

BROASTER®

EQUIPMENT

SERVICE MANUAL

BROASTER® 2400
PRESSURE FRYER

Be sure ALL installers read, understand, and have access to this manual at all times.



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Broaster Company
2855 Cranston Road, Beloit, WI 53511-3991
608/365-0193 broaster.com

FOR YOUR SAFETY

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

⚠ WARNING Improper installation, adjustments, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

For the sake of safety and clarity, the following words used in this manual are defined as follows:

⚠ DANGER Indicates an imminently hazardous situation which, if not avoided, could result in serious injury or death.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor injury, property damage or both.

All adjustments and repairs shall be made by an authorized Broaster Company representative.

If there is a power failure, turn cook/filter switch OFF. On the Model 2400GH, also slide switch on gas valve OFF. DO NOT attempt to operate unit during a power failure.

⚠ WARNING Failure to read and understand this manual completely could result in serious injury or death. Be sure ALL operators read, understand and have access to this manual at all times.

⚠ WARNING Rags or paper containing cooking oil can catch fire if exposed to heat. Laundering will not remove the oil. Dispose of all oil-soiled papers and rags in a trash container that is in a ventilated area away from all cooking equipment or other heat sources such as direct sunlight.

⚠ WARNING If at any time the **POWER ON** light does not turn off when the cook/filter switch is moved to the **OFF** position, disconnect the power to the fryer and contact your local Broaster Company representative for service immediately.

⚠ WARNING DO NOT operate unit without filter pan and filter pan cover in its proper position. Filter pan cover must be wiped clean after each filtering cycle. Make sure Pressure Relief Valve and Pressure Gauge ports on bottom of cover are clear of any oil or grease buildup.

⚠ WARNING Make sure Pressure Relief Valve and Pressure Gauge ports on bottom of cover are clear of any oil or grease buildup.

2400GH: Post, in prominent locations, instructions to be followed in the event that the user smells gas. This information can be obtained from your local gas supplier.

cont'd on next page

⚠ WARNING Make sure a restraining device is used that complies with the Standard for *Commercial Gas Ranges*, ANSI Z83.11/ CSA 1.8 to guard against transmission of strain to the gas connectors.

⚠ DANGER Failure to restrain the fryer could allow it to move, causing hot shortening to spill out, or a possible break in the gas line causing an explosive condition.

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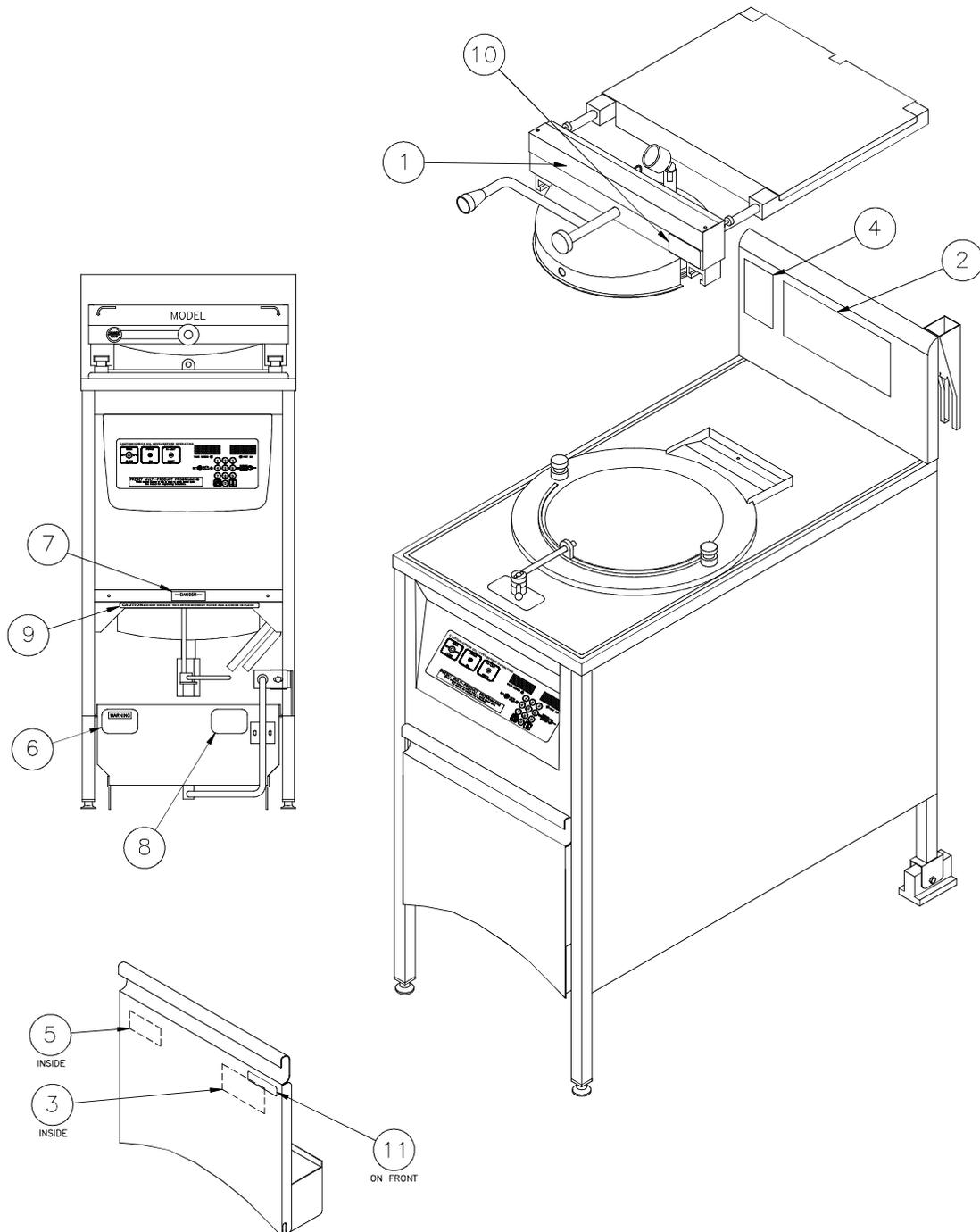
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1 - WARNING SIGNS

When servicing a Broaster® pressure fryer, be sure all safety devices and warning signs are in place and legible. If not, the Broaster Company should be notified in writing of the lack of warning signs and the existence of an unsafe condition.

If you need replacement warning signs or manuals, contact an authorized Broaster Company representative or the Broaster Company Service Department at:

(608) 365-0193



DANGER

DO NOT HEAT OR BOIL WATER IN FRYER. KEEP COVER OPEN WHEN WASHING WELL. IF COVER IS CLOSED ON A WELL HOLD HOT OR BOILING WATER, A LARGE QUANTITY OF HOT WATER WILL SPLASH OUT WHEN COVER IS OPENED, CAUSING EXPOSURE TO POSSIBLE PERSONAL INJURY.

PELIGRO

SE PROHIBE CALENTAR O HERVIR AGUA EN ESTE APARATO. MANTENGA LA TAPA ABIERTA CUANDO ESTE LAVANDO LA OLLA. SI LA OLLA ESTA TAPADA Y CONTIENE AGUA CALIENTE O HERVIDA, TENGA CUIDADO. AL ABRIR LA TAPA DE LA OLLA, UNA GRAN CANTIDAD DE AGUA PODRA SALTAR CAUSANDOLE SERIAS QUEMADURAS.

COVER CLOSED

DO NOT OPEN COVER
UNLESS PRESSURE IS AT ZERO P.S.I.

MODEL 2400

MANUFACTURED BY THE BROASTER COMPANY

COVER OPEN

Item 1 - Part #15724

SAFETY AND OPERATING INSTRUCTIONS

FAILURE TO COMPLY WITH THESE SAFETY AND OPERATING INSTRUCTIONS COULD CAUSE INJURY TO OPERATOR AND BYSTANDERS.

- Be familiar with the Operation Manual
- DO NOT attempt to heat water in fryer
- Never over-fill with shortening or product
- Keep cover open when draining cooking well
- Be sure cooking well is clean and free of water before filling with shortening
- Keep cover closed when cooker is not in use
- Never force cover open or closed
- Only operate with filter pan and cover in place
- Clean with Cooking Well Cleaner when oil is changed
- Remove all pressure before making any repairs
- Disconnect electrical power before servicing



MAXIMUM WORKING PRESSURE IS 15 P.S.I.

VOLTS* Hz Kw

PHASE	AMPS	BREAKER	WIRE
1		A	3
3		A	4

* IF HIGH LEG EXISTS CONNECT TO CENTER LUG OF CONTACTOR.

- FOR SUPPLY CONNECTIONS USE WIRES SUITABLE FOR 90°C.
- USE COPPER WIRE ONLY FOR FIELD CONNECTIONS.

CAUTION: CONNECT ONLY TO CIRCUIT WHERE POTENTIAL TO GROUND DOES NOT EXCEED 150V.

- FOR USE ONLY WITH THE SPECIFIC LEGS AND CASTERS SUPPLIED BY BROASTER COMPANY.



BROASTER COMPANY
BELOIT, WI USA
MADE IN USA



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BROASTER EQUIPMENT AND PRODUCTS ARE MANUFACTURED AND SOLD UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS AND TRADEMARKS: 636,699 - 1,690,034 - 2,688,611 - 7,134,385

Item 2 - Part #18018

OPERATING INSTRUCTIONS

START UP

YOU ARE NOT REQUIRED TO PHYSICALLY LIGHT THE PILOT ON THIS UNIT.

1. TURN THE MANUAL SHUT-OFF VALVE TO THE "ON" POSITION. WAIT 5 MINUTES BEFORE TURNING GAS VALVE ON.
2. MOVE SLIDE SWITCH ON GAS VALVE TO "ON"
3. MOVE COOK / FILTER SWITCH TO THE "COOK" POSITION.

SHUT DOWN

1. TURN COOK / FILTER SWITCH TO "OFF" POSITION.
2. MOVE SLIDE SWITCH ON GAS VALVE TO "OFF".
3. TURN THE MANUAL SHUT-OFF VALVE TO THE "OFF" POSITION.

INSTALL IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD FUEL GAS CODE ANSI Z223. 1 LATEST ADDITION

Item 3 - Part #15694
2400GH Only

MODEL 2400G

MANUFACTURED BY THE BROASTER COMPANY OF BELOIT, WI.
PARTS AND SERVICE SUPPLIED BY AUTHORIZED BROASTER DISTRIBUTORS.

INTENDED FOR OTHER THAN HOUSEHOLD USE

FOR USE WITH GAS

B.T.U./HR

MANIFOLD PRESSURE IN W.C.

CLEARANCE

BACK _____
RIGHT SIDE _____
LEFT SIDE _____

FOR USE ONLY IN
NON-COMBUSTIBLE
LOCATIONS.



ANS Z83.11
CGA 1.8 -
FOOD SERVICE EQUIPMENT

Item 4 - Part #15667
2400GH Only

WATER & HOT OIL DO NOT MIX!
DO NOT POUR CONTENTS BACK
INTO COOKING WELL OR FILTER.
BODILY INJURY MAY OCCURE!

Item 5 - Part #10900

WARNING

HOT SHORTENING!
DO NOT USE THIS
CONTAINER
TO TRANSPORT
HOT SHORTENING

Item 6 - Part #11028

— DANGER —
NEVER OPEN POT DRAIN VALVE
WHILE UNDER PRESSURE

Item 7 - Part #06375

CAUTION

DO NOT OPERATE
THIS FRYER WITHOUT
FILTER PAN & CLEAN COVER
IN PLACE

Item 8 - Part #15725

CAUTION: DO NOT OPERATE THIS FRYER WITHOUT FILTER PAN & CLEAN COVER IN PLACE

Item 9 - Part #15785



WARNING: Rags or papers containing cooking oil can catch fire if exposed to heat. Laundering will not remove the oil. Dispose of all oil-soiled papers and rags in a trash container that is in a ventilated area away from all cooking equipment or other heat sources such as direct sunlight.

ADVERTENCIA: Trapos o papeles conteniendo aceite de cocinar pueden incendiar fuego si están expuestos al calor. Trapos de limpieza no son suficientes para remover el aceite completamente. Dispongan todo el aceite – papel y trapos con lodo en una basura que esta en un lugar ventilado lejos de todos los equipos de cocinar y lejos de otros lugares que pueden incendiar fuego como directo al pasadillo de luz del sol.

Item 10 - Part #16368

MANUAL SHUTOFF VALVE
LOCATED BEHIND THIS PANEL

Item 11 - Part #11746

2 - ELECTRIC POWER SUPPLY

⚠ WARNING The 2400E is designed to operate on 3-phase input **ONLY. DO NOT** connect to 1-phase power.

⚠ DANGER Many sections in this manual pertain to checking and repairing electrical components. High voltage will be encountered in several instances. Only persons trained and equipped for checking high voltage shall undertake such repairs.

If no component operates, check main power supply. Be sure main circuit breaker is ON and main fuses are good.

Correct voltage:

1-Phase	
2400GH	120 VAC
2400GH Export	220 VAC
3-Phase	
2400E	208 or 240 VAC
2400E Export & CE	220/380 VAC 220/415 VAC

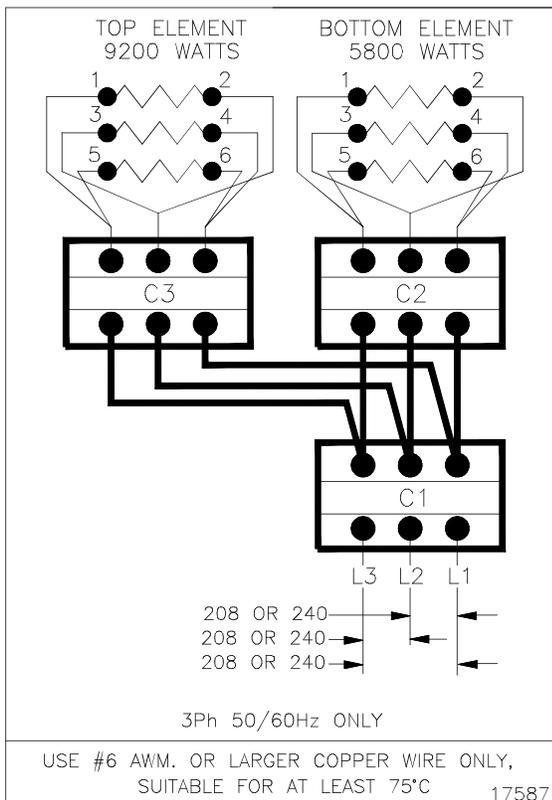
Perform the following if unit will not turn on:

1. Disconnect main power supply.
2. Be sure all connections are tight. If power supply is proper, see TROUBLESHOOTING section.

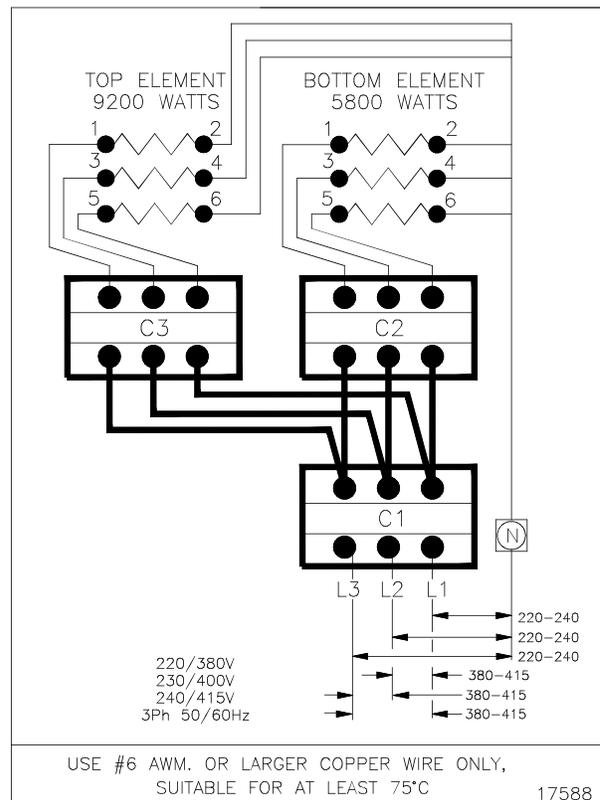
Wiring diagrams are located on inside front panel.

WIRING DIAGRAMS:

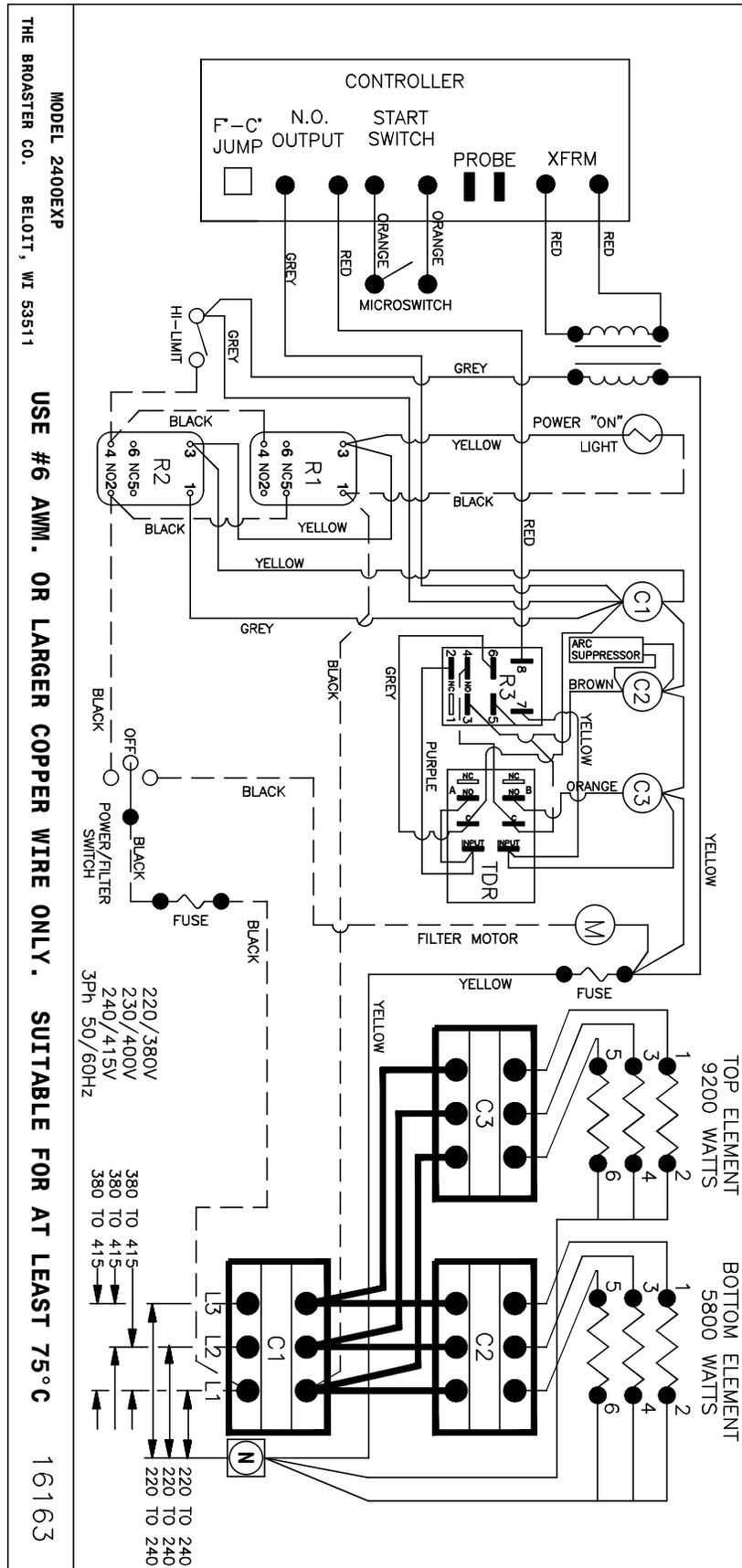
2400E DOMESTIC



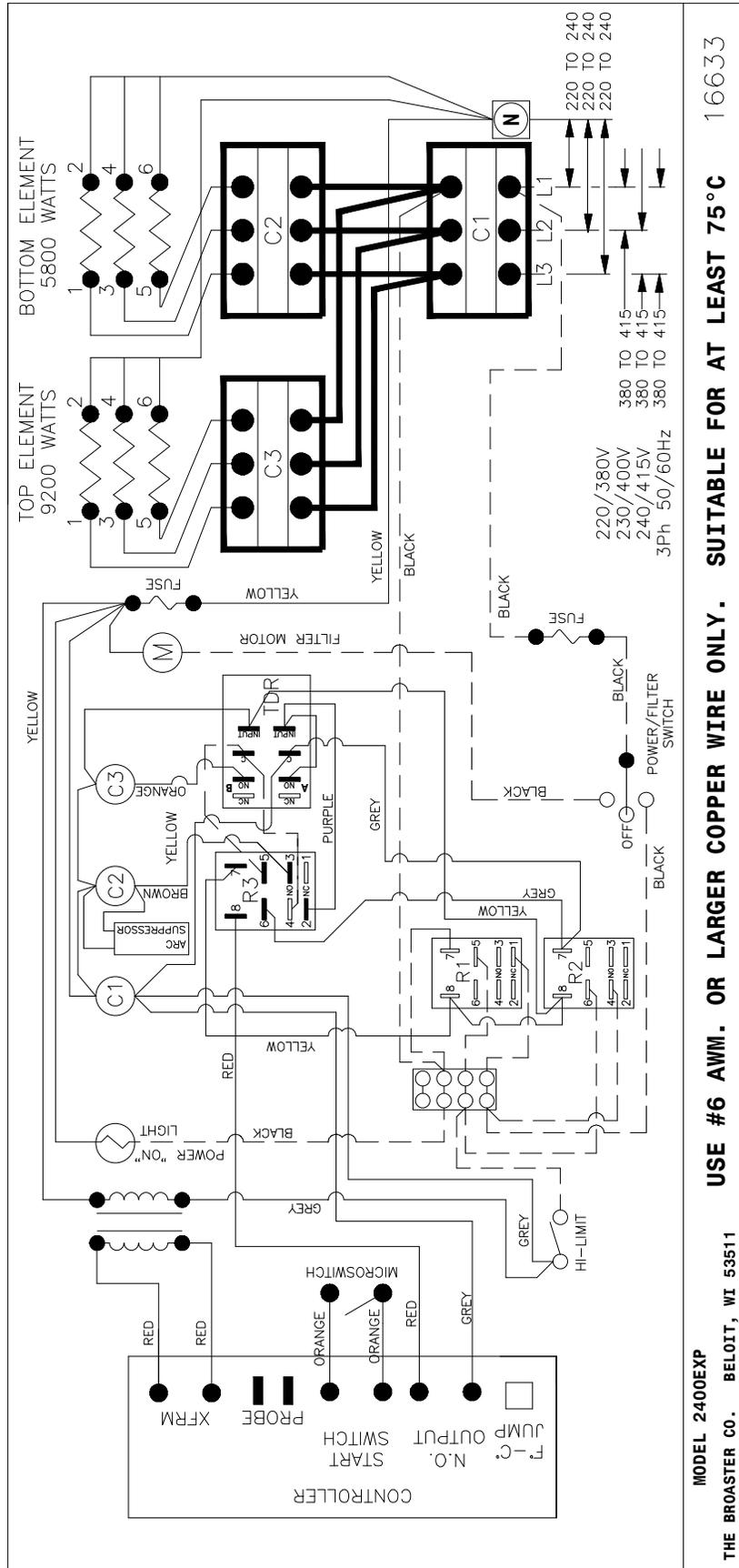
2400E EXPORT



EXPORT: 2400EXP: 220/380 VAC to 240/415 VAC:



EXPORT: 2400EXP: 220/380 VAC to 240/415 VAC: Effective SE4A700011



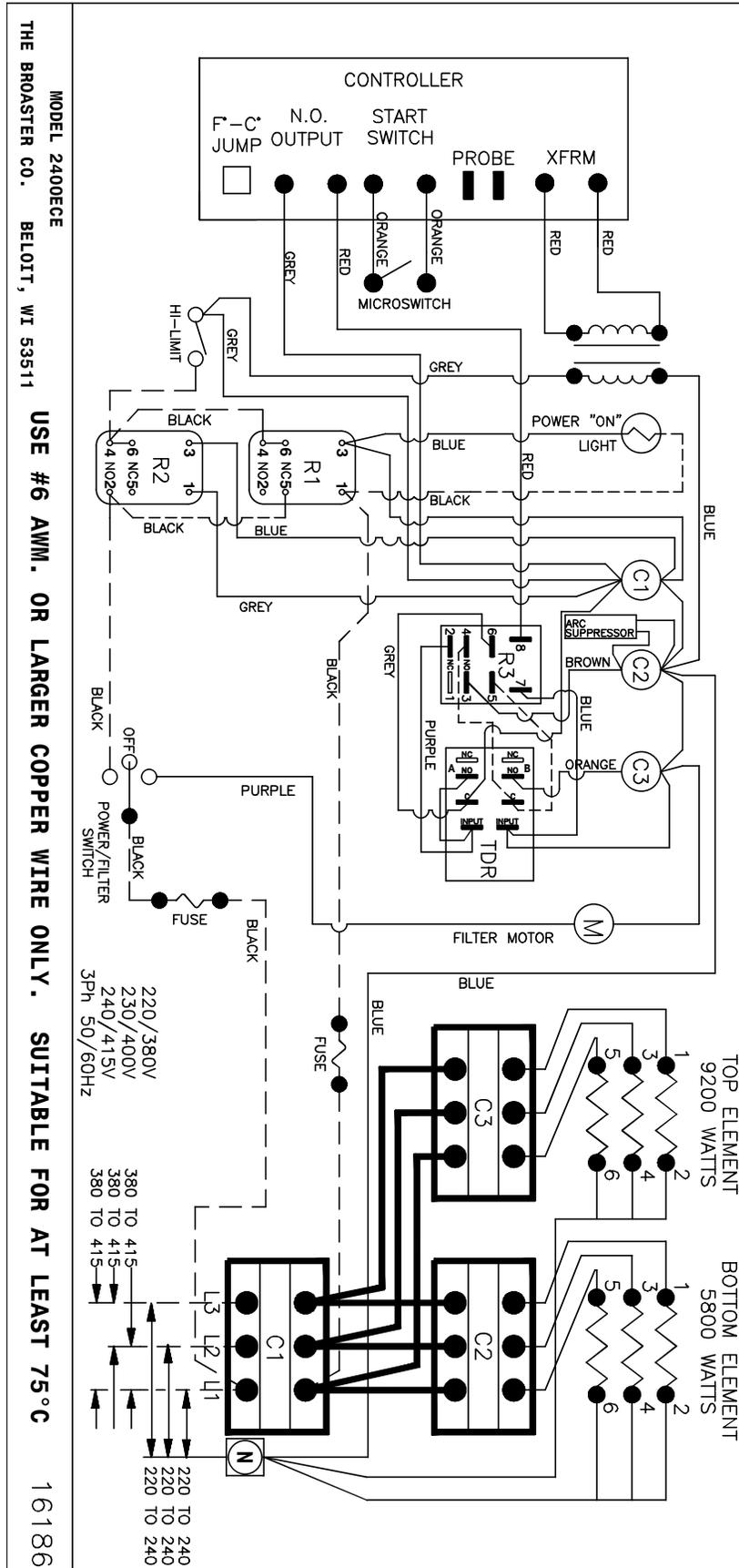
MODEL 2400EXP

THE BROASTER CO. BELLOIT, WI 53511

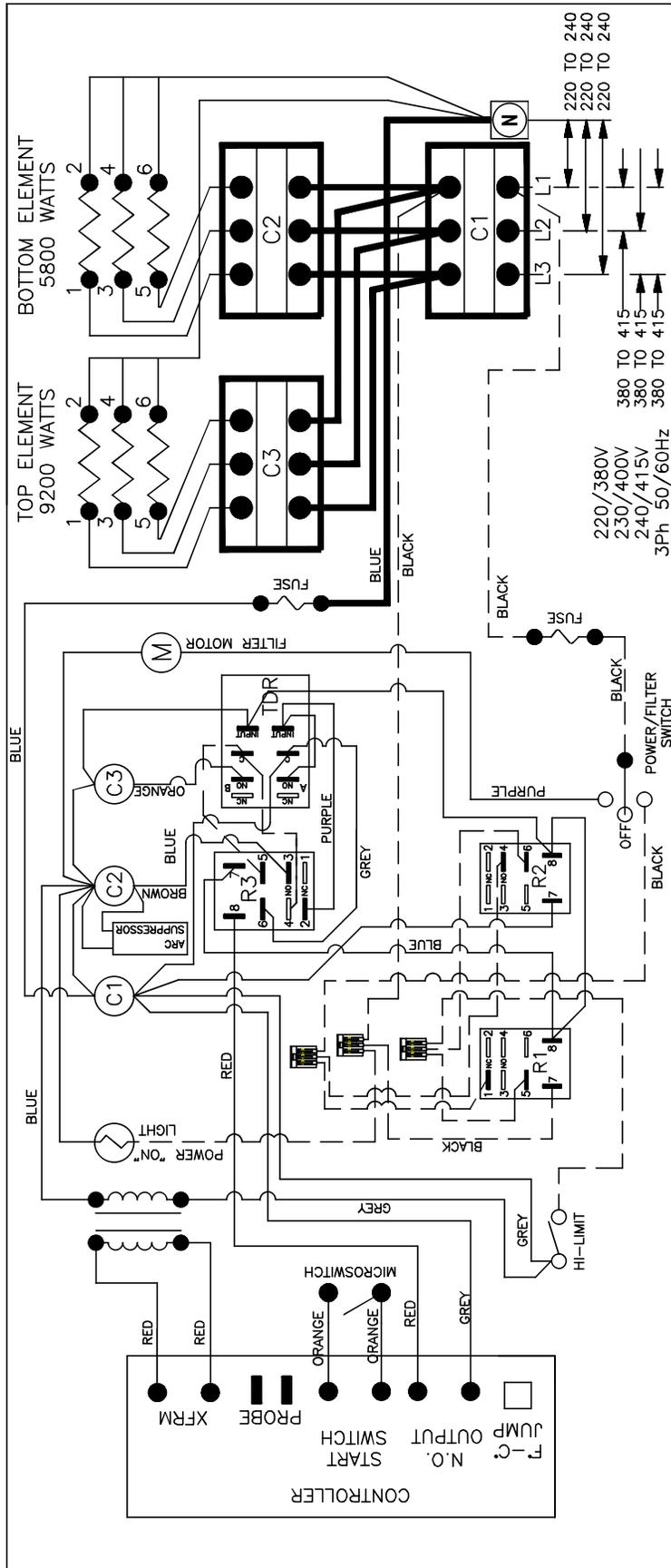
USE #6 AWM. OR LARGER COPPER WIRE ONLY. SUITABLE FOR AT LEAST 75°C

16633

EU: 2400ECE 220/380VAC to 240/415VAC:

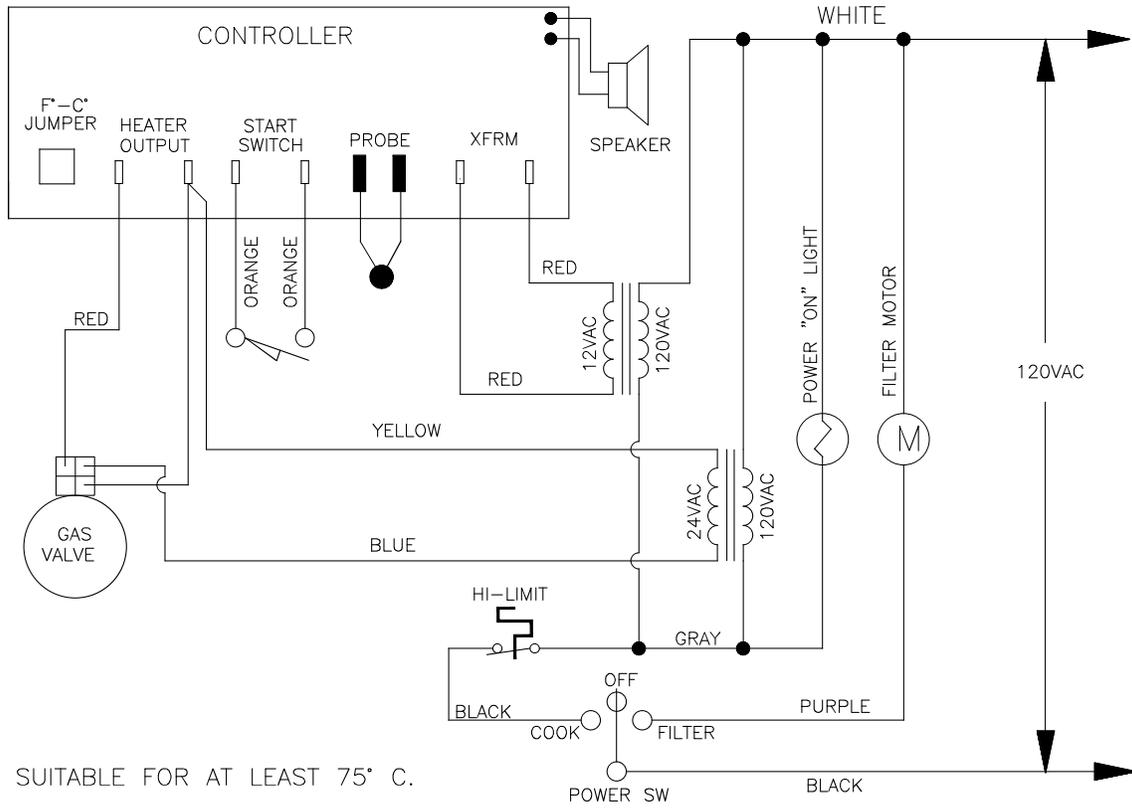


EU: 2400ECE 220/380VAC to 240/415VAC: Effective SE4A70011

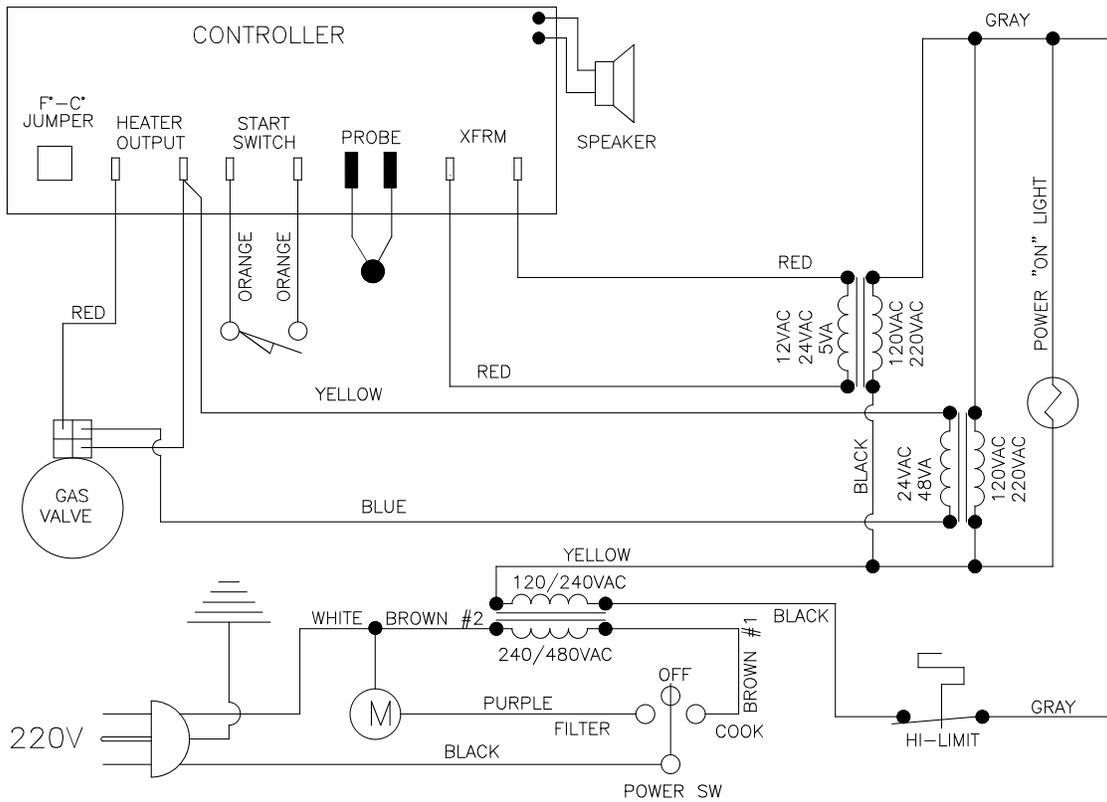


MODEL 2400ECE THE BROASTER CO. BELLOIT, WI 53511 **USE #6 AWG. OR LARGER COPPER WIRE ONLY. SUITABLE FOR AT LEAST 75°C** 16638

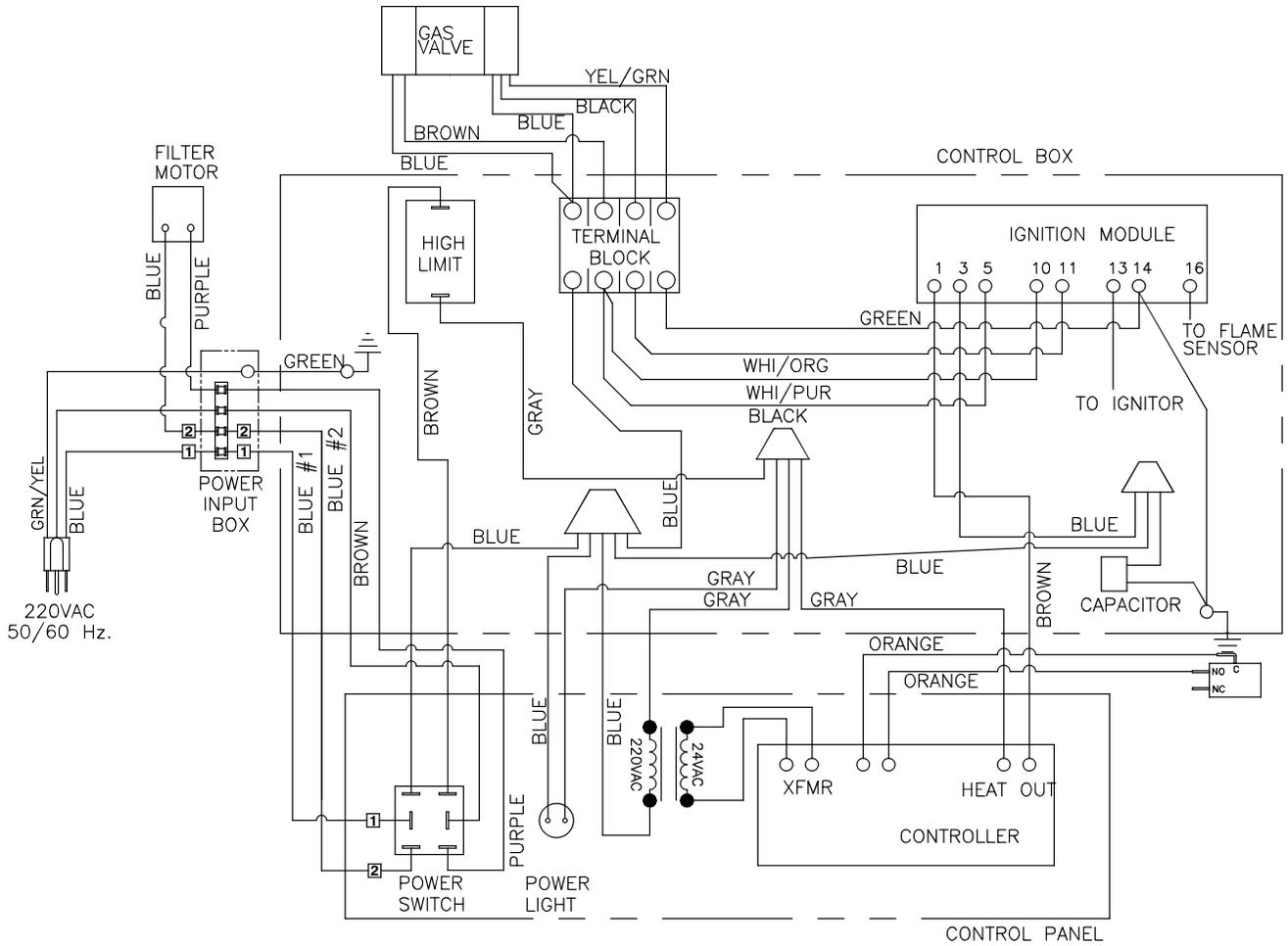
MODEL 2400GH: DOMESTIC



MODEL 2400GHXP: EXPORT

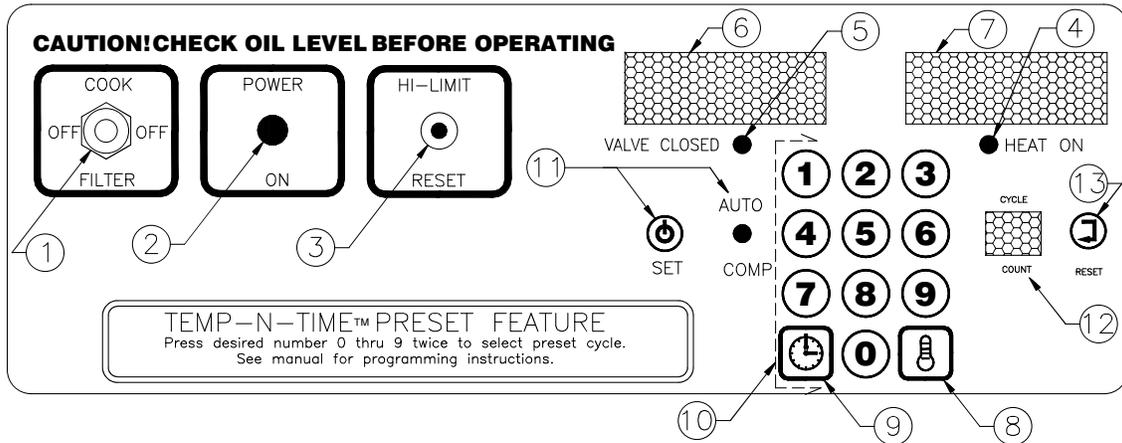


MODEL 2400GHCE: EU



3 - CONTROL PANEL

TEMP-N-TIME FAMILIARIZATION



- 1. Cook/Filter Switch:** Has three positions: COOK, OFF and FILTER.
- 2. Power On indicator Light:** Illuminates when cook/filter switch is in COOK position.
- 3. Hi-Limit Control:** Prevents oil temperature from exceeding 475°F. If power to unit turns off due to Hi-Limit Control, turn unit OFF and DO NOT attempt to operate until it has been serviced by an authorized Broaster Company representative.

NOTICE It is possible for this control to trip during shipment. If it does, fully depress red reset button. If control “clicks” it was tripped. If not, it is correctly reset.

- 4. Heat On Indicator Light:** Illuminates when oil is being heated.
- 5. Valve Closed Indicator Light:** Illuminates when pressure regulating valve is CLOSED.
- 6. Time Display:** Shows time count-down during a cook cycle, program values during programming and programmed time during idle period.

- 7. Temp Display:** Shows set temperature and actual temperature on demand.
- 8. Cook Temperature Button:** Initiates temperature programming and display actual temperature.
- 9. Cook Time Button:** Initiates time programming.
- 10. Numerical Keypad:** Enters and adjusts set point values.
- 11. AUTO COMP (Automatic Time Compensation) Set Button and Light:** Indicates timing method. When OFF, controller operates as a regular timer. When ON, controller monitors oil temperature and adjusts time down rate to compensate for fluctuations in the oil temperature.
- 12. Cycle Count Display:** Increases in increments of one every time a cooking cycle is completed.
- 13. Cycle Count Reset Button:** Resets the cycle count display to “zero”.

CONTROLLER PROGRAMMING



Check oil level before turning cook/filter switch to COOK.

NORMAL OPERATING MODE

Action: Turn cook/filter switch to COOK.

Response: Temp Display alternates between number values for cook temperature, and LO (idle mode). LO will disappear when oil temperature has reached cook temperature value. Time Display will show the set time in minutes and seconds.

Set Temperature:

Action: Press Cook Temperature Button twice within 5 seconds.

Response: Programming mode has been entered. Flashing Temp Display reads “###F.” (### = temperature value ie: 360F)

Action: If desired, press keypad numbers to change displayed value. Press Cook Temperature Button once to enter new value into memory.

Response: Controller returns to idle mode.

Set Time:

Action: Press Cook Time Button twice within 5 seconds.

Response: Programming mode has been entered. Flashing Time Display reads “##:##.” (##:## = time value ie: 08:00)

Action: If desired, press key pad numbers to change displayed value in minutes and seconds. Press Cook Time Button once to enter new value into memory.

Response: Controller returns to idle mode.

Set AUTO COMP (Automatic Time Compensation):

Action: Press and hold AUTO COMP Button for 3 seconds.

Response: Green light will toggle on or off.

Display Actual Temperature:

Action: Press and hold Temp Button for 3 seconds.

Response: Temp Display will show actual oil temperature and will vary as cooling and heating takes place.

Action: Press Temp Button to return to set point display.

Reset Cycle Counter:

Action: Press Reset Button twice in 5 seconds.

Response: Display will return to a setting of “00.”

NOTICE

If counter is not reset before reaching “99”.

Upon the next cycle completion, the display will begin counting at “01”.

Normal operating programming can be done at any time without affecting presets.

PRESET COOK MODE PROGRAMMING METHOD 1

Choose Preset Cook Cycle:

Action: Press a button, 0 thru 9, corresponding to the desired preset.

Response: The TIME display will show "P__X", where X is the preset selected.

NOTICE If a button is not pressed in ten seconds, the display will revert to the previous display.

Action: Press the same button again,

Response: The TIME display will show the preset time, the AUTO COMP LED will turn on if enabled, the TEMP display will show the preset setpoint, and the temperature will now regulate to the new setpoint.

PROGRAMMING PROCEDURE (PRESET MODE)

Action: Press and hold the TIME and TEMP buttons simultaneously for three seconds.

Response: The TIME display and TEMP display will begin flashing. The CYCLE COUNT display will show "-0" indicating that the preset #0 values are displayed. The preset values for the TIME, TEMP, and AUTO COMP will be shown on the display.

Change Cook Time:

Action: Press the TIME button once.

Response: The TEMP display will turn off and only the TIME display will flash.

Action: Key in the desired cook time and press the TIME button to save the new setting.

NOTICE If a button is not pressed in ten seconds, the display will revert back to both the TIME and TEMP displays flashing.

Change Cook Temperature:

Action: Press the TEMP button once.

Response: The TIME display will turn off and the TEMP display will be flashing.

Action: Key in the desired temperature setting and press the TEMP button to save the new setting.

NOTICE If a button is not pressed in ten seconds, the display will revert back to both the TIME and TEMP displays flashing.

Activate/Deactivate Auto Comp:

Action: Press the AUTO COMP button once.

Response: AUTO COMP is enabled when the AUTO COMP LED is on and disabled when it is off.

Advance to Next Preset:

Action: Press the RESET button once.

Response: The CYCLE COUNT display will change to "-1" and the presets for #1 will be displayed.

Repeat the process as described. After the presets for #9 are displayed, pressing the RESET button again will cause the control to return to normal operation.

PRESET COOK MODE PROGRAMMING METHOD 2

Select the temperature and time, following the normal programming procedure. To save these settings for a preset. Press and hold the desired preset number for five seconds until an audible beep is sounded.

WARNING DISPLAYS

HI - Display will flash HI if cooking oil temperature exceeds 415°F. Audible alert will sound until cook/filter switch is turned OFF or hi-limit trips. All controller functions and heat source are disabled during this condition.

Cause: Faulty controller, gas valve (2400GH Only) or contactor (2400E Only).

PROB - Display will flash PROB if there is a problem with temperature sensor probe. Audible alert will sound until cook/filter switch is turned OFF. All controller functions and heat source are disabled during this condition.

Cause: Temperature sensor probe faulty, polarity of probe wires reversed or probe wire(s) loose.

CHEC - Display will flash CHEC if cooking oil temperature does not rise 6°F within the first three minutes. Audible alert will sound until cook/filter switch is turned OFF. All controller functions and heat source are disabled during this condition.

Cause: Faulty controller, heating element(s) (2400E Only) gas valve (2400GH Only), contactor (2400E Only), probe or loose wiring.

NOTICE

CHEC could appear if cooking oil temperature is below 45°F. Turn cook/filter switch OFF then to COOK for another three minute heating period. This may have to be repeated two or three times.

FAIL - Display will flash FAIL if controller detects a fault within itself. Audible alert will sound until cook/filter switch is turned OFF. All controller functions and heat source are disabled during this condition.

Cause: Faulty controller.

DISPLAY ACTUAL TEMPERATURE

Action: Press and hold cook temperature button for three seconds.

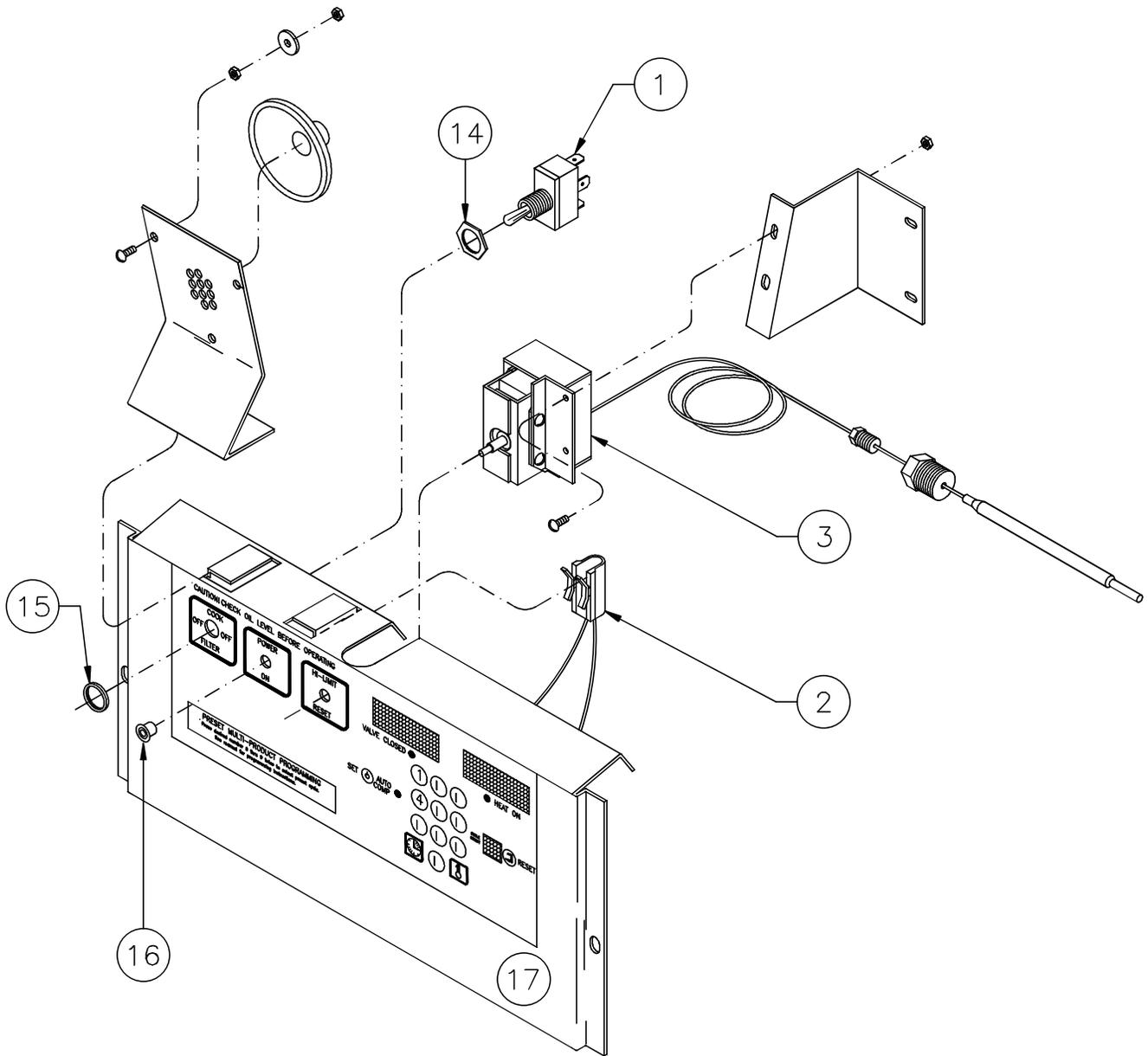
Response: Display will show actual temperature and will vary as cooling and heating takes place.

Action: Press cook temperature button again to return to idle mode.

CALIBRATION

Calibration will be necessary when temperature sensor probe or controller is replaced. Calibrate using an accurate non-mercury test thermometer.

1. Thoroughly heat cooking oil. When HEAT ON light goes out, stir oil. If HEAT ON light comes on allow unit to recover until light goes out. This may have to be done several times.
2. Press and hold cook temperature button for ten seconds until OFF then SET is displayed twice. Release button.
3. Uncalibrated cooking oil temperature is displayed. Calibration must be performed.
4. Check cooking oil temperature one inch below oil surface in the center of cooking well.
5. Using keypad, enter temperature to match controller display with calibrating thermometer.
6. Press temp button to exit calibration.



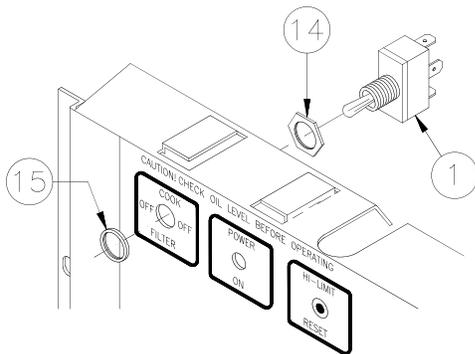
ACCESS FOR SERVICE

1. Disconnect main power supply.
2. Remove condensate pan and screws from bottom of front panel. Pull out and remove front panel.
3. Remove screws holding controller (17) to the power input box. Tilt panel down so back is visible.

COOK/FILTER SWITCH

1. See ACCESS FOR SERVICE.
2. Check all terminals and connections. Refer to wiring diagram.
3. With needle nose pliers, disconnect center terminal from switch.
4. Turn switch to COOK.
5. Check across center terminal and lower terminal with an ohmmeter. Meter should indicate a closed circuit. If not, switch is faulty.
6. Turn switch to FILTER. Check across center terminal and upper terminal. Meter should indicate a closed circuit. If not, switch is faulty.

Replacement:



1. See ACCESS FOR SERVICE.
2. Note where wires are connected. With needle nose pliers, remove all wires from switch (1).
3. Loosen hex nut (14) on rear of control panel. Remove small knurled nut (15) from front of switch.
4. Install new switch in reverse order. Be sure small groove in threaded portion of switch is down. Be sure all wire connections are secure and in the original location.

HI-LIMIT CONTROL

When controller opens, all controls are disabled except the filter motor.

There are two ways to determine if the control is faulty:

- Control open at cooking temperature. Check cooking oil temperature 1 inch below oil surface in center of cooking well.
- Electricity cannot travel across faulty points.

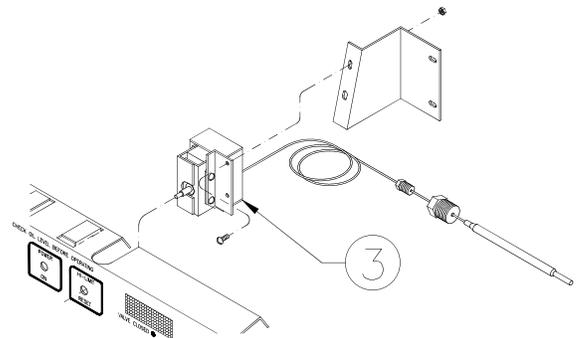
1. See ACCESS FOR SERVICE.

2. Fully depress red reset button then release.

3. With needle nose pliers, disconnect one wire from control.

4. Check across two terminals with an ohmmeter. Meter should indicate a closed circuit. If not, control is faulty.

Replacement:

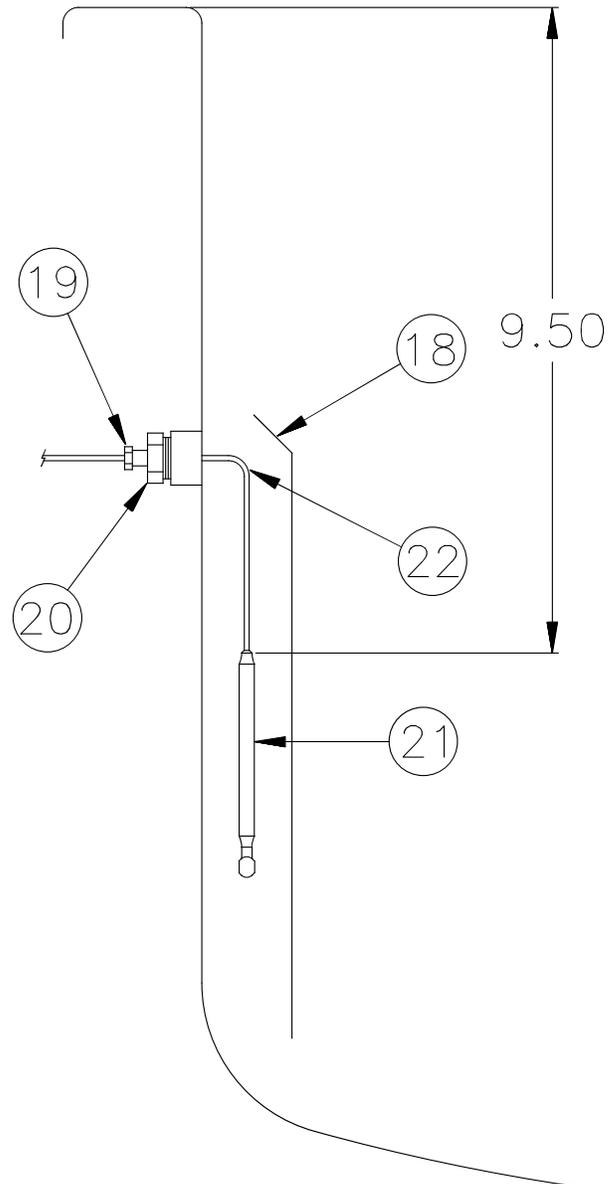


1. See ACCESS FOR SERVICE.

2. OPEN cover. Drain cooking oil from cooking well.

3. Note where wires are connected. Remove wires from control (3).

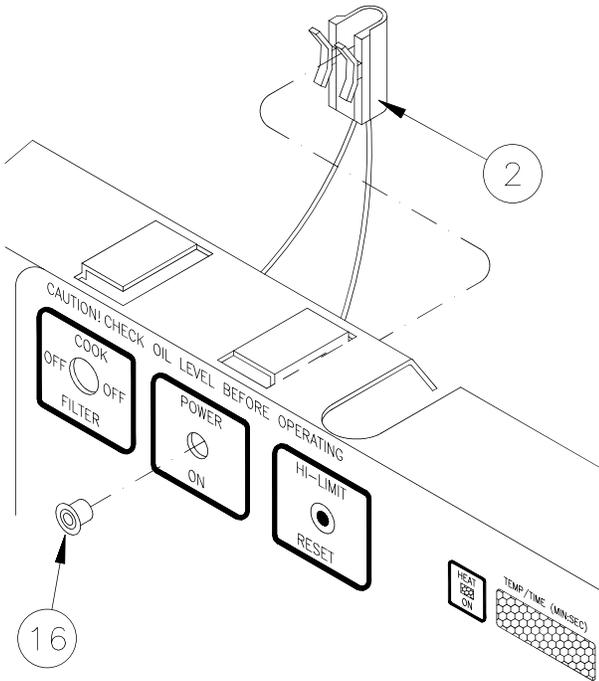
4. Remove capillary guard (18) from inside cooking well.
5. Remove small nut (19) then large capillary nut (20) from outside cooking well.
6. Pull control bulb (21) out of cooking well then remove control from control panel.
7. Insert control bulb as shown in picture at right. Pull excess capillary (22) out of cooking well. Bend in capillary must be large and smooth as possible.
8. Install large capillary nut securely after applying teflon tape on threads.
9. Install small capillary nut finger tight then tighten 1/4 turn with a wrench. DO NOT over tighten. Capillary may collapse or be cut in two.
10. Reconnect wires then mount new control.
11. Replace capillary guard.
12. Return cooking oil to cooking well.
13. Cook a load and check for leaks.
14. Tighten smaller nut (19) if necessary.



POWER ON INDICATOR LIGHT

Illuminates when cook/filter switch is turned to COOK.

Replacement:



1. See ACCESS FOR SERVICE.
2. Disconnect wires.
3. Push down on light fixture (2) located behind control panel. Slide fixture toward wire end until amber lens (16) is free of fixture.
4. Install new light in reverse order. Be sure all wire connections are secure and in the original location.

SOLID STATE CONTROLLER

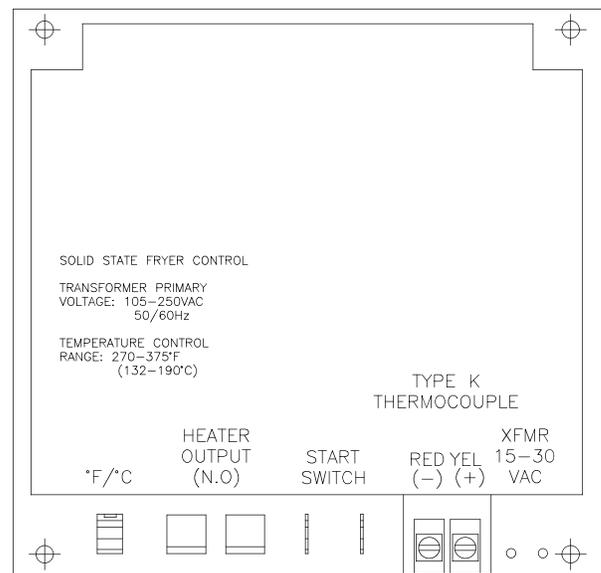
The controller regulates time and temperature.

Miscellaneous: Remove F/C jumper to display temperature in Celsius.

Replacement:

Note: Within warranty, controller should be replaced as a whole: circuit board, transformer, speaker and control panel. Out of warranty, transformer and speaker are available separately.

1. See ACCESS FOR SERVICE.
2. Remove cook/filter switch.
3. Remove power on indicator light.



4. Disconnect HEATER OUTPUT (N.O.) wires using needle nose pliers.
5. Disconnect START SWITCH wires using needle nose pliers.

Continued:

- Disconnect probe wires.

Note: Be sure red and yellow wires are not reversed during replacement. Controller will display PROB if polarity is reversed.

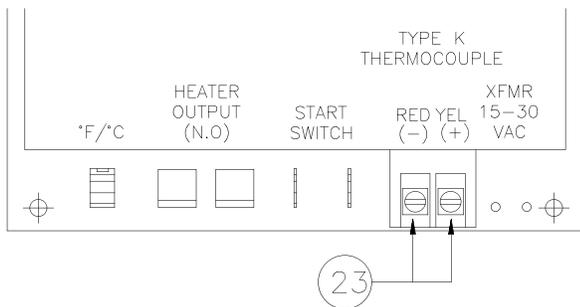
- Disconnect transformer wires within wire nuts.
- Remove controller.
- Assemble in reverse order.
- See CALIBRATION.

TEMPERATURE SENSOR PROBE

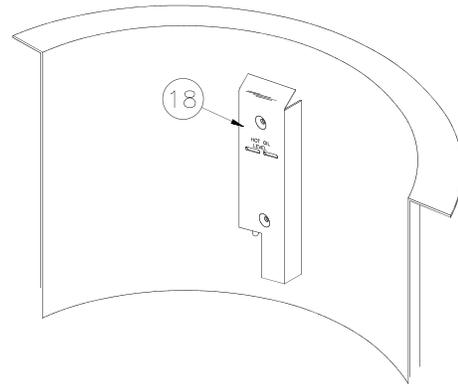
This probe is a thermocouple. It sends fluctuating millivolts to the controller which is translated into degrees of temperature.

Replacement 2400GH:

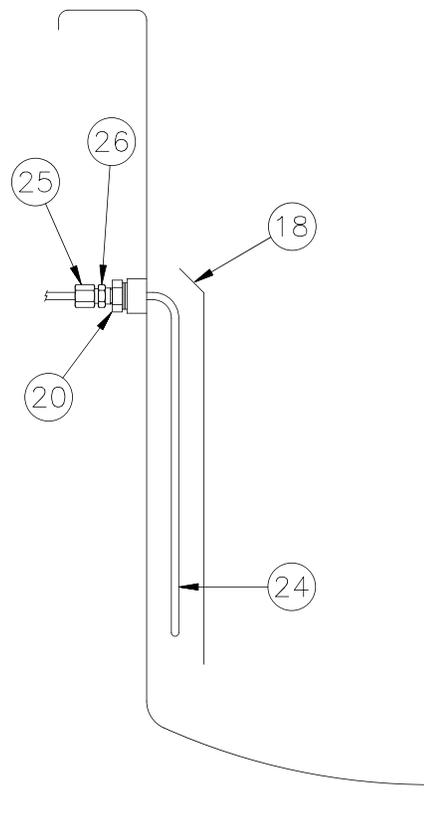
- See ACCESS FOR SERVICE.



- Disconnect probe (23) wires.
- OPEN cover. Drain cooking oil from cooking well. Close drain valve.
- Remove capillary guard (18) inside of cooking well.
- Loosen compression nut (25).
- Remove fitting (26) from reducer fitting (20).



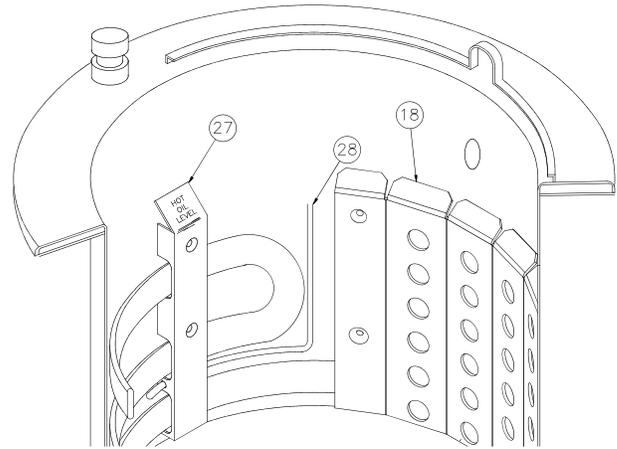
- Remove reducer fitting (20) from outside cooking well.
- Carefully pull probe (24) out of cooking well.
- Install new probe in the same location as old probe.
- Use teflon tape on reducer fitting (20) and tighten securely. Install new fitting (26) into reducer fitting (20) using teflon tape.



11. Tighten compression nut (25).
12. Reconnect red and yellow wires (23).
13. Replace controller, front panel and condensate pan.
14. Replace capillary guard (18).
15. Return cooking oil to cooking well.
16. See CALIBRATION.
17. Cook a load and check for leaks.
18. Tighten compression nut (25) if necessary.

Replacement 2400E:

1. See ACCESS FOR SERVICE.
2. Disconnect probe (23) wires.
3. OPEN cover. Drain cooking oil from cooking well. Close drain valve.



4. Remove capillary guard (18) inside of cooking well.
5. Remove basket guide (27) inside of cooking well.
6. Slide item (27) off of Temperature Sensor probe (28). Note where probe bend is located. Placement is important.
7. Loosen compression nut (25).
8. Remove fitting (26) from reducer fitting (20).
9. Remove reducer fitting (20) from outside of the cooking well.
10. Carefully pull probe out of cooking well.
11. Install new probe in the same location as old probe. Slide guide (27) onto probe and assemble noting dimensions for locating probe (28). See Fig.1 below.

12. Use teflon tape on reducer fitting (20) and tighten securely. Install new fitting (26) into reducer fitting (20) using teflon tape.
13. Tighten compression nut (25).
14. Reconnect red and yellow wires (23).
15. Replace controller, front panel and condensate pan.
16. Replace capillary guard.
17. Return cooking oil to cooking well.
18. See CALIBRATION.
19. Cook a load and check for leaks.
20. Tighten compression nut (25) if necessary.

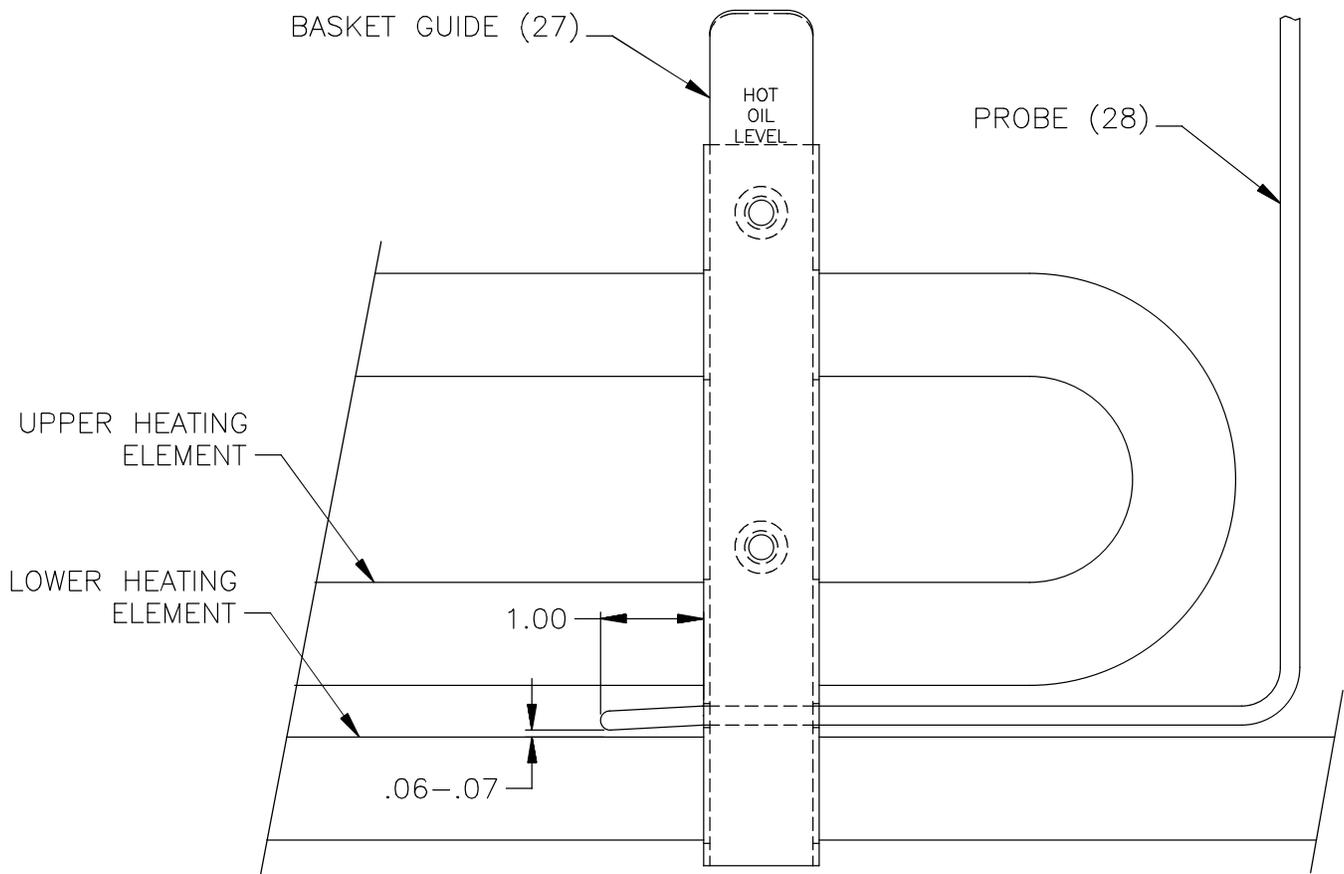


Fig. 1

4 - POWER INPUT BOX

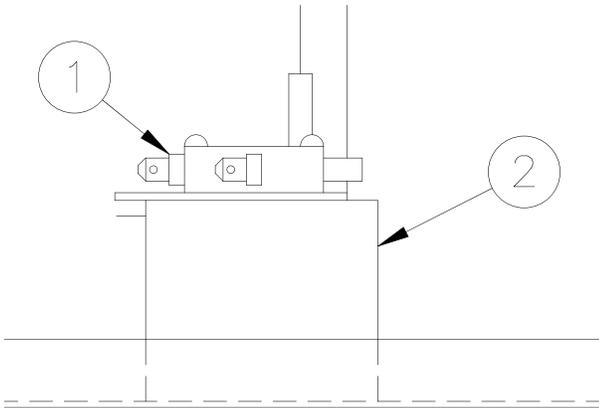
ACCESS FOR SERVICE

1. Disconnect main power supply.
2. Remove condensate pan and screws from bottom of front panel. Pull out and remove from panel.

TIMER SWITCH

When the pressure regulating valve is CLOSED, the timer switch initiates the timing circuit.

1. See ACCESS FOR SERVICE.



2. With needle nose pliers, disconnect one wire from the switch (1).
3. CLOSE pressure regulating valve. Check between remaining wire and terminal where other wire was disconnected with an ohmmeter. Meter should indicate a closed circuit. If not, mounting bracket is out of adjustment or switch is faulty.

Timer Switch Adjustment:

1. See ACCESS FOR SERVICE.
2. With pliers, bend mounting bracket (2) closer or further away from control rod.

Timer Switch Replacement:

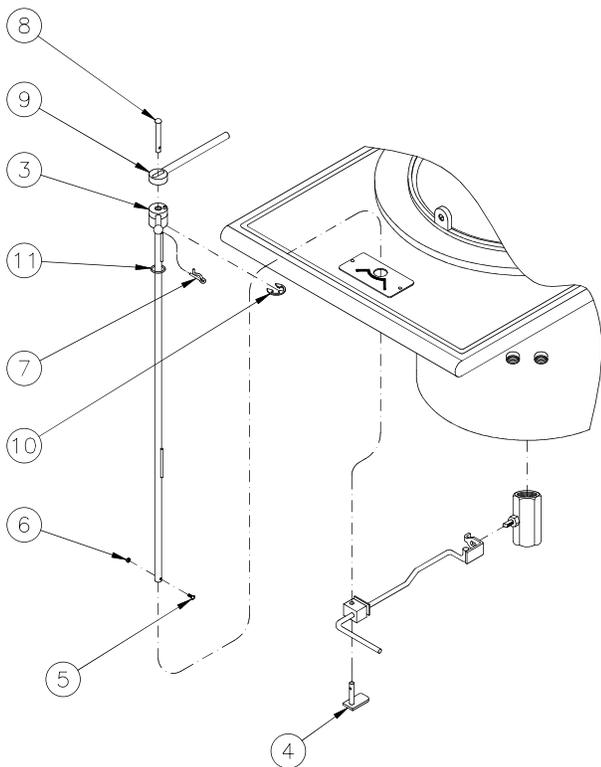
1. See ACCESS FOR SERVICE.
2. Remove wires from switch.
3. Remove two mounting screws.
4. Install new switch in reverse order. Be sure all wire connections are secure and in their original location.

CONTROL ROD

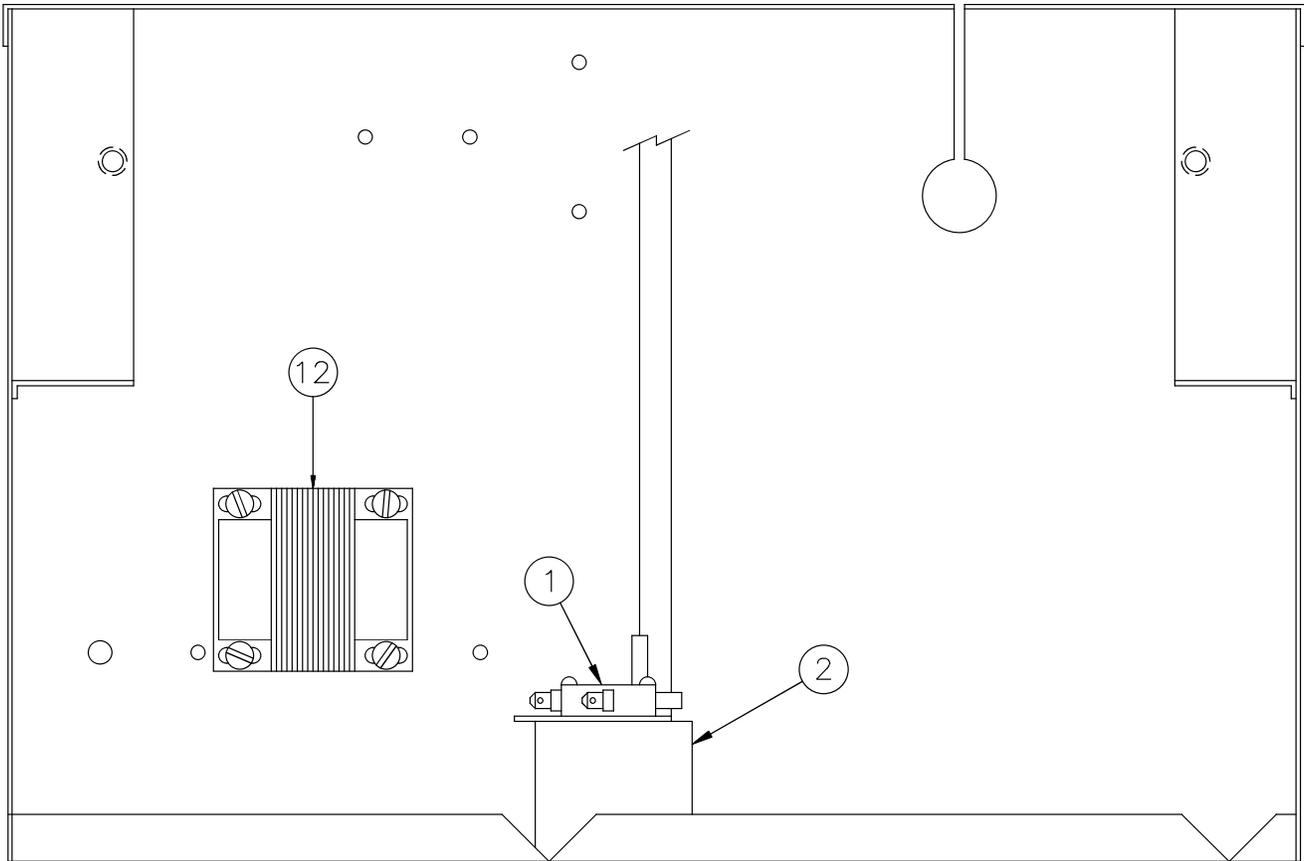
The Control Rod controls the function of the exhaust valve (open/close) and the timer switch (timer start/beeper off).

Control Rod Removal:

1. Separate Control Rod (3) from Drain Valve Interlock (4) by removing screw (5) and nut (6).
2. Remove Bridge Pin (7) from Control Rod just below countertop.
3. Pull Button Pin (8) from top of Control Rod and remove Cover Interlock (9).
4. Remove E-Clip (10) which hold Control Rod to countertop.
5. Pull Control Rod straight up from countertop. Be sure to retain o-ring (11) to use at reassembly.



2400GH Pressure Fryer:

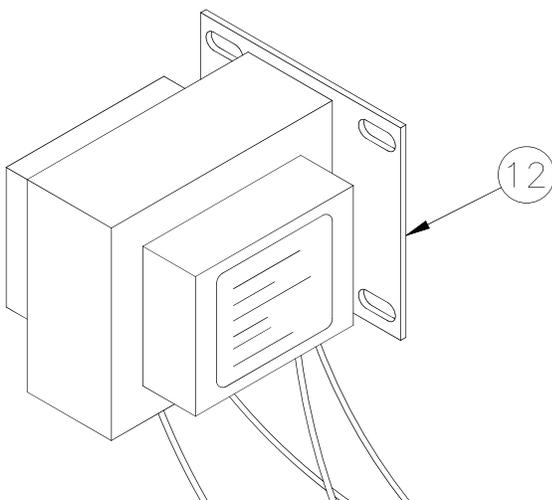


TRANSFORMER (2400GH)

(This transformer not part of fryers manufactured for the European Union)

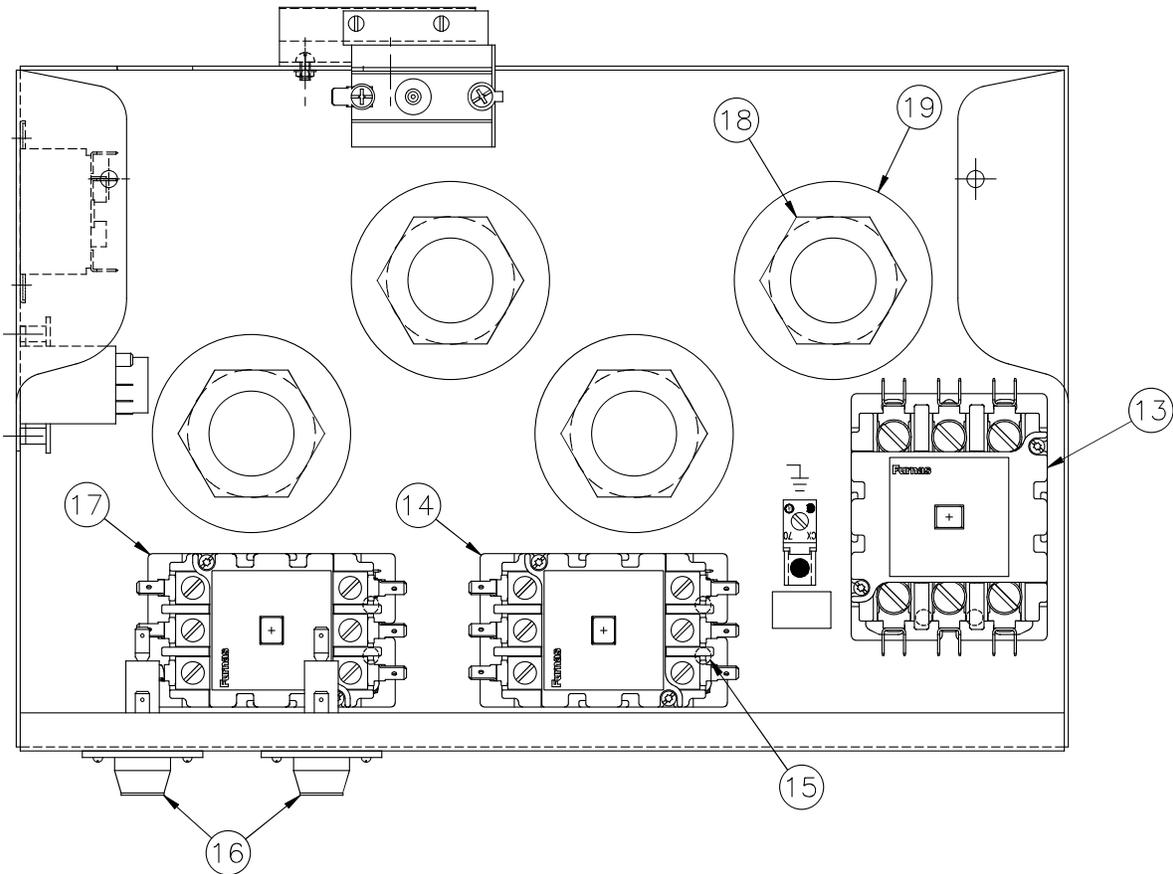
The transformer (12) supplies power to the gas control valve.

1. See ACCESS FOR SERVICE.



2. Disconnect one wire from the primary (black and white wires) side and secondary (yellow and blue wires) side of the transformer.
3. Check between the two primary wires with an ohmmeter. Meter should indicate a closed circuit, If not, transformer is faulty.
4. Check between the two secondary wires with an ohmmeter. Meter should indicate a closed circuit. If not, transformer is faulty.

2400E Pressure Fryer:



The 2400E has a pre-heat circuit that controls Secondary Contactor (17). When the 2400E is turned on for the first time the pre-heat circuit keeps the upper element from energizing until the oil temperature reaches set point. If more the ten seconds elapses before the next call for heat the upper elements will energize when the HEAT ON light illuminates.

CONTACTORS (2400E)

Primary Contactor (13) is controlled by the cook/filter switch. This contactor opens if hi-limit opens. Secondary Contactor (14) is controlled by the solid state controller and Secondary Contactor (17) is controlled by the preheat relay circuit.

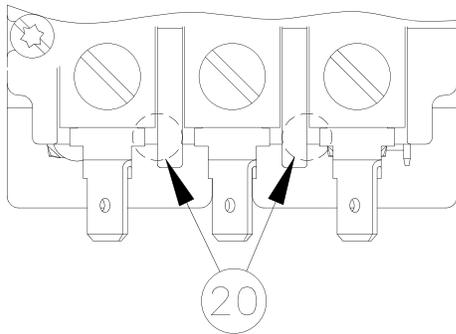
1. See ACCESS FOR SERVICE.



Check oil level before turning cook/filter switch to COOK.

2. Connect main power supply.
3. Turn cook/filter switch to COOK. You should hear an audible snap followed by another shortly after the first.
4. Check voltage through Primary Contactor (13) using a voltmeter. For three phase, check across any two of three connections. Meter should indicate 208 or 240 volts across all combinations. If not, cook/filter switch, contactor, main power supply or power cord may be faulty or hi-limit may be open.
5. Check voltage between any two of the three connections opposite element wires on Secondary Contactor (14). Any great drop in voltage indicates a poor connection or dirty contact within the contactor.

6. Secondary Contactor (14) will close when HEAT ON light is illuminated. Make same checks as in step 4 between any two of the three connections on element wire side of contactor (14). Any drop in voltage indicates a poor or dirty contact within the contactor.
7. Secondary Contactor (17) will close after temperature reaches set point and the HEAT ON light is illuminated. Make same checks as in step 4 between any two of the three connections on element wire side of contactor (17). Any drop in voltage indicates a poor or dirty contact within the contactor.
8. Disconnect main power supply.



9. If any contactor will not close electrically, check coil (20) with an ohmmeter. With needle nose pliers, disconnect wire(s) from one side of the coil. Meter should indicate a closed circuit. If not, coil is faulty.

Contactor Replacement:

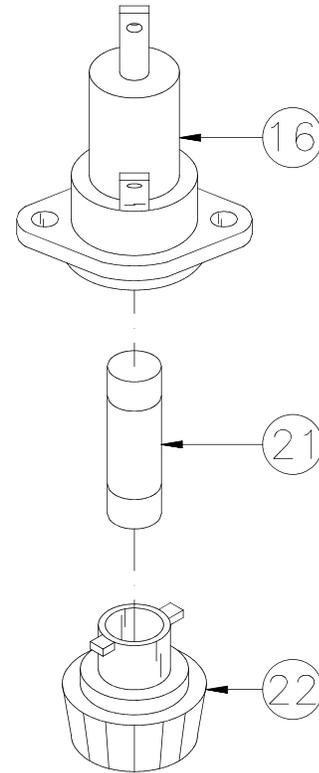
1. See ACCESS FOR SERVICE.
2. Remove all wires from the contactor.
3. Remove two mounting screws. Remove contactor.

4. Install new contactor in reverse order. Be sure all wire connections are secure and in their original location. See wiring diagram.

FUSE (2400E)

Two 15 amp fuses protect the control and filter circuits.

1. See ACCESS FOR SERVICE.



2. With needle nose pliers, disconnect wire(s) from one end of fuse holder (16).
3. Check between two terminals of fuse holder with an ohmmeter. Meter should indicate a closed circuit. If not, fuse may be faulty.

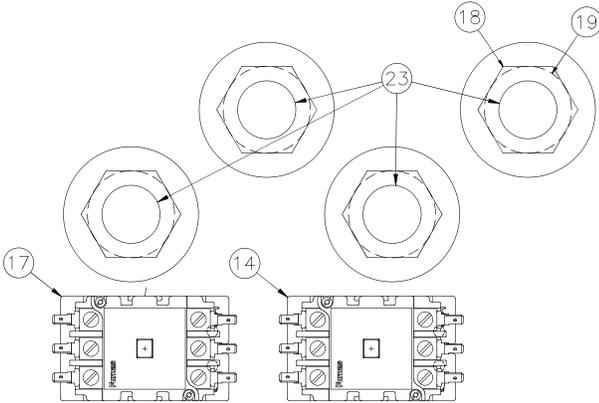
Fuse Replacement:

1. Remove end cap (22) and replace fuse (21).

HEATING ELEMENTS (2400E)

All elements heat the oil when the solid state controller calls for heat. If HEAT ON light is illuminated for long periods of time, this may indicate a faulty element or wire connection.

1. See ACCESS FOR SERVICE.

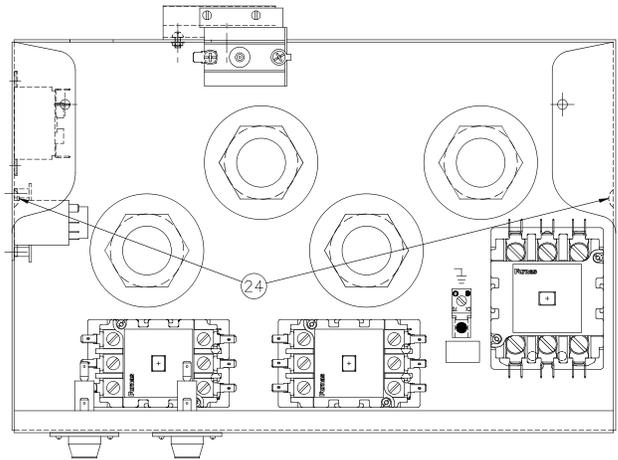


2. Disconnect all suspected element wires from contactor.
3. Check for closed circuit from:
 - 1-2
 - 3-4
 - 5-6

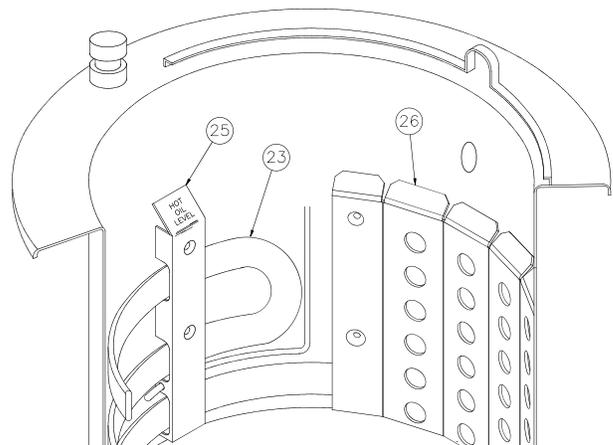
Heating Element Replacement:

1. See ACCESS FOR SERVICE.
2. Drain cooking oil from the cooking well.
3. Remove side panel using a 7/16" wrench or socket, remove the bolt from both the front and rear of the panel that screws up into the frame from the bottom edge of the panel.
4. Pull the panel straight down until the top of the panel is visible below the edge of the countertop.

5. Separate the rear edge of the panel from the frame, then push the panel forward off of the front of the frame.
6. Remove the control rod. (SEE CONTROL ROD REMOVAL page 4-2)
7. Remove the solid state control panel.
8. Remove two screws (24) that mount the Power Input Box to the frame.



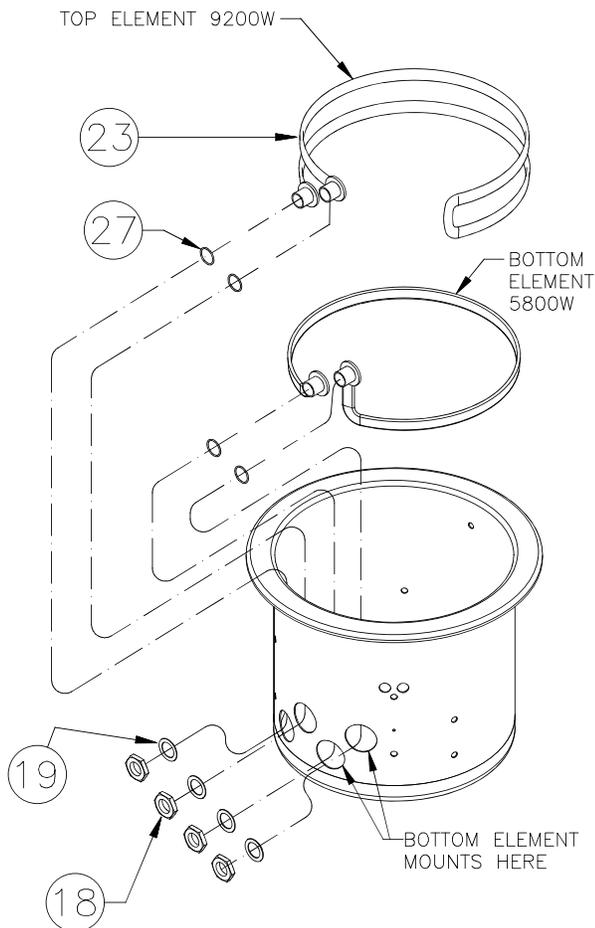
9. Pull Power Input Box forward. You may have to remove the locknut from the conduit fitting on the left side of the box, as well as any wires that prevent you from moving the box far enough to access the element mounting nuts.



10. Remove element wires from Secondary Contactors (14 & 17),
11. Remove four Basket Guides (25) from inside cooking well that secure elements (23) to the cooking well.
12. Remove capillary guard (26).
13. Remove large nut (18) and washer (19) from element(s) (23).

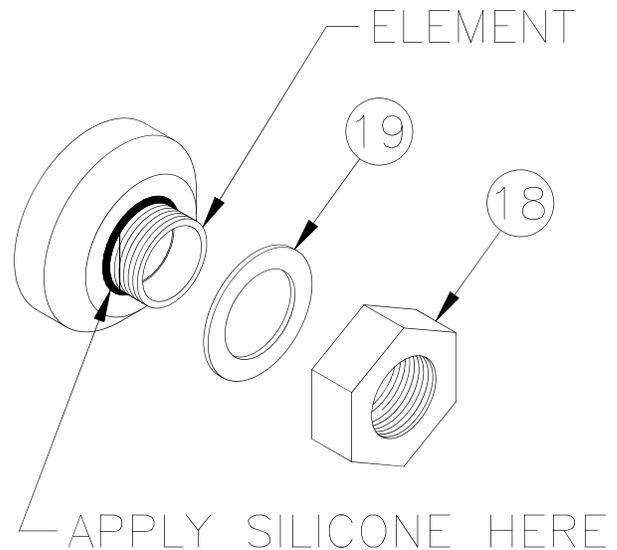
Note: To remove bottom element, remove element above it.

14. From inside the cooking well, slide element out, lift and rotate on end to remove.



15. Install new elements using new gaskets (27) located between element and inside of the cooking well bulkhead.

16. Loosely attach basket guides (25) and capillary guard (26).
17. Apply bead of #94622 Silicone to threads of element at the bulkhead fitting.



18. Loosely attach washers (19) and large nuts (18).
19. Tighten large nuts (18).
20. Tighten basket guides (25) and capillary guard (26).
21. Be sure all wire connections are secure and in their original location.

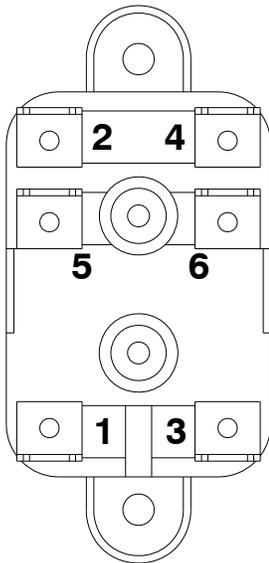
RELAY (2400E)

If R1 Relay is faulty, the relay circuit prevents the unit from being turned on after it has been turned off. In this condition, the filter motor will operate normally.

If the unit is off and the POWER ON light is illuminated, replace R1 Relay.

There are two styles of relays that have been used on the 2400E pressure Fryer. If yours looks like the picture below then continue with step one, if not then go to step 7.

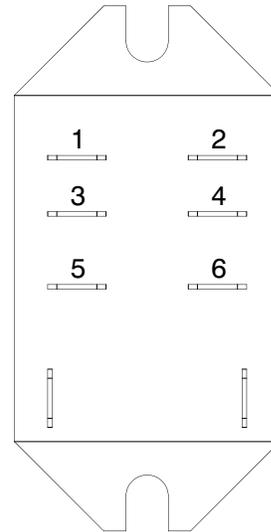
1. See ACCESS FOR SERVICE.



2. With needle nose pliers, disconnect wire from terminal 4.
3. Check between terminal 4 and terminal 5 with an ohmmeter. Meter should indicate an closed circuit. If not, relay is faulty.
4. Check between terminal 4 and terminal 2 with an ohmmeter. Meter should indicate a open circuit. If not, relay is faulty.

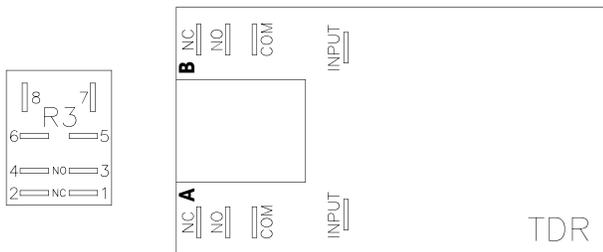
5. With needle nose pliers, disconnect one wire from the coil terminals (Terminal 1 or 3).
6. Check between coil connections with an ohmmeter. Meter should indicate a closed circuit. If not, coil is faulty.

Relay Effective: S/N SE4A700011



7. With needle nose pliers, disconnect wire from terminal 1.
8. Check between Terminal 5 and Terminal 3 with an ohmmeter. Meter should indicate an closed circuit. If not, relay is faulty.
9. Check between terminal 5 and terminal 1 with an ohmmeter. Meter should indicate a open circuit. If not, relay is faulty.
10. With needle nose pliers, disconnect one wire from the coil terminals.
11. Check between coil connections with an ohmmeter. Meter should indicate a closed circuit. If not, coil is faulty.

PRE-HEAT RELAYS (2400E)



R3 RELAY

The R3 relay controls the power to contactor C2 and the TDR relay. If R3 relay is faulty when the HEAT ON light is illuminated there will be a 10 second delay and only the C3 contactor will energize.

1. See ACCESS FOR SERVICE.
2. With needle nose pliers, disconnect wires from terminals 5 and 6.
3. Check between terminals 6 and 4 and between terminals 5 and 3 with an ohmmeter. Meter should indicate an open circuit between both sets of terminals. If not, relay is faulty.
4. Check between terminals 6 and 2 and between terminals 5 and 1 with an ohmmeter. Meter should indicate an closed circuit between both sets of terminals. If not, relay is faulty.
5. With needle nose pliers, disconnect one wire from the coil terminals (Terminal 7 or 8).
6. Check between coil connections with an ohmmeter. Meter should indicate a closed circuit. If not, coil is faulty.

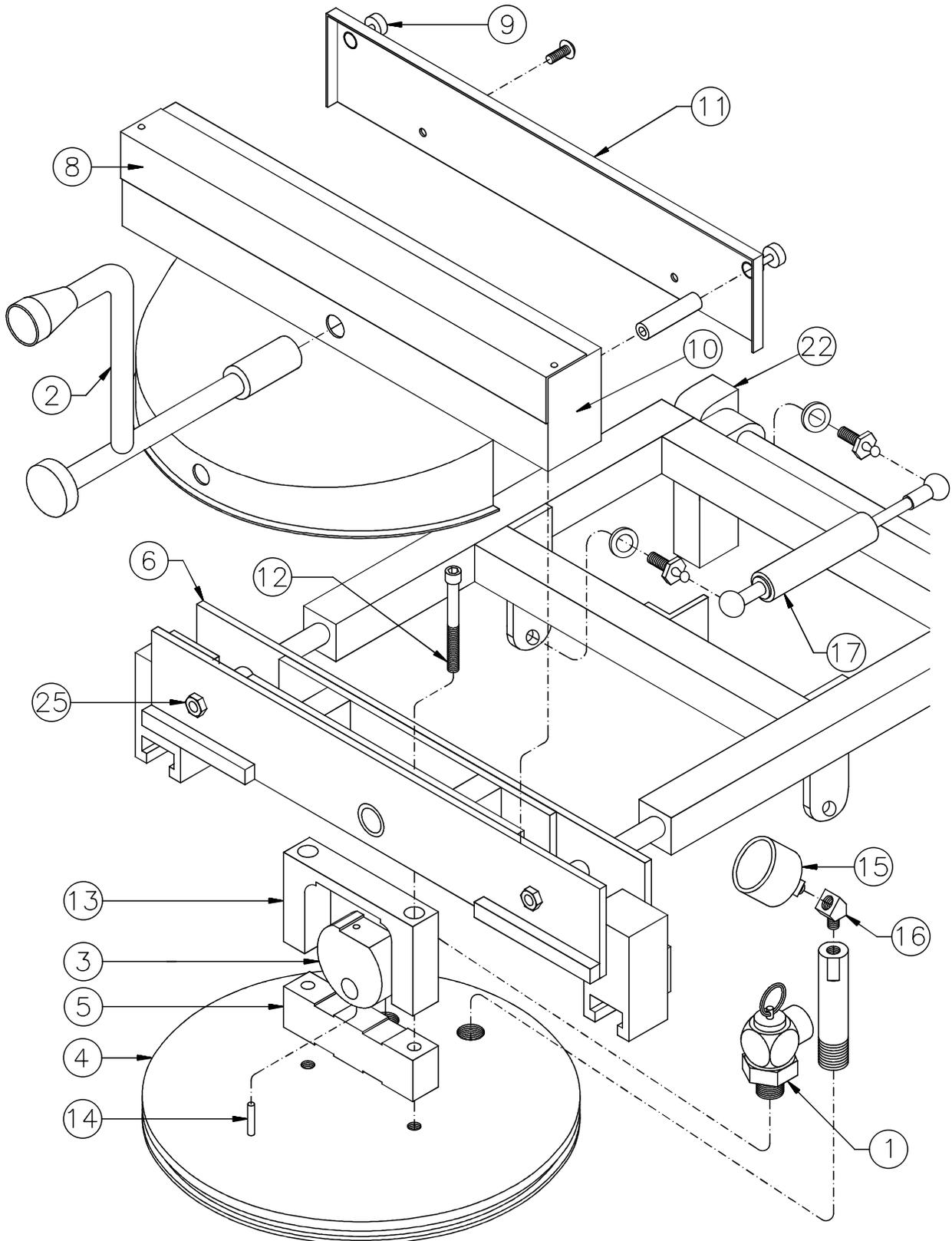
TDR RELAY

The TDR relay controls the power to the C3 contactor. When the oil temperature has reached set point and the HEAT ON light goes out for 10 seconds or more, the TDR relay is faulty if the C3 contactor does not energize when the HEAT ON light is illuminated again.

1. See ACCESS FOR SERVICE.
2. With needle nose pliers, disconnect wires from the COM terminals of sides A & B of the TDR.
3. Check between COM and NC on both sides A & B with an ohmmeter. Meter should indicate an closed circuit between both sets of terminals. If not, relay is faulty.
4. Check between COM and NO on both sides A & B with an ohmmeter. Meter should indicate an open circuit between both sets of terminals. If not, relay is faulty.
5. With needle nose pliers, disconnect one wire from the input terminals.
6. Check between the input terminals with an ohmmeter. Meter should indicate a closed circuit. If not, the TDR relay is faulty.

5 - COVER, YOKE, AND LIFT

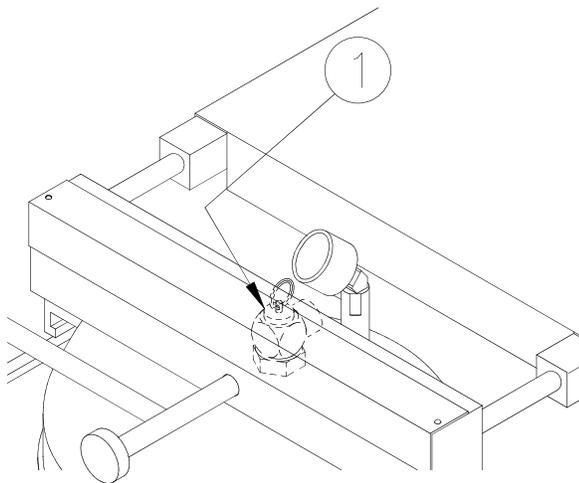
FAMILIARIZATION



PROPER COVER OPERATION

- Never use force to OPEN the cover. OPEN only when no pressure is present in the cooking well.
- If cover will not open easily, be sure the pressure regulating valve is OPEN. If cover will not OPEN, turn cook/filter switch OFF.

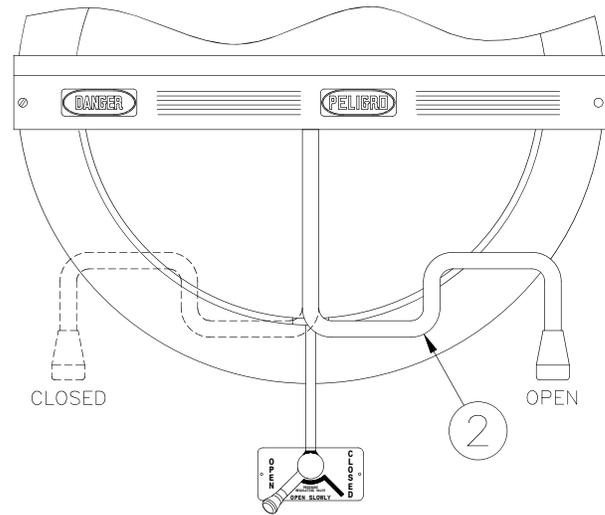
WARNING Keep away from safety relief valve opening without heat and steam protective apparel. Escaping steam could cause serious burns.



- Using a hot mitt, lift safety relief valve (1) handle. If pressure is released, do not attempt to open the cover. Do not attempt to operate the unit until it has been serviced.

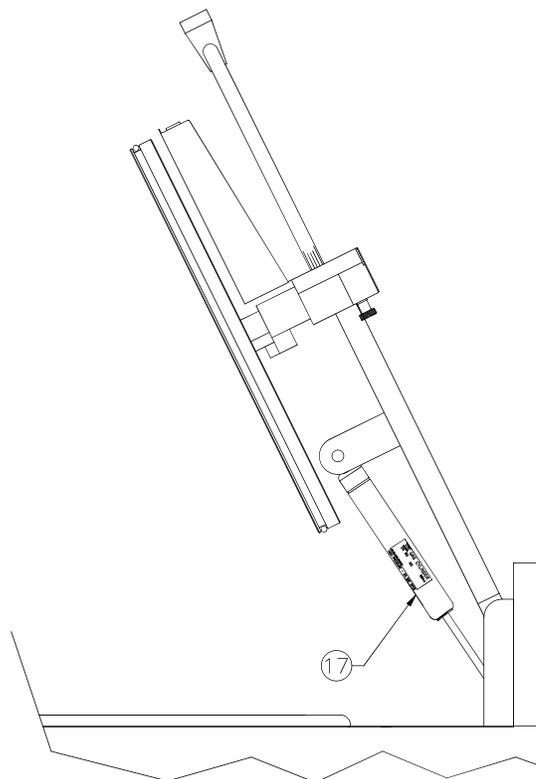
NOTICE Always fully rotate cover handle (2) OPEN or CLOSED.

To CLOSE cover, lower cover, slide cover forward then rotate the handle (2) counter-clockwise. To OPEN cover, push down on cover handle then slowly rotate the handle clockwise. Slide cover toward the rear of the unit and raise cover.



When the cover is raised, the gas springs (17) compensate for the weight of the cover and lift assembly. This reduces the force needed to raise the cover. When the cover is in the fully raised position the gas springs hold the cover in position until it is lowered.

WARNING DO NOT operate unit if cover will not remain in raised position. The hot cover could cause serious burns.



GAS SPRINGS

The gas springs are required to hold the cover, yoke and lift assembly in the raised position.

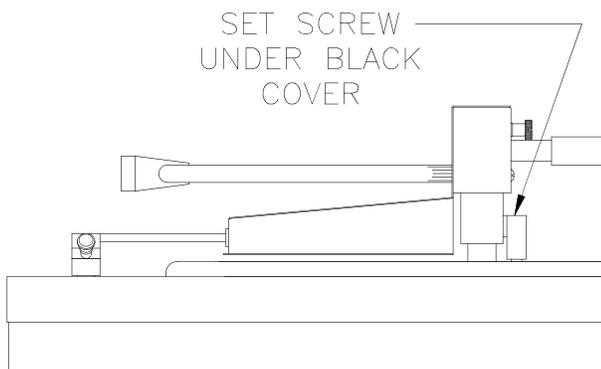
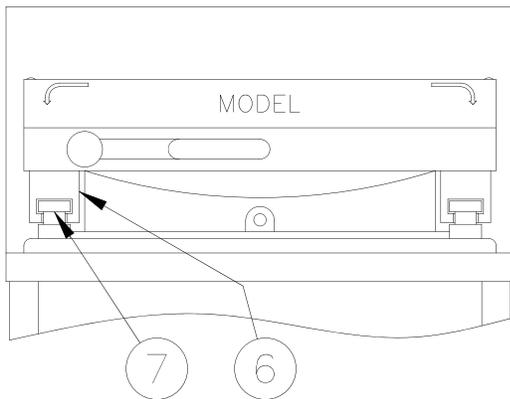
⚠ WARNING DO NOT operate unit if cover will not remain in raised position. Cover is hot after cooking. Falling cover could cause serious burns.

1. See Steps 1-6 of COVER AND YOKE REMOVAL.

ADJUSTMENTS

Height Adjustment:

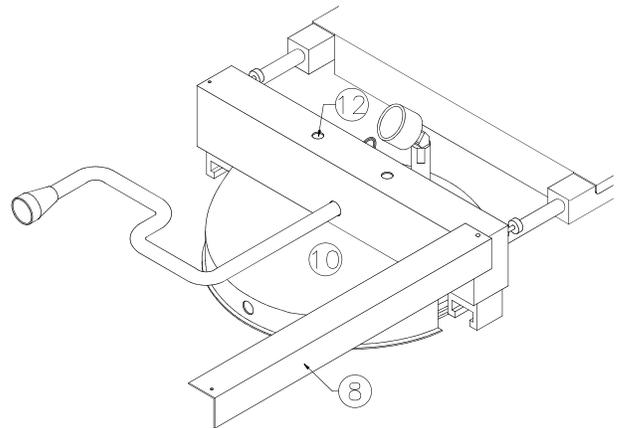
Proper alignment of the yoke latches (6) and latch column (7) is essential. Remove black cover and turn set screw in or out to raise or lower the yoke latch.



Centering Cover:

This is important for prevention of steam leaks and keeping O-ring wear to a minimum.

NOTICE It is important warning sign (8) be placed back into its original position and screw replaced after making this adjustment. If this sign becomes worn or illegible, it must be replaced immediately.

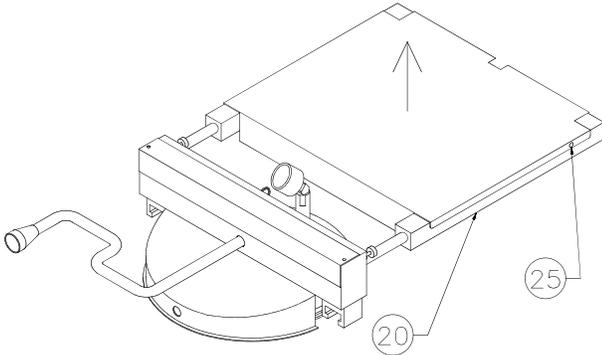


1. Remove screw from left side of warning sign (8) and swing out toward the right.
2. Loosen but do not remove two cover bolts (12) in top of splash shield (10).
3. Open and close cover several times in cooking well to let cover seek its own center. With cover in CLOSED position, tighten each cover bolt a little at a time while alternating between the two.
4. Using a torque wrench, tighten each bolt to a maximum torque of 180 in/lbs or 15 ft/lbs.

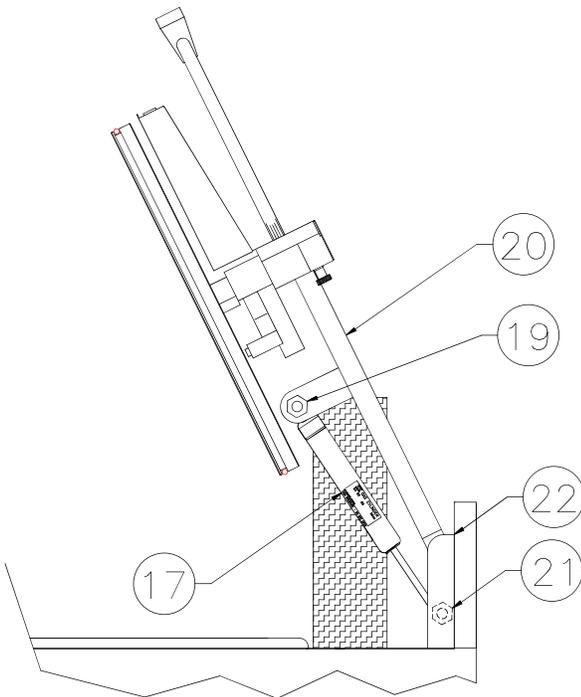
COVER AND YOKE REMOVAL

To remove complete cover and yoke assembly:

1. Keep the cover in its CLOSED position.



2. Remove two thumbscrews (25) attaching the lift assembly cover and remove from assembly (20).



3. Raise the cover to its full open position and place a solid support under the lift to keep it in raised position.

4. Place a plastic, metal or wooden board across well opening to support cover and yoke assembly.
5. Remove gas spring keepers from both ends of the three gas springs.

WARNING Cover Assembly is very heavy. DO NOT allow cover assembly to fall. Serious injury or damage to the unit may result.

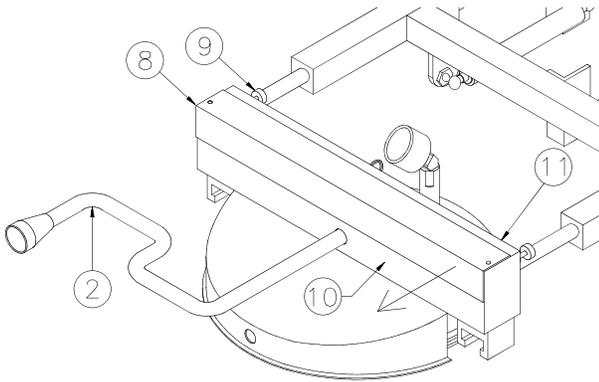
6. Push up on cover until the two outer gas springs are at their full extension. While holding the cover up, pop them off the ballstuds at the large end of both springs. Then raise the cover further until the center gas spring is at its full extension and pop it off also.
7. Lower cover to the support block holding it in the up position.

WARNING When performing the next step be extremely careful so that the support does not become dislodged. Cover is very heavy. If it falls, serious injury or damage to unit may result.

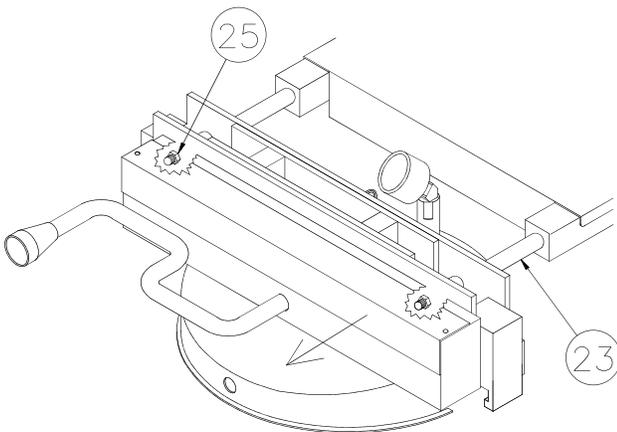
8. Pop the other end of the gas springs off of the ballstuds on the mounting blocks.
9. Carefully lower cover assembly to the support board over the well.

WARNING Cover Assembly is very heavy. DO NOT allow cover assembly to fall. Serious injury or damage to the unit may result.

- Loosen two large head knurled screws (9) attaching splash shield (10) to back panel assembly (11).

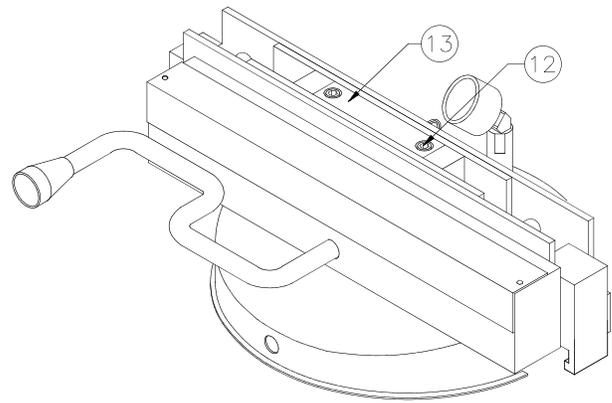


- Slide splash shield (10) forward towards the end of the cover handle (2).
- Remove nuts (25) attaching yoke and cover assembly to lift assembly.

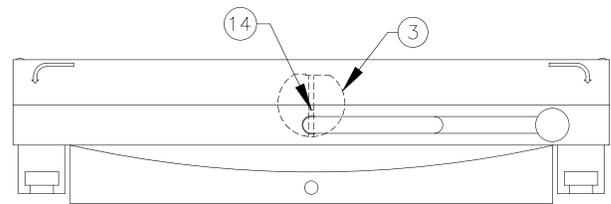


- Pull cover assembly toward front of unit until it is free of the slide rods (23).
- Reassemble in reverse order.

COVER AND YOKE DISASSEMBLY



- Remove two cover bolts (12).
- Lift yoke bar up. The cover (4) and spacer block (5) will remain.
- Remove lifter box (13).
- Rotate cover handle to the OPEN position.



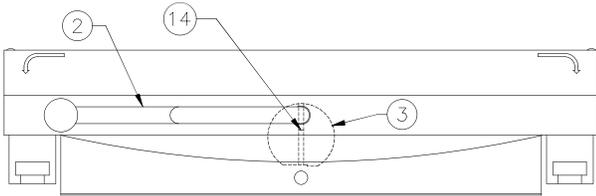
- Locate grooved pin (14) hole in the flat of the cam (3).

NOTICE Be sure to note how the handle and cam are removed. Use a stiff wire to tie the handle and cam together after removal.

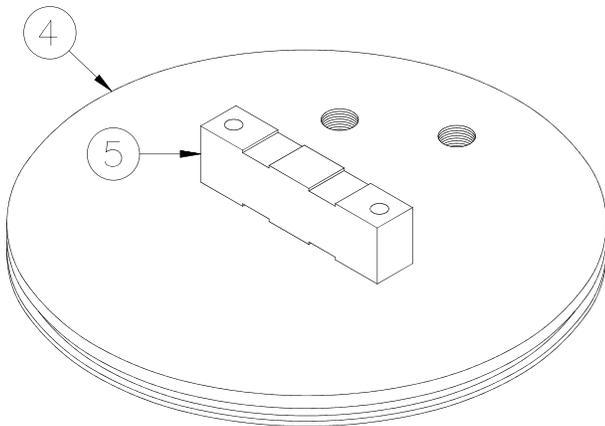
- Use a 1/8 inch punch to remove grooved pin. Remove handle and cam.
- Clean lifter box, handle, cam and yoke bar where lifter box slides up and down.

COVER AND YOKE ASSEMBLY

1. Install cam (3) into yoke bar.



2. Install handle (2) through splash guard, into yoke bar then into the cam.
3. Align holes in handle and cam then install a new grooved pin (14). Be sure the grooved pin is installed flush with the cam.
4. Lubricate inside of yoke bar where lifter box slides up and down.
5. Lubricate lifter box then install lifter box into the yoke bar.
6. Lower assembly over the cover (4) and spacer block (5).



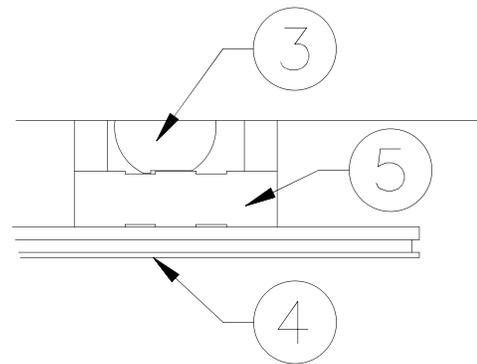
7. Rotate cover handle to the CLOSED position.
8. Align holes in lifter box, spacer block and cover.

9. Install new cover bolts but do not tighten.

NOTICE Bolts will be tightened when centering cover at reassembly (see Centering Cover under ADJUSTMENTS).

CHECK CAM OPERATION

When handle is rotated, cam (3) moves cover (4) in or out of the cooking well. Cam and spacer block (5) lock the cover when pressure in cooking well pushes up on the cover.

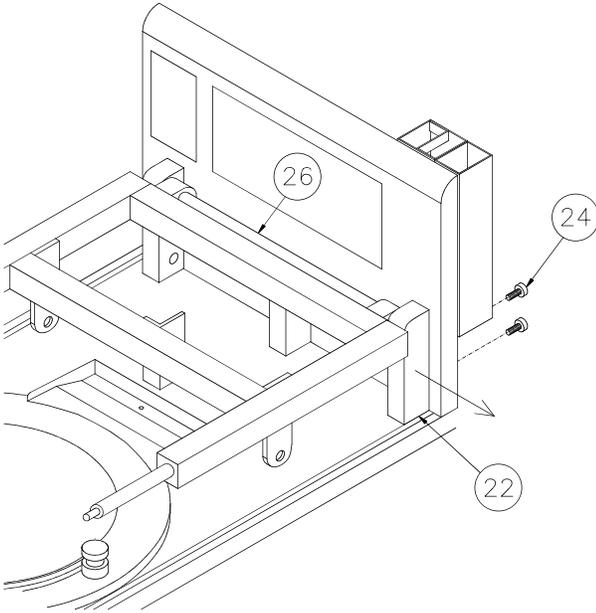


REAR VIEW

LIFT REMOVAL

To remove complete lift assembly:

1. Complete COVER AND YOKE REMOVAL.
2. Remove two screws (24) attaching either one of the cover mounts (22) to the frame.



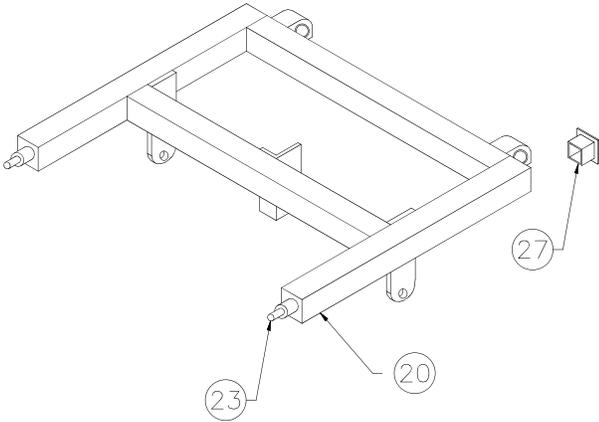
3. Slide the cover mount block (22) toward the outside of the unit.
4. Slide the lift assembly toward the outside of the unit thereby disengaging the lift hinge bar (26) from the opposite cover mount block.

CAUTION DO NOT allow the lift hinge bar to be damaged. It may not allow the lift assembly to be reattached to the unit.

5. Reassemble in reverse order.

SLIDE ROD AND BEARING REPLACEMENT

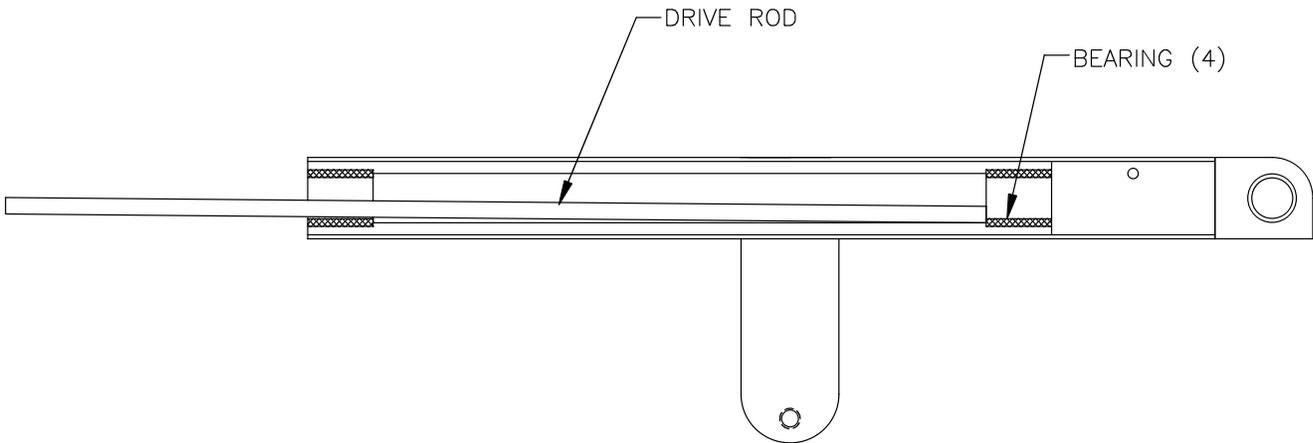
1. Remove plastic caps (27).



2. Remove the slide rod (23) from the lift assembly (20).

CAUTION DO NOT allow the sliding rod bar to be damaged. It may not be able to be reinserted into the lift assembly.

3. Drive out old bearings using a bar 1/4" Dia. x 15" long. (See diagram).
4. Install new bearings.
5. Reassemble in reverse order.

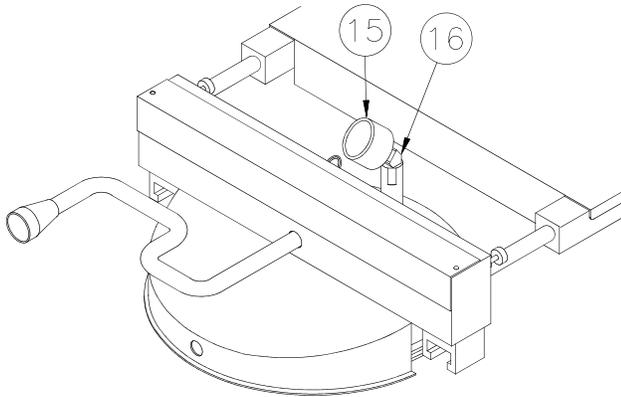


PRESSURE GAUGE

Gauge indicates pressure within the cooking well. Operating pressure is 12-14 PSI.

Replacement:

1. OPEN the pressure regulating valve then the cover.



2. Unscrew gauge (15) from the elbow (16).
3. Use teflon tape on the threads. Screw new gauge onto the elbow.

SAFETY RELIEF VALVE

The safety relief valve opens in the event pressure in the cooking well meets relief pressure rating of the valve. DO NOT alter or attempt to repair this valve. See PROPER COVER OPERATION.

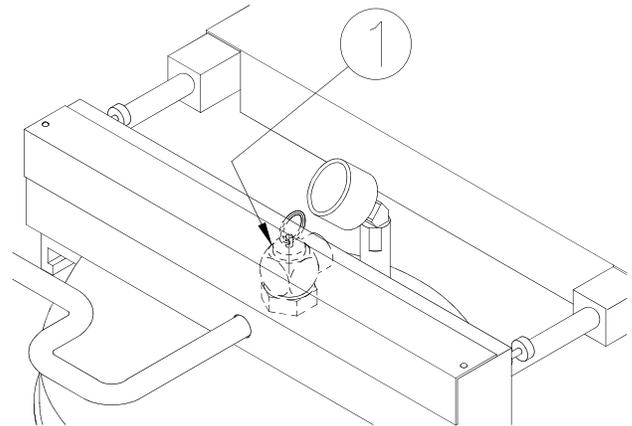
WARNING Keep away from safety relief valve opening without heat and steam protective apparel. Escaping steam could cause serious burns.

Replacement:

NOTICE

Replacement valve must have a 15 PSI relief pressure.

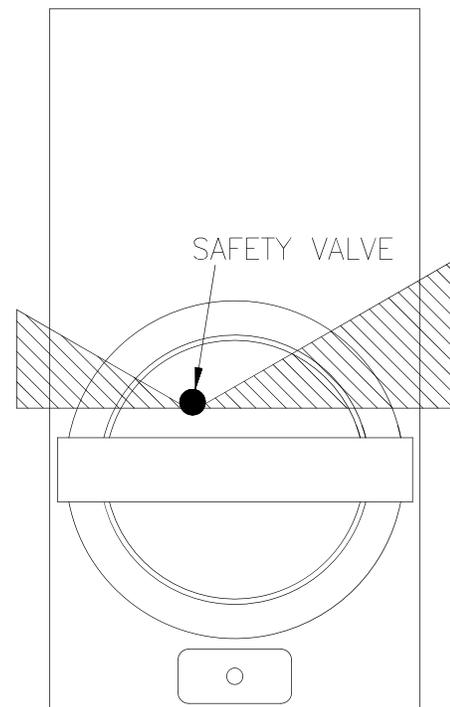
1. OPEN the pressure regulating valve then the cover.



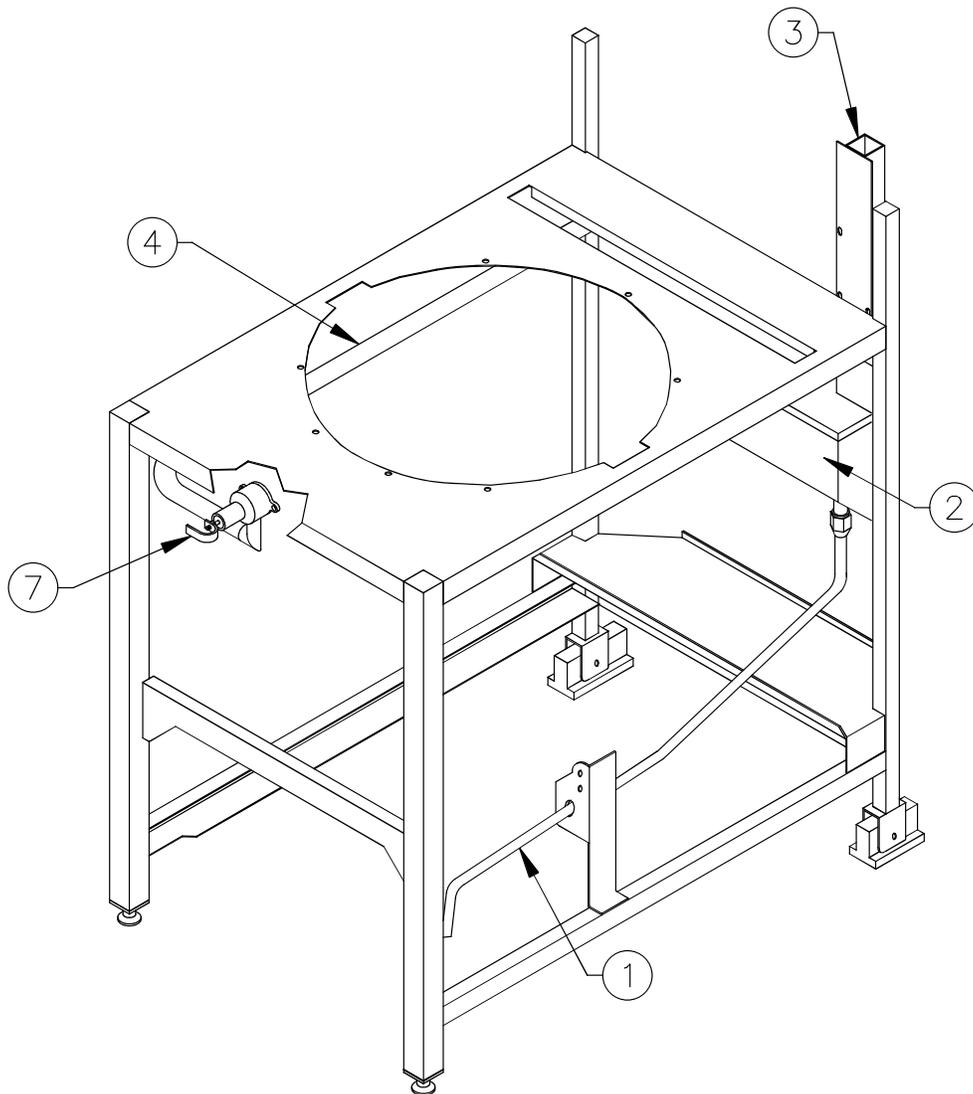
2. Unscrew valve (1) from the cover.

NOTICE DO NOT install valve discharge opening in the direction of foot traffic areas.

3. Apply teflon tape to threads. Screw new valve into the cover with valve discharge opening facing the rear, at an angle, away from foot traffic as shown below.



6 - PRESSURE SYSTEM

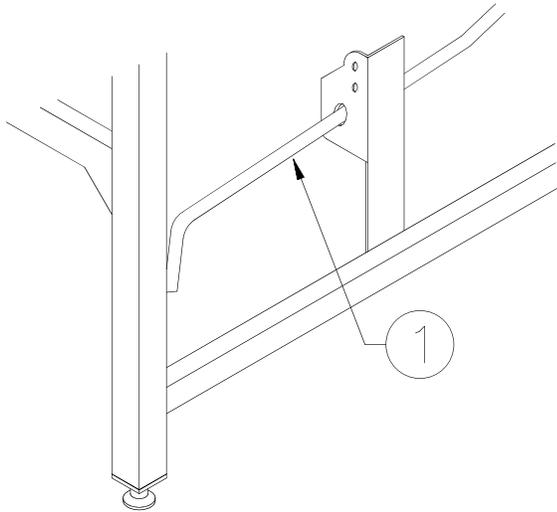


⚠ DANGER DO NOT attempt to tighten, repair, or replace any fitting, line or component unless main electric power is disconnected, pressure regulating valve is OPEN and cooking oil has cooled. Hot oil could spray out under pressure causing serious burns.

The following operator habits may cause the pressure system to become faulty:

- Overfilling cooking well with oil: See operation manual for correct oil level.
- Overloading basket with product: Oil level will raise too high.
- Breeding then dropping: Excess coating can collect in pressure regulating valve and exhaust tank. See operation manual for coating instructions.
- Opening pressure regulating valve quickly at the end of a cooking cycle: Excess coating can collect in pressure regulating valve and exhaust tank.

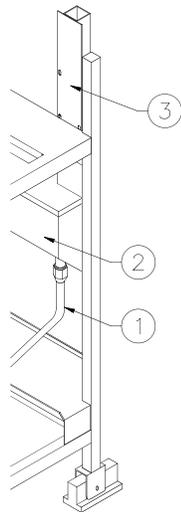
EXHAUST DRAIN TUBE



Tube (1) drains condensation from exhaust tank into the condensate pan.

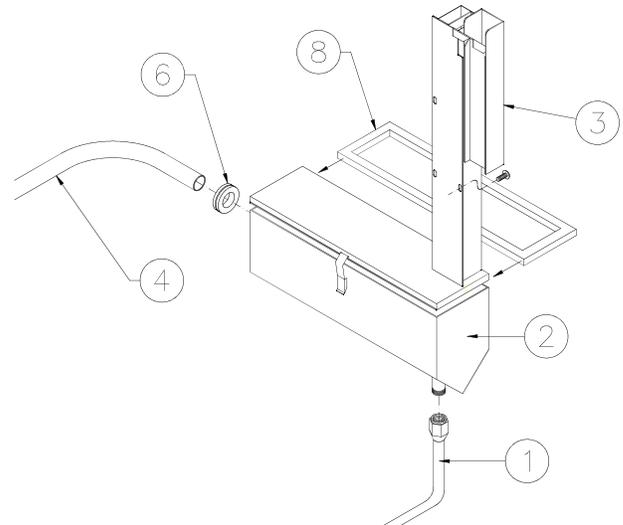
EXHAUST TANK

Steam and vapors are exhausted through the muffler (2).



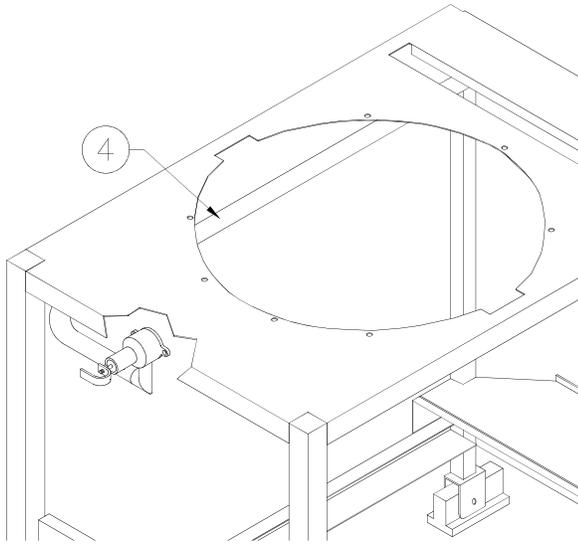
See previously mentioned operator habits. Muffler (2) can become obstructed. The obstruction usually forms on the bottom of tank where exhaust drain tube (1) is connected. Tank will then become filled with liquid. Liquid may be forced up the stack (3) when pressure is released at the end of a cooking cycle.

Cleaning:



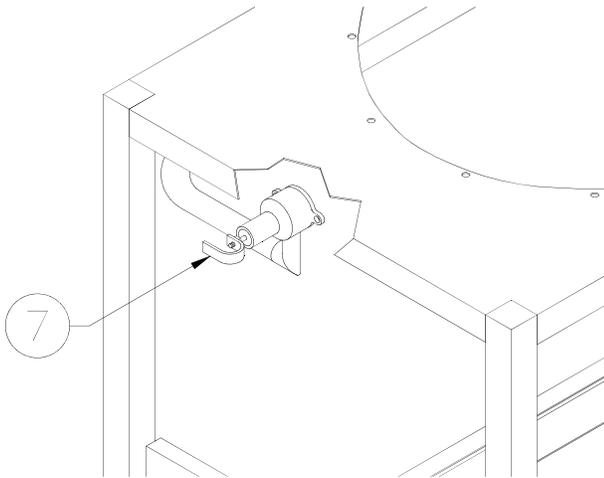
1. Remove exhaust drain tube (1) from bottom of the tank (2).
2. Remove three screws from the stack (3) which mounts tank to the unit.
3. Remove Exhaust tube (4) from end of tank and pull tank away from the frame.
4. Loosen two latches holding cover (3) to the tank then remove cover. Remove rubber grommet (6) on end of the muffler. Set the tank in a sink and clean thoroughly.
5. Inspect gasket. Replace if needed. If replacing gasket, apply small bead of silicone sealant in bottom of gasket groove before installing on to tank.
6. Clean all tubes.
7. Replace grommet (6) if necessary.
8. Assemble in reverse order.

EXHAUST TUBE



Tube (4) directs steam and vapors from cooking well into the exhaust tank.

PRESSURE REGULATING VALVE

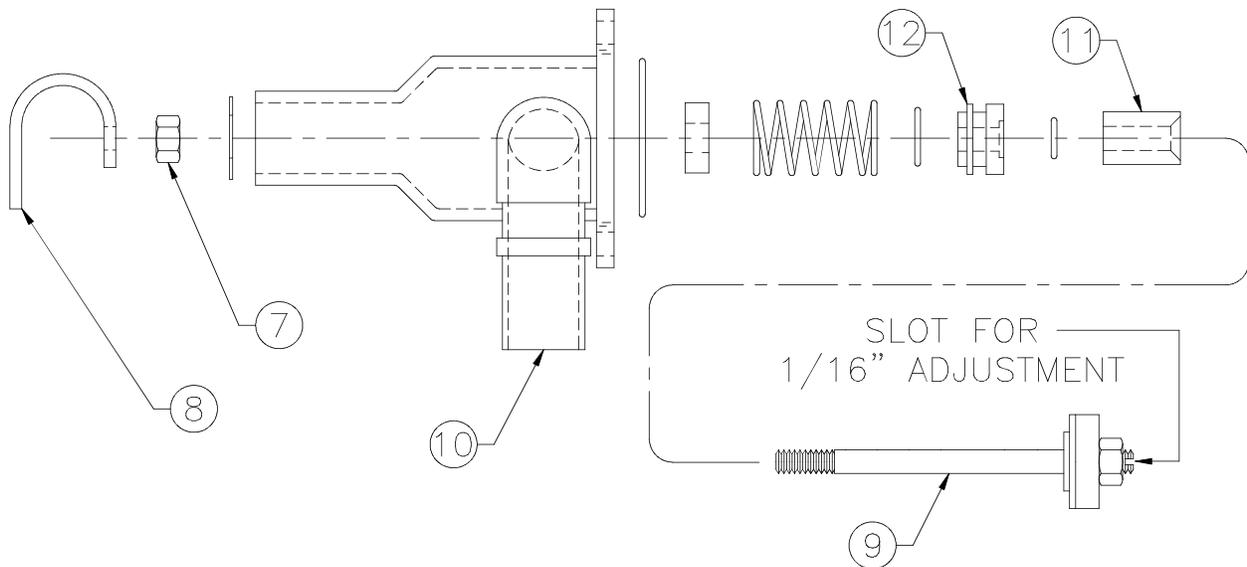


Valve (7) is preset to maintain a maximum pressure of 12-14 psi during a cooking cycle. Pressure may build slowly or remain low when cooking small loads. Add one or two quartered potatoes with product to help build and maintain maximum pressure.

Replacement:

1. Disconnect main electric power supply.
2. Slide right hand squeeze clamp, on valve outlet, to the left.
3. Pull silicone sleeve and exhaust tube (4) free of valve outlet.
4. Remove two allen screws mounting valve to the cooking well and remove valve.
5. See **Repair**.
6. Install silicone sleeve and exhaust tube onto the valve outlet.
7. Slide right hand squeeze clamp onto the valve outlet.

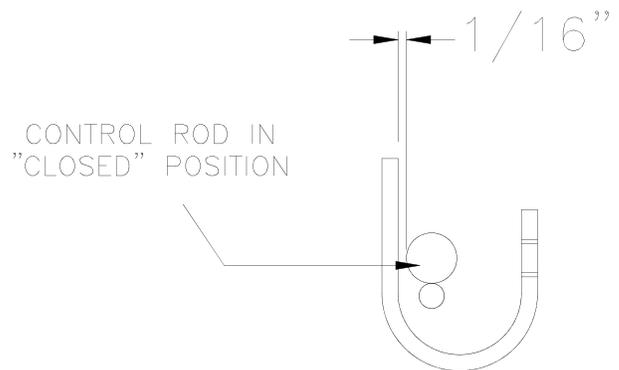
Repair:



Use repair kit #15279.

1. Remove two allen screws which attach the valve assembly to the cooking well.
2. Remove valve from the unit.
3. Loosen locking nut (9) then remove valve control yoke (10) from the stem assembly (11).
4. Remove entire stem assembly from the housing (12) by pushing on threaded end of the stem assembly.
5. Remove all components from the stem assembly (11).
6. Clean then dry all metal components, not replaced, with hot water and a mild detergent.
7. Install new parts from the repair kit. Lubricate all O-rings and contacting surfaces with olive oil.

8. Mount valve assembly back on cooking well with the allen screws. With open end of yoke pointing to the left.



9. With control arm in the "CLOSED" position, a distance of 1/16" should be maintained between the control yoke (10) and control rod. While locking nut (9) is loose, adjust distance in the pressure port located on inside top of the cooking well. Using a screwdriver, turn stem assembly (11) either clockwise or counterclockwise to obtain this distance.
10. Tighten locking nut.

7 - 2400GH MAIN BURNER SYSTEM

BURNER INFORMATION

Main Burner Orifice Sizes Up To 2000 Feet Above Sea Level:

Natural (G20) Gas: #14 (4.50mm)
Propane (G31) Gas: #32 (2.87mm)

Pilot Burner Orifice Sizes:

Natural (G20) Gas: .018 (.46mm)
Propane (G31) Gas: .011 (.27mm)

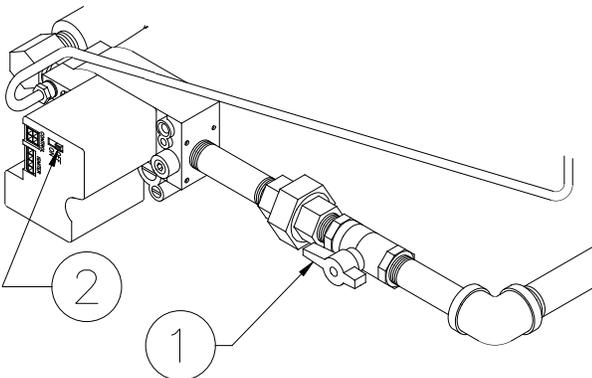
Standard gas units operate up to 2000 feet above sea level. Installations above this require a special main burner orifice. Contact Broaster Company for orifice sizing.

Gas Conversion:

To convert from one type of gas to another, four components must be changed: gas valve, pilot burner orifice, main burner orifice and gas data plate. Notify Broaster Company Service Department of a conversion in writing.

LIGHTING INSTRUCTIONS

Start Up:



1. Turn power switch OFF.
2. See OIL LEVEL in the operation manual.
3. Turn gas shut-off valve (1) ON. Wait five minutes before turning gas control ON.
4. Slide switch (2) on top of gas valve to ON.

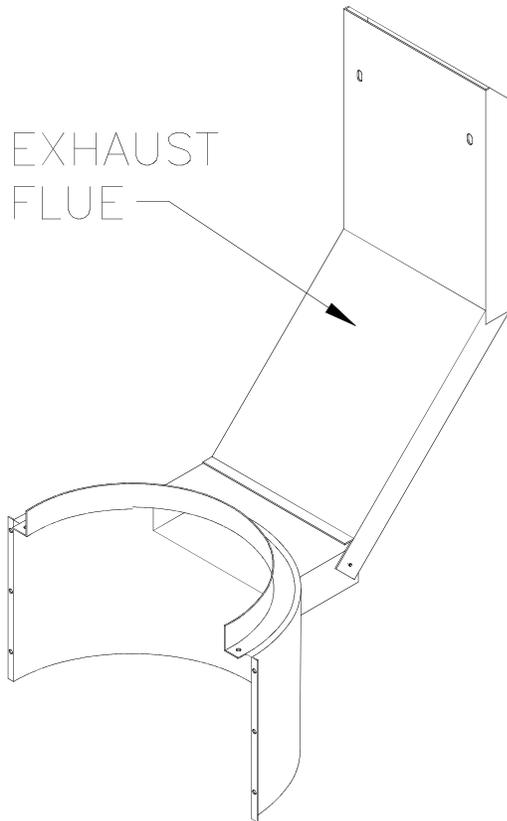
NOTICE The unit has an intermittent pilot burner. This type of pilot lights when the controller calls for heat and goes out when the controller is not calling for heat.

5. To light pilot and main burners, turn cook/filter switch to COOK.

Shut Down:

1. Turn power switch OFF.
2. *Turn gas valve switch (2) OFF.
3. Turn gas shut-off valve (1) OFF.

VENTILATION

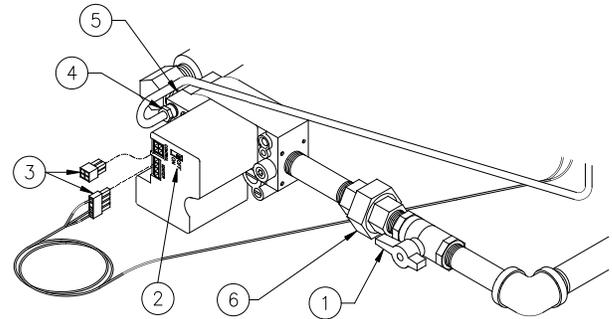


- **Never modify exhaust flue!** Back pressures from added extensions can cause high ambient temperatures near the controls.
- Make sure unit is correctly ventilated. Restrictions, drafts or other adverse conditions might affect proper operation of the burner and combustion assemblies.

GAS VALVE

Regulates gas supply. The gas valve has a two position switch*: OFF to stop all gas flow, and ON allows gas flow to pilot and main burners as needed. Adjustment for gas pressure and gas flow to pilot burner are also found on the valve.

Replacement:



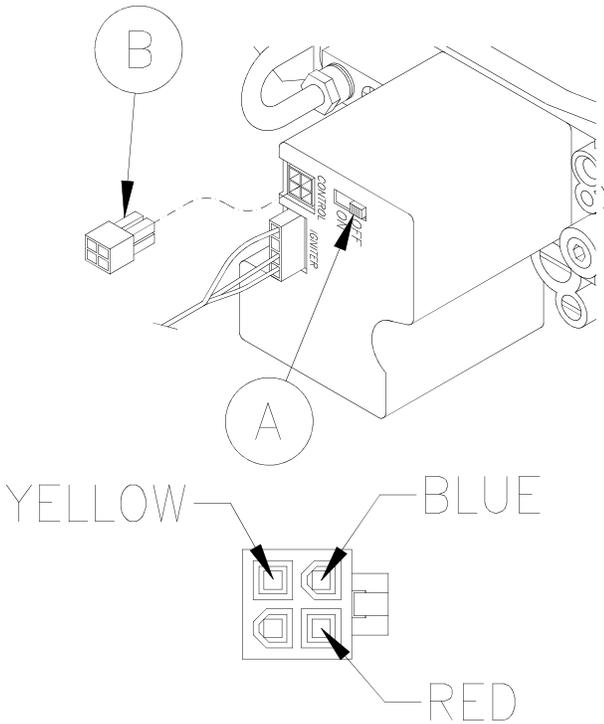
1. Turn power switch, manual gas shut off valve (1) and switch (2) OFF.
2. Turn main gas supply OFF.
3. Disconnect main electric supply.
4. Remove condensate pan and front panel.
5. Disconnect gas valve wire harnesses (3).
6. Loosen fitting (4) that mounts pilot burner gas supply line to gas valve.
7. Loosen brass union elbow (5).
8. Loosen pipe union (6).
9. Remove piping from gas valve.

⚠ WARNING Be sure pilot burner gas supply line is fully installed into gas valve fitting during installation. If not, a gas leak may be the result.

10. Install in reverse order. Use gas pipe sealer on pipe threads. Check all gas connections and pipes with a soap and water solution. Bubbles indicate a gas leak.

GAS VALVE POWER CHECK

1. Turn SWITCH A to off.
2. Pull out plug B.
3. Turn the power switch to ON.
4. At the end of the plug, check for 24VAC between the blue and red wire and the blue and yellow wire. (see below)



5. Refer to the TROUBLESHOOTING FLOW CHART on page 11-10 if there is no voltage at either or both places.

FLAME ADJUSTMENTS

Gas Pressure Adjustment:

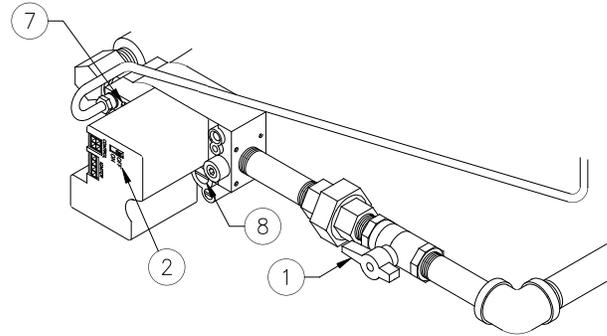
NOTICE

Input Gas Pressure must be below:
7" wc for Natural Gas
14" wc for LP Gas

Always check gas pressure after a new gas valve installation. Check pressure when other gas equipment is also operating. This will ensure adequate pressure during peak operating times.

There is a pressure tap in output side of the gas valve for manometer hook-up. Correct output gas pressures, in Water Column, are:

Natural (G20) Gas: 4.0" wc (10mbar)
Propane (G31) Gas: 10.0" wc (25mbar)



1. Turn power switch, manual gas shut off valve (1) and switch (2) OFF.
2. Remove pressure tap (7) on gas valve.
3. Install manometer.
4. Turn gas shut off valve (1) ON.
5. Turn gas valve switch (2) ON.

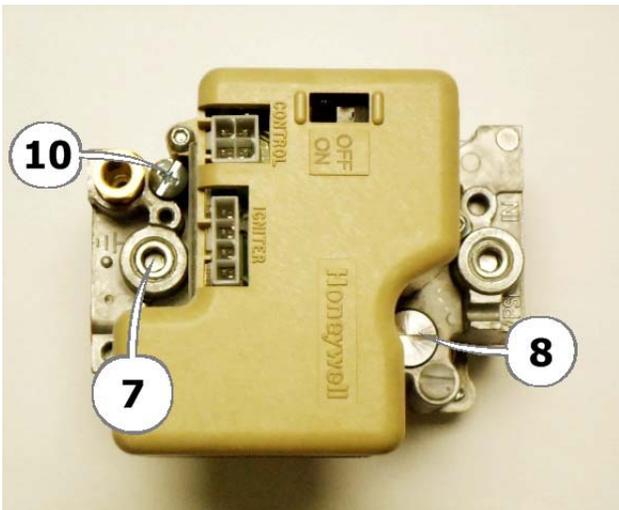
CAUTION Check cooking oil level before turning cook/filter switch to COOK.

(continued)

- Turn cook/filter switch to COOK.

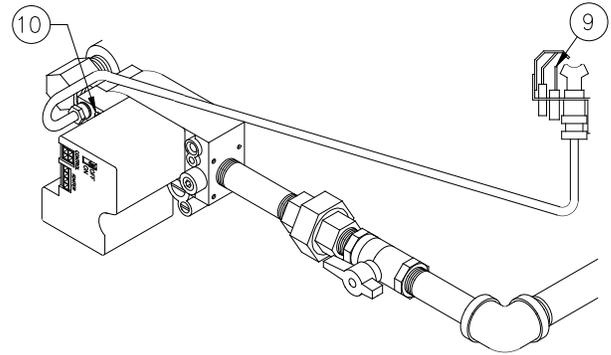
NOTICE Check manometer reading. If at correct pressure go to step 8.

- Remove regulator adjustment cover (8). Adjust pressure when main burner is on.
- Turn cook/filter switch, manual gas shut off valve (1) and switch (2) OFF.
- Remove manometer. Replace pressure tap plug. Use gas pipe sealer on threads.
- Turn manual gas shut off valve (1) ON.
- Slide gas valve switch (2) ON.
- Turn cook/filter switch to COOK.
- Check pressure tap with a soap and water solution when main burner is on. Bubbles indicate a gas leak.



Pilot Burner Flame Adjustment:

Pilot burner flame must surround sensor (9).



- Remove screw (10).
- Adjust flame and replace screw.

Main Burner Flame:

Flame must be blue and sit on the burner surface. During normal operation, a slight “whoosing” sound may be heard when burner shuts off. If you cannot adjust the flame correctly check the following:

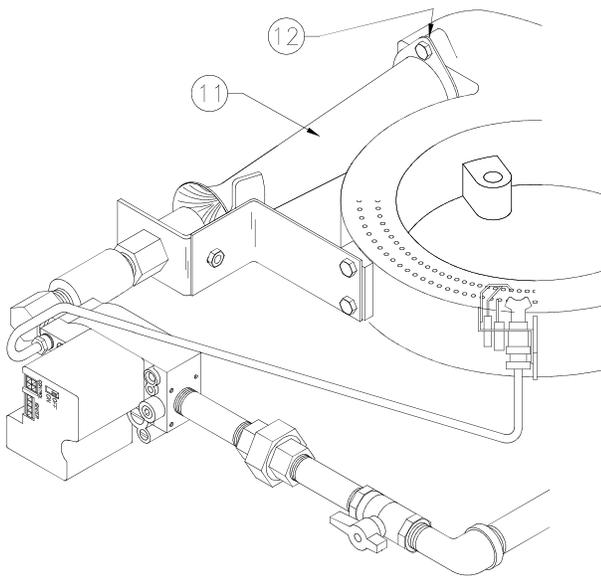
- Centered main burner orifice. After installing a new gas valve or piping, brackets can shift causing gas not to travel down center of the venturi. A bad air/gas mixture is the result.

Adjustment will be necessary if main burner flame is mostly orange or yellow. If flame is out of adjustment, check combustion chamber and flue for soot build-up.

WARNING If soot is present, DO NOT operate unit until all soot is removed and correction made. Soot is black and powdery to the touch. See COMBUSTION CHAMBER.

- Drafts on floor can affect combustion.

2. Drafts on floor can affect combustion. Drafts can be caused by open doors, fans and ventilation systems. See VENTILATION.
3. Incorrect ventilation can affect combustion. See VENTILATION.
4. Gas pressure is a main factor for good operation. Be sure correct water column is present. See Gas Pressure Adjustment under FLAME ADJUSTMENTS.



5. Loose venturi (11) or bad gasket (12) can affect combustion. Tighten or replace gasket.

MAIN BURNER FLAME ADJUSTMENT

1. On the back of the fryer loosen the set screws holding the clamps on each side of the gas line support bracket.
2. While observing the flame, slowly slide the gas pipe from front to back in the support bracket. When the flame is as blue as it can get, re-tighten the clamps on each side of the support bracket to hold the pipe in position.

Is the flame blue and settled on the face of the burner? If it is, no further adjustment is necessary otherwise continue.

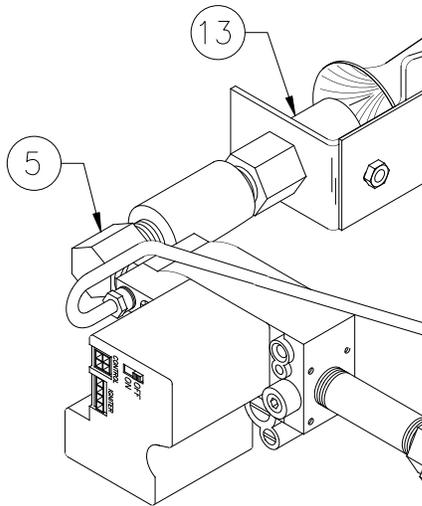
3. Remove the LH side panel.
4. Using an adjustable wrench or large pair of pliers, carefully change the angle of the orifice holder mounting bracket, up or down, so the orifice is pointing down the middle of the mixer tube.
5. Replace the side panel.

NOTICE To get the best flame several adjustments, both up and down and right and left, may be necessary.

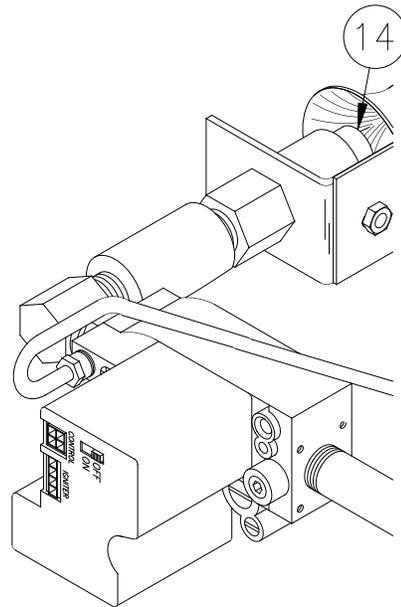
MAIN BURNER ORIFICE

Replacement:

1. Turn cook/filter switch, gas valve switch and manual gas shut off valve OFF.
2. Turn main gas supply OFF.
3. Disconnect main electric supply.
4. Remove condensate pan.
5. Facing the front of unit, remove left and side panel if possible.

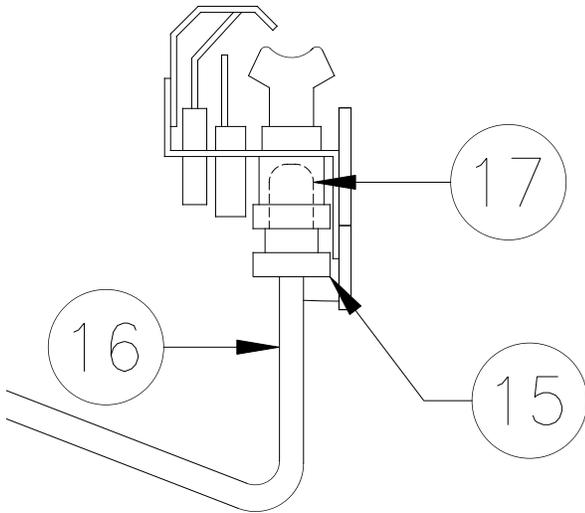


6. Loosen union elbow (5) and remove locknut (13).
7. Remove orifice holder and union elbow from mixer.
8. Remove main burner orifice (14).



9. Assemble in reverse order. Check all connections and pipes with a soap and water solution. Bubbles indicate a gas leak.

PILOT BURNER ORIFICE



Orifice (17) is located above brass fitting (15).

Replacement:

1. Remove condensate pan.
2. Turn cook/filter switch, gas valve switch and manual gas shut off valve OFF.
3. Loosen brass fitting (15) from pilot burner.
4. Pull 1/4" gas supply line (16) and brass fitting free of burner.
5. Remove orifice (17).
6. Install new orifice in reverse order. Check all gas connections with a soap and water solution. Bubbles indicate a gas leak.

COMBUSTION CHAMBER

Combustion chamber directs heat from main burner flame across fins on cooking well and out the exhaust flue (19). If main burner flame is not adjusted correctly, soot deposits can form on the combustion chamber inner jacket (20), exhaust flue (19) and cooking well (21). Soot is identified as black and powdery to the touch.

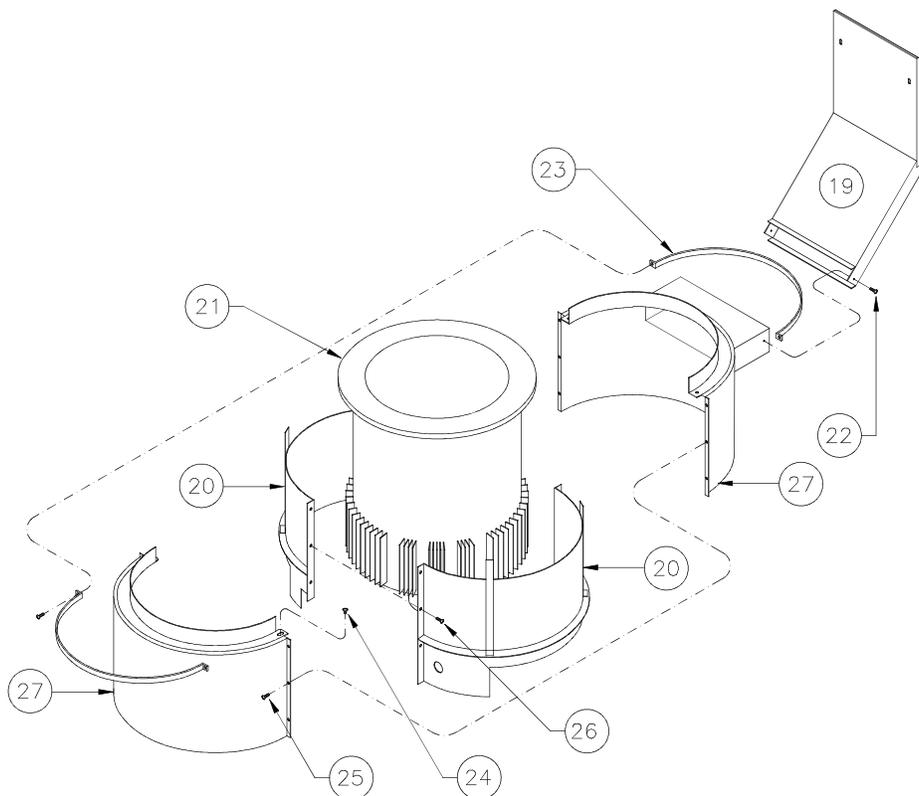
⚠ WARNING If soot is present, **DO NOT** operate unit until all soot is removed and corrections made.

⚠ WARNING Allow combustion chamber parts to cool before servicing. Hot metal may cause serious burns.

Cleaning:

1. Turn cook/filter switch, gas valve switch and manual gas shut off valve OFF.
2. Turn main gas supply OFF.
3. Disconnect main electric supply.

4. Remove condensate pan.
5. Remove left and right hand side panels.
6. Remove exhaust flue mounting screws (22) from combustion chamber. Remove upper mounting nuts inside upper flue opening and remove flue (19).
7. Remove outer wall clamp (23).
8. Remove screw (24) on top of outer walls (27).
9. Remove screws (25) on both sides of outer walls (27) and remove.
10. Remove screws (26) on both sides of inner jackets (20) and remove.
11. Clean exhaust flue (19), inner jackets (20), outer walls (27) and cooking well (21).
12. Assemble in reverse order.



8 - DRAIN VALVE AND FILTER SYSTEM

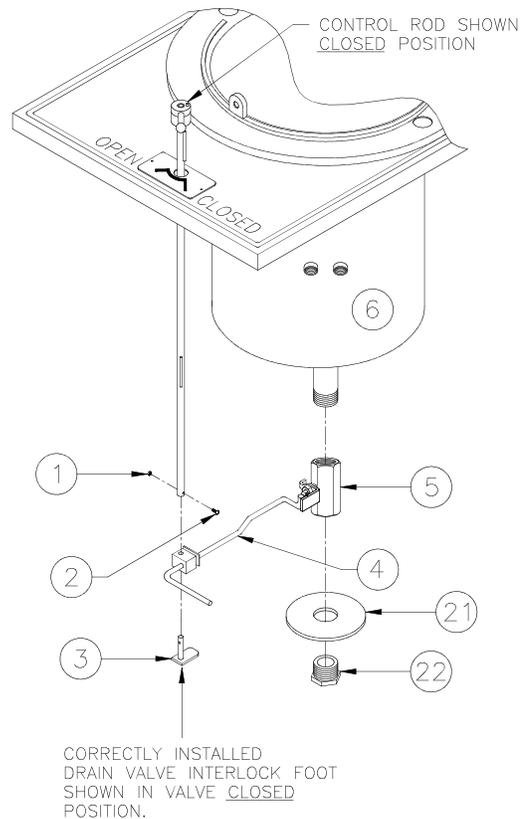
DRAIN VALVE

Used to drain oil from cooking well into filter pan or container made for handling hot oil.

⚠ DANGER Never drain oil unless cook/filter switch is OFF and pressure regulating valve is OPEN. Hot oil could spray out under pressure causing serious burns.

Replacement:

1. Disconnect main electric supply.
2. Remove filter pan from under the unit. Drain cooking oil from cooking well into a container made for handling hot oil.
3. Remove splash disc (21) and bushing (22). (2400GH only)
4. Remove nut (1), screw (2) and interlock (3).
5. Remove nut mounting handle (4) to the drain valve (5).
6. Unscrew drain valve from the cooking well (6).
7. Assemble in reverse order using #15820 Primer & #15359 Sealant on cooking well threads.

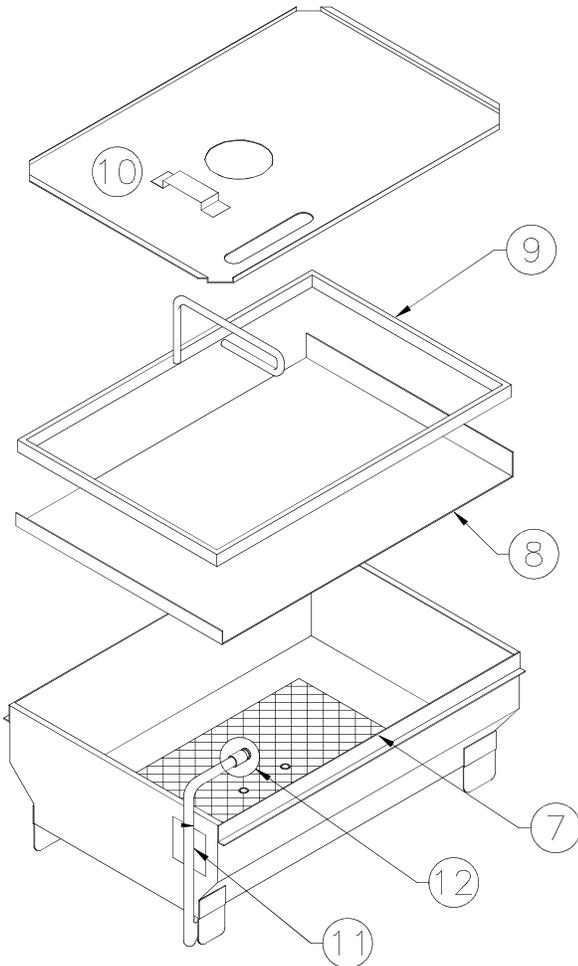


FILTER PAN

See Operation Manual for detailed filtering procedures.

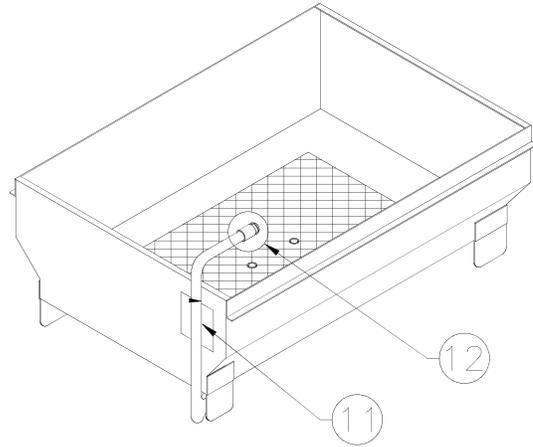
Filter Pan Assembly:

⚠ WARNING DO NOT use the filter pan to transport hot oil. Hot oil could splash causing serious burns.



Be sure filter components are assembled correctly. Correct order is filter screen (7) on bottom of filter pan, filter paper (8), filter hold-down (9), 3 cups of Broaster® filtering compound on top of filter paper and cover (10) on filter pan.

Preventive Maintenance:

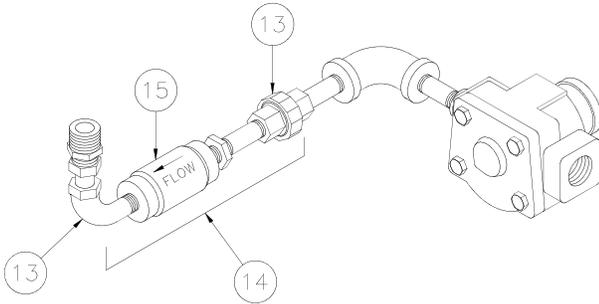


1. Use a clean cloth or paper towel to wipe crumbs from filter hold down and the filter pan interior before replacing filter paper. This will help prevent crumbs from causing a poor seal or entering the riser line (11) and pump.
2. Be sure the O-ring (12) is in good condition, lubricated with cooking oil and installed correctly.

CHECK VALVE

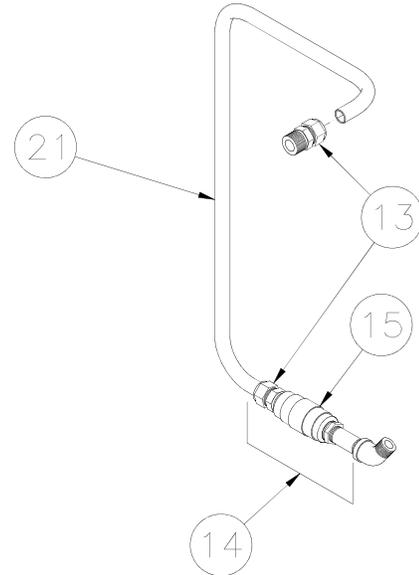
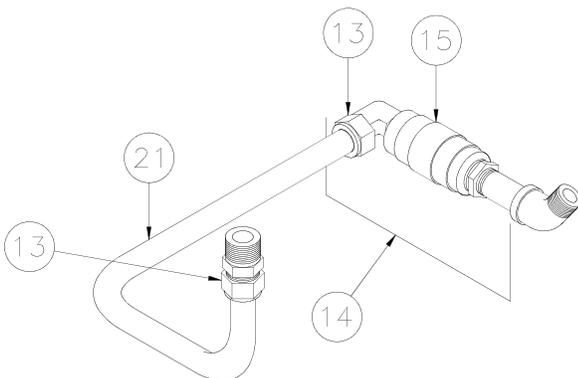
Prevents cooking oil from draining into the filter pan from cooking well.

2400E Replacement:



1. Disconnect main electric power supply.
2. Drain cooking oil from the cooking well and into a container made for handling hot oil then close the drain valve.
3. Remove left hand side panel.
4. Loosen fittings (13), remove pipe assembly (14).
5. Remove any fittings from the valve (15).
6. Install in reverse order using #15820 Primer & #15359 Sealant on pipe threads.

2400GH Replacement:

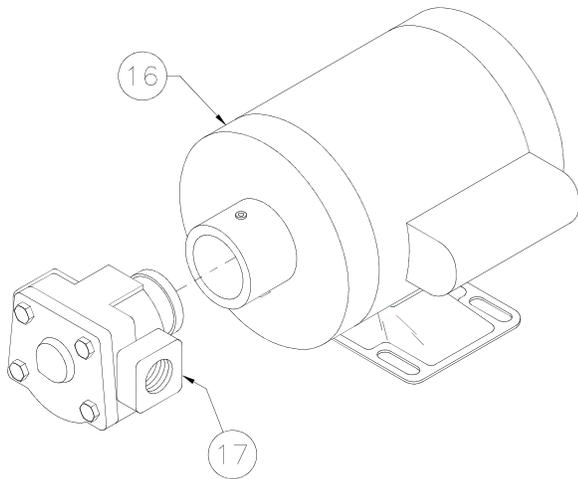


1. Disconnect main electric power supply.
2. Drain cooking oil from the cooking well and into a container made for handling hot oil then close the drain valve.
3. Remove left hand side panel.
4. Loosen fittings (13), remove return tube (21), remove pipe assembly (14) from pump.
5. Remove any fittings from the valve (15).
6. Install in reverse order using #15820 Primer & #15359 Sealant on pipe threads.

Installation hint:

1. When installing a fitting or pipe nipple into the valve, be sure to place wrench on the same side of valve into which fitting or nipple is being installed. **DO NOT** tighten across the valve! Distortion of valve seat could occur.
2. When installing compression fittings on tubing, tighten nut finger tight then turn 1-1/4 turns more.

MOTOR



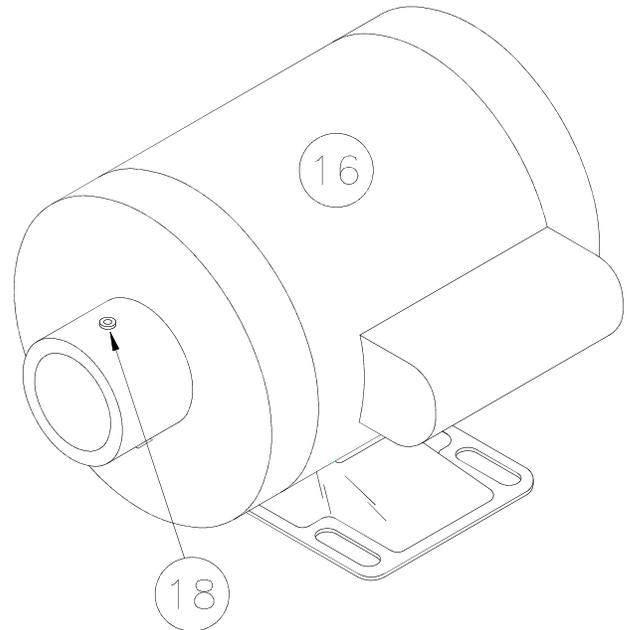
Motor (16) turns pump (17) which returns cooking oil from filter pan to the cooking well.

⚠ WARNING Turn cook/filter switch **OFF** before resetting manual reset thermal overload.

Motor has a manual reset thermal overload. If overload trips, push red reset button on back after motor has cooled.

Replacement:

1. Disconnect main electric power supply.
2. Disconnect conduit wires and conduit from the motor.



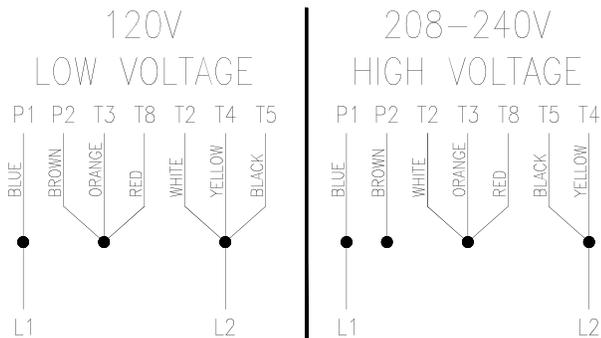
3. Loosen three set screws (18) in neck of motor (16) which hold pump in place.
4. Remove motor mounting bolts and remove motor.
5. Install in reverse order.

Installation Hints:

1. Be sure pump is fully installed into the motor neck before tightening set screws.
2. Tighten three set screws in neck a little at a time, in sequence, around neck until tight. This will prevent any unnecessary binding on shafts of the pump and motor.

Continued next page

3. Be sure motor is wired for correct voltage and direction. Motor wires are identified to ensure proper connection.



NOTICE

The dots represent wire nuts.

NOTICE

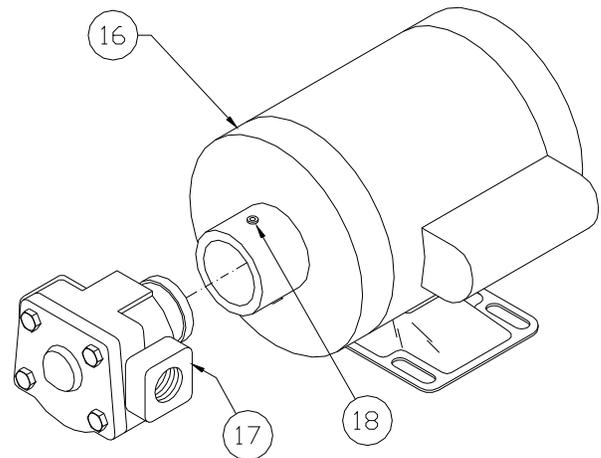
Wire 2400 pump motor as shown above.

PUMP

Pumps cooking oil from filter pan to the cooking well.

Removal:

1. Disconnect main electric power supply.
2. Drain cooking oil from cooking well into a container made for handling hot oil and close drain valve.



3. Remove piping from pump (17).
4. Loosen three set screws (18) in neck of motor (16) which hold pump in place. Remove pump.
5. Assemble in reverse order using #15820 Primer & #15359 Sealant on pipe threads.

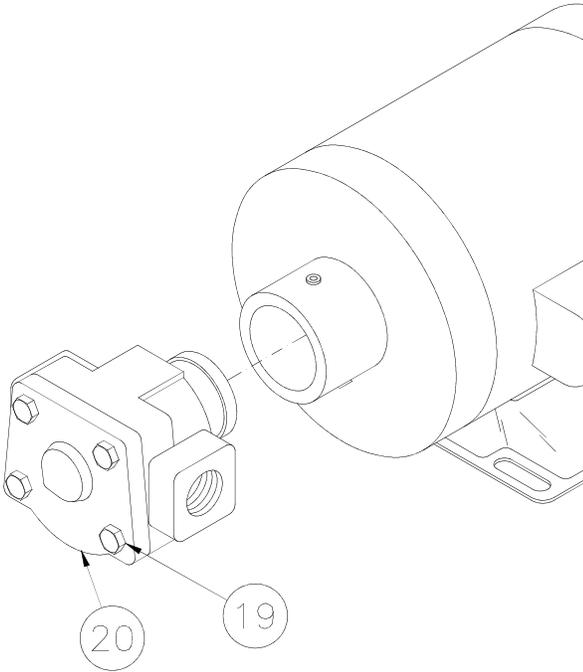
Installation Hints:

1. Loosen motor mounting bolts to help install piping.
2. See MOTOR Installation Hints.

Pump Cleaning:

Cleaning will be necessary if pump is seized and tripping thermal overload on the motor.

1. See PUMP Removal. Remove pump.



2. Remove four bolts (19) and cover (20).
3. Remove interior gears.
4. Clean gears and covers.
5. Replace O-ring and shaft seal if necessary.
6. Install in reverse order using #15820 Primer & #15359 Sealant on pipe threads.

Reassembly Hints:

1. Pour olive oil or cooking oil on gears and inside front cover bearing where gear shaft is installed. Turn gears by hand for good oil coverage.
2. Be sure cover O-ring is in place before tightening bolts.

9 - TROUBLESHOOTING

NOTICE

Check all wire connections before replacing any part.

ELECTRICAL TIPS

COMPLAINT	CAUSE	REMEDY
POWER ON light not illuminated	<ol style="list-style-type: none"> 1. Hi-limit tripped 2. Faulty light 3. Faulty cook/filter switch 4. Faulty Fuse 	<ol style="list-style-type: none"> 1. Reset or replace 2. Replace 3. Replace 4. Replace
Timer will not time	<ol style="list-style-type: none"> 1. Controller in program mode 2. Pressure regulating valve OPEN 3. Microswitch faulty or out of adjustment 	<ol style="list-style-type: none"> 1. Exit program mode 2. CLOSE 3. Replace or adjust
HEAT ON light not illuminated	<ol style="list-style-type: none"> 1. Controller in program mode 2. Faulty light or controller 3. Faulty temperature control 	<ol style="list-style-type: none"> 1. Exit program mode 2. Replace controller 3. Replace
Hi-limit will not reset	<ol style="list-style-type: none"> 1. Cooking oil temperature too high 2. Faulty hi-limit 	<ol style="list-style-type: none"> 1. Allow oil to cool approximately 100°F 2. Replace
Heating element(s) won't heat	<ol style="list-style-type: none"> 1. Controller in program mode 2. Faulty element(s) 3. Faulty contactor 	<ol style="list-style-type: none"> 1. Exit program mode 2. Replace 3. Replace
Cooking oil temperature too hot or too cold	<ol style="list-style-type: none"> 1. Controller in program mode 2. Check controller calibration 3. Faulty contactor (2400E) 4. Faulty controller 5. Faulty temperature sensor probe 6. Faulty gas valve (2400GH) 7. Faulty element(s) (2400E) 	<ol style="list-style-type: none"> 1. Exit program mode 2. See CALIBRATION 3. Replace 4. Replace 5. Replace 6. Replace 7. Replace

SOLID STATE CONTROLLER TIPS

COMPLAINT	CAUSE	REMEDY
Display reads FAIL	1. Faulty controller	1. Replace
Display reads HI	1. Faulty gas valve 2. Faulty controller	1. Replace 2. Replace
Display reads PROB	1. Wire polarity reversed 2. Faulty temperature sensor probe 3. Faulty controller	1. Rewire 2. Replace 3. Replace
Display reads CHEC	1. Gas valve OFF (2400GH) 2. Low gas pressure (2400GH) 3. Poor air/gas mix (2400GH) 4. Main burner not on (2400GH) 5. Pilot does not light (2400GH) 6. Loose gas valve wire harness (2400GH) 7. Faulty flame sensor (2400GH) 8. Faulty gas valve (2400GH) 9. Faulty contactor (2400E) 10. Faulty heating element(s) (2400E) 11. Open or faulty wall fuse (2400GH & 2400E)	1. Turn ON 2. Check pressure 3. Adjust air shutter 4. See GAS TIPS 5. See GAS TIPS 6. Replace 7. Replace 8. Replace 9. Replace 10. Replace 11. Replace

SMART TOUCH CONTROLLER TIPS

COMPLAINT	CAUSE	1800E REMEDY	1800GH REMEDY
Display reads HEATER FAULT	Oil temperature not rising properly	* Call for service	* Remove anything causing a draft by the unit (like a fan). * Turn on the gas valve. * Call for service
Display is blank	Screen not calibrated	* With unit off, place finger on screen and hold while turning unit on. Touch the small box in the upper left corner until it moves to the upper right corner, then touch it again until it moves to the lower left corner, then touch it again until it disappears. Controller will reboot. * Call for service	
Display doesn't respond when touched			
Display reads PROBE FAULT	* Probe circuit is open or shorted *Probe wires are connected in reverse *Temperature changes more than 100F in two seconds	* Call for service	* Call for service
Display reads HI TEMP FAULT	Temp reaches 415F	* Call for service	* Call for service
Display reads INTERNAL FAULT	Internal fault detected	* Call for service	* Call for service
Display reads C1 FAULT	C1 contactor is stuck in the closed position	* Call for service	* Call for service

GAS TIPS

COMPLAINT	CAUSE	REMEDY
Pilot burner won't light	<ol style="list-style-type: none"> 1. Gas valve OFF 2. Air in gas line 3. Gas shut-off valve OFF 4. Pilot burner flame too small 5. Gas pressure too high 	<ol style="list-style-type: none"> 1. Turn ON 2. Tighten 3. Replace 4. Adjust flame 5. Install pressure regulator
Main burner will not turn on	<ol style="list-style-type: none"> 1. Gas valve not ON 2. Controller in program mode 3. No electrical power to the gas valve 4. Faulty gas valve 5. Loose gas valve wire harness 6. Faulty flame sensor 7. Open or faulty wall fuse 	<ol style="list-style-type: none"> 1. Turn On 2. Exit program mode 3. Check circuit 4. Replace 5. Check connections 6. Replace 7. Check wall fuse or circuit-breaker

COVER, YOKE, AND SLIDE TIPS

COMPLAINT	CAUSE	REMEDY
Cover hard to CLOSE	<ol style="list-style-type: none"> 1. O-ring groove and O-ring dry or dirty 2. Hard O-ring 3. Teflon bearing out of adjustment or worn 4. Cover not centered 5. Lifter box dirty or dry 	<ol style="list-style-type: none"> 1. Clean and lubricate 2. Replace 3. Adjust or replace 4. Center 5. Clean and lubricate
Cover won't OPEN  Never use force to OPEN cover.	<ol style="list-style-type: none"> 1. O-ring groove and O-ring dry or dirty 2. Pressure not released 3. Pressure regulating valve out of adjustment 	<ol style="list-style-type: none"> 1. Clean and lubricate 2. OPEN pressure regulating valve 3. Adjust valve
Cover hard to move from front of the unit to the rear	<ol style="list-style-type: none"> 1. Yoke bearings and slide rod dirty 	<ol style="list-style-type: none"> 1. Clean
O-ring breaking  DO NOT rest basket on top flange of cooking well. Damage to area in contact with o-ring can cause leaking under pressure or O-ring failure.	<ol style="list-style-type: none"> 1. Dirty O-ring groove 2. Nicks in cooking well or cover 	<ol style="list-style-type: none"> 1. Clean 2. Remove nicks
Cover won't remain in raised position	<ol style="list-style-type: none"> 1. Weak gas spring 	<ol style="list-style-type: none"> 1. Replace

PRESSURE SYSTEM TIPS



DO NOT attempt to tighten, repair or replace any fitting, line or component when there is pressure in the cooking well. Hot oil could spray out under pressure causing serious burns.

COMPLAINT	CAUSE	REMEDY
No pressure	<ol style="list-style-type: none"> 1. Pressure regulating valve OPEN 2. Pressure regulating valve dirty or blocked open 3. Leaks around cover O-ring 4. Cover cold 5. Low cooking oil temperature 6. Faulty safety relief valve 7. Pressure valve out of adjustment 8. Faulty pressure gauge 	<ol style="list-style-type: none"> 1. CLOSE 2. Use repair kit 3. Replace O-ring and center cover 4. Pre-heat cover 5. Check programmed temperature 6. Replace 7. Adjust 8. Replace
Excess pressure	<ol style="list-style-type: none"> 1. Restriction in exhaust system 2. Overloaded with fresh product 3. Faulty pressure gauge 	<ol style="list-style-type: none"> 1. Locate, remove then clean 2. Decrease load 3. Replace

PRODUCT TIPS

Fresh Chicken

COMPLAINT	CAUSE	REMEDY
Product too light	<ol style="list-style-type: none">1. Low cooking oil temperature2. Wrong coating3. No coating4. Not done5. Food basket overloaded	<ol style="list-style-type: none">1. Check cook temperature2. Check procedures3. Check procedures4. Increase cook time5. Decrease product load
Product too dark	<ol style="list-style-type: none">1. High cooking oil temperature2. Product cooked too long3. Wrong coating4. Coated product held in refrigeration too long5. Dirty cooking oil	<ol style="list-style-type: none">1. Check cook temperature2. Decrease time3. Check procedures4. Rinse then recoat5. Filter or replace
Product not done	<ol style="list-style-type: none">1. Low cooking oil temperature2. Food basket overloaded3. Cook time too short4. Frozen product	<ol style="list-style-type: none">1. Check cook temperature2. Decrease product load3. Increase cook time4. Increase cook time
No flavor	<ol style="list-style-type: none">1. Improper marination	<ol style="list-style-type: none">1. Check procedures
White spots on product	<ol style="list-style-type: none">1. Product stuck together while loading2. Food basket overloaded	<ol style="list-style-type: none">1. Float food basket while loading2. Decrease load size
Dark spots on product	<ol style="list-style-type: none">1. Dirty oil	<ol style="list-style-type: none">1. Filter or replace

Frozen IQF Chicken:

COMPLAINT	CAUSE	REMEDY
Product too light	<ol style="list-style-type: none"> 1. Low oil temperature 2. Not done 3. Food basket overloaded 	<ol style="list-style-type: none"> 1. Check cook temperature 2. Increase cook time 3. Decrease load
Product too dark	<ol style="list-style-type: none"> 1. High oil temperature 2. Overcooked 3. Oil old 4. Thawed and refrozen 	<ol style="list-style-type: none"> 1. Check cook temperature 2. Decrease cook time 3. Change oil 4. Keep product at 0°F or below
Product not done	<ol style="list-style-type: none"> 1. Low oil temperature 2. Food basket overloaded 3. Cook time too short 	<ol style="list-style-type: none"> 1. Check cook temperature 2. Decrease load 3. Increase cook time
No flavor	<ol style="list-style-type: none"> 1. Overcooked 2. Old product 	<ol style="list-style-type: none"> 1. Check cook time 2. Discard
White spots	<ol style="list-style-type: none"> 1. Product stuck together 2. Food basket overloaded 	<ol style="list-style-type: none"> 1. Float basket while loading 2. Decrease load size
Dark spots	<ol style="list-style-type: none"> 1. Dirty oil 	<ol style="list-style-type: none"> 1. Filter or replace

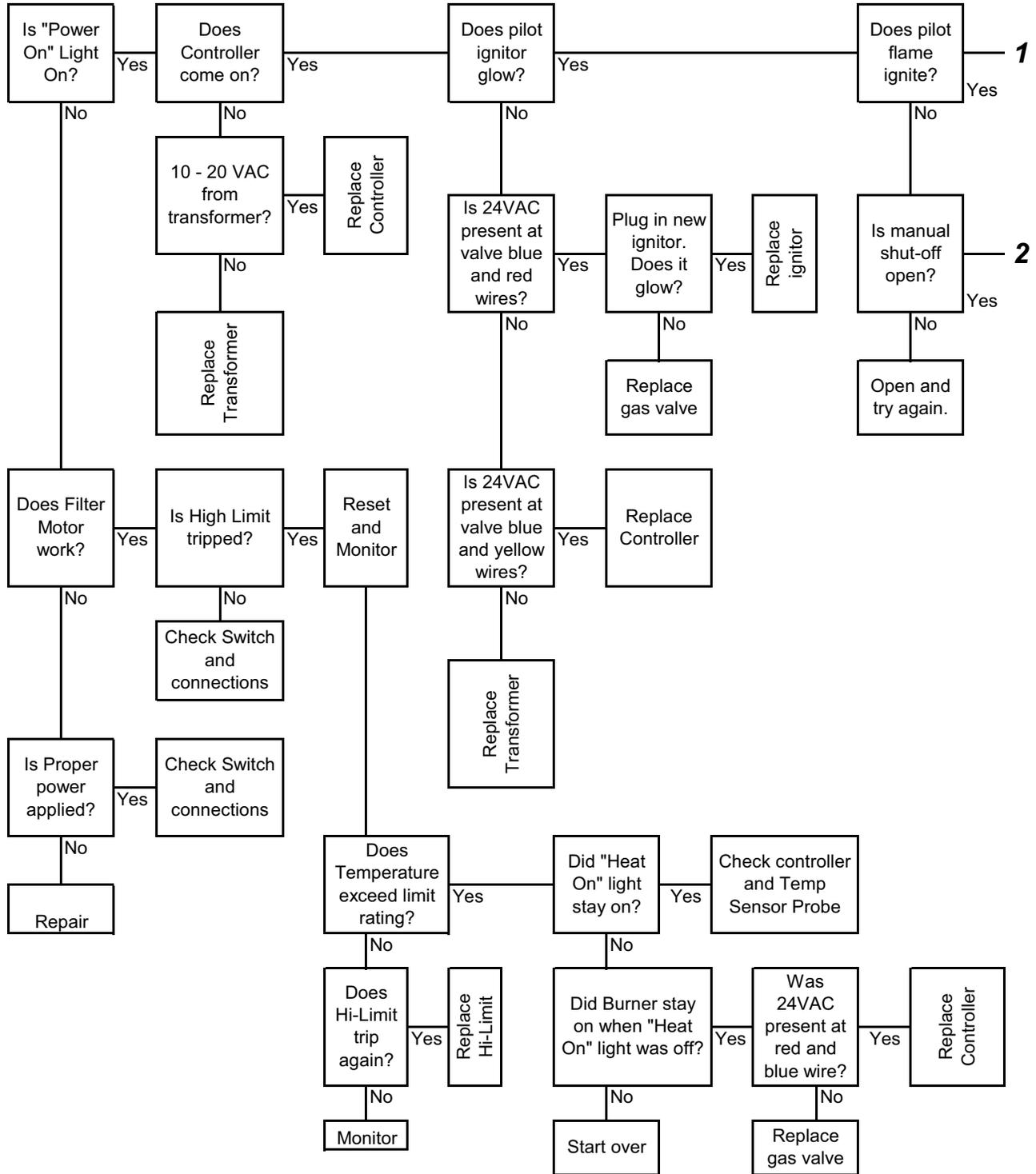
FILTERING TIPS

COMPLAINT	CAUSE	REMEDY
<p>Motor will not start</p> <p>⚠ WARNING Turn cook/filter switch to OFF position to avoid splashing of oil when motor protector reset button is pushed.</p>	<ol style="list-style-type: none"> 1. Overload tripped 2. Cook/filter switch OFF 3. Open or faulty wall fuse or circuit breaker 	<ol style="list-style-type: none"> 1. Wait for overload to cool. Push red motor protector reset button located on rear of motor. 2. Turn to FILTER 3. Check wall fuse or circuit breaker
<p>Motor hums but will not start</p>	<ol style="list-style-type: none"> 1. Solidified shortening in pump 2. Crumbs in pump 3. Faulty motor 	<ol style="list-style-type: none"> 1. Turn cook/filter switch OFF. Clean pump. 2. Turn cook/filter switch OFF. Clean pump. 3. Replace motor.
<p>Motor starts but will not pump</p>	<ol style="list-style-type: none"> 1. Filter pan not completely installed 2. O-ring on riser line not installed 3. Solidified shortening in piping or filter pan 	<ol style="list-style-type: none"> 1. Firmly push filter pan in 2. See FILTERING 3. Turn cook/filter switch OFF. Contact service person.
<p>Motor starts but will not pump or stops at any level</p>	<ol style="list-style-type: none"> 1. Filter paper or hold down improperly installed 2. Not using enough Broaster filtering compound 	<ol style="list-style-type: none"> 1. See COOKING OIL CARE AND FILTERING 2. Next filtering cycle, make sure proper amount of Broaster filtering compound is used
<p>Motor starts but stops pumping when oil is level with top of hold down, approximately 1 inch of oil in bottom</p>	<ol style="list-style-type: none"> 1. Filter paper improperly installed or crumbs under filter paper or hold down 	<ol style="list-style-type: none"> 1. See COOKING OIL CARE AND FILTERING

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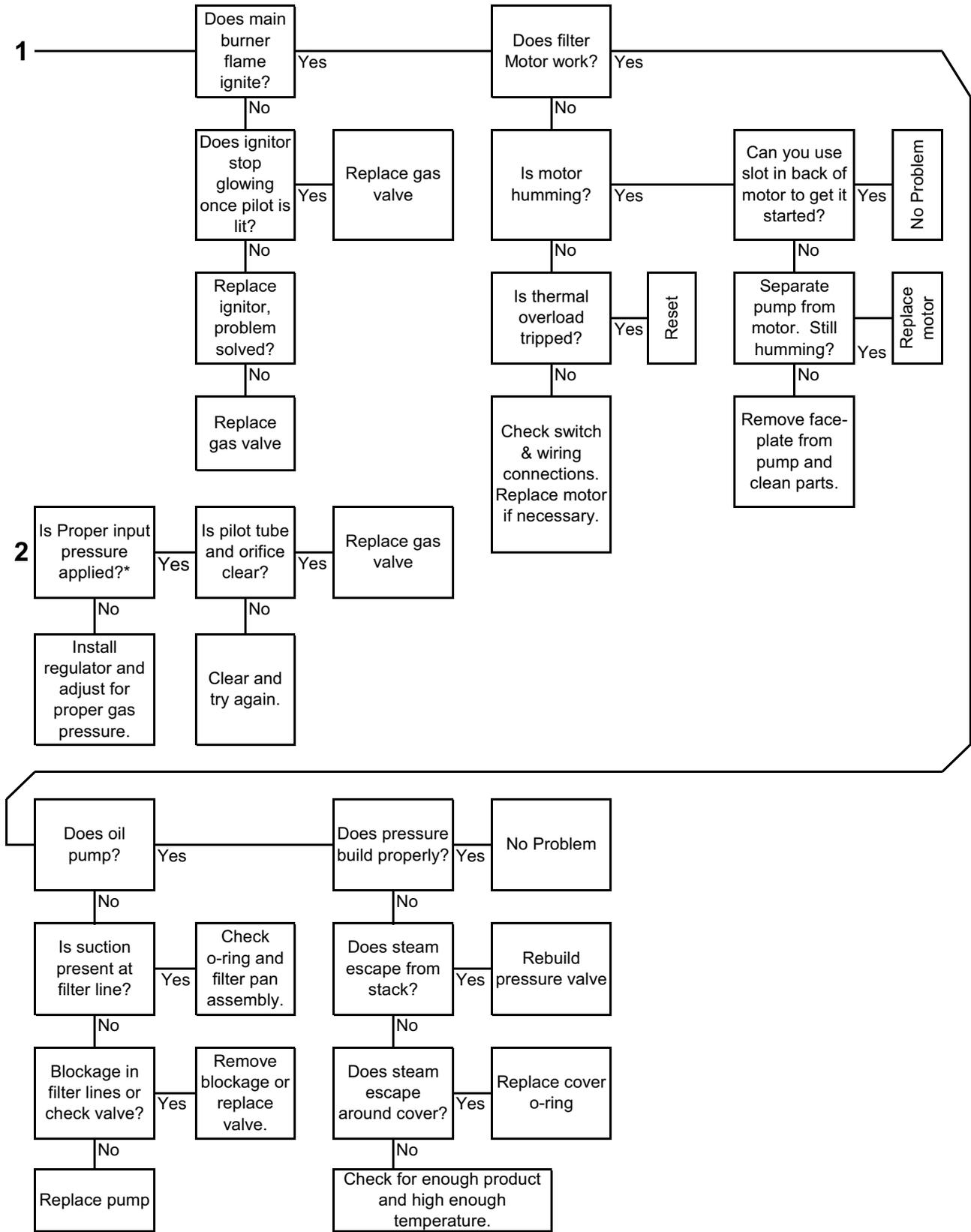
2400GH Troubleshooting Flow Chart Sheet 1



Controller Alarms

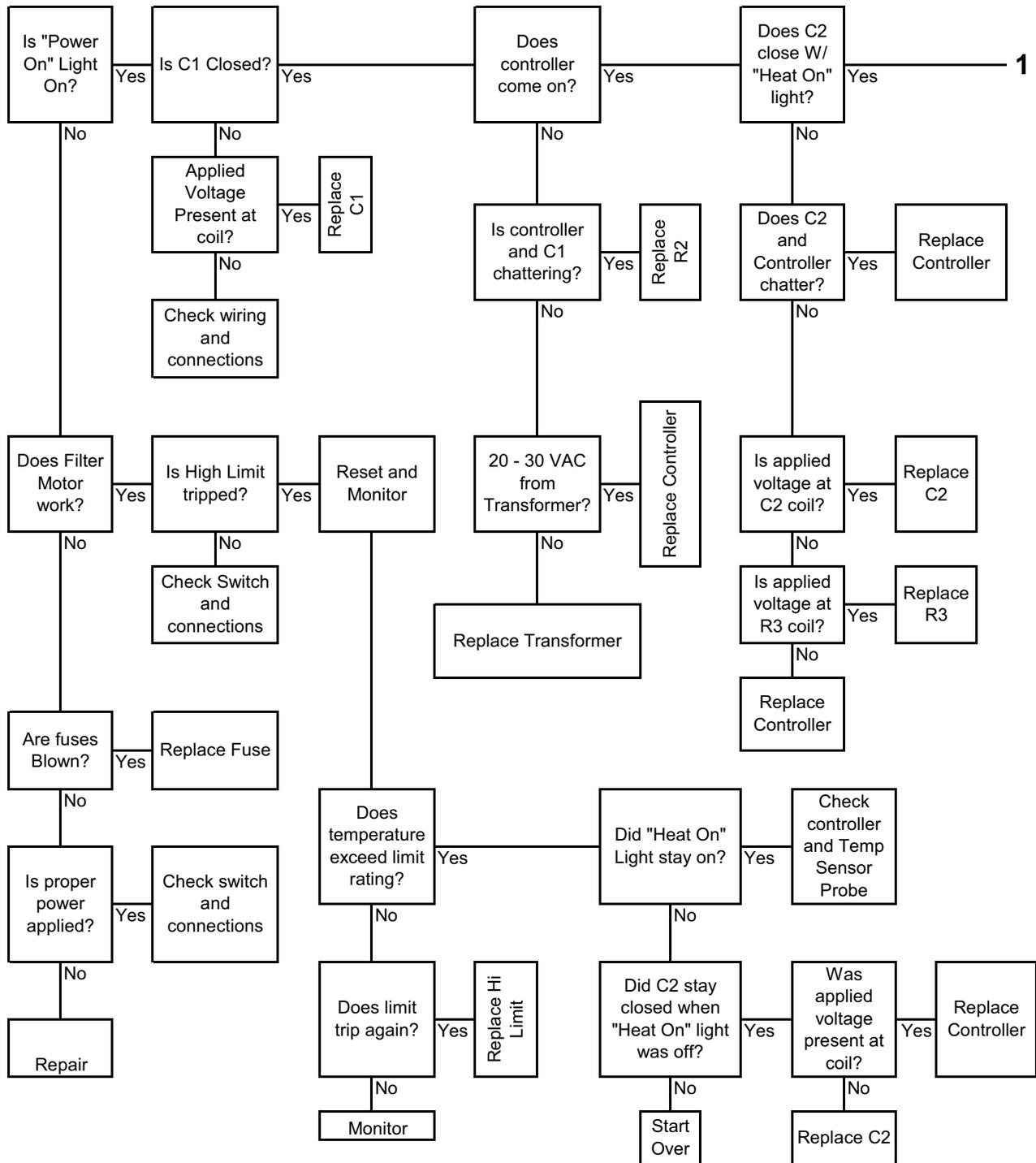
- HI:** Temperature exceeded 415 degrees. Check actual temperature, controller, gas valve.
- CHEC:** Temperature didn't rise 6 degrees in 3 minutes. Check controller, gas valve, wiring and connections.
- PROB:** Problem with temperature sensing. Check controller, probe, speaker.
- FAIL:** Internal fault detected or temperature fluctuation. Check controller or probe.

2400GH Troubleshooting Flow Chart Sheet 2



*Proper input gas pressure is below 7"WC for Natural Gas and below 14"WC for LP

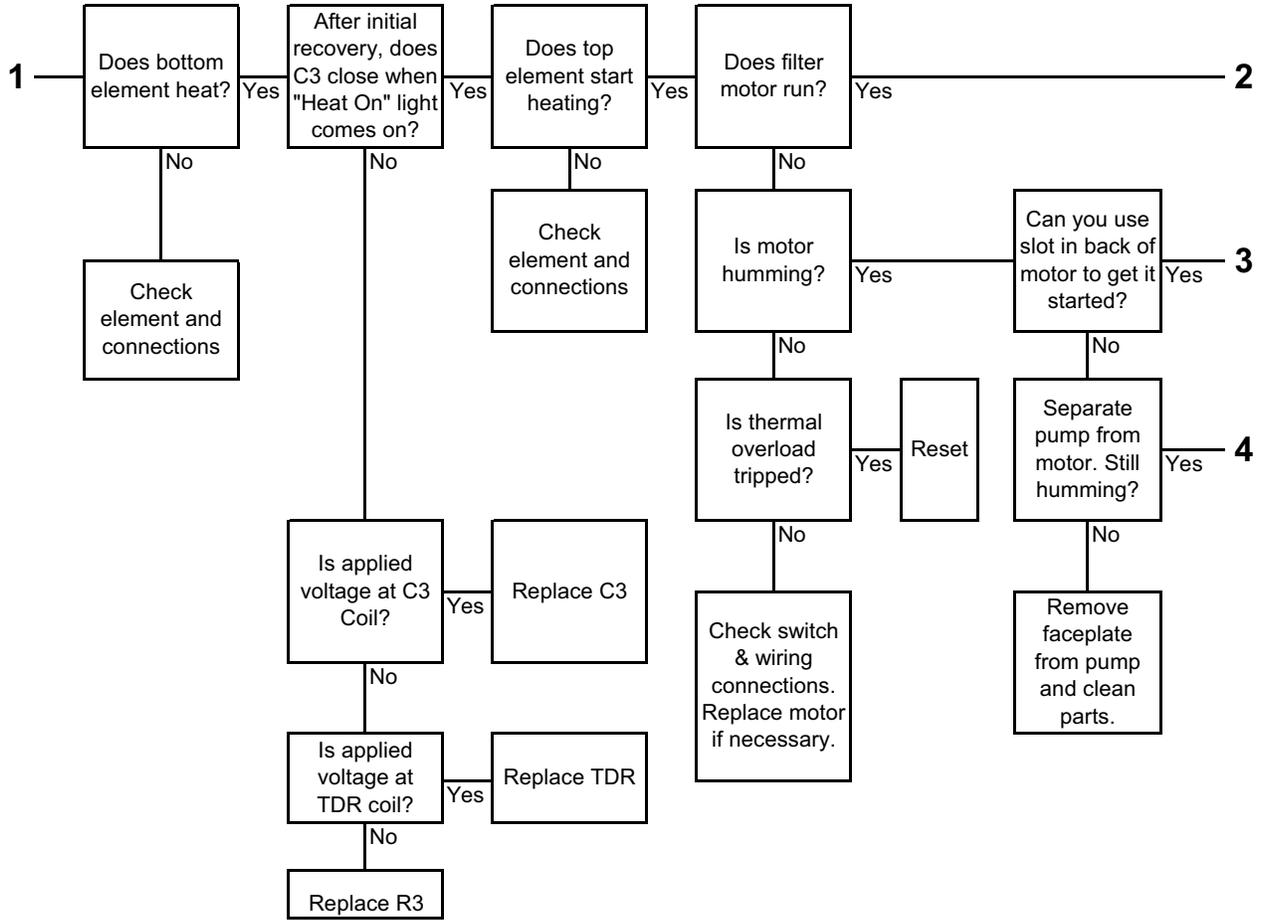
2400E Troubleshooting Flow Chart Sheet 1



Controller Alarms

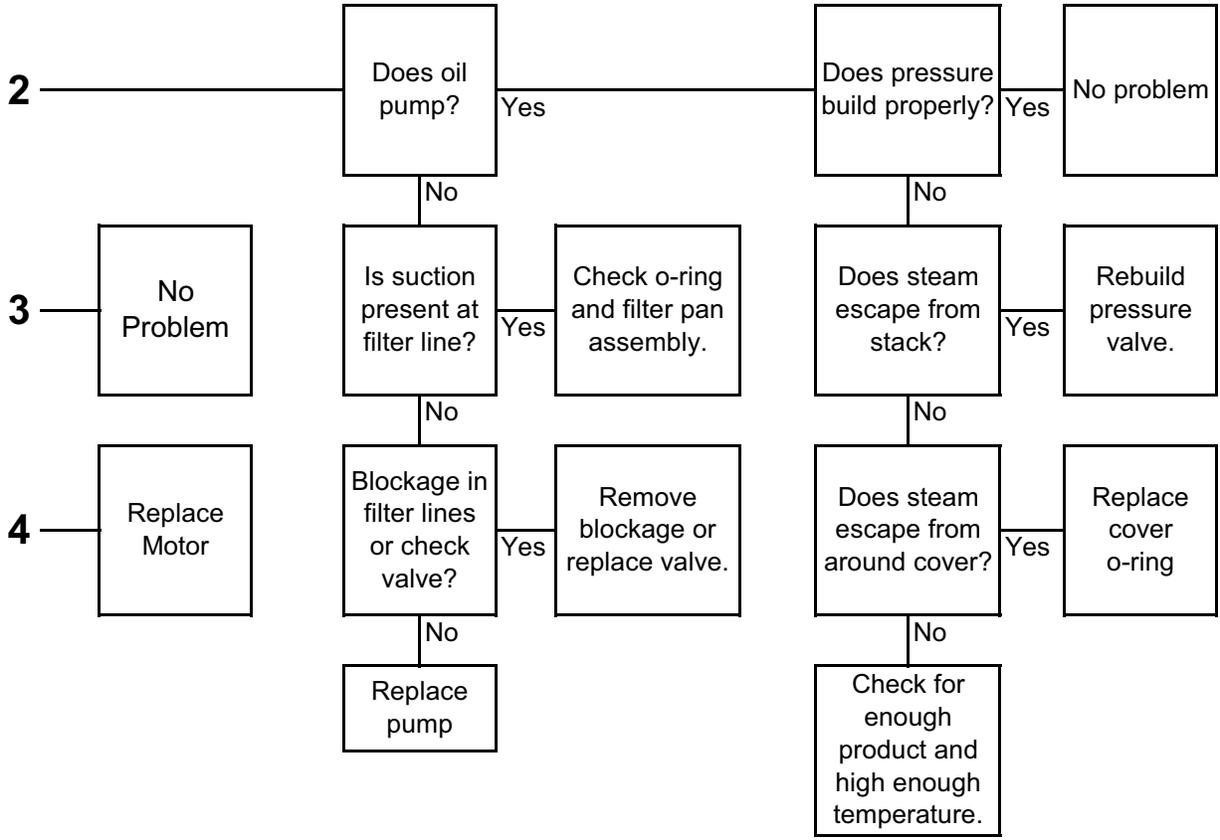
- HI:** Temperature exceeded 415 degrees. Check actual temperature, controller, C2.
- CHEC:** Temperature didn't rise 6 degrees in 3 minutes. Check controller, C2, wiring and connections.
- PROB:** Problem with temperature sensing. Check controller, probe, speaker.
- FAIL:** Internal fault detected or temperature fluctuation. Check controller or probe.

2400E Troubleshooting Flow Chart Sheet 2



Continued on next page

2400E Troubleshooting Flow Chart Sheet 3



SERVICE NOTES

SERVICE NOTES

SERVICE NOTES



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