Commercial Kitchen Equipment Parts

VULCAN HART VG30

Service Manual

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SERVICE MANUAL



VG40 Shown

VG GAS BRAISING PANS (30 & 40 GALLON)

VG30	**ML-126847**
VG40	**ML-126848**

- NOTICE -

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

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

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SERVICE UPDATES

SERVICE UPDATES

September 2020

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

August 2019

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

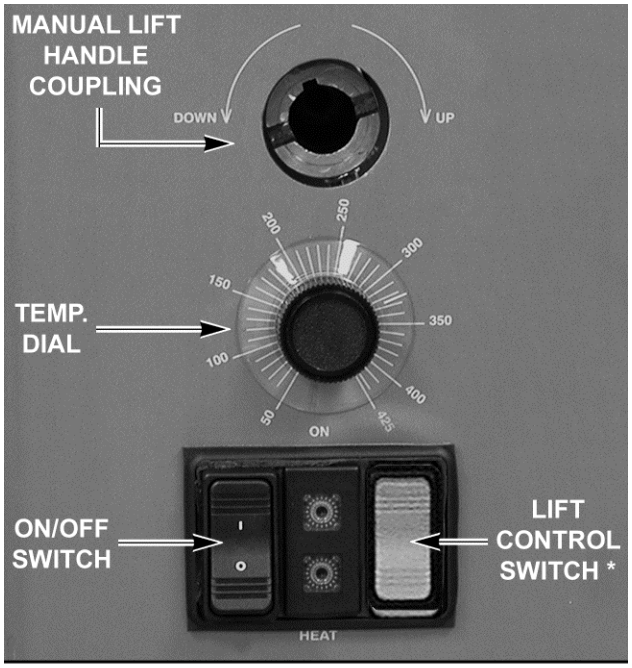
GENERAL

INSTALLATION, OPERATION AND CLEANING

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

INTRODUCTION

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



*** AUTO LIFT OPTION ONLY** **7780**

Control Panel

Model Designations

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

TOOLS

Standard

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

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

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

Special

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

SPECIFICATIONS

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

REMOVAL AND REPLACEMENT OF PARTS

COVERS AND PANELS

Front, Rear & Side Panels

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

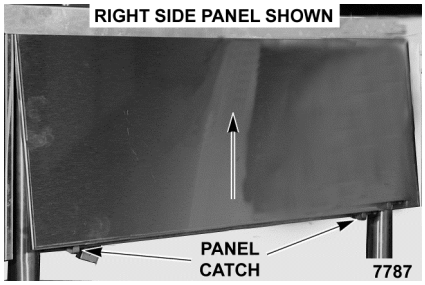


Fig. 2

Control Panel

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

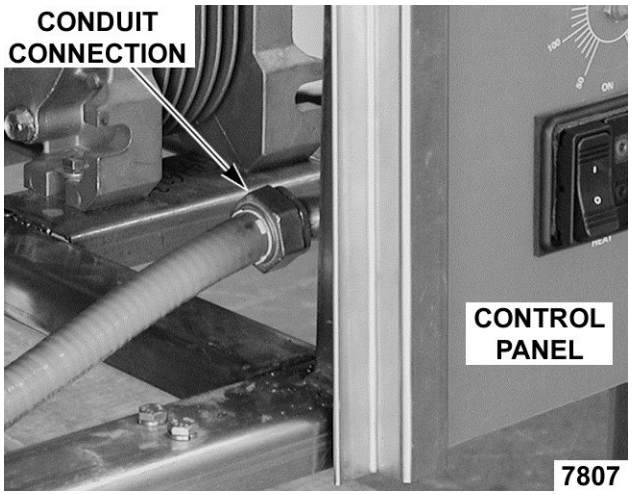


Fig. 3

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

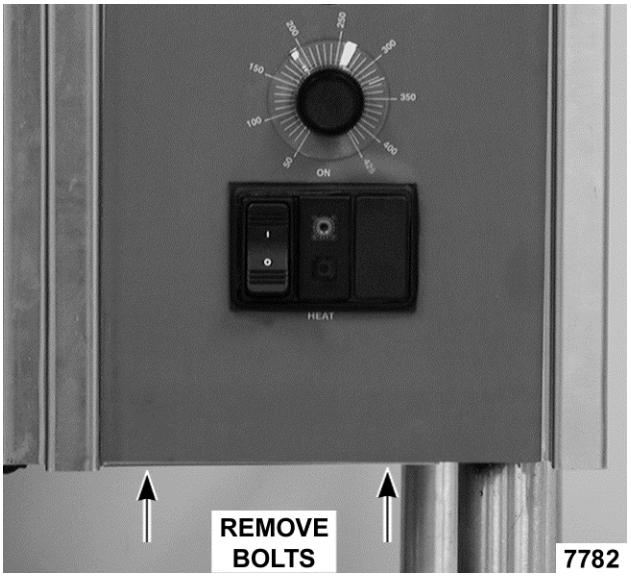


Fig. 4

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

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

6. Remove control box from control panel.

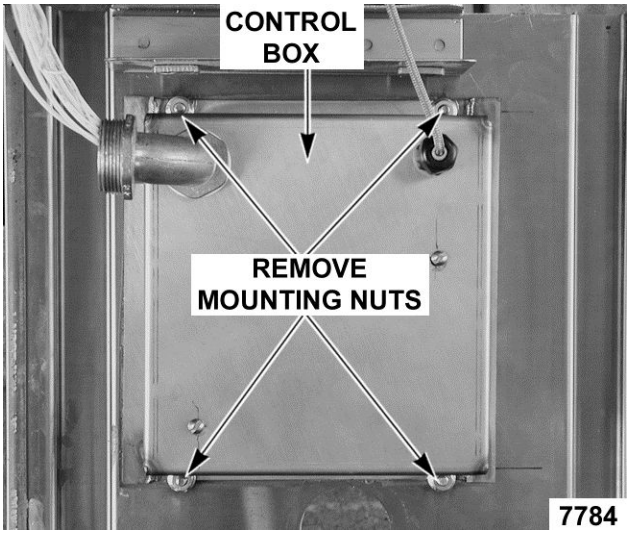


Fig. 5

7. Disconnect lead wires from control switch.

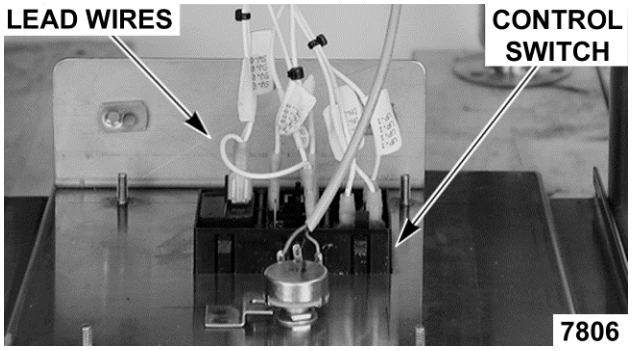


Fig. 6

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

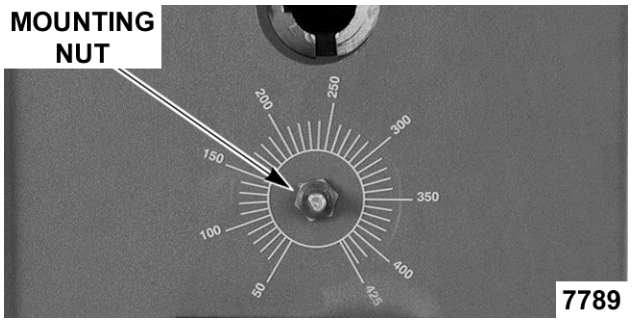


Fig. 7

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

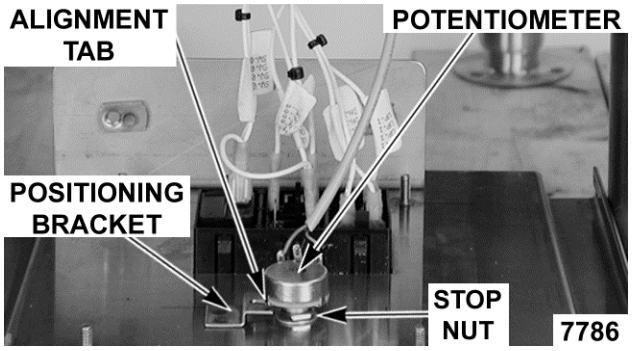


Fig. 8

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

POWER SUPPLY BOX COMPONENTS



⚠ WARNING

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

NOTICE

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

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



Fig. 9

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

POWER SUPPLY BOX

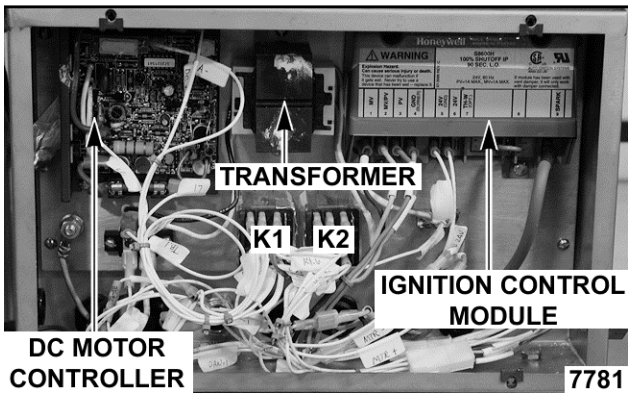


Fig. 10

TEMPERATURE CONTROLLER



⚠ WARNING

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

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

1ST GENERATION TEMPERATURE CONTROLLER SHOWN IN Fig. 11

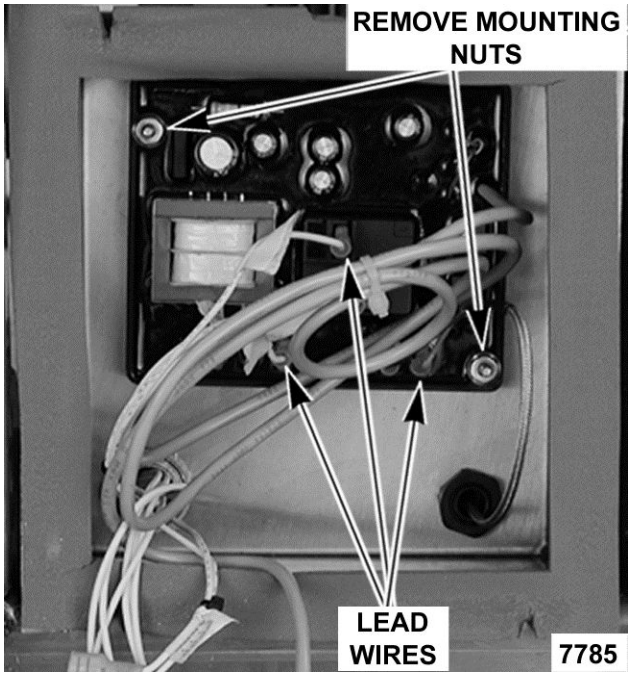


Fig. 11

2ND GENERATION TEMPERATURE CONTROLLER SHOWN IN Fig. 12

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

NOTICE

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

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

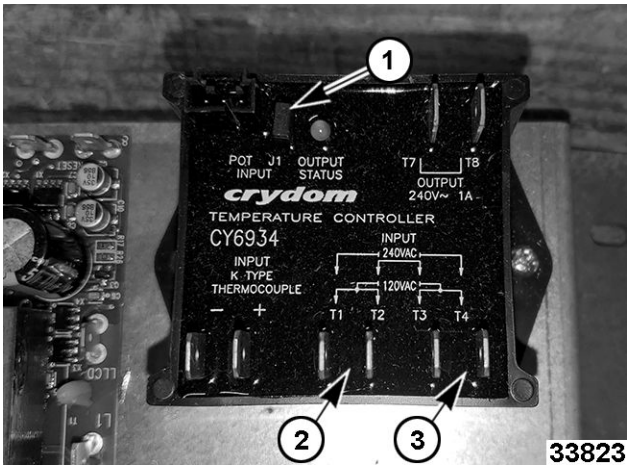


Fig. 12

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

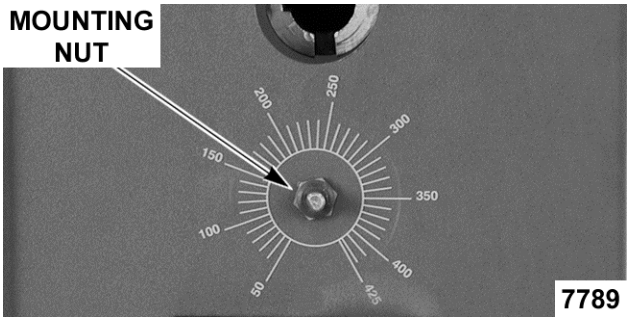


Fig. 13

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

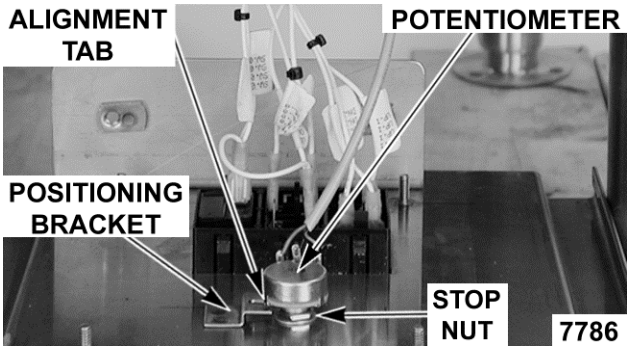


Fig. 14

6. Reverse procedure from Step 3 to complete installation.

NOTICE

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

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

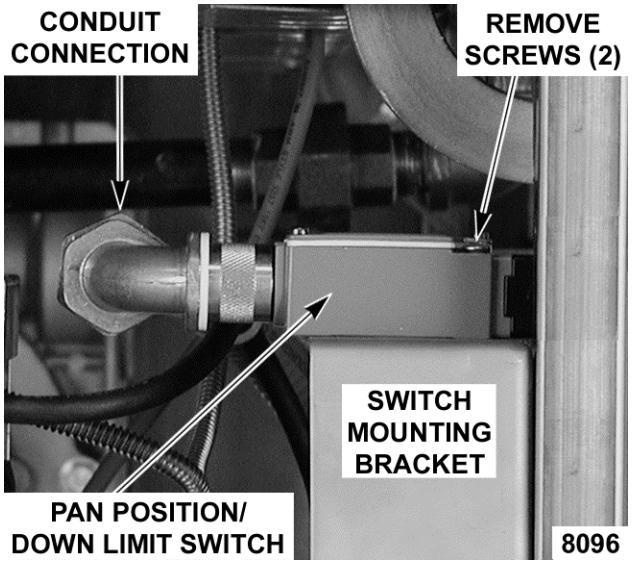
PAN POSITION / DOWN LIMIT SWITCH



⚠ WARNING

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

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



Left Side View Shown

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

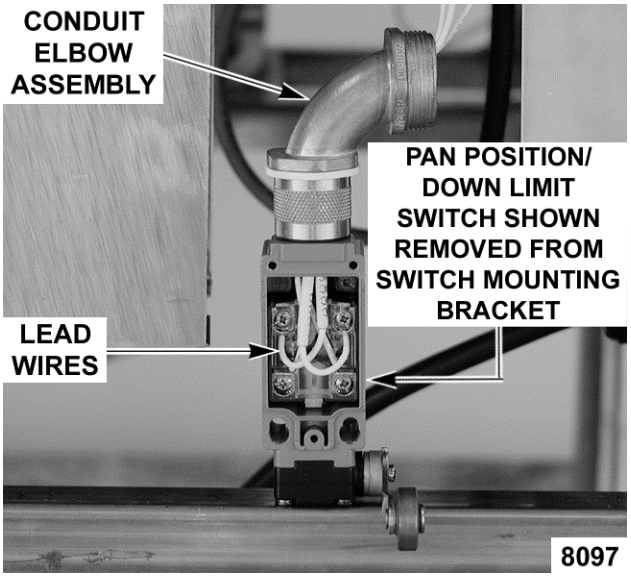


Fig. 16

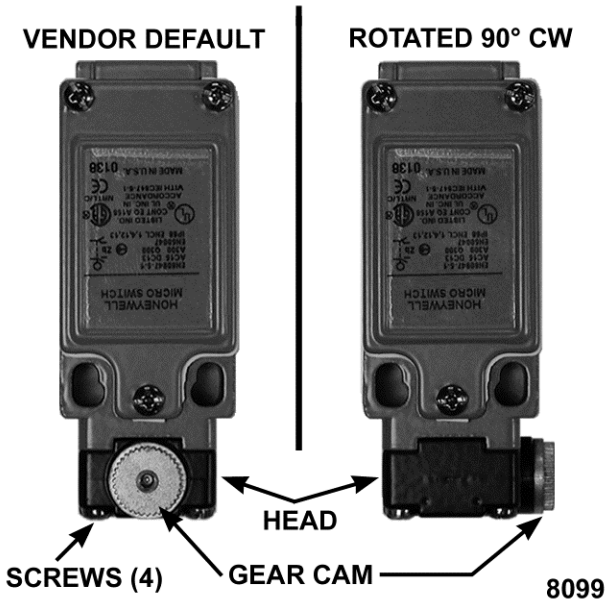
NOTE: When installing, replace the o-ring seal (provided) inside the brass fitting and re-use conduit elbow assembly.

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

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

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

PAN POSITION/DOWN LIMIT SWITCH HEAD POSITIONS

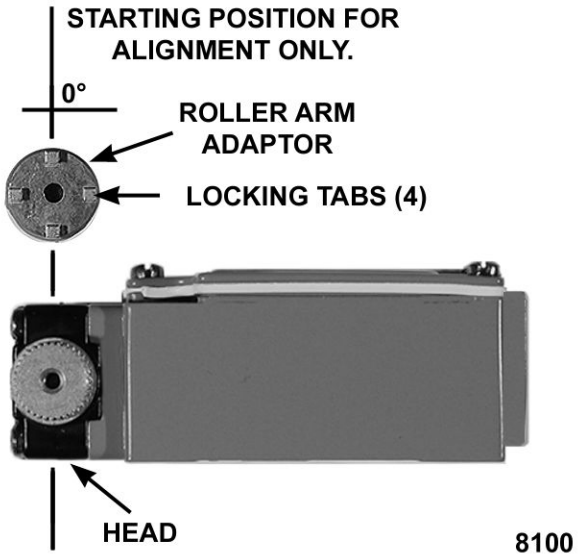


Top View Shown

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

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

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



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.

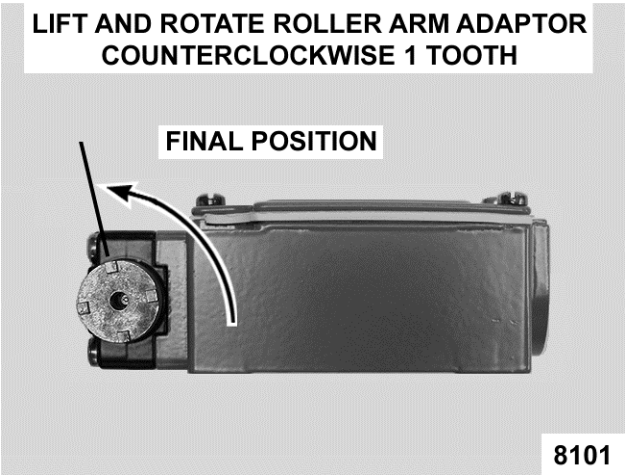


Fig. 19

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

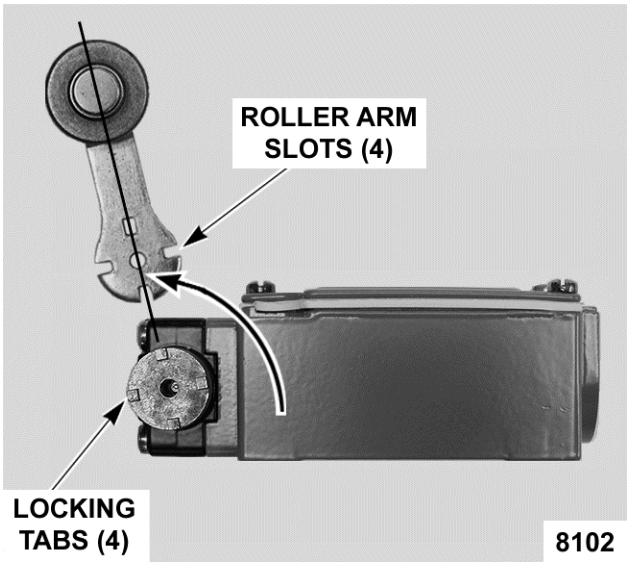


Fig. 20

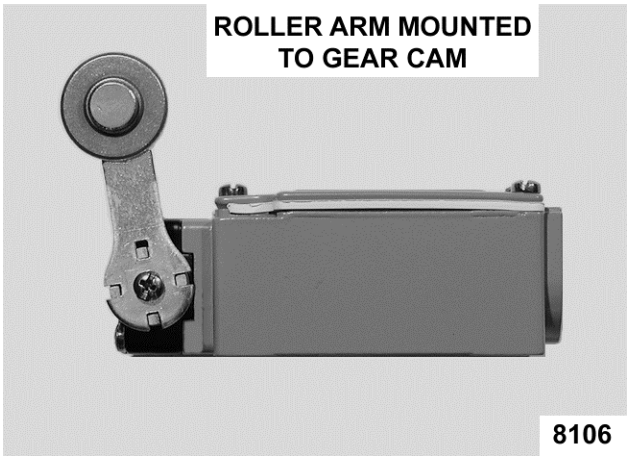


Fig. 21

G. Verify roller arm position on switch.

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

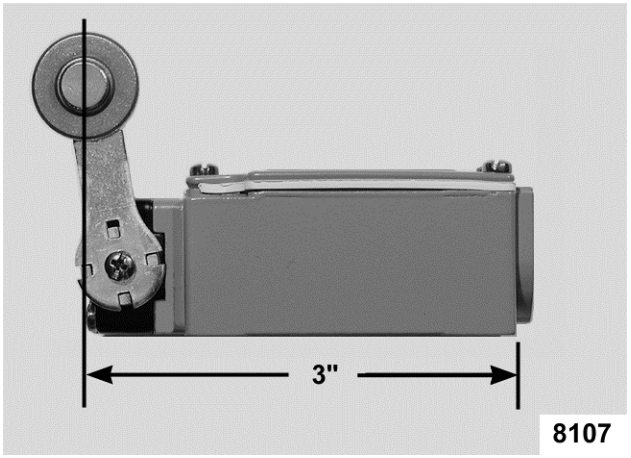


Fig. 22

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

I. If distance is not ok, adjust the roller arm position (as necessary) to obtain the 3" roller arm dimension.

7. Reverse procedure from Step 5 to complete the installation.

8. Adjust pan position/down limit switch on switch mounting bracket as outlined under PAN POSITION / DOWN LIMIT SWITCH ADJUSTMENT in SERVICE PROCEDURES AND ADJUSTMENTS.

THERMOCOUPLE PROBE



⚠ WARNING

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

1. Access temperature controller as outlined under TEMPERATURE CONTROLLER .

2. Disconnect thermocouple lead wires.

3. Raise the pan to the full tilt position.

4. Remove insulation cover bracket.

NOTICE

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

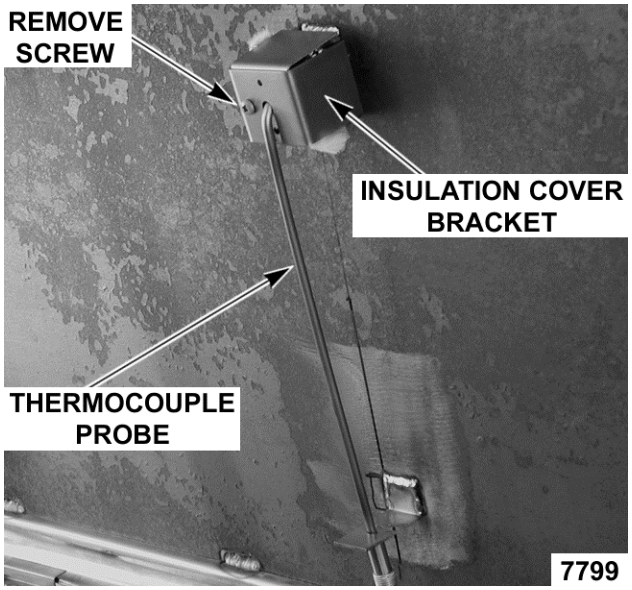


Fig. 23

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

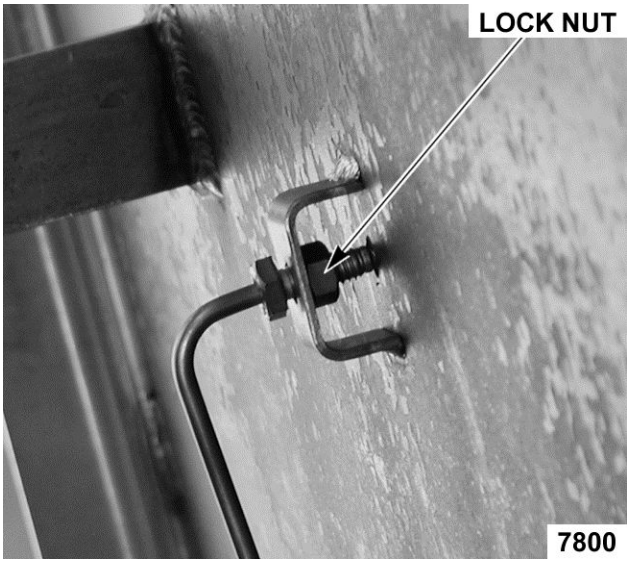


Fig. 24

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

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

DC LIFT MOTOR



⚠ WARNING

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

1. Remove FRONT, REAR AND RIGHT SIDE PANELS .

2. Remove power supply box cover.



Fig. 25

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

POWER SUPPLY BOX
LOWER RIGHT VIEW SHOWN

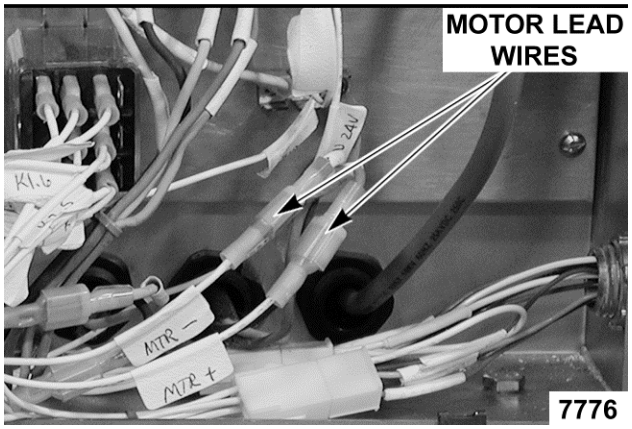
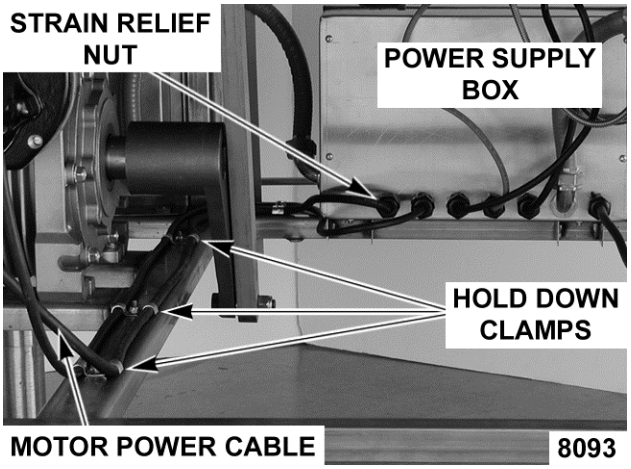


Fig. 26

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

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



VG30 REAR VIEW SHOWN

5. Remove motor mounting bolts from gear reducer flange.

6. Remove motor from gear reducer.

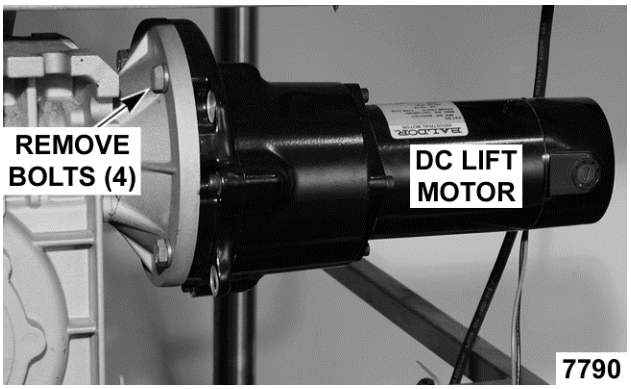


Fig. 28

7. To install:

   A. With drive key on shaft, install motor to gear reducer.

   B. Route and secure the motors' power cable and re-connect motor lead wires.

   C. Replace power supply box cover and side panels.

8. Check for proper operation.

GEAR REDUCER



⚠ WARNING

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

⚠ WARNING

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

ACCESSING BRAISING PAN ACTUATOR FROM TOP OF UNIT

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

   ⚠ WARNING

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

   ⚠ WARNING

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

2. Before disconnecting pan lift pin, set-up safety blocking.

   A. Block braising pan (1, Fig. 29) with two 25" long wood blocks (2" x 4") (2, Fig. 29), one at each end.

   B. Place 2"x4" wood block, 36 inches long for VG30 models, 44" for VG40 models , (3, Fig. 29) across front of braising as shown.

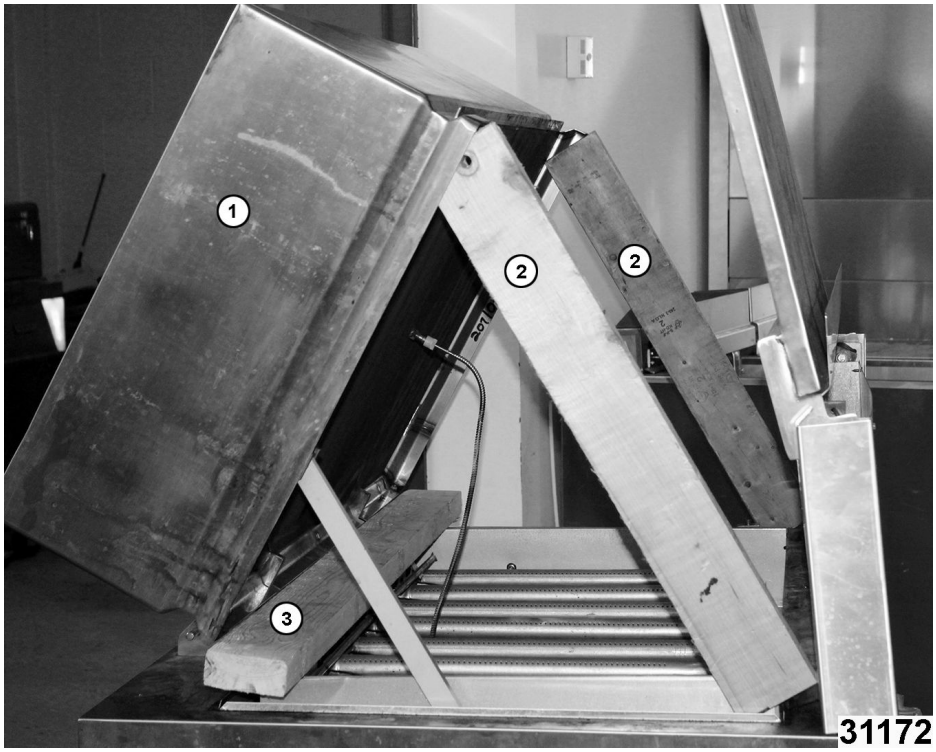


Fig. 29

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

GEAR REDUCER REMOVAL

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

   NOTICE

   There is not a stop on the pan when raising or lowering. The directions will reverse (opposite of direction / down is up and up is down).
3. If DC lift motor is installed, remove motor. Refer to: DC MOTOR LIFT.
4. Remove lock nut securing crank assembly to lift arm.

   NOTICE

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

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

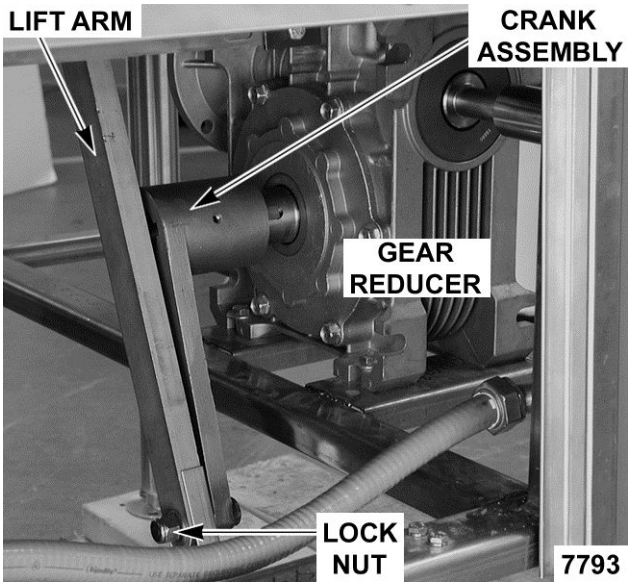


Fig. 30

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

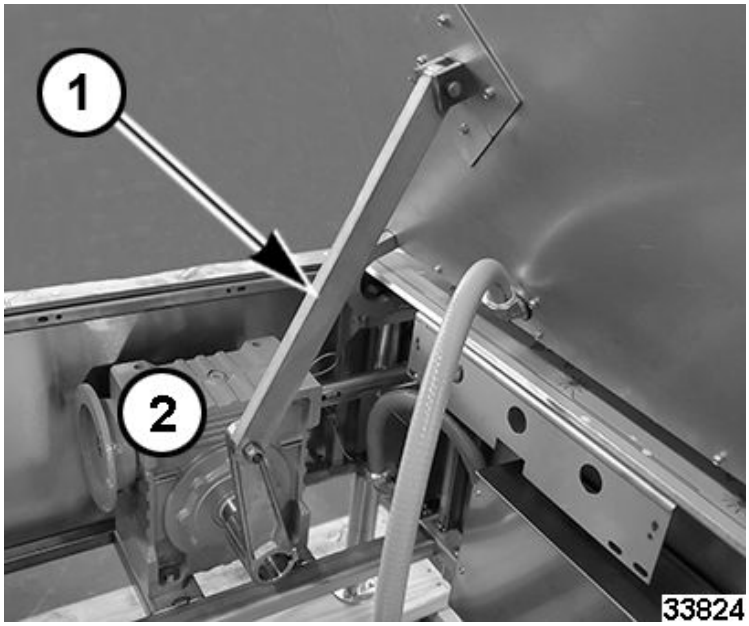


Fig. 31

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

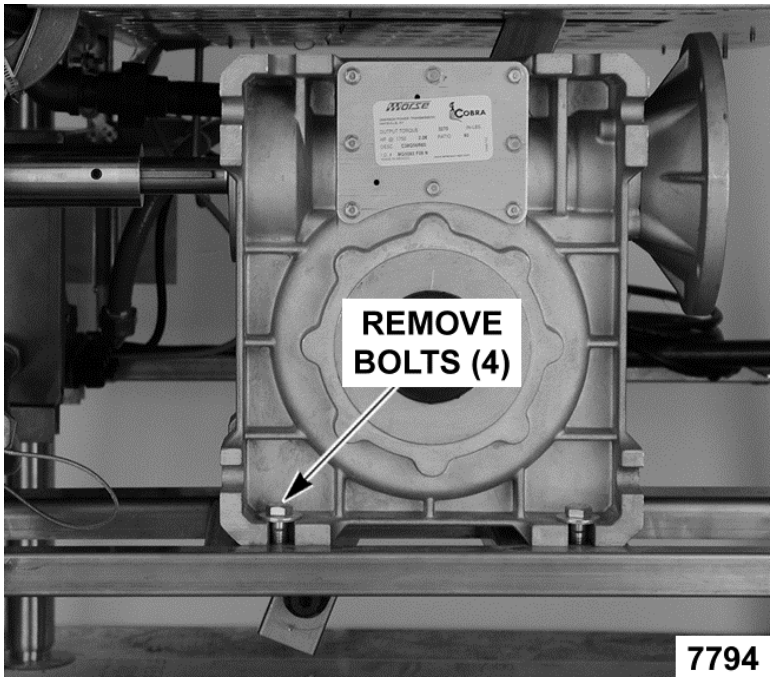


Fig. 32

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

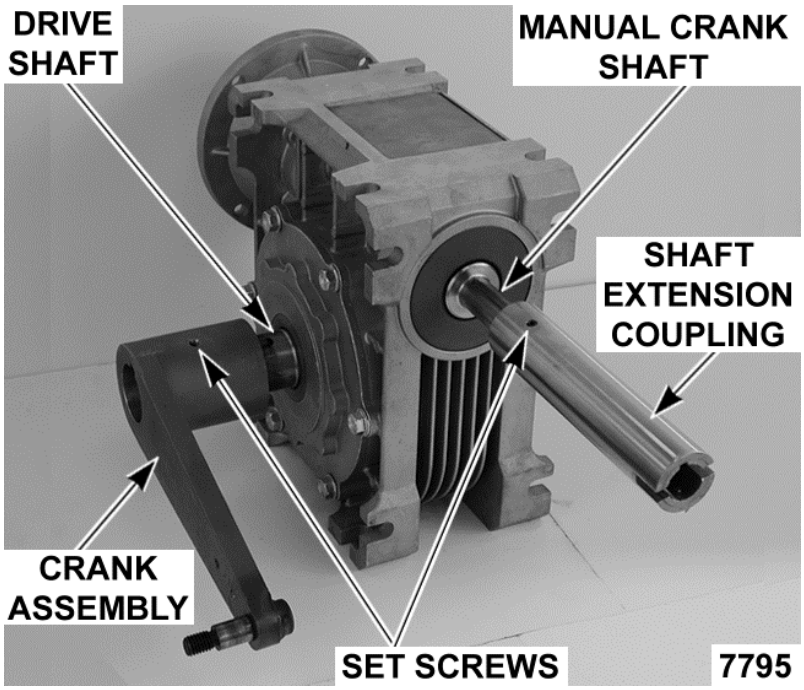


Fig. 33

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

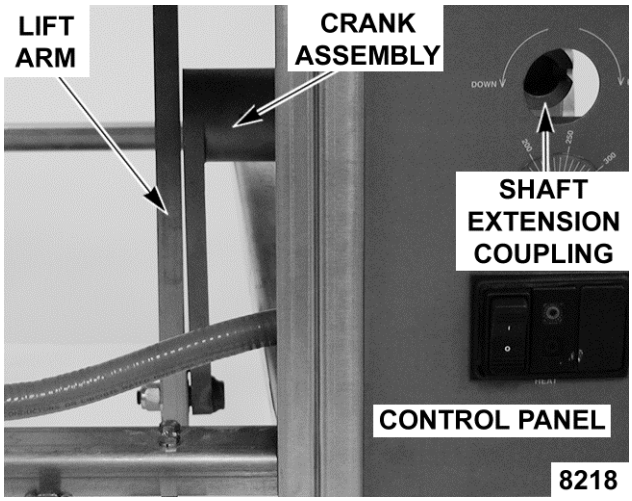


Fig. 34

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

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

ACCESSING BRAISING PAN ACTUATOR FROM TOP OF UNIT

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

⚠ WARNING

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

⚠ WARNING

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

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

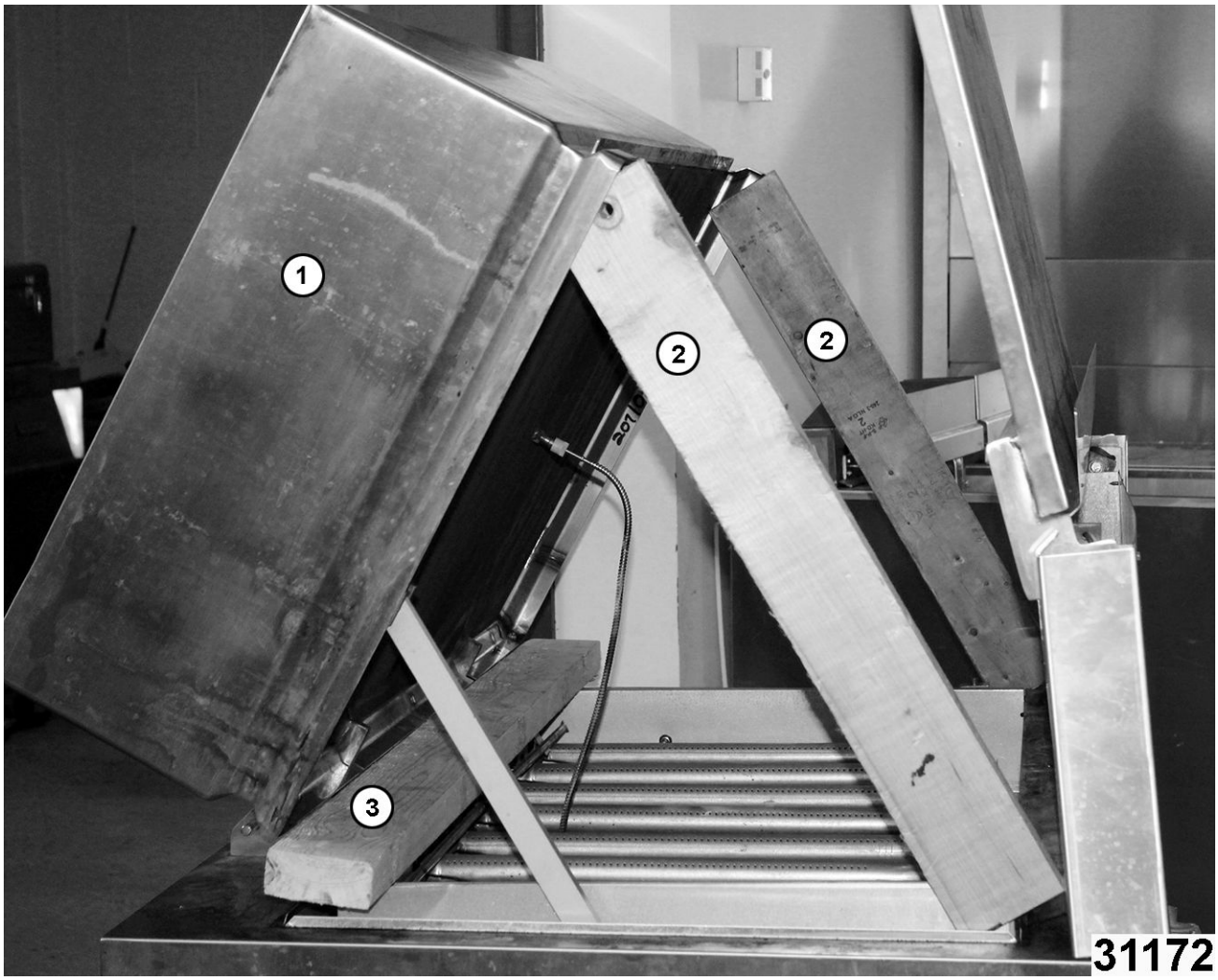


Fig. 35

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

GAS COMBINATION VALVE



⚠ WARNING

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



⚠ WARNING

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

⚠ WARNING

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

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

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

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

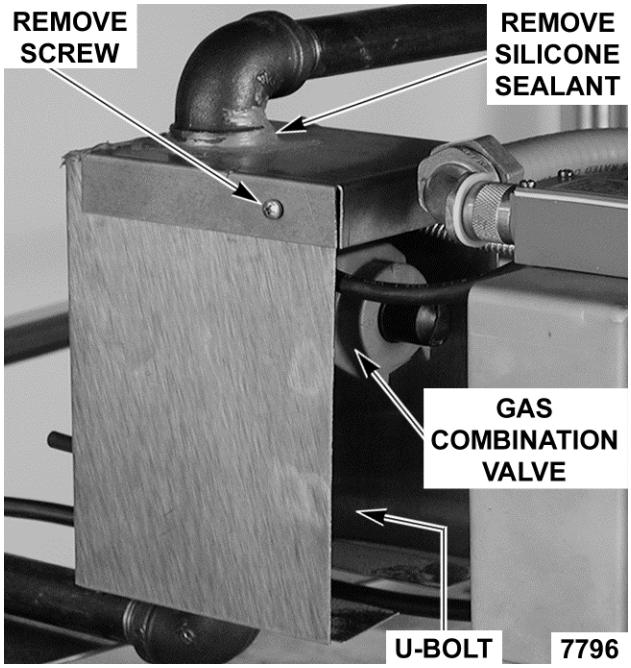


Fig. 36

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

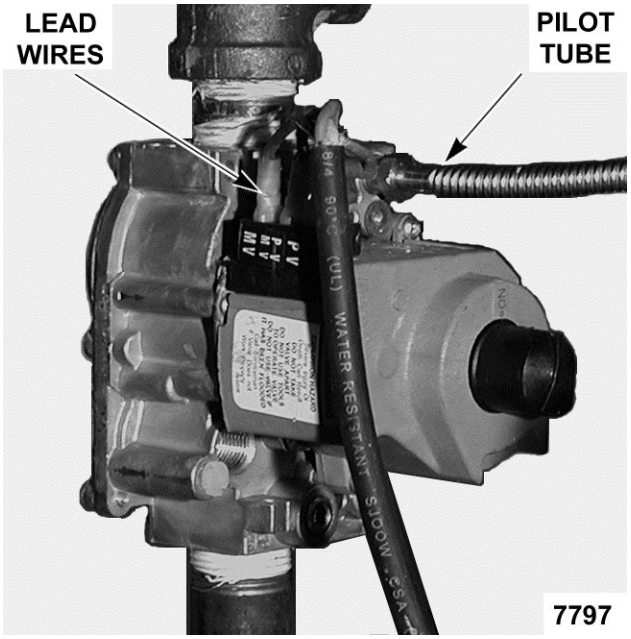


Fig. 37

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

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

10. Check for proper operation.

PILOT BURNER



⚠ WARNING

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

⚠ WARNING

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

1. Raise pan to full tilt position.

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

NOTE: Ground wire is located on pilot mounting screws.

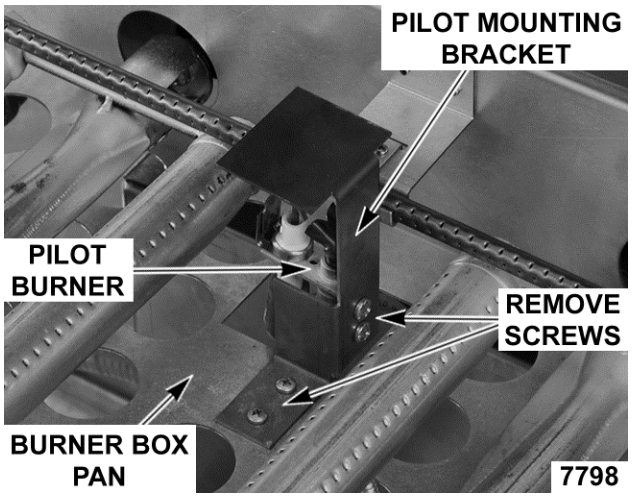


Fig. 38

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

NOTICE

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

1ST GENERATION PILOT BURNER SHOWN IN Fig. 39

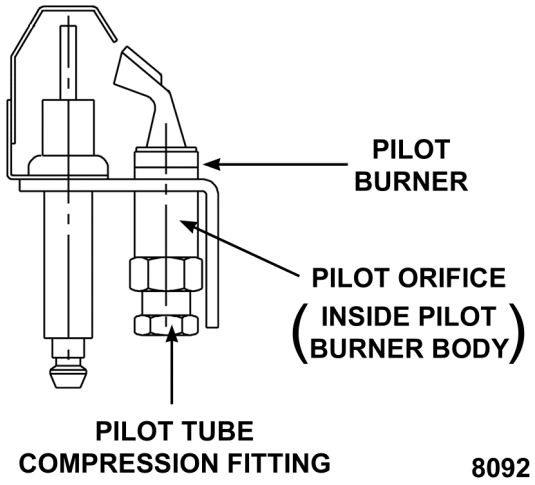


Fig. 39

2ND GENERATION PILOT BURNER SHOWN IN Fig. 40

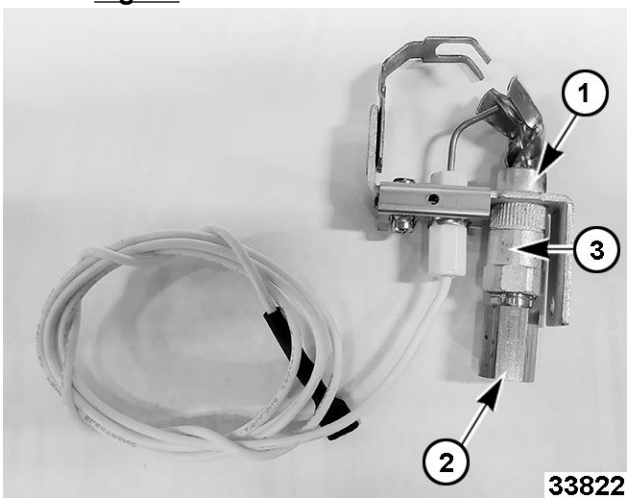


Fig. 40

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

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

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

RUNNER TUBE



⚠ WARNING

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

⚠ WARNING

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

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

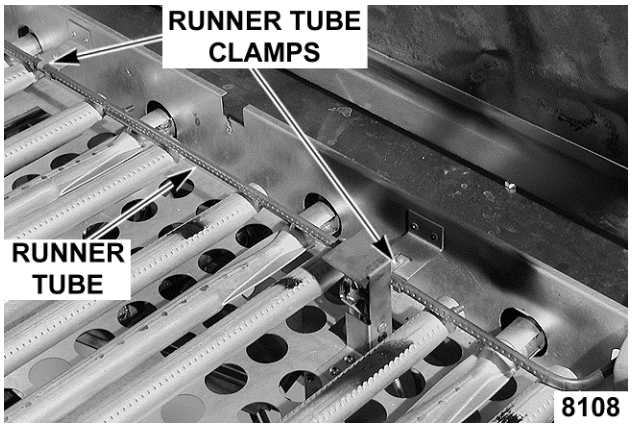


Fig. 41

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

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

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

NOTICE

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

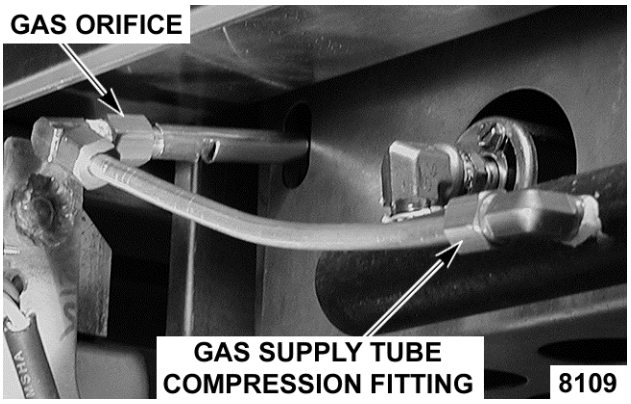


Fig. 42

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

MAIN BURNERS



⚠ WARNING

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

⚠ WARNING

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

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

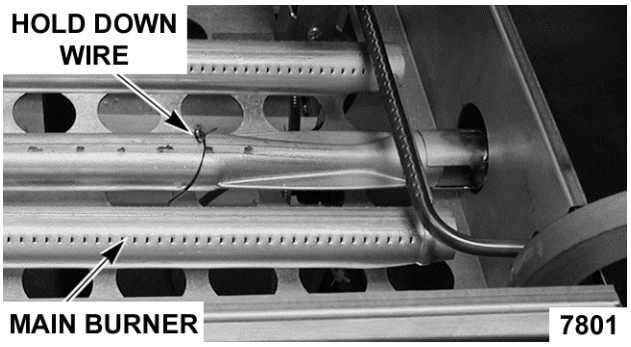


Fig. 43

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

NOTICE

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

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

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

LID SPRINGS



⚠ WARNING

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

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.

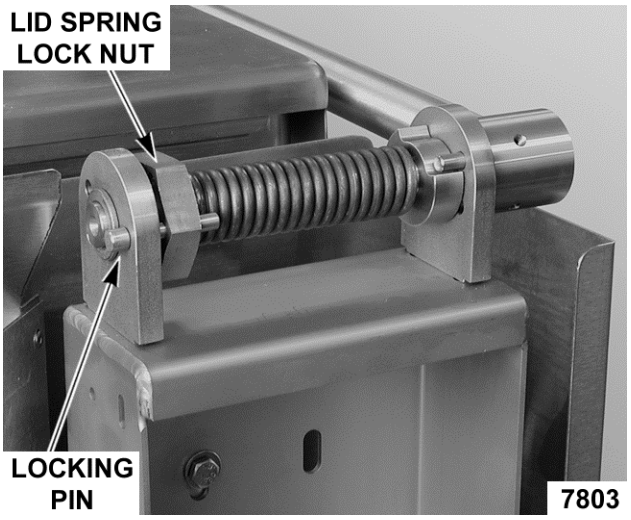


Fig. 45

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.

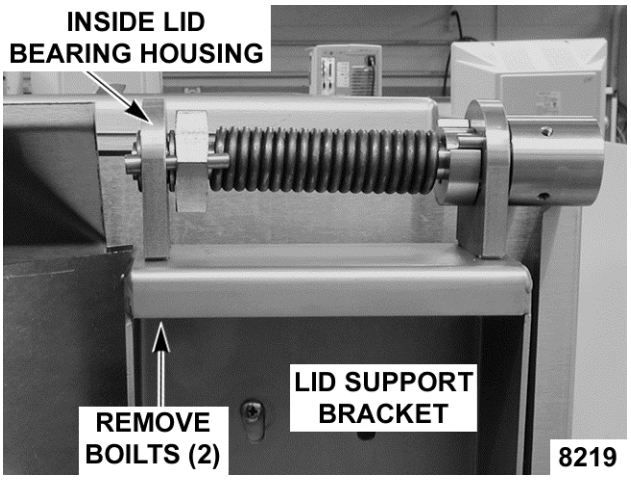


Fig. 46

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

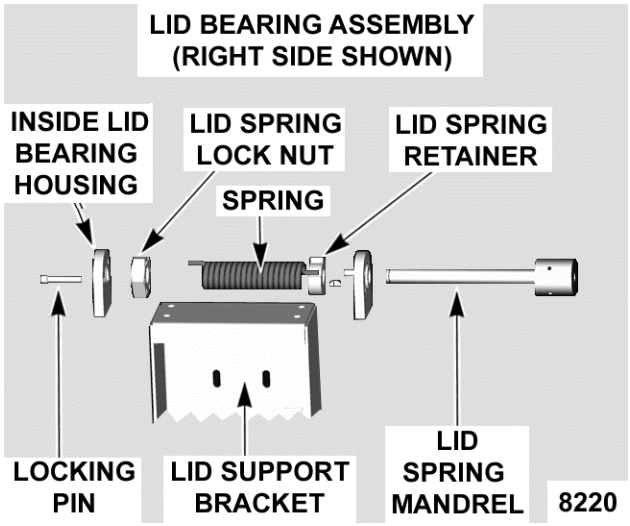


Fig. 47

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

SERVICE PROCEDURES AND ADJUSTMENTS

⚠ WARNING

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

⚠ WARNING

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

TEMPERATURE CONTROLLER CALIBRATION

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

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

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

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

   Example: 260° + 240°÷ 2 = 250°

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

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

   B. Hold the dial & knob together to maintain the adjusted setting and tighten screws.

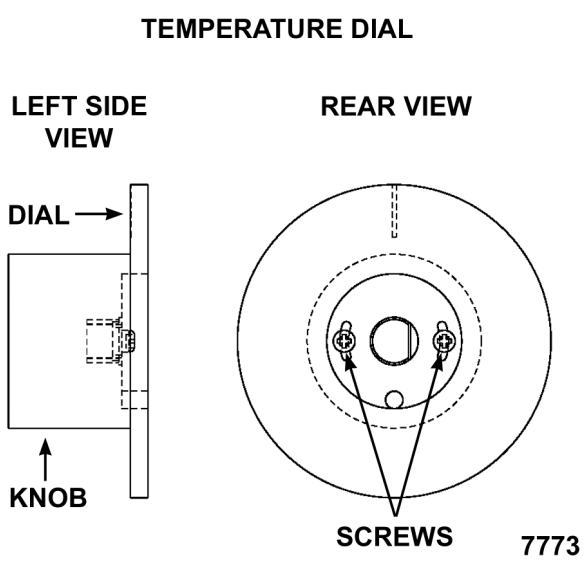


Fig. 48

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

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

NOTICE

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



⚠ WARNING

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

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

Watlow Temp Controller

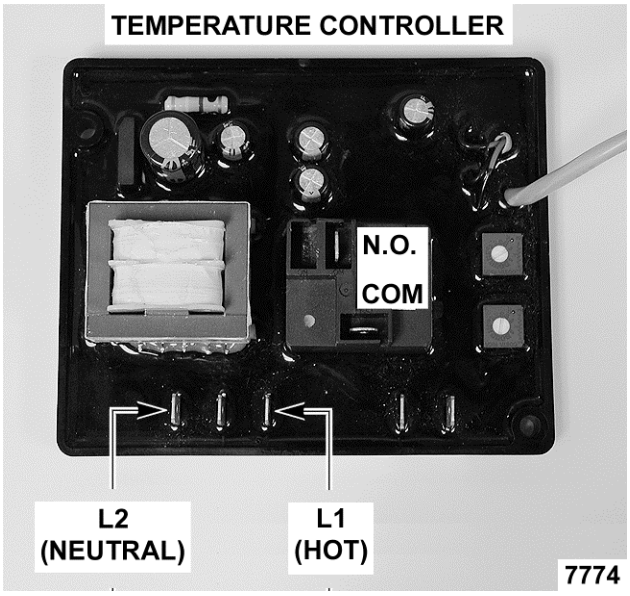


Fig. 49

Crydom Temp Controller

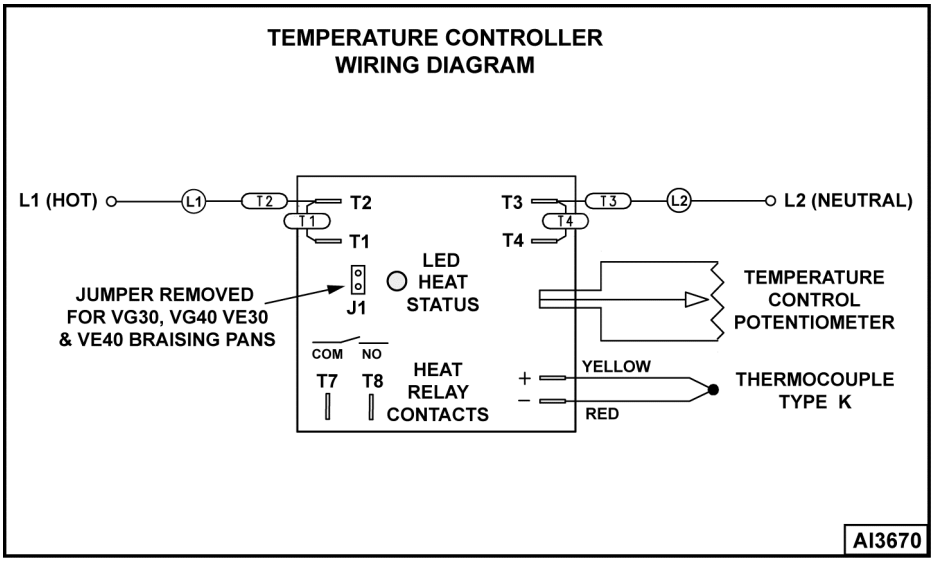


Fig. 50

1. Lower pan to full down position.

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

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

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

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

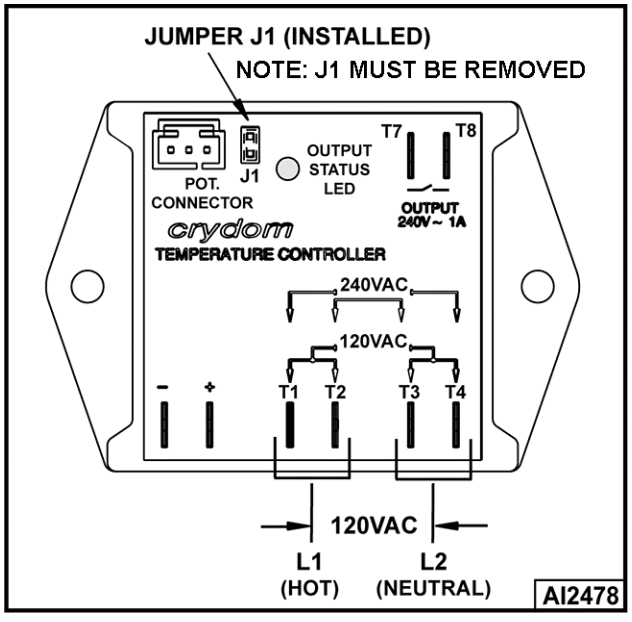


Fig. 51

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

NOTICE

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

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

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

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

      2) Check lead wire connections at the component that is not functioning (heat light, blower motor or transformer).
      3) Verify power at the component that is not functioning. If power is present, determine if the component is malfunctioning. If power is not present at any of the components, continue with procedure.

10. Disconnect lead wire from terminal T7 on the controller.
    A. Verify 120VAC between lead wire from T7 and ground. If correct, re-connect lead wire to terminal T7 and continue with procedure.
    B. If incorrect, check pressure switch (1PS) and water level controller (WLC LLCO).
11. Disconnect lead wire from terminal T8 on the controller.
    A. Verify 120VAC between T8 and ground. If correct, output from controller is functioning properly.
    B. If incorrect, install a replacement temperature controller and check for proper operation.

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

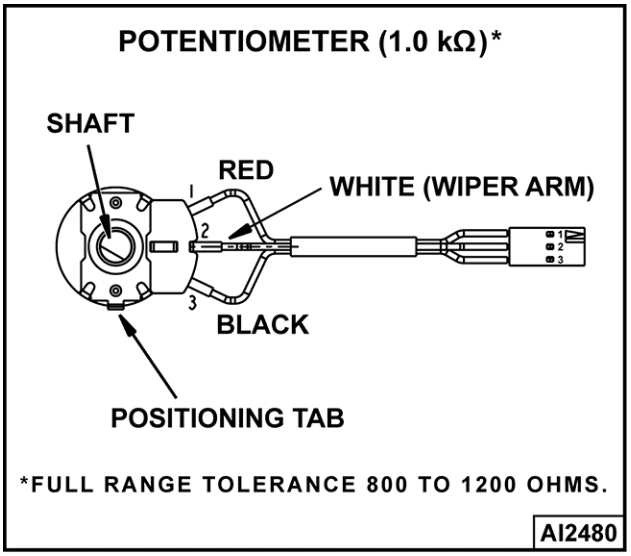


Fig. 52

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

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

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

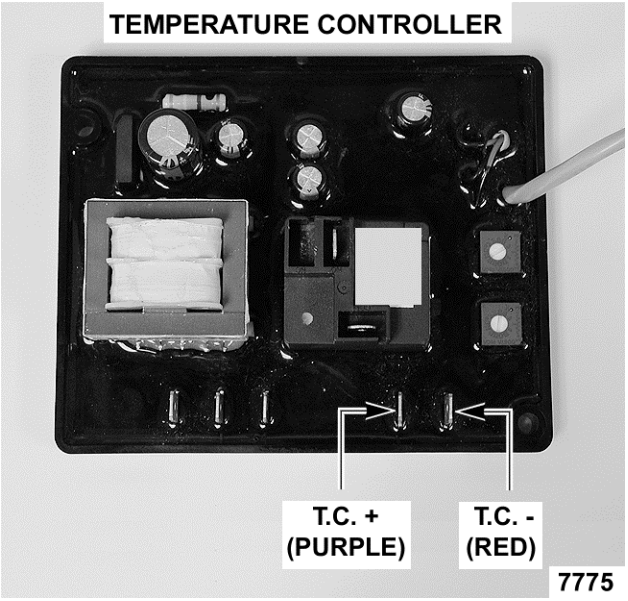


Fig. 53

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

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

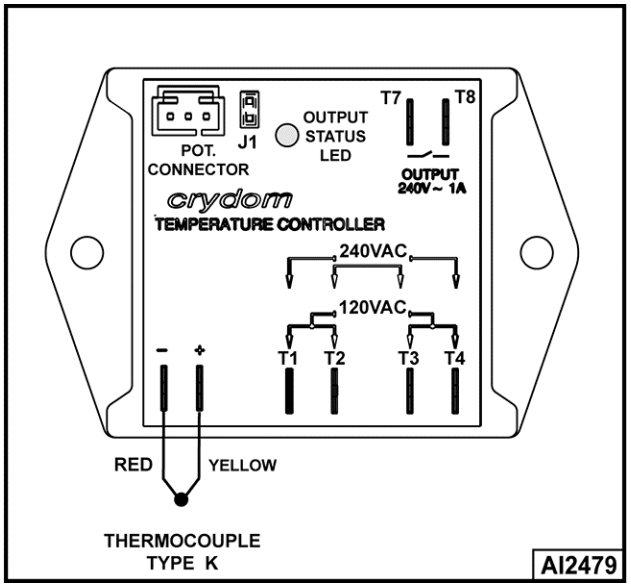


Fig. 54

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

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

NOTICE

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

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

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

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

SPARK IGNITION TEST



⚠ WARNING

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

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

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

1ST GENERATION SHOWN IN Fig. 55

IGNITION CONTROL MODULE

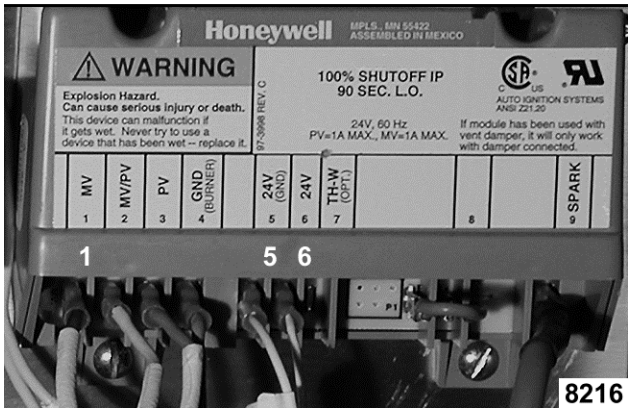


Fig. 55

2ND GENERATION SHOWN IN Fig. 56

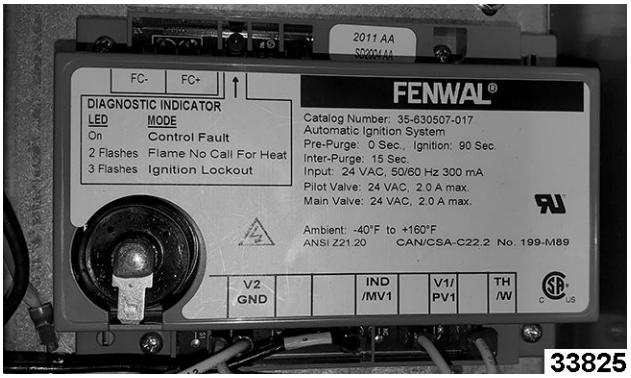


Fig. 56

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



⚠ WARNING

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

⚠ WARNING

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

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

B. Inspect ignitor electrode and ground clip for contaminates, or corrosion. Clean those surfaces as necessary.

C. Spark gap between the ignitor/flame sense electrode and the ground clip should be 0.120" ± 0.020". If the gap is outside of this dimension, bend the ground clip as necessary, to make adjustment.

1ST GENERATION SHOWN IN Fig. 57

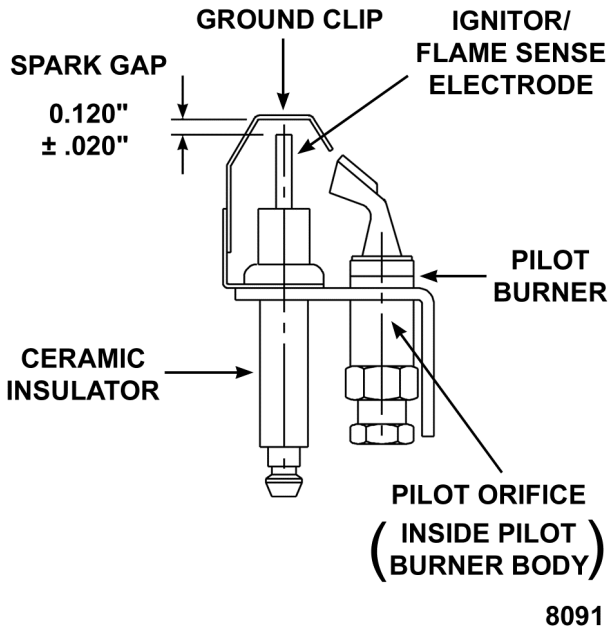


Fig. 57

2ND GENERATION SHOWN IN Fig. 58

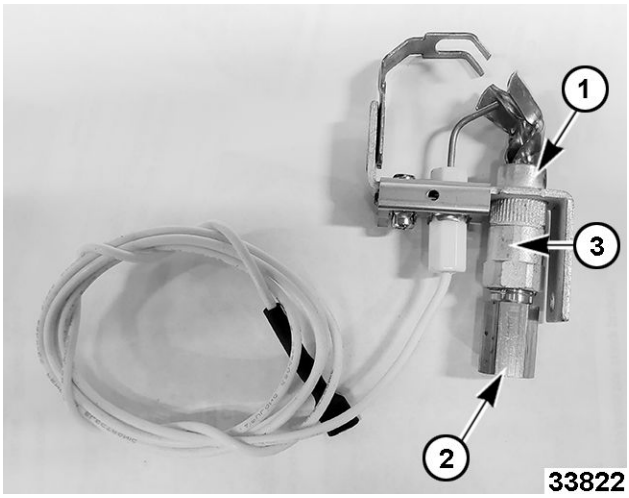


Fig. 58

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

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

D. Check ignitor cable connection for tightness and damaged insulation. If ignitor cable appears to be damaged, then install a replacement ignitor cable.

8. Install pilot burner and connect ignitor cable.

9. Disconnect main valve (MV) lead wire from terminal 1 on ignition control module.

1ST GENERATION SHOWN IN Fig. 59

IGNITION CONTROL MODULE

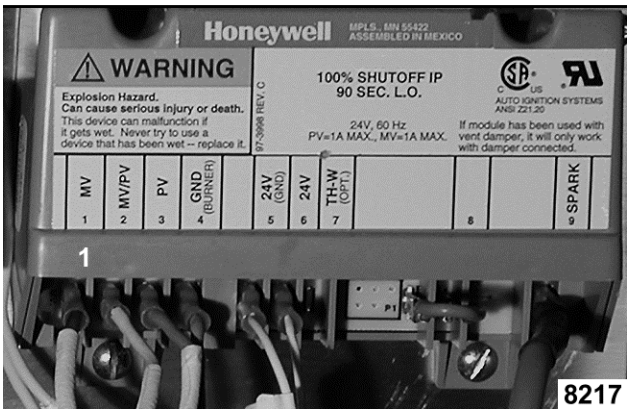


Fig. 59

2ND GENERATION SHOWN IN Fig. 60

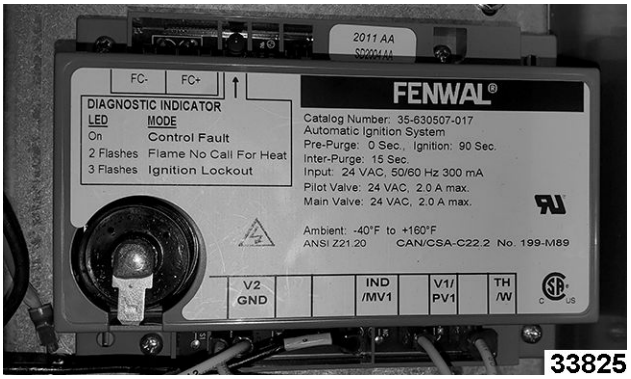


Fig. 60

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

10. Reconnect power to machine and turn gas supply on.

11. Turn on/off switch on and set temperature dial to call for heat.

12. . Manually operate pan position/down limit switch and observe spark from ignitor.

FRONT UPPER LEFT VIEW SHOWN

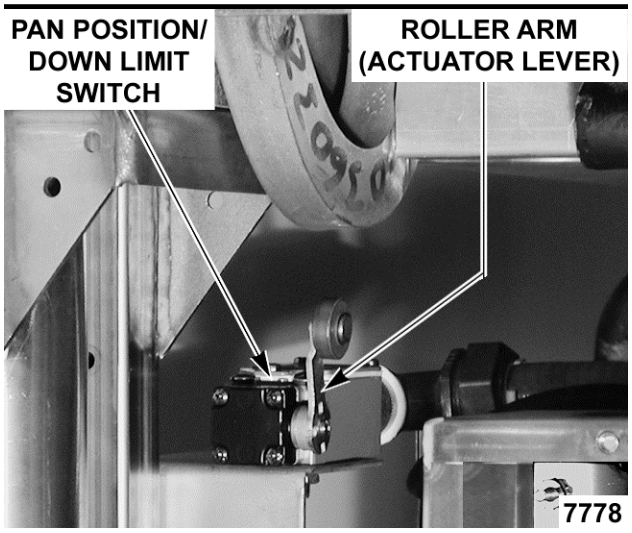


Fig. 61

A. If spark from ignitor is present and lights the gas for pilot burner, and pilot burner remains lit, then system is working properly.

B. If pilot burner lights but does not maintain an adequate flame during the trial for ignition (90 seconds):

1) Check pilot burner orifice for clogging.

NOTICE

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

2) Check PILOT BURNER FLAME ADJUSTMENT.

C. If spark from ignitor is present but does not light the pilot gas before ignition control module locks out, there may not be enough gas in the supply line for ignition.

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

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

1) If pilot burner ignition is successful, release the pan position/down limit switch, turn the on/off switch to off and re-connect main valve (MV) lead wire on ignition control module.

D. If ignitor is still not sparking, turn the on/off switch off, disconnect power to machine and turn gas supply off.

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

PILOT BURNER FLAME ADJUSTMENT

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

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

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

PILOT BURNER FLAME ADJUSTMENT

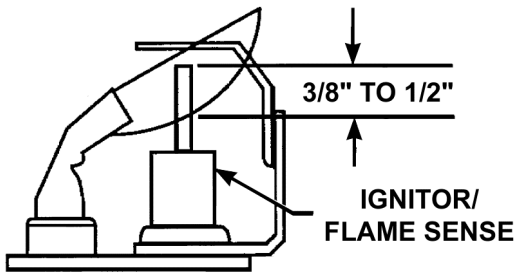


Fig. 62

A. If flame envelops 3/8" to 1/2" of the ignitor/flame sense electrode, pilot burner is adjusted properly.

B. If flame is outside of the specified range, release the pan position/down limit switch and continue with procedure.

9. Remove adjustment screw cap to access the pilot burner flame adjustment screw.

GAS COMBINATION VALVE

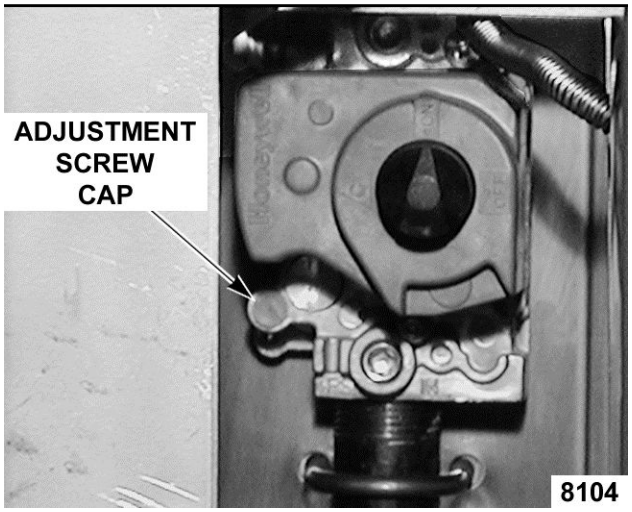


Fig. 63

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

FLAME SENSE CURRENT TEST

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

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

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

IGNITION CONTROL MODULE

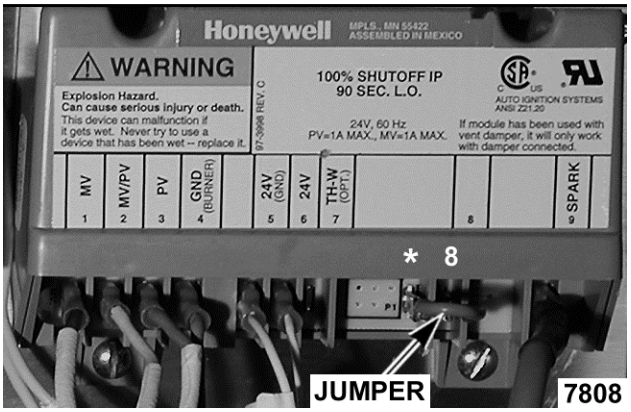


Fig. 64

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

IGNITION CONTROL MODULE TEST



⚠ WARNING

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

1ST GENERATION IGNITION CONTROL MODULE SHOWN IN Fig. 65

IGNITION CONTROL MODULE

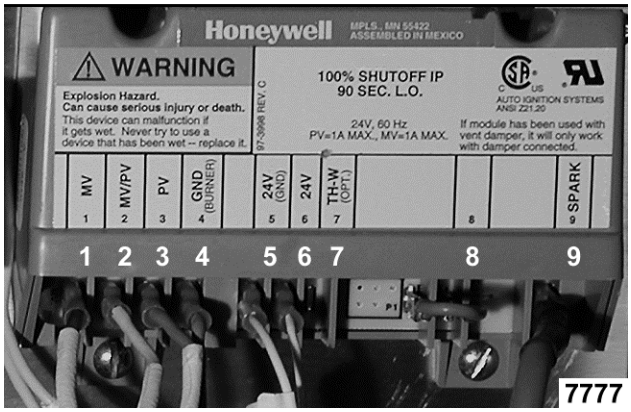


Fig. 65

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

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

   The pilot burner lights, pilot flame is sensed, spark voltage from terminal 9 is removed and sparking stops. Main valve (MV) contacts close to energize main valve coil, allowing gas flow to the runner tube and main burners.
   A. Verify 24VAC between terminals 1 and 2.
      1) If voltage is not present, replace ignition control module and check for proper operation.
5. With pilot burner lit, the runner tube lights and main burners light.

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

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

GAS MANIFOLD PRESSURE ADJUSTMENT



⚠ WARNING

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

GAS PRESSURE (INCHES W.C.)				
Gas Type	**Manifold**	**Line**		
		Recommended	**Min**	**Max**
Natural	3.7	7.0	5.0	14.0
Propane	10.0	11.0	11.0	14.0
NOTE: If the incoming line pressure is **less** than the minimum stated, then the manifold pressure cannot be set correctly.				

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

B. If adjustment is necessary, continue with procedure.

8. Remove adjustment screw cap to access the pressure adjustment screw.

   A. To increase pressure, turn the screw *clockwise*. To decrease pressure, turn the screw *counterclockwise*.

GAS COMBINATION VALVE

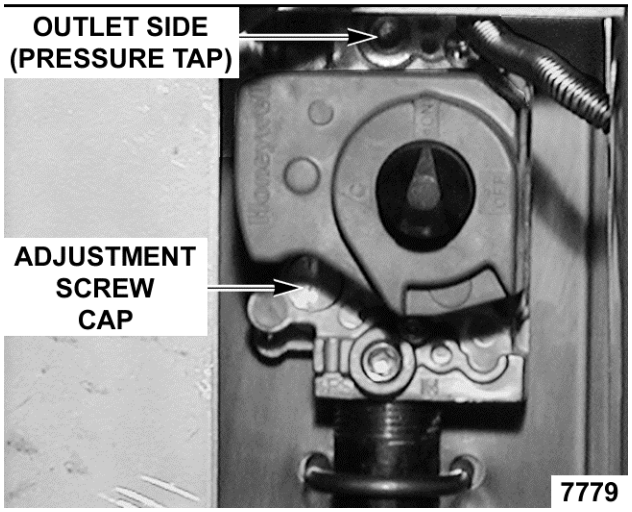


Fig. 66

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

9. Set pressure as listed in gas pressure table.

10. Once the correct pressure has been set, turn the on/off switch off, replace the adjustment screw cap and pipe plug.

11. Check for proper operation.

MAIN BURNERS

Inspection

1. Access the main burners as outlined in REMOVAL AND REPLACEMENT OF PARTS.

2. Inspect burners for clogged ports or obstructions around air shutter. Clean the burner (as necessary) using a soft bristle brush.

3. Inspect gas orifice for clogging. If clogs are found, remove the orifice and clean with air or non-flammable liquid only.

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

Air Shutter Adjustment

1. Verify the gas manifold pressure as outlined under GAS MANIFOLD PRESSURE ADJUSTMENT.

2. Turn the on/off switch off.

3. Remove the control panel as outlined in REMOVAL AND REPLACEMENT OF PARTS to gain viewing access to the right side burner.

4. Turn the on/off switch on and set the temperature dial to call for heat.

NOTICE

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

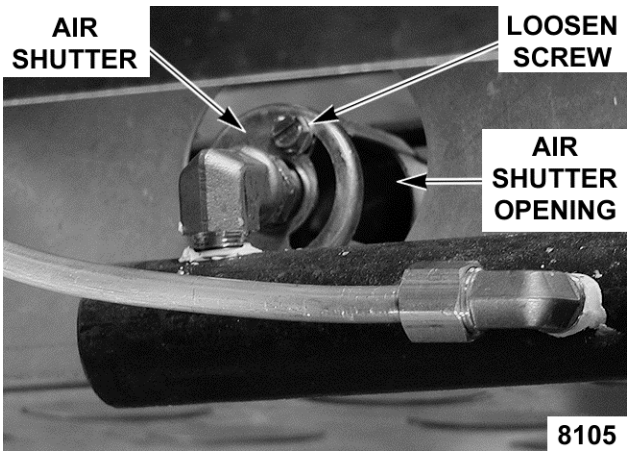
5. Allow burners to remain lit for at least five minutes.

6. Observe each burners< flame thru the opening in the front of the burner box.

   A. If the flame is blue, air shutter is adjusted properly. A slight tinge of orange in the flame is acceptable.

   B. If the flame is yellow tipping, this indicates too little primary air (oxygen) for proper combustion. The heating efficiency is reduced, and the amount of soot (carbon) generated as a by-product is increased. Continue with procedure to adjust.

7. Loosen screw on the air shutter for the burner being adjusted. Closing the air shutter will *decrease* primary air to the burner and opening the shutter will *increase* primary air the burner.



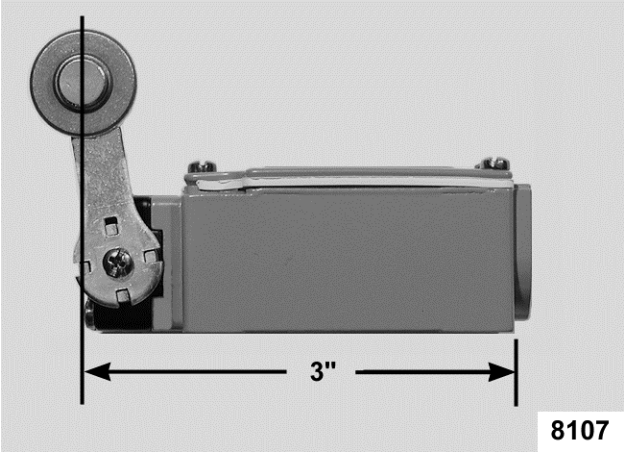
FRONT VIEW OF BURNER AIR SHUTTER SHOWN

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

PAN POSITION / DOWN LIMIT SWITCH ADJUSTMENT

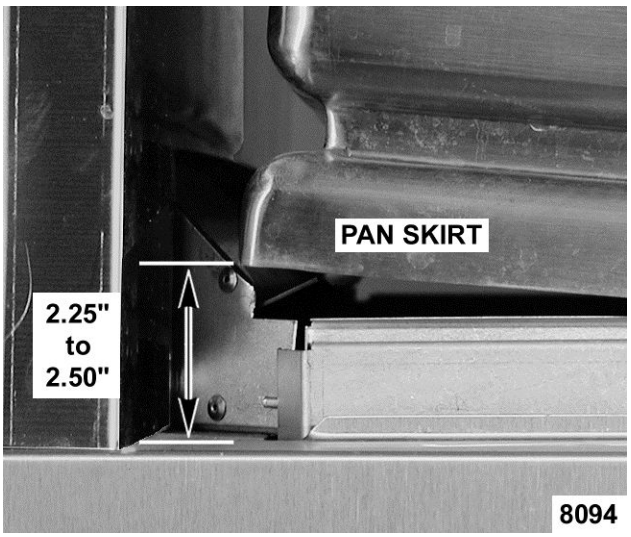
NOTE: Do not use the motorized lift (if installed) for this procedure.

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



SIDE VIEW SHOWN

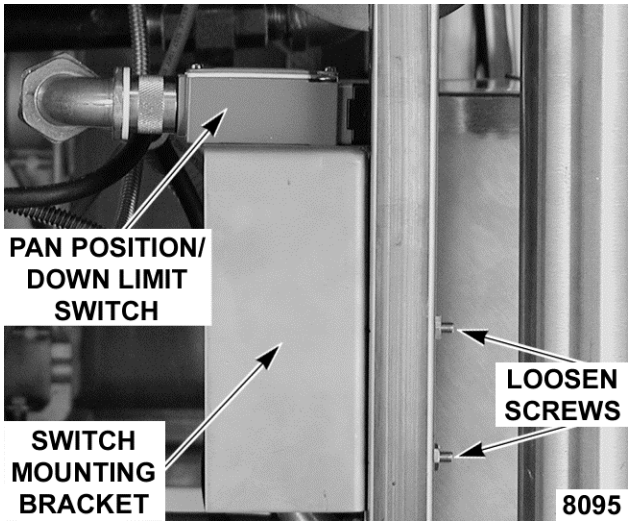
   B. If distance is ok, proceed to Step 6.
   C. If distance is not ok, position the roller arm as outlined under PAN POSITION / DOWN LIMIT SWITCH in REMOVAL AND REPLACEMENT OF PARTS.
6. Lower the pan to the full down position. The roller should make contact with the hinge and operate the switch.
7. Verify pan position/down limit switch N.O. contacts are closing.
   A. Turn the on/off switch on and set the temperature dial to call for heat.
   B. Heat light (red) comes on and main burners light.
      1) If main burners do not light, verify 24VAC input to the switch, and that the voltage is output from the switch.
      2) If voltage is present on the output side of the switch, the switch is functioning properly.
      3) If voltage is not present, install a replacement pan position/down limit switch and repeat this procedure to adjust.
8. Verify pan position/down limit switch N.O. contacts are opening.
   A. Slowly raise the pan until the heat light and burners go out then stop.
   B. At the rear of the pan, measure the distance from the bottom of the pan skirt to the flat surface covering the frame.
      1) Distance should be 2.25" to 2.50".



LEFT SIDE VIEW SHOWN

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

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



LEFT SIDE VIEW SHOWN

B. Adjust mounting switch bracket up or down (as necessary) to obtain the rear pan dimension of 2.25" to 2.50".

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

LID SPRING TENSION ADJUSTMENT

1. Raise the lid and release at several positions thru the range of travel.

   A. If lid remains in place, no adjustment is necessary.

   B. If lid does not remain in place (springs up or falls down), continue with procedure.

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

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



RIGHT SIDE REAR VIEW SHOWN

3. To adjust:

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

NOTICE

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

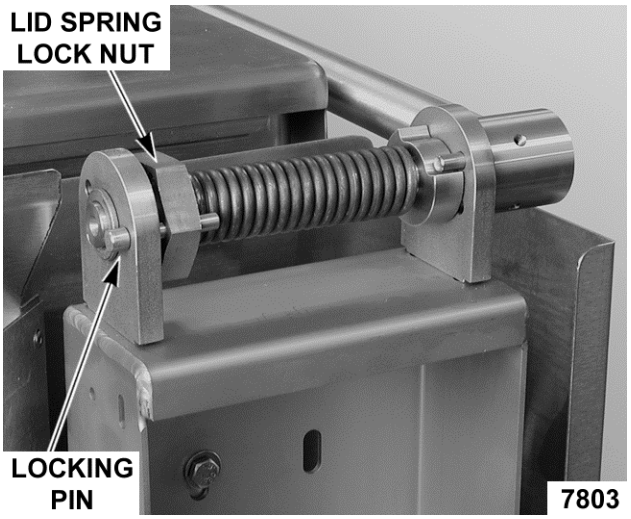


Fig. 72

   B. Apply additional downward force to *increase* spring tension; or slowly release downwards force to *decrease* spring tension.

   C. Rotate lid spring lock nut to the next hole position then replace locking pin. Adjust the spring tension, one position at a time.

   D. Repeat tension adjustment on the opposite spring.

4. Repeat Step 1 to verify adjustment. Make additional adjustments as necessary.

DC MOTOR CONTROLLER TEST



⚠ WARNING

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

1ST GENERATION CONTROLLER BOARD SHOWN IN Fig. 73

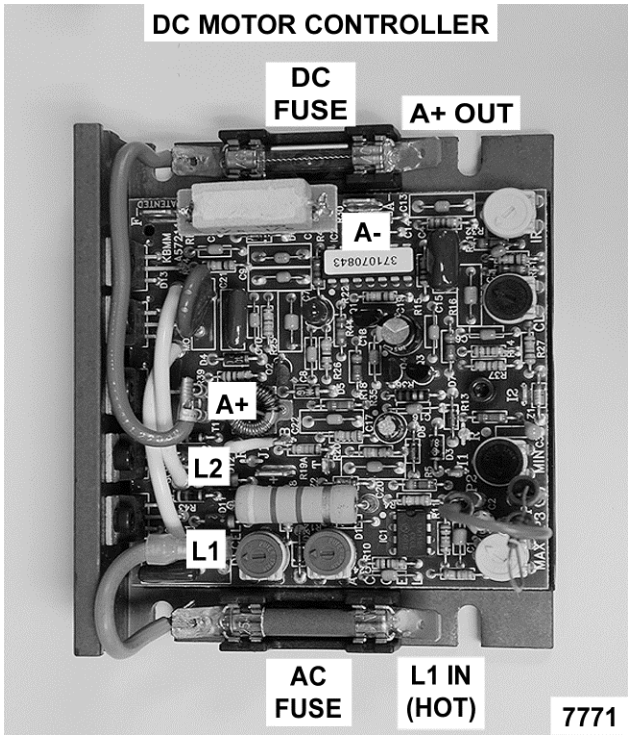


Fig. 73

2ND GENERATION CONTROLLER BOARD SHOWN IN Fig. 74

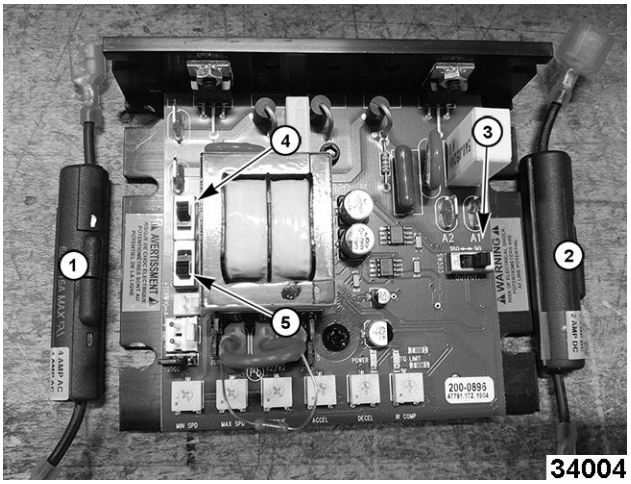


Fig. 74

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

Trimpots 2nd Generation Controller Board in Fig. 75

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

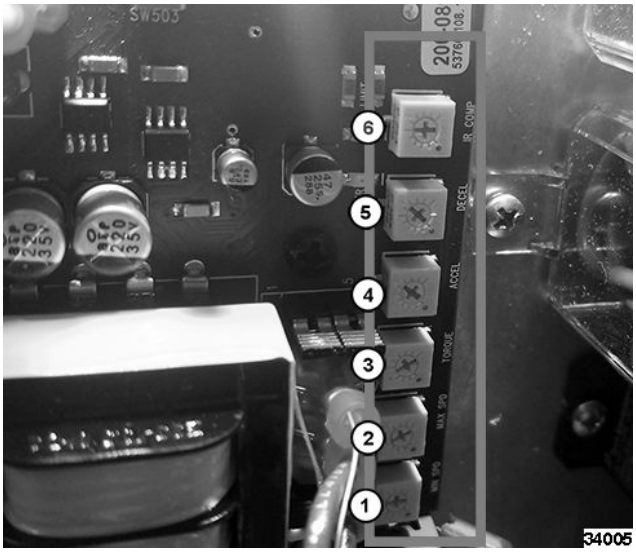


Fig. 75

1. Lower the pan to full down position.

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

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.

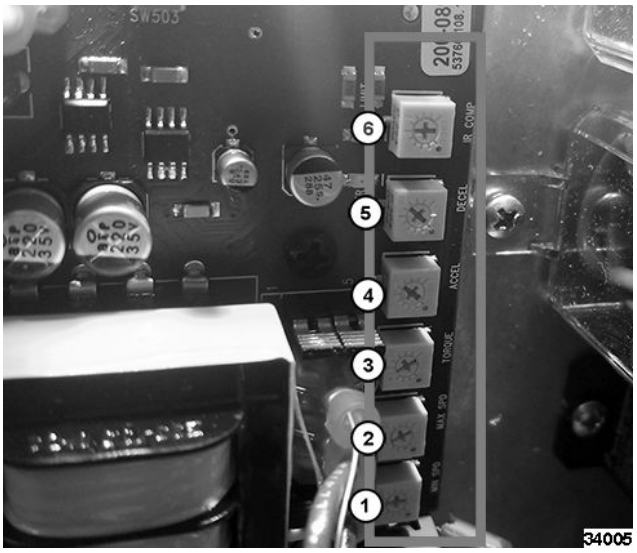


Fig. 76

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.
Transformer	Supplies 24VAC for heating circuit. If motorized pan lift option is installed, supplies 24VAC for lift control circuit.
ON/OFF Switch	Controls 24VAC to the gas heating circuit. If motorized pan lift option is installed, controls power to lift 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 gas heating circuit when pan is down. Removes power from gas heating circuit when pan is raised. The N.C. contacts are used for the down limit switch (motorized lift option only).
Ignition Control Module	Controls and monitors gas heating. Energizes pilot valve coil to supply gas to pilot, generates spark to light gas at the pilot, monitors the presence of flame and energizes the main valve coil upon a call for heat.
Ignitor / Flame Sense Electrode	Ignites pilot burner and senses the presence of a flame. The Igniter / Flame Sense is a component of the pilot burner.
Gas Combination Valve	Allows gas flow to the pilot burner when pilot valve coil is energized; and gas flow to the runner tube & main burners when main valve coil is energized. Also, regulates gas manifold pressure.

COMPONENT FUNCTION - MOTORIZED PAN LIFT OPTION CONTROLS

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	Supplies 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. The voltage polarity to the DC motor is reversed thru K2 contacts to turn motor CCW and lower the pan.

COMPONENT LOCATION

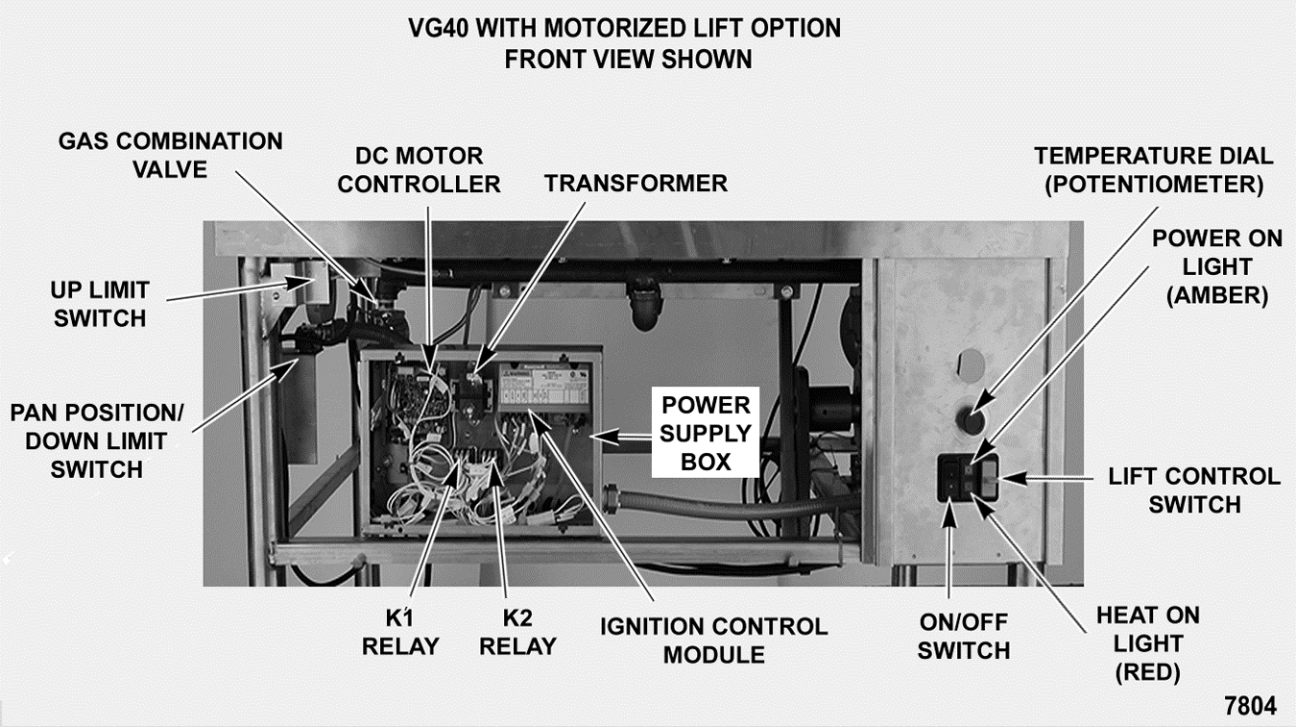


Fig. 77

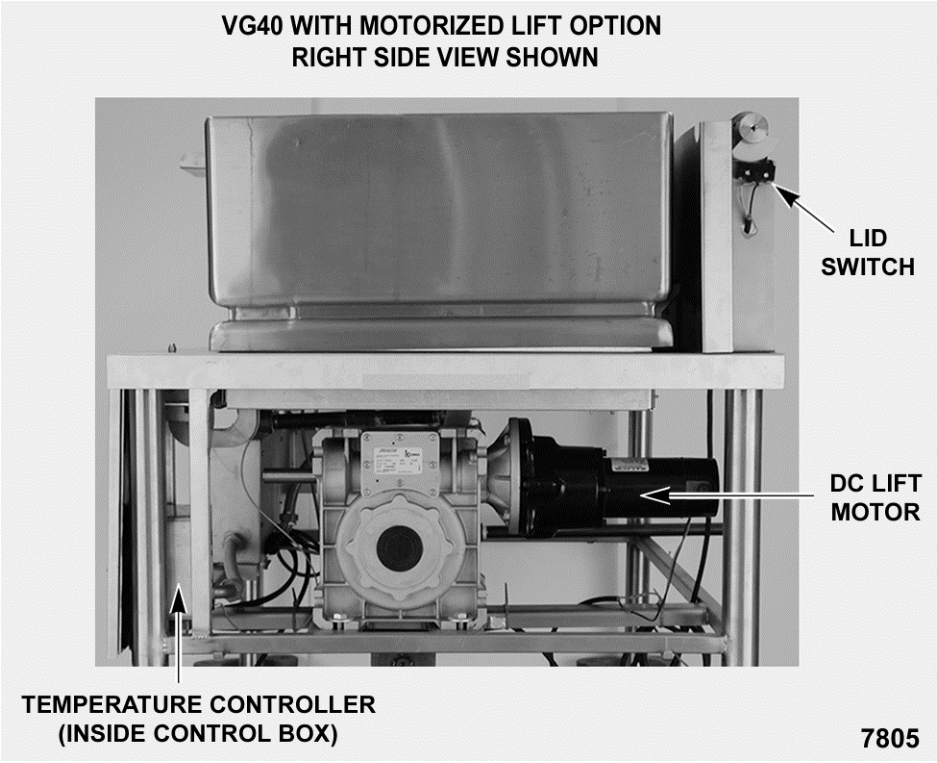


Fig. 78

IGNITION CONTROL MODULE

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

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

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

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

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

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

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

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

NOTE: 1st generation shown in Fig. 79. Refer to WIRING DIAGRAMS for 2nd generation wiring connections.

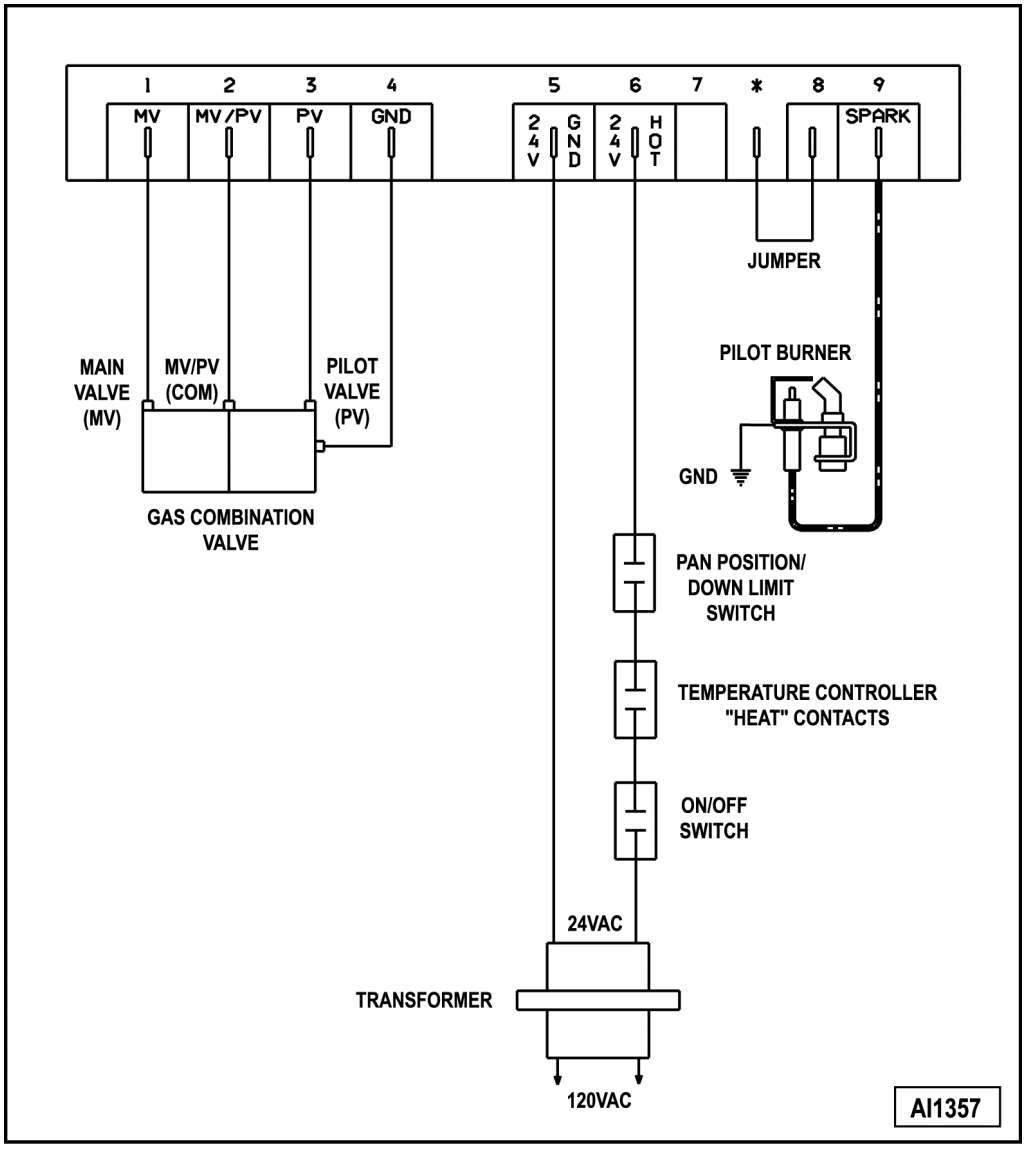


Fig. 79

SEQUENCE OF OPERATION - HEATING

Refer to schematic diagram AI1341 for the electrical sequence of operation. Manual pan lift is the standard configuration.

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

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

   - C. Pan temperature is below 200°F.
   - D. On/off switch off.
   - E. Pan position/down limit switch N.O. contacts closed (pan down).
   - F. Gas supply on.
   - G. Gas combination control valve on.
2. Turn on/off switch on.
   - A. Indicator light (amber) comes on.
3. Set the temperature dial to call for heat.
   - A. Internal relay on temperature controller is energized and the "HEAT" contacts close (N.O.).
     - 1) Heat light (red) comes on.
     - 2) Ignition control module.

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

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

SEQUENCE OF OPERATION - MOTORIZED PAN LIFT (Option)

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

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

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

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

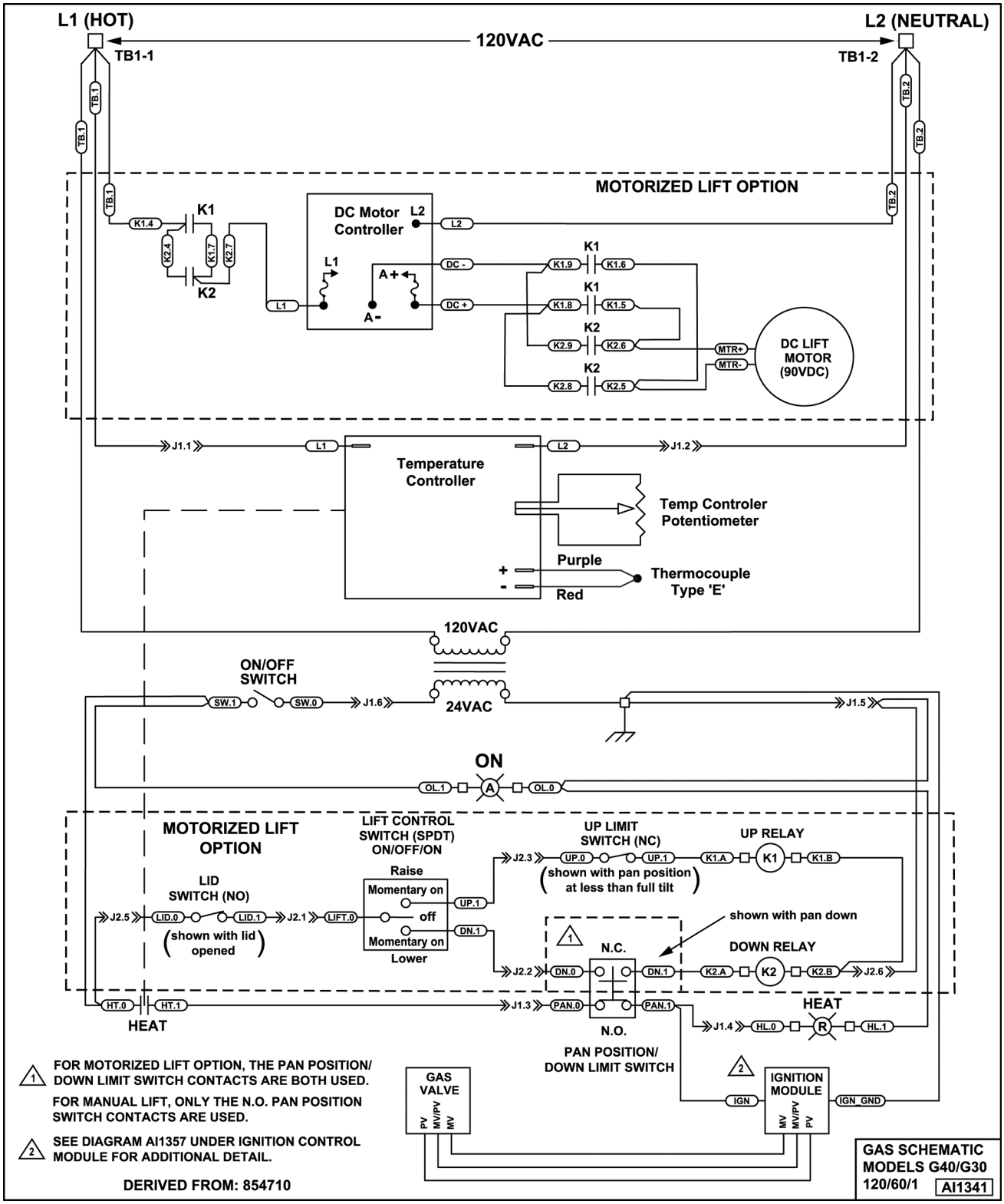
NOTE: If the temperature dial is set to call for heat, the ignition trial starts and module begins sparking.

3. Operate the lift control switch to raise the pan (momentary on - raise).
    A. K1 relay coil is energized thru the up limit switch N.C contacts.
        1) K1 4/7 N.O. contacts close.
        2) K1 9/6 N.O. contacts close.
        3) K1 8/5 N.O. contacts close.
    B. 120VAC to DC motor controller thru K1 4/7 N.O. contacts.
        1) 90VDC output is activated at terminals A + (positive) and A - (negative). DC lift motor powered thru K1 9/6 N.O. contacts, K1 8/5 N.O. contacts and pan raises.
4. When the pan is raised 2.25" to 2.50" at the rear, pan position/down limit switch contacts change state. The N.O contacts open to remove power from the heating circuit; and the N.C contacts close. Power is then available for K2 relay coil thru the N.C. set of contacts.

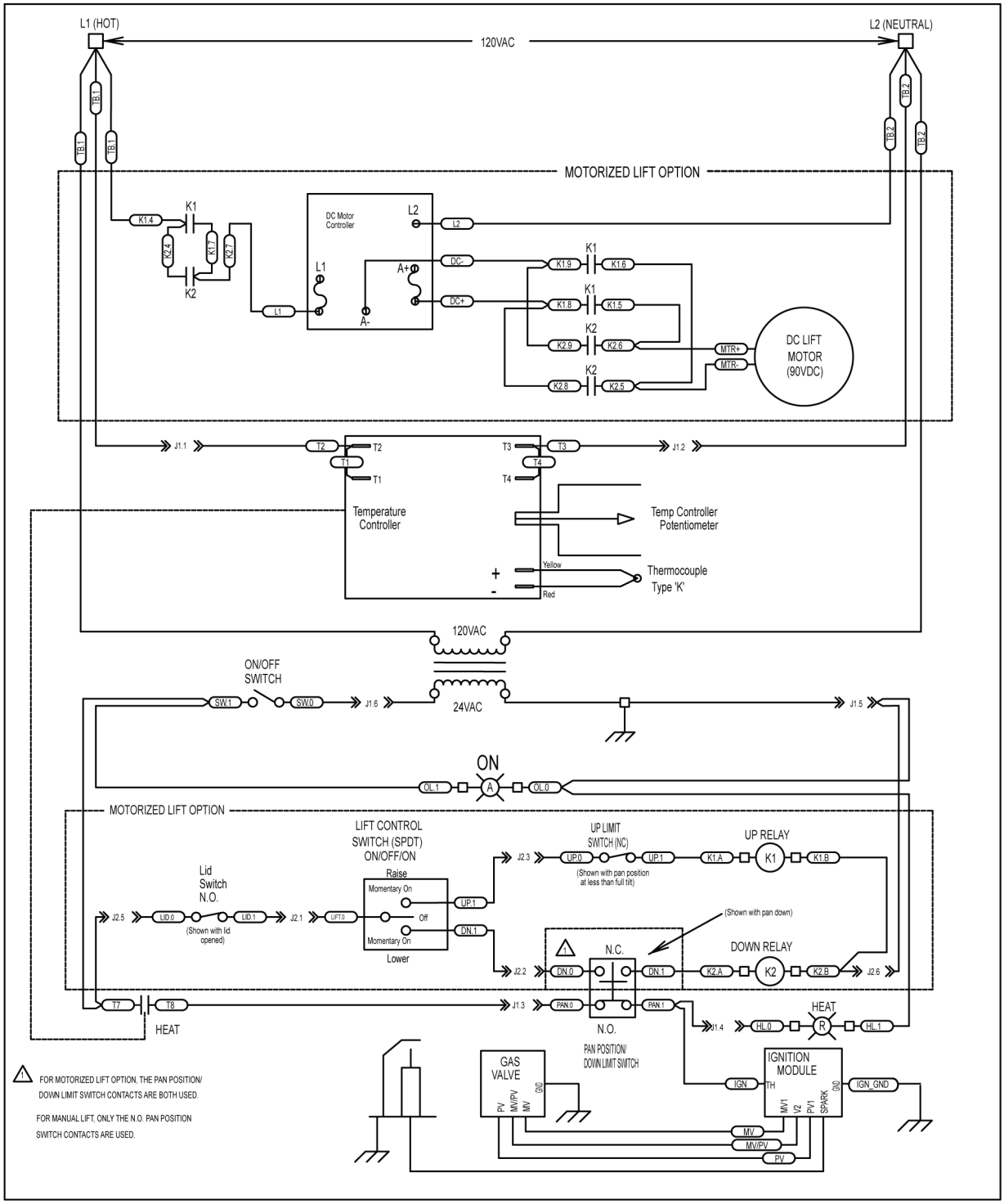
    The pan can still be raised or lowered thru its travel range by operating the lift control switch. Release switch to stop pan travel.
5. Pan reaches full tilt position, the up limit switch N.C. contacts open and K1 relay coil is deenergized.
    A. The three sets of K1 contacts return to N.O. position.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

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

SCHEMATIC DIAGRAM



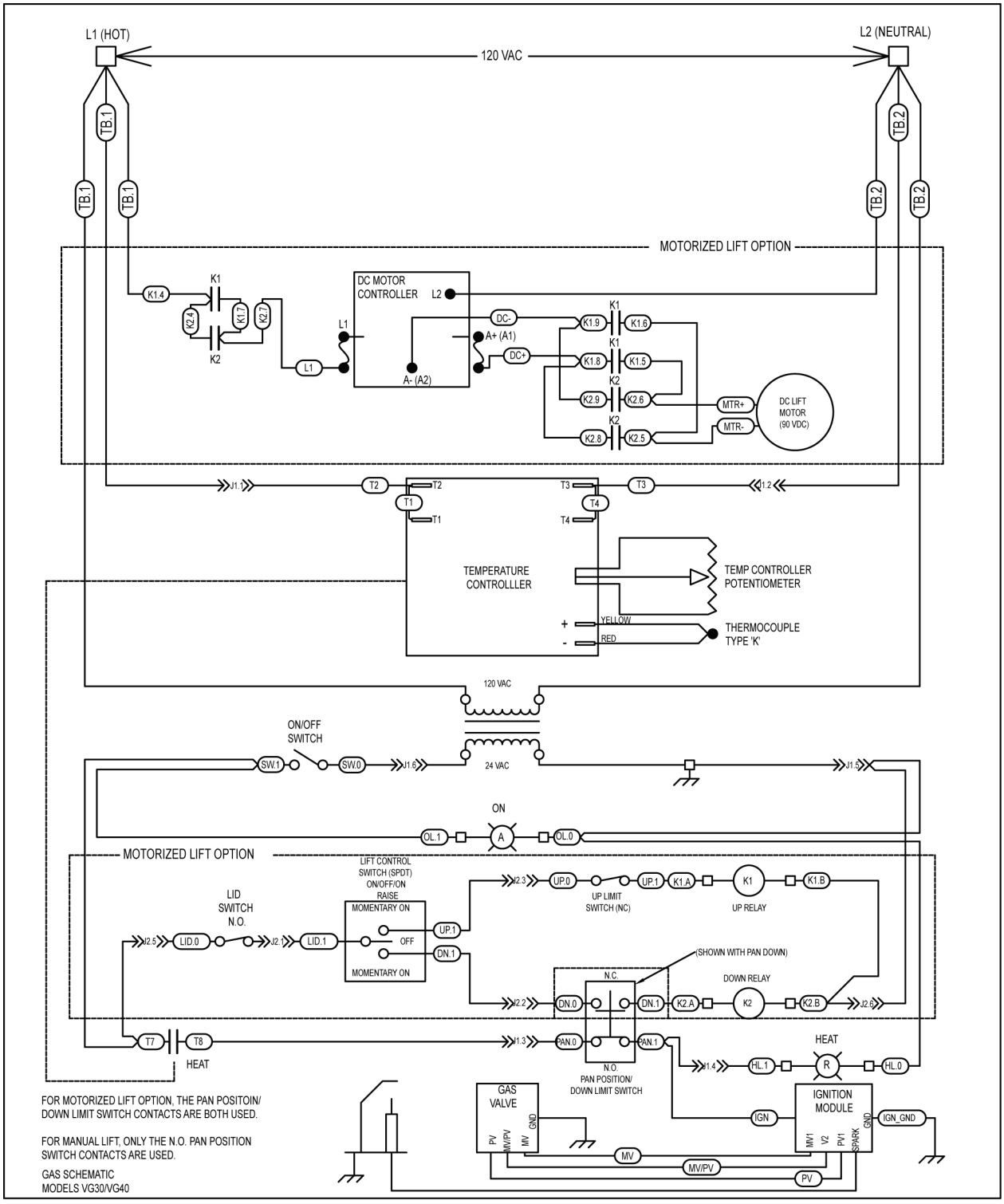
1ST GENERATION WATLOW TEMPERATURE CONTROLLER - HONEYWELL IGNITION CONTROL MODULE



DERIVED FROM 00-854710-00001 REV H

AI4983

2ND GENERATION CYRDOM TEMPERATURE CONTOLLER - HONEYWELL IGNITION CONTROL MODULE



DERIVED FROM 00-854710-0001 REV I

AI4981

2ND GENERATION CYRDOMTEMPERATURE CONTROLLER - FENWELL IGNITION CONTROL MODULE

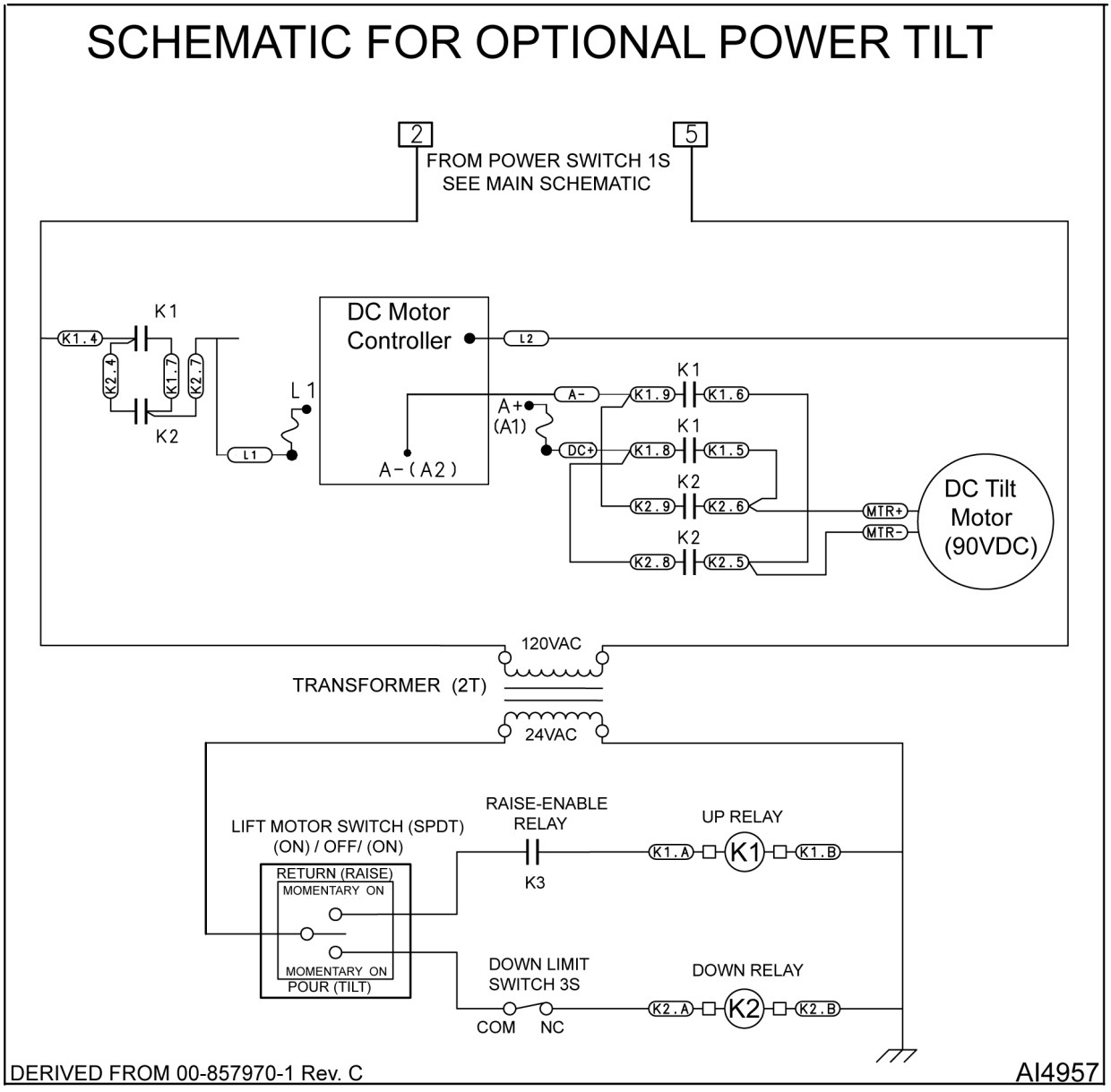

SCHEMATIC FOR OPTIONAL POWER TILT
2
5
FROM POWER SWITCH 1S
SEE MAIN SCHEMATIC
K1
K1.4
K2.4
K1.7
K2.7
K2
L1
L1
DC Motor
Controller
L2
A-
A+
(A1)
A-(A2)
DC+
K1
K1.9
K1.6
K1
K1.8
K1.5
K2
K2.9
K2.6
K2
K2.8
K2.5
MTR+
MTR-
DC Tilt
Motor
(90VDC)
120VAC
TRANSFORMER (2T)
24VAC
LIFT MOTOR SWITCH (SPDT)
(ON) / 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. 83

TROUBLESHOOTING

GAS HEATING (MANUAL LIFT OR MOTORIZED LIFT OPTION)

SYMPTOMS	POSSIBLE CAUSES
No spark to ignite pilot burner gas, power on light is lit.	1. Pan not fully lowered or pan position/down limit switch malfunction. 2. Temperature dial not set to call for heat or temperature controller malfunction. 3. Verify ground wire attached to pilot mounting bracket. 4. Ignitor cable open or grounded (short). 5. Ignitor spark gap distance incorrect. 6. Shorted electrode or an improper ground on ignitor/flame sense. 7. Ignition module not grounded or inoperative.
Spark at ignitor but pilot burner does not light.	1. Gas combination valve off or inoperative. 2. Gas supply off or insufficient gas pressure. 3. Ignitor spark gap distance incorrect. 4. Pilot burner orifice obstructed. 5. Ignition Module malfunction.
Pilot burner lights but will not maintain flame.	1. Ignitor/flame sense lead wire connections malfunction. 2. Improper ground on pilot burner or ignitor/flame sense; or ignitor/flame sense malfunction. 3. Pilot burner misaligned or Ignitor/flame sense malfunction. 4. Gas pressure not within specified range. 5. Incorrect polarity from transformer to Ignition module. 6. Ignition Module malfunction.
Main burner(s) do not light or will not maintain flame.	1. Gas pressure incorrect. 2. Altitude issue. Verify orifice is correct size. 3. Runner tube - gas orifice obstructed or malfunction. 4. Main burner - gas orifice obstructed or malfunction. 5. Main Burner(s) incorrect air shutter position or burner malfunction. 6. Gas combination valve malfunction.
Braising pan does not heat, power on light is lit.	1. Temperature controller malfunction. 2. Pan position/down limit switch malfunction. 3. Ignition module malfunction. 4. Gas combination valve malfunction. 5. Interconnecting wiring malfunction.

SYMPTOMS	POSSIBLE CAUSES
Braising pan does not heat, power on light is not lit.	1. Main circuit breaker off or power not connected. 2. On/off switch off or malfunction. 3. Transformer inoperative. 4. Interconnecting wiring malfunction.
Excessive or low heat.	1. Temperature probe malfunction. 2. Temperature controller malfunction. 3. Gas pressure incorrect. 4. Gas orifice obstructed or incorrect.
Pilot valve lights fine initially but intermittently will not light even though it is sparking.	1. If voltage is present at gas valve MV/PV (common) and PV connections then the gas valve may not be opening. 2. If there is no voltage present at the MV/PV and PV connections check the ignition module.

MOTORIZED LIFT OPTION ONLY

SYMPTOM	POSSIBLE CAUSES
Pan will not raise.	1. Lid switch open (lid not opened) or malfunction. 2. 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.
Pan will not lower.	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. 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.

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