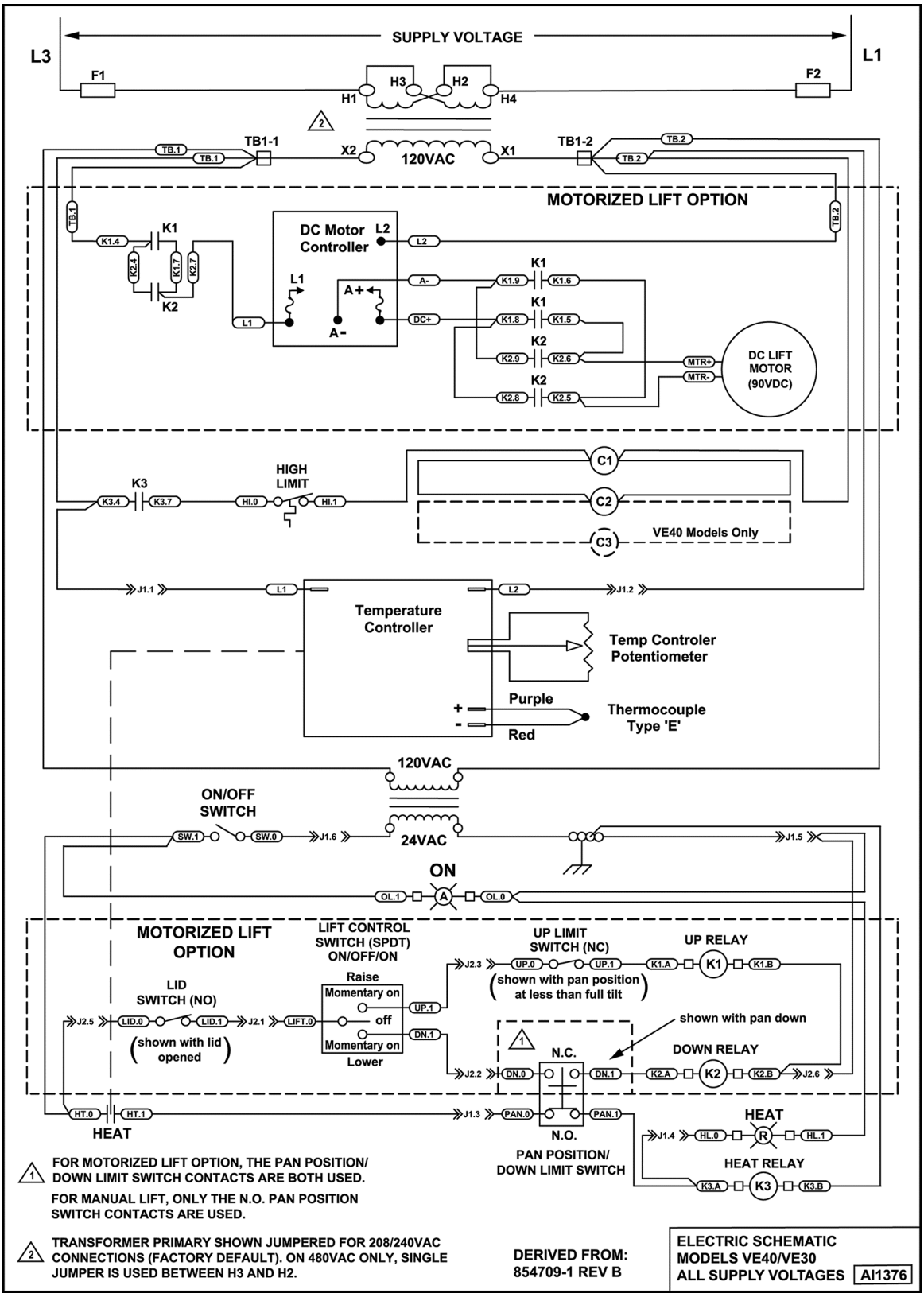
**NOTE:** If temperature dial is set to call for heat, contactors C1, C2, and C3 (VE40 only) are energized through heat relay K3 4/7 N.O. contacts.

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.

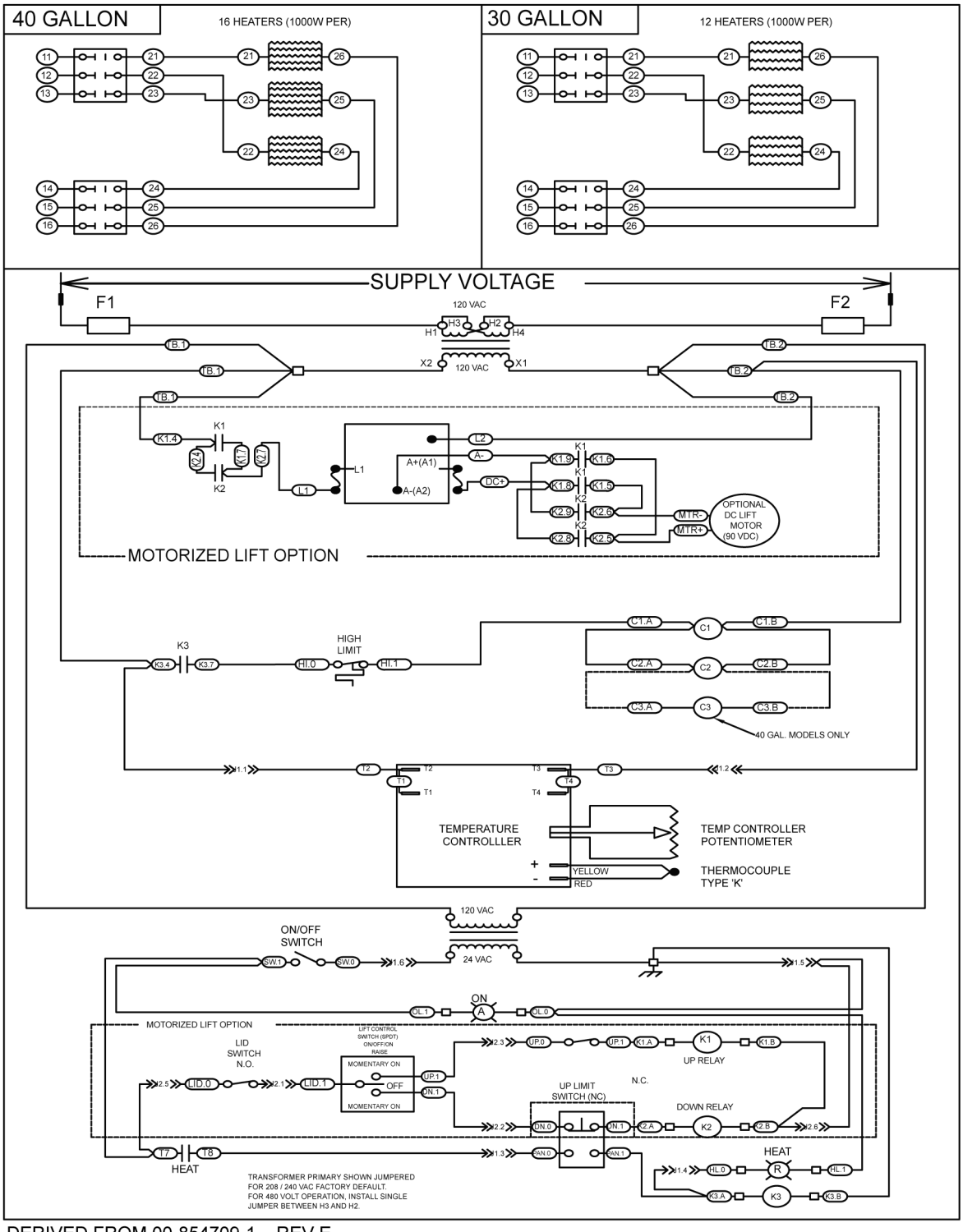
4. When pan is raised 2.25" to 2.50" at rear, pan position/down limit switch contacts change state. The N.O contacts open to remove power from K3 heat relay coil; and N.C contacts close. Power is then available for K2 relay coil through N.C. set of contacts. Pan can still be raised or lowered through its travel range by operating ift 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**

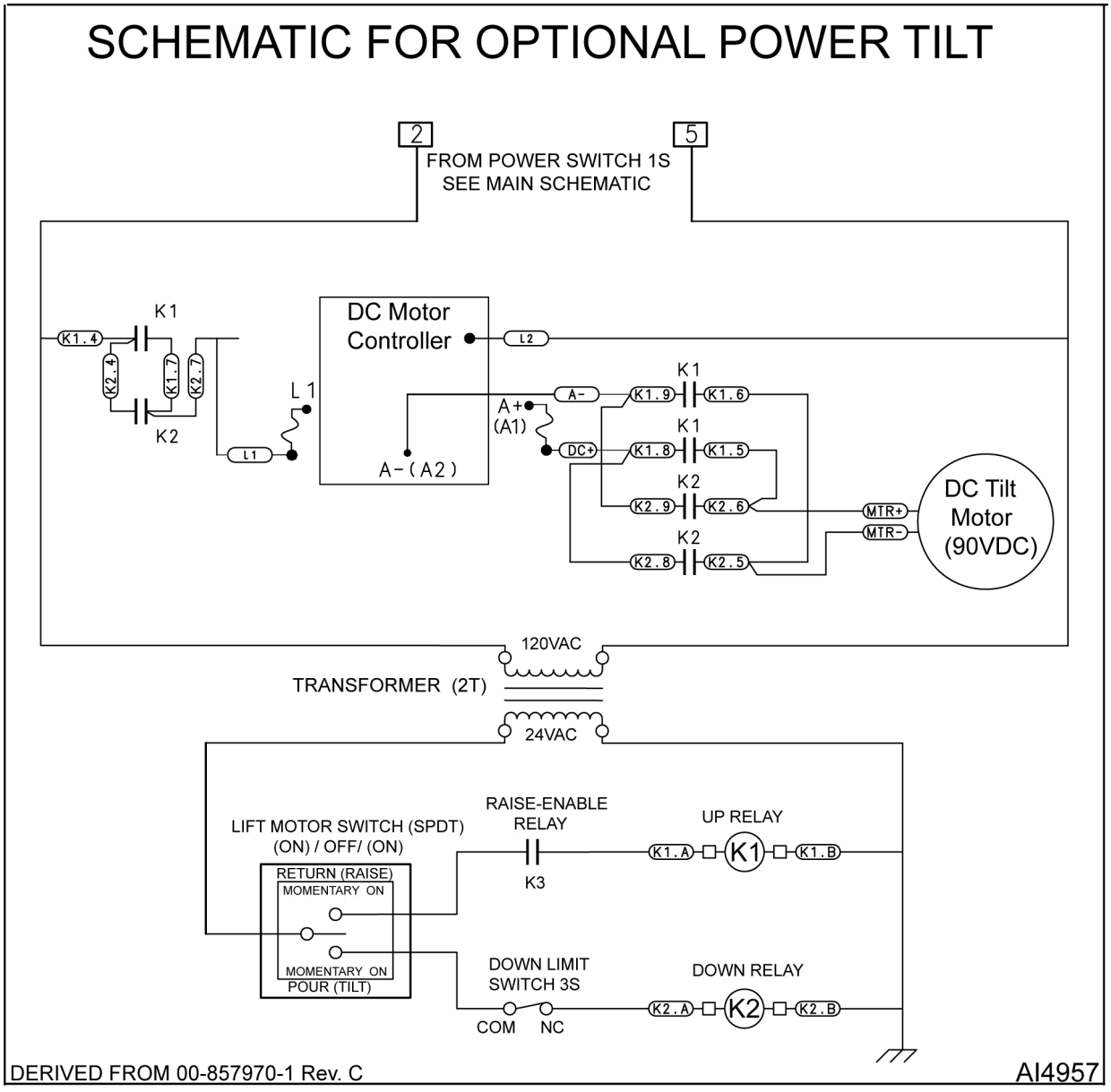
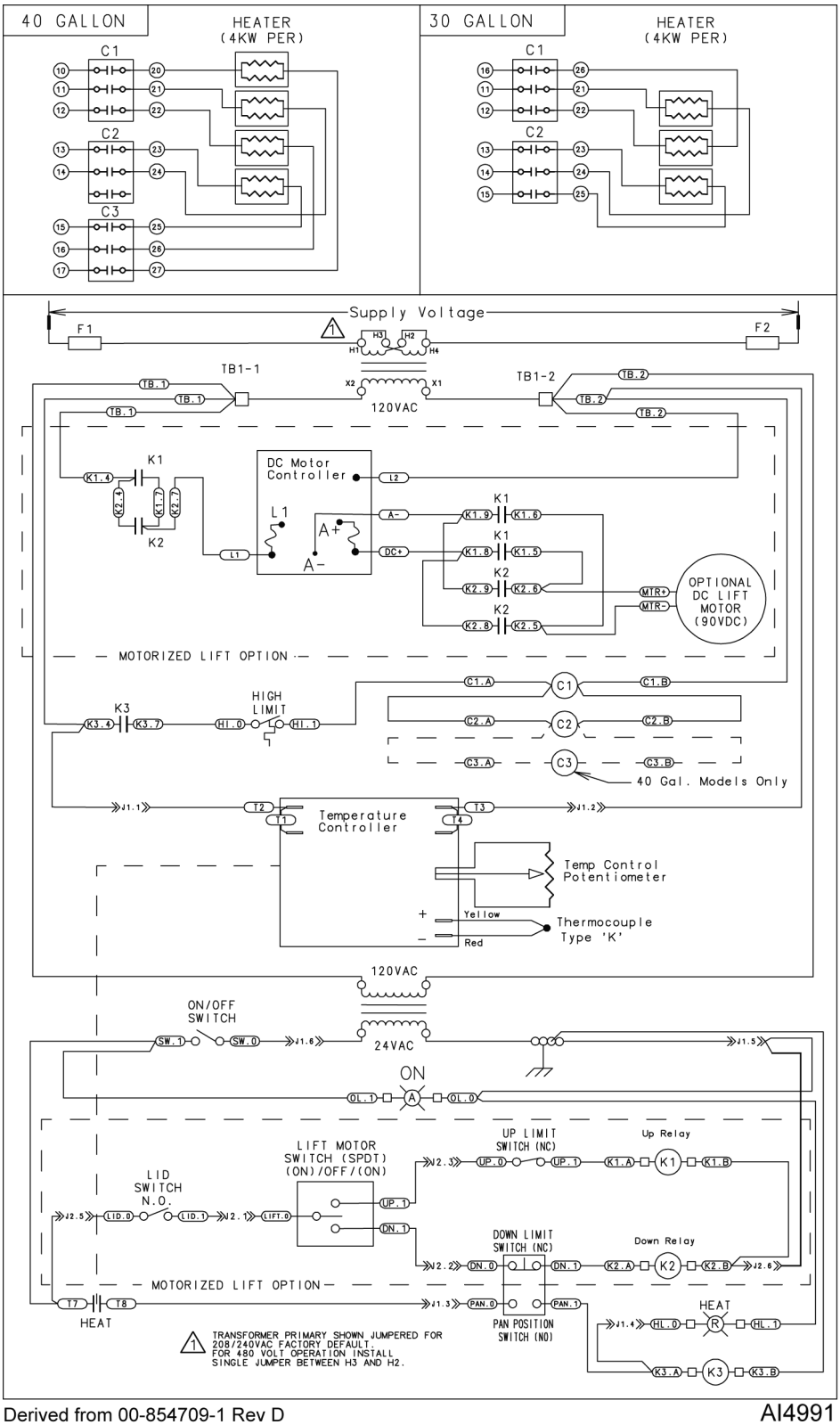

SCHEMATIC FOR OPTIONAL POWER TILT
2
5
FROM POWER SWITCH 1S
SEE MAIN SCHEMATIC
K1
K1.4
K2.4
K1.7
K2.7
K2
L1
L1
DC Motor
Controller
L2
A-
A+
(A1)
A-(A2)
K1
K1.9
K1.6
K1
DC+
K1.8
K1.5
K2
K2.9
K2.6
K2
K2.8
K2.5
MTR+
MTR-
DC Tilt
Motor
(90VDC)
120VAC
TRANSFORMER (2T)
24VAC
LIFT MOTOR SWITCH (SPDT)
(ON) / OFF/ (ON)
RETURN (RAISE)
MOMENTARY ON
MOMENTARY ON
POUR (TILT)
RAISE-ENABLE
RELAY
K3
UP RELAY
K1.A
K1
K1.B
DOWN LIMIT
SWITCH 3S
COM
NC
DOWN RELAY
K2.A
K2
K2.B
DERIVED FROM 00-857970-1 Rev. C
AI4957

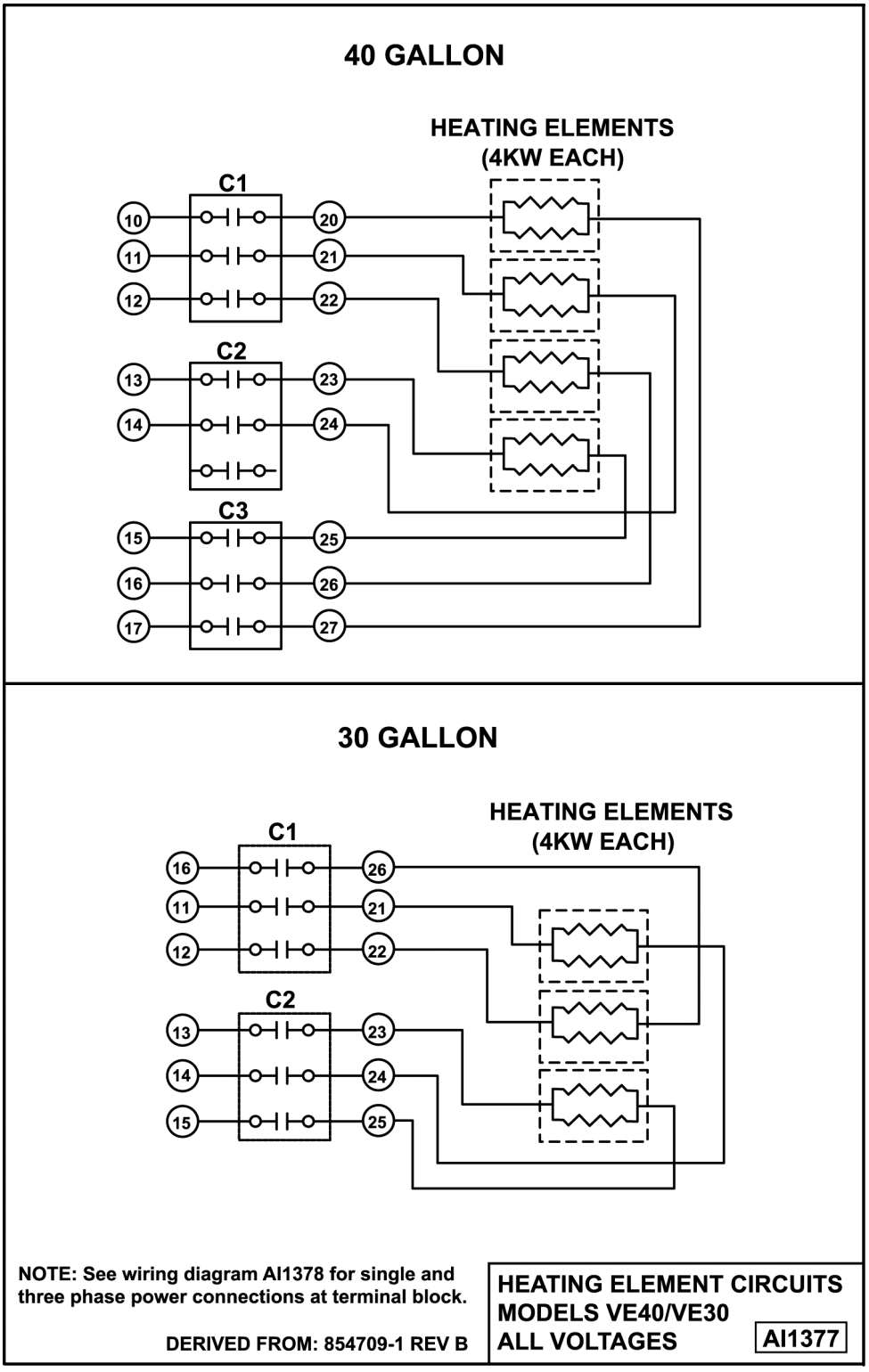
**Fig. 81**

# WIRING DIAGRAMS

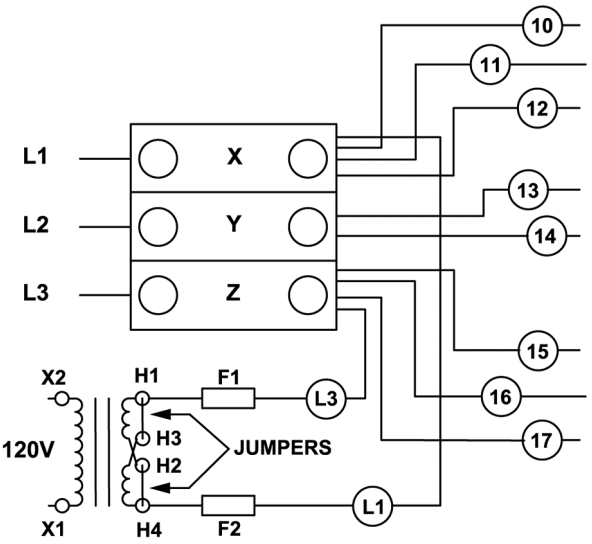



Derived from 00-854709-1 Rev D AI4991

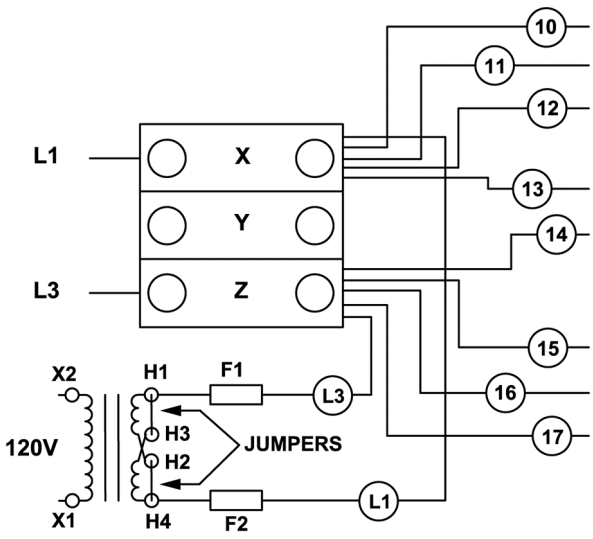
**1ST GENERATION VE**



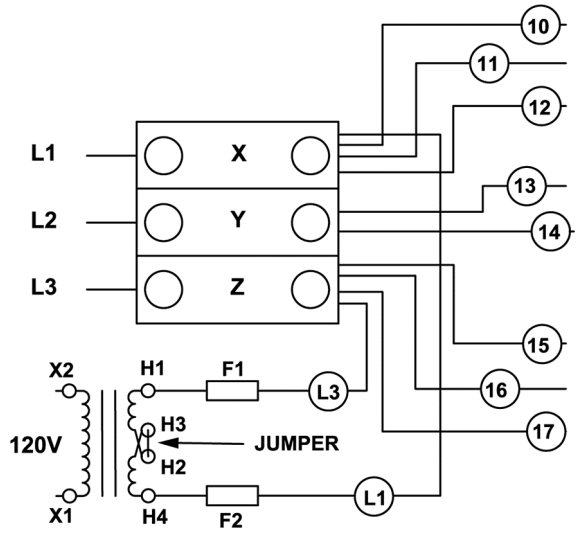

**Heating Element Circuits**




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

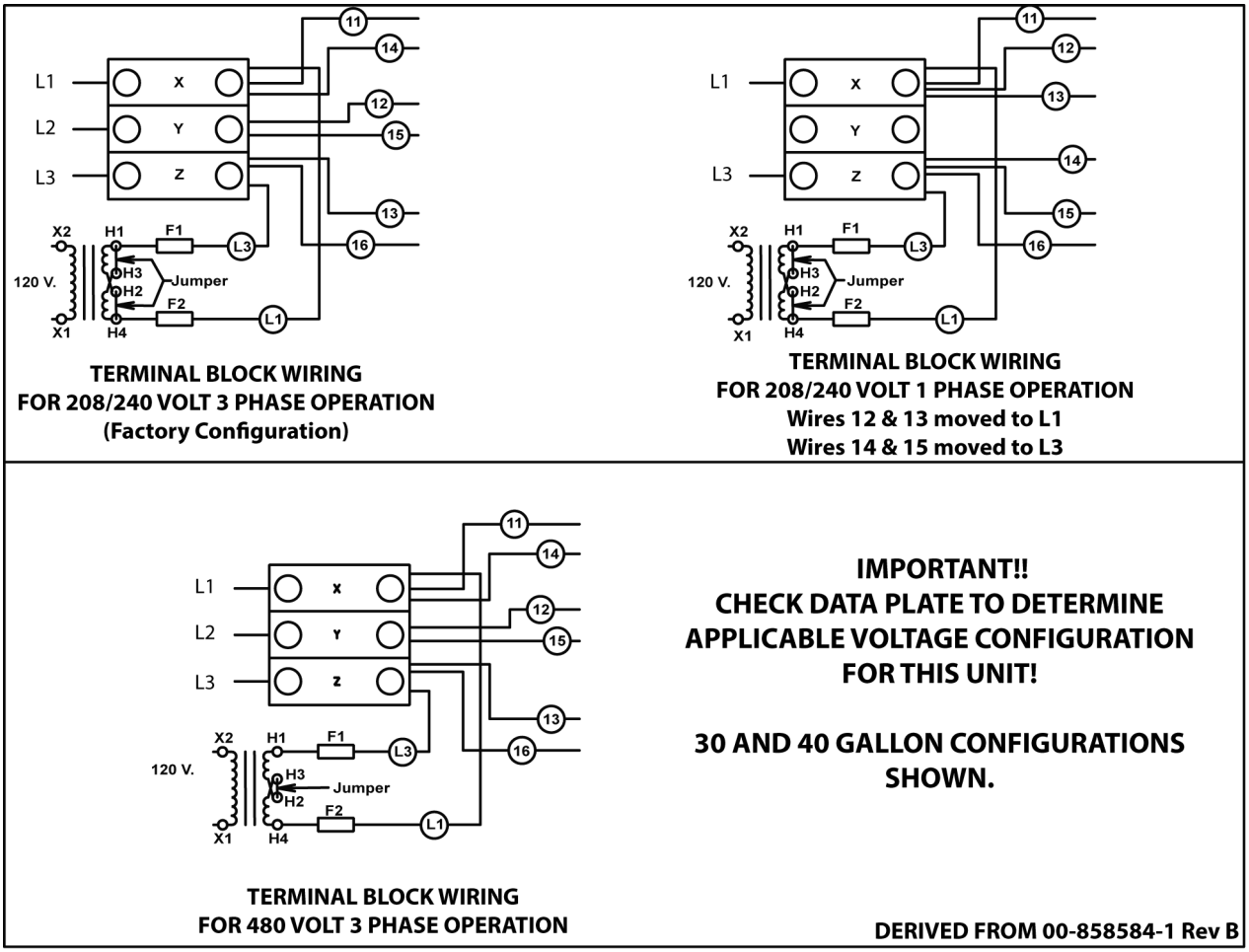
**IMPORTANT!!**
**CHECK DATA PLATE TO DETERMINE APPLICABLE VOLTAGE CONFIGURATION FOR THIS UNIT!**

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

DERIVED FROM:
854714 REV. B

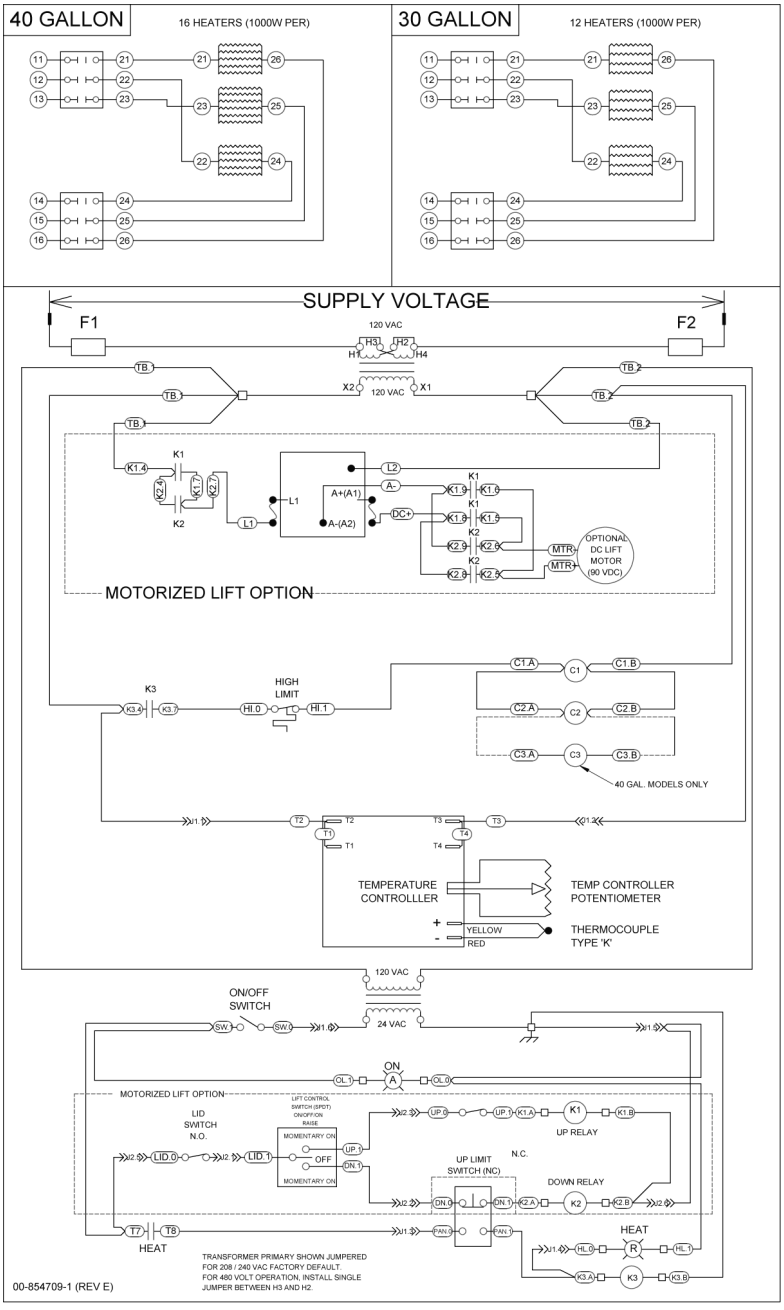
**TERMINAL BLOCK WIRING**
**MODELS VE40/VE30**
**SINGLE AND THREE PHASE POWER**
**208/240/480V**
AI1378

**TERMINAL BLOCK 1ST GENERATION**




AI5106

**TERMINAL BLOCK 2ND GENERATION**




AI5112

**Fig. 86**

# 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. | 1. K3 heat relay malfunction.<br>2. High limit thermostat open.<br>3. Contactor(s) malfunction.<br>4. Heating element(s) malfunction. |
| Braising pan does not heat, power on light is lit but heat light is not lit. | 1. Pan not fully lowered; pan position/down limit switch out of adjustment; or pan position/down limit switch malfunction.<br>2. Temperature dial not set to call for heat; temperature probe malfunction; or temperature controller malfunction.<br>3. Interconnecting wiring malfunction. |
| Braising pan does not heat, power on light is not lit. | 1. Main circuit breaker off; or control circuit fuse F1 or F2 open.<br>2. Supply voltage incorrect.<br>3. 240-480/120VAC transformer - Missing or incorrect jumper location; or transformer inoperative.<br>4. On/off switch off or malfunction.<br>5. 120/24VAC transformer inoperative.<br>6. Interconnecting wiring malfunction. |
| Excessive or low heat on cooking surface (no uneven cooking). | 1. Supply voltage incorrect.<br>2. Temperature probe not properly mounted.<br>3. Temperature controller calibration.<br>4. Temperature probe malfunction; or temperature controller malfunction. |
| Hot or cold zones on cooking surface (uneven cooking). | 1. Supply voltage incorrect.<br>2. Heating element(s) not properly mounted.<br>3. Contactor(s) malfunction.<br>4. Heating element(s) malfunction. |

## MOTORIZED LIFT OPTION ONLY

| SYMPTOMS | POSSIBLE CAUSES |
|---|---|
| Pan will not raise. | 1. Lid switch open (lid not opened) or malfunction.<br>2. 120/24VAC transformer inoperative.<br>3. On/off switch off or malfunction.<br>4. Lift control switch malfunction (momentary on - raise).<br>5. Up limit switch malfunction.<br>6. K1 relay malfunction.<br>7. DC motor controller - Fuses open or controller malfunction.<br>8. DC Lift motor inoperative.<br>9. Gear reducer malfunction.<br>10. Interconnecting wiring malfunction. |
| Pan will not lower. | 1. Lid switch open (lid not opened) or malfunction.<br>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.<br>3. 120/24VAC transformer inoperative.<br>4. On/off switch off or malfunction.<br>5. Lift control switch malfunction (momentary on - lower).<br>6. Down limit switch malfunction.<br>7. K2 relay malfunction.<br>8. DC motor controller - Fuses open or controller malfunction.<br>9. DC Lift motor inoperative.<br>10. Gear reducer malfunction.<br>11. Interconnecting wiring malfunction. |

Commercial Kitchen Equipment Parts

Find more Vulcan Hart equipment resources at

**parthubz.com/equipment/vulcan-hart**

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## Need parts or service?

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support@parthubz.com

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