



**PROTECTOR® SERIES
ELECTRIC FRYERS**
Service & Parts Manual



Frymaster, a member of the Commercial Food Equipment Service Association, recommends using CFESA Certified Technicians.

24-Hour Service Hotline 1-800-551-8633

*** 8196344 *^{APRIL 2008}**

www.frymaster.com

E-mail: service@frymaster.com

NOTICE

IF, DURING THE WARRANTY PERIOD, THE CUSTOMER USES A PART FOR THIS ENODIS EQUIPMENT OTHER THAN AN UNMODIFIED NEW OR RECYCLED PART PURCHASED DIRECTLY FROM FRYMASTER DEAN, OR ANY OF ITS AUTHORIZED SERVICE CENTERS, AND/OR THE PART BEING USED IS MODIFIED FROM ITS ORIGINAL CONFIGURATION, THIS WARRANTY WILL BE VOID. FURTHER, FRYMASTER DEAN AND ITS AFFILIATES WILL NOT BE LIABLE FOR ANY CLAIMS, DAMAGES OR EXPENSES INCURRED BY THE CUSTOMER WHICH ARISE DIRECTLY OR INDIRECTLY, IN WHOLE OR IN PART, DUE TO THE INSTALLATION OF ANY MODIFIED PART AND/OR PART RECEIVED FROM AN UNAUTHORIZED SERVICE CENTER.

⚠ DANGER

Copper wire suitable for at least 167°F (75°C) must be used for power connections.

⚠ DANGER

The electrical power supply for this appliance must be the same as indicated on the rating and serial number plate located on the inside of the fryer door.

⚠ DANGER

This appliance must be connected to the voltage and phase as specified on the rating and serial number plate located on the inside of the fryer door.

⚠ DANGER

All wiring connections for this appliance must be made in accordance with the wiring diagrams furnished with the equipment. Wiring diagrams are located on the inside of the fryer door.

⚠ DANGER

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

⚠ WARNING

Do not attach accessories to this fryer unless fryer is secured from tipping. Personal injury may result.

⚠ WARNING

Frymaster fryers equipped with legs are for permanent installations. Fryers fitted with legs must be lifted during movement to avoid damage and possible bodily injury. For a moveable or portable installation, Frymaster optional equipment casters must be used. Questions? Call 1-800-551-8633 or email at service@frymaster.com.

⚠ WARNING

Do not use water jets to clean this equipment.

⚠ WARNING

This equipment is intended for indoor use only. Do not install or operate this equipment in outdoor areas.

⚠ DANGER

Adequate means must be provided to limit the movement of this appliance without depending on or transmitting stress to the electrical conduit. A restraint kit is provided with the fryer. If the restraint kit is missing contact your local KES.

⚠ DANGER

Prior to movement, testing, maintenance and any repair on your Frymaster fryer, disconnect all electrical power from the fryer.

ELECTRICAL POWER SPECIFICATIONS

Three (3) Phase Requirements								
kW	VOLTAGE	PHASE	WIRE SERVICE	MINIMUM SIZE		AMPS PER LEG		
				AWG	mm ²	L1	L2	L3
14	208	3	3	6	16	39	39	39
14	240	3	3	6	16	34	34	34
14	480	3	3	8	10	17	17	17
14	220/380	3	4	6	16	21	21	21
14	240/415	3	4	6	16	20	20	21
14	230/400	3	4	6	16	21	21	21
ALL EPRI 14kW (SOLID STATE)	208	3	3	6	16	39	39	39
	240	3	3	6	16	34	34	34
	220/380	3	4	6	16	21	21	21
	240/415	3	4	6	16	20	20	20
17	208	3	3	6	16	48	48	48
17	240	3	3	6	16	41	41	41
17	480	3	3	6	16	21	21	21
17	220/380	3	4	6	16	26	26	26
17	240/415	3	4	6	16	24	24	24
17	230/400	3	4	6	16	25	25	25
ALL EPRI 17kW (SOLID STATE)	208	3	3	6	16	48	48	48
	240	3	3	6	16	41	41	41
	220/380	3	4	6	16	26	26	26
	240/415	3	4	6	16	24	24	24
22	208	3	3	4	25	61	61	61
22	240	3	3	4	25	53	53	53
22	480	3	3	6	16	27	27	27
22	220/380	3	4	6	16	34	34	34
22	240/415	3	4	6	16	31	31	31
22	230/400	3	4	6	16	32	32	32

Single Phase Requirements						
kW	VOLTAGE	PHASE	WIRE SERVICE	MINIMUM SIZE		AMPS
				AWG	mm ²	
14	208	1	2	3	34	68
14	240	1	2	4	25	59
14	480	1	2	8	10	30



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PROTECTOR® SERIES ELECTRIC FRYERS

CHAPTER 1: SERVICE PROCEDURES

1.1 General

Before performing any maintenance on your Frymaster fryer, disconnect the fryer from the electrical power supply.

⚠ WARNING

To ensure the safe and efficient operation of the fryer and hood, the electrical plug must be fully engaged and locked in its pin and sleeve socket.

When electrical wires are disconnected, it is recommended that they be marked in such a way as to facilitate re-assembly.

1.2 Replacing a Computer

1. Disconnect the fryer from the electrical power supply.
2. The controller bezel is held in place by tabs at the top and bottom. Slide the metal bezel up to disengage the lower tabs. Then slide the bezel down to disengage the upper tabs.
3. Remove the two screws from the upper corners of the control panel. The control panel is hinged at the bottom and will swing open from the top.
4. Unplug the wiring harnesses from the connectors on the back of the computer, marking their position for reassembly, and disconnect the grounding wires from the terminals. Remove the control panel assembly by lifting it from the hinged slots in the control panel frame.



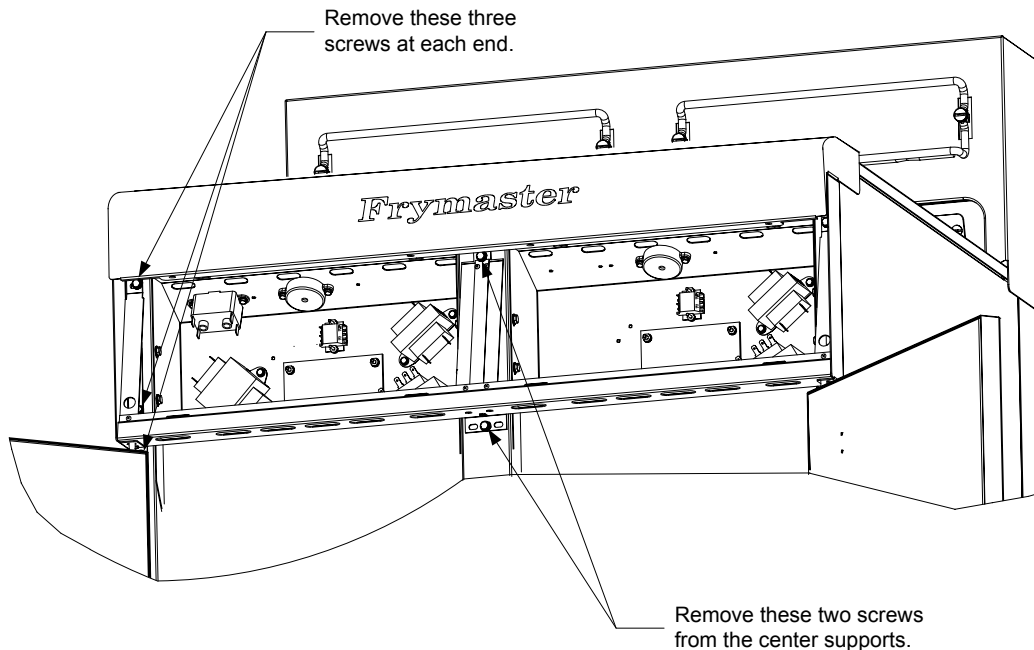
5. Remove the controller from the control panel assembly and install the replacement computer. Reinstall the control panel assembly by reversing steps 1 thru 4.

1.3 Replacing Component Box Components

1. Disconnect the fryer from the electrical power supply.
2. The controller bezel is held in place by tabs at the top and bottom. Slide the metal bezel up to disengage the lower tabs. Then slide the bezel down to disengage the upper tabs.
3. Remove the two screws from the upper corners of the control panel and allow the control panel to swing down.

4. Unplug the wiring harnesses and disconnect the grounding wires from the terminals on the back of the controller. Remove the control panel assembly by lifting it from the hinge slots in the control panel frame.
5. Disconnect the wiring from the component to be replaced, being sure to make a note of where each wire was connected.
6. Dismount the component to be replaced and install the new component, being sure that any required spacers, insulation, washers, etc. are in place.

NOTE: If more room to work is required, the control panel frame assembly may be removed by removing the hex-head screws, which secure it to the fryer cabinet (see illustration below). If this option is chosen, all control panel assemblies must be removed per steps 1 and 2 above. The cover plate, on the lower front of the component box, may also be removed to allow additional access if desired. *Removing the component box itself from the fryer is not recommended due to the difficulty involved in disconnecting and reconnecting the oil-return valve rods, which pass through openings in the component box.*



Removing the Control Panel Frame and Top Cap Assembly

7. Reconnect the wiring disconnected in step 5, referring to your notes and the wiring diagrams on the fryer door to ensure that the connections are properly made. Also, verify that no other wiring was disconnected accidentally during the replacement process.
8. Reverse steps 1 through 4 to complete the replacement and return the fryer to service.

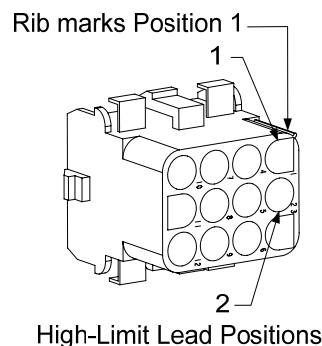
1.4 Replacing a High-Limit Thermostat

1. Remove the filter pan and lid from the unit. Drain the frypots into a Shortening Disposal Unit (SDU) or other appropriate **METAL** container.

⚠ DANGER

DO NOT drain more than one full frypot into the SDU at one time.

2. Disconnect the fryer from the electrical power supply and reposition it to gain access to the rear of the fryer.
3. Remove the screws from the bottom of the lower back panel attaching the contactor plug guards.
4. Remove each of the guards.
5. Remove the four screws from both the left and right sides of the lower back panel.
6. Locate the high-limit that is being replaced and follow the two-black wires to the 12-pin connector C-6. Note where the leads are connected prior to removing them from the connector. Unplug the 12-pin connector C-6 and using a pin-pusher push the pins of the high-limit out of the connector.
7. Carefully unscrew the high-limit thermostat to be replaced.
8. Apply Loctite™ PST 567 or equivalent sealant to the threads of the replacement and screw it securely into the frypot.
9. Insert the leads into the 12-pin connector C-6 (see illustration below). For full-vats the leads go into positions 1 and 2 of the connector. Polarity does not matter.



10. Reconnect the 12-pin connecting plug C-6. Use wire ties to secure any loose wires.
11. Reinstall the back panels, contactor plug guards, reposition the fryer under the exhaust hood, and reconnect it to the electrical power supply to return the fryer to service.

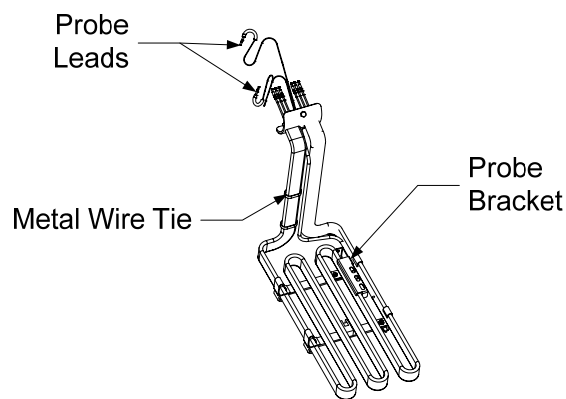
1.5 Replacing a Temperature Probe

1. Remove the filter pan and lid from the unit. Drain the frypots into a Shortening Disposal Unit (SDU) or other appropriate **METAL** container.

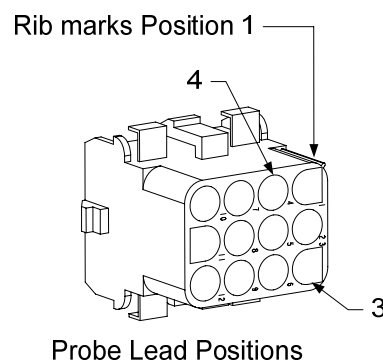
⚠ DANGER

DO NOT drain more than one full frypot into the SDU at one time.

2. Disconnect the fryer from the electrical power supply and reposition it to gain access to the rear of the fryer.
3. Remove the screws from the bottom of the lower panel attaching the contactor plug guards.
4. Remove each of the guards.
5. Remove the four screws from both sides of the lower back panel. Then remove the two screws on both the left and right sides of the back of the tilt housing. Lift the tilt housing straight up to remove from the fryer.
6. Locate the red and white wires of the temperature probe to be replaced. Note where the leads are connected prior to removing them from the connector. Unplug the 12-pin connector C-6 and using a pin-pusher push the pins of the temperature probe out of the connector.
7. Raise the element and remove the securing probe bracket and metal tie wraps that secure the probe to the element (see illustration below).



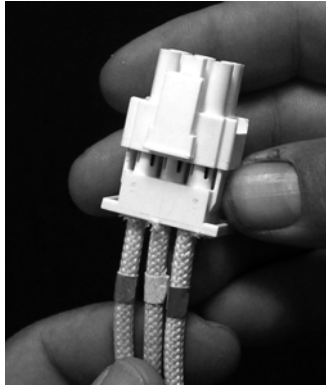
8. Gently pull on the temperature probe and grommet, pulling the wires up the rear of the fryer and through the element tube assembly.
9. Insert the replacement temperature probe (wires first) into the tube assembly ensuring that the grommet is in place. Secure the probe to the elements using the bracket which was removed in Step 7 and the metal tie wraps which were included in the replacement kit.
10. Route the probe wires out of the tube assembly following the element wires down the back of the fryer through the Heyco bushings to the 12-pin connector C-6. Secure the wires to the sheathing with wire ties.
11. Insert the temperature probe leads into the 12-pin connector C-6 (see illustration below). For full-vat units, the red lead goes into position 3 and the white lead into position 4 of the connector.



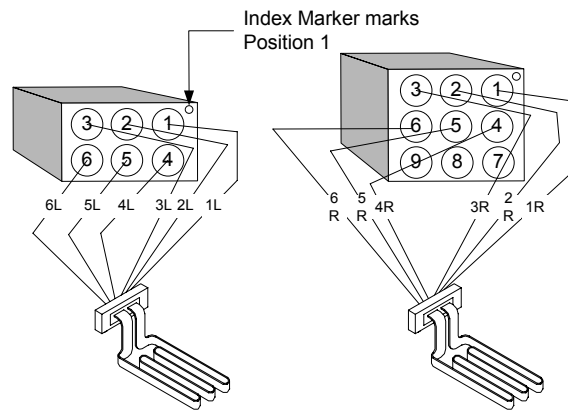
12. Secure any loose wires with wire ties, making sure there is no interference with the movement of the springs. Rotate the elements up and down, making sure movement is not restricted and that the wires are not pinched.
13. Reinstall the tilt housing, back panels and contactor plug guards. Reposition the fryer under the exhaust hood, and reconnect it to the electrical power supply to return the fryer to service.

1.6 Replacing a Heating Element

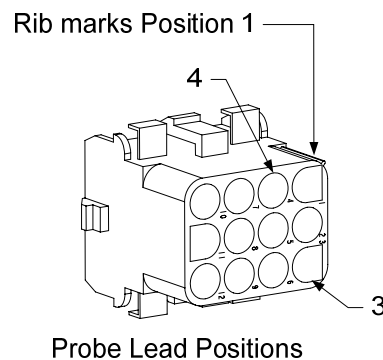
1. Perform steps 1-5 of section 1.5, *Replacing a Temperature Probe*.
2. Disconnect the wire harness containing the probe wiring. Using a pin pusher, disconnect the probe wires from the 12-pin connector C-6.
3. In the rear of the fryer, disconnect the 6-pin connector for the left element (as viewed from the front of the fryer) or the 9-pin connector for the right element from the contactor box. Press in on the tabs on each side of the connector while pulling outward on the free end to extend the connector and release the element leads (see photo below). Pull the leads out of the connector and out of the wire sleeving.



4. Raise the element to the full up position and support the elements.
5. Remove the hex head screws and nuts that secure the element to the tube assembly and pull the element out of the frypot. **NOTE:** Full-vat elements consist of two dual-vat elements clamped together. For full-vat units, remove the element clamps before removing the nuts and screws that secure the element to the tube assembly.
6. If applicable, recover the probe bracket and probe from the element being replaced and install them on the replacement element. Install the replacement element in the frypot, securing it with the nuts and screws removed in Step 5 to the tube assembly. Ensure the gasket is between the tube and element assembly.
7. Route the element leads through the element tube assembly and into the wire sleeving to prevent chafing. Ensure that the wire sleeving is routed back through the Heyco bushings, keeping it clear from the lift springs. Also ensure that the wire sleeving extends into the tube assembly, protecting the wires. Press the pins into the connector in accordance with the diagram on the following page, and then close the connector to lock the leads in place. **NOTE:** It is critical that the wires be routed through the sleeving to prevent chafing.



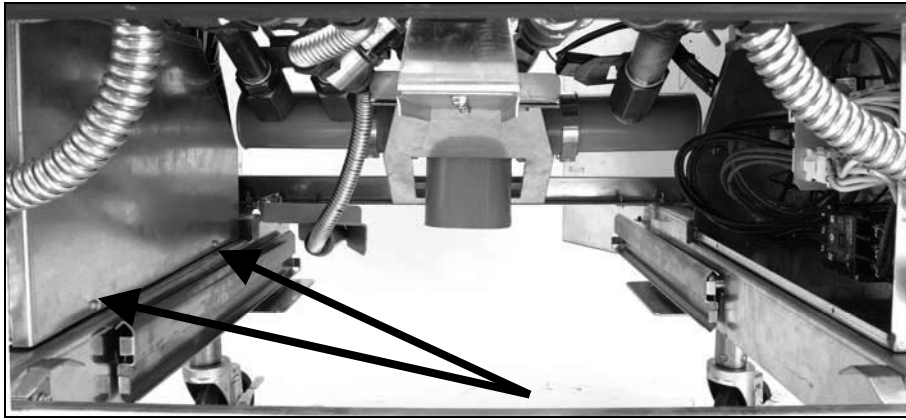
8. Reconnect the element connector ensuring that the latches lock.
9. Insert the temperature probe leads into the 12-pin wiring harness connector C-6 (see illustration below). For full-vat units the red lead goes into position 3 and the white into position 4.



10. Reconnect the 12-pin connector C-6 of the wiring harness disconnected in Step 2.
11. Lower the element down onto the basket rack.
12. Reinstall the tilt housing, back panels and contactor plug guard. Reposition the fryer under the exhaust hood, and reconnect it to the electrical power supply.

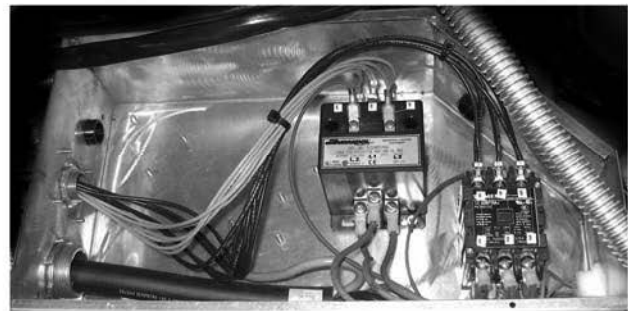
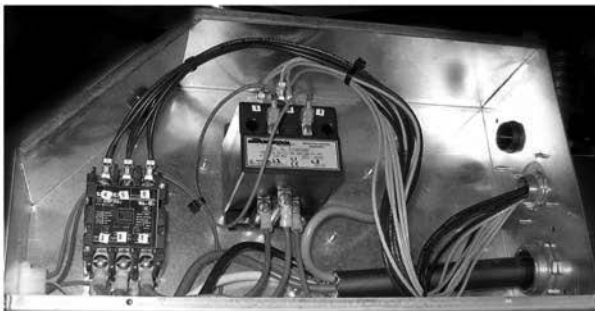
1.7 Replacing Contactor Box Components

1. If replacing a contactor box component, remove the filter pan and lid from the unit.
2. Disconnect the fryer from the electrical power supply.
3. Remove the two screws securing the cover of the contactor box. The contactor boxes above the filter pan are accessed by sliding under the fryer. They are located to the left and right above the guide rails (see photo on following page).



Remove two screws to access contactor box components above the filter pan.

4. The contactors and relays are held on by threaded pin studs so that only removal of the nut is required to replace the component.
5. After performing necessary service, reverse steps 1-4 to return the fryer to operation.



Left and right views of mechanical contactor box components.

1.8 Replacing a Frypot

1. Drain the frypot into the filter pan or, if replacing a frypot over the filter system, into a Shortening Disposal Unit (SDU) or other appropriate **METAL** container. If replacing a frypot over the filter system, remove the filter pan and lid from the unit.

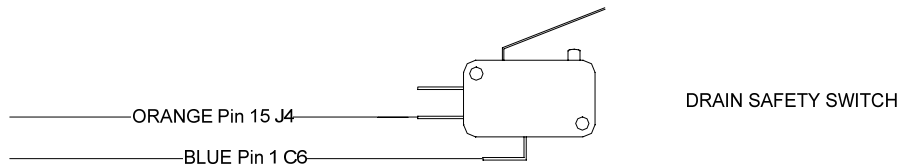
⚠ DANGER

DO NOT drain more than one full frypot into the SDU at one time.

2. Disconnect the fryer from the electrical power supply and reposition it to gain access to both the front and rear.
3. Slide the metal bezel up to release the bottom tabs, then slide the bezel down to disengage the upper tabs.
4. Remove the two screws from the upper corners of the control panels and allow them to swing down (see photo on page 1-1).

5. Unplug the wiring harnesses and ground wires from the backs of the controllers. Remove the controllers by lifting them from the hinge slots in the control panel frame.
6. Remove the screws from the bottom of the lower back panel attaching the contactor plug guards.
7. Remove each of the guards
8. Remove the tilt housing and back panels from the fryer. The tilt housing must be removed first in order to remove the upper back panel.
9. To remove the tilt housing, remove the hex head screws from the rear edge of the housing. The housing can be lifted straight up and off the fryer.
10. Remove the control panel by removing the screws on both sides.
11. Loosen the component boxes by removing the screws, which secure them in the cabinet.
12. Remove the top cap by removing the nuts at each end that secure it to the cabinetry.
13. Remove the hex head screw that secures the front of the frypot to the cabinet cross brace.
14. Remove the top-connecting strip that covers the joint with the adjacent frypot.
15. Unscrew the nut located on the front of each section of drain tube, and remove the tube assembly from the fryer.
16. Remove the covers from the drain safety switch(es) and disconnect the wiring at the switch(es).
17. Disconnect any auto top-off sensors and wiring.
18. At the rear of the fryer, unplug the 12-pin connector C-6 and, using a pin pusher, disconnect the high-limit thermostat leads.
19. Disconnect the oil return and top off flexline(s).
20. Raise the elements to the “up” position and disconnect the element springs.
21. Remove the machine screws and nuts that secure the element tube assembly to the frypot. Carefully lift the element assembly from the frypot and secure it to the cross brace on the rear of the fryer with wire ties or tape.
22. Carefully lift the frypot from the fryer and place it upside down on a stable work surface.
23. Recover the drain valve(s), oil return flexline connection fitting(s), auto top-off sensors and high-limit thermostat(s) from the frypot. Clean the threads and apply Loctite™ PST 567 or equivalent sealant to the threads of the recovered parts and install them in the replacement frypot.
24. Carefully lower the replacement frypot into the fryer. Reinstall the hex head screw removed in step 9 to attach the frypot to the fryer.
25. Position the element tube assembly in the frypot and reinstall the machine screws and nuts removed in step 21.

26. Reconnect the oil return and auto top off flexlines to the frypot, and replace aluminum tape, if necessary, to secure heater strips to the flexlines.
27. Insert the high-limit thermostat leads disconnected in step 18 (see illustration on page 1-3 for pin positions).
28. Reconnect the auto top-off sensors.
29. Reconnect the drain safety switch wiring to the switch(es) in accordance with the diagram below then reinstall the switch covers.



30. Reinstall the drain tube assembly.
31. Reinstall the top connecting strips, top cap, tilt housing, back panels and contactor plug guards.
32. Reinstall controllers in the control panel frame and reconnect the wiring harnesses and ground wires.
33. Reposition the fryer under the exhaust hood and reconnect it to the electrical power supply.

1.9 Built-in Filtration System Service Procedures

1.9.1 Filtration System Problem Resolution

One of the most common causes of filtration problems is placing the filter paper on the bottom of the filter pan rather than over the filter screen.

⚠ CAUTION

Ensure that filter screen is in place prior to filter paper placement and filter pump operation. Improper screen placement is the primary cause of filtration system malfunction.

Whenever the complaint is “the pump is running, but no oil is being filtered,” check the installation of the filter paper, and ensure that the correct size is being used. While you are checking the filter paper, verify that the O-rings on the pick-up tube of the filter pan are in good condition. A missing or worn O-ring allows the pump to take in air and decrease its efficiency.

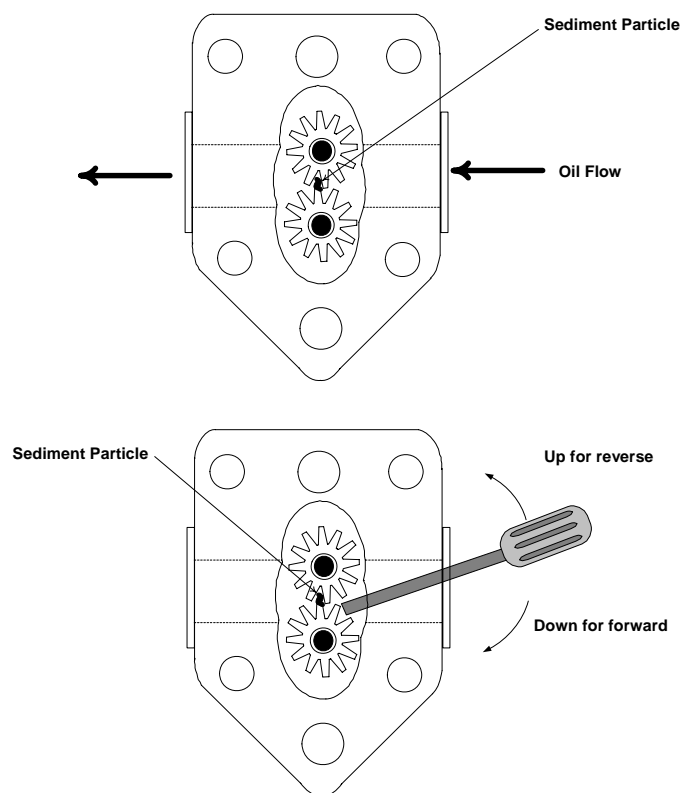
If the pump motor overheats, the thermal overload will trip and the motor will not start until it is reset. If the pump motor does not start, press the red reset switch (button) located on the rear of the motor.

If the pump starts after resetting the thermal overload switch, then something is causing the motor to overheat. A major cause of overheating is when several frypots are filtered sequentially, overheating the pump and motor. Allow the pump motor to cool at least 30 minutes before resuming operation. Pump overheating can be caused by:

- Solidified shortening in the pan or filter lines, or
- Attempting to filter unheated oil or shortening (cold oil and shortening are more viscous, overloading the pump motor and causing it to overheat).

If the motor runs but the pump does not return oil, there is a blockage in the pump. Incorrectly sized or installed paper will allow food particles and sediment to pass through the filter pan and into the pump. When sediment enters the pump, the gears bind, causing the motor to overload, again tripping the thermal overload. Shortening that has solidified in the pump will also cause it to seize, with the same result.

A pump seized by debris or hard shortening can usually be freed by manually moving the gears with a screwdriver or other instrument.



Disconnect power to the filter system, remove the input plumbing from the pump, and use a screwdriver to manually turn the gears.

- Turning the pump gears in reverse will release a hard particle.
- Turning the pump gears forward will push softer objects and solid shortening through the pump and allow free movement of the gears.

Incorrectly sized or installed paper/pads will also allow food particles and sediment to pass through and clog the suction tube on the bottom of the filter pan. Particles large enough to block the suction tube may indicate that the crumb tray is not being used. Pan blockage can also occur if shortening is left in the pan and allowed to solidify. Blockage removal can be accomplished by forcing the item out with an auger or drain snake. Compressed air or other pressurized gases should not be used to force out the blockage.

1.9.2 Replacing the Filter Motor, Filter Pump, and Related Components

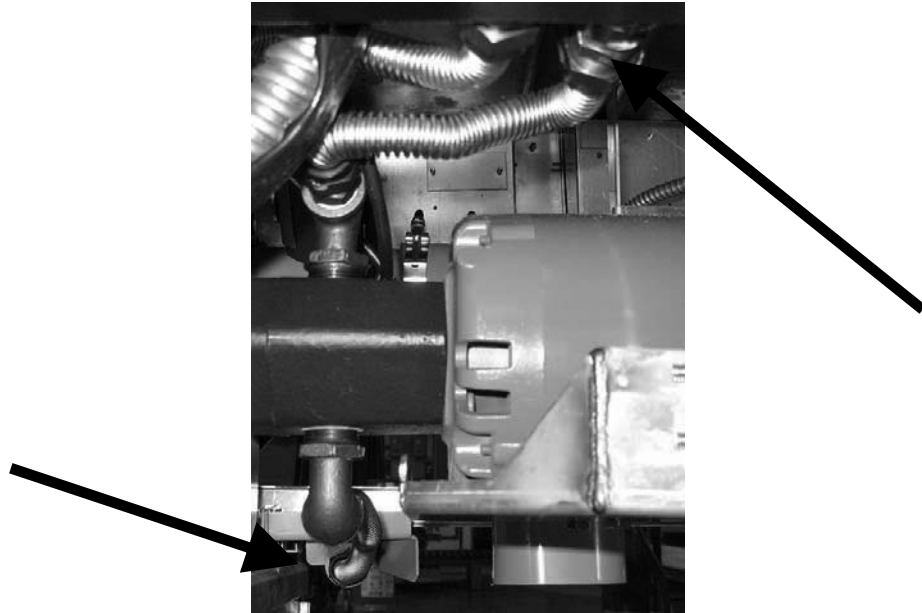
1. Remove the filter pan and lid from the unit. Drain the frypots into a Shortening Disposal Unit (SDU) or other appropriate metal container.

⚠ DANGER

DO NOT drain more than one full frypot into the SDU at one time.

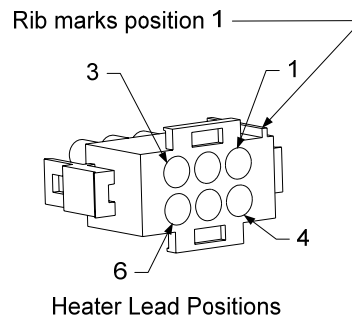
2. Disconnect the fryer from the electrical power supply and reposition it to gain access to both the front and rear.

3. Disconnect the flexline running to the oil-return manifold at the rear of the fryer as well as the pump suction flexline at the end of the filter pan connection (see photo below).



Disconnect flexlines indicated by the arrows.

4. Loosen the nut and bolt that secures the bridge to the oil-return manifold.
5. Remove the cover plate from the front of the motor and disconnect the motor wires.
6. Unplug the pump motor assembly 6-pin connector C-2.
7. Remove the two nuts and bolts which secure the front of the bridge to the cross brace and carefully slide the bridge rearward off the cross brace until its front end can be lowered to the floor. Undo the single nut holding it in place in back. Be careful not to let the rear of the bridge slip off the manifold at this point.
8. Get a good grip on the bridge, carefully pull it forward off the oil-return manifold, and lower the entire assembly to the floor. Once on the floor, pull the assembly out the front of the fryer.
9. When required service has been completed, reverse steps 3-8 to reinstall the bridge. **NOTE:** The black motor wires go on the top terminal, the white on the bottom. The red/black heater tape wires go into position 3 and the violet/white wires go into position 6 (see illustration below).



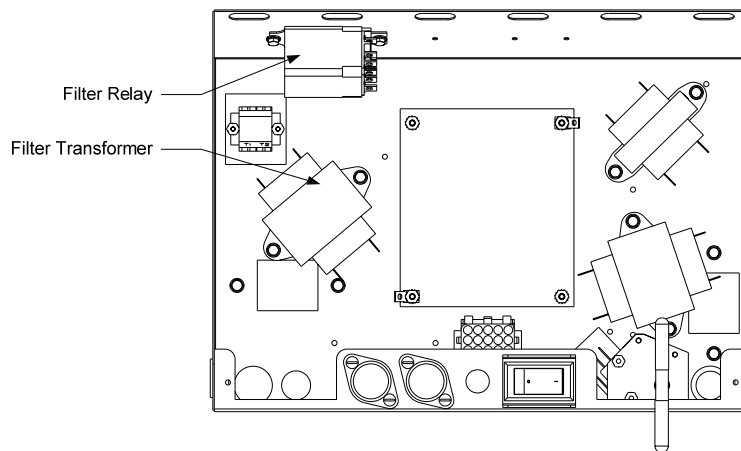
10. Reconnect the unit to the electrical power supply, and verify that the pump is functioning correctly (i.e., when a filter handle is placed in the ON position, the motor should start and there should be strong suction at the intake fitting and outflow at the rear flush port.)

11. When proper operation has been verified, reinstall the back panels and the filter pan and lid.
12. Reposition the fryer under the exhaust hood and reconnect it to the electrical power supply, if necessary to return the fryer to service.

1.9.3 Replacing the Transformer or Filter Relay

Disconnect the fryer from the electrical power supply. Remove the left controller from the fryer to expose the interior of the left component box. The transformer and relay on the left are located as shown in the illustration below. Once replaced, reconnect the power.

When replacing a filter relay in the left component box, ensure the 24VAC relay (8070670) is used on 208-240V units and 8070012 is used on 120V units. This relay is the same relay used in the RE fryers.



1.10 Basket Lift Service Procedures

Protector[®] Series electric fryers may be equipped with automatic basket lifts. Basket lifts always come in pairs, although each operates independently.

A **modular basket lift** (illustrated on the following page) is a self-contained sub-assembly consisting of a pair of toothed rods, which support removable basket lift arms, a pair of reversible-drive gear motors, and four microswitches. The gear motors engage the teeth of the rods, moving them up or down depending upon the motors' direction of rotation. The microswitches at the upper and lower limits of movement stop the motors when the basket is in the full up or full down position.

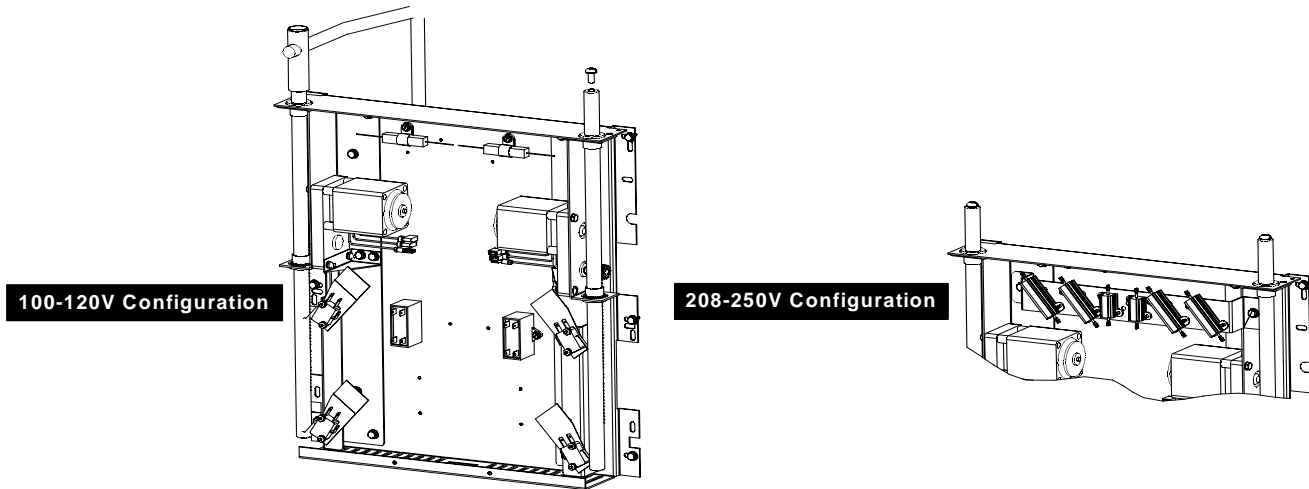
Timing circuitry in the controller initiates and stops basket lift operation depending upon the variables programmed by the operator. When the product button is pressed, the timing circuitry activates a coil in the basket lift relay to supply power to the lower microswitch. The microswitches stop the motor at the lift's upper and lower travel limits and reverse the direction of current flow thus reversing the motor direction.

When the product button is pushed on the computer/controller, current flows through a coil in the basket lift relay, causing the lower circuit to be activated. The basket lift lowers, closing the normally open upper-micro-switch. When the downward-moving rod opens the lower normally closed microswitch, the power to the motor ceases to flow. When the computer times out, the current to the relay coil is cut, allowing the upper circuit to be activated. The basket lift rises and re-closes the lower

microswitch. When the basket lift rod clears the upper microswitch, the microswitch reopens, power to the circuit is cut, and the motor stops. Pushing the product button restarts the cycle.

Problems with the basket lift can be grouped into three categories:

- Binding/jamming problems
- Motor and gear problems
- Electronic problems



BINDING/JAMMING PROBLEMS

Noisy, jerky or erratic movement of the lifts is usually due to lack of lubrication of the rods and their bushings. Apply a light coat of Lubriplate[®] or similar lightweight white grease to the rod and bushings to correct the problem.

With the modular basket lift, another possible cause of binding is improper positioning of the motor, which prevents the gear from correctly engaging the teeth in the rod. To correct the problem, loosen the screws that hold the motor in place and move it forward or backward until the rod has just enough slack to be rotated slightly.

MOTOR AND GEAR PROBLEMS

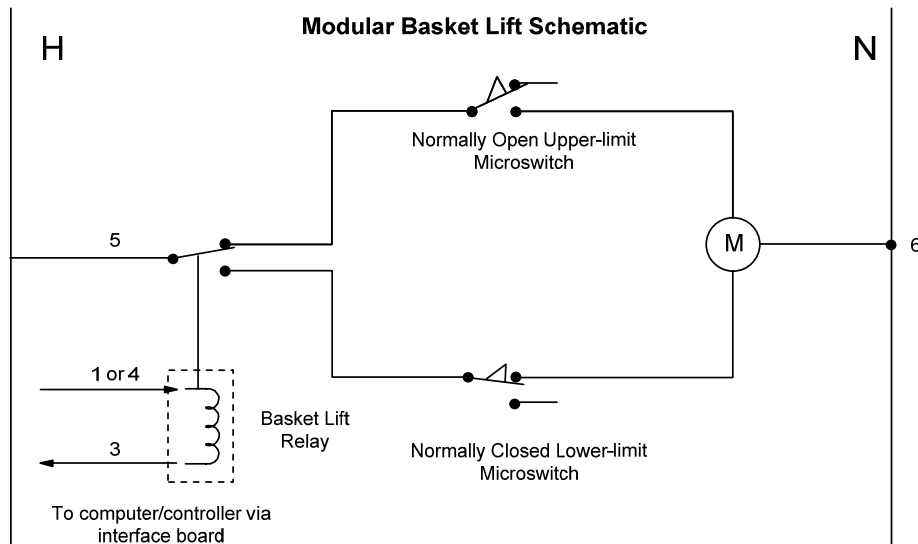
With the modular basket lift, the most likely problem to be encountered in this category is erratic motion of the lift due to a worn drive gear. Failure to keep the lift rod and bushings properly lubricated will cause unnecessary wear of the gear. The problem is corrected by replacing the worn gear.

If the lift cycles correctly but fails to remain in the up position (i.e., goes up, but then slowly settles back down into the frypot), the problem is a failed motor brake. A failed motor brake cannot be repaired and requires replacement of the motor itself.

If power is reaching the motor but the motor fails to run, the motor is burned out and must be replaced.

ELECTRONIC PROBLEMS

Within this category are problems associated with the relays, microswitches, capacitors, resistors, interface board, wiring, and controls. The most common problem in this category is a lift that continuously travels up and down. This is usually caused by a microswitch that is out of adjustment. Troubleshooting the electronics of a modular basket lift is simply a process of verifying current flow through the individual components up to and including the motor. Using a multimeter set to the 250 VAC range, check the connections on both sides of the component for the presence of the applied line voltage. The schematic below and the wiring diagram on page 1-27 and 1-28 can identify the components and wiring connection points.



1.11 ATO (Automatic Top-off) Service Procedures

The automatic top-off system is activated when the oil level falls below a sensor in the rear of the frypot. The signal is sent to the ATO board to engage the solenoid to the frypot and turn on the ATO pump. The pump draws oil from the JIB (Jug In Box) to a port in the rear of the frypot. Once the oil level has satisfied the sensor, the pump and solenoid turn off.

The ATO board is located inside the box, behind the JIB (see Figure 1). The power for the ATO board is supplied from the right hand component box. The power passes through the transformer inside the ATO box to the board.

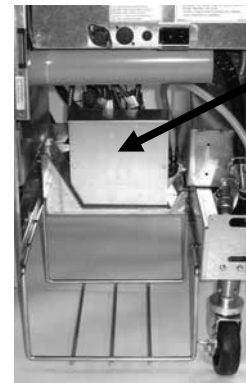


Figure 1

1.11.1 ATO (Automatic Top-off) Troubleshooting

Problem	Probable Causes	Corrective Action
<p>Frypots won't top off.</p>	<p>A. Probe temperature lower than setpoint.</p> <p>B. Temperature in supply line or JIB is too low.</p> <p>C. ATO board power loss</p> <p>D. Failed solenoid.</p> <p>E. ATO pump failed or over tightened.</p> <p>F. Failed transformer/harness.</p> <p>G. Failed ATO board.</p>	<p>A. Check to see that fryer is heating. Fryer temperature must be at least 300°F (149°C). Check probe resistance. If probe is bad, replace the probe.</p> <p>B. Ensure oil is above 70°F (21°C).</p> <p>C. Power to the ATO board has been cut off. Restore power to the board and switch all computers off and on again to readdress system.</p> <p>D. Check solenoid to see if functioning properly.</p> <p>E. If the solenoid is working, ensure that the screws on the bottom of the pump are not too tight. Loosen the screws. If loosening the screws doesn't fix the problem, replace the pump.</p> <p>F. Ensure transformer in ATO box is functioning properly. Check power from transformer to ATO board. Ensure all harnesses are plugged securely into place.</p> <p>G. Check for proper voltages using the pin position chart found on page 1-16. If ATO found defective, replace ATO board.</p>
<p>The yellow JIB low light won't illuminate.</p>	<p>A. No power in the component box.</p> <p>B. Failed transformer.</p> <p>C. Loose wire connection</p>	<p>A. Ensure power is present in the component box.</p> <p>B. If power is present in component box, check the transformer for correct voltage.</p> <p>C. Ensure the yellow LED is securely attached to plug J6 on the ATO board.</p>
<p>One vat tops off but other vats fail to top off.</p>	<p>A. Failed solenoid</p> <p>B. Loose wire connection.</p>	<p>A. Check power to the pump. If the pump is hot, the solenoid has probably failed.</p> <p>B. Ensure all wiring harnesses are securely connected to ATO board and solenoids.</p>
<p>Incorrect vat tops off.</p>	<p>A. Wired incorrectly.</p> <p>B. Flexlines connected to wrong vat.</p>	<p>A. Ensure wires are wired correctly.</p> <p>B. Switch flexlines to correct vat.</p>

1.11.2 ATO (Automatic Top-Off) Board Pin Positions and Harnesses

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J8	Solenoids	8074572 x1 (FV) 8074572 x2 (DV)	1	Output DV - Vat #1	Ground	Orange
			2	Output FV - Vat #1		
			3	Output DV - Vat #2		
			4	Output FV - Vat #2		
			5	Output DV - Vat #3		
			6	Output FV - Vat #3		
	Top Off Pump JIB Low Reset Switch	8074627	7	Top Off Pump	16VDC	Black
			8	JIB Low Reset		Black
	Solenoids	8074572 x1 (FV) 8074572 x2 (DV)	9	24VAC DV - Vat #1	24VAC	Orange
			10	24VAC FV - Vat #1		
			11	24VAC DV - Vat #2		
			12	24VAC FV - Vat #2		
			13	24VAC DV - Vat #3		
			14	24VAC FV - Vat #3		
	Top Off Pump & JIB Low Reset Switch	8074627	15	Ground	16VDC	Red
			16	Ground		Red
J4 (Rear) / J5 (Front)	Transformer	8074553	1	24VAC Ret	24VAC	Orange
			2	24VAC		Blue
			3			
			4			
			5	12VAC Ret	12VAC	Red
			6	12VAC		Brown
			7			
			8			
J3 - Vat #3 J2 - Vat #2 J1 - Vat #1	ATO RTD	8074655 - Vat #1 8074654 - Vat #2 8074621 - Vat #3	1	DV - Probe Ground	Ohm	White
2			DV - Probe	Red		
3			FV - Probe Ground	White		
4			FV - Probe	Red		
J6	Orange LED	8074555	1	16VDC	16VDC	Black
2			16VDC Ret	Red		
J7			1			
			2			
			3	Ground		
			4	RB7/DATA		
			5	RB6/CLOCK		
J10	Network Resistor (pins 2 & 3) or to next ATO Board (4 & 5 vat units)	8074552	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			
J9	CM7 J7	8074646	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			

1.11.3 Replacing the ATO board or Transformer

Disconnect the fryer from the electrical power supply. Locate the ATO box (see Figure 1 on page 14), behind the JIB (Jug In Box). Remove the cover to expose the transformer and ATO board (see Figure 2). Mark and unplug any wires or harnesses. Replace the defective component and reattach all wires or harnesses. Replace the cover. Once replaced, reconnect the power. Remove and restore power to **ALL** computers after power has been restored to the ATO board.



Figure 2

1.11.4 Replacing the ATO Pump or Solenoid

Disconnect the fryer from the electrical power supply. Locate the ATO pump and solenoid tree (see Figure 3), behind the ATO box. Mark and unplug any wires or harnesses. Replace the defective component and reattach all wires or harnesses. Once replaced, reconnect the power.



Figure 3

1.12 CM7 Computer Service Procedures

1.12.1 CM7 Computer Troubleshooting

Problem	Probable Causes	Corrective Action
No Display on Computer.	A. Computer not turned on.	A. Press the ON/OFF switch to turn the computer on.
	B. No power to the fryer.	B. Verify fryer is plugged in and that the circuit breaker is not tripped.
	C. Computer has failed.	C. Swap the computer with a computer known to be good. If computer functions, replace the computer.
	D. Damaged computer wiring harness.	D. Swap with a harness known to be good. If computer functions, replace the harness.
	E. Power supply component or interface board has failed.	E. If any component in the power supply system (including the transformer and interface board) fail, power will not be supplied to the computer and it will not function.
Computer locks up.	Computer error.	Remove and restore power to the computer.
CM7 display is in wrong temperature scale (Fahrenheit or Celsius).	Incorrect display option programmed.	See section 1.12.2 on page 1-21 to change temperature scale.
CM7 display shows HOT-HI-1.	Frypot temperature is more than 410°F (210°C) or, in CE countries, 395°F (202°C).	This is an indication of a malfunction in the temperature control circuitry, including a failure of the high-limit thermostat.
CM7 display shows HI-LIMIT.	Computer in high-limit test mode.	This is displayed only during a test of the high-limit circuit and indicates that the high-limit has opened properly.

Problem	Probable Causes	Corrective Action
CM7 display shows LOW TEMP.	Frypot temperature is between 180°F (82°C) and 315°F (157°C).	This display is normal when the fryer is first turned on while in the melt cycle mode. To bypass the melt cycle press and hold a #2 product button under the LCD display until it chirps. The computer displays EXIT MELT alternating with YES NO . Press the #1 YES button to exit melt.
CM7 display shows PROBE FAILURE.	Problem with the temperature measuring circuitry including the probe.	This indicates a problem within the temperature measuring circuitry.
CM7 display shows PROBE FAILURE with alarm sounding.	Damaged computer wiring harness or connector.	Swap the computer wiring harness with one known to be good. If problem is corrected replace harness.
CM7 display shows IGNITION FAILURE.	Open drain valve, failed computer, failed interface board, open high-limit thermostat.	Is displayed if the fryer loses its ability to heat oil. It is also displayed when the oil temperature is above 450°F (232°C) and the high-limit thermostat has opened, halting the heating of the oil. Verify that the drain valves are fully closed.
Computer will not go into program mode or some buttons do not actuate.	Failed computer.	Replace computer
CM7 display shows HI 2 BAD.	Computer in high-limit test mode.	This is displayed only during a test of the high-limit circuit and indicates that the high-limit has failed.
Heat indicator off upon initial startup. Display shows HI or HOT with alarm sounding.	Failed computer.	Replace computer.
CM7 display shows IGNITION FAILURE with alarm sounding. Heating indicator is on, but fryer is not heating.	Drain valve not fully closed.	Ensure all drain valves are completely closed and that microswitches are adjusted and working.

Problem	Probable Causes	Corrective Action
CM7 display shows IGNITION FAILURE and alarm sounds, but fryer operates normally (false alarm).	Failed computer.	Replace computer.
CM7 display shows LOW TEMP, heating indicator cycles on and off normally but fryer does not heat.	A. Failed computer. B. Damaged computer wiring harness.	A. Replace computer. B. Replace computer wiring harness.
CM7 display shows software for only CM7 or ATO board.	Loose or damaged harness	Check that all harnesses between CM7's and ATO are secure and no pins are pushed out or broken.
CM7 display shows ERROR RM SDCRD	Defective SD Card	Replace card with another card.

1.12.2 CM7 Useful Codes

To enter any of the following codes: Press the UNLOCK ▼ button three times. **TECH** is displayed. Press the ✓ button. Enter a code number below:

- **Reset Factory Menu** - Enter **3322**. The computer display flashes and quickly counts from 1-40 and switches to **OFF**. (**NOTE**: This will delete any hand-entered menu items).
- **Reset BADCRC Message** - Disconnect board locator plug (J10). Reinsert plug. Enter **9988**. Computer display switches to **OFF**. Remove and then restore power to the computer using the 20-pin plug.
- **Change from F° to C°** - Enter **1658**. The computer displays **OFF**. Turn the computer on and check temperature to see the temperature scale. If the desired scale is not displayed, repeat.
- **Reset RECOVERY FAULT CALL SERVICE** – Enter **0042**.
- **Reset CALL TECH Message** - Disconnect board locator plug (J10). Reinsert plug. Enter **1000**. Computer display switches to **OFF**. Remove and then restore power to the computer using the 20-pin plug. If this message appears at any time other than after upgrade from a previous version, replace the computer
- **Enter Setup** – Enter **7378**.

PASSWORDS

Program Mode: Press the UNLOCK ▼ button once. The computer displays **PROGRAM**. Press the ✓ button. **ENTER CODE** is displayed. Enter **1650**.

Manager Mode: Press the UNLOCK ▼ button twice. The computer displays **MANAGER**. Press the ✓ button. **ENTER CODE** is displayed. Enter **4321**.

Tech Mode: Press the UNLOCK ▼ button three times. The computer displays **TECH**. Press the ✓ button. **CODE** is displayed. Enter **7378**.

1.12.3 CM7 Menu Summary Tree

Reflected below are the major programming sections in the CM7 and the order in which submenu headings will be found under the sections in the Installation and Operation Manual.

Adding New Product Menu Items	See section 4.10.2
Storing Product Menu Items in Product Buttons	See section 4.10.3
Temperature Conversion from F° to C°	See section 4.10.4

CM7 Programming Menu

Programming	
└ Program Mode.....	4.11
[With the fryer OFF, press the UNLOCK button once, displays <i>PROGRAM</i> . Press the ✓. Enter 1650]	
└ Setpoint Temperature.....	4.11.1
└ Product Selection.....	4.11.2
└ Name	
└ Cook Time	
└ Cook ID	
└ Shake Time	
└ Hold Time	
└ Filt After	
└ Sensitivity	
└ Assign Btn	
└ Boil Out Mode.....	4.11.3
Manager Mode.....	4.12
[With the fryer OFF, press the UNLOCK button twice, displays <i>MANAGER</i> . Press the ✓. Enter 4321]	
└ E-Log	
└ Alert Tone	
└ Volume 1-9	
└ Tone 1-3	
Tech Mode.....	4.9
[With the fryer OFF, press the UNLOCK button three times, displays <i>TECH</i> . Press the ✓. Enter 7378]	
└ Setup	
└ Fryer Setup	

1.12.4 CM7 Pin Positions and Harnesses

Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color		
J2	Interface Board to Computer	8074199 SMT Computer to Interface Board Harness	1	12VAC In	12VAC	Black		
			2	Ground				
			3	12VAC In	12VAC			
			4	FV Heat Demand				
			5	V Relay	12VDC			
			6	DV Heat Demand				
			7	R/H B/L	12VDC			
			8	Analog Ground				
			9	L/H B/L	12VDC			
			10	ALARM				
			11	Sound Device	5VDC			
			12	ALARM				
			13	FV Probe				
			14	Common Probes				
			15	DV Probe				
			16					
			17					
			18					
			19					
			20					
J6	Previous CM7 J7 or Network Resistor	8074546 Computer Communication Harness	1	Ground		Black		
			2	CAN Lo		Red		
			3	CAN Hi		White		
			4					
			5					
			6					
J7	ATO J1 or Next CM7 J6	8074546 Computer Communication Harness	1	Ground		Black		
			2	CAN Lo		Red		
			3	CAN Hi		White		
			4					
			5					
			6					
J9								
J10	Interface Board Ground to Computer	8074573 Computer Locator Harness	1	Vat #1		Black		
			2	Vat #2				
			3	Vat #3				
			4	Vat #4				
			5	Vat #5				
			6					
J11	SD Card							

1.13 Loading and Updating Software Procedures

Loading Software from an SD card to an CM7 Computer and ATO Board

To update CM7 and ATO software follow these steps:

1. Switch all computers to **OFF**. Press the TEMP button to check current CM7/ATO software version.
2. Remove the two screws on the left side cover plate of the CM7 computer.
3. With the computer folded down, insert the SD card, with the contacts facing down and the notch on the bottom right (see Figure 4 and 5), into the slot on the left side of the CM7.
4. Once inserted, **FWUPD** appears on the left display and **SCCRCOK** on the right. Numbers count up on the right display.
5. The display then changes to **FWLOAD** on the left; numbers count up on the right.
6. The computer displays **OBFCRC**. If updating ATO software, the computer will display **FWU ATO** on the left and will count down from 2500 on the right.
7. When the update is complete the CM7 displays **DONE** on the left and **RM SDCRD** on the right.
8. Remove the SD card using the fingernail slot on the top of the SD card.
9. Repeat steps 1-8 for all computers.
10. Remove **ALL** power from the fryer on the rear of the unit.
11. Restore power to the fryer. There is short delay prior to the computer powering up and displaying **OFF**.
12. With the computer displaying **OFF**, verify software update by pressing the **TEMP** button to check updated CM7/ATO version.



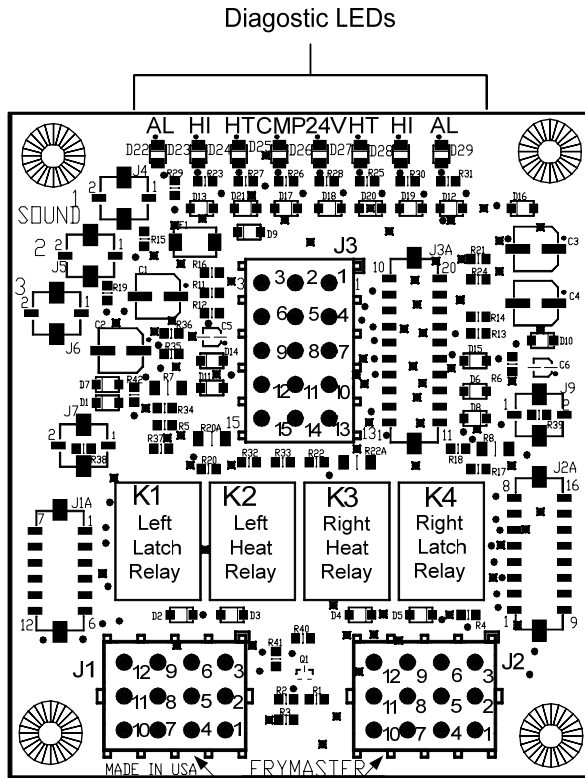
Figure 4



Figure 5

1.14 Interface Board Diagnostic Chart

The following diagram and charts provide ten quick system checks that can be performed using only a multimeter.



Diagnostic LED Legend	
CMP	indicates power from 12V transformer
24	indicates power from 24V transformer
HI (RH)	indicates output (closed) from right latch relay
HI (LH)	indicates output (closed) from left latch relay
HT (RH)	indicates output from right heat relay
HT (LH)	indicates output from left heat relay
AL (RH)	indicates output (open) from right latch relay
AL (LH)	indicates output (open) from left latch relay

PN 826-2260 (106-6664)

Test Points
J1 Left J2 Right

NOTE – Pin 1 is located in the bottom right corner of Both J1 and J2. These test points are ONLY for the Protector® Series boards with J1 and J2 plugs on the front of the board.

Meter Setting	Test	Pin	Pin	Results
12 VAC Power	50 VAC Scale	3 of J2	1 of J2	12-16 VAC
24 VAC Power	50 VAC Scale	2 of J2	Chassis	24-30 VAC
*Probe Resistance (RH)	R X 1000 OHMS	11 of J2	10 of J2	See Chart
*Probe Resistance (LH)	R X 1000 OHMS	1 of J1	2 of J1	See Chart
High-Limit Continuity (RH)	R X 1 OHMS	9 of J2	6 of J2	0 - OHMS
High-Limit Continuity (LH)	R X 1 OHMS	6 of J1	9 of J1	0 - OHMS
Latch Contactor Coil (RH)	R X 1 OHMS	8 of J2	Chassis	3-10 OHMS
Latch Contactor Coil (LH)	R X 1 OHMS	5 of J1	Chassis	3-10 OHMS
Heat Contactor Coil (RH)	R X 1 OHMS	7 of J2	Chassis	11-15 OHMS
Heat Contactor Coil (LH)	R X 1 OHMS	4 of J1	Chassis	11-15 OHMS

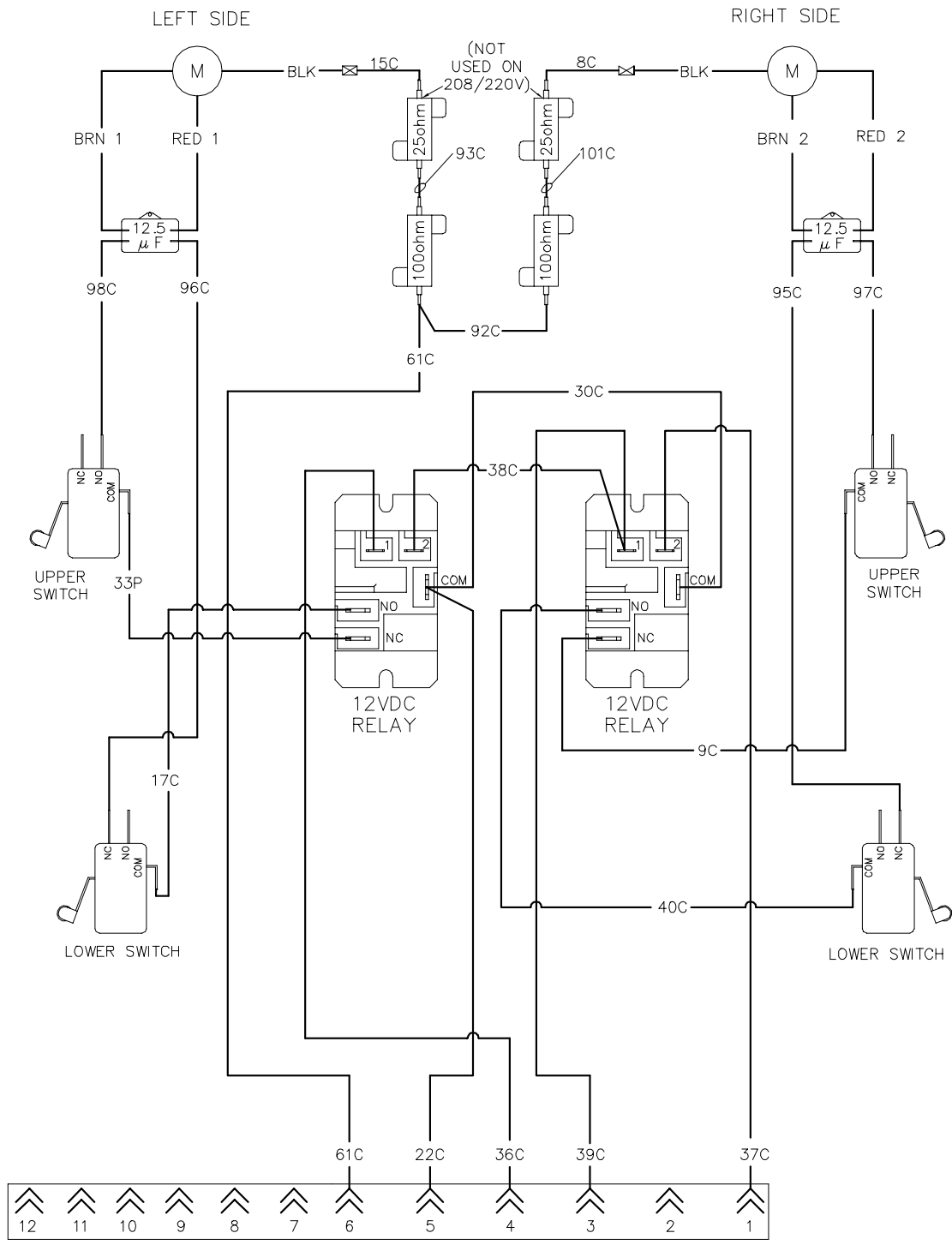
* Disconnect 15-Pin harness from the computer/controller before testing the probe circuit.

1.15 Probe Resistance Chart

<h3 style="text-align: center;">Probe Resistance Chart</h3> <p style="text-align: center;"><i>For use with fryers manufactured with Minco Thermistor probes only.</i></p>																	
F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C			
60	1059	16	130	1204	54	200	1350	93	270	1493	132	340	1634	171			
65	1070	18	135	1216	57	205	1361	96	275	1503	135	345	1644	174			
70	1080	21	140	1226	60	210	1371	99	280	1514	138	350	1654	177			
75	1091	24	145	1237	63	215	1381	102	285	1524	141	355	1664	179			
80	1101	27	150	1247	66	220	1391	104	290	1534	143	360	1674	182			
85	1112	29	155	1258	68	225	1402	107	295	1544	146	365	1684	185			
90	1122	32	160	1268	71	230	1412	110	300	1554	149	370	1694	188			
95	1133	35	165	1278	74	235	1422	113	305	1564	152	375	1704	191			
100	1143	38	170	1289	77	240	1432	116	310	1574	154	380	1714	193			
105	1154	41	175	1299	79	245	1442	118	315	1584	157	385	1724	196			
110	1164	43	180	1309	82	250	1453	121	320	1594	160	390	1734	199			
115	1174	46	185	1320	85	255	1463	124	325	1604	163	395	1744	202			
120	1185	49	190	1330	88	260	1473	127	330	1614	166	400	1754	204			
125	1195	52	195	1340	91	265	1483	129	335	1624	168	405	1764	207			

1.16 Wiring Diagrams

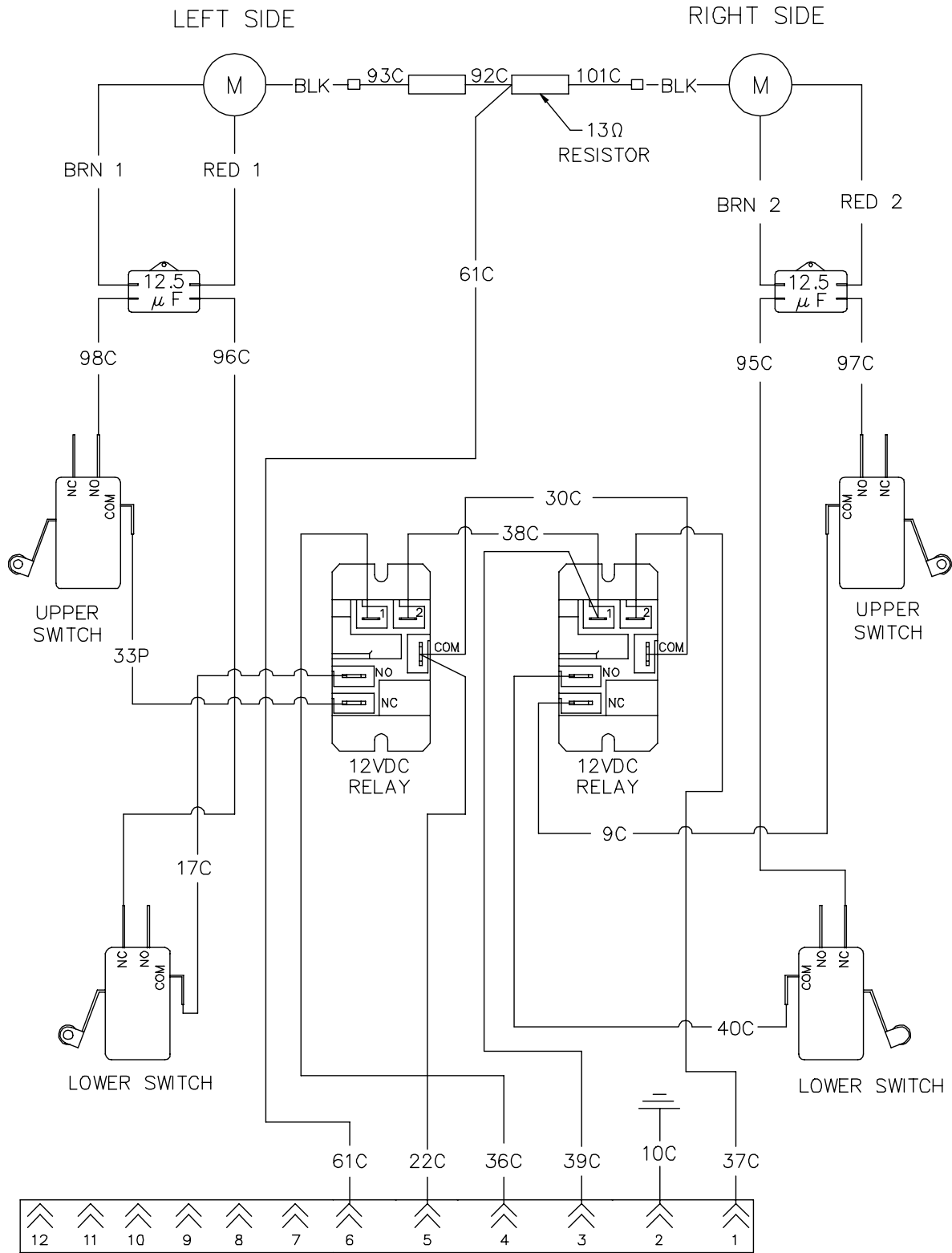
1.16.1 Modular Basket Lift Wiring Diagram 208-250V



REFERENCES TO LEFT & RIGHT ARE FROM THE REAR OF THE FRYER

8050888D

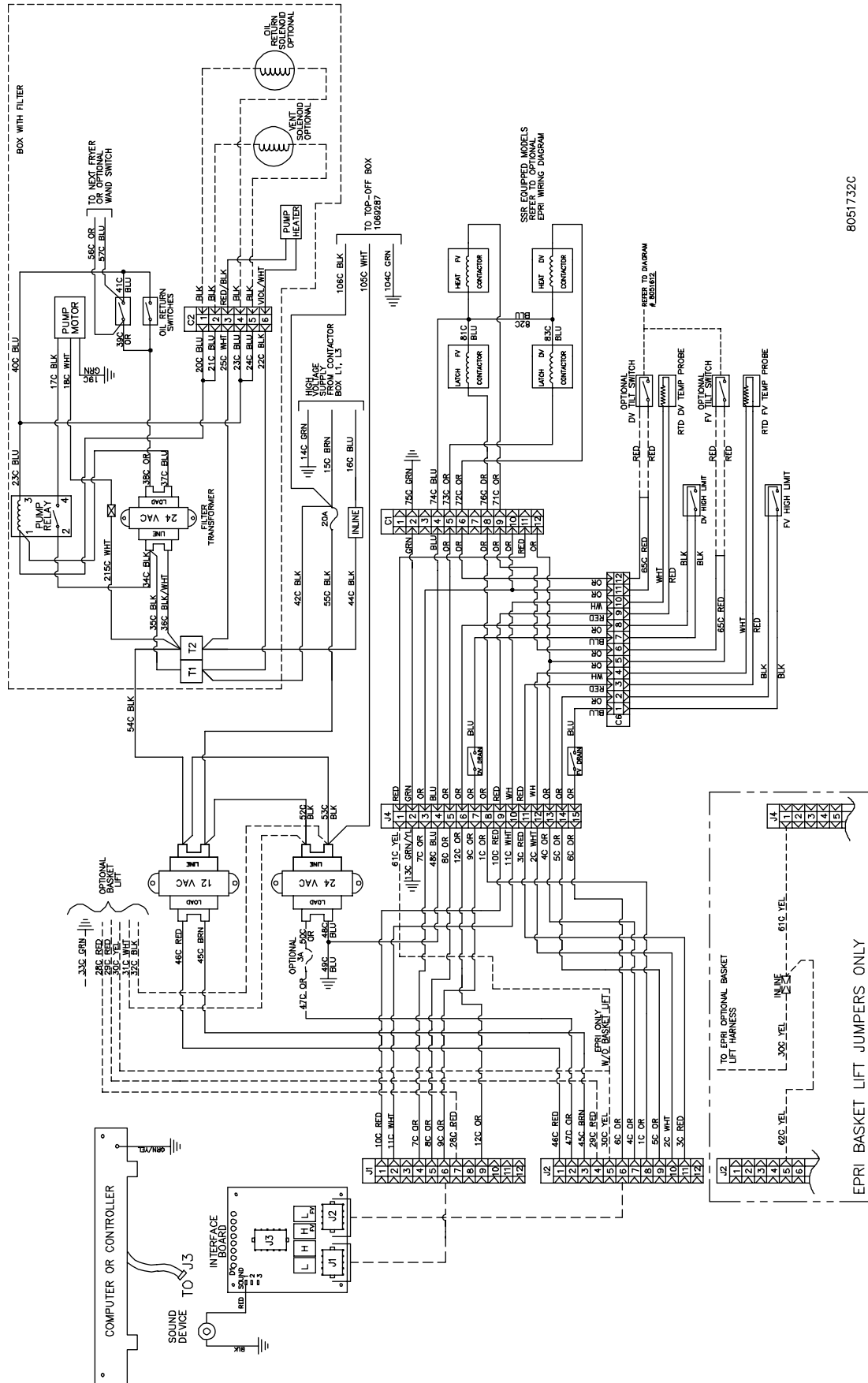
1.16.2 Modular Basket Lift Wiring Diagram 100-120V



REFERENCES TO LEFT & RIGHT ARE FROM THE REAR OF THE FRYER

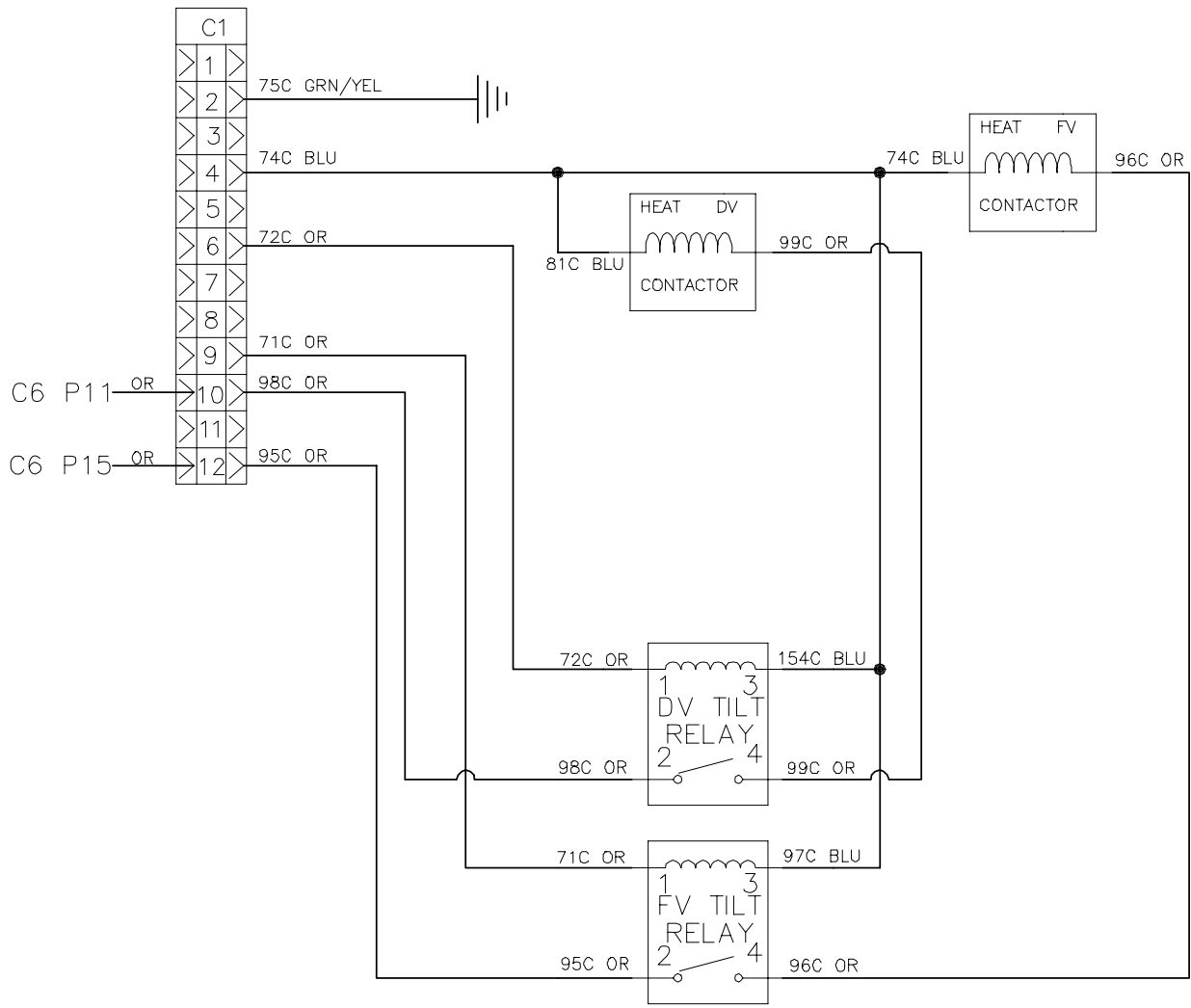
8050555E

1.16.5 FPEL Component Wiring (CE)



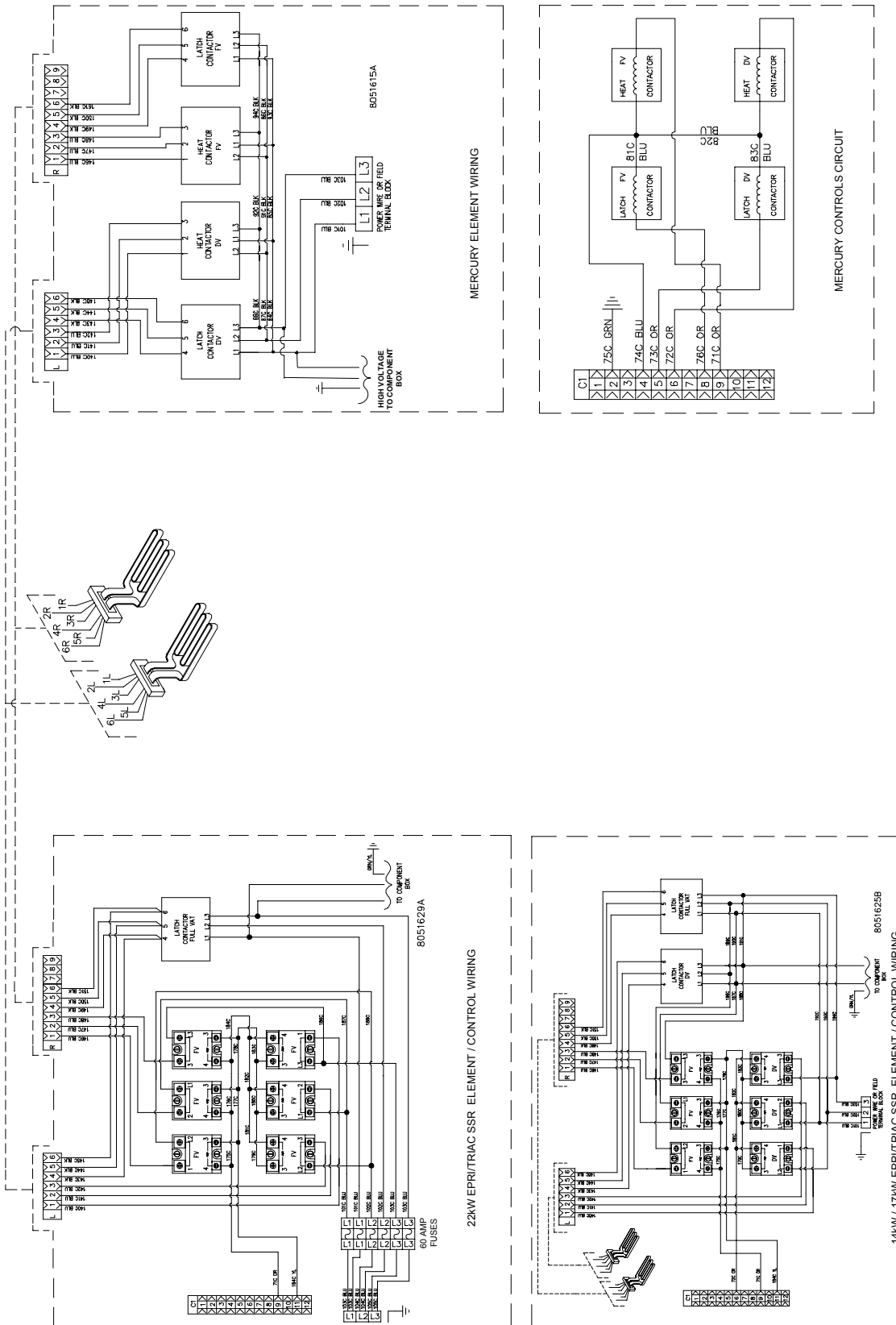
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1.16.6 Tilt Switch Wiring

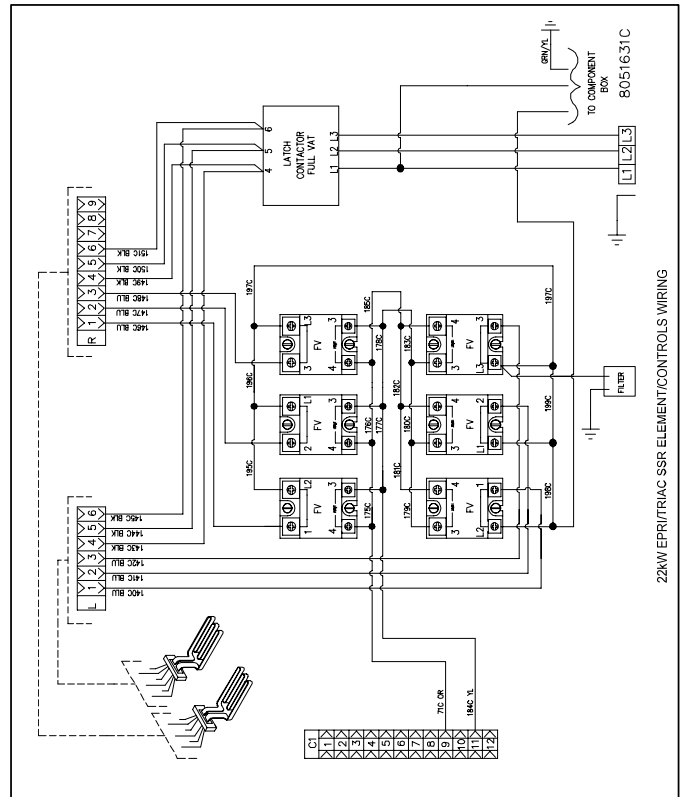
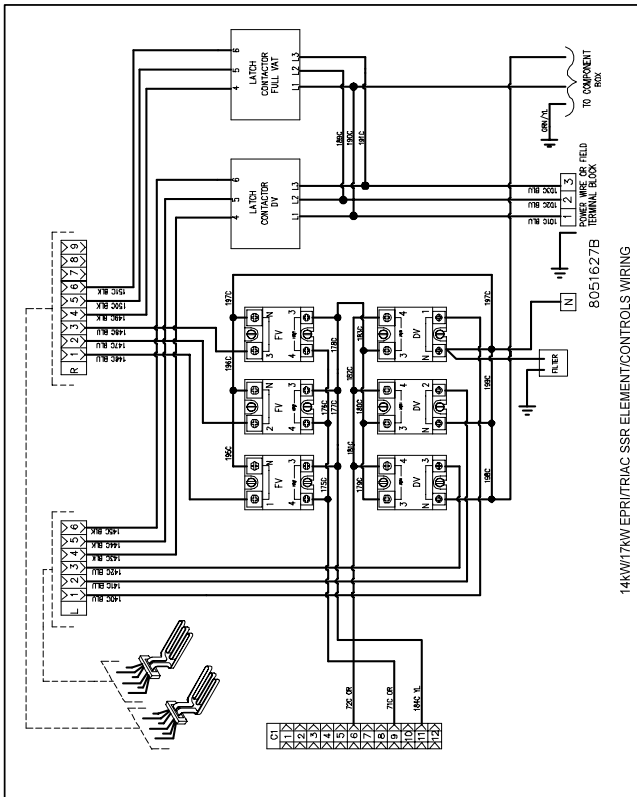
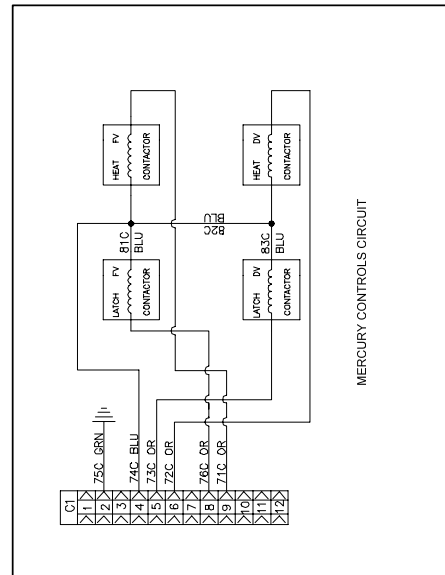
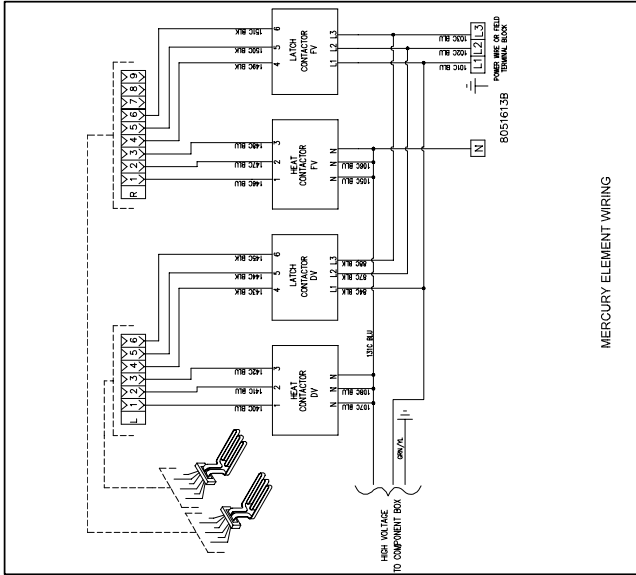


8051612B

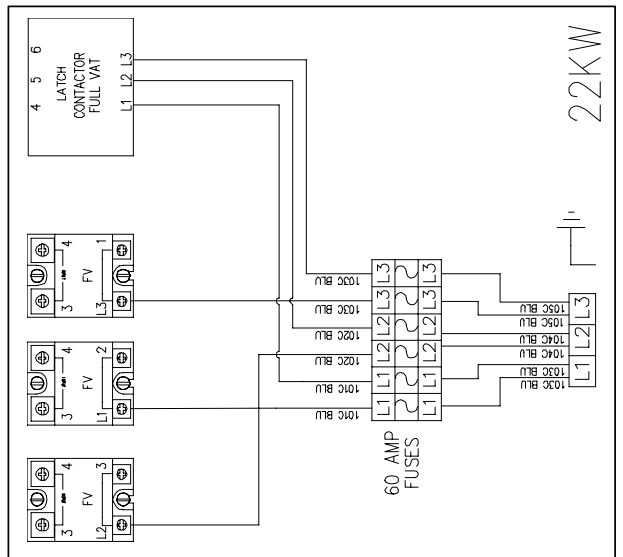
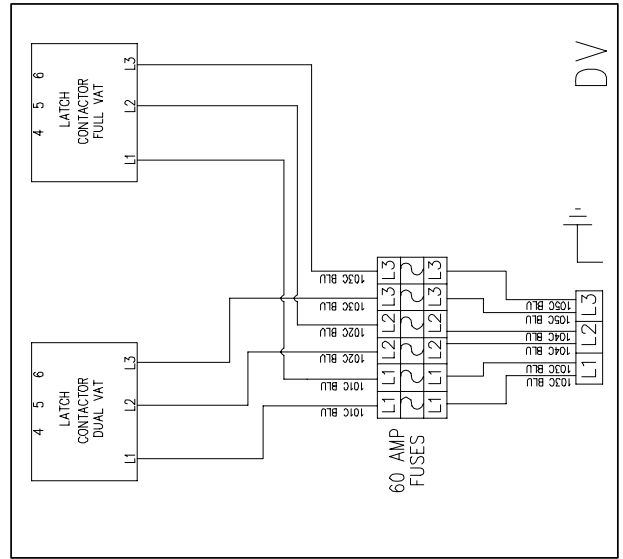
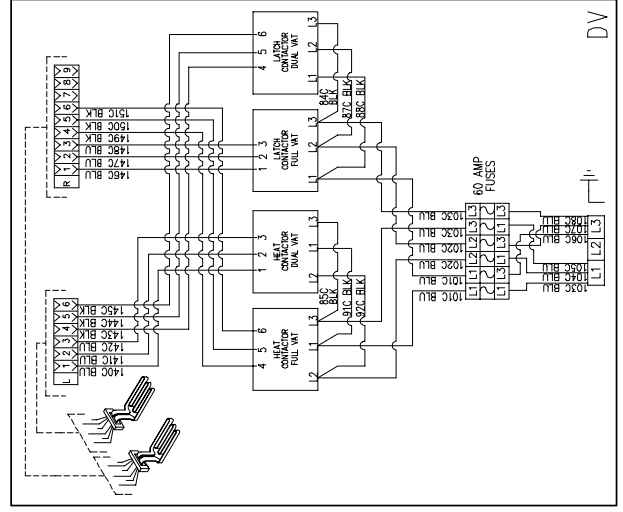
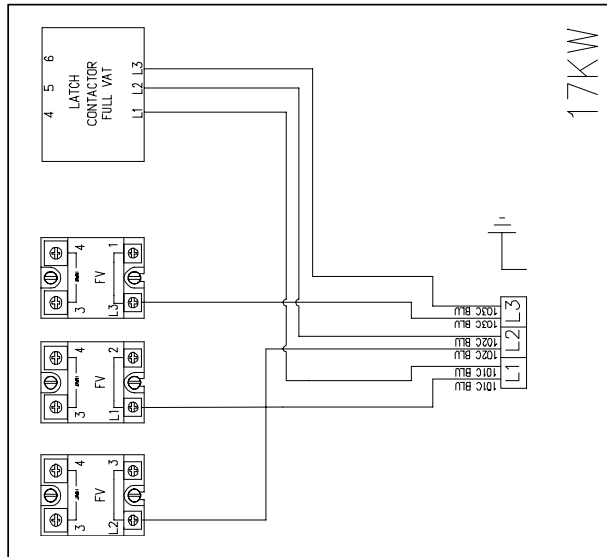
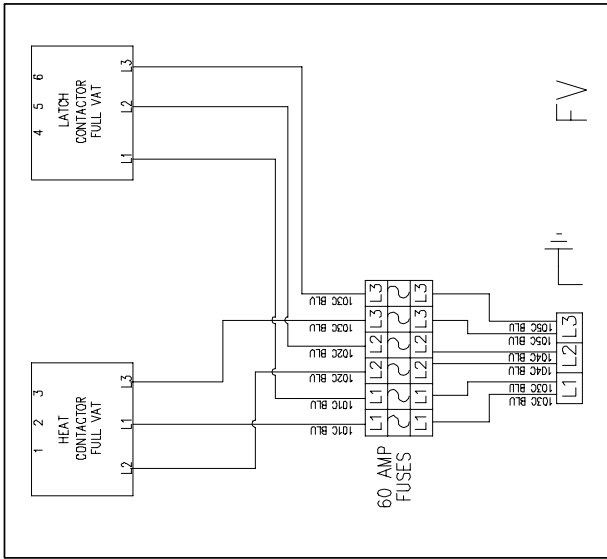
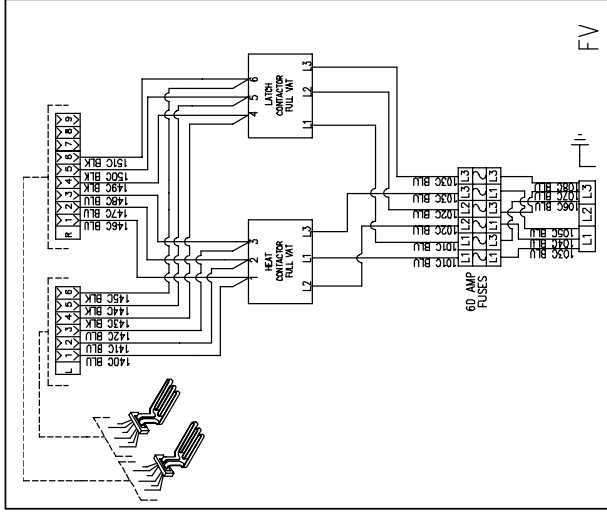
1.16.7 Contactor Box – Delta Configuration



1.16.8 Contactor Box – WYE Configuration



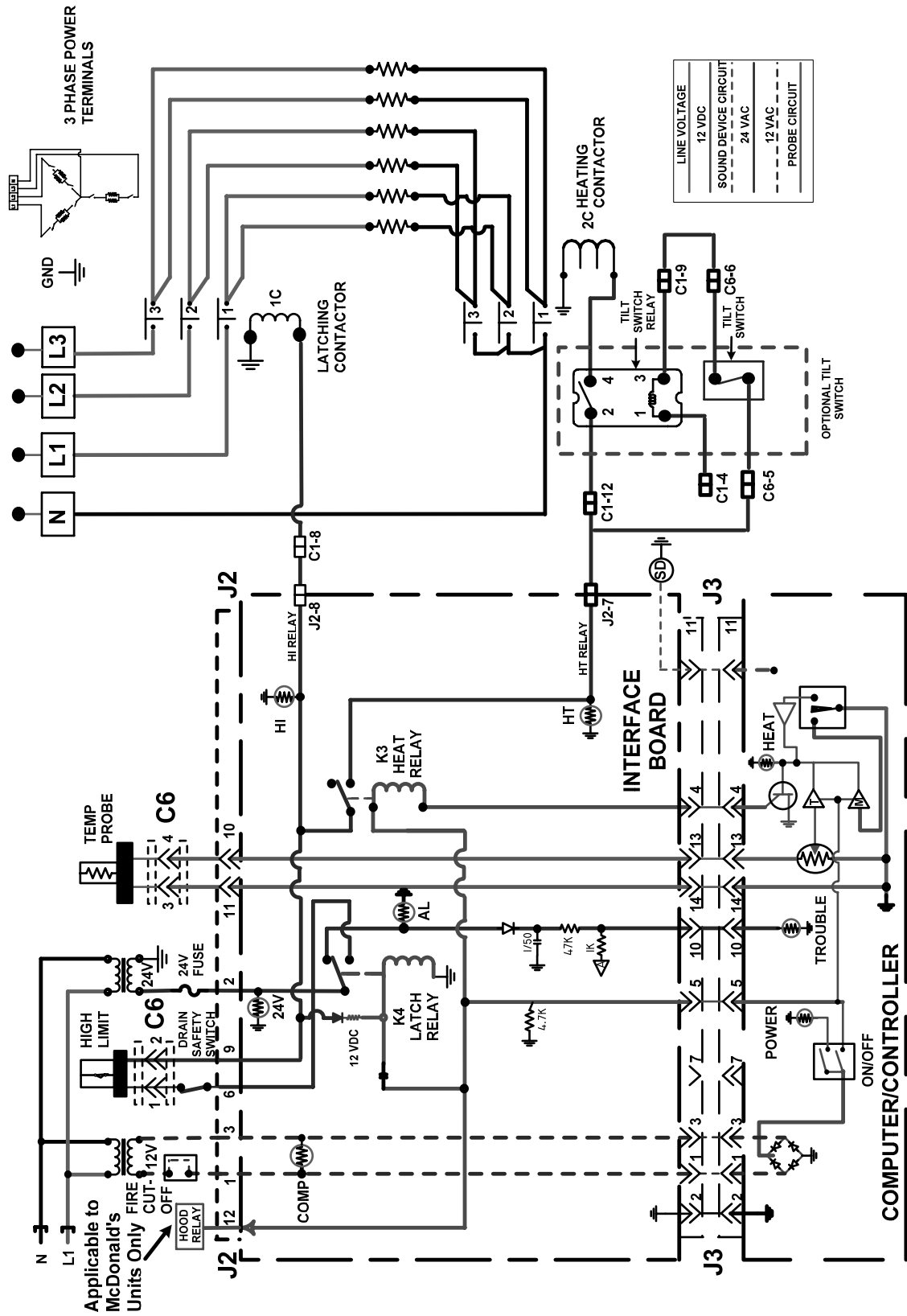
1.16.9 Terminal Block Wiring



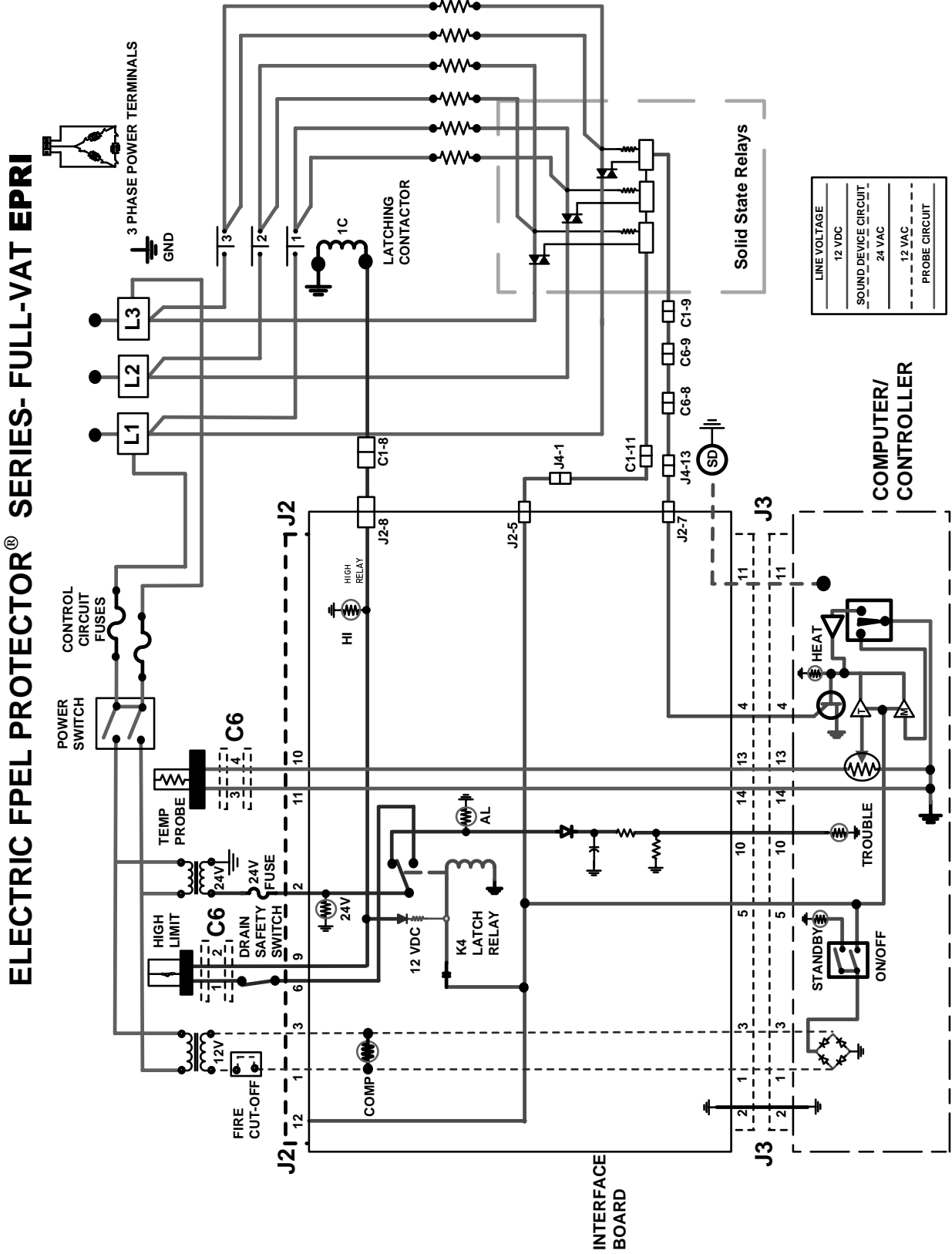
8051633A 8051634B 8051652C
 EPR TRIAC TERMINAL BLOCK WIRING DIAGRAMS 22kW TERMINAL BLOCK WIRING DIAGRAMS SINGLE PHASE TERMINAL BLOCK WIRING DIAGRAMS

1.16.11 Simplified FPEL14, 17 and 22 Series – Full Vat Wiring EXPORT WYE

ELECTRIC FPEL PROTECTOR® SERIES - FULL-VAT EXPORT WYE

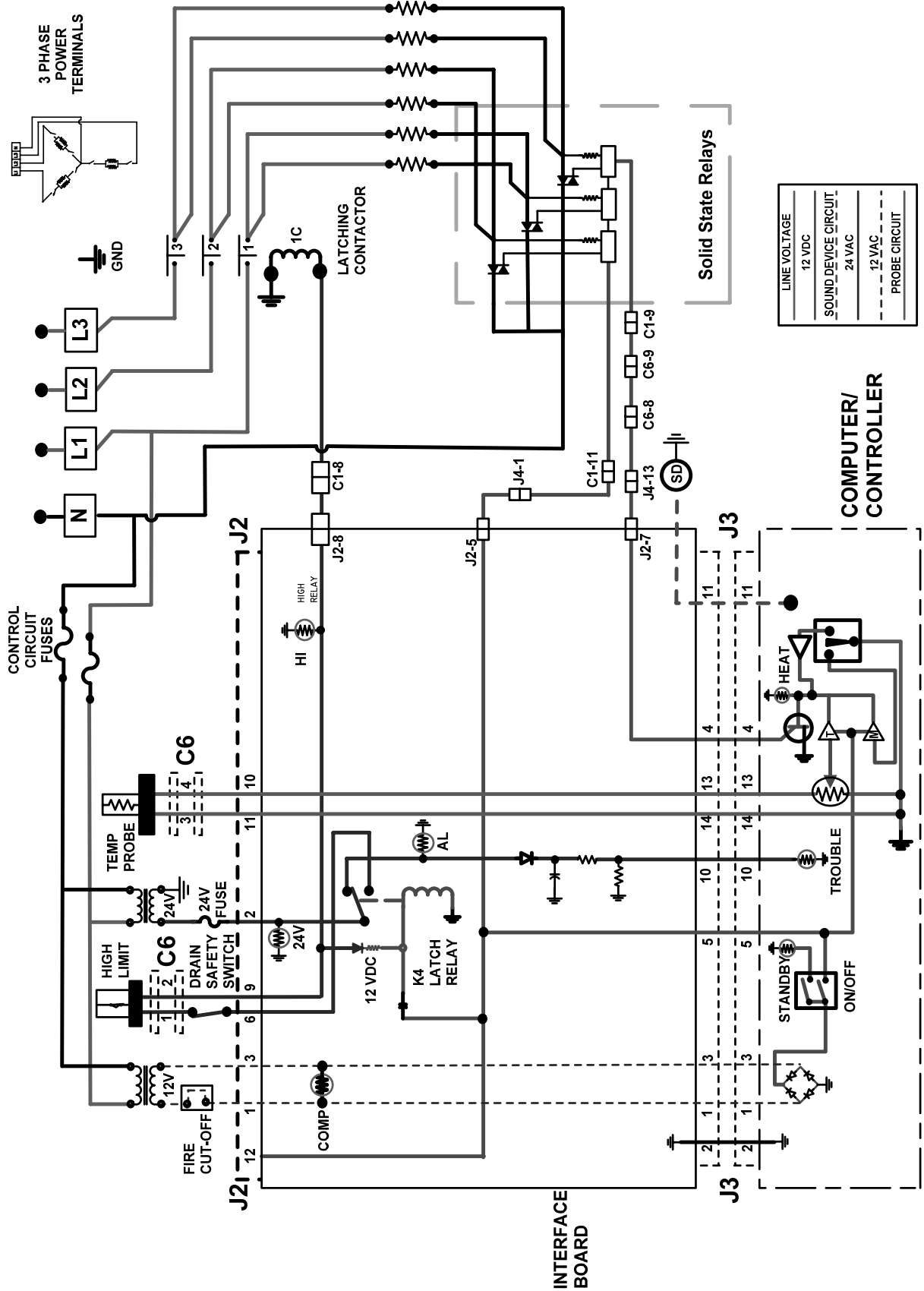


1.16.12 Simplified FPEL14, 17 and 22 Series – Full Vat Wiring EPRI

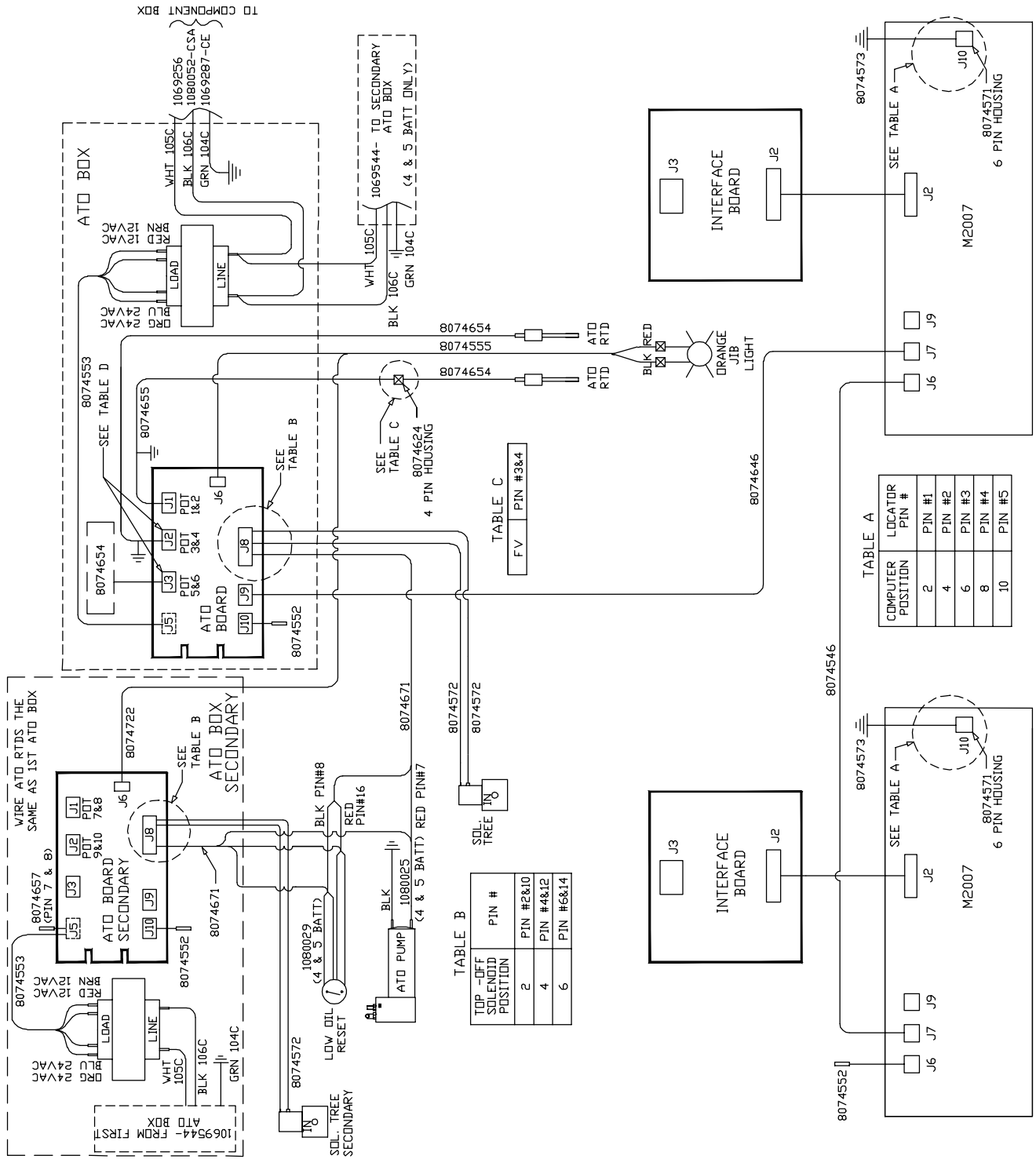


1.16.13 Simplified FPEL14, 17 and 22 Series – Full Vat Wiring EPRI EXPORT WYE

ELECTRIC FPEL PROTECTOR® SERIES-FULL-VAT EPRI WYE



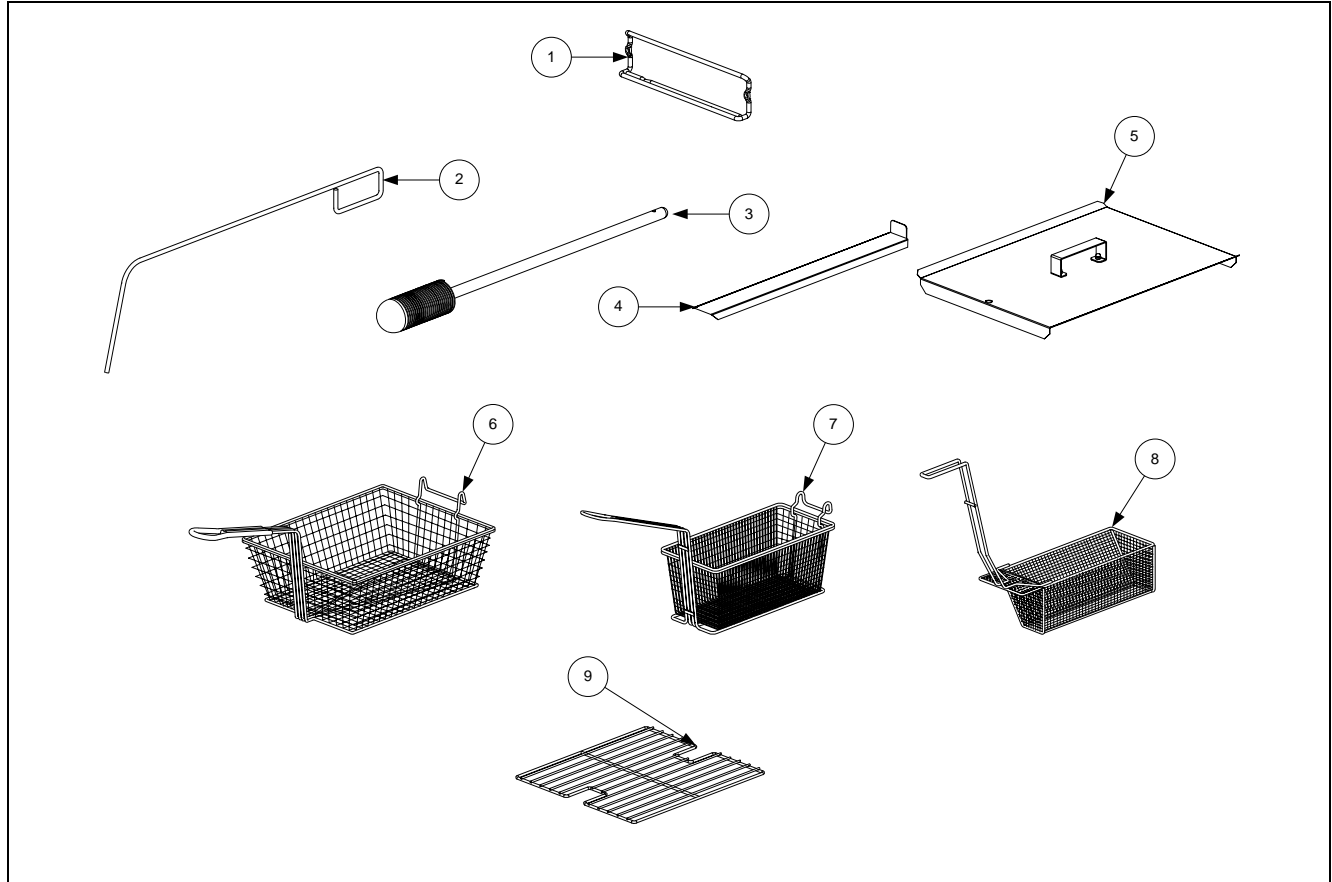
1.16.14 FPEL Series Simplified Wiring



PROTECTOR® SERIES ELECTRIC FRYERS

CHAPTER 2: PARTS LIST

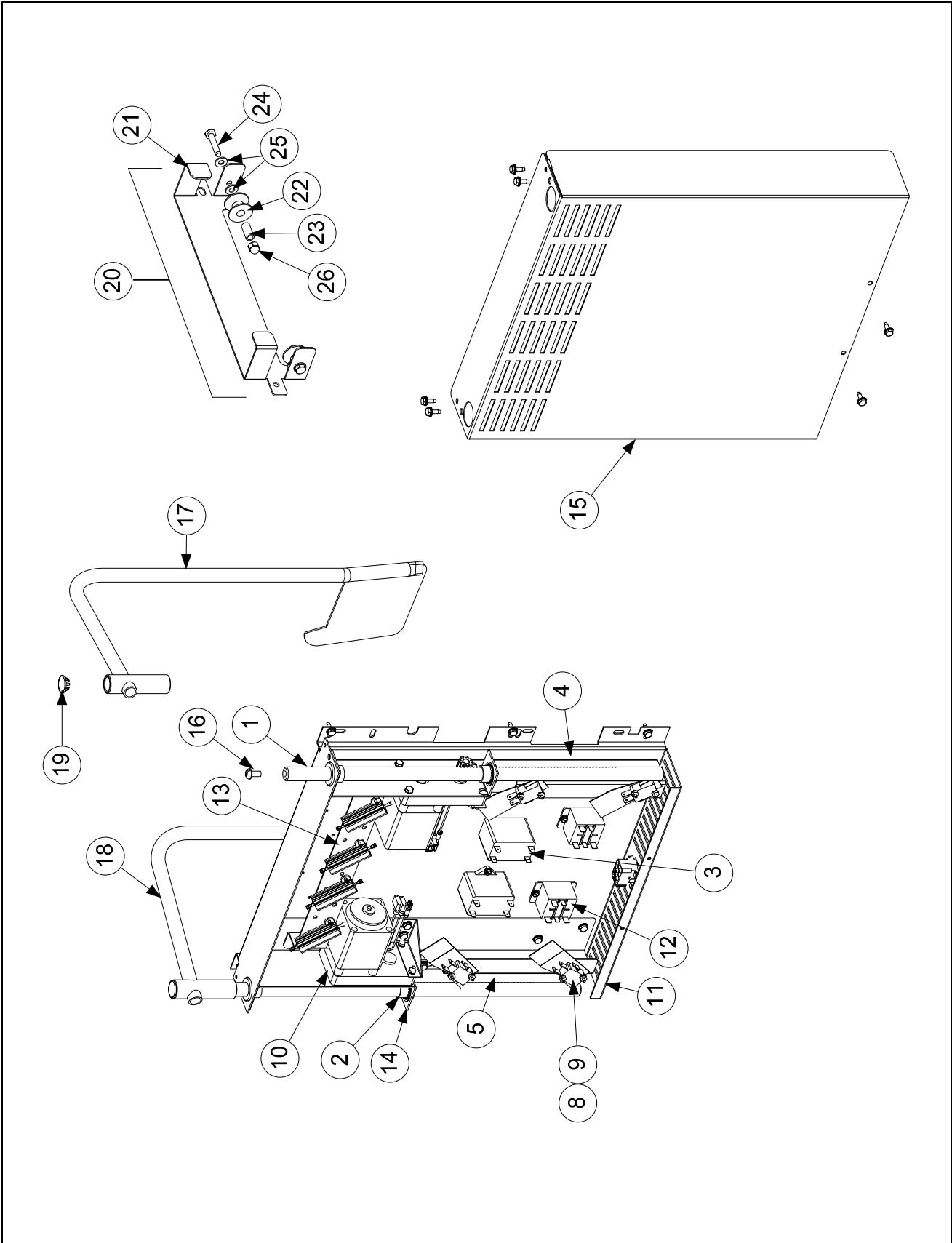
2.1 Accessories



ITEM	PART #	COMPONENT
1	810-2793	Hanger, Wireform Basket
*	809-0921	Spacer, Basket Hanger
2	803-0197	Cleanout Rod, 27-inch
3	803-0209	Brush, Frypot
4	823-5956	Connecting Strip, Frypot
*	823-6755	Connecting Strip, Spreader LH Side (<i>Use 823-6756 for Spreader RH Side</i>)
5	106-8325	Cover, Full-Vat Frypot
6	803-0099	Basket, Full-Vat
7	803-0271	Basket, Dual-Vat (Twin)
8	803-0113	Sediment Tray, Full-Vat
9	803-0132	Rack, Full-Vat Basket Support
*	824-1664	Spreader Pan
*	824-1720	Cover, Spreader Pan
*	807-1575	Heatlamp, Merco 120V 2 Bulb (<i>use 806-5278SP for 120V Lamp Assembly</i>)
*	807-1576	Heatlamp, Merco 240V 2 Bulb (<i>use 806-5285SP for 240V Lamp Assembly</i>)
*	803-0002	Powder, Filter (80- 1-Cup Applications)
*	803-0170	Pack, 100-Sheet Filter Paper

*Not illustrated.

2.2 Basket Lift Assembly and Associated Parts

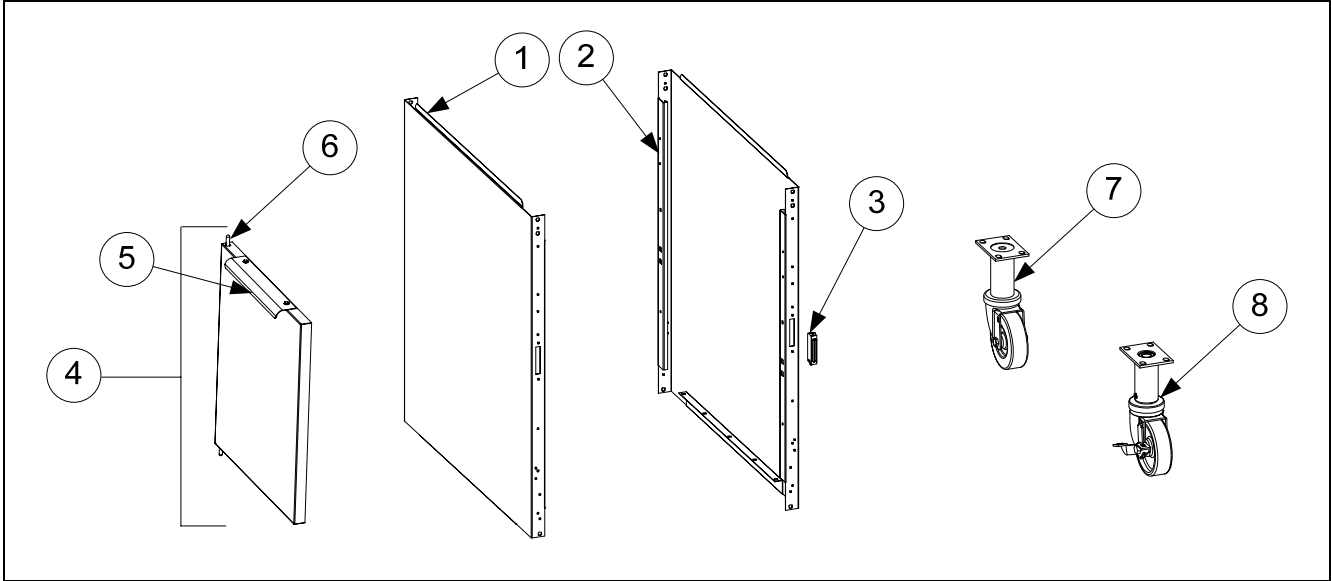


2.2 Basket Lift Assembly and Associated Parts cont.

ITEM	PART #	COMPONENT
	106-1805SP	Basket Lift Assembly, 200-220VAC w/Relay (<i>Items 1-20</i>)
1	810-1012	Rod, Basket Lift
2	813-0035	Bushing, Bronze
3	807-2513	Capacitor, 12.5 μ Fd 330VAC
4	901-8499	Chassis, Left Basket Lift
5	902-8499	Chassis, Right Basket Lift
6	807-0159	Connector, 12-Pin Female
7	900-5529	Gusset, Basket Lift Motor
8	812-0442	Insulation, Microswitch
9	807-2572	Microswitch
10	806-5964SP	Motor Assembly, 208-240VAC Modular Basket Lift
11	200-2942	Mount, Modular Basket Lift
12	807-1683	Relay, 12VDC
13	106-2770SP	Resistor Assembly, 208-220VAC Modular Basket Lift
14	809-0082	Ring, Bushing Retainer
15	910-4776	Cover, Modular Basket Lift Rear S/S (<i>Use 900-4776 for Mild Steel</i>)
16	809-0127	Screw, 1/4-20 X 1/2-inch Slotted Round Head
17	823-2704	Arm, Left Basket Lift
18	823-2705	Arm, Right Basket Lift
19	810-0179	Button, Plug
20	806-9110SP	Roller Assembly, Basket Lift
21	910-8112	Bracket, Basket Lift Roller
22	810-0194	Roller, Basket Lift
23	810-0374	Spacer, Basket Lift Roller
24	809-0508	Bolt, 1/4-20 X 1 1/4 -Inch
25	809-0190	Washer, 1/4-inch Flat
26	809-0047	Nut, 1/4-20 Cap
*	WIR-0166SP	Wire Bundle, 200-250VAC Basket Lift w/Relay
*	106-5957	Wiring Harness, RE Series Electric Basket Lift (<i>Plugs into Item 6</i>)

* Not illustrated.

2.3 Doors, Sides and Casters

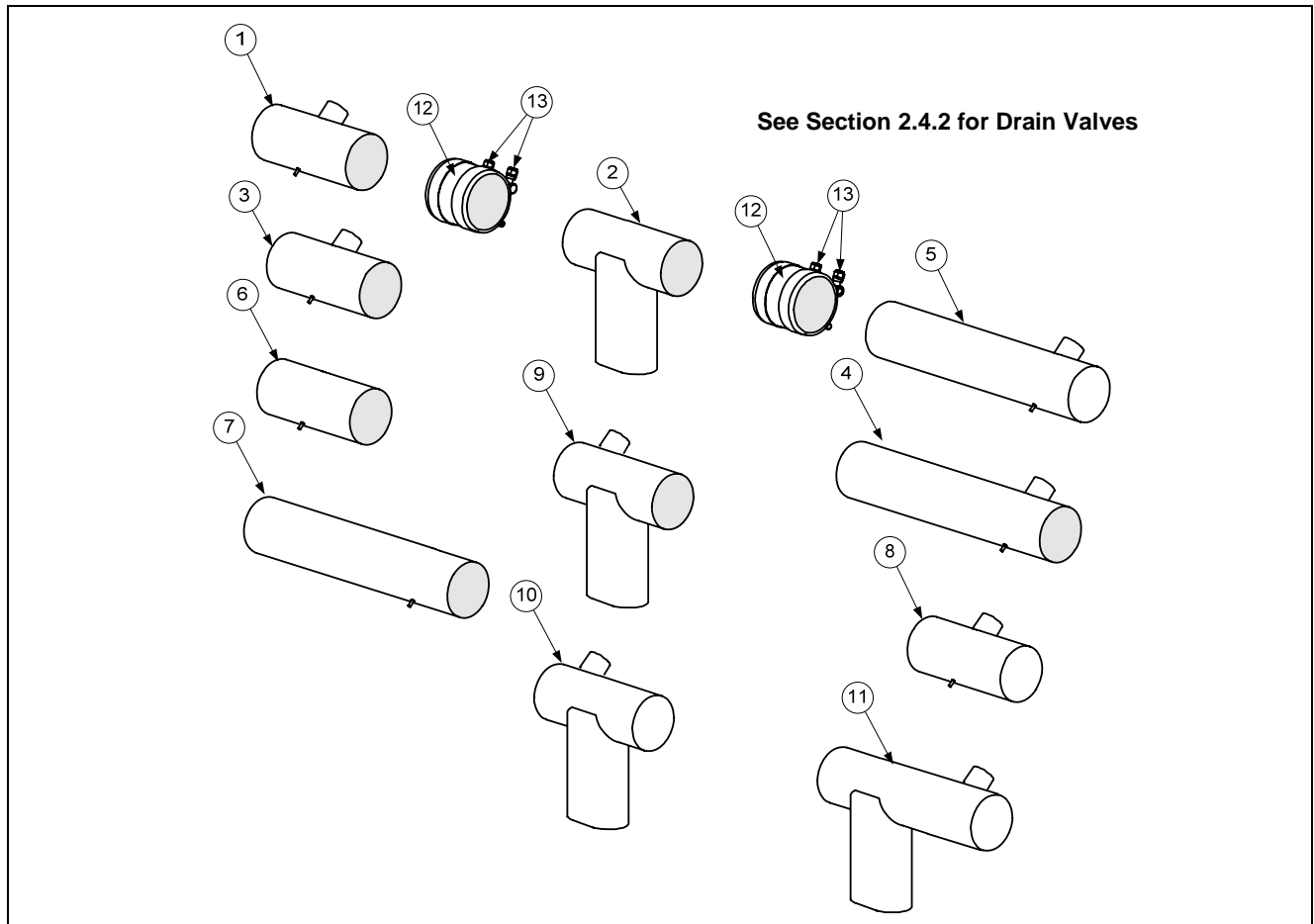


ITEM	PART #	COMPONENT
1	231-0323	Side, Standard Cabinet Left SS (use 221-0323 for Enameled Steel)
2	232-0323	Side, Standard Cabinet Right SS (use 222-0323 for Enameled Steel)
3	810-1105	Magnet, Door (vertical) (use 810-2346 for horizontal over filter pan)
4	106-4397	Door, Left or Right (Left shown – move handle to bottom for right)
5	210-9739	Handle, Eurolook Door
6	106-4067	Pin Assembly, Door
*	810-0275	Spring, Door Pin
*	809-0970	Retaining Ring
*	230-4685	Hinge, Door Lower
7	810-1494	Caster without Brake
8	810-2970	Caster with Brake

* Not illustrated.

2.4 Drain System Components

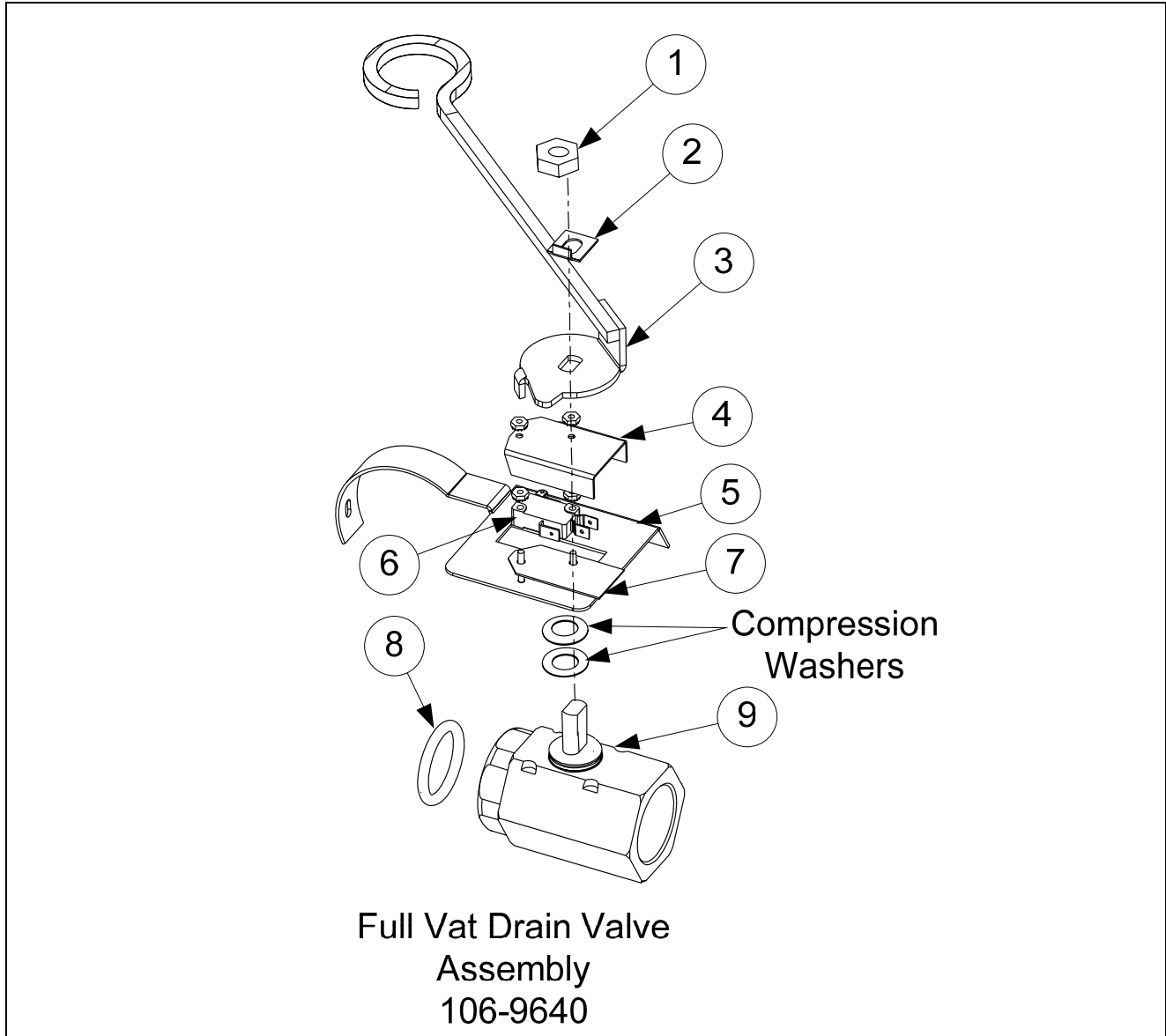
2.4.1 Drain Tube Sections and Associated Parts



ITEM	PART#	COMPONENT
1	823-4625	Drain Tube, Full-Vat Left Closed/Right End Open
2	823-6663	Drain Tube, Dump
3	823-4643	Drain Tube, Full-Vat Left and Right Open Short
4	823-4641	Drain Tube, Full-Vat Left and Right Open Long
5	823-4639	Drain Tube, Full-Vat Left Open/Right End Closed
6	220-5395	Drain Tube, Full-Vat, Short, Spreader, Open Both Ends
7	220-5396	Drain Tube, Full-Vat, Long, Spreader, Open Both Ends
8	823-7093	Drain Tube, Full-Vat Two Battery Right Left Open/Right End Closed
9	823-7094	Drain Tube, Dump Two Battery Left Closed, Right Open
10	823-7103	Drain Tube, Dump Two Battery w/ Spreader, Left, Both Ends Closed
11	823-7104	Drain Tube, Dump Two Battery w/ Spreader, Right, Both Ends Closed
12	816-0772	Sleeve
13	809-0969	Clamp
*	816-0630	Vinyl Cap

* Not illustrated.

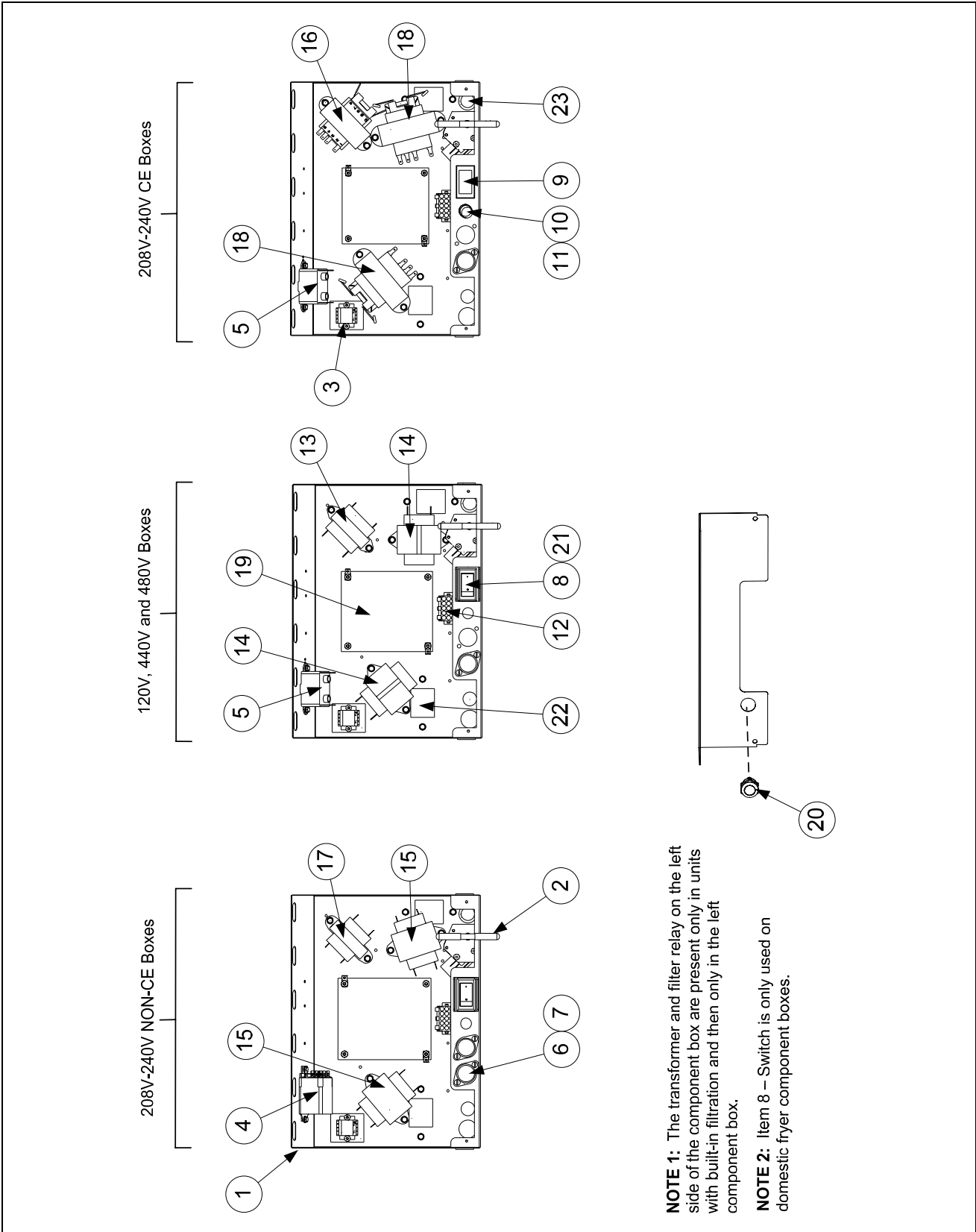
2.4.2 Drain Valves and Associated Parts



ITEM	PART #	COMPONENT
1	809-0540	Nut, ½-13 2-Way Hex Lock
2	900-2936	Retainer, Nut Drain Valve
3	823-6634	Handle, Drain Valve FV
4	901-2348	Cover, Safety Switch
5	106-9031	Bracket, Elec. Protector FV
6	807-2104	Switch, CE Micro Roller Lever
7	816-0220	Insulation, RF Switch
8	816-0135	O-Ring, Round Drain Seal
9	810-1018	Valve, 1¼-inch Drain

2.5 Electronics and Wiring Components

2.5.1 Component Boxes

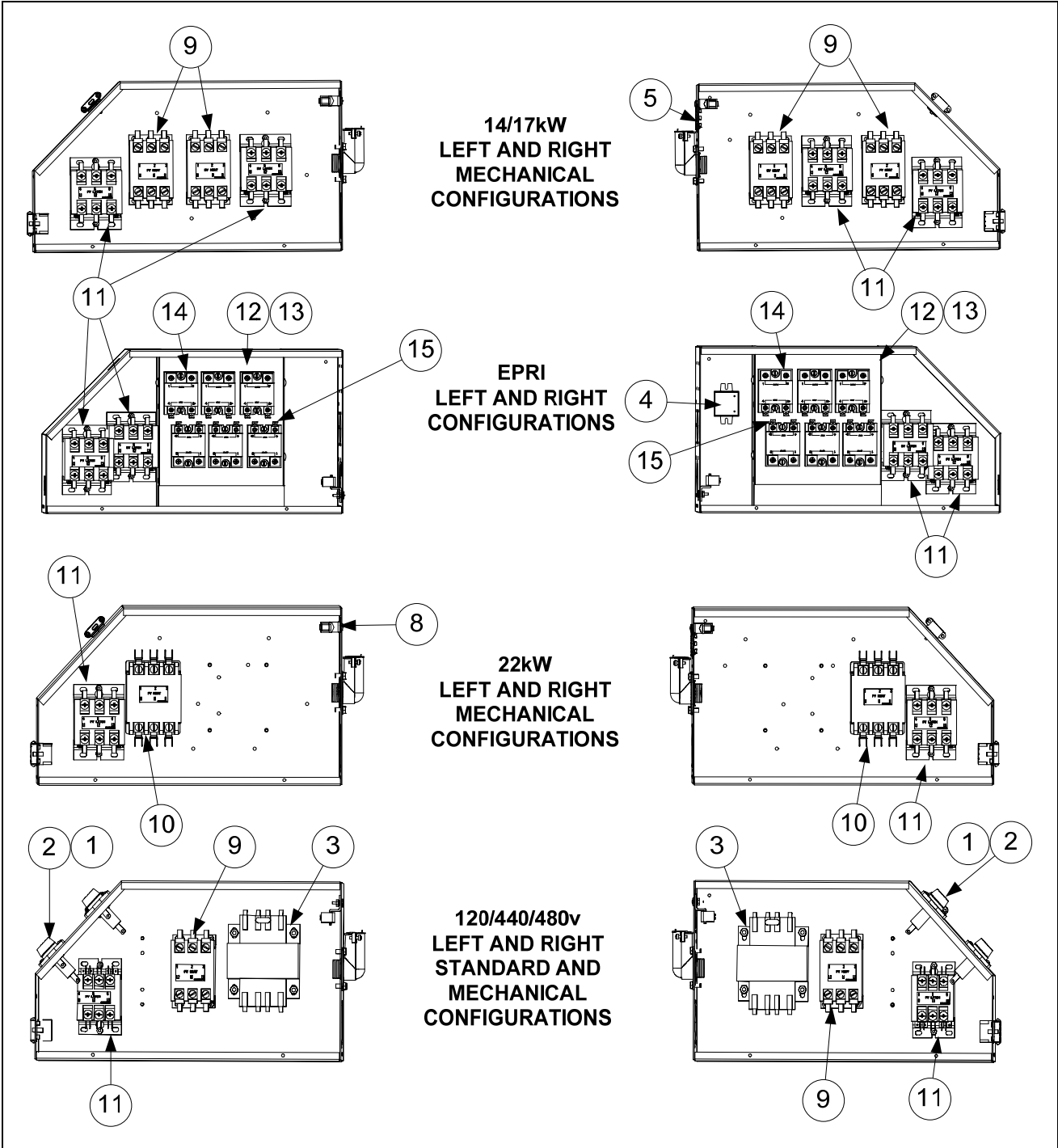


2.5.1 Component Boxes cont.

ITEM	PART #	COMPONENT
1	106-5592	Box Assembly, Component
2	106-6094	Handle, Assembly Oil Return
3	806-9495SP	Terminal Block
4	807-0670	Relay, Filter DPDT 24VAC
5	807-0012	Relay, Filter 18 amp 24VAC coil
6	807-0922	Holder, Buss Fuse HPS
7	807-2278	Fuse, 20 Amp
8	807-4036	Switch, Power
9	807-3575	Plug, Carling Switch Hole (<i>used on some models without a switch</i>)
10	807-1321	Holder, AGC Panel Mount ¼" Fuse (<i>Some models use item 10 here.</i>)
11	807-1597	Fuse, 3 AMP Slow-Blow
12	106-6639	Harness Assembly, FV Control
	106-6640	Harness Assembly, Basket Lift
13	807-0855	Transformer, 100-120V/12V 20VA
14	807-0800	Transformer, 100-120V/24V 50VA Filter
15	807-0680	Transformer, 208-240V/24V 20VA Filter
16	807-2191	Transformer, 208-240V/12V 30VA
17	807-0979	Transformer, 208-240V/12V 43VA
18	807-2180	Transformer, 208-240V 50VA Filter
19		Interface Board
	826-2260	Standard Interface Board (<i>includes sound harness</i>)
	826-2261	EPRI, Interface Board (<i>includes sound harness</i>)
	106-6501	Fallback Controller Assembly
*	809-0349	Spacer, 4mm X 6mm Aluminum
*	810-3141	Sound Device, Universal SMT
20	807-4678	Switch, Momentary Flush JIB Reset
21	230-0834	Guard, RE Box Switch
22	816-0217	Paper, Insulating Terminal Block
23	810-0045	Bushing, .875 Diameter 11/16"
*	826-2249	RE Hood/Ansul Interlock Kit (<i>includes terminal block, wires and connectors</i>)

* Not illustrated.

2.5.2 Contactor Boxes



2.5.2 Contactor Box Configurations

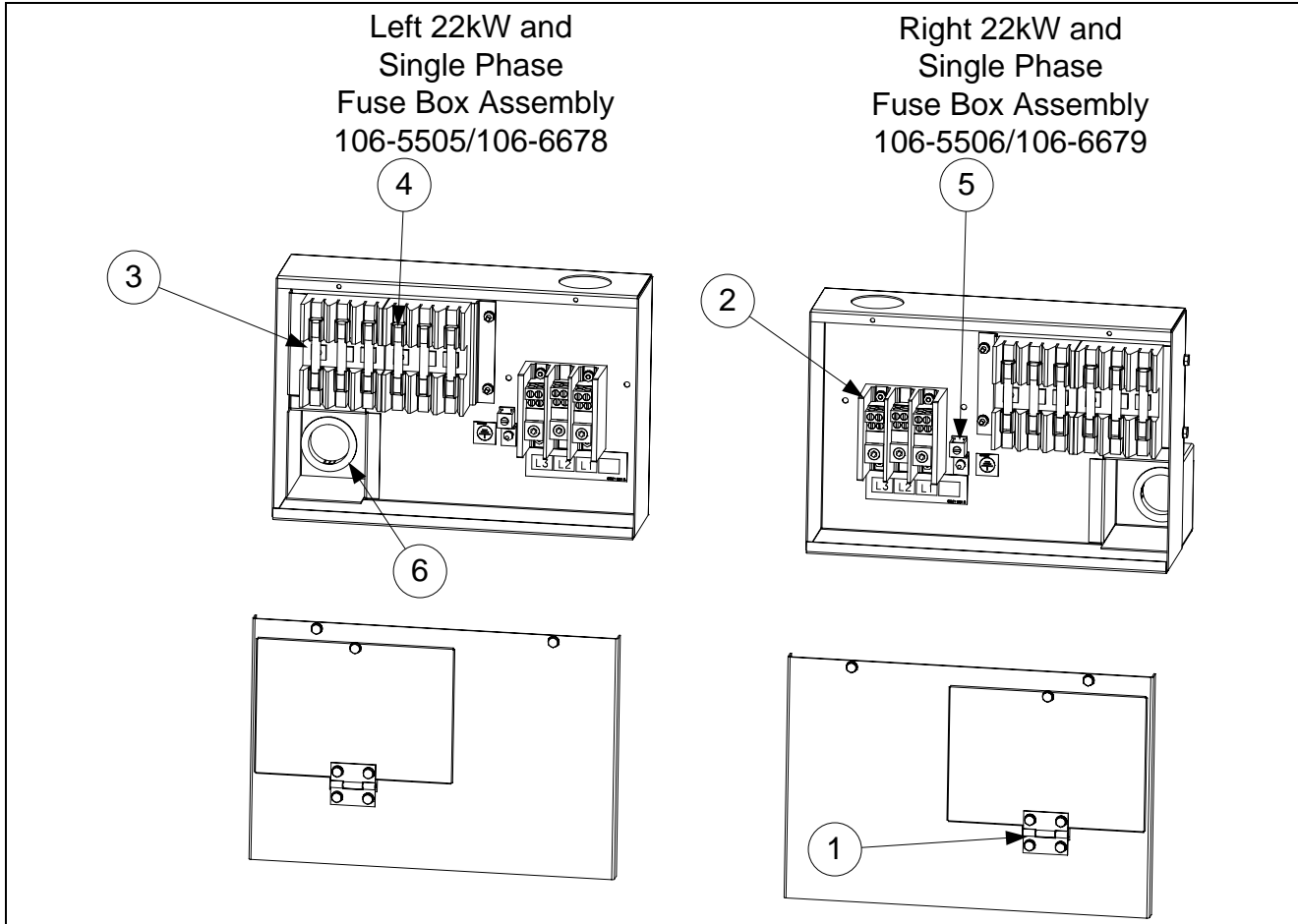
NOTES: The configurations illustrated show all possible components, but a particular configuration may not have all the components shown.

ITEM	PART #	COMPONENT
1	807-2278	Fuse, 20 Amp
2	807-0922	Holder, Bus Fuse
3	807-0064	Transformer, 480V/120V 150VA
4	106-6204	Filter Assembly, EPRI (Used on some CE WYE configurations)
5	810-2554	Plug, Cord Cutout 1.125 Button
6	807-1947	Plug, .875 Diameter Dome
7	807-0064	Transformer, 480V/120V 150VA
8	807-0070	Terminal, Ground Lug
9	807-2284	Contactora, 24V 50 Amp Mechanical (<i>only in 14kW & 17kW units</i>) (Heat)
10	807-2283	Contactora, 24V 63 Amp Mechanical (<i>only in 22kW units</i>) (Heat)
11	810-1202	Contactora, 24V 40 Amp Mechanical (Latch)
12**	806-8673	Heatsink Assembly, FV Solid State Relay (See components below)
		Components of Items 12 and 13
13	826-1562	Kit Relay, Solid State 40 Amp 280V with Heatsink
14	807-2749	Heatsink, Solid State
15	807-0037	Terminal, 1/4-inch Push-on
*	221-0482	Cover, Left Contactor Box
*	222-0482	Cover, Right Contactor Box
*	807-0012	Relay, Tilt Switch 18 Amp 1/3 HP 24 V Coil

* Not illustrated.

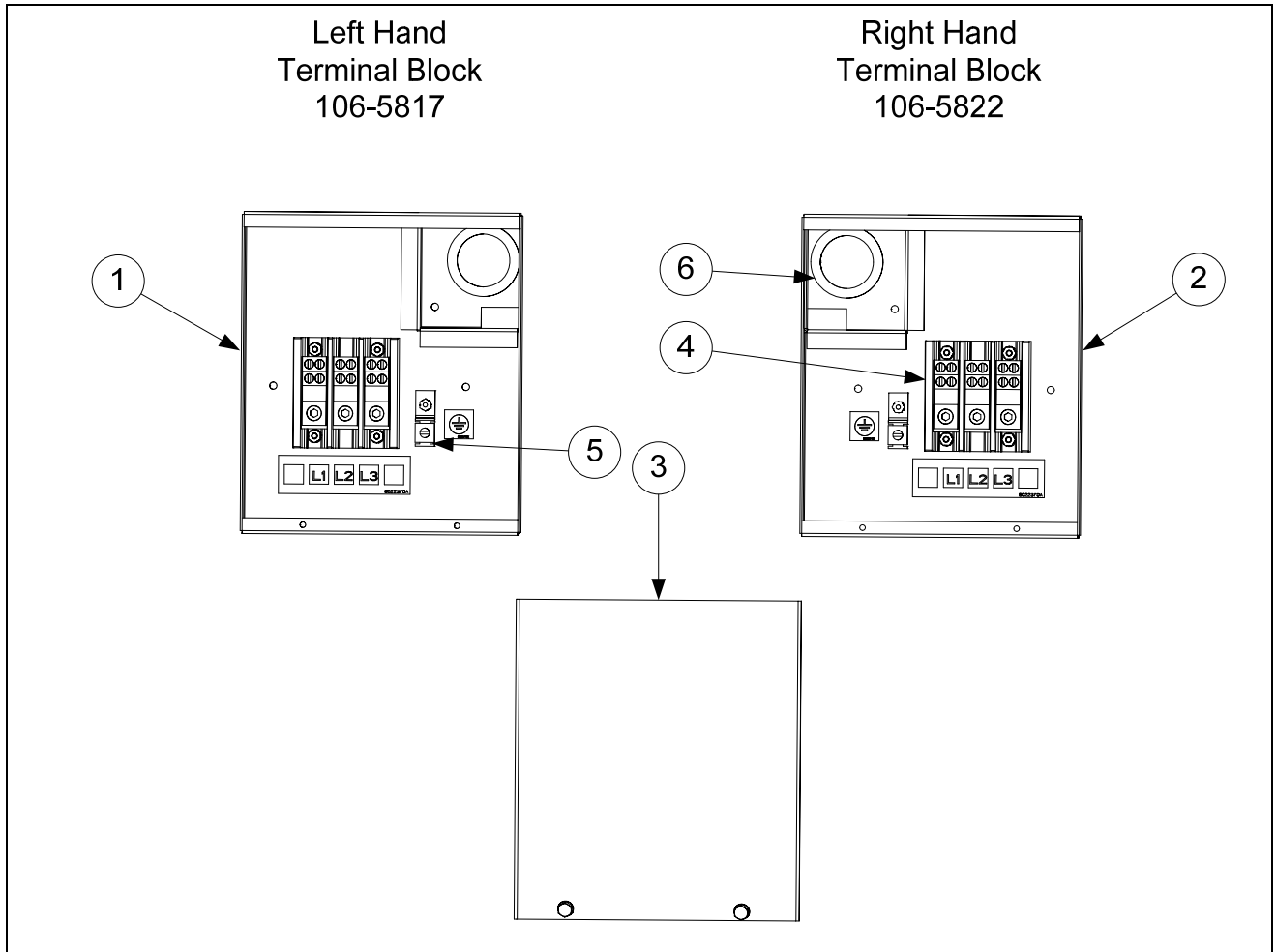
** Full Vat has three relays 826-1562, Dual-Vat has six relays.

2.5.3 Fuse Boxes



ITEM	PART #	COMPONENT
1	810-0519	Hinge
2	807-3970	Block, 3 Pole 600V 175A Terminal
3	807-0501	Fuse Block, Buss #2968 3-Pole
4	807-2240	Fuse, 60 AMP 300VAC
5	807-0070	Terminal, Ground Lug
6	807-0128	Bushing, Insulating Heyco

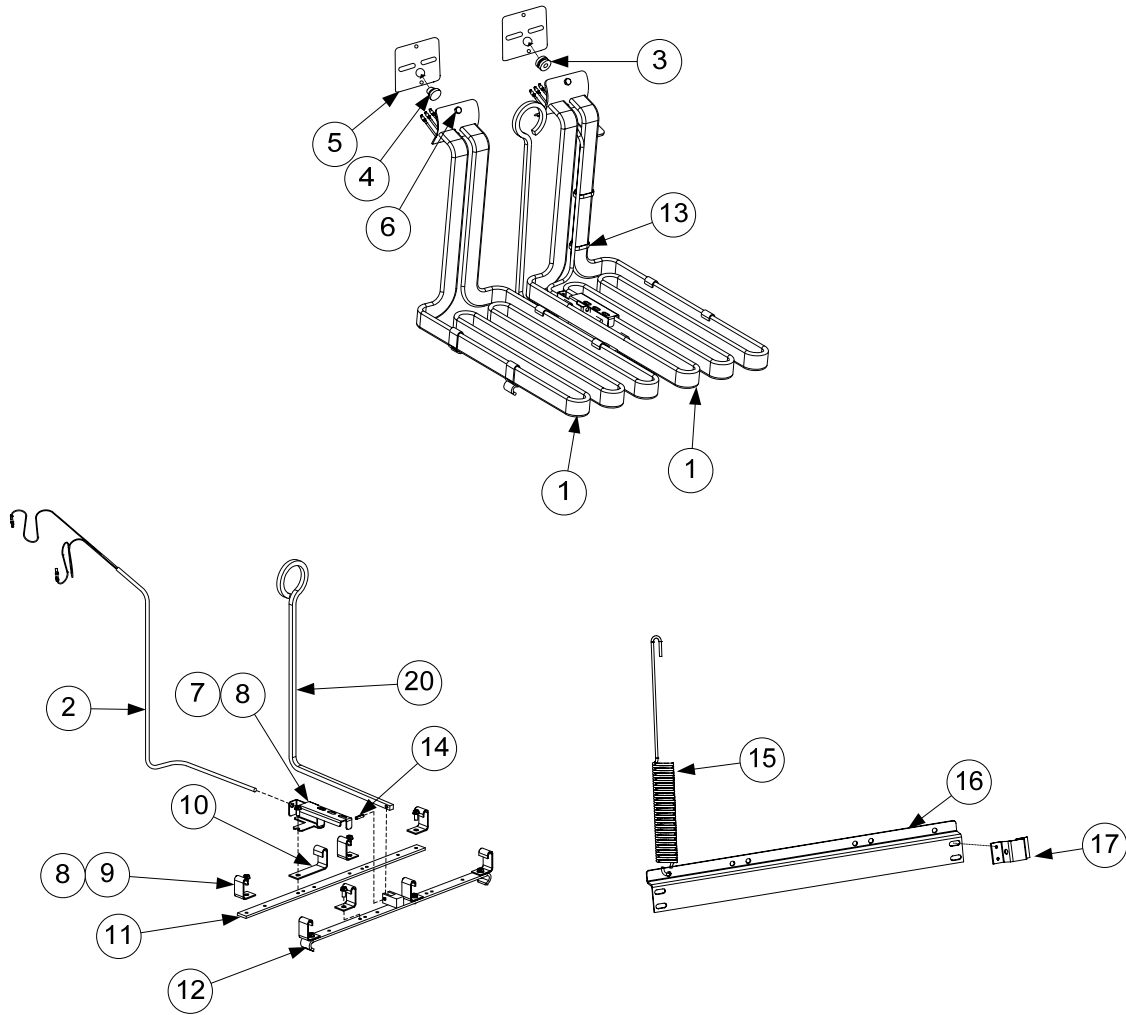
2.5.4 Terminal Blocks



ITEM	PART #	COMPONENT
1	823-5631	Box, LH Rear Terminal Block
2	823-5632	Box, RH Rear Terminal Block
3	220-0801	Cover, Rear Terminal Block Box
4	807-3970	Block, 3 Pole 600V 175A
5	807-0070	Terminal, Ground Lug
6	807-0128	Bushing, Insulating Heyco

2.5.5 Heating Element Assemblies and Hardware

FULL-VAT ELEMENT ASSEMBLY



NOTES:

The only difference between element assemblies for different voltage and kW ratings is the element itself (Item 1).

Items 15, 16 and 17 are shown as associated parts. They are not part of the element assembly.

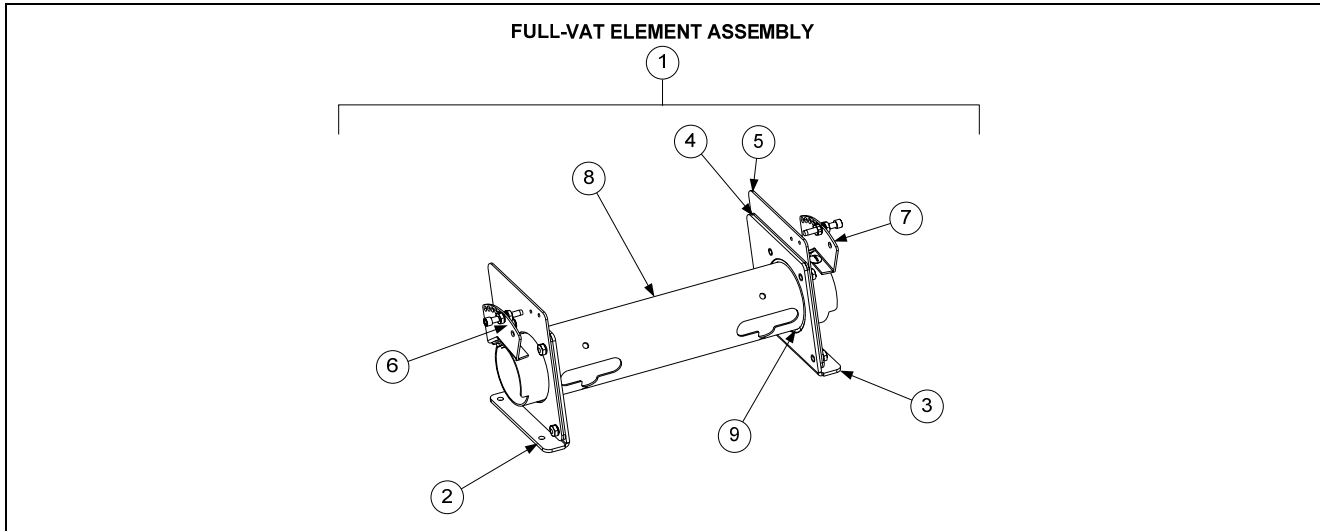
NOTE: These elements apply only to FPEL series fryers.

2.5.5 Element Assemblies and Hardware cont.

ITEM	PART #	COMPONENT
1		Element Kits – <i>includes gaskets, grommets, tie wraps, screws and nuts.</i>
	826-2198	200V 7.0 kW (also used for 220V 8.5 kW)
	826-2201	200V 8.5 kW
	826-2208	200V 11.0 kW
	826-2192	208V 7.0 kW
	826-2197	208V 8.5 kW
	826-2210	208V 11.0 kW
	826-2200	220V 7.0 kW (also used for 240V 8.5 kW)
	826-2205	220V 11.0 kW
	826-2193	230V 7.0 kW
	826-2199	230V 8.5 kW
	826-2206	230V 11.0 kW
	826-2194	240V 7.0 kW
	826-2207	240V 11.0 kW
	826-2204	400V 8.5kW
	826-2195	440V 7.0 kW
	826-2202	440V 8.5 kW
	826-2211	440V 11.0 kW
	826-2196	480V 7.0 kW
	826-2203	480V 8.5 kW
	826-2209	480V 11.0 kW
2	826-2212	Probe, Temperature RE – <i>includes tie wraps and grommet.</i>
	807-4324	Probe, Temperature Fast Ready
3	816-0681	Grommet, Probe
4	816-0480	Plug, .375-inch Dome
5	816-0688	Gasket, Element
6	809-1003	Screw, 10-32 X 3/8-inch Hex Head SS
*	809-0766	Nut, 10-32 Keps Hex Head SS
*	230-4028	Wrench, Element Tube Nut Spanner
7	910-5022	Bracket, Temperature Probe 7.0 kW
	230-0784	Bracket, Temperature Probe 8.5/11 kW
8	809-0518	Screw, 8-32 X 3/8-inch Slotted Hex Head
9	910-2042	Clamp, Element (Short)
10	230-0781	Clamp, Element (Long)
11	230-0780	Support, Full-Vat Element Rear
12	823-5621	Support, Full-Vat Element Front
13	809-0567	Tie-Wrap, Metal
14	810-1212	Pin, .125 X .5-inch Split
15	220-0464	Bracket, Lower Spring
16	220-0733	Bracket, Lower Spring Mating
17	810-1233	Handle, Element Lift

* Not illustrated.

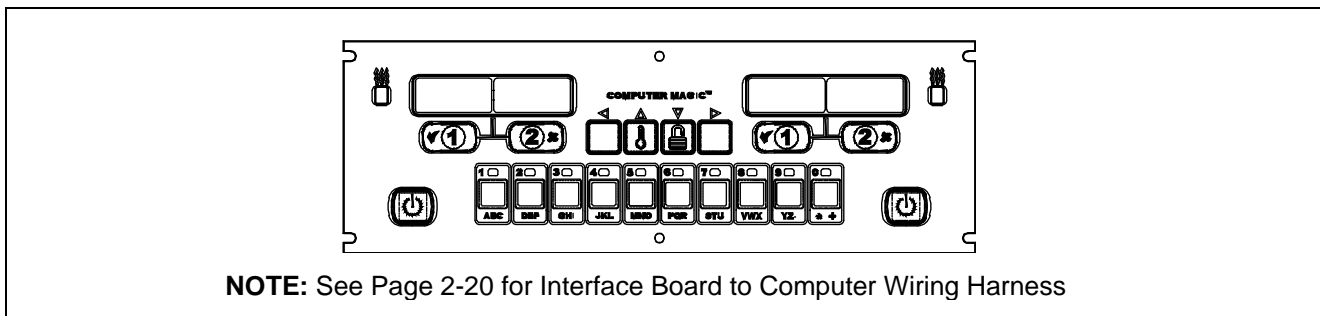
2.5.6 Element Tube Assemblies



ITEM	PART #	COMPONENT
1	106-7653SP	Tube Assembly Element, Full-Vat
2	106-5329	Bracket Assembly, LH Element Tube Support
3	106-5330	Bracket Assembly, RH Element Tube Support
4	220-0122	Plate, Element Tube Support Inner
5	220-0123	Plate, Element Tube Support Outer
6	106-7651	Bracket Assembly, LH Upper Spring <i>(use 106-6569 for 17kW)</i>
7	106-7652	Bracket Assembly, RH Upper Spring <i>(use 106-6570 for 17kW)</i>
8	810-2992	Tube, Full Vat Element Mounting
9	810-2993	Bushing, Tube End Teflon
*	106-6587	Magnetic Position Sensor Assembly
*	826-2228	Magnetic Position Sensor Assembly with Bracket
*	810-3007	Magnet
*	230-0794	Bracket, Magnetic Position Sensor Wire

* Not illustrated.

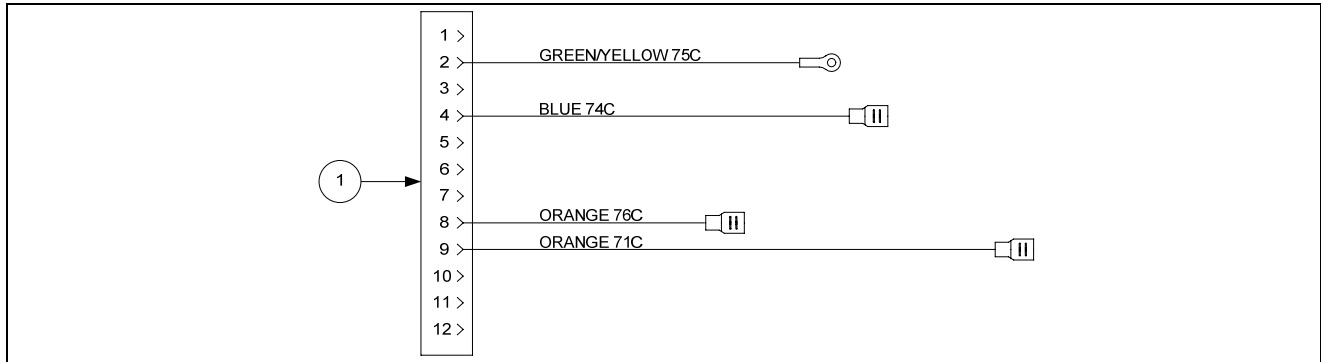
2.5.7 Computers



ITEM	PART #	COMPONENT
		Replacement CM7 Computer
	108-0227	Non-CE CM7 <i>(For use in US, Canada, Mexico and all other non-CE countries)</i>
	108-0229	Non-CE CM7 EPRI <i>(For use in US, Canada, Mexico and all non-CE countries)</i>
	108-0223	CE CM7 <i>(For use in European CE countries)</i>
	108-0225	CE CM7 EPRI <i>(For use in European CE countries)</i>
	810-3141	Sound Device, Universal SMT

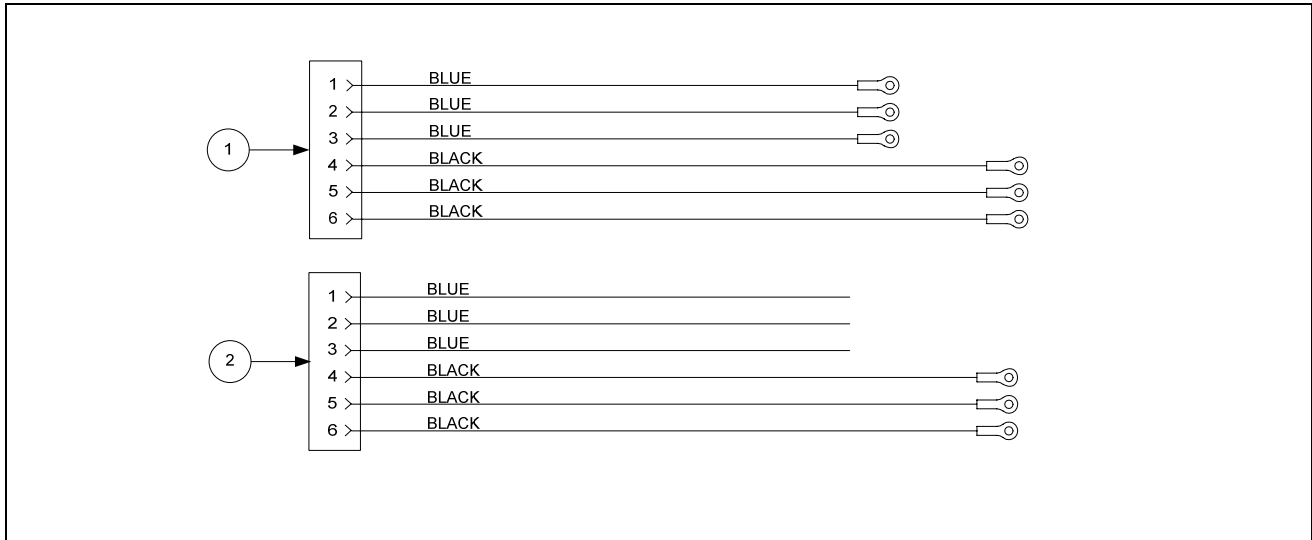
2.5.8 Wiring

2.5.8.1 Contactor Box Wiring Assemblies – 12-Pin Full-Vat C-1



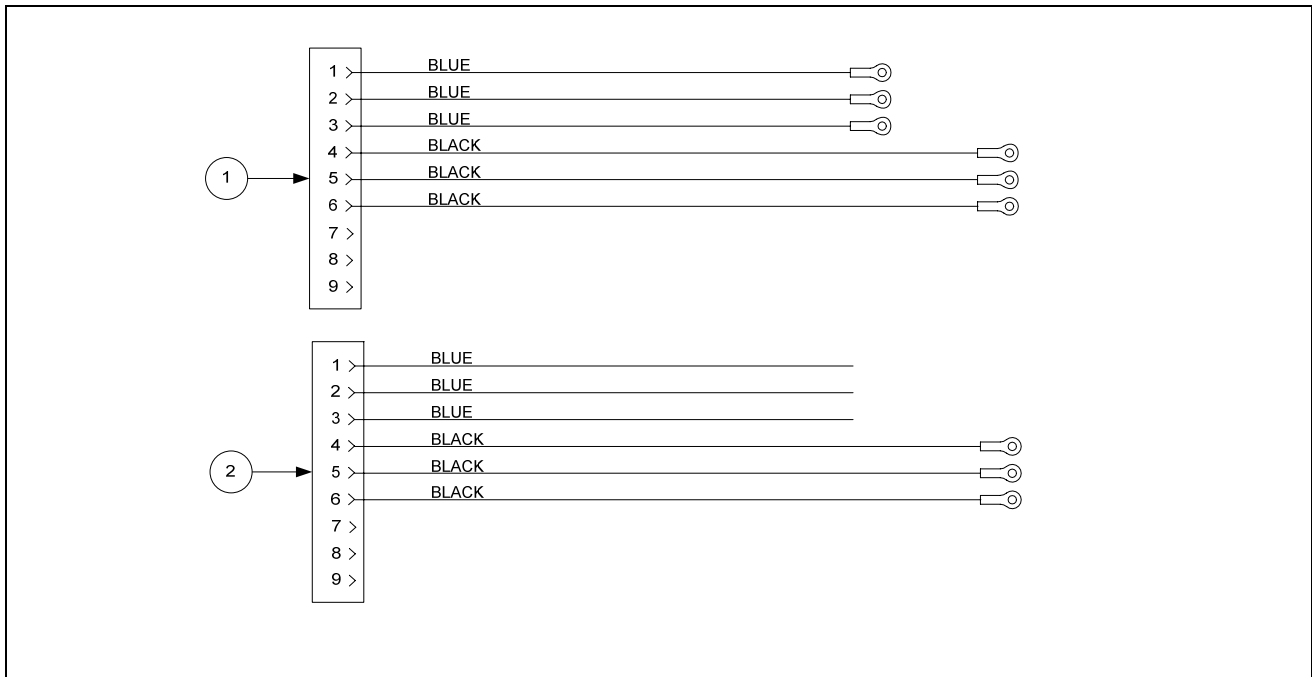
ITEM	PART #	COMPONENT
1	106-6031SP	Contactor Box Harness Assembly Full Vat Standard (See wiring diagrams on pages 1-29 thru 1-31.) EPRI (uses harness above plus wire kits WIR0733 and WIR0736) (See wiring diagrams on pages 1-33 and 1-34.)

2.5.8.2 Contactor Box Wiring Assembly – 6-Pin (Left Element)



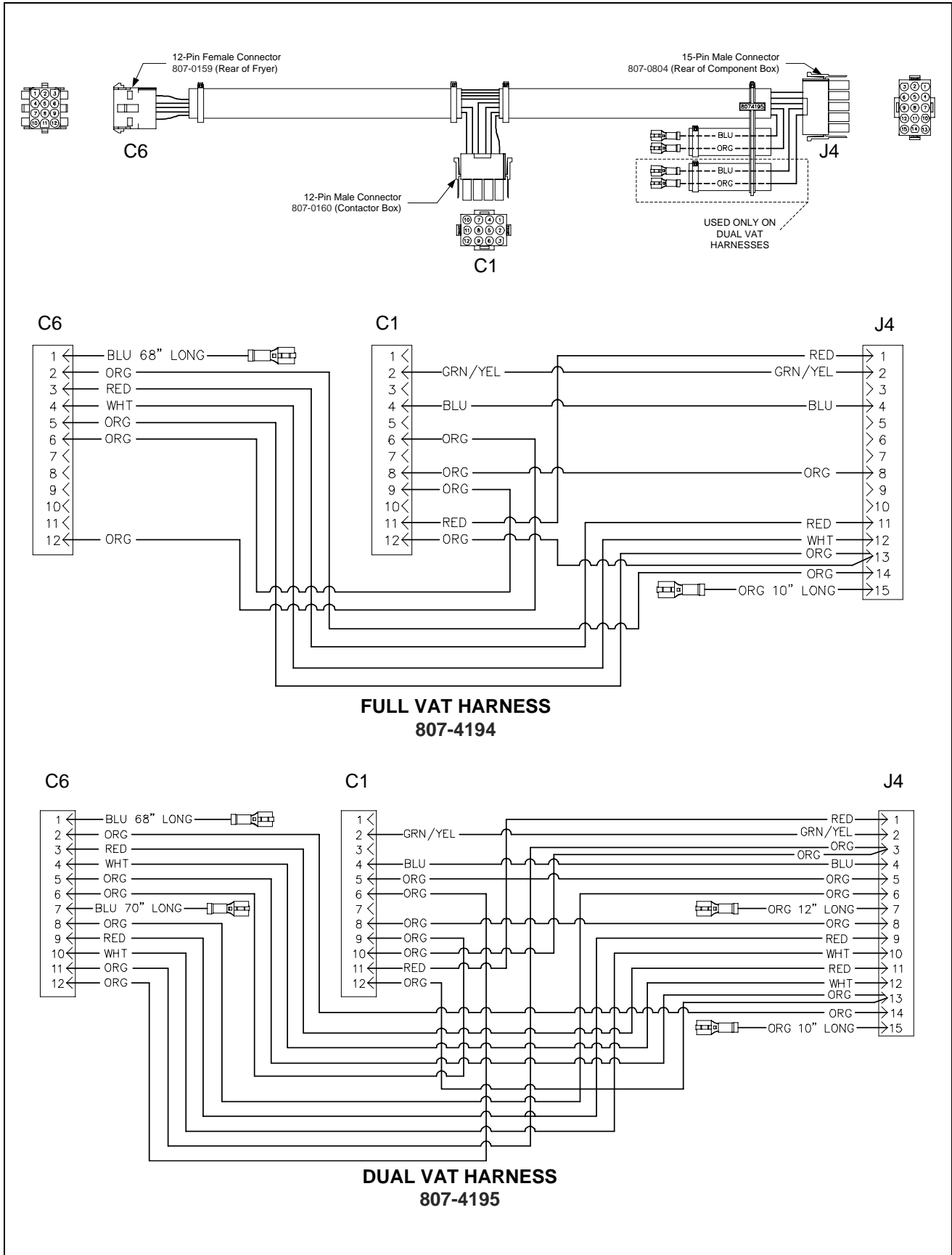
ITEM	PART #	COMPONENT
1	106-6768SP	14/17 kW Standard Mercury Contactor
	106-7849SP	22 kW Triac SSR
2	106-6771SP	14/17 kW Mechanical Contactor
	106-7851SP	22 kW Mercury and High Amp Mechanical Contactor

2.5.8.3 Contactor Box Wiring Assembly – 9-Pin (Right Element)

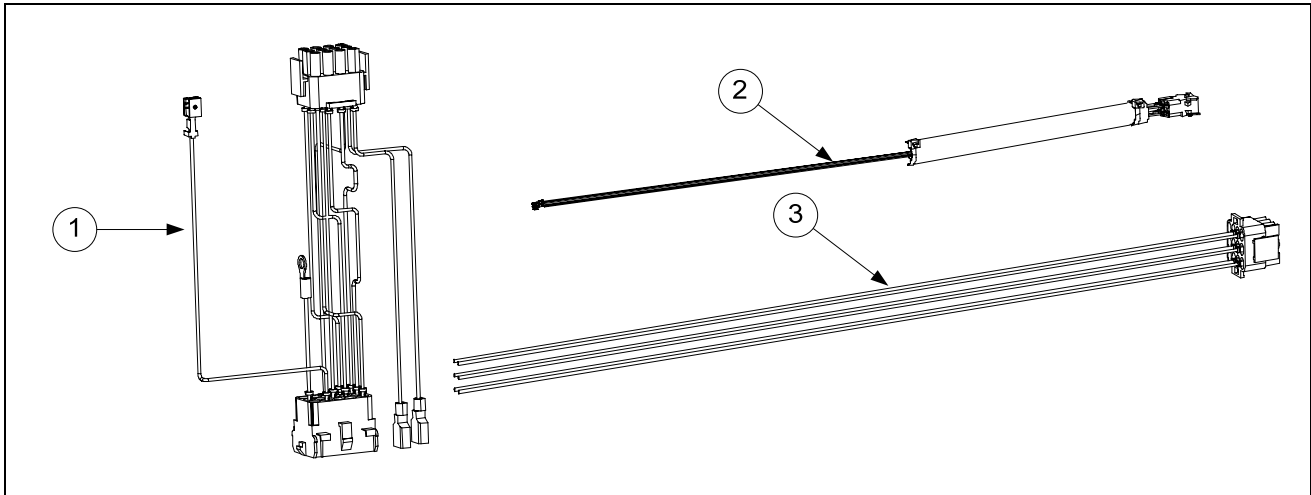


ITEM	PART #	COMPONENT
1	106-6769SP	14/17 kW Standard Mercury Contactor
	106-7850SP	22 kW Triac SSR
2	106-6772SP	14/17 kW Mechanical Contactor
	106-7852SP	22 kW Mercury and High Amp Mechanical Contactor

2.5.8.4 Main Wiring Harnesses

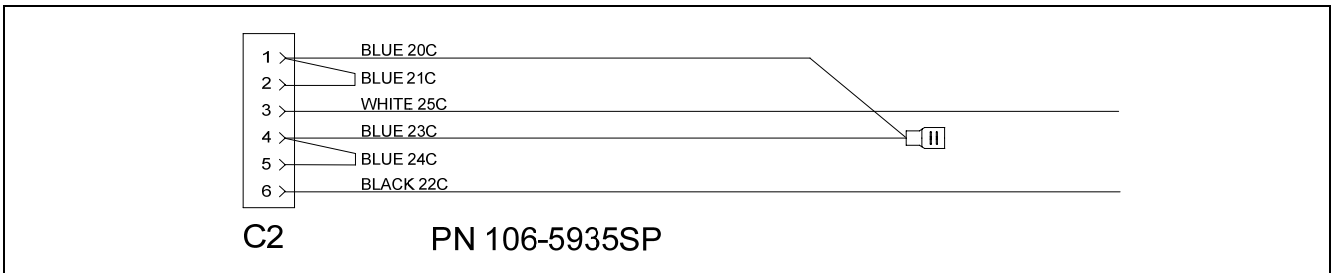


2.5.8.5 Component Box, Filter Pump and Basket Lift Wiring Harnesses

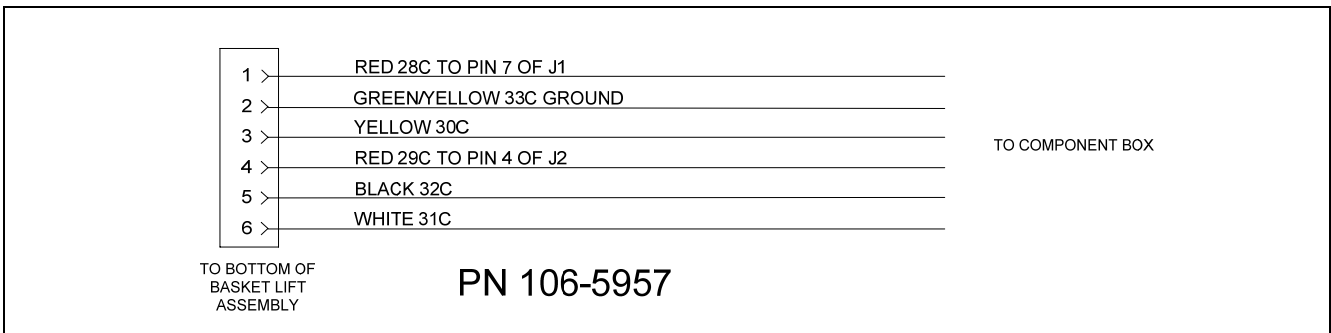


ITEM	PART #	COMPONENT
1	106-5750SP	Full Vat Control Harness J4 to J2 (<i>Standard</i>)
	106-6639	Full Vat Control Harness J4 to J2 (<i>EPRI</i>)
2	106-5935SP	Filter Pump C2 to Component Box Wiring Harness
3	106-5957	Basket Lift Harness Assembly (<i>Standard</i>)
	106-6640	Basket Lift Harness Assembly (<i>EPRI</i>)

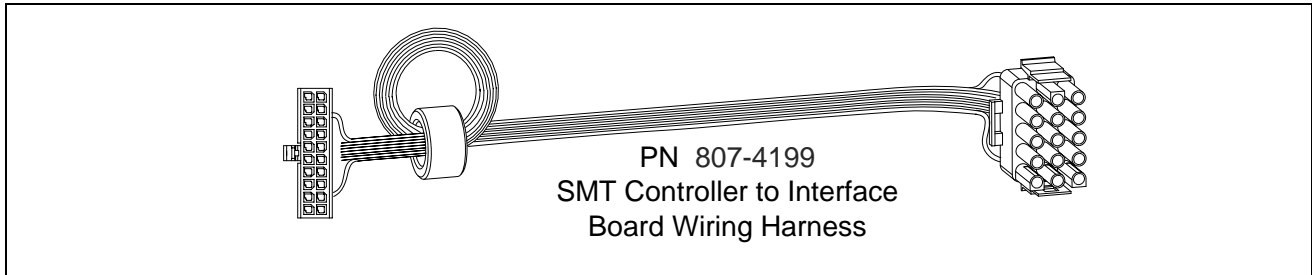
2.5.8.6 Component Box to Filter Pump Harness



2.5.8.7 Basket Lift Harness



2.5.8.8 Interface Board to Controller Wiring Harness – 15-Pin



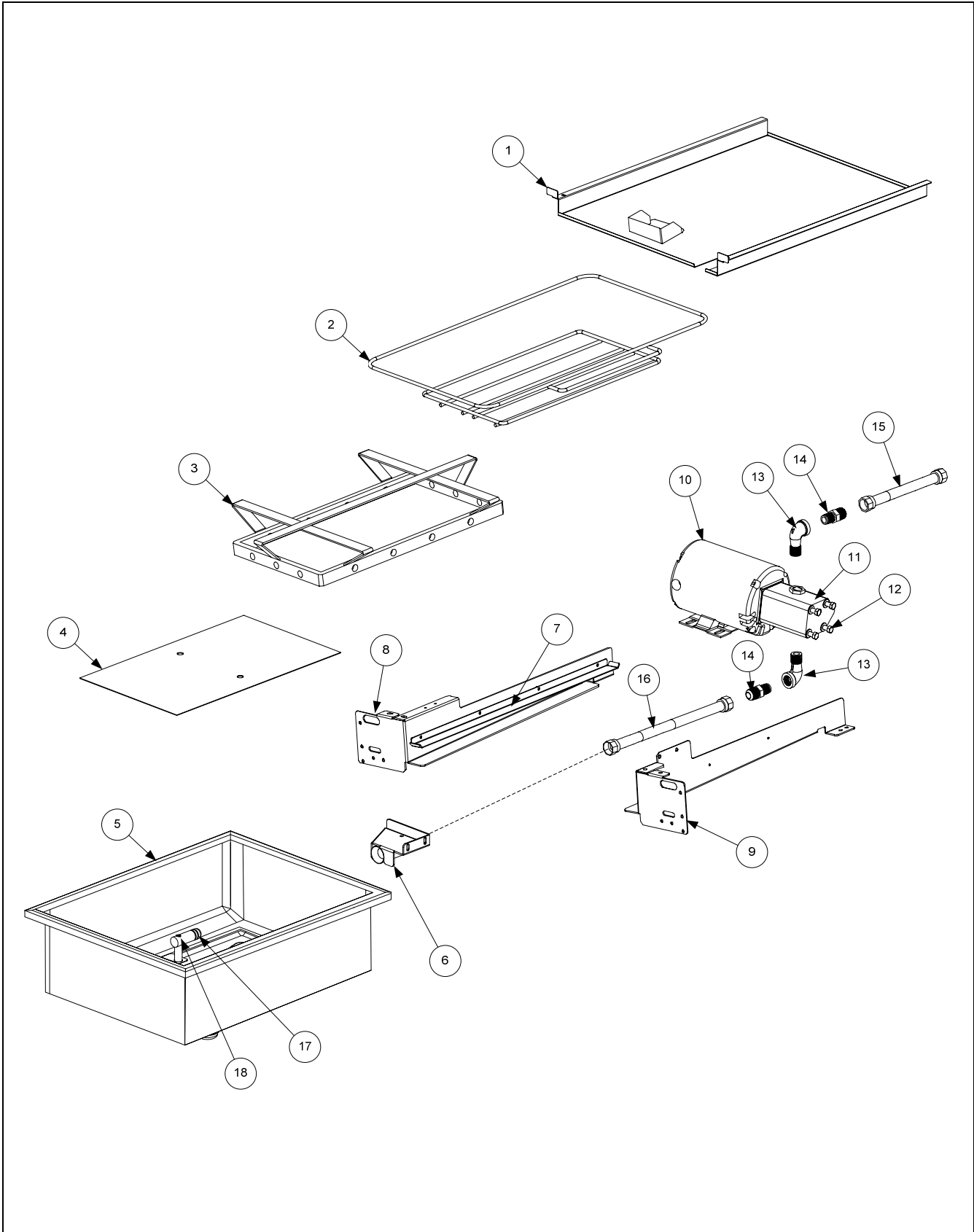
2.5.8.9 CM7 and ATO Wiring Harnesses

ITEM	PART #	COMPONENT
*	807-4546	Computer Communication (<i>used from Computer to Computer</i>)
*	807-4655	Harness RTD Medium (<i>used from RTD to ATO Board</i>)
*	807-4654	ATO RTD Probe
*	807-4621	Harness RTD Short (<i>used from RTD to ATO Board</i>)
*	807-4553	Harness, ATO Power (<i>used from Transformer to ATO Board</i>)
*	807-4671	Harness, ATO Pump and JIB (<i>used from ATO Board to Top-off Pump and JIB Reset Switch</i>)
*	807-4555	ATO Yellow LED (<i>used from ATO Board to Yellow LED</i>)
*	807-4573	Computer Locator Wire (<i>used from Computer to Interface Board</i>) See wiring diagram 805-1735 on page 1-38 for locator pin positions.
*	807-4552	Communications Terminator (<i>used on Computer pin J6 and ATO board pin J10 to terminate network</i>)
	807-4657	Jumper (<i>used on 4 and 5 battery ATO board plug J5 pin 7 and 8</i>)
*	106-9256SP	Long Top-off Power (<i>used between Component Box to ATO Box</i>)
*	807-4646	Harness, Communication Long (<i>used from Far Right Computer to ATO board</i>)
*	807-4660PK	SMT Pin Service Repair Kit
*	230-2345	SMT Pin Extractor

* Not illustrated.

See page 1-16 and 1-23 for Pin Positions.

2.6 Filtration System Components

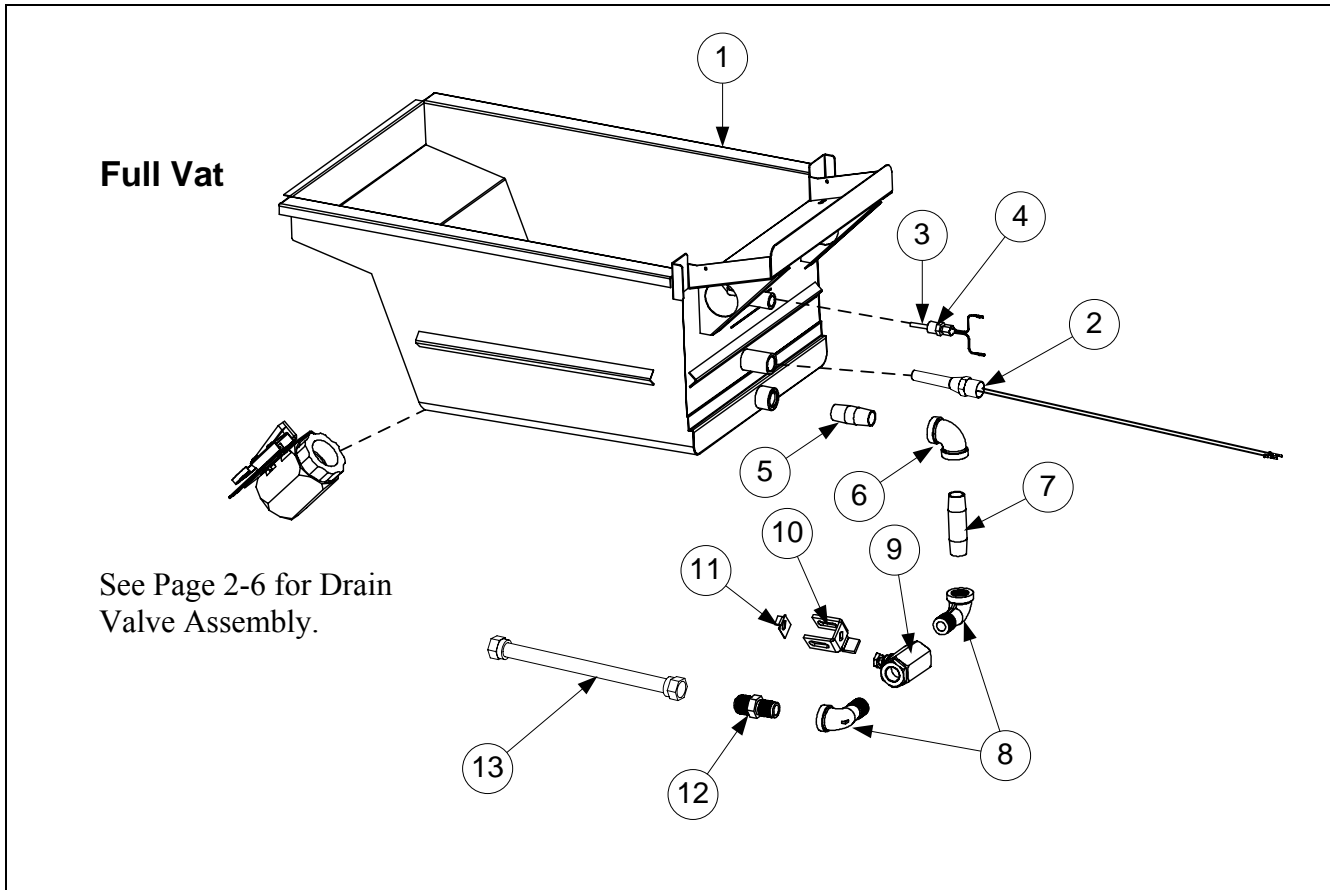


2.6 Filtration Components cont.

ITEM	PART #	COMPONENT
1	823-6560	Lid, Multi-Vat Fryers, Standard Size Filter Pan
	823-6362	Lid, Two-Vat Fryer, Half Size Filter Pan
2	810-3276	Crumb Tray, Standard Size Filter Pan 3, 4 and 5 Vat
	810-3288	Crumb Tray, Two-Vat Fryer, Half Size Filter Pan
3	810-3419	Hold-Down Ring for Paper 13.65 x 21.41, Standard Size Pan 3, 4, and 5 Vat
	810-3289	Hold-Down Ring for Pad 11.20 x 19.10, Two-Vat Fryer, Half Size Filter Pan
4	200-2240	SanaGrid Filter Screen, Standard Size Filter Pan
	220-2901	SanaGrid Filter Screen, Two-Vat Fryer, Half Size Filter Pan
5	106-8677	Pan, One-Piece Filter Standard Size
	106-8211SP	Pan, Two-Vat Fryer, Half Size
6	823-6191	Suction Tube Standard
	823-6399	Suction Tube Two Vat
7	220-3879	Rail, Filter Pan Retaining Standard
	220-2999	Rail, Filter Pan Retaining Two Vat
8	220-3748	Support, Left Filter Pan
	220-3275	Support, Left Filter Pan Two Vat
9	220-3749	Support, Right Filter Pan
	106-8487	Support, Right Filter Pan Two Vat
10		Motor and Gasket Kit
	826-1785	100V 50/60 Hz
	826-1712	115V 50/60 Hz
	826-1756	208V 50/60 Hz
	826-1270	220-240V 50/60 Hz
	826-1755	250V 50/60 Hz
11	826-1264	Pump and Gasket Kit, Viking 4 GPM (includes gasket and capscrews below)
	816-0093	Gasket, Pump/Motor
12	809-0514	Cap Screw, 5/16-inch-18 4.50" NC Hex (<i>Connects pump to motor.</i>)
*	807-11973	Viking Pump Seal Kit
13	813-0165	Elbow, ST 1/2-inch x 1/2-inch NPT 90° BM
14	810-1668	Adapter, 5/8-inch to 1/2-inch NPT Male
15	810-1067	Flexline, 8.5-inch Oil Return
16	810-1057	Flexline, 13-inch Oil Return
17	826-1392	O-Ring (Pkg. of 5; used with Item 5)
18	813-0568	Plug, 1/8-inch Socket Head Pipe (used with Item 5; two required)
*	106-5911	Heater Strip Assembly, 100-120V 25W 18"
*	106-5912	Heater Strip Assembly, 208-250V 25W 18"

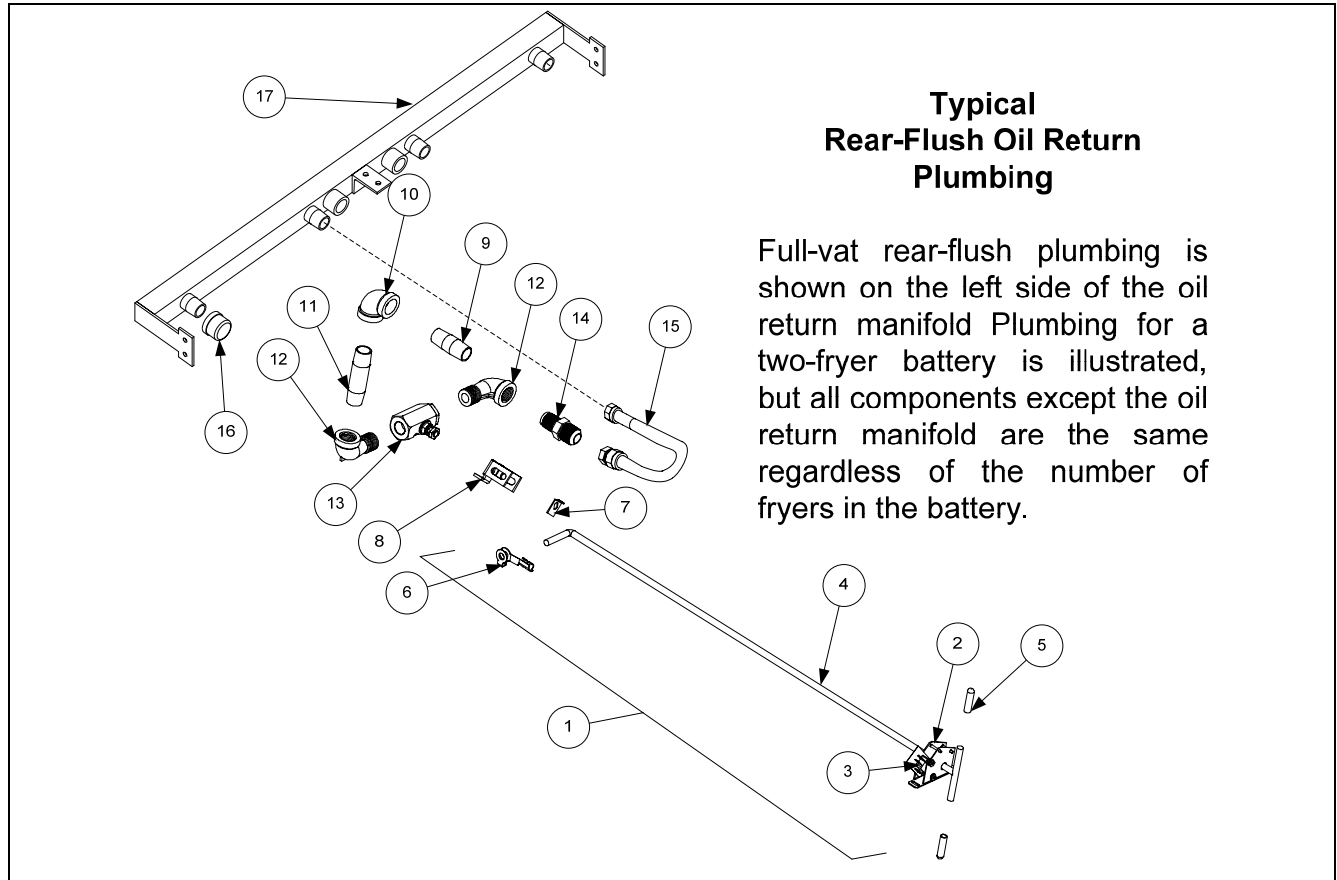
* Not illustrated.

2.7 Frypot Assemblies and Associated Parts



ITEM	PART #	COMPONENT
1	823-6912	Frypot, Full-Vat
2		Thermostat Assembly, High-Limit Long Standard
	806-7543	Non-CE Full Vat 425°F (218°C) (14 and 17kW FV) (Color Coded Black)
	806-8035	Non-CE Full Vat 435°F (224°C) (22kW) (Color Coded Red)
	806-8132	CE Full Vat 415°F (213°C) (14kW and 17kW CE) (Color-Coded Yellow)
	806-8536	CE Full Vat 405°F (207°C) (22kW CE) (Color-Coded White)
3	807-4645	Probe, Temperature ATO RTD
4	813-0617	Fitting, 3/16" x 1/4" NPT
5	813-0298	Nipple, 1/2" x 2.00" NPT BM Pipe
6	813-0062	Elbow, 1/2" BM x 90°
7	813-0460	Nipple, 1/2" x 3.00" NPT BM Pipe
8	813-0165	Elbow, St 1/2" x 1/2" NPT 90° BM
9	810-0278	Valve, Return 1/2" Ball
10	200-5438	Handle, Valve Rear Flush
11	900-2935	Retainer, Nut Oil Return Valve
12	810-1668	Adaptor, Male 5/8" OD x 1/2"
13	810-1055	Flexline, 5/8" OD x 11.50" Long

2.8 Oil Return System Components

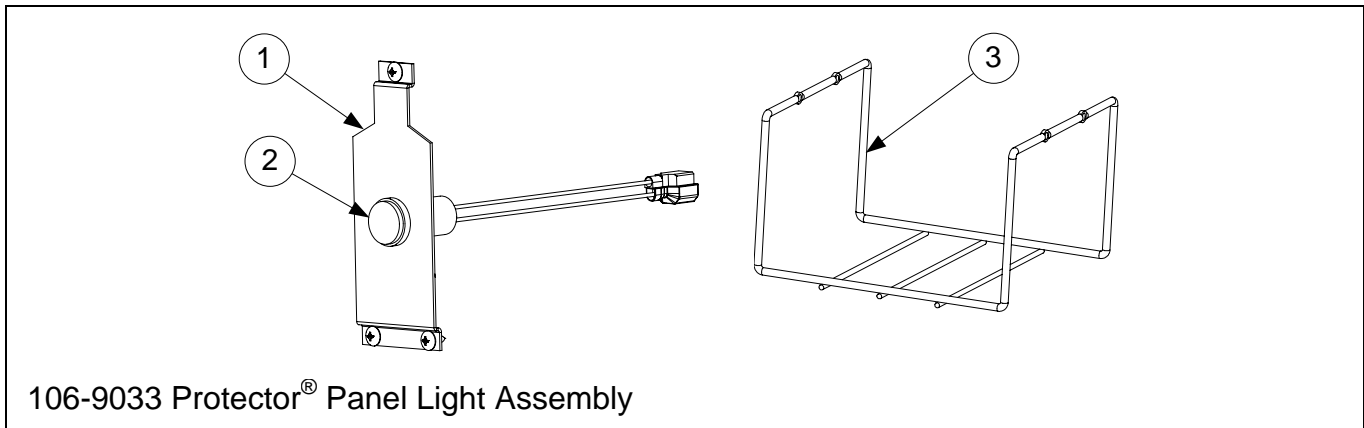


ITEM	PART #	COMPONENT
1	106-9044	Handle Assembly, Full-Vat Rear Flush Protector
2	106-5595	Bracket Switch Assembly
3	807-2103	Microswitch, Straight Lever
4	823-6653	Handle, Oil Return Protector Rod
5	816-0643	Grip, Oil Return Handle
	816-0220	Insulation, Oil Return Microswitch
6	809-0601	Clip, Clevis
7	900-2935	Retainer, Nut Oil Return Valve
8	200-5438	Handle, Valve Rear Flush
9	813-0298	Nipple, 1/2" x 2.00" NPT BM Pipe
10	813-0062	Elbow, 1/2" BM x 90°
11	813-0460	Nipple, 1/2" x 3.00" NPT BM Pipe
12	813-0165	Elbow, St 1/2" x 1/2" NPT 90° BM
13	810-0278	Valve, Return 1/2" Ball
14	810-1668	Adaptor, Male 5/8" OD x 1/2"
15	810-2532	Flexline, 7.00" Long
16	813-0907	Cap, 15/16-inch Valve Safety
17	810-3015	Manifold, Two-Station Fryer
*	810-3016	Manifold, Three-Station Fryer
*	810-3017	Manifold, Four-Station Fryer
*	810-3018	Manifold, Five-Station Fryer

* Not illustrated.

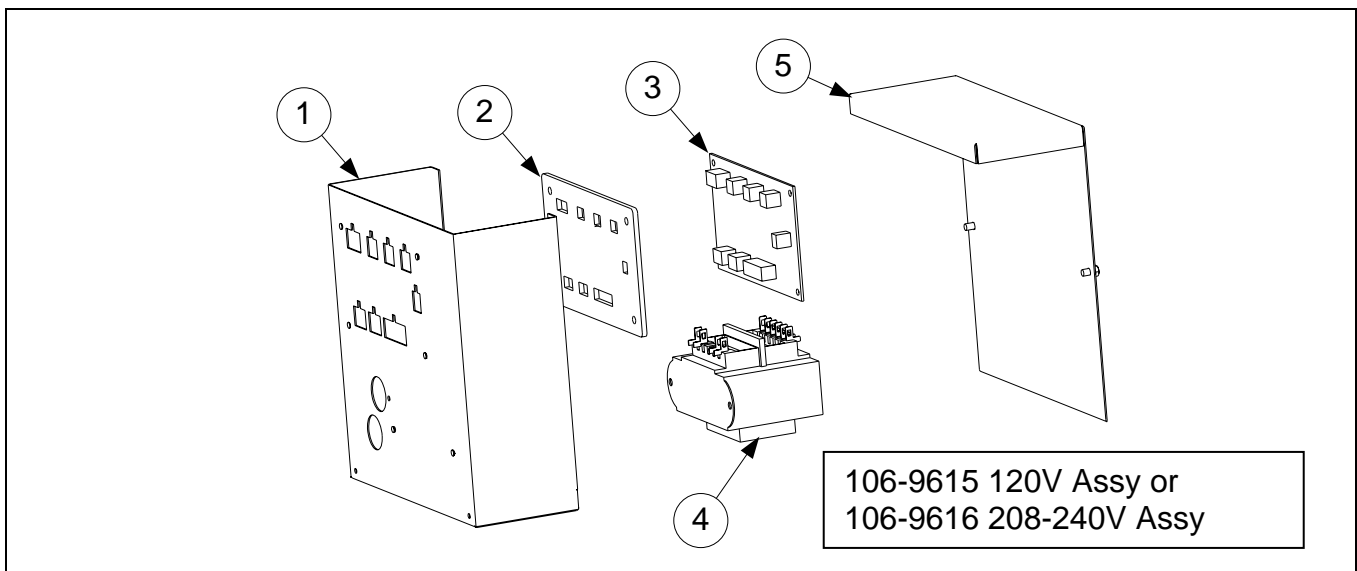
2.9 Auto Top-Off Components

2.9.1 JIB Indicator Light and Basket



ITEM	PART #	COMPONENT
1	230-4142	Bracket, Protector® Light
2	106-8105SP	Light, Yellow 24VDC LED Flush
3	810-3277	Basket, JIB

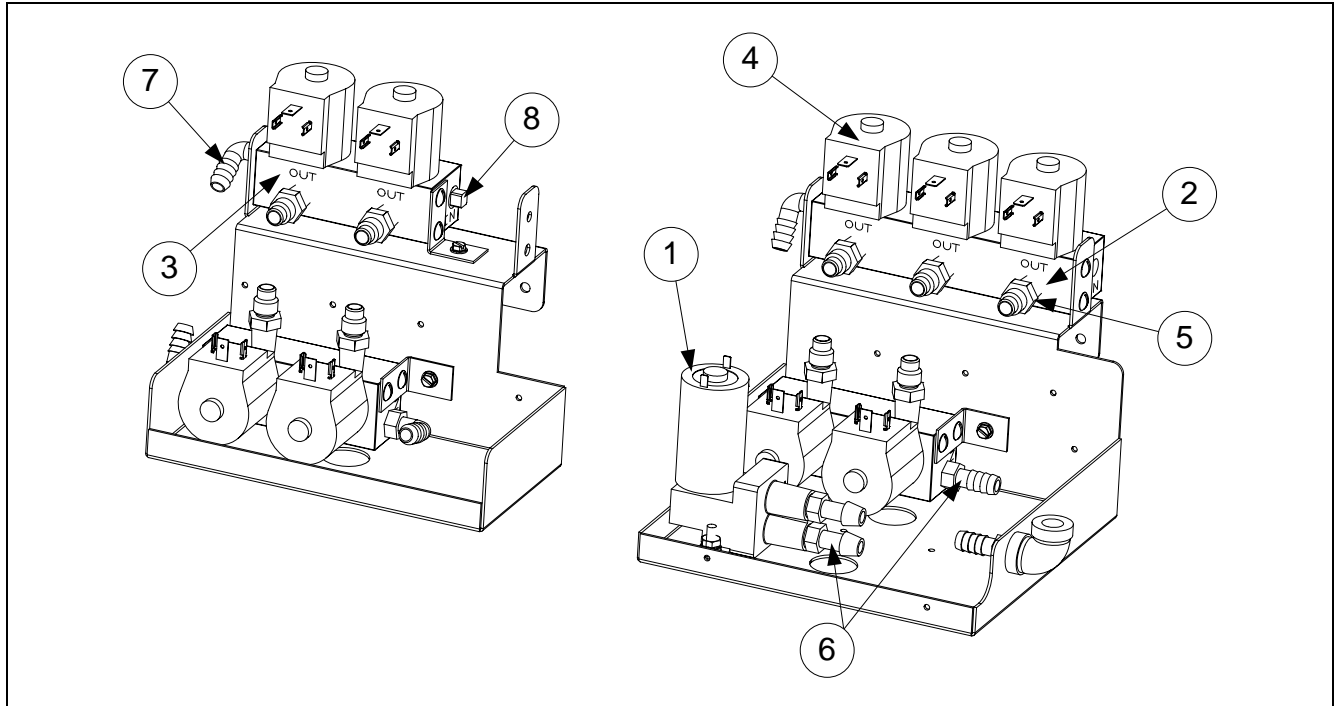
2.9.2 Automatic Top-Off Board Assembly



ITEM	PART #	COMPONENT
1	106-9258	Box, Assembly Auto Top Off Board (use 106-8913 for 2-Vat)
2	816-0747	Seal, Top Off Board
3	106-9611	PCB Board, Automatic Top Off 2
4	807-1999	Transformer, Dual Voltage 208-240V
	807-2176	Transformer, Dual Voltage 120V
5	220-4352	Cover, Top Off Board 3, 4 or 5-Vat
	220-3987	Cover, Top Off Board 2-Vat
*	807-3575	Plug, Carling Switch Hole

* Not illustrated.

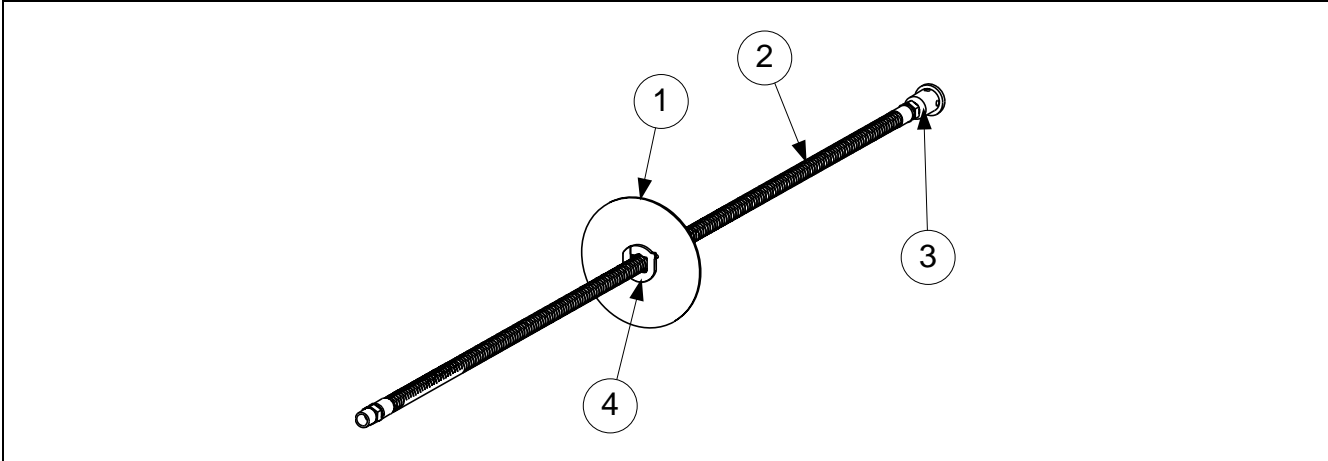
2.9.3 Solenoid and Pump Assemblies



ITEM	PART #	COMPONENT
1	106-9680SP	Pump, ¼ FNPT 12VDC, 19PSI 15.1GPH
2	807-4412	Solenoid Manifold Top-Off (includes three solenoid assemblies)
3	807-4587	Solenoid Manifold Top-Off (includes two solenoid assemblies)
4	807-4590	Solenoid
5	810-3270	Fitting, ⅜ Flare x ¼ NPT
6	816-0708	Fitting, ¼ NPT x ½ Male Barb
7	816-0710	Fitting, ¼ NPT x ½ Barb 90°
8	813-0640	Plug, ¼ NPT SQ HD BM
*	811-1139	Tubing, Braided Silicone 20-inch
*	810-3266	Flexline, ½" OD x 19.5-inch (used between solenoid and top off port)
*	810-3265	Flexline, ½" OD x 24-inch (used between solenoid and top off port)
*	810-3263	Flexline, ½" OD x 36-inch (used between solenoid and top off port)
*	810-3264	Flexline, ½" OD x 42-inch (used between solenoid and top off port)

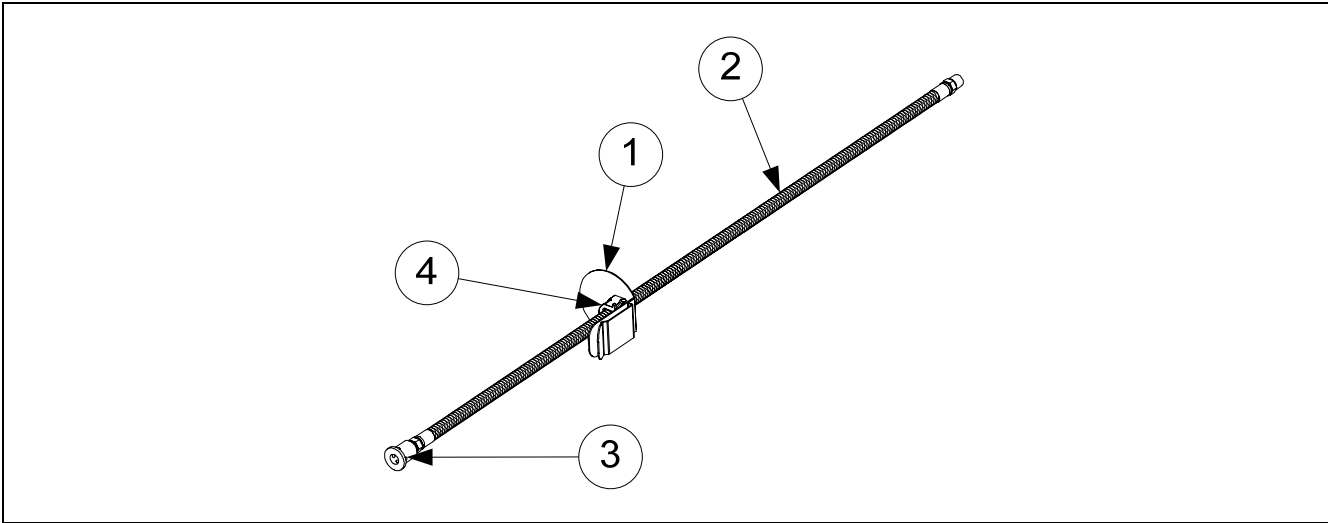
* Not illustrated.

2.9.4 JIB Cap and Pick-Up Assembly



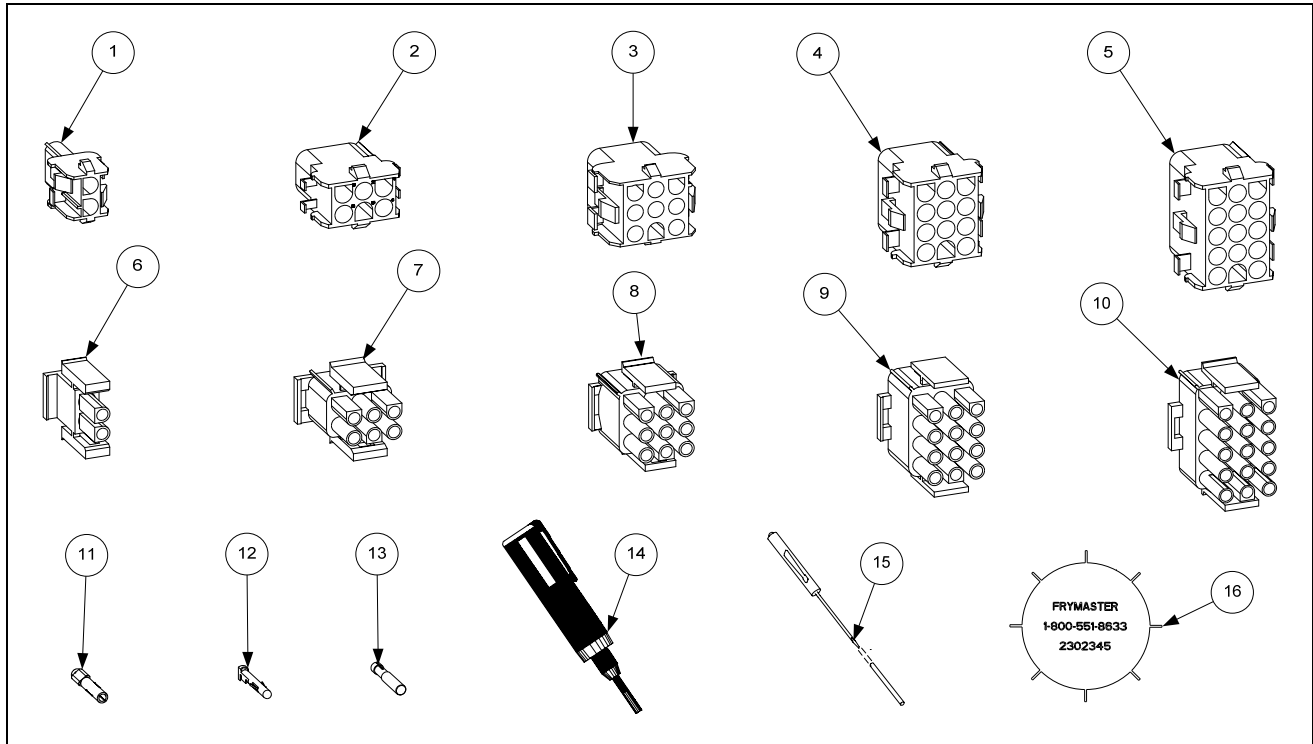
ITEM	PART #	COMPONENT
	106-8512	Cap, JIB Assembly
1	230-3737	Cap, JIB
2	810-3242	Hose, JIB
3	810-3300	Inlet, Oil Reservoir Tube
4	810-3334	Bushing, Heyco

2.9.5 BIB Cap and Pick-Up Assembly (Used Internationally)



ITEM	PART #	COMPONENT
	106-9495	Cap, BIB Assembly
1	823-6812	Cap w/ Clamp, BIB Assembly
2	810-3242	Hose
3	810-3300	Inlet, Oil Reservoir Tube
4	810-3334	Bushing, Heyco

2.10 Wiring Connectors, Pin Terminals, and Power Cords



ITEM	PART #	COMPONENT
Power Cords		
*	807-0154	100/120V–15A 3-wire, w/grounded plug
*	807-1685	100/208/240V–18A 3-wire, w/o plug
*	807-3817	208-250V/74A 3-Phase 4-wire w/plug 96” 8 awg
*	807-4668	208-250V/84A 3-Phase 4-wire w/plug 96” 6 awg
*	807-3834	208-250V/84A 3-Phase 4-wire w/plug 96” 6 awg
*	807-3428	220V/15A 3-wire, w/o plug Export 96” 8 awg
*	807-3836	240V/32A 3-Phase 5-wire w/plug Export 86.5”
*	807-3835	220-250V 3-Phase 4-wire w/o plug Export 92”
*	807-3867	220-250V/50A 3-Phase 5-wire w/plug Export 109”
Connectors		
1	807-1068	2-Pin Female
2	807-0158	6-Pin Female
3	807-0156	9-Pin Female
5	807-0159	12-Pin Female
5	807-0875	15-Pin Female
6	807-1067	2-Pin Male
7	807-0157	6-Pin Male
8	807-0155	9-Pin Male
9	807-0160	12-Pin Male
10	807-0804	15-Pin Male
11	826-1341	Terminal, Female Split Pin (Pkg of 25)
12	826-1342	Terminal, Male Split Pin (Pkg of 25)
13	807-2518	Plug, Mate-N-Lock (Dummy Pin)
14	807-0928	Extract Tool Pin Pusher
15	806-4855	Pin Pusher Screwdriver Assembly
16	230-2345	SMT Pin Extractor
*	807-4660PK	SMT Pin Service Repair Kit

* Not illustrated.

2.11 Fasteners

ITEM	PART #	COMPONENT
*	809-0429	Bolt, 1/4-inch – 20 x 2.00-inch Hex Head ZP Tap
*	809-0131	Bolt, 1/4-inch -20 x 3/4-inch Hex
*	809-1020	Cap Screw, 5/16-inch-18 5.50" NC Hex (<i>Connects pump to motor.</i>)
*	809-0448	Clip, Tinnerman
*	826-1366	Nut, 4-40 Keps Hex (Pkg. of 25) (809-0237)
*	826-1358	Nut, 6-32 Keps Hex (Pkg. of 25) (809-0049)
*	809-0247	Nut, 8-32 Keps Hex
*	826-1376	Nut, 10-32 Keps Hex (Pkg. of 10) (809-0256)
*	809-0766	Nut, 10-32 Keps Hex SS
*	809-0581	Nut, 1/2 NPT Locking
*	809-0020	Nut Cap 10-24 NP
*	826-1372	Nut Grip 1/4-inch 1/4-20 Hex NP (Pkg. of 10) (809-0059)
*	809-0417	Nut Flange 1/4-inch 1/4-20 Serr
*	809-0535	Nut, "T" 1/4-inch-20 x 7/16 SS
*	809-0495	Nut, 1/4-inch – 20 Press
*	809-0540	Nut, Lock 1/2-inch-13 Hex 2-Way ZP
*	826-1359	Screw, 4-40 x 3/4-inch Slotted Round Head (Pkg. of 25) (809-0354)
*	826-1365	Screw, 6-32 x 3/8-inch Slot Head (Pkg. of 25) (809-0095)
*	809-0357	Screw, 6 x 3/8-inch Phillips Head NP
*	809-0359	Screw, 8 x 1/4-inch Hex Washer Head
*	809-0360	Screw, 8 x 3/8-inch Hex Washer Slot Head
*	826-1371	Screw, 8 x 1/2-inch Hex Head ZP (Pkg. of 25) (809-0361)
*	809-0364	Screw, 8 x 5/8-inch Hex Washer Head ZP
*	809-0518	Screw, 8-32 x 3/8-inch Hex Washer Slotted Head SS
*	809-0104	Screw, 8-32 x 1/2-inch Slotted Head ZP
*	826-1363	Screw, 8-32 x 1/2-inch NP (Pkg. of 25) (809-0103)
*	826-1360	Screw, 10-24 x 5/16-inch Round Slot Head ZP (Pkg. of 25) (809-0024)
*	826-1330	Screw, 10-32 x 3/8-inch Slot Head SS (Pkg. of 25) (809-0117)
*	809-1003	Screw, 10-32 x 3/8-inch Hex Trim Head SS
*	809-0270	Screw, 10-32 x 1/2-inch Phillips Head ZP
*	826-1375	Screw, 10-32 x 3/4-inch Hex Trim Head SS (Pkg. of 5) (809-0401)
*	809-1000	Screw, 10-32 x 1 1/4-inch Hex Sck C/S
*	826-1374	Screw, 10 x 1/2-inch Hex Head (Pkg. of 25) (809-0412)
*	809-0266	Screw, 10 x 1/2-inch Phillips Head ZP
*	809-0434	Screw, 10 x 3/8-inch Hex Washer Head NP
*	809-0123	Screw, 10 x 3/4-inch Slot Head
*	826-1389	Screw, 1/4-20 x 3/4-inch Hex Head ZP (Pkg. of 10) (809-0131)
*	809-0582	Washer 1/2 NPT Locking
*	809-0184	Washer, #10 LK ZP
*	809-0190	Washer, .625 X .275 X 40 Flat SS
*	809-0191	Washer, Lock 1/4 Spring ZP
*	809-0193	Washer, Flat 1/4 Nylon
*	809-0194	Washer, Flat 5/16 ZP



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