SERVICE MANUAL

VHG Quick Fryer Series

VHG A SERIES
VHG C SERIES
VHG D SERIES

- NOTICE -

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

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

A Product of Vulcan
3600 North Point Blvd Baltimore, MD 21222
F45818 Rev. A (0526)

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SERVICE UPDATES

May 2026

- Restructured to current standard.
- Updated SPECIFICATIONS BEFORE SN 65026221.
- Updated COMPONENT FUNCTION - KLEENSCREEN FILTER CONTROLS - BEFORE SN 65026221.
- Updated SCHEMATICS.
- Updated WIRING DIAGRAMS.
- Updated A - CONTROL.
- Updated C & D CONTROL PIN-OUTS.
- Merged and updated COMPONENT LOCATION & FUNCTION - BEFORE SN 65026221.
- Merged and updated INSTALLATION and OPERATOR
- Added COMPONENT LAYOUT & FUNCTION - KLEENSCREEN FILTER CONTROLS - STARTING SN 65026221.
- Added COMPONENT LOCATION & FUNCTION (1VHG50AF / 75AF QUICKFRY) - STARTING SN 65026221.
- Added COMPONENT LOCATION & FUNCTION (1VHG50CF / 75CF QUICKFRY) - STARTING SN 65026221.
- Added COMPONENT LOCATION & FUNCTION (1VHG50DF / 75DF QUICKFRY) - STARTING SN 65026221.
- Added POWER SUPPLY BOX - STARTING SN 65026221.
- Added SPECIFICATIONS STARTING SN 65026221.
- Added GAS COMBINATION VALVE - STARTING SN 65026221.
- Added SIDE PANELS - STARTING SN 65026221.
- Added HEAT SHIELD - STARTING SN 65026221.
- Added CONTROL PANEL INTERFACE BOARD - STARTING SN 65026221.
- Added BULLNOSE / CONTROL PANEL BOX - STARTING SN 65026221 .
- Added TEMPERATURE PROBE - STARTING SN 65026221 .
- Added OIL RETURN SOLENOID - STARTING SN 65026221.
- Added POWER SUPPLY BOX - STARTING SN 65026221.
- Added ANALOG CONTROL BOARD - STARTING SN 65026221.
- Added BURNER - STARTING SN 65026221.
- Added C & D CONTROL PANEL / COVER - STARTING SN 65026221.
- Added ERROR CODES.
- Added KLEENSCREEN FILTERING SYSTEM.
- Added PUMP / MOTOR ASSEMBLY - STARTING SN 65026221.
- Added ELECTRICAL CONNECTIONS - STARTING SN 65026221.
- Added BURNER ORIFICE - STARTING SN 65026221 .
- Added POWER SWITCH / DISCARD HOSE SWITCH - STARTING SN 65026221.
- Added HIGH LIMIT - STARTING SN 65026221.

- Added PILOT ASSEMBLY - STARTING SN 65026221.
- Added FLAME SENSE WIRE - STARTING SN 65026221.
- Added TRANSFORMER - STARTING SN 65026221.
- Added IGNITION MODULE - STARTING SN 65026221.
- Added PUMP AND OIL RETURN SOLENOID RELAYS - STARTING SN 65026221.
- Added DRAIN VALVE - STARTING SN 65026221.
- Added DRAIN VALVE INTERLOCK SWITCH (D.V.I.) - STARTING SN 65026221.
- Added FRY TANK - STARTING SN 65026221.

INTRODUCTION

This service manual covers the specific service information related to the VHG series gas fryers that come equipped with solid state analog (A), solid state digital (D) or programmable computer (C) controls. This manual covers single floor model fryers, battery fryers as well as fryers with the KleenScreen PLUS® Filtration System.

KLEENSCREEN PLUS FILTRATION SYSTEM: (KSP) - BEFORE SN 65026221

The KleenScreen PLUS® filtration system is integrated into the VHG Series fryer battery. The filter screen is housed in a pullout drawer assembly at the base of the fryer. The filtering components in the drawer include a stainless-steel filter tank, a stainless steel mesh filter screen with a stainless-steel insert, a suction tube and double handle nut and mechanical seal to close the assembly. In addition, the KSP has the availability of an optional filtering system; a microfiltration fabric envelope (3), a dedicated stainless steel insert and stainless-steel clip that holds the assembly together. With the filter drawer closed, a self-sealing oil return line provides the path to return the filtered oil back into the fry tank.

This system is designed to provide a thorough and easy method to filter the oil. Some of the benefits include:

- Self-contained system eliminating the use of external filter equipment
- Paperless filtering system.
- Easy to clean and low maintenance.
- Extends the life of the oil.

KSP fryer batteries are standard in single and up to a maximum of a four-fryer battery in most cases. Batteries are made up of only fryers, no warming stations.

KLEENSCREEN PLUS FILTRATION SYSTEM: (KSP) - STARTING SN 65026221

The KleenScreen *PLUS*® filtration system is integrated into the VHG Series fryer battery. The filter is housed in a pullout drawer assembly at the base of the fryer. The filtering components in the drawer include a stainless steel filter tank, a stainless steel mesh filter screen with a stainless steel insert, a suction tube and a knurled knob that holds the assembly together. In addition, the KSP has a second filtering system option; a microfiltration fabric envelope (3), a dedicated stainless steel insert and stainless steel clip that holds the assembly together. With the filter drawer closed, a self-sealing oil return line provides the path to return the filtered oil back into the fry tank.

This system is designed to provide a thorough and easy method to filter the oil. Some of the benefits include:

- Self-contained system eliminating the use of external filter equipment.
- Paperless filtering system.
- Easy to clean and low maintenance.
- Extends the life of the oil.

KSP fryer batteries can be in a single and up to a maximum of a four fryer battery in most cases. Batteries are made up of only fryers, no warming stations.

INSTALLATION and OPERATOR

Refer to Instruction Manual for detailed installation instructions.

- VHG-A Series Gas Fryers Intallation and Operator Manual
- VHG-C and D Series Gas Fryers Intallation and Operator Manual

CLEANING

Refer to the Instruction Manual for specific cleaning instructions.

- VHG A Series Gas Fryers Installation and Operator Manual
- VHG C and D Series Gas Fryers Installation and Operator Manual

TOOLS

Standard

- Standard set of hand tools.
- Metric set of hand tools.
- VOM with measuring micro amp current tester. Any VOM with minimum of CAT III 600V, CE certified. Sensitivity of at least 20,000 ohms per volt can be used. In addition, meter leads must also be a minimum of CAT III 600V.
- Clamp on type amp meter with minimum of NFPA-70E CAT III 600V, UL/CSA/TUV listed.

Special

- Temperature tester (thermocouple type).
- Manometer.
- Burndy pin extraction tool RX2025 GE1; Newark Electronics Catalog Number 16F6666. Used for removing pin terminals on Burndy connectors.
- Thumb drive (part number 00-443444) or acquire locally.
- RECTORSEAL 5® or equivalent NSF rated thread sealant.

NOTE: Menu Editor software will be available for download on the Vulcan website. Output from this software is compatible with the new VHG C-control.

- Extended needle test probes for multimeter leads.

SPECIFICATIONS BEFORE SN 65026221

GAS TYPE	OPERATING PRESSURE	RECOMENDED SUPPLY PRESSURE (MAXIMUM) Note: Building supply pressure max ½ psi. (14" W.C.)	SERVICE CONNECTION	ELECTRICAL
Natural	3.5" W. C.	7" W.C. **NOTE:** Not to exceed 14" W. C.	1⁄2" (13 mm) ID and 3⁄4" (19 mm) OD rear gas connection for single units and 1-1/4"(31.75mm) for battery units.	120V Unit Only: NEMA 5-15P 120 Volt cord & plug supplied with fryers.120V unit only. **NOTE:** 240V unit not shipped with plug and cord.
Propane	10.0" W. C.	11" W.C. **NOTE:** Not to exceed 14" W. C.		
NOTE: If building pressure exceeds 14"WC, an external regulator needs to be installed by customer.				

Refer to Specification Sheets

- ***1VHG50 SERIES SPECIFICATIONS***
- ***1VHG75 SERIES SPECIFICATIONS***

SPECIFICATIONS STARTING SN 65026221

GAS TYPE	OPERATING (MANIFOLD) PRESSURE	RECOMMENDED SUPPLY PRESSURE Note: Recommended supply pressure max ½ psi. (14" W.C.)	SERVICE CONNECTION	ELECTRICAL
Natural	3.5" W. C.	7-9" W.C. **NOTE:** Not to exceed 14" W. C.	Gas supply line must be at least equivalent ½" (12.7 mm) iron pipe for single units and 1-1/4" (31.75 mm) for batteries. If using optional quick-disconnect flex hose, ¾" (19 mm) iron pipe for single units and 1-1/4" (31.75 cm) iron pipe for batteries.	120V unit only: NEMA 5-15P 120V cord & plug supplied with fryers.
Propane	10.0" W. C.	11-12" W.C. **NOTE:** Not to exceed 14" W. C.		
NOTE: If building pressure exceeds 14"WC, an external regulator needs to be installed by customer.				

Refer to Specification Sheets

- **1VHG50** SERIES SPECIFICATIONS
  - ***1VHG50 - BEFORE SN 65026221***
  - *1VHG50 - STARTING SN 65026221*
- **1VHG50F** SERIES SPECIFICATIONS
  - *1VHG50F - STARTING SN 65026221*
- **1VHG70** SERIES SPECIFICATIONS
  - *1VHG70 - STARTING SN 65026221*
- **1VHG70F** SERIES SPECIFICATIONS
  - *1VHG70F - STARTING SN 65026221*
- **1VHG75** SERIES SPECIFICATIONS
  - ***1VHG75 - BEFORE SN 65026221***
- **2VHG50F**, **3VHG50F**, **4VHG50F** SERIES SPECIFICATIONS
  - *2VHG50F, 3VHG50F, 4VHG50F - STARTING SN 65026221*
- **2VHG70F**, **3VHG70F**, **4VHG70F** SERIES SPECIFICATIONS
  - *2VHG70F, 3VHG70F, 4VHG70F - STARTING SN 65026221*

2. REMOVAL AND REPLACEMENT OF PARTS

SIDE PANELS - BEFORE SN 65026221

⚠ WARNING

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

1. Remove mounting screws (1, Fig. 1).

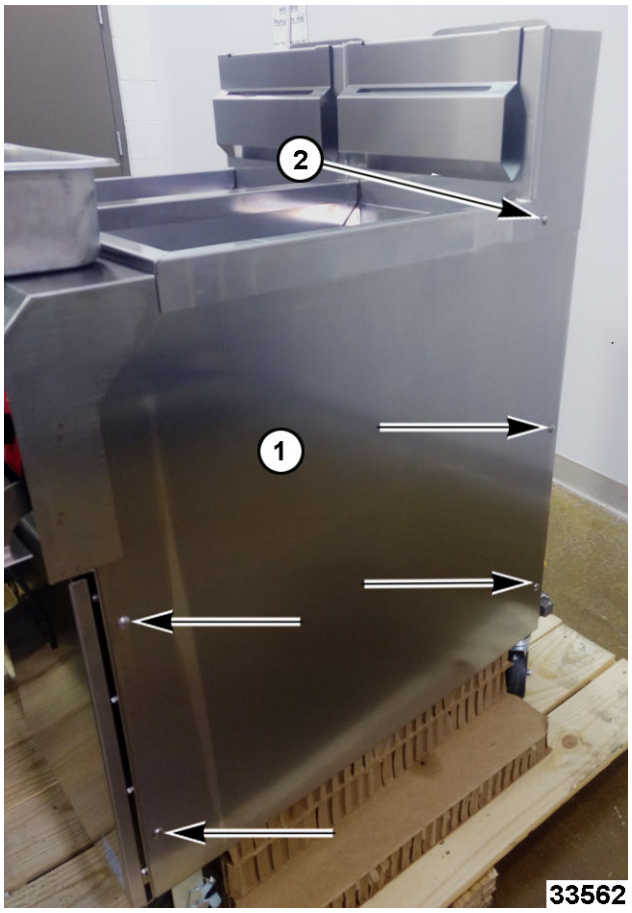


Fig. 1

2. Loosen flue screw (2, Fig. 1) while carefully holding side panel.
3. Position panel under bullnose and tank side lip.
4. Install screws (1, Fig. 1).
5. Retighten flue screw (2, Fig. 1).

SIDE PANELS - STARTING SN 65026221

⚠ WARNING

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

NOTE: Same procedure for left and right panel.

1. Remove panel bottom screws.

Fig. 2

2. Slide panel down and out to remove.
3. Reverse steps to install.

C & D CONTROL PANEL / COVER - BEFORE SN 65026221

⚠ WARNING

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

1. Remove control panel mounting screws.

Fig. 3

2. Interface control board replacement.
   A. Document and disconnect wiring from interface board.

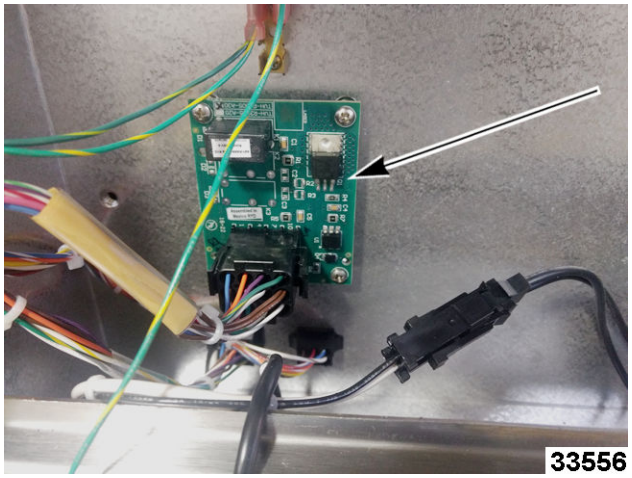


Fig. 4

   B. If replacing interface board, remove mounting screws and replace.
   C. Reverse procedure.
   D. Verify operation.
3. Remove control mount plate.

NOTE: Control mount plate only needs removed if replacing the bullnose.

   A. Screws on both sides (Fig. 5).
   B. Allen screws underneath (Fig. 6).

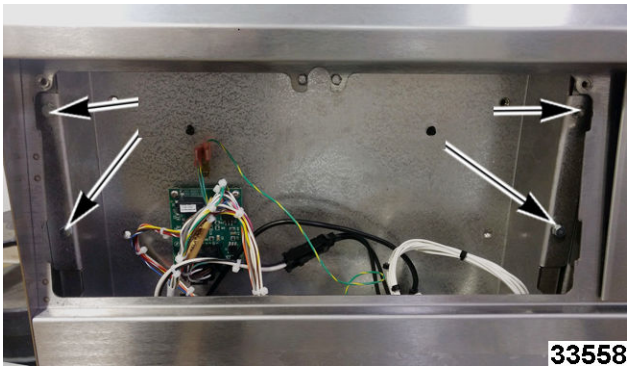


Fig. 5

Fig. 6

NOTE: Connections on back of control mount plate are connectors for USB (1, Fig. 7), and C-control connector harness (2, Fig. 7).

Fig. 7

NOTICE

D-control has two additional connectors, input and output. Verify these connections for misalignment of pins after installing, carefully fix a pin if it gets bend over. A replacement controller will need to be set to the fryer's matching service control parameters before operating. Refer to: VHG A CONTROL SERVICE PROGRAMMING, VHG C CONTROL SERVICE PROGRAMMING and VHG D CONTROL SERVICE PROGRAMMING.

4. Reverse procedure to install.

C & D CONTROL PANEL / COVER - STARTING SN 65026221

⚠ WARNING

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

1. Remove control panel mounting screws.

Fig. 8 C Controller

2. Pull out control panel / cover.

NOTE: D-control has four connectors, two of which are labeled input and output. Verify these connections for misalignment of pins after installing, carefully fix a pin if it gets bent over. A replacement controller will need to be set to the fryer's matching service control parameters before operating. Refer to: VHG C CONTROL SERVICE PROGRAMMING or VHG D CONTROL SERVICE PROGRAMMING.

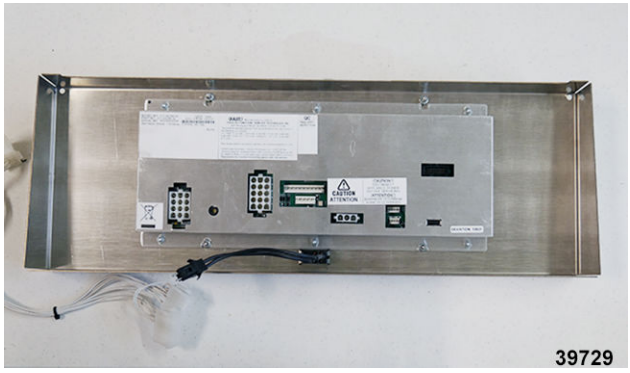


Fig. 9 C Controller

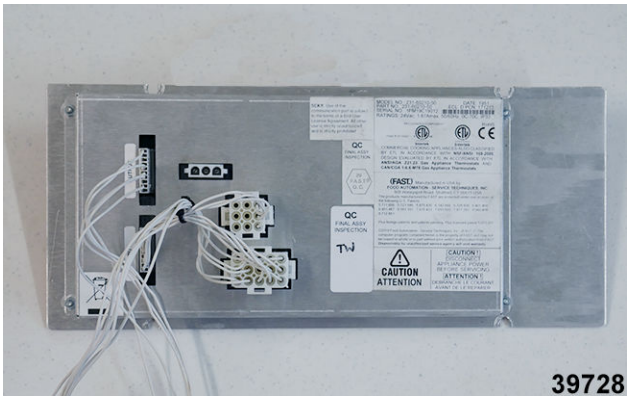


Fig. 10 D Controller

3. If replacing controller document and disconnect wiring harnesses and remove controller from mounting bracket.
4. Reverse procedure for installation.
5. Turn on power supply.
6. Verify operation.

CONTROL PANEL INTERFACE BOARD - BEFORE SN 65026221

⚠ WARNING

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

1. Remove C & D CONTROL PANEL / COVER.
2. Disconnect interface board wire harness plug (1, Fig. 11).

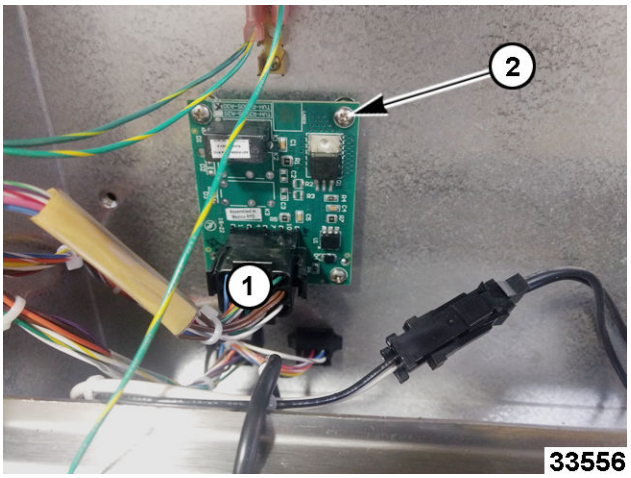


Fig. 11

3. Remove interface board mounting screws (2, Fig. 11).

4. Reverse procedure to install.
5. Verify operation.

CONTROL PANEL INTERFACE BOARD - STARTING SN 65026221

⚠ WARNING

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

1. Remove C & D CONTROL PANEL / COVER - STARTING SN 65026221.
2. Disconnect ground wires (1, Fig. 12).

NOTE: Interface board location may be on right hand side for certain A-control variants.

3. Disconnect interface board wire harness plug (2, Fig. 12).
4. Remove interface board mounting screws (3, Fig. 12).

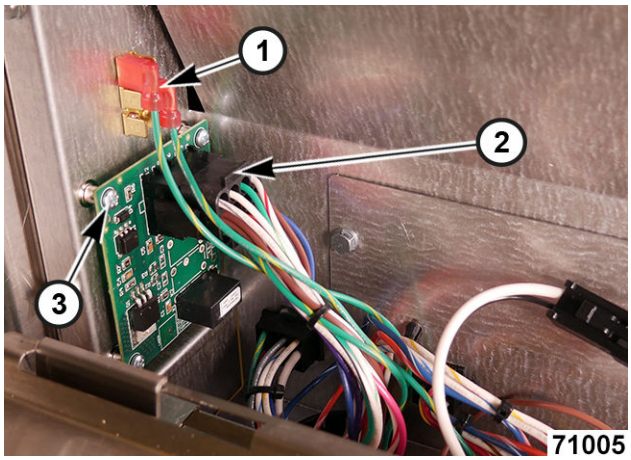


Fig. 12

5. Reverse procedure to install.
6. Turn on power supply.
7. Verify operation.

HEAT SHIELD - STARTING SN 65026221

⚠ WARNING

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

1. Open fryer door.
2. Remove LEFT SIDE PANEL.
3. Remove C & D CONTROL PANEL / COVER.
4. Remove BULLNOSE & CONTROL PANEL MOUNT.
5. Unclip wiring harnesses from rear of heat shield (Fig. 13).

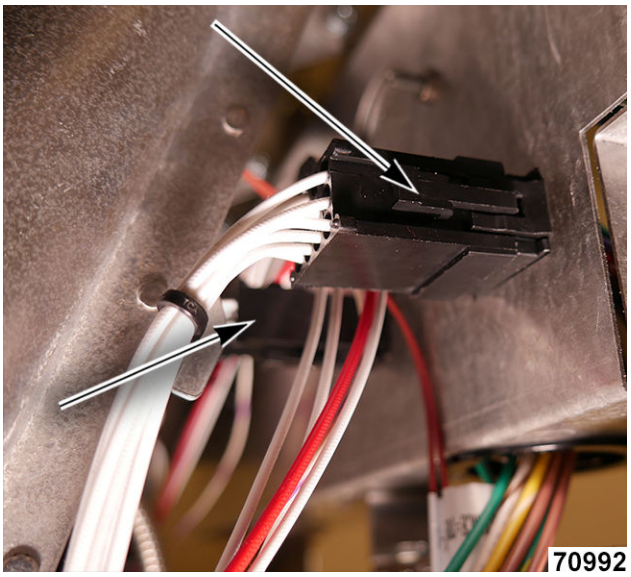


Fig. 13

6. Document and disconnect wiring harnesses from rear of heat shield.
7. Remove heat shield bolts (Fig. 14).

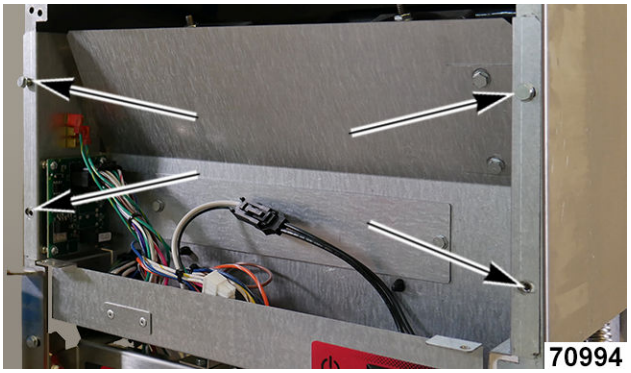


Fig. 14

8. Pull out heat shield.
   i. Pull right side out first.
   ii. Slide toward right to fully remove.
9. Install heat shield replacement.

NOTE: Transfer control panel interface board to replacement heat shield.

10. Align holes and install heat shield bolts Fig. 14.

11. Connect wiring harnesses to rear of heat shield (Fig. 13).
12. Attach wiring harness to clip rear of heat shield.
13. Install BULLNOSE & CONTROL PANEL MOUNT.
14. Install C & D CONTROL PANEL / COVER.
15. Install LEFT SIDE PANEL.
16. Verify operation.

ANALOG CONTROL BOARD - BEFORE SN 65026221

⚠ WARNING

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

1. Open access door (1, Fig. 15) to analog control board.

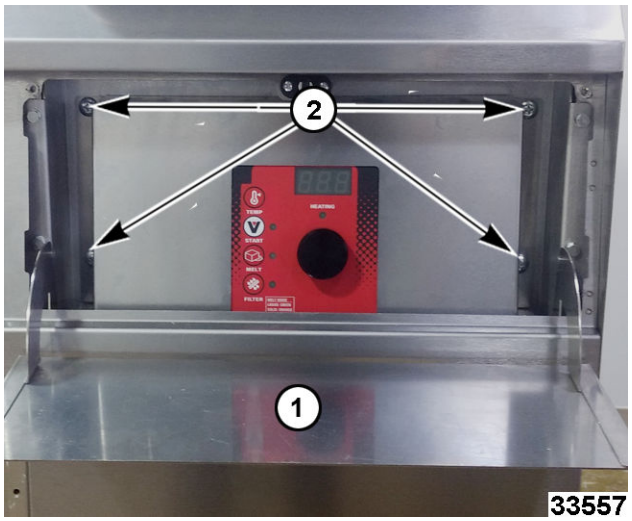


Fig. 15

2. Remove control panel mount screws (2, Fig. 15).
3. Note and disconnect wire connections (Fig. 16) from back of control board.

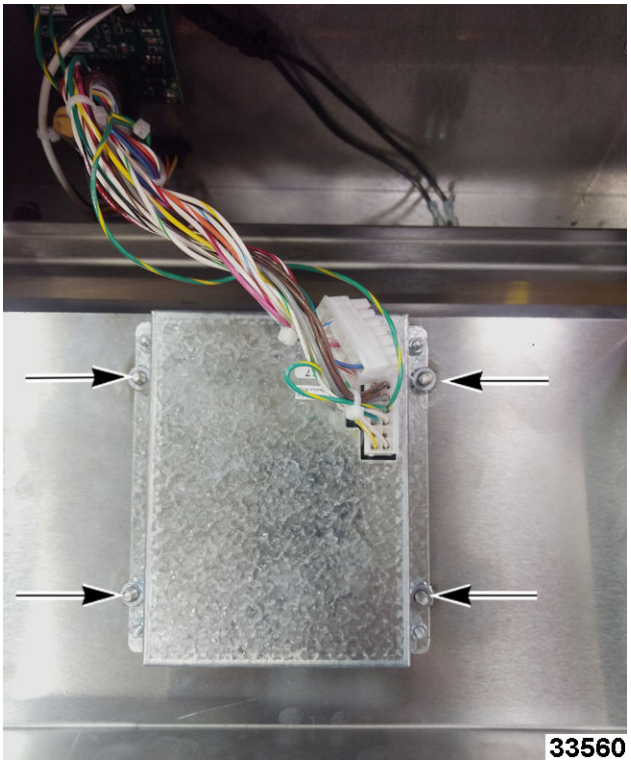


Fig. 16

4. Remove analog control board mounting nuts (Fig. 16).
5. Set replacement controller to fryer's matching service control parameters before operating. Refer to: VHG A CONTROL SERVICE PROGRAMMING, VHG C CONTROL SERVICE PROGRAMMING and VHG D CONTROL SERVICE PROGRAMMING.
6. Reverse procedure to install.

ANALOG CONTROL BOARD - STARTING SN 65026221

⚠ WARNING

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

1. Open fryer door.
2. Locate analog control board (Fig. 17).

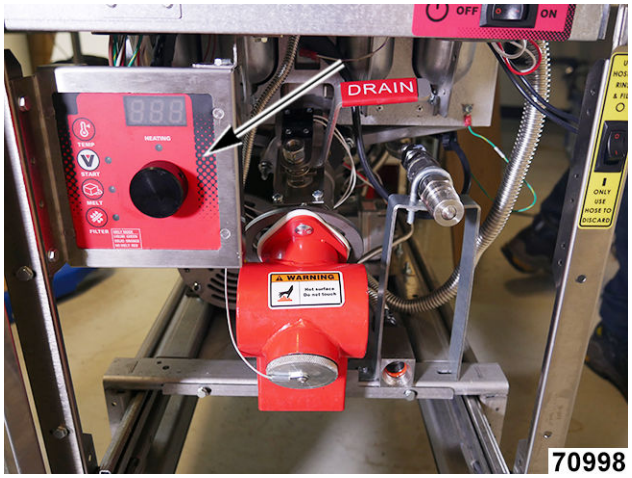


Fig. 17

3. Remove LEFT SIDE PANEL.
4. Disconnect and unclip wiring harness from control panel.

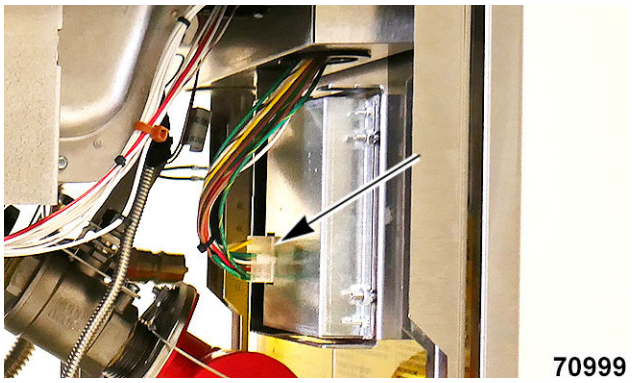


Fig. 18

5. Remove frame bolts.

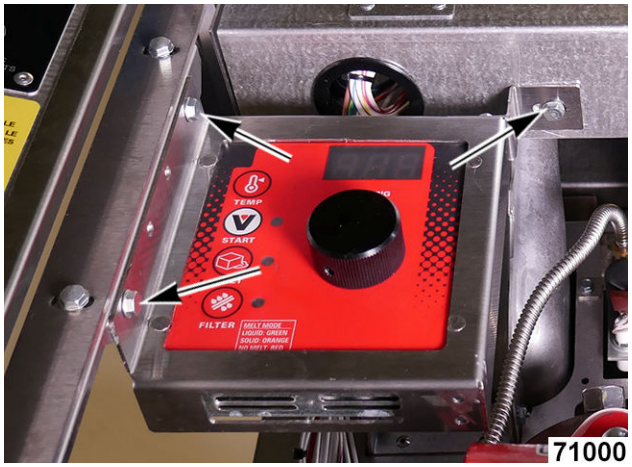


Fig. 19

6. Pull out control unit.
7. Remove mounting hardware back of control unit.

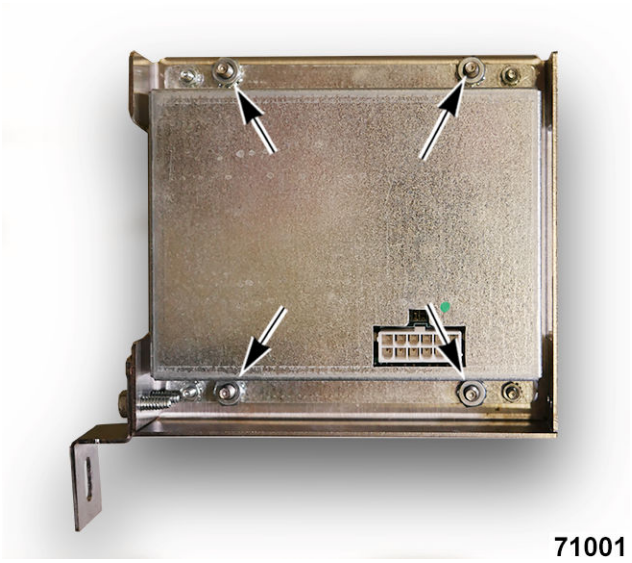


Fig. 20

8. Reverse removal procedure to install replacement.
9. Set replacement controller to fryer's matching service control parameters before operating. Refer to:
   VHG A CONTROL SERVICE PROGRAMMING,
   VHG C CONTROL SERVICE PROGRAMMING
   and
   VHG D CONTROL SERVICE PROGRAMMING.
10. Verify operation.

BURNER - BEFORE SN 65026221

⚠ WARNING

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

⚠ WARNING

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

1. Remove BULLNOSE.
2. Remove flame sense wire (1, Fig. 21).

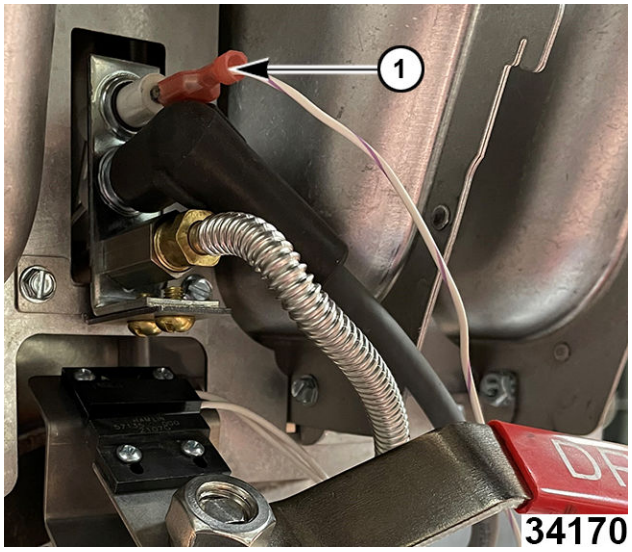


Fig. 21

3. Unplug igniter cable.
4. Disconnect gas line.

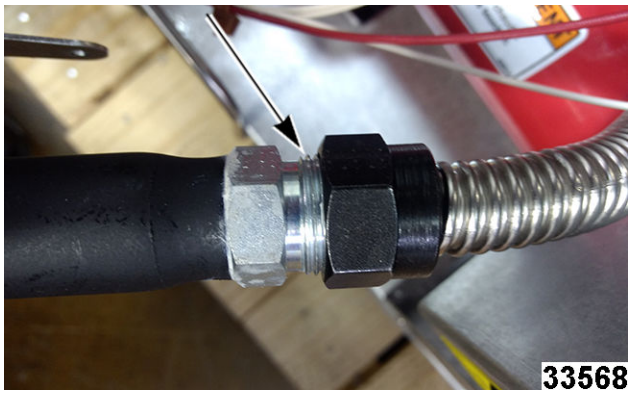


Fig. 22

5. Remove burner mounting nuts from tank welded stud.

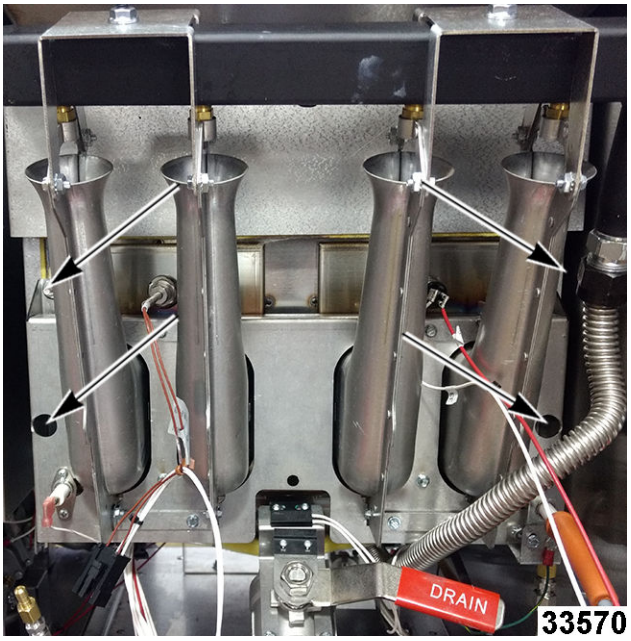


Fig. 23

6. Remove burners and manifold from front of tank as one assembly. Pull away from tank face and off studs that are welded to tank.
7. Remove burners bracket mounting nuts on top and bottom to remove burners from brackets.

TOP NUTS

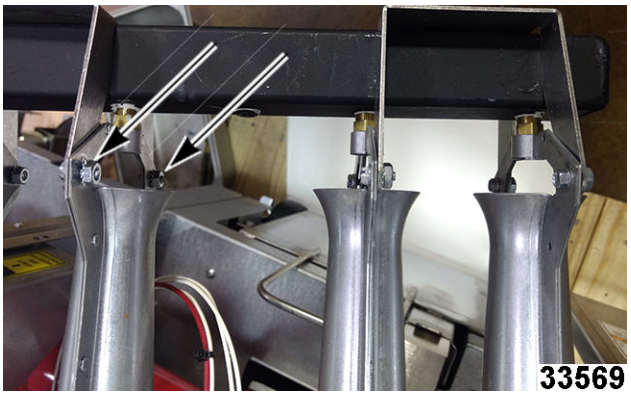


Fig. 24

BOTTOM NUTS

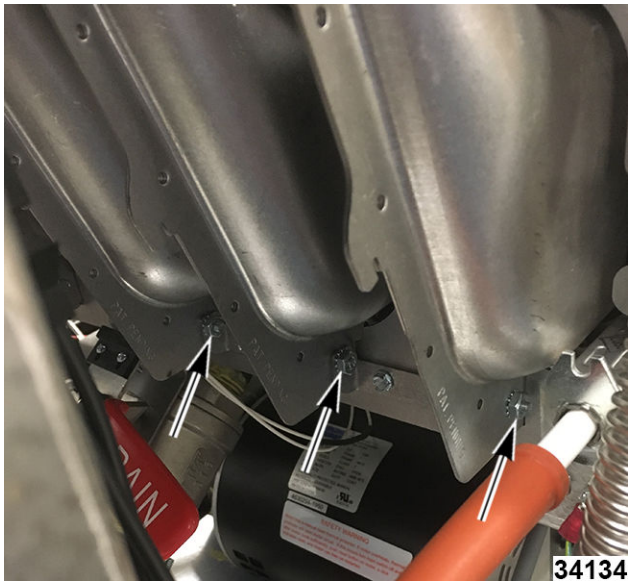


Fig. 25

8. Reverse procedure to install.

⚠ WARNING

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

9. Verify proper operation.

BURNER - STARTING SN 65026221

⚠ WARNING

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

⚠ WARNING

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

1. Remove SIDE PANELS.
2. Remove COVER / C & D CONTROL PANEL.

NOTE: If unit has analog controller, remove A CONTROL PANEL.

3. Remove BULLNOSE / CONTROL PANEL MOUNT.
4. Remove HEAT SHIELD.
5. Remove PILOT ASSEMBLY - STARTING SN 65026221.

NOTE: Pilot gas line can remain attached if desired.

6. Disconnect gas line at combination valve, leave gas line connected to burner assembly (Fig. 26).

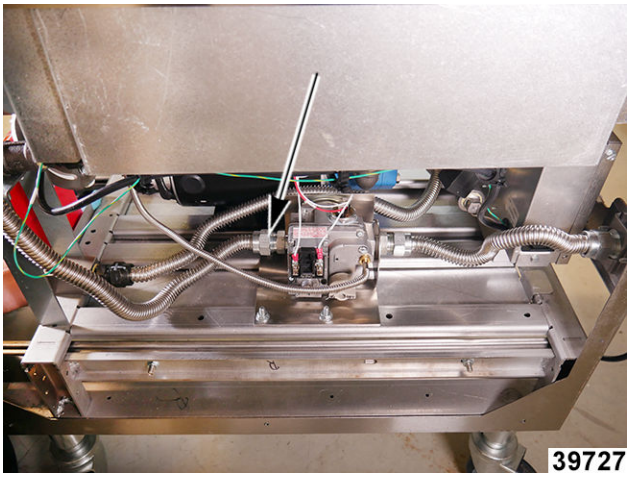


Fig. 26

7. Remove burner mounting nuts from tank welded stud (Fig. 27).

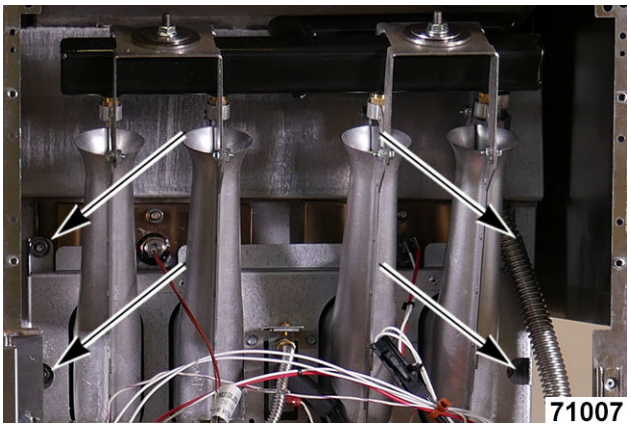


Fig. 27

8. Remove burners and manifold from front of tank as one assembly. Pull away from tank face and off studs welded to tank.

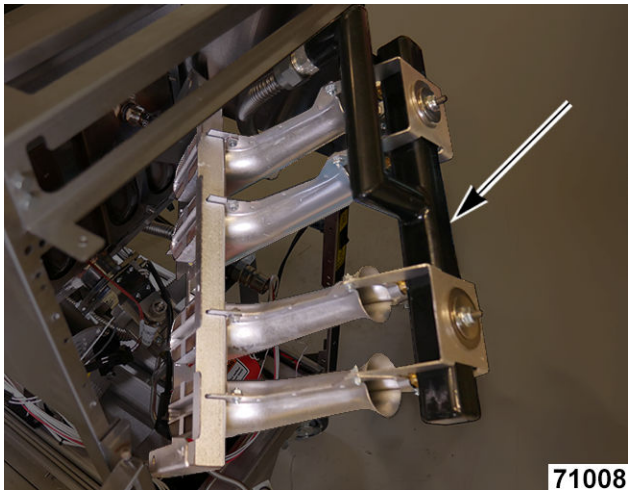


Fig. 28

9. Remove top burner bracket mounting nuts.
10. Remove bottom burner bracket mounting nuts.

TOP NUTS

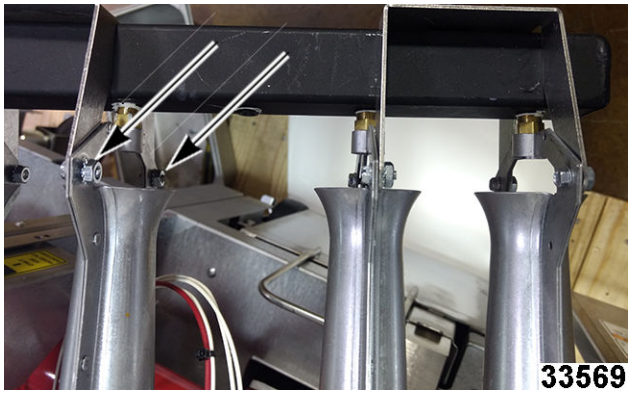


Fig. 29

BOTTOM NUTS

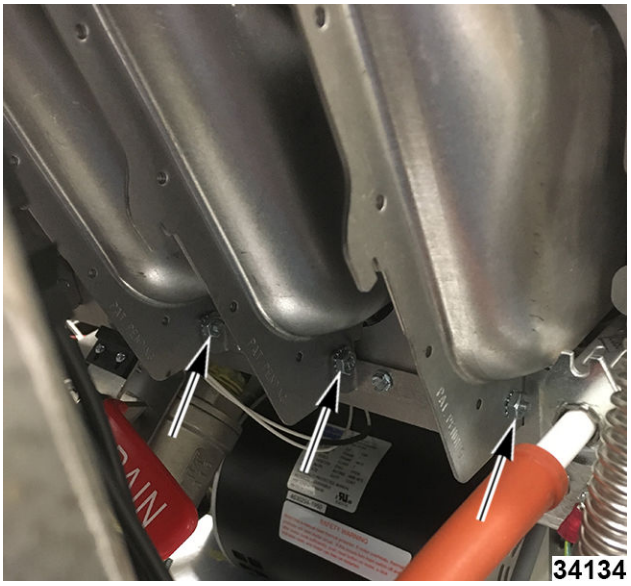


Fig. 30

11. Remove burner.
12. Fasten replacement burner to bracket.
13. Tighten bottom burner bracket mounting nuts Fig. 30.
14. Tighten top burner bracket mounting nuts Fig. 29.
15. Position burner / bracket assembly to studs welded to tank Fig. 28.
16. Install and tighten burner mounting nuts to tank welded studs Fig. 27.
17. Connect gas line to gas valve (Fig. 26).
18. Reinstall pilot assembly.
19. Reconnect flame sense and ignitor.
20. Reconnect pilot gas flex tube.

⚠ WARNING

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

21. Turn on gas for leak test.
22. Install HEAT SHIELD.
23. Install BULLNOSE / CONTROL PANEL MOUNT.
24. Install C & D CONTROL PANEL / COVER.

NOTE: If unit has analog controller, install A CONTROL PANEL.

25. Verify proper operation.

⚠ WARNING

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

26. Install SIDE PANELS.

BULLNOSE - BEFORE SN 65026221

⚠ WARNING

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

1. Remove C & D CONTROL PANEL / COVER or ANALOG CONTROL BOARD cover.

Fig. 31

2. Remove control panel box.

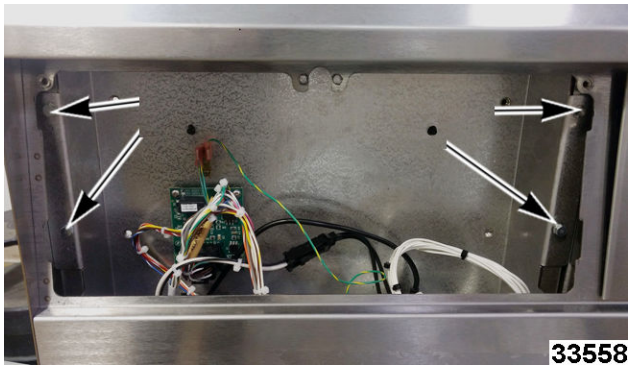


Fig. 32

3. Open lower door.

4. Note and disconnect front to back wire harness connections.

5. Remove top door mounting screw (1, Fig. 33) and loosen two screws (2, Fig. 33) below.

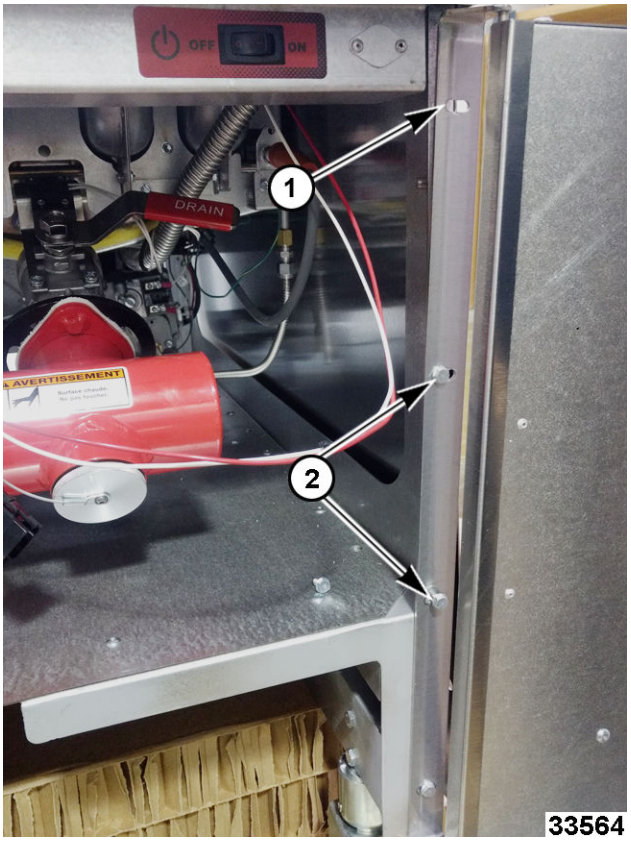


Fig. 33

6. Lift up and out to remove bullnose (1, Fig. 34 and Fig. 35).

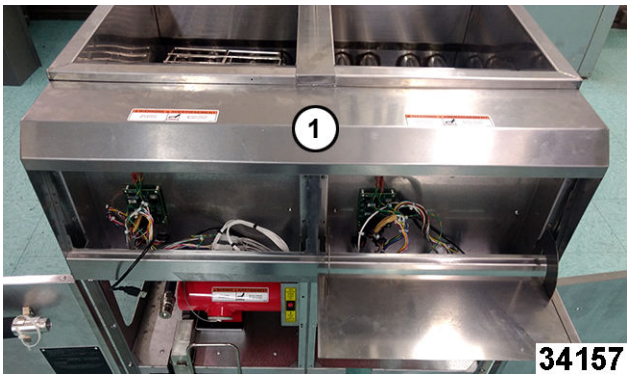


Fig. 34

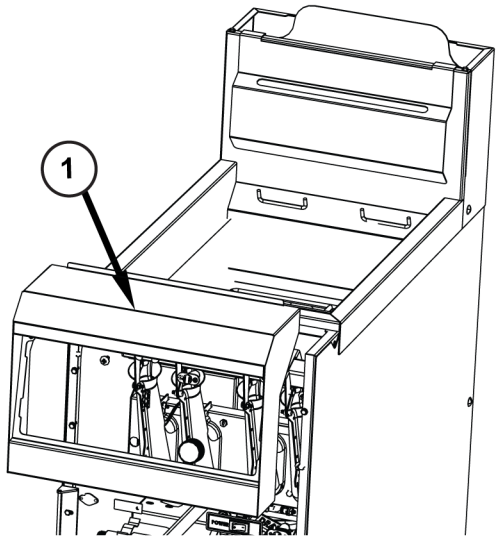


Fig. 35

7. Reverse procedure to install.
8. Verify operation.

BULLNOSE / CONTROL PANEL BOX - STARTING SN 65026221

⚠ WARNING

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

1. Open fryer door.
2. Remove C & D CONTROL PANEL / COVER.
3. Remove bullnose bolts (1, Fig. 36).
4. Remove control panel box bolts (2, Fig. 36).

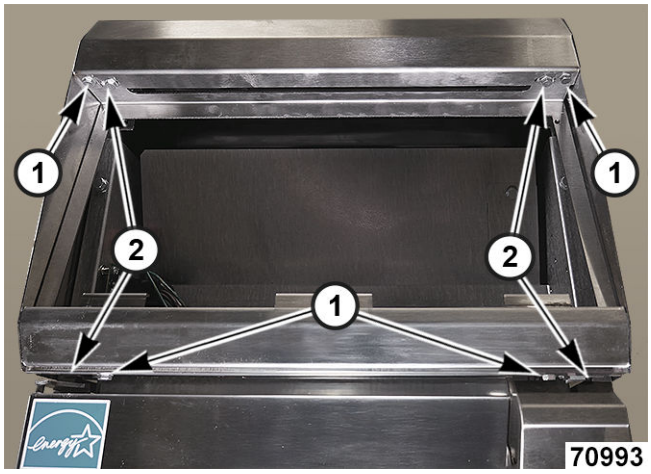


Fig. 36

5. Pull out control panel box.
6. Lift rear of bullnose and pull up and out.
7. Reverse procedure to install.
8. Turn on power supply.
9. Verify operation.

POWER SUPPLY BOX - BEFORE SN 65026221

⚠ WARNING

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

⚠ WARNING

This procedure applies to a single tank unit power supply box. If working on a multiple tank unit, disconnect the power supply box to each tank unit. Battery units will have to be accessed from the back of machine. Use special care when opening the wiring clip attached to power box from the back side of fryer.

1. Remove BOTH SIDE PANELS.
2. Unplug power cord to power supply box (1, Fig. 37. Note and disconnect wire connectors.

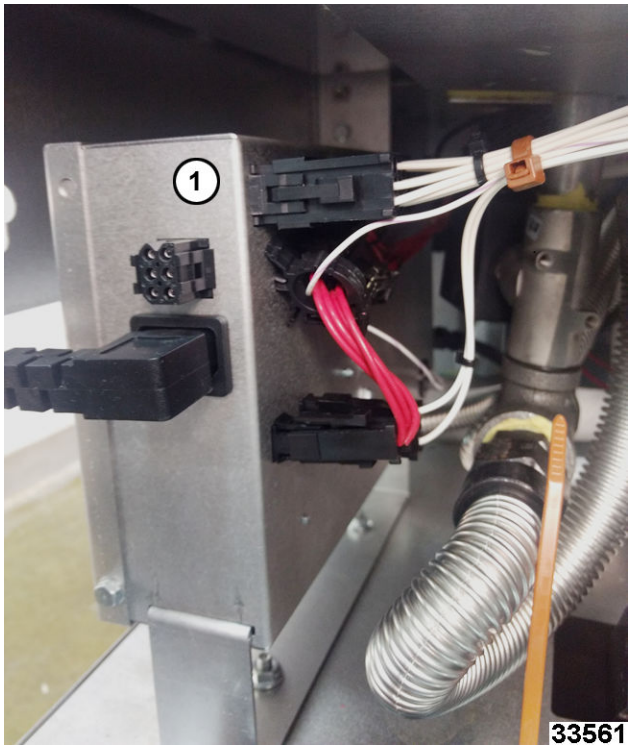


Fig. 37

3. Remove mounting nuts. Reach power box mounting nuts through rear of fryer if accessible.

Fig. 38

4. Reverse procedure to install.
5. Verify proper operation.

POWER SUPPLY BOX - STARTING SN 65026221

⚠ WARNING

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

⚠ WARNING

This procedure applies to a single tank unit power supply box. If working on a multiple tank unit, disconnect the power supply box to each tank unit. All units will have to be accessed from the back of machine. Use special care when opening the wiring clip attached to power box from the back side of fryer.

1. Remove SIDE PANELS.
2. Remove cross member.

NOTE: Power supply box does not need to be removed for troubleshooting. Only cross member and box cover need to be removed.

Fig. 39

⚠ WARNING

If performing other repair tasks before installing replacement power supply, be sure to re-attach cross-member to the frame for unit stability and safety reasons.

3. Remove screw on side of power supply box.

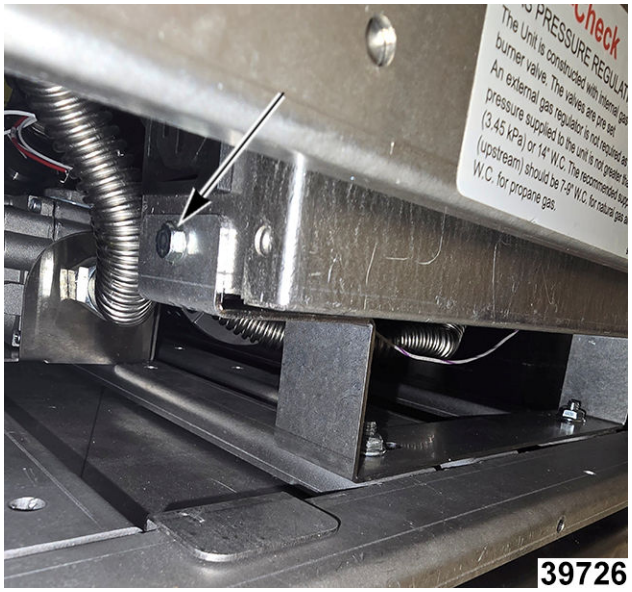


Fig. 40

4. Slide power supply box left to disengage from slot bracket (1, Fig. 41).
5. Disconnect power cord from power supply box (2, Fig. 41).

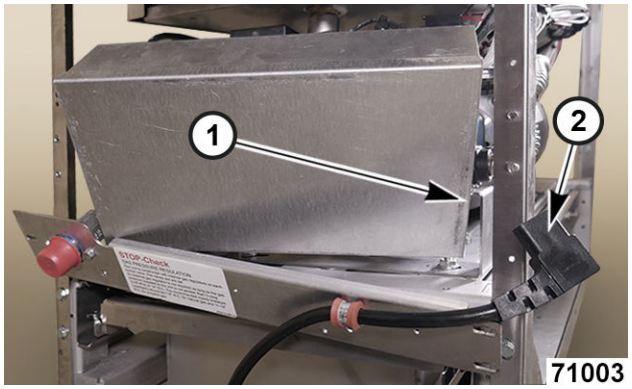


Fig. 41

6. Document and disconnect wires (1, Fig. 42) from power supply box.
7. Document and disconnect wires from wire clip (2, Fig. 42).

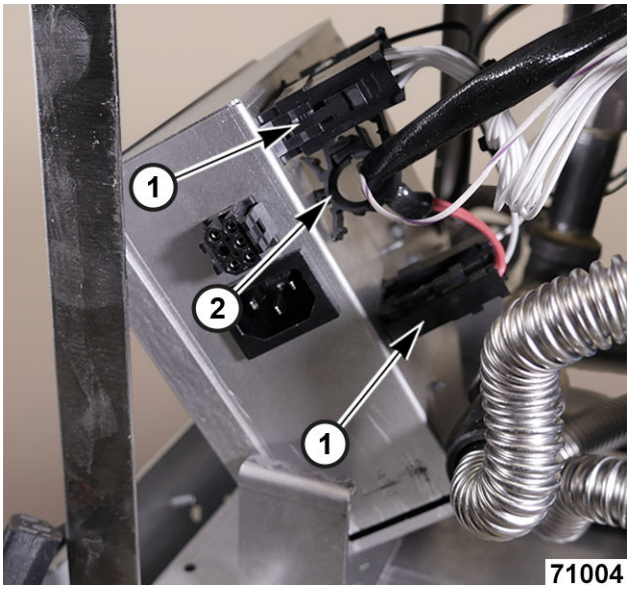


Fig. 42

8. Pull power supply box out.

NOTE: When disconnecting wires make sure there is not excessive stress or strain that would break or pull out wires from the connectors.

9. Install power supply replacement.

NOTE: Do not engage slot brackets yet.

10. Connect wires to wire clip (2, Fig. 42).
11. Connect wires to power supply (1, Fig. 42).
12. Connect power cord to power supply (2, Fig. 41).
13. Position power supply to engage slot bracket (1, Fig. 41).
14. Position cross member to frame.
15. Tighten cross member bolts.

⚠ WARNING

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

16. Verify proper operation.
17. Install SIDE PANELS.

OIL RETURN SOLENOID - BEFORE SN 65026221

⚠ WARNING

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

1. DRAIN OIL from tank.
2. Remove POWER SUPPLY BOX.
3. Note and disconnect piping and wiring from solenoid.
4. Remove solenoid (1, Fig. 43).

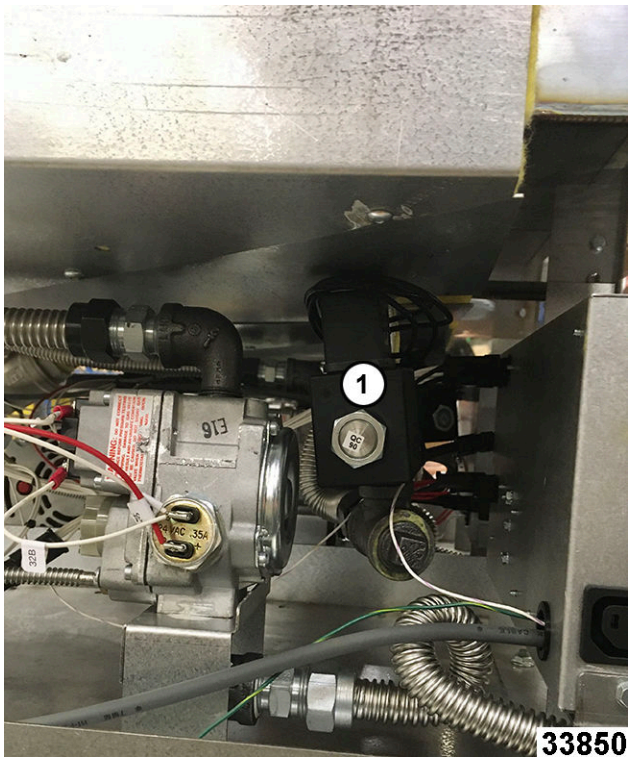


Fig. 43

5. Reverse procedure to install.
6. Verify operation.

OIL RETURN SOLENOID - STARTING SN 65026221

⚠ WARNING

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

1. Open fryer door
2. DRAIN OIL from tank.
3. Remove RIGHT SIDE PANEL.
4. Remove POWER SUPPLY BOX.
5. Locate oil return solenoid assembly.

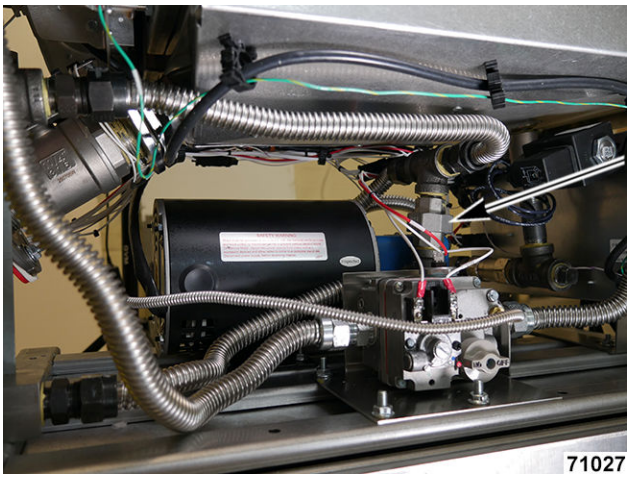


Fig. 44

6. Document piping orientation and disconnect piping and wiring from solenoid.
7. Remove solenoid assembly.
8. Remove check valve from solenoid valve assembly for clearance.

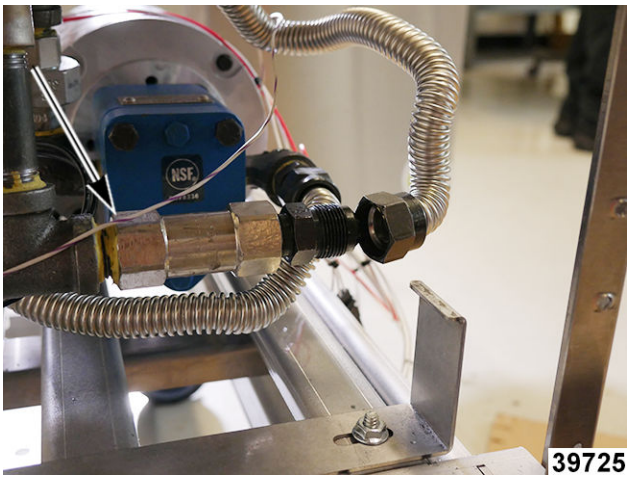


Fig. 45

9. Install solenoid assembly replacement.

NOTE: Use proper pipe sealant when installing.

10. Connect piping and wiring to replacement solenoid.
11. Refill tank with oil.
12. Check for leaks.
13. Install POWER SUPPLY BOX.

⚠ WARNING

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

14. Verify operation.
15. Install RIGHT SIDE PANEL.

GAS COMBINATION VALVE - BEFORE SN 65026221

⚠ WARNING

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

⚠ WARNING

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

1. Remove POWER SUPPLY BOX.
2. Disconnect gas piping from gas combination valve.
3. Disconnect pilot tubing.
4. Note and remove wiring.
5. Remove valve bracket nuts.

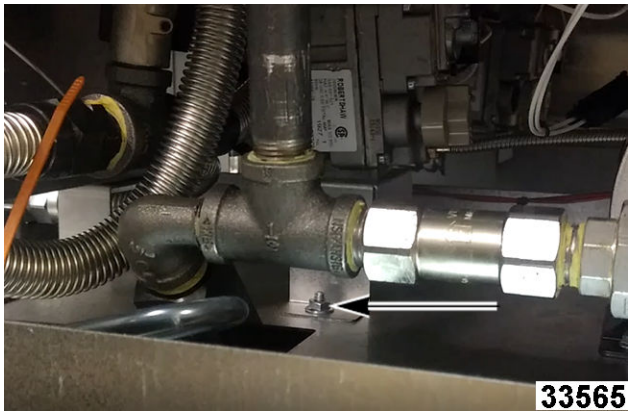


Fig. 46

6. Reverse procedure to install.

⚠ WARNING

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

7. Verify proper operation.

GAS COMBINATION VALVE - STARTING SN 65026221

⚠ WARNING

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

⚠ WARNING

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

1. Remove RIGHT SIDE PANEL.
2. Disconnect gas piping (2, Fig. 47) from gas combination valve (1, Fig. 47).
3. Disconnect pilot tubing (3, Fig. 47).
4. Document and remove wiring (4, Fig. 47).

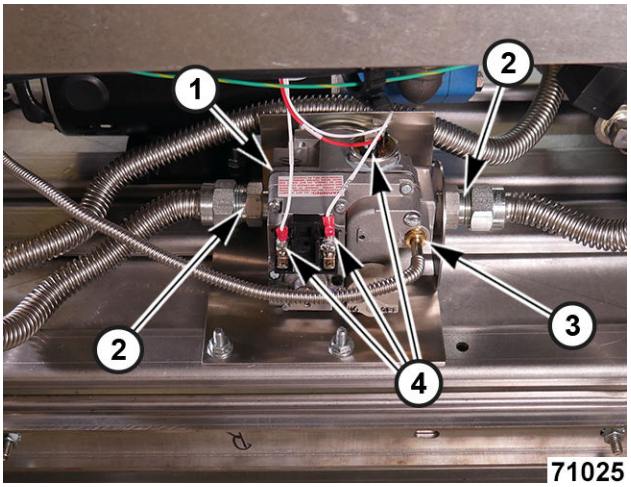


Fig. 47

5. Remove valve bracket nuts (Fig. 48).

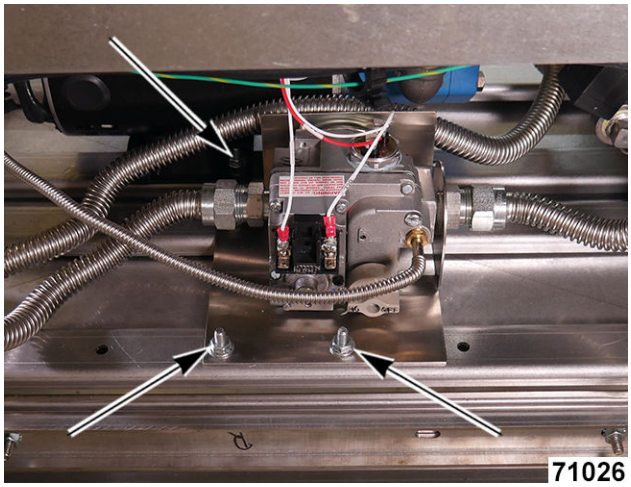


Fig. 48

6. Remove bracket with combination valve.
7. Remove valve from bracket.
8. Transfer fittings from old valve to new valve.

⚠ WARNING

Clean pipe threads and apply thread sealant that is suitable for use with natural and propane gases.

9. Install new valve onto bracket using existing hardware.
10. Bolt in replacement valve / bracket (Fig. 48).
11. Reconnect wires (4, Fig. 47).
12. Connect pilot tubing (3, Fig. 47).
13. Connect gas piping (2, Fig. 47)
14. Turn on gas supply.

⚠ WARNING

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

15. Turn on power supply.

⚠ WARNING

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

16. Verify proper operation.
17. Perform GAS MANIFOLD PRESSURE ADJUSTMENT.
18. Install RIGHT SIDE PANEL.

PUMP/MOTOR ASSEMBLY - BEFORE SN 65026221

⚠ WARNING

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

⚠ WARNING

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

1. Remove BOTH SIDE PANELS.
2. Disconnect pump piping flex lines.
   A. Flex lines to solenoid valve connection.
   B. Flex line on left side of pump.
   C. Flex line from front of pump.
3. Remove U-bolt (1, Fig. 49) nuts (Fig. 50).

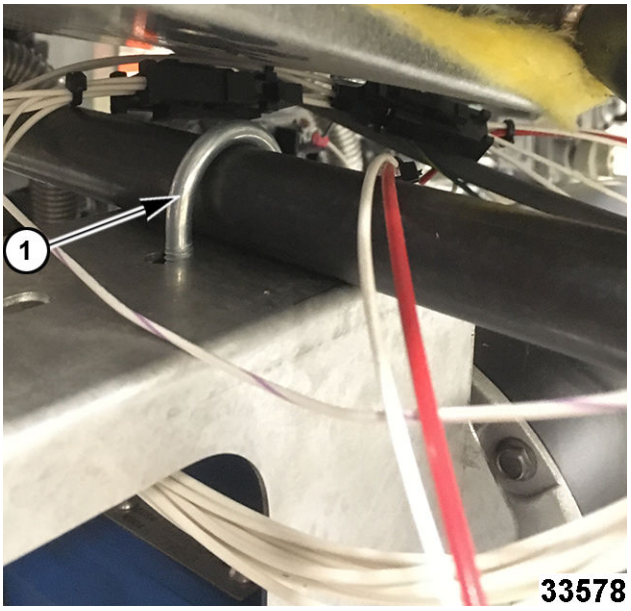


Fig. 49

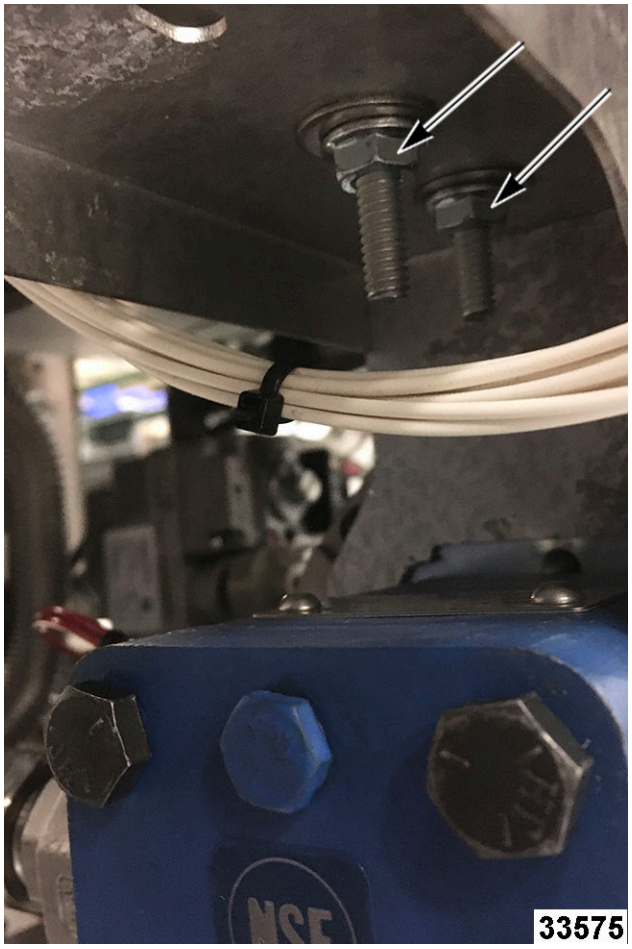


Fig. 50

4. Note and disconnect motor wiring connector from power box.
5. Disconnect pipe system union connection.
6. Remove pipe system through side of fryer. (careful to not hit the gas valve of the next fryer over).
7. Remove motor mounting flange nuts.

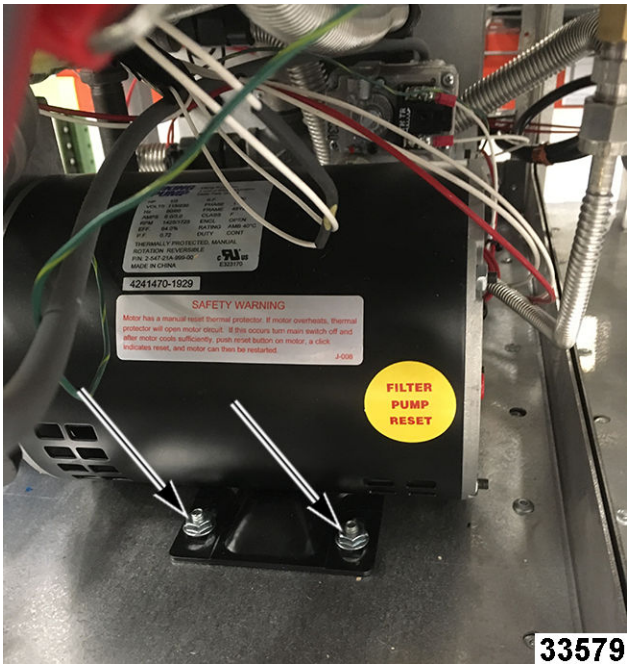


Fig. 51

8. Lift and remove pump motor through side of next fryer over.
9. Disassemble remaining pump connections on inlet of pump.
10. Disassemble remaining pump connections on discharge of pump.
11. Remove pipe mount bracket from pump.
12. Note electrical connections and disconnect harness from pump motor. Reconnect new pump motor wires in any order to terminal 1 and 4.

NOTICE

It is recommended to replace pipe nipples that were removed from original pump housing. Use NSF approved pipe thread sealant during installation (i.e., RECTORSEAL 5®).

13. Reverse procedure to install.

⚠ WARNING

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

14. Verify proper operation.

PUMP / MOTOR ASSEMBLY - STARTING SN 65026221

⚠ WARNING

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

⚠ WARNING

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

1. Remove LEFT / RIGHT SIDE PANELS.

⚠ WARNING

Hot oil and parts can cause burns. Use care when servicing the filter.

2. DRAIN OIL from tank.

NOTE: Removing POWER SUPPLY BOX - STARTING SN 65026221 allows more room for servicing pump motor assembly.

3. Disconnect union from pump (Fig. 52).

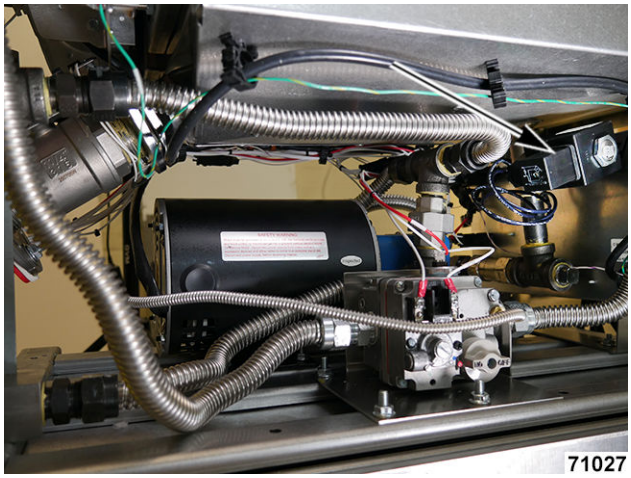


Fig. 52

4. Disconnect flex line left and right side of pump (1, Fig. 53).
5. Document / disconnect motor wiring connector from power supply box (2, Fig. 53).

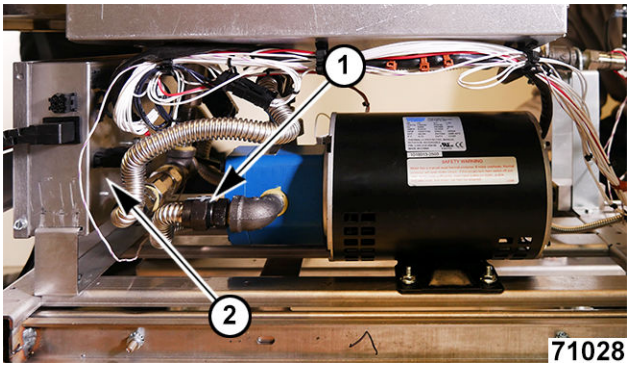


Fig. 53

6. Pull filter drawer and move to safe location.
7. Remove filtration mount cover (Fig. 54).

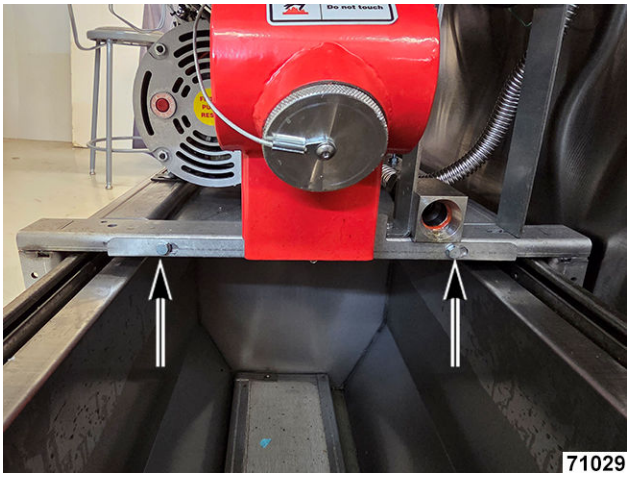


Fig. 54

NOTE: Insert tab above support in back of fryer. when installing

Fig. 55

8. Remove pump motor mounting flange nuts.

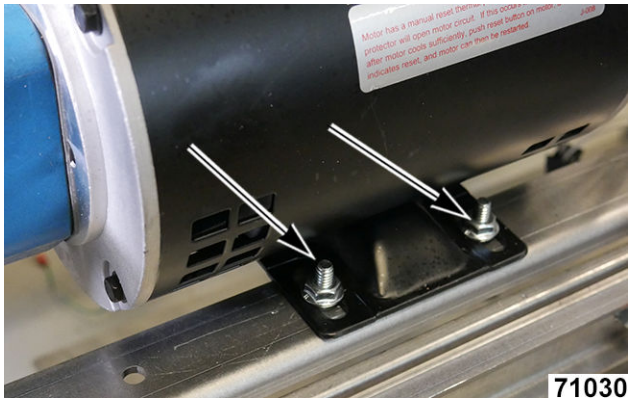


Fig. 56

9. Lift and remove pump motor.

NOTE: If multiple fryer setup, remove pump motor through adjacent fryer.

10. Document orientation of fittings on pump.
11. Disassemble remaining pump connections on inlet of pump.
12. Disassemble remaining pump connections on discharge of pump.
13. Document electrical connections on pump motor.
14. Disconnect electrical connections / harness from pump motor.
15. Reconnect new pump motor wires.

NOTICE

Use NSF approved pipe thread sealant during installation (i.e., RECTORSEAL 5®).

16. Install fittings taken off in previous steps in same orientation that was documented during disassembly.
17. Reverse remaining procedure to install.
18. Fill fryer tank with oil.
19. Turn on gas supply.

⚠ WARNING

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

20. Turn on power supply.

⚠ WARNING

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

21. Verify proper operation.
22. Install LEFT / RIGHT SIDE PANELS.

TEMPERATURE PROBE - BEFORE SN 65026221

⚠ WARNING

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

1. Remove BOTH SIDE PANELS.
2. Drain liquid from tank.
3. Document and disconnect temperature probe lead wires.
4. Loosen packing nut (1, Fig. 57).
5. Remove mounting nut (2, Fig. 57).

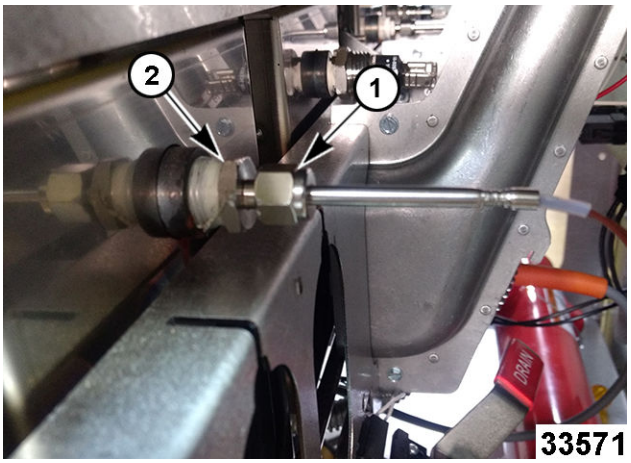


Fig. 57

6. Remove probe.
7. Install replacement probe.
8. Apply high temperature thread sealant to prevent leaking.

NOTICE

Use RECTORSEAL 5® or equivalent NSF rated high temperature thread sealant.

9. Tighten mounting nut (2, Fig. 57).
10. Tighten packing nut (1, Fig. 57).
11. Connect temperature probe lead wires.
12. Check for oil leaks.
13. Check for gas leaks.

⚠ WARNING

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

14. Verify proper operation.
15. Install BOTH SIDE PANELS.

TEMPERATURE PROBE - STARTING SN 65026221

⚠ WARNING

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

1. Remove LEFT SIDE PANEL.
2. Open fryer door.
3. Drain liquid from tank.
4. Remove C & D CONTROL PANEL/COVER.
5. Remove BULLNOSE / CONTROL PANEL MOUNT.
6. Remove HEAT SHIELD.
7. Document and disconnect temperature probe lead wires.
8. Loosen packing nut (1, Fig. 58).
9. Remove mounting nut (2, Fig. 58).

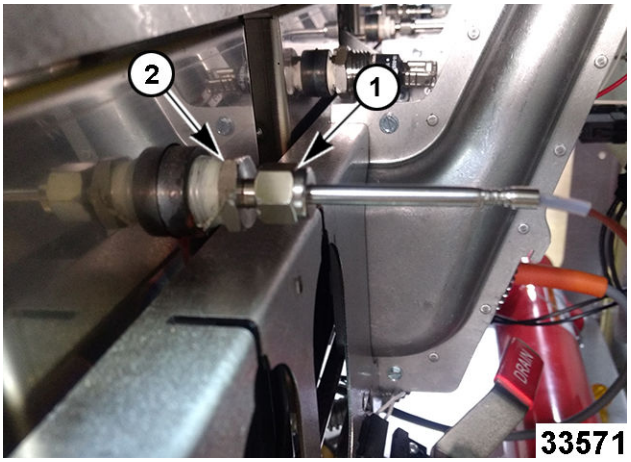


Fig. 58

10. Remove probe.
11. Install replacement probe.
12. Guide probe through guide bracket hole. (1, Fig. 59).

NOTE: Verify probe is sliding through guide bracket hole before applying force.

13. Position end of probe approx. 4.5 inches from inner tank wall (2, Fig. 59).

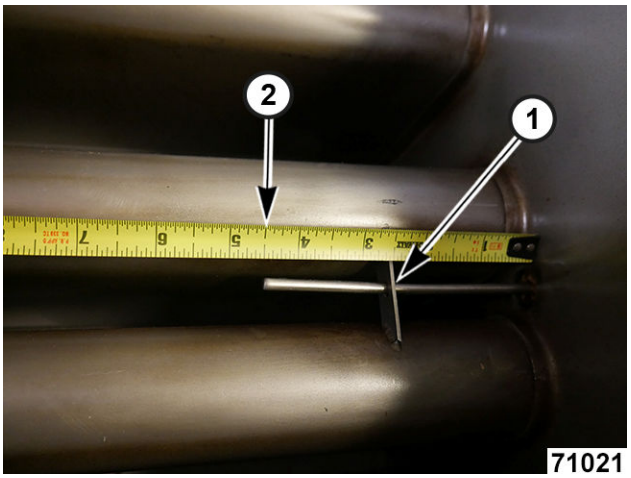


Fig. 59

14. Apply high temperature thread sealant to prevent leaking.

NOTICE

Use RECTORSEAL 5® or equivalent NSF rated high temperature thread sealant.

15. Tighten mounting nut (2, Fig. 58).
16. Tighten packing nut (1, Fig. 58).
17. Connect temperature probe lead wires.
18. Refill tank.

19. Check for oil leaks.
20. Check for gas leaks.

⚠ WARNING

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

21. Install HEAT SHIELD.
22. Install BULLNOSE / CONTROL PANEL MOUNT.
23. Install C & D CONTROL PANEL/COVER.
24. Install LEFT SIDE PANEL.
25. Verify proper operation.
26. Recheck for leaks after oil has been heated.
27. Perform COOKING CONTROL CALIBRATION.

BURNER ORIFICE - BEFORE SN 65026221

⚠ WARNING

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

⚠ WARNING

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

1. Remove BULLNOSE.
2. Remove BURNER.
3. Remove orifice (1, Fig. 60).

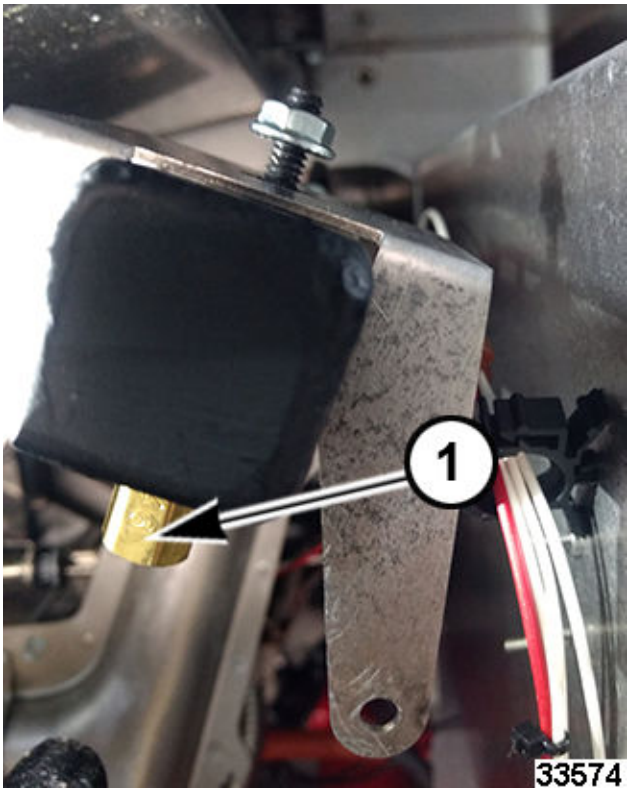


Fig. 60

4. Reverse procedure to install.

⚠ WARNING

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

BURNER ORIFICE - STARTING SN 65026221

⚠ WARNING

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

⚠ WARNING

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

1. Remove LEFT / RIGHT SIDE PANELS.
2. Open fryer door.
3. Remove C & D CONTROL PANEL / COVER .
4. Remove BULLNOSE / CONTROL PANEL MOUNT .

5. Remove HEAT SHIELD.
6. Remove BURNER.
7. Remove orifice (1, Fig. 61).

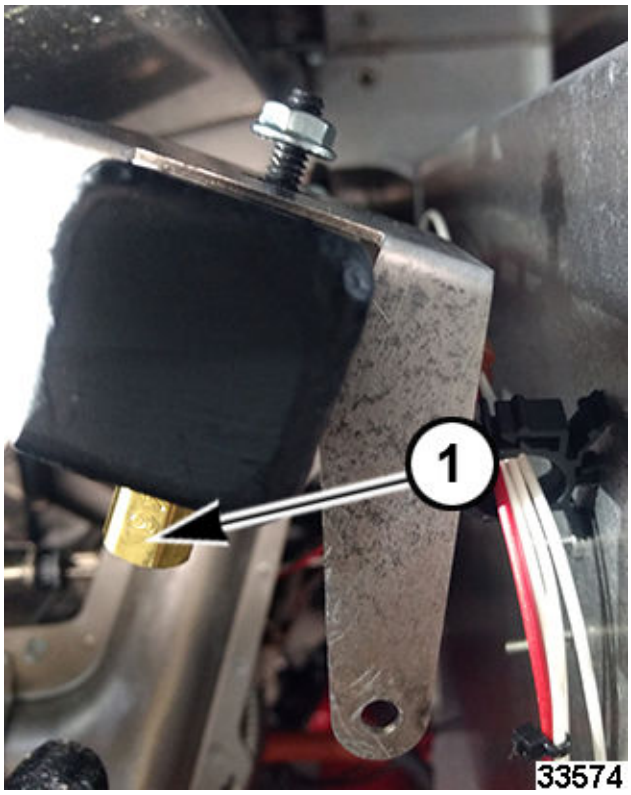


Fig. 61

8. Install replacement orifice.
9. Reverse remaining procedures to complete install.

⚠ WARNING

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

10. Turn on gas supply.

⚠ WARNING

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

11. Turn on power supply.
12. Verify operation.
13. Install LEFT / RIGHT SIDE PANELS.
14. Close fryer door.

POWER SWITCH / DISCARD HOSE SWITCH - BEFORE SN 65026221

⚠ WARNING

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

1. Open fryer door
2. Locate power switch (1, Fig. 62).
3. Locate discard hose switch (2, Fig. 62).

NOTE: For power switch remove CONTROL PANEL to access back of switch.

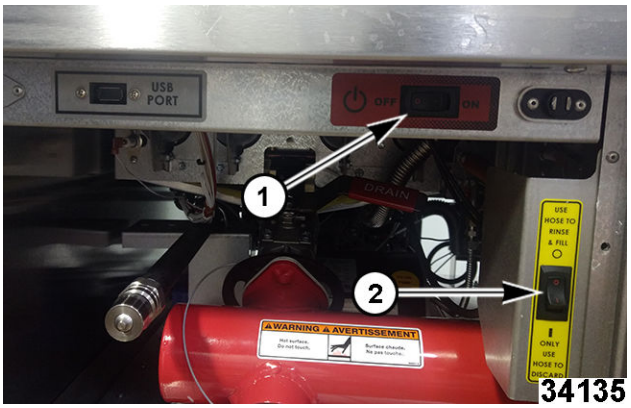


Fig. 62

4. Unplug switch from wire harness.
5. Squeeze switch retainers on back of switch while prying out switch (from sheet metal) to the front of unit.
6. Reverse procedure to install.
7. Verify operation

POWER SWITCH / DISCARD HOSE SWITCH - STARTING SN 65026221

⚠ WARNING

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

1. Open fryer door.
2. Locate power switch (1, Fig. 63).

3. Locate discard hose switch (2, Fig. 63).

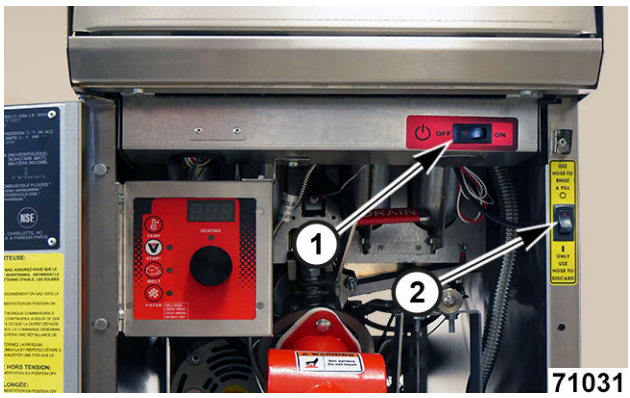


Fig. 63

NOTE: For power switch, remove C & D CONTROL PANEL / COVER to access back of switch.

4. Unplug switch from wire harness.
5. Squeeze switch retainers on back of switch (Fig. 64) while prying out switch forward.

Fig. 64

6. Reverse procedure to install.
7. Turn on power supply.
8. Verify operation.

HIGH LIMIT - BEFORE SN 65026221

⚠ WARNING

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

1. Remove .
2. DRAIN OIL from fry tank.
3. Note and disconnect high limit terminal wires (1, Fig. 65).

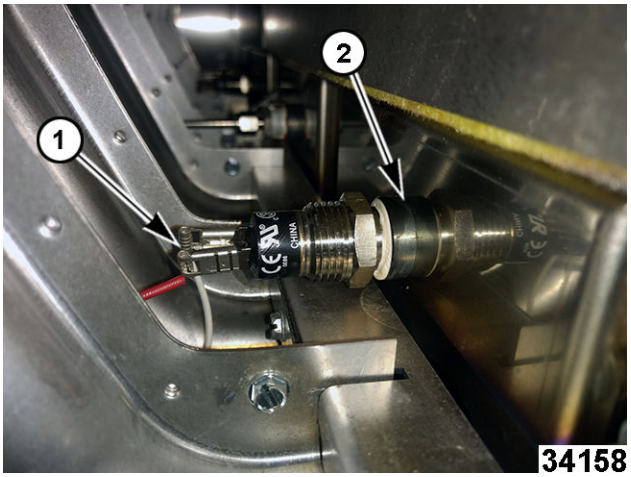


Fig. 65

4. Remove/unthread high limit (2, Fig. 65) from fry tank.
5. Reverse procedure to install.

NOTICE

Use a high temperature thread sealant to prevent leaking. RECTORSEAL 5® or equivalent NSF rated high temperature thread sealant is recommended.

6. Verify operation and check for leaks.

HIGH LIMIT - STARTING SN 65026221

⚠ WARNING

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

1. Open fryer door.
2. Remove LEFT / RIGHT SIDE PANELS.
3. DRAIN OIL from fry tank.
4. Remove C & D CONTROL PANEL / COVER.
5. Remove BULLNOSE / CONTROL PANEL MOUNT.
6. Remove HEAT SHIELD.
7. Document and disconnect high limit terminal wires (1, Fig. 66).

NOTE: High limit is on right side in front of tank.

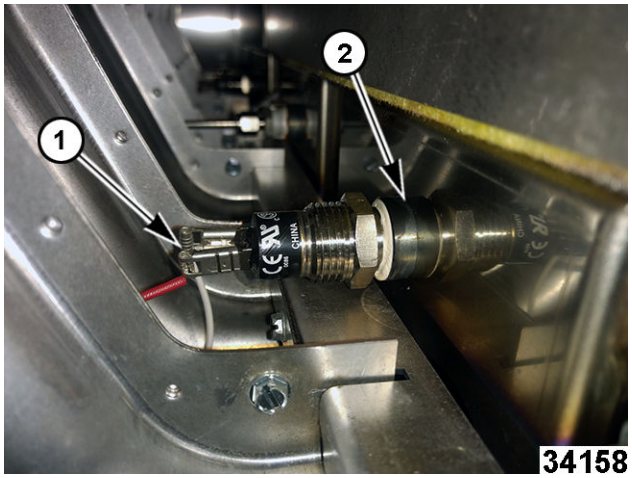


Fig. 66

8. Remove/unthread high limit (2, Fig. 66) from fry tank.
9. Install high limit replacement.

NOTICE

Use a high temperature thread sealant to prevent leaking. RECTORSEAL 5® or equivalent NSF rated high temperature thread sealant is recommended.

10. Fill tank with oil.
11. Check for oil leaks.
12. Install HEAT SHIELD.
13. Install BULLNOSE / CONTROL PANEL MOUNT.
14. Install C & D CONTROL PANEL / COVER.

⚠ WARNING

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

15. Install LEFT / RIGHT SIDE PANELS.
16. Verify operation.

PILOT ASSEMBLY - BEFORE SN 65026221

⚠ WARNING

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

1. Disconnect flame sense wire (1, Fig. 67) from flame sensor terminal.

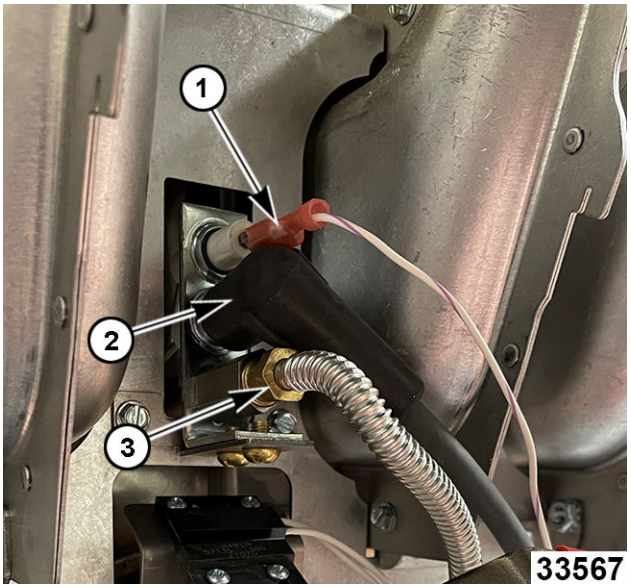


Fig. 67

2. Remove electrode cable (2, Fig. 67).
3. Disconnect pilot gas tube. (3, Fig. 67).
4. Remove pilot assembly mounting screws.

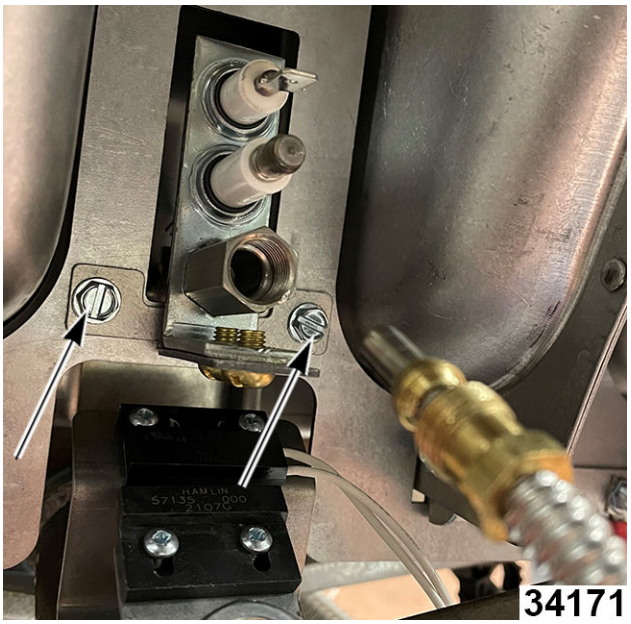


Fig. 68

5. Reverse procedure to install.
6. Verify operation.
   A. Ensure electrode is sparking to the pilot burner head.
   B. Spark gap should be 0.120" +/- 0.010".

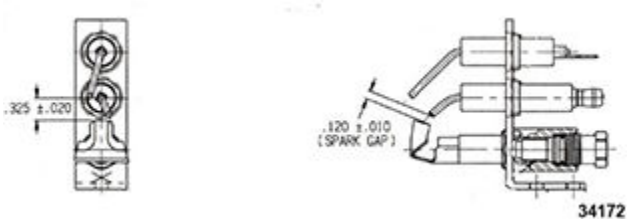


Fig. 69

PILOT ASSEMBLY - STARTING SN 65026221

⚠ WARNING

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

⚠ WARNING

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

NOTE: Pilot assembly is mounted differently than previous construction. Mounting ears should be at top and flame sense connection should be a bottom. Pilot assembly is 180° opposite of previous construction.

1. Disconnect electrical power.
2. Shut-off gas supply.
3. Open fryer door.
4. Disconnect flame sense wire (1, Fig. 70) from flame sensor terminal.
5. Remove electrode cable (2, Fig. 70).
6. Disconnect pilot gas tube. (3, Fig. 70).

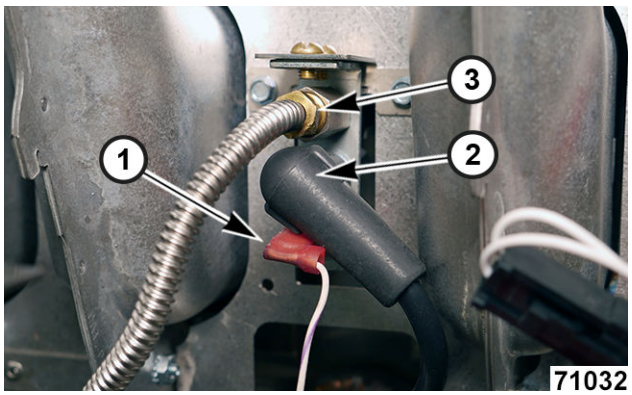


Fig. 70

7. Remove pilot assembly mounting screws (Fig. 71).

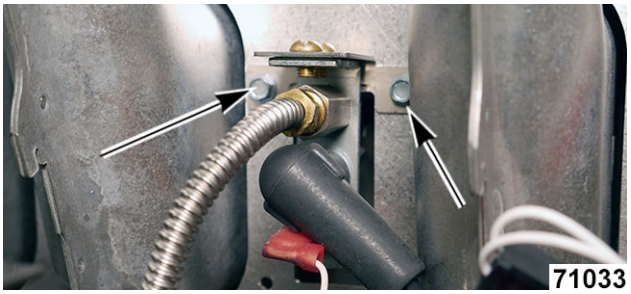


Fig. 71

8. Remove assembly.

Fig. 72

9. Spark gap should be 0.120" +/- 0.010" or approximately 1/8".
10. Install replacement assembly.
11. Connect pilot gas tube (3, Fig. 70).
12. Connect electrode cable (2, Fig. 70).
13. Connect flame sense wire (1, Fig. 70).

⚠ WARNING

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

14. Turn on power supply.
15. Verify electrode is sparking to the pilot burner head.

⚠ WARNING

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

16. Turn on gas supply.
17. Verify fryer operation.
18. Close fryer door.

FLAME SENSE WIRE - BEFORE SN 65026221

⚠ WARNING

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

1. Disconnect power supply.
2. Open door.
3. Disconnect flame sense wire terminal.

NOTE: If performing FLAME SENSE CURRENT CHECK, leave flame sense wire terminal connected.

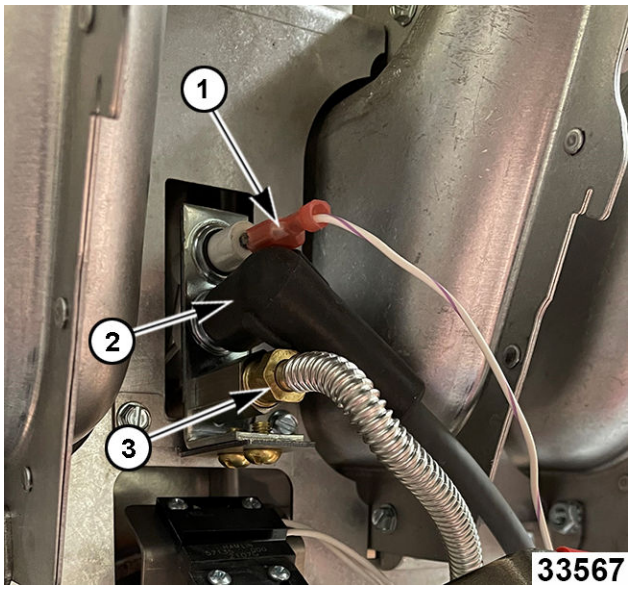


Fig. 73

4. Remove POWER SUPPLY BOX.
5. Remove power supply box lid to test and access flame sense wire. Refer to: FLAME SENSE CURRENT CHECK.

NOTE: Harness may need to be removed from rear tank mounted harness clips for additional stretch room.

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

FLAME SENSE WIRE - STARTING SN 65026221

⚠ WARNING

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

1. Disconnect power supply.
2. Remove LEFT SIDE PANEL.
3. Open fryer door.
4. Disconnect flame sense wire (Fig. 74) from flame sense terminal.

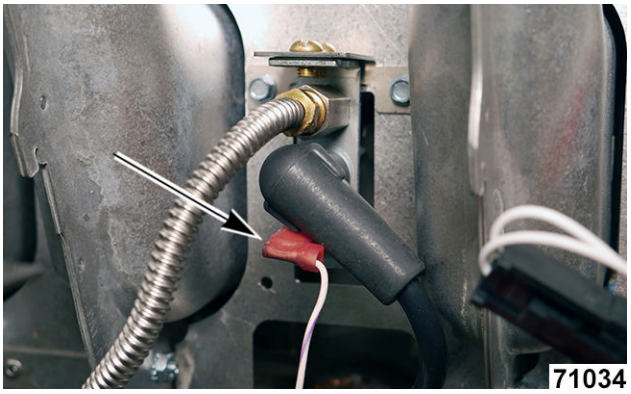


Fig. 74

5. Access POWER SUPPLY.
6. Remove power supply box lid.
7. Disconnect flame sense wire from ignition module.

NOTE: Ensure wire is routed through tank harness clips.

8. Reverse procedure to install.

⚠ WARNING

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

9. Turn on power supply.

10. Verify proper operation.
11. Install LEFT SIDE PANEL.

TRANSFORMER - BEFORE SN 65026221

⚠ WARNING

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

1. Remove POWER SUPPLY BOX.
2. Remove power supply box lid.
3. Disconnect transformer assembly (1, Fig. 75) wires at harness plug.

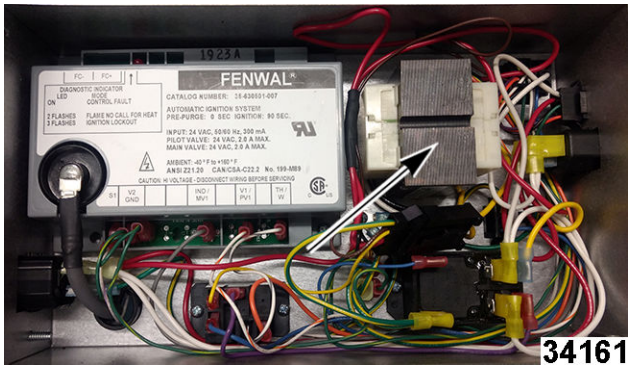


Fig. 75

4. Remove transformer mounting screws.
5. Reverse procedure to install.
6. Verify operation.

TRANSFORMER - STARTING SN 65026221

⚠ WARNING

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

1. Remove LEFT / RIGHT SIDE PANELS.
2. Remove POWER SUPPLY box lid.
3. Disconnect transformer assembly wires at harness plug (Fig. 76).

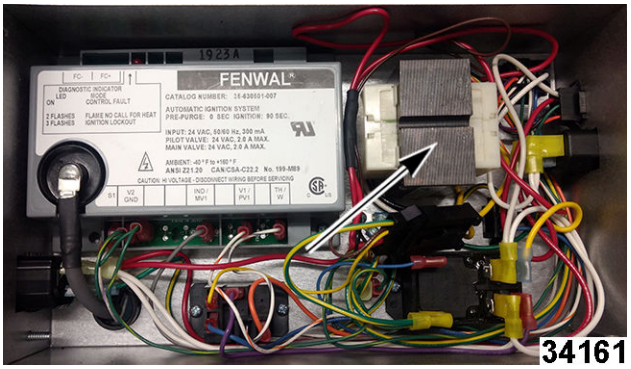


Fig. 76

4. Remove transformer mounting screws.
5. Pull out transformer.
6. Insert / fasten replacement transformer.
7. Install / fasten power supply lid.
8. Install POWER SUPPLY.

⚠ WARNING

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

9. Turn on power supply.
10. Verify operation.
11. Install LEFT / RIGHT SIDE PANELS.

IGNITION MODULE - BEFORE SN 65026221

⚠ WARNING

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

1. Remove POWER SUPPLY BOX.
2. Remove power supply box lid.
3. Note and disconnect module (1, Fig. 77) wiring.

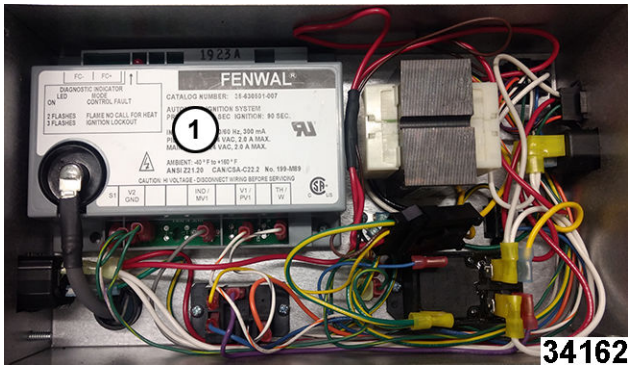


Fig. 77

4. Remove module mounting screws.
5. Reverse procedure to install.
6. Verify operation.

IGNITION MODULE - STARTING SN 65026221

⚠ WARNING

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

1. Remove LEFT / RIGHT SIDE PANELS.
2. Remove POWER SUPPLY box lid.
3. Document and disconnect module wiring.

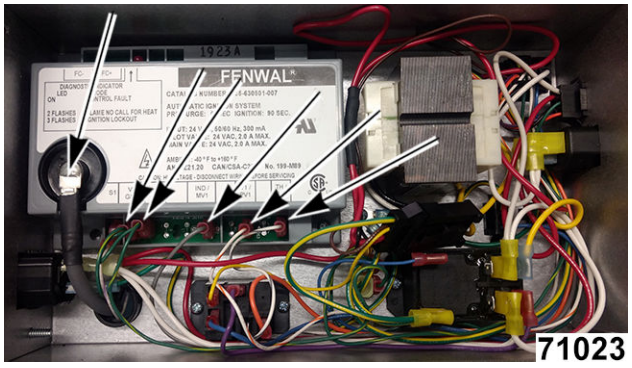


Fig. 78

4. Remove module mounting screws (Fig. 79).

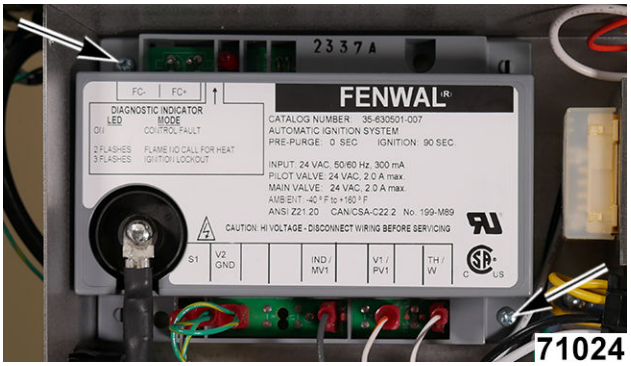


Fig. 79

5. Remove ignition module.
6. Reverse steps for installation.

⚠ WARNING

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

7. Turn on power supply.
8. Verify operation.
9. Install LEFT / RIGHT PANELS.

PUMP AND OIL RETURN SOLENOID RELAYS - BEFORE SN 65026221

⚠ WARNING

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

1. Remove POWER SUPPLY BOX.
2. Remove power supply box lid.
3. Note and disconnect oil return solenoid relay (1, Fig. 80) and pump relay (2, Fig. 80) wiring.

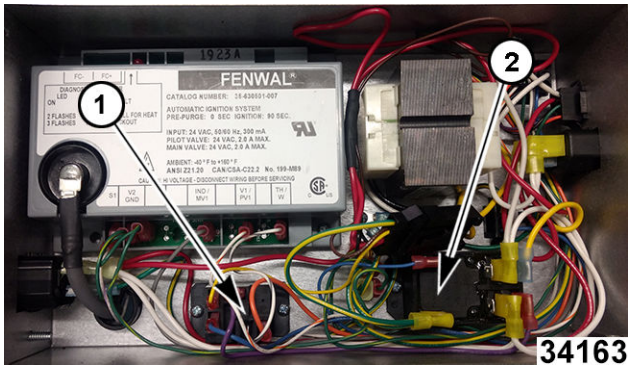


Fig. 80

4. Remove relay mounting screws.
5. Reverse procedure to install.
6. Verify operation.

PUMP AND OIL RETURN SOLENOID RELAYS - STARTING SN 65026221

⚠ WARNING

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

1. Remove LEFT / RIGHT SIDE PANELS.
2. Remove POWER SUPPLY box lid.
3. Identify which relay - oil return solenoid relay (1, Fig. 81) or pump relay (2, Fig. 81) - needs to be replaced.

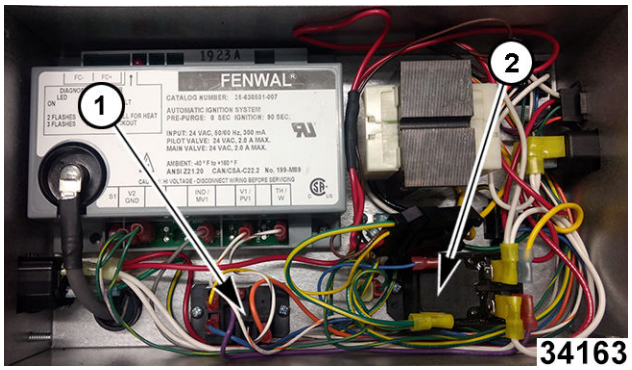


Fig. 81

4. Document, then disconnect wiring.
5. Remove mounting screws.
6. Install replacement relay(s).
7. Reverse steps to install.

⚠ WARNING

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

8. Turn on power supply.
9. Verify operation.
10. Install LEFT / RIGHT SIDE PANELS.

DRAIN VALVE - BEFORE SN 65026221

⚠ WARNING

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

1. Open fryer door.
2. Remove LEFT / RIGHT SIDE PANELS.
3. DRAIN OIL liquid from fry tank.
4. Remove drain manifold (1, Fig. 82) and flange gasket (2, Fig. 82) if fryer has a filter system.

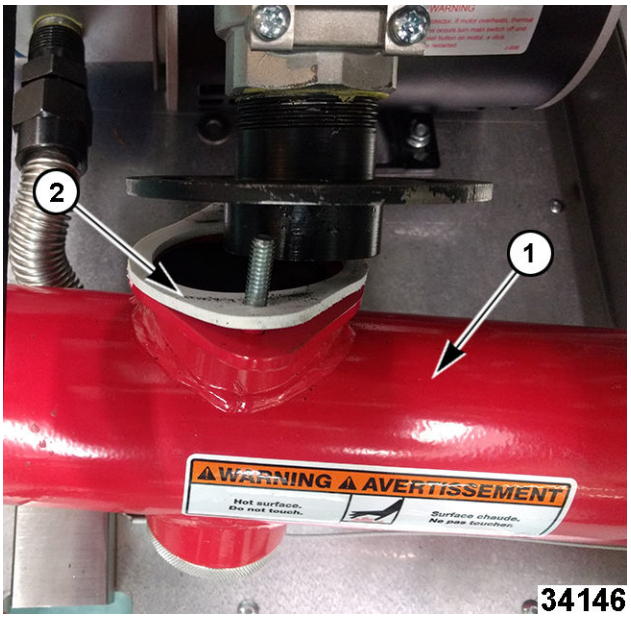


Fig. 82

5. Remove drain valve handle.
6. Note and disconnect drain valve switch wires at plug.
7. Remove drain valve and manifold flange assembly.
8. Note dimensions listed before separating flange from valve.
    - Bottom of old valve to flange.
    - Top of the valve to the tank.

NOTICE

These dimensions will need to be duplicated when flange is reinstalled on the replacement valve. This will ensure the drain manifold will be installable and level. Units without a filter system will not have a drain manifold flange.

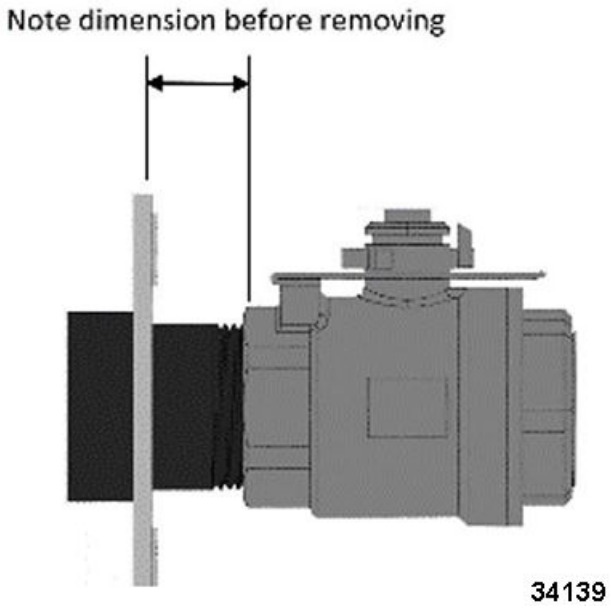


Fig. 83

9. Remove drain manifold flange from the valve.
10. Reverse procedure to install.
11. Use a high temperature thread sealant.

⚠ WARNING

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

12. Verify operation and check for leaks.
13. Install .

DRAIN VALVE - STARTING SN 65026221

⚠ WARNING

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

1. Open fryer door.
2. Remove LEFT / RIGHT SIDE PANELS.

⚠ WARNING

Contact with hot oil and hot oil components may cause serious burn injuries to personnel and damage to equipment. Exercise extreme caution. Ensure oil and components have cooled before servicing. Always wear proper PPE.

3. DRAIN OIL oil from fry tank.
4. Disconnect drain valve switch wires at plug.
5. Remove drain valve bolts (1, Fig. 84).

NOTE: For a single tank fryer the entire drain assembly can be removed without removing the drain manifold (3, Fig. 84).

NOTE: For battery fryers remove drain manifold (3, Fig. 84 and (3, Fig. 85).

6. Remove drain valve (2, Fig. 84) and manifold (3, Fig. 84) assembly.

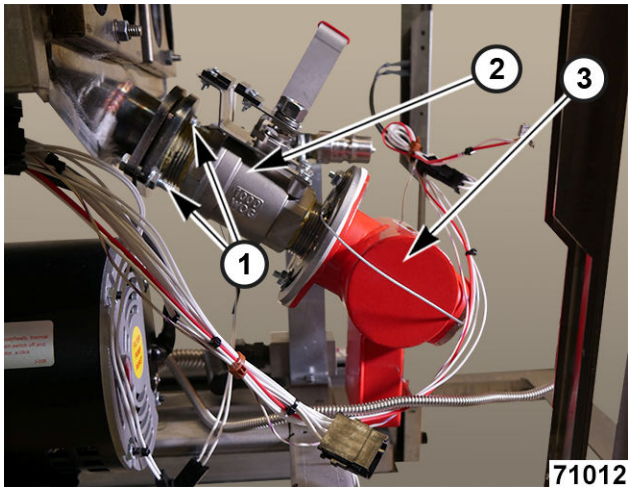


Fig. 84

NOTE: Document orientation of fittings and transfer to new valve using high temperature thread sealant such as Rectorseal or equivalent. Ensure flange (4, Fig. 85) is placed onto fitting before it is threaded into new valve.

7. Reattach drain manifold (3, Fig. 85) to flange (1, Fig. 85) with new gasket (2, Fig. 85).

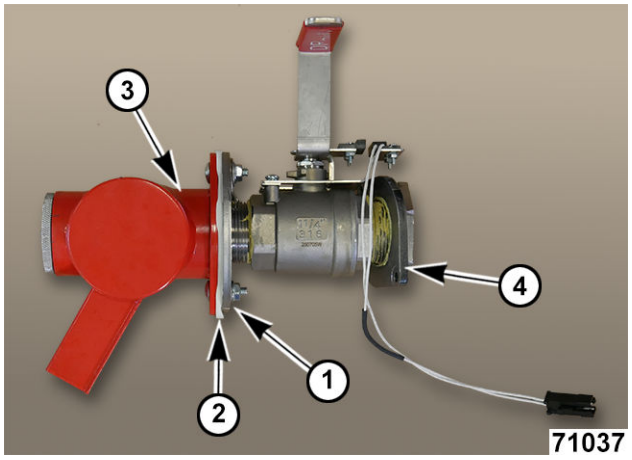


Fig. 85

NOTE: If flange was removed, use high temperature thread sealant when reinstalling flange.

NOTE: For a single tank fryer, install drain valve (2, Fig. 84) and drain manifold (3, Fig. 84) as an assembly with new O-ring.

NOTE: For battery fryers install drain valve (2, Fig. 84) with new O-ring first, then install drain manifold (3, Fig. 84) with new gasket (2, Fig. 85).

8. Install drain valve bolts. (1, Fig. 84).

NOTE: Tighten bolts alternately and evenly.

9. Ensure drain valve is in closed position (Fig. 86).

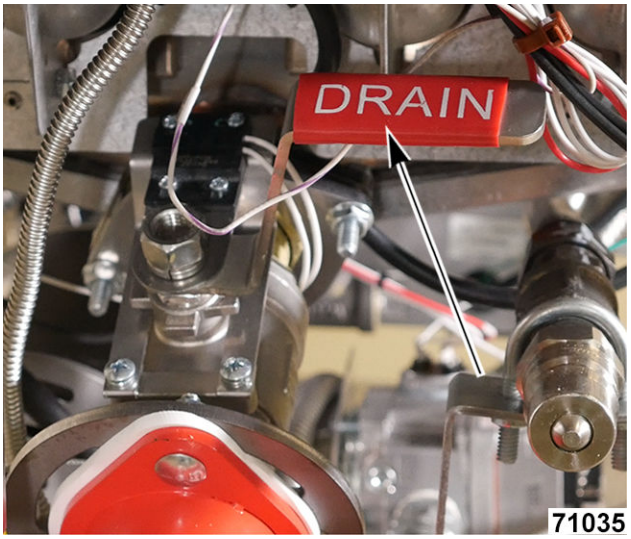


Fig. 86

10. Fill tank with oil.

⚠ WARNING

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

11. Turn on power supply.
12. Verify operation / check for leaks.
13. Install LEFT / RIGHT SIDE PANELS.
14. Close fryer door.

DRAIN VALVE INTERLOCK SWITCH (D.V.I.) - BEFORE SN 65026221

⚠ WARNING

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

1. Open door.
2. Note and disconnect drain valve switch wires at plug.
3. Remove switch mounting screws.

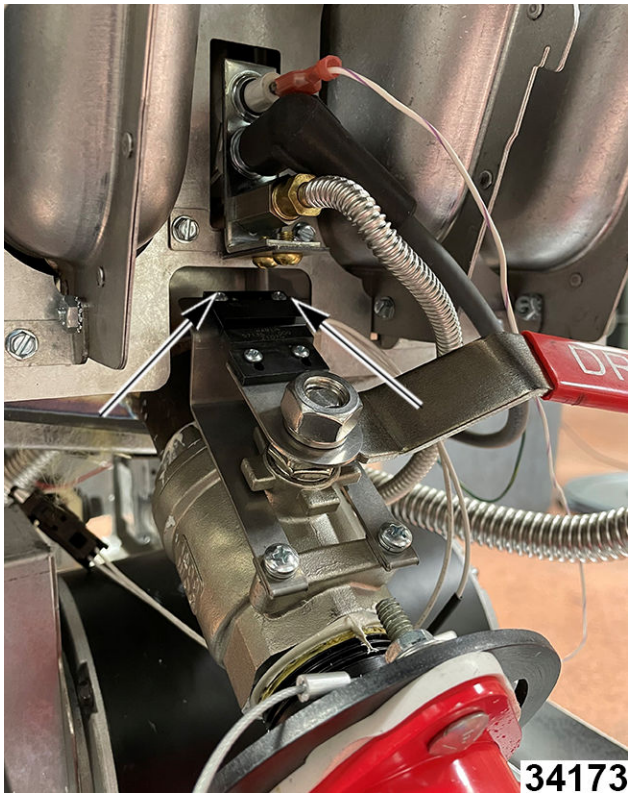


Fig. 87

4. Reverse procedure to install.
5. Verify operation.

DRAIN VALVE INTERLOCK SWITCH (D.V.I.) - STARTING SN 65026221

⚠ WARNING

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

1. Open fryer door.
2. Disconnect drain valve switch wires at plug.
3. Remove switch mounting screws.

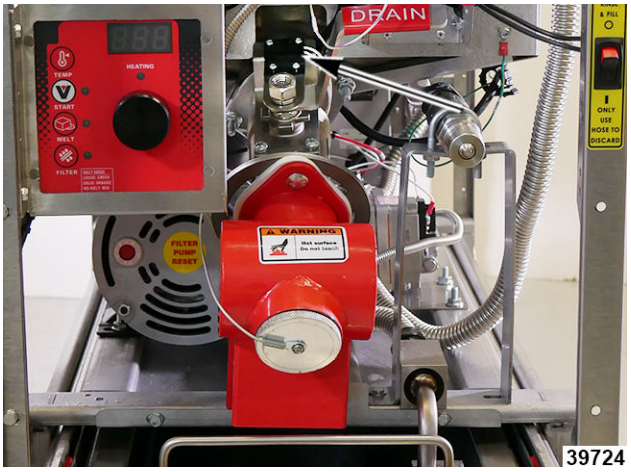


Fig. 88

4. Remove switch.
5. Install replacement switch.
6. Tighten screws.

⚠ WARNING

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

7. Turn on power supply.
8. Verify operation.
9. Close fryer door.

PILOT ORIFICE

⚠ WARNING

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

1. Disconnect flame sense wire (1, Fig. 89).

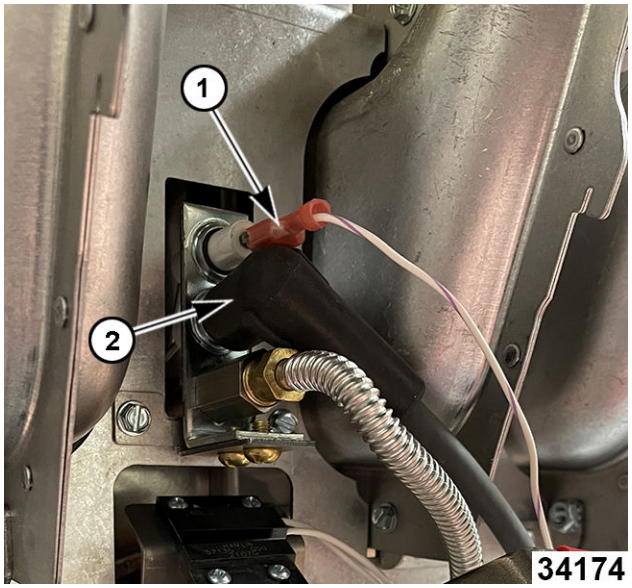


Fig. 89

2. Disconnect electrode cable (2, Fig. 89).
3. Disconnect pilot tube.

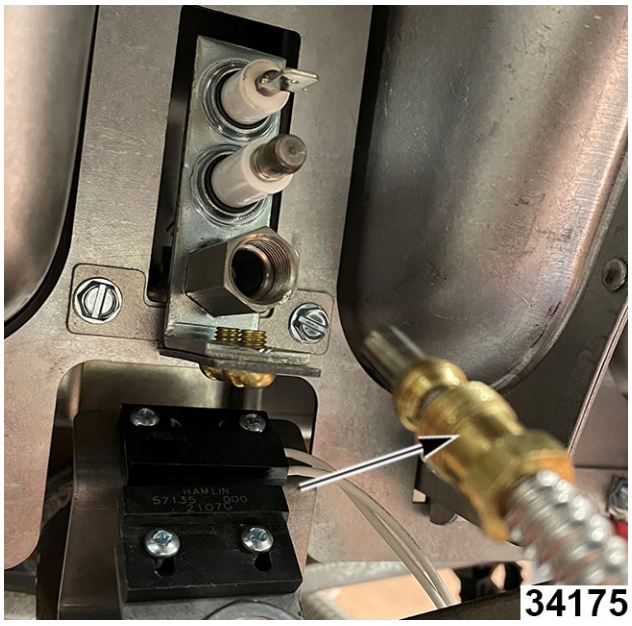


Fig. 90

4. Remove orifice from pilot assembly.
5. Reverse procedure to install.
6. Verify operation.

FRY TANK - BEFORE SN 65026221

⚠ WARNING

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

⚠ WARNING

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

1. DRAIN OIL fry tank.
2. Remove the following:
   A. Fry baskets.
   B. Basket holder (1, Fig. 91).

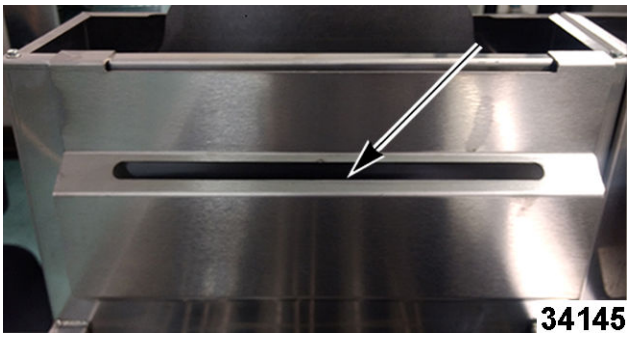


Fig. 91

   C. Basket rack.
   D. Outer flue panel (1, Fig. 92).

Fig. 92

E. BOTH SIDE PANELS.

F. BULLNOSE.

G. Banking strip (1, Fig. 93) (if a multiple tank unit).

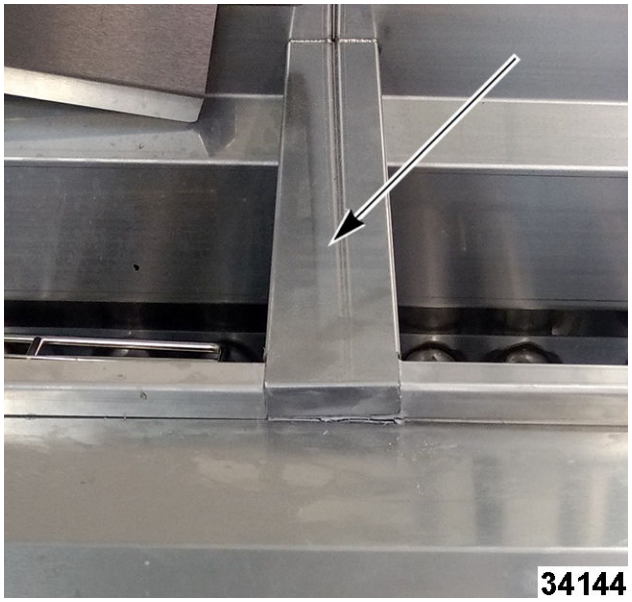


Fig. 93

PANELS EXPLODED VIEW

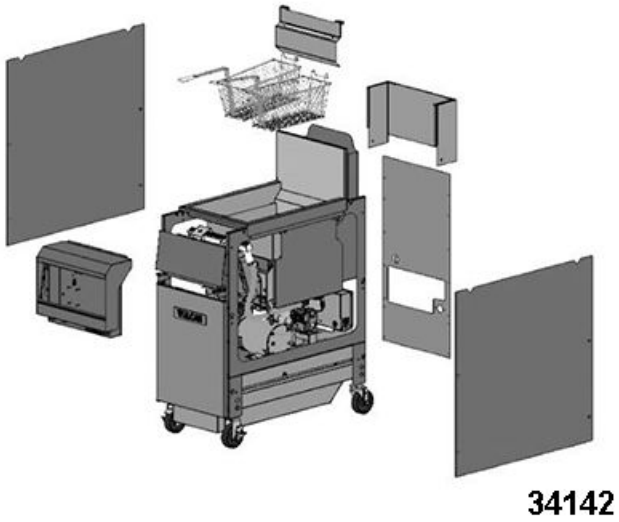


Fig. 94

3. Remove drain manifold (1,Fig. 95) and flange gasket (2, Fig. 95) if fryer has a filter system.

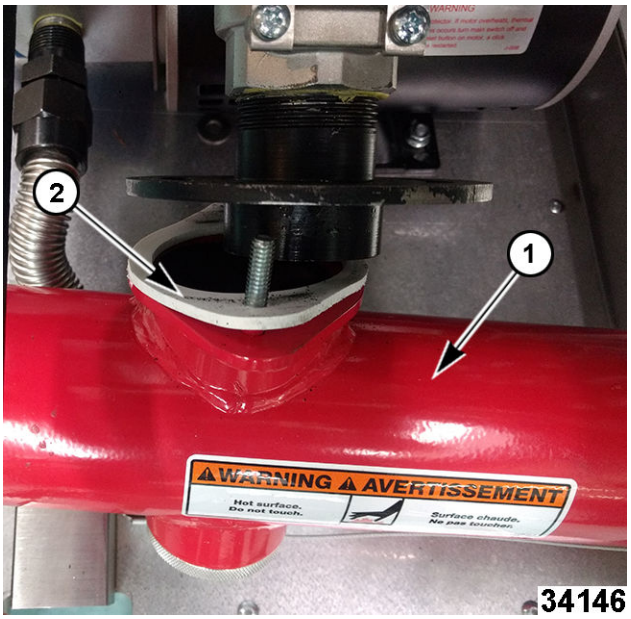


Fig. 95

4. Note and disconnect following wire harness connections.
   A. DRAIN VALVE INTERLOCK SWITCH (DVI).
   B. PILOT ASSEMBLY.
   C. OIL RETURN SOLENOID.
5. Note and remove wire harnesses from harness supports on bottom of fry tank assembly.
6. Disconnect gas lines at burner manifold (1, Fig. 96)

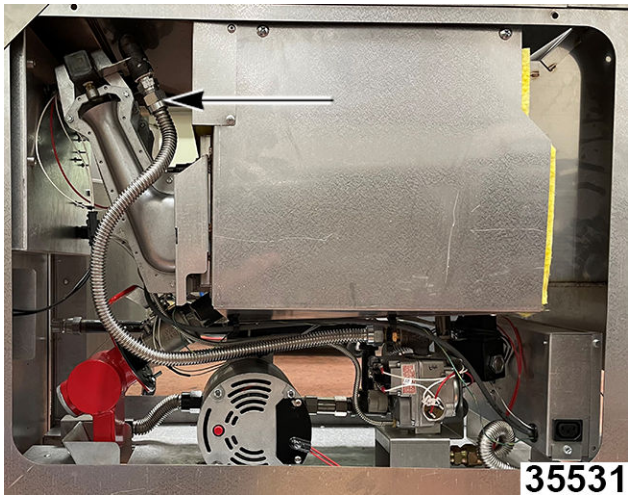


Fig. 96

7. Remove four tank hold-down nuts from tank studs.

NOTE: Two on each side, front (Fig. 97) and back (Fig. 98).

Fig. 97

Fig. 98

NOTE: If working on a two-tank unit, remove back panel and use a 14" extension to reach nut (Fig. 99) between tanks.

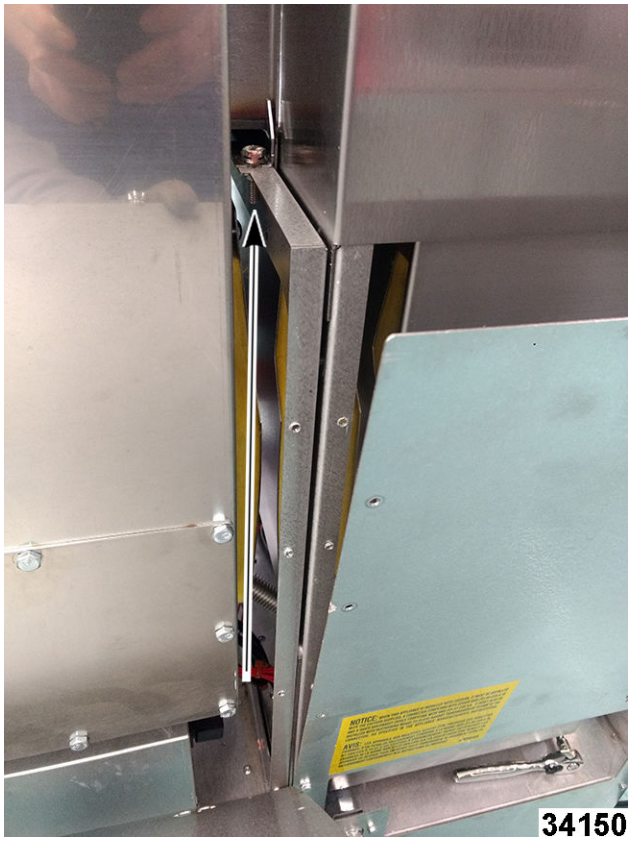


Fig. 99

8. Lift tank assembly up and out of chassis frame.

NOTE: Tank assembly includes burners, manifold, high limit, temperature probe, drain valve, oil solenoid valve and insulation kit.

9. Remove oil solenoid valve assembly (Fig. 100 and 1 in Fig. 102) and drain valve (Fig. 101 and 2, Fig. 102) from tank and install on new tank using RECTORSEAL 5® or equivalent NSF rated thread sealant.

NOTICE

Note distance from bottom of old drain valve to flange and from top of valve to tank before removing valve to separate flange from valve. The dimensions will need to be duplicated when flange and valve is reinstalled.

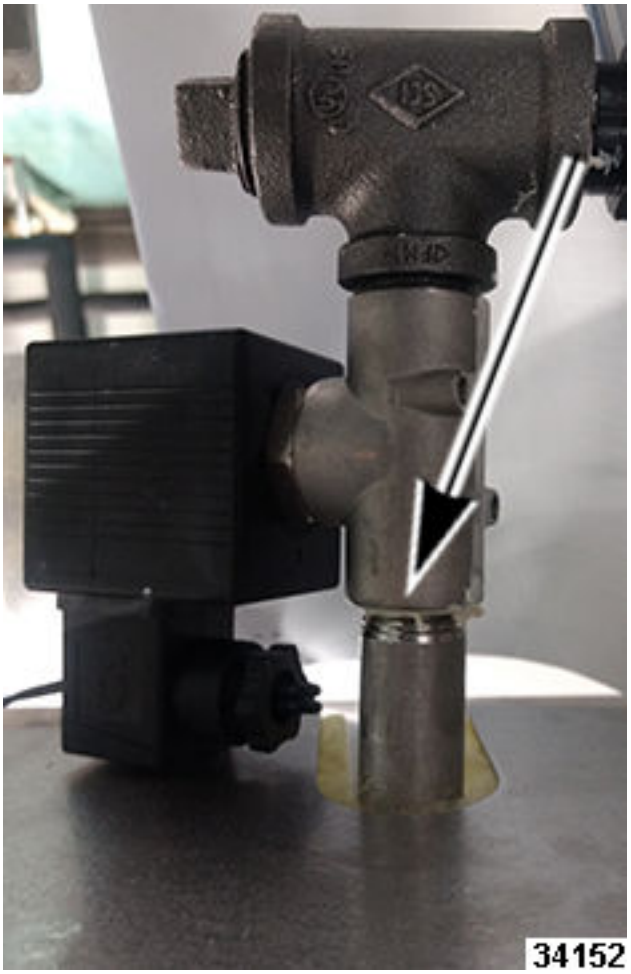


Fig. 100

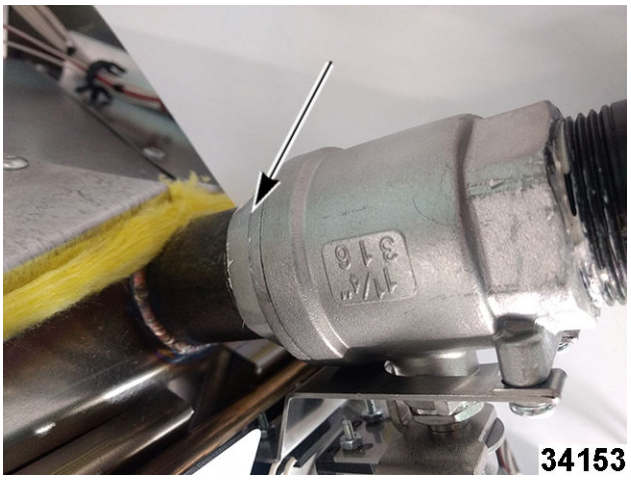


Fig. 101

NOTICE

Note distance from bottom of old drain valve to flange and from top of valve to tank before removing valve to separate flange from valve. The dimensions will need to be duplicated when flange and valve is reinstalled.

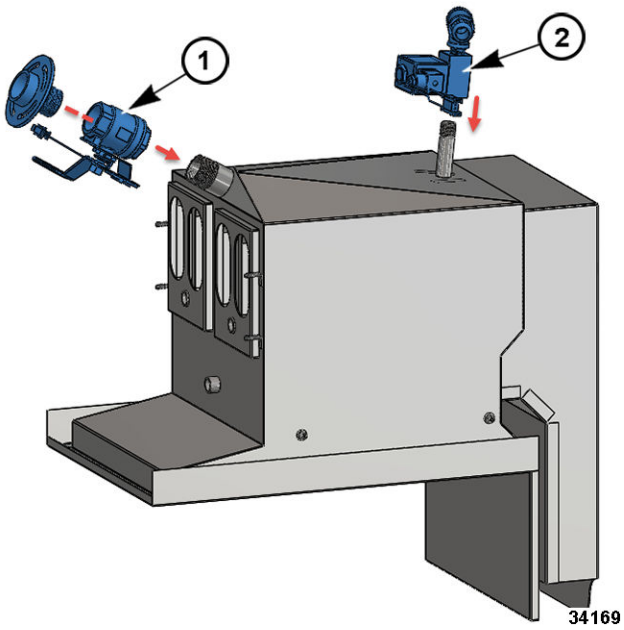


Fig. 102

10. Remove four mounting nuts (Fig. 103) holding burner assembly on tank.

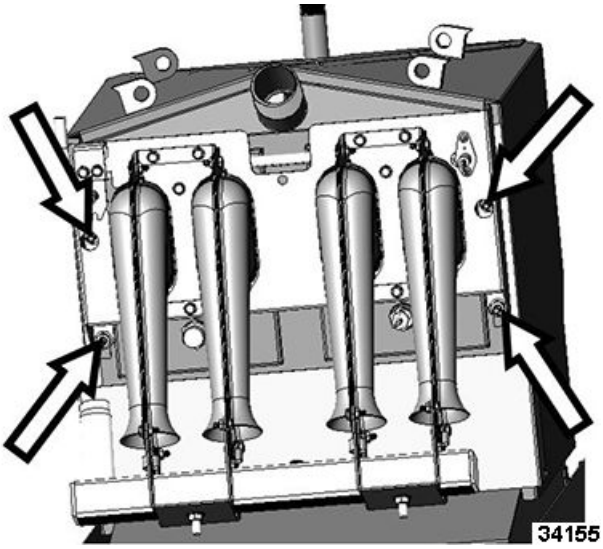


Fig. 103

11. Pull burner assembly off tank studs to remove and install on new tank.
12. Install following parts on new tank.

NOTICE

It is recommended you install new parts on new tank instead of reinstalling old parts.

A. Install insulation kit (1,in Fig. 104 and Fig. 105) by setting into place and riveting (3/16” blind rivets) sections to itself. Attach kit assembly to tank with four ¼-20 x 3/8 truss head screws, two on each side.

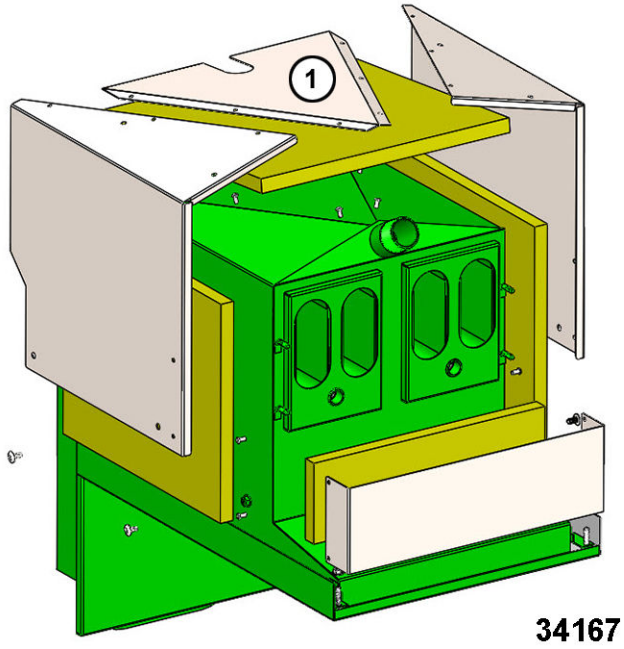


Fig. 104

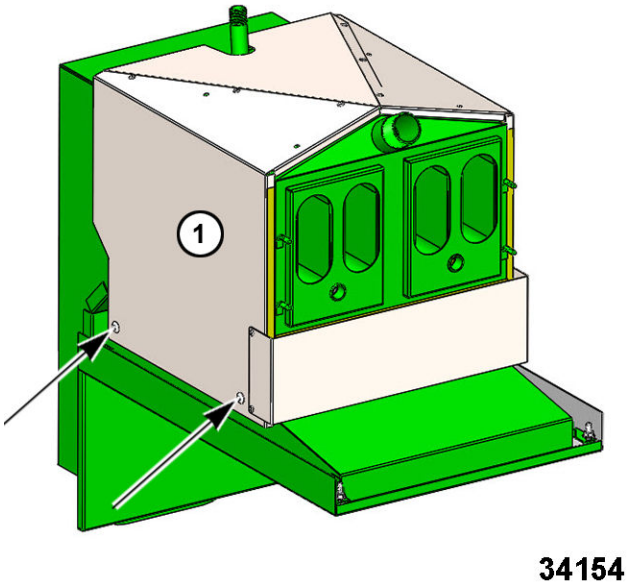


Fig. 105

B. Four wire assembly support guides.

Fig. 106

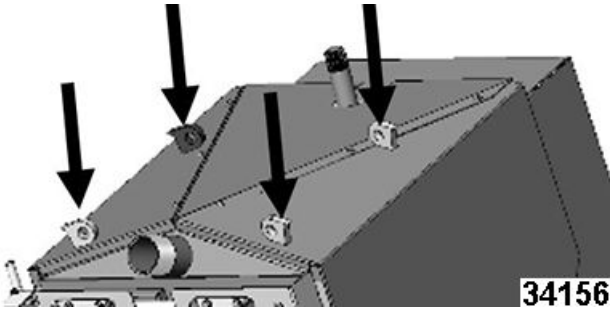


Fig. 107

C. HIGH LIMIT.

D. TEMPERATURE PROBE.

13. Reverse STEP 1 through STEP 9 to complete installation.

NOTICE

Verify drain valve is at same depth on new tank that was measured when removing. This will ensure that the drain manifold will be installable and level.

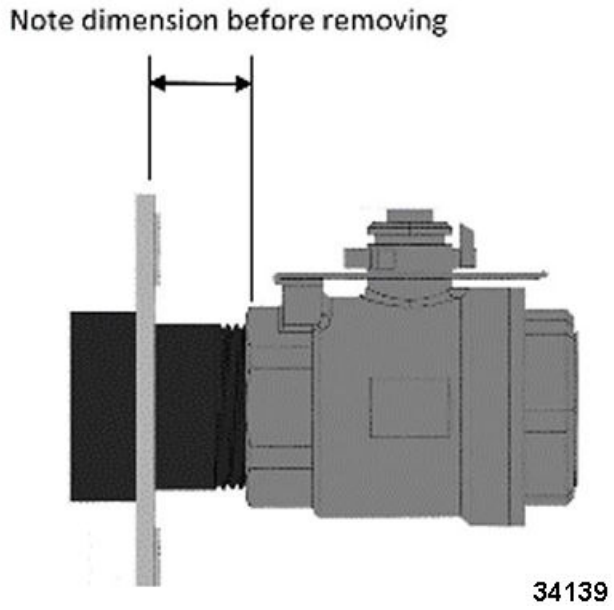


Fig. 108

14. Verify operation.
15. Check for leaks.

FRY TANK - STARTING SN 65026221

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

Tank weighs ~70lbs. Follow proper lifting procedures.

1. Remove fry baskets.
2. Remove basket holder (Fig. 109).

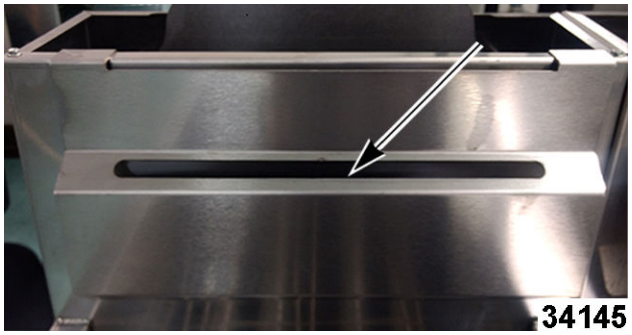


Fig. 109

3. Remove banking strip (if a multiple tank unit) (Fig. 110).

Fig. 110

4. Remove basket rack.
5. Open fryer door.
6. Remove LEFT / RIGHT SIDE PANELS.
7. DRAIN OIL from fry tank.
8. Remove C & D CONTROL PANEL / COVER.
9. Remove BULLNOSE / CONTROL PANEL MOUNT.
10. Remove ANALOG CONTROL PANEL (if installed).
11. Remove HEAT SHIELD
12. Remove BURNER to install on new tank.
13. Document and disconnect following wire harness connections:
    A. Drain valve switch (D.V.I) (1, Fig. 111).
    B. Pilot assembly (2, Fig. 111).

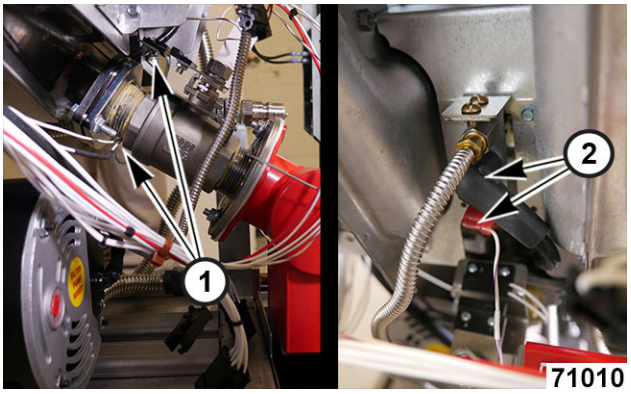


Fig. 111

14. Document and remove wire harnesses from harness support clips both sides bottom of fry tank assembly.

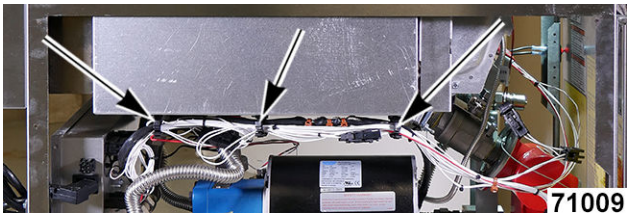


Fig. 112

15. Unmount gas line support bracket.
16. Remove drain valve bolts (1, Fig. 113).
17. Remove drain valve (2, Fig. 113) and manifold (3, Fig. 113) assembly.

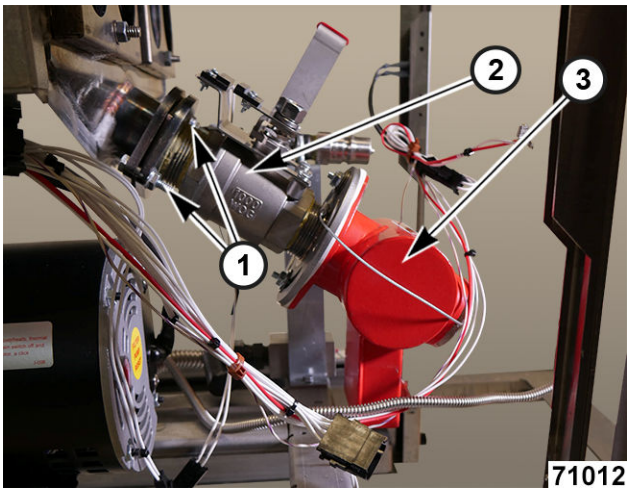


Fig. 113

18. Replace flange gasket (2, Fig. 114) if removing manifold (1, Fig. 114) from valve.

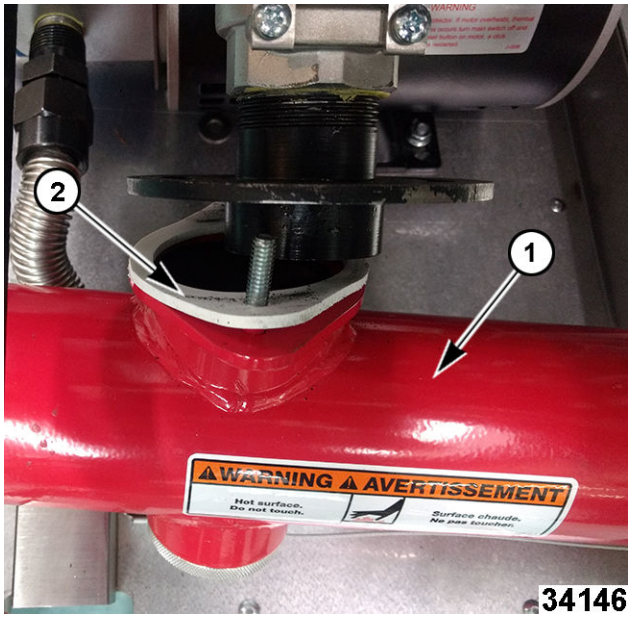


Fig. 114

19. Document and disconnect wire harness connections from oil return solenoid.

Fig. 115

20. Remove outer flue panel bolts.

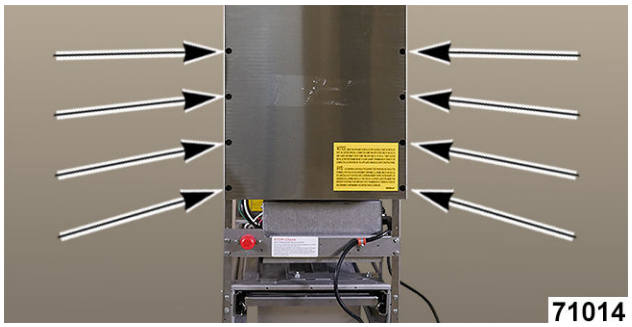


Fig. 116

21. Remove tank/flue bolts top.

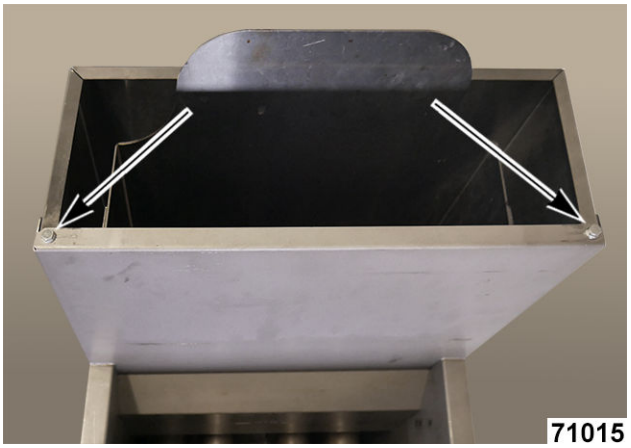


Fig. 117

22. Tilt out flue panel from bottom and remove.

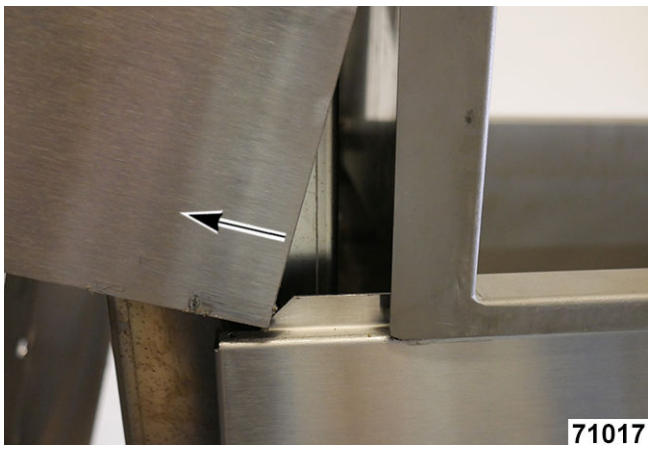


Fig. 118

NOTE: Ensure all wires, lines, attachments are detached from tank before lifting.

23. Lift tank assembly up and out of chassis frame.
24. Lay tank on drip pad.

NOTE: In the forthcoming steps, the following parts will need to be installed on new tank: insulation kit, oil solenoid valve, high limit, temperature probe, and drain valve.

NOTE: It is recommended to install new parts on new tank instead of old parts.

25. Remove oil solenoid valve assembly from tank.

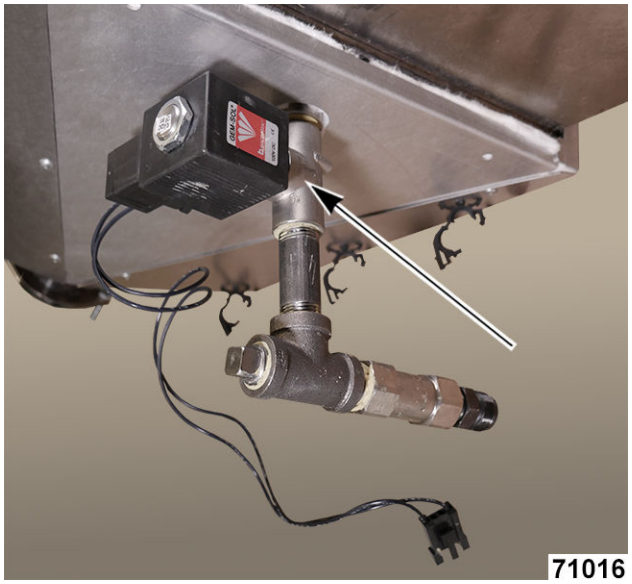


Fig. 119

26. Install insulation kit:
    A. Set into place as shown (1, Fig. 120).
    B. Rivet (3/16” blind rivets) sections to itself (2, Fig. 120).
    C. Attach kit assembly to tank with four ¼-20 x 3/8 truss head screws, two on each side (3, Fig. 120).

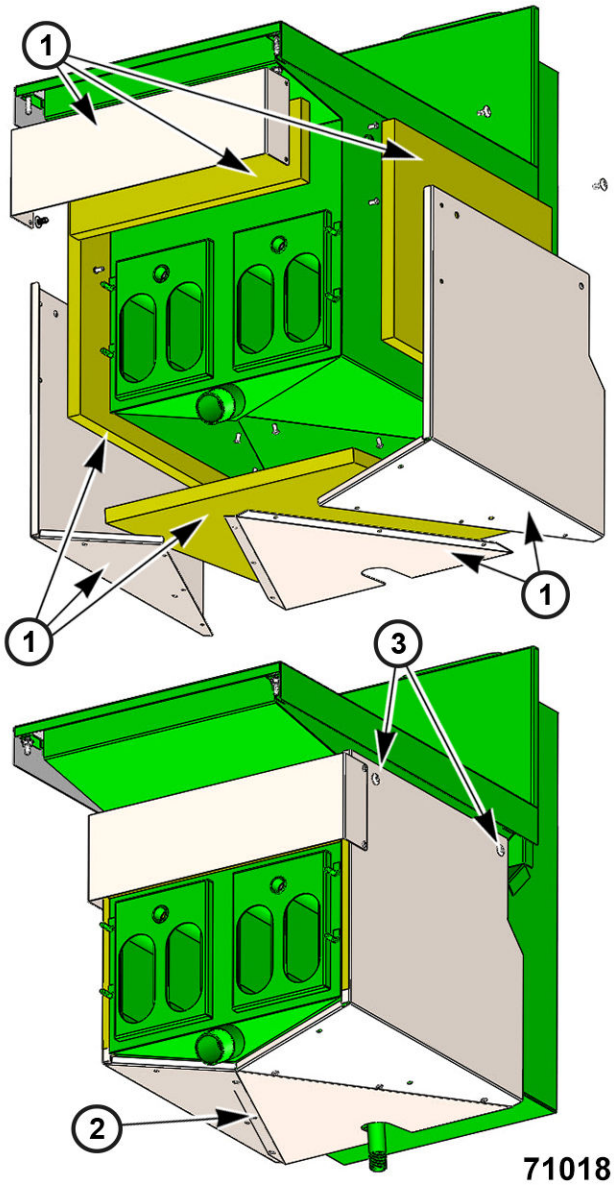


Fig. 120

27. Install oil solenoid on new tank.

NOTE: Use RECTORSEAL 5® or equivalent NSF rated thread sealant.

28. Install four wire assembly support guides.

Fig. 121

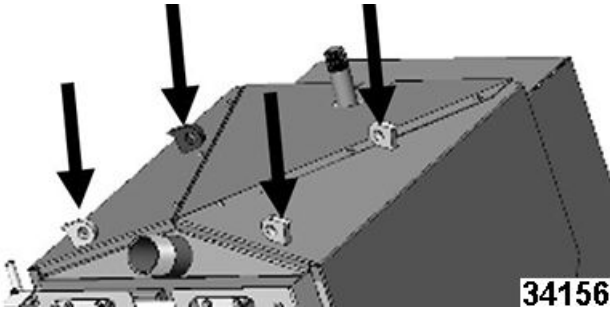


Fig. 122

29. Install new tank.
30. Install flue panel tilting bottom in.

NOTE: Ensure bottom of panel is fitted between lip and tank frame as shown.

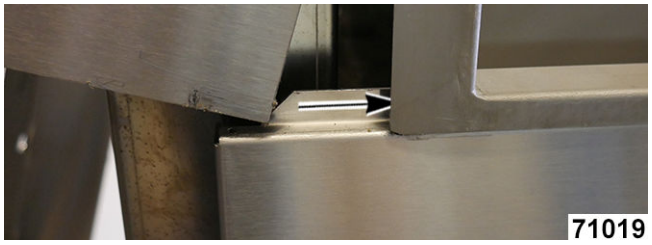


Fig. 123

31. Install top bolts.

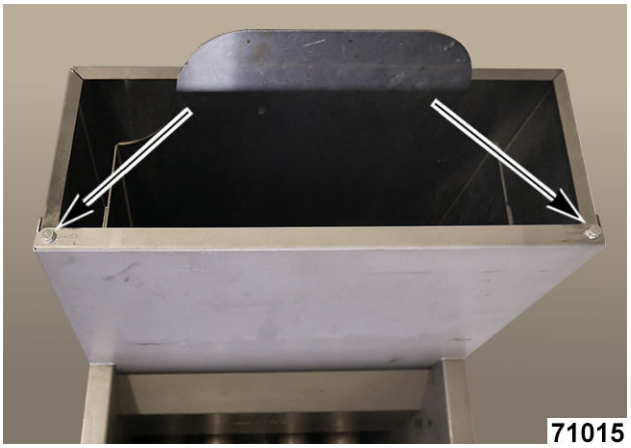


Fig. 124

32. Install flue panel bolts.

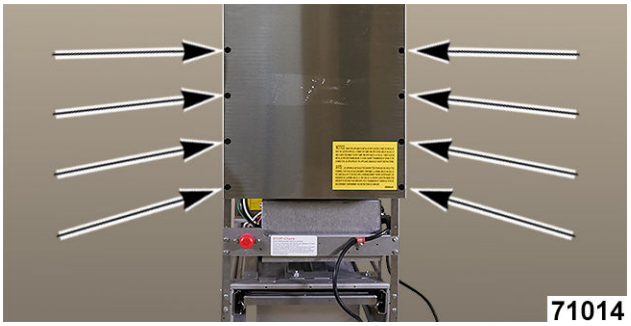


Fig. 125

33. Install .
34. Install .
35. Reconnect wires to oil solenoid.

Fig. 126

36. Install drain valve (2, Fig. 127) / drain manifold (3, Fig. 127) assembly.

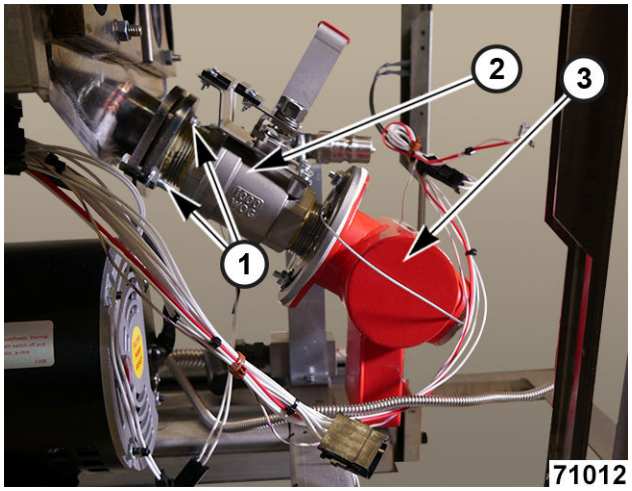


Fig. 127

37. Install and tighten flange bolts alternately and evenly (1, Fig. 127).
38. Mount gas line support bracket.
39. Re-attach wiring harnesses to clips bottom of tank.

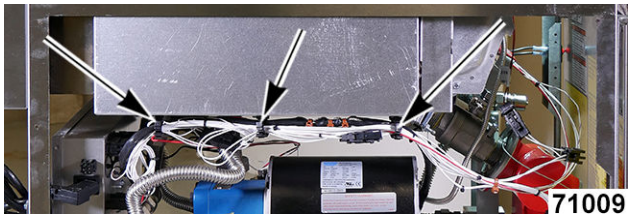


Fig. 128

40. Reconnect wiring harness to pilot assembly (2, Fig. 129).
41. Route / reconnect wiring harness to drain valve interlock switch (D.V.I) (1, Fig. 129).

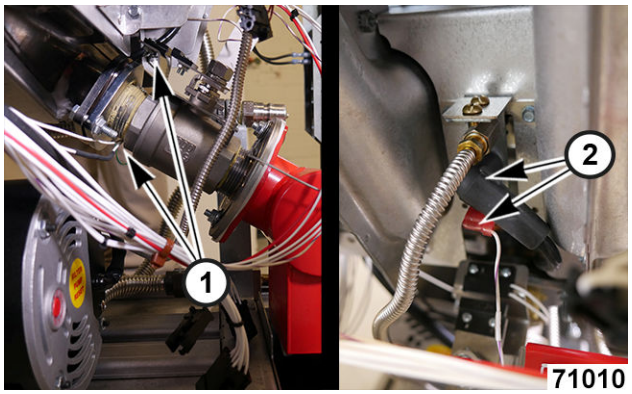


Fig. 129

42. Install BURNER on new tank.
43. Check for gas leaks as directed in BURNER instructions.

⚠ WARNING

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

44. Check for oil leaks.
45. Install HEAT SHIELD.
46. Install ANALOG CONTROL PANEL (if installed).
47. Install BULLNOSE / CONTROL PANEL MOUNT.
48. Install C & D CONTROL PANEL / COVER.

⚠ WARNING

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

49. Verify operation.
50. Recheck for oil and gas leaks.
51. Install LEFT / RIGHT PANELS.

3. SERVICE PROCEDURES TESTS AND ADJUSTMENTS

DRAIN OIL

Refer to DRAINING THE TANK for VHG A models in: ***VHG-A SERIES GAS FRYERS INSTALLATION AND OPERATION***.

Refer to DRAINING THE TANK for VHG C-D models in: ***VHG-C-D SERIES GAS FRYERS INSTALLATION AND OPERATION***.

ELECTRICAL CONNECTIONS - BEFORE SN 65026221

NOTE: This section applies to the 120V fryer only. 240V version does not come with a power cord and the Ground Fault Circuit Interrupter (GFCI) will not work due to it being rated at 125V only.

The VHG series fryers are supplied with a 120Volt cord and three prong plug. If local electrical codes require that these fryers be plugged into a GFCI. You must use GFI part number 00-913053. Other GFCI outlets may not have the correct tolerance for the spark to ground ignition system employed with the VHG series fryers.

ELECTRICAL CONNECTIONS - STARTING SN 65026221

NOTE: This section applies to the 120V fryer only.

The VHG series fryers are supplied with a 120Volt cord and three prong plug. If local electrical codes require that these fryers be plugged into a GFCI, then a high quality commercial grade GFCI outlet needs to be used to prevent issues with the spark to ground electronic ignition system employed with the VHG series fryers.

NOTE: A GFCI outlet is not required and not recommended.

TEMPERATURE PROBE FAULT CODES

The probe is an RTD (resistance temperature detector) thermistor type. As temperature increases, resistance value decreases.

Probe Fault

- If a temperature probe fault or high temperature condition occurs, a fault message will be displayed, and the electronic alarm will sound continuously on D and C controls. The heat demand and basket lift outputs are de-activated. If a cooking cycle is in process (timer active), it will be cancelled.

  This will continue until the fault clears, power is cycled, or problem is resolved.
- A High Temperature condition does not disable the keypad. If someone has their fryer at 350°F (176.6°C) and decides to take it down to 300°F (148.8°C), this will produce the high temp alarm and alarm tone C & D). Go back into program mode to reset the setpoint on C & D models or turn temperature control knob on A models to bring the control out of the error mode.

CONTROL TYPE	FAULT
D - Digital C - Computer	Open will display **PROBE OPEN** Short will display **PROBE SHORT** High Temperature on D will display **HI TEMP** High Temperature on C will display **HIGH TEMP**
A - Solid-state with Knob	Open will display **oP** Short will display **SP** High Temperature will display **HI**

TEMPERATURE PROBE TEST

CHECK

1. Turn power switch off.
2. Unplug temperature probe.
3. Test the probe using a VOM to measure resistance. Connect meter leads to temperature probe wires.
   - If measured resistance values are within allowable range, the probe is functioning properly.

NOTE: Recommendation - if still receiving a Probe Fault Code on controller, trace color coded probe wires from 6 and 12 pins of the 12-pin connector all the way to controller. Check resistance across the temperature probe wires directly at controller plug. If resistance does not match, check for loose connections and/or damaged wiring.

- If measured resistance values are outside the allowable range, install a replacement probe and check for proper operation.

TEMPERATURE	RESISTANCE (Ω)
40°F (4.4°C)*	>268900
77°F (25°C)	90,000 - 110,000
350°F (176.6°C)	604 - 836
415°F (212.7°C)**	302 - 369
460°F (237.7°C)***	191 - 233

* Control will read OPEN PROBE. Fryers installed in a non-heated kitchen can display this problem for service from time to time.

** High temperature alarm level for the cooking controls. 415°F is the max temp before a High Temp alarm is triggered. High Temp alarm also happens when the temperature is greater than 40°F above desired setpoint.

*** Shorted probe equivalent temperature

4. Reverse procedure to reconnect wires when probe is functioning properly.
5. Verify operation.

COOKING CONTROL CALIBRATION

NOTICE

Verify condition of temperature probe before proceeding. Refer to: TEMPERATURE PROBE TEST.

1. Check level of oil in fry tank.

NOTE: The level must be between MIN & MAX fill lines before proceeding.

2. Allow oil to cool below 300°F (176.6°C).
3. Place a thermocouple in the geometric center of fry tank one inch below oil surface.
4. Set cooking control to 350°F (176.6°C) and turn fryer on.
5. Monitor heat indicator lamp. When cooking control is calling for heat, lamp will be on. If cooking control is satisfied, lamp will be off.
   - Solid-state with Knob - Heat light is below display window.
   - Digital Control - LED under heat indicator; "HEATING" is displayed.
   - Computer Control - LED under heat indicator; "HEATING" is displayed.

NOTE: Agitate the oil, to eliminate any cold zones.

NOTE: The real indication of control function is the heating LED located along the top of display. Sometimes it says "HEATING" but isn't calling for heat at that moment. When the control is coming up to setpoint it will stop calling for heat early to minimize overshoot. It will say HEATING until the temperature reaches setpoint for the first time. "HEATING" really means "NOT READY TO COOK"

   A. Allow cooking control to cycle three times to stabilize oil temperature.
   B. Record meter reading from thermocouple when cooking control cycles off and on for at least two complete heating cycles.

6. Calculate the average temperature by adding the temperature reading when the heat lamp goes out to the temperature reading when the heat lamp comes on & divide this answer by 2.

   [Temp. (Lamp off) + Temp. (lamp on)] ÷ 2 = Average Temp. Example: 360° + 340° ÷ 2 = 350°F (182.2°C + 171.1°C ÷ 2 = 176.6°C).

   The average temperature should be 350°F (182.2°C) (± 5°F (±15°C)).
   - If the average temperature reading is within tolerance, cooking control is properly calibrated.
   - If the average temperature reading is out of tolerance, adjust OFFSET TEMPERATURE.

NOTE: Refer to: VHG A CONTROL SERVICE PROGRAMMING or VHG C CONTROL SERVICE PROGRAMMING or VHG D CONTROL SERVICE PROGRAMMING to adjust OFFSET TEMPERATURE.

7. Repeat average temperature calculation for up to three attempts. Allow cooking control to cycle at least two times between adjustments before performing the calculation.
8. If calibration is unsuccessful, cooking control may be malfunctioning and cannot be adjusted properly. Install a replacement cooking control and check calibration.

ELECTRONIC IGNITION CONTROL

The electronic ignition control lights the pilot, monitors the presence of a pilot flame and energizes

the main gas valve coil to ignite the burners. When control is unable to detect a pilot flame the module will begin a single trial for ignition and igniter will spark for 90 seconds. If a pilot flame has not been detected within 90 seconds, the igniter will stop sparking and will not try again until power switch is cycled.

Ignition Module Lockout

- "A" Style Controller: If pilot does not ignite within 90 seconds, PLt will show in the display window, the ignition module locks out, the heat demand is disabled, and the control locks out.
- "C" and "D" Style Controller: If pilot goes out, **PILOT OUT** will show in display window. If no action is taken after 90 seconds, an alarm sounds continuously, **IGNITION LOCKOUT** will show in display window, the ignition module locks out, the heat demand is disabled, and any running cooking cycles are cancelled.

Electronic Ignition System

⚠ WARNING

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

1. Access burner electrode.
2. Verify fry tank is full between max and min lines on back of tank.
3. Turn power switch on.
4. Bypass the Dry Fire Test:
   - A-control: **Press V-Start**
   - D-control: Press **V-PROGRAM**
   - C-control: Press **CONFIRM**
5. Verify function.
   - Look at electrode to verify spark.
   - If no spark is seen but can be heard, carefully look along igniter wire for cuts and damage.
   - If igniter wire is undamaged, open power box to ensure igniter wire is properly installed onto ignition module.
   - Ensure electrode is sparking to pilot burner head.
   - Spark gap between electrode and pilot burner head should be 0.120 in. +- 0.010 in (Fig. 130), approximately 1/8".

NOTE: A replacement assembly should come with correct gap, but must be verified.

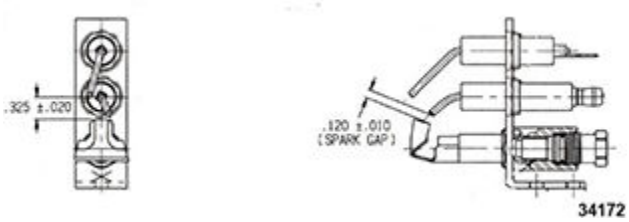


Fig. 130

GAS MANIFOLD PRESSURE ADJUSTMENT

⚠ WARNING

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

⚠ WARNING

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

NOTICE

Service connection, ½" (13mm) ID and 3/4" (19mm) OD rear gas connection for single units and 1-1/4"(31.75mm) for battery units.

1. Open the door(s) and turn the gas combination valve off (1, Fig. 132).
2. To measure the manifold pressure, remove the 1/8-inch NPT plug (pressure tap) from the gas valve and attach a manometer.

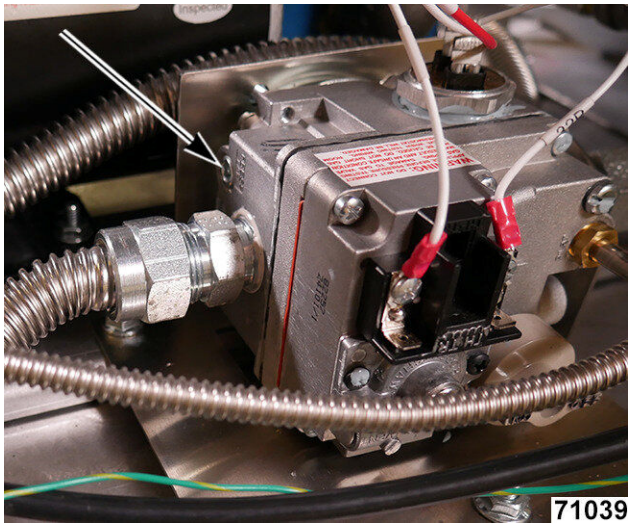


Fig. 131

3. Turn the gas supply, gas combination valve and the main power switch to on.

NOTE: Verify burners light.

4. Observe the manometer pressure reading and compare to the pressure chart near the end of this procedure.
   - If other appliances are connected to the same gas line, turn them all on and check manometer pressure reading again. If a pressure drops of ½ inch water column or more is observed, then gas supply needs to be checked by the gas line installer or local gas company for adequate sizing.
   - If adjustment is necessary, continue with procedure.
5. Remove adjustment screw cover (2, Fig. 132) to access pressure adjustment screw.
   - To increase pressure, turn the screw clockwise.
   - To decrease pressure, turn the screw counterclockwise.

NOTE: Accurate gas pressure adjustments can only be made with gas on and burner lit.

6. Set pressure as outlined below:

Gas Type	PRESSURE READINGS			
	Mani-fold	Line		
		Recommended	Min.	Max.
Natural	3.5 W.C.	7-9 W.C.	6 W.C.	14 W.C.
Pro-pane	10 W.C.	11-12 W.C.	11 W.C.	14 W.C.

NOTE: If incoming line pressure is less than minimum stated, then manifold pressure cannot be set correctly.

7. Once the correct pressure has been set, turn power switch off, replace adjustment screw cap and 1/8" NPT plug (pressure tap) on the outlet side of valve.
8. Check for proper operation and adjust if necessary.

PILOT ADJUSTMENT

A. Remove gas valve pilot adjustment cover (3, Fig. 132) to expose adjustment screw.

B. Adjust flow with pilot lit. The flame sensor should be surrounded (engulfed) by as much of the outer cone of the pilot flame as practical, allowing maximum current (DC micro-amp) flow.

C. Turn pilot adjustment.
   - Clockwise decreases pilot flow.
   - Counterclockwise increases pilot flow.

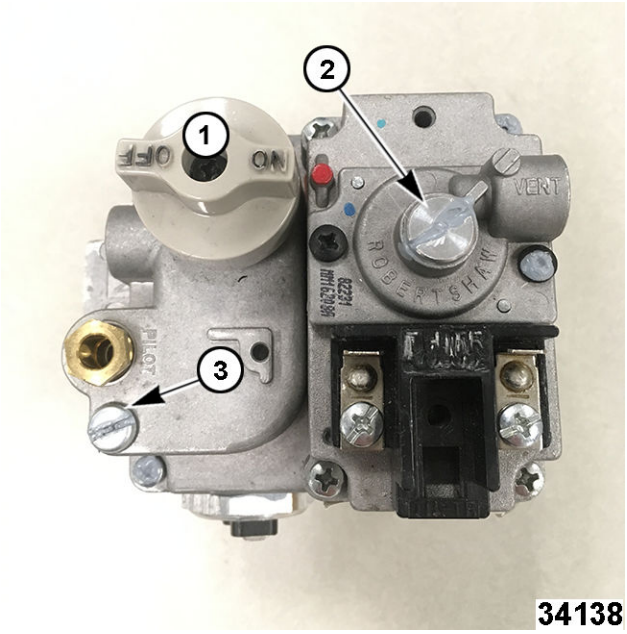


Fig. 132

GAS VALVE

A ON/OFF Knob

B Gas Pressure Adjustment Screw Cover

C Pilot Adjustment Screw Cover

⚠ WARNING

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

FLAME SENSE CURRENT CHECK

⚠ WARNING

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

1. Access flame sense wire at pilot assembly (1, Fig. 133).

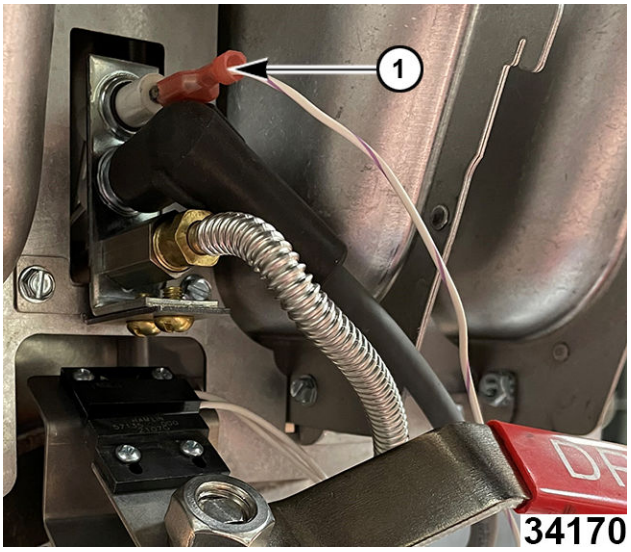


Fig. 133

2. Connect a true RMS or analog DC microammeter in series between the flame sense rod terminal and the flame sense wire terminal, set to DC microamps µA.
3. Power up fryer and have it call for heat.
4. Verify a minimum microamp reading of at least 1.0 DC microamp.

   Reading

   - Greater or equal to value given, then flame sense current is within tolerance.
   - Lower than value given, then troubleshoot flame sense circuit.
   - Below 0.0 microamps, reverse meter leads and take another reading.

NOTE: Alternative method: Check flame sense directly at ignition module in power supply box. Access POWER SUPPLY and take reading. A digital voltmeter may be used to measure DC voltage between FC+ and FC- terminals. Each micro-amp of flame current produces 1.0 VDC. For example, 2.0 VDC equals 2.0 µA.

4. FIRMWARE / SOFTWARE

FIRMWARE / SOFTWARE

Not applicable to this machine.

5. PROGRAMMING

VHG A CONTROL SERVICE PROGRAMMING

1. Enter service mode. (Fig. 134)
   A. Simultaneously press and hold **START** and **MELT** buttons for 3-5 seconds until “At” displays (may also show PF, Er or CEF).
   B. Select **“At”** (for atmospheric burners) only for VHG Series model fryers.
   C. Remaining options to be used for different fryer models. Turning the knob cycles through the options for each service setting.
   D. Press **START** button when finished to move on to next service setting.

Fig. 134

2. **VAt** will display and tank size setting will toggle back forth. (Fig. 135)
   - Select either **50** (if 4 burners per tank) or **75** (if 6 burners per tank) for the tank size on VHG models.

NOTE: The remaining options are to be used for different fryer models.

Fig. 135

3. **oFS** will display and **offset** setting will toggle back forth. (Fig. 135)
   A. Select **desired temperature** offset setting.
   B. Select **0** if unsure of previous offset setting.

Fig. 136

4. **FLt** will display and **oFF** or **on** setting will toggle back and forth. (Fig. 137)
   - Select **on** if the fryer has a built-in oil filtration system or **oFF** if it does not.

Fig. 137

5. **F** or **C** will display (Fig. 138).
   - Select **F** for Fahrenheit temperature scale or **C** for Celsius.

Fig. 138

6. **dF** will display and **oFF** or **on** setting will toggle back and forth. (Fig. 139)
   - Turn Dry Fire Test **off** or **on** with this setting.

Fig. 139

7. Press **START** button to exit service settings mode and normal operation will begin.

VHG C CONTROL SERVICE PROGRAMMING

1. Enter service mode.
   A. Cycle power switch.
   B. Press **PROGRAM** when VULCAN FRYER (Fig. 140) appears on the screen for the second time and **SERVICE MODE** (Fig. 141) will appear.

NOTE: Lights over the buttons with service setting functions will illuminate.

Fig. 140

Fig. 141

2. Select service setting being checked or changed.
   A. Press **UP** and **DOWN** arrows on **PROGRAM** button to cycle through each setting.
   B. Press **CONFIRM** to save change or **CANCEL** button to exit without saving setpoint change.

BUTTON LEGEND (LEFT TO RIGHT)	
1.	Keypad configuration.
2.	Temperature scale.
3.	Filter mode.
4.	Fryer type and tank size.
5.	Temperature offset.
6.	Basket lift.
7.	Recovery type.
8.	Oil level probe enable.
9.	Diagnostic mode.
17.	Copy factory settings from USB.
18.	Copy factory settings to USB.

3. **CONFIG** will display. Select the keypad configuration to match the overlay (Fig. 142) represents the 1-9 1-9. The configuration numbered buttons are arranged in two sections of 1-9.

Fig. 142

4. **TEMP SCALE** will display (Fig. 143). Select **Fahrenheit** or **Celsius** temperature scale.

Fig. 143

5. **MODE** will display (Fig. 144). Select **FILTER** if the fryer has a built-in oil filtration system or **NON-FILTER** if it does not.

Fig. 144

6. **FRYER TYPE** will display. Remaining options are to be used for different fryer models.
   A. Only select **AT** (for atmospheric burners) for the VHG Series model fryers. Remaining options are to be used for different fryer models. (Fig. 145)
   B. Press **CONFIRM** button once the correct **FRYER TYPE** is displayed.
   C. **VAT SIZE?** will display. Only select either **50 (4 burners per tank)** or **75 (6 burners per tank)** for tank size on VHG models. (Fig. 146)
   D. Remaining options are to be used for different fryer models.

Fig. 145

Fig. 146

7. **TEMP OFFSET** will display (Fig. 147).
   A. Select desired temperature offset setting.
   B. Select **0F** if unsure of previous offset setting.

Fig. 147

8. **BASKET LIFTS** will display (Fig. 148). Select **0** if there are no automatic basket lifts or 1-2 for the number of automatic basket lifts per tank.

Fig. 148

9. **RECOVERY** will display (Fig. 149).

NOTE: This feature is not currently used and is not a changeable service option.

Fig. 149

10. **LEVEL PROBE ENABLE** will display (Fig. 150).

NOTE: This feature is not currently used and should be set to **NO**.

Fig. 150

11. **DIAGNOSTIC MODE**will display (Fig. 151). The lights over the buttons with diagnostics functions will illuminate.

    A Go to the function you wish to check by pressing corresponding button.

    B Pressing **CONFIRM** or **CANCEL BUTTON** will allow you to return to diagnostic menu and make another selection.

    - **LEFT BASKET** Toggling the 1 button moves the left basket lift (if applicable) up and down.
    - **RIGHT BASKET** Toggling the 2 button moves the right basket lift (if applicable) up and down.
    - **HEATER** Toggling the 3 button turns the heating function off and on.
    - **FILTER PUMP** Toggling the 4 button turns the filter pump (if applicable) off and on.
    - **DRAIN SWITCH** Indicates the drain switch status by toggling either CLOSED or OPEN on the display.
    - **LED Test** Tests controller LEDs by illuminating all simultaneously.
    - **VAT TEMP** – Displays the current tank temperature.

Fig. 151

12. Pressing **CANCEL** button twice or pressing **CANCEL** button after **CONFIRM** button will return to service mode.
13. Pressing **PROGRAM** button after **CONFIRM** or **CANCEL** button exits service mode and normal operations will begin.
14. **COPY FACTORY FROM USB?** will display (Fig. 152) by pressing **17 button** while in service mode.

NOTE: This uploads control configuration from USB.

A. Insert USB into USB port.

NOTE: USB needs to have factory configuration files saved in top level of USB drive before inserting.

B. Press the **CONFIRM** button.

C. Control displays **WORKING** and then **USB COPYING COMPLETED**.

Fig. 152

15. **COPY FACTORY TO USB?** will display (Fig. 153) by pressing **18 button (far right)** while in service mode. This will download original factory control configuration to a USB.

    A. Insert USB into USB port.

    B. Press the **CONFIRM** button.

    C. Control displays **WORKING** and then **USB COPYING COMPLETED**.

Fig. 153

VHG D CONTROL SERVICE PROGRAMMING

1. Enter service mode.

    A. Cycle power switch.

    B. Press **PROGRAM** button when VULCAN first appears on screen.

Fig. 154

2. **TEMP** will display.

    A. Select F for Fahrenheit temperature scale or C for Celsius.

    B. Pressing **UP** and **DOWN** arrows of the **PROGRAM** button cycles through the options for each service setting.

    C. Press **PROGRAM** button when finished to move on to the next service setting.

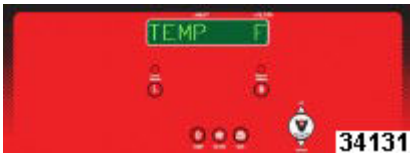


Fig. 155

3. **FILT?** will display. Select **Y** if fryer has a built-in oil filtration system or **N** if it does not.

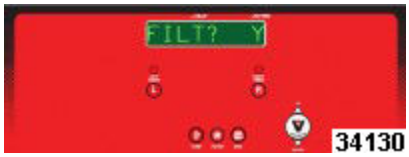


Fig. 156

4. **TYPE** will display. Only select **AT** (for atmospheric burners) for the VHG Series model fryers. Remaining options are to be used for different fryer models.

Fig. 157

5. **VSIZE** will display. Select **50** (4 burners per tank) or **75** (6 burners per tank) for the tank size on VHG models. Remaining options are to be used for different fryer models.

Fig. 158

6. **OFS** will display. Select desired temperature offset setting. Select **0F** if unsure of previous offset setting.

Fig. 159

7. **BASKET** will display. Select 0 if there are no automatic basket lifts or 1-2 for the number of automatic basket lifts per tank.

Fig. 160

8. **DIAGMODE** will display.

NOTE: Diagnostics mode is the last service setting feature.

9. Cycle through diagnostics mode options with **PROGRAM** button. Each diagnostic function can be tested by pressing **UP** or **DOWN** arrows of the **PROGRAM** button.
   - **D-BASK L** Test the left automatic basket lift function.
   - **D-BASK R** Test the right automatic basket lift function.
   - **D-HEAT** Test the heating function.
   - **D-FILTER** Test filtering- pump motor function
   - **D-DRAIN** Indicates the drain switch status by toggling either **CLOSED** or **OPEN** on the display.

Fig. 161

NOTE: Pressing the **PROGRAM BUTTON** again exits diagnostics mode and normal operation will begin.

6. ELECTRICAL OPERATION

COMPONENT FUNCTION - KLEENSCREEN FILTER CONTROLS - BEFORE SN 65026221

Fill Solenoid Valve	When energized by the filter button, the solenoid valve opens to allow flow of oil to return to the tank. When disabled by the oil discard switch, the solenoid valve remains closed when the filter button is energized to allow 100% of oil flow to be discarded through the oil wand or by the optional rear oil discard port.
Pump Motor	Operates pump to circulate oil through filtering system.
R1 Pump Motor Relay	When 24VAC relay coil is energized by filter button, supplies 120VAC to pump motor; and fill solenoid valve (through R2 fill relay N.C. contacts).
R2 Fill Relay	When 24VAC relay coil is energized by filter button, supplies 120VAC to the fill solenoid valve to open the valve and allow oil to flow through filter system.
Oil Discard Switch	When activated, the oil discard switch disables the fill solenoid valve from opening to prevent oil from flowing back to the tank. This feature requires the oil wand to be connected to the front oil quick disconnect or a rear oil discard system connected to the optional rear oil discard quick disconnect.

COMPONENT LAYOUT & FUNCTION - KLEENSCREEN FILTER CONTROLS - STARTING SN 65026221

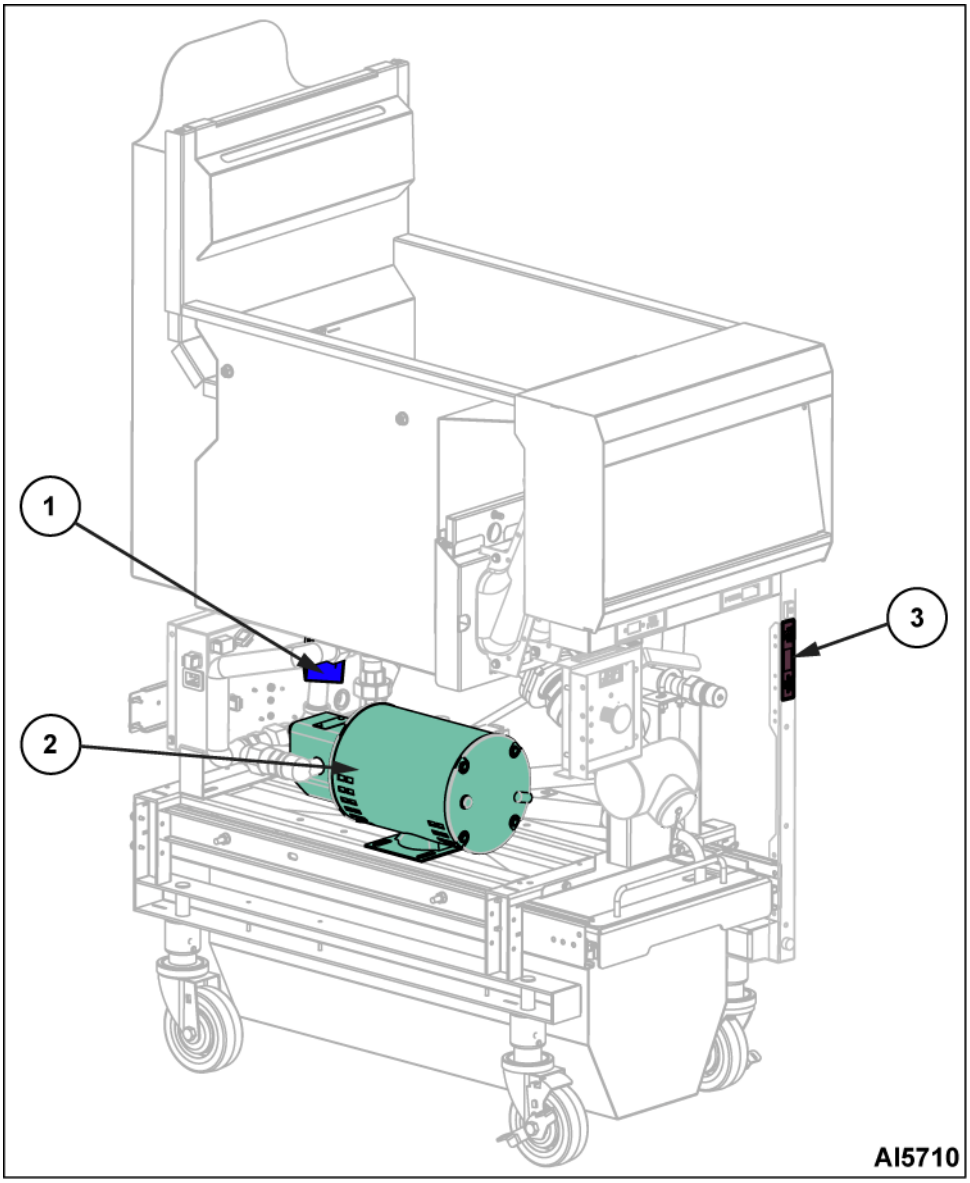


Fig. 162

ITEM	ELECTRICAL CALLOUT	FUNCTION
1	Fill Solenoid Valve	When energized by the filter button, the solenoid valve opens to allow flow of oil to return to the tank. When disabled by the oil discard switch, the solenoid valve remains closed when the filter button is energized to allow 100% of oil flow to be discarded through the oil wand or by the optional rear oil discard port.
2	Pump Motor	Operates pump to circulate oil through filtering system.
3	Filter Rinse / Filter Discard Switch	When activated, the oil discard switch disables the fill solenoid valve from opening to prevent oil from flowing back to the tank.

ITEM	ELECTRICAL CALLOUT	FUNCTION
		This feature requires the oil wand to be connected to the front oil quick disconnect or a rear oil discard system connected to the optional rear oil discard quick disconnect.
COMPONENTS NOT SHOWN		
	Pump Motor Relay (R1)	When 24VAC relay (R1) is energized by filter button, supplies 120VAC to pump motor, and fill solenoid valve (thru R2 fill relay N.C. contacts).
	Fill Relay (R2)	When 24VAC relay (R2) is energized by filter button, supplies 120VAC to the fill solenoid valve to open the valve and allow oil to flow through filter system.

COMPONENT LOCATION & FUNCTION - BEFORE SN 65026221

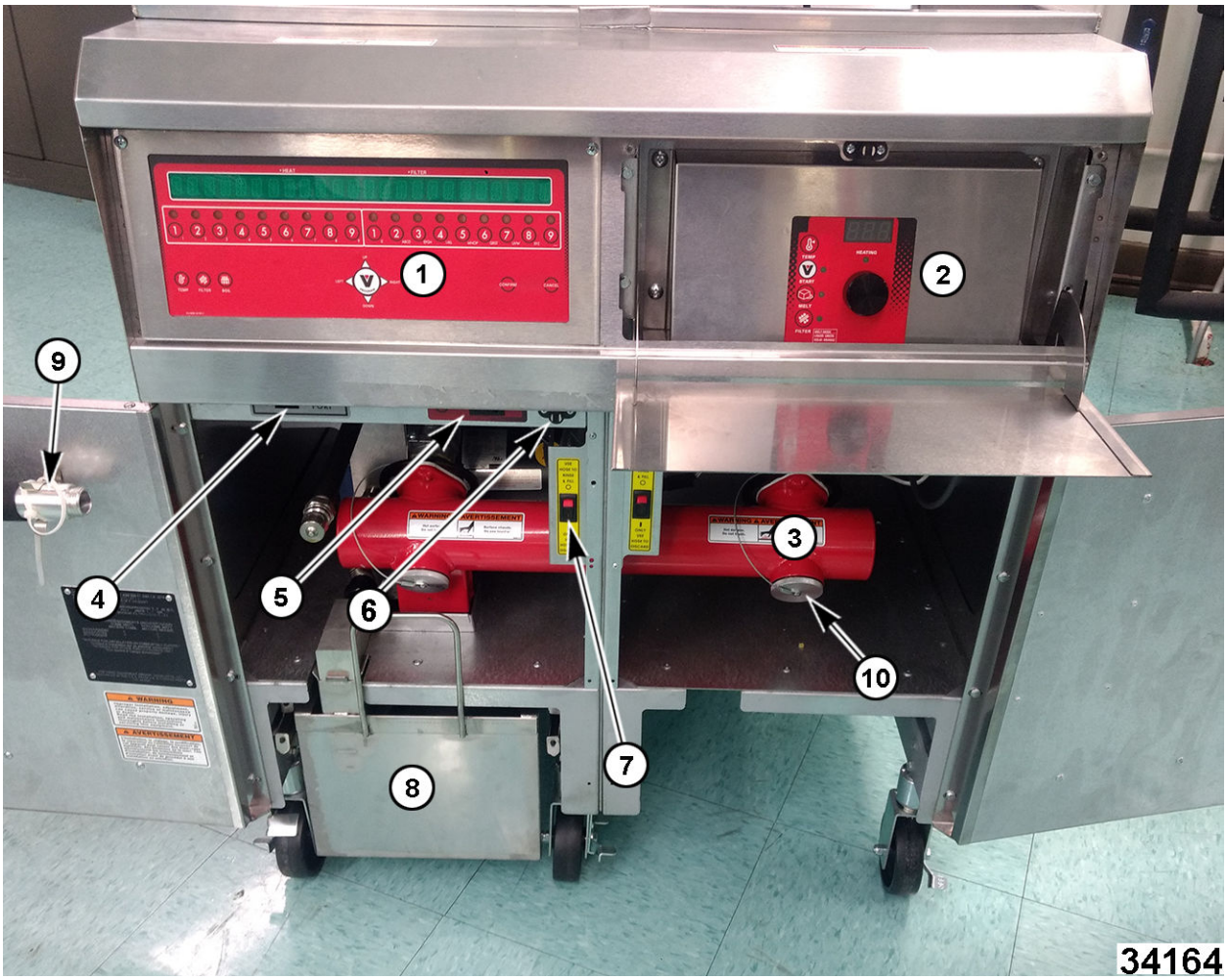


Fig. 163

ITEM	COMPONENTS	FUNCTION
1	C & D Control Panel	Monitors and evaluates input signals to the control: Activates heat output signal to maintain oil temperature; counts product cook

ITEM	COMPONENTS	FUNCTION
		time(s) and signals the electronic alarm at the end of a cooking cycle (D and C only); activates the left and right lift output signal to operate the basket lifts(s) (D and C only); and activates filter output signal to power the fill solenoid valve. **NOTE:** By utilizing the same wiring harness connections A, D and C controls are interchangeable between fryers. However, A-control requires specific sheet metal to be properly mounted.
2	Analog Control Panel	Monitors and evaluates input signals to the control: Activates heat output signal to maintain oil temperature. **NOTE:** By utilizing the same wiring harness connections A, D and C controls are interchangeable between fryers. However, A-control requires specific sheet metal to be properly mounted.
3	Drain Manifold	Interconnects drain pipes from tanks on multi-tank (battery) fryers.
4	USB Port	Used to update software and load menu programs.
5	On/Off Switch / Power Switch	Supplies power to control circuit for fryer operation and filtering.
6	Door Push Magnet	Holds door closed when fryer is in use.
7	Filter Rinse/Oil Discard Switch	When activated, the oil discard switch disables the fill solenoid valve from opening to prevent oil from flowing back to the tank. This feature requires the oil wand to be connected to the front oil quick disconnect or a rear oil discard system connected to the optional rear oil discard quick disconnect.
8	KleenScreen Filter Pan	For units with filtration: contains Suction Tube, Screen Assembly and Crumb Basket.
9	Boil-Out By-Pass Pipe	Boil-Out-Bypass Pipe come with fryers that have built-in filtration. The pipe bypasses the filter system to allow for quick and easy discard of water during boil-out process.
10	Boil-Out By-Pass Drain Plug	Installed for normal operation. Removed to install Boil-Out ByPass Pipe during boil out procedure.
PARTS NOT SHOWN		
	Igniter	Ignites the pilot burner.
	Ignition Control Module	Controls and monitors gas pilot ignition. Energizes pilot valve coil on the gas combination valve and generates spark for pilot ignition. Monitors the presence of a flame and supplies an ignition status input signal to the cooking control
	Control Interface Board	There are two different interface boards. One is the standard model which has a heat control Triac and K1 N.O. relay for the filter pump. The other optional interface board is for basket lift equipped fryers and has a heat control Triac and K1, K2, & K3 N.O. relays.

ITEM	COMPONENTS	FUNCTION
	Transformer	Supplies 24VAC to the cooking control, also supplies power to ignition control module. Transformer is energized when power switch is turned on.
	Gas Combination Valve	Allows gas flow to the pilot when pilot valve coil is energized, gas flow to the burners when main valve coil is energized, and regulates gas manifold pressure.
	High Limit Thermostat	Prevents the oil from reaching temperatures over 450°F (232.2°C) (auto reset @ 415°F (212.7°C). Serves as a backup to the cooking control's high temperature alarm setting of 415°F (212.7°C) or more than 40°F (4.4°C) over setpoint, whichever occurs first (normal operation resumes when temperature falls below this point).
	Temperature Probe	Senses temperature of oil. Converts the temperature into a resistance value which is monitored by the cooking control. The probe is an RTD (resistance temperature detector) of the Thermistor type. As temperature increases the resistance value decreases.
	Drain Valve Interlock Switch (DVI)	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/ closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
	Flame Sensor	The flame presence conducts and rectifies a micro amp flame sense current that is detected by the ignition control module.
KLEENSCREEN FILTER CONTROLS PARTS NOT SHOWN		
	Fill Solenoid Valve	When energized by the filter button, the solenoid valve opens to allow flow of oil to return to the tank. When disabled by the oil discard switch, the solenoid valve remains closed when the filter button is energized to allow 100% of oil flow to be discarded through the oil wand or by the optional rear oil discard port.
	Pump Motor	Operates pump to circulate oil through filtering system.
	R1 Pump Motor Relay	When 24VAC relay coil is energized by filter button, supplies 120VAC to pump motor; and fill solenoid valve (through R2 fill relay N.C. contacts).
	R2 Fill Relay	If filter / discard switch is in "Use hose to rinse & fill" position, supplies 120VAC to the fill solenoid valve to open the valve and allow oil to flow through filter system.

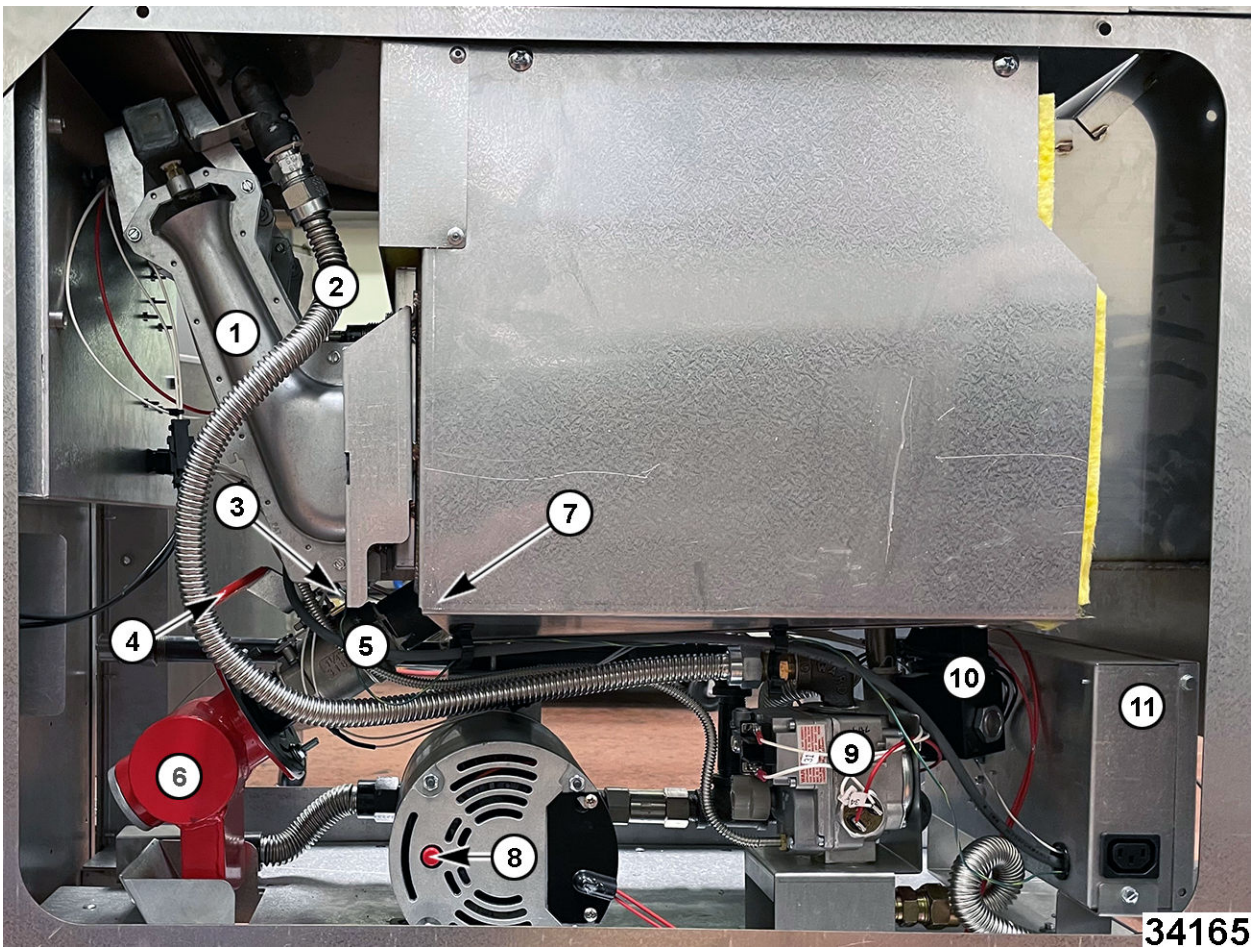


Fig. 164

ITEM	COMPONENT	FUNCTION
1	Burner Assembly	Supplies heat to heat exchanger.
2	Gas Line	Supplies gas from gas combination valve to burner assembly.
3	Pilot Assembly	Provides ignition source for burners.
4	Drain Valve Handle	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
5	Drain Valve Assembly	Interconnects drain pipes from tanks on multi-tank (battery) fryers. Used to empty contents of tank, either into filter pan for units with filtration, or container for units without filtration or for water after a boil out.
6	Drain Manifold	Interconnects drain pipes from tanks on multi-tank (battery) fryers.

ITEM	COMPONENT	FUNCTION
7	Pilot Orifice	Located inside of pilot assembly, controls flow of gas to pilot for either Natural or LP gas.
8	Filter Pump Motor (arrow pointing at reset button)	Operates pump to circulate oil through filtering system.
9	Gas Combination Valve	Allows gas flow to the pilot when pilot valve coil is energized, gas flow to the burners when main valve coil is energized, and regulates gas manifold pressure.
10	Oil Return Solenoid Valve	Opens when unit is filtering to allow oil to return to tank. After filtering, it closes to ensure oil stays in tank. When energized by the filter button, the solenoid valve opens to allow flow of oil to return to the tank. When disabled by the oil discard switch, the solenoid valve remains closed when the filter button is energized to allow 100% of oil flow to be discarded through the oil wand or by the optional rear oil discard port. When energized by the filter button, the solenoid valve opens to allow flow of oil to return to the tank. When disabled by the oil discard switch, the solenoid valve remains closed when the filter button is energized to allow 100% of oil flow to be discarded through the oil wand or by the optional rear oil discard port.
11	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).

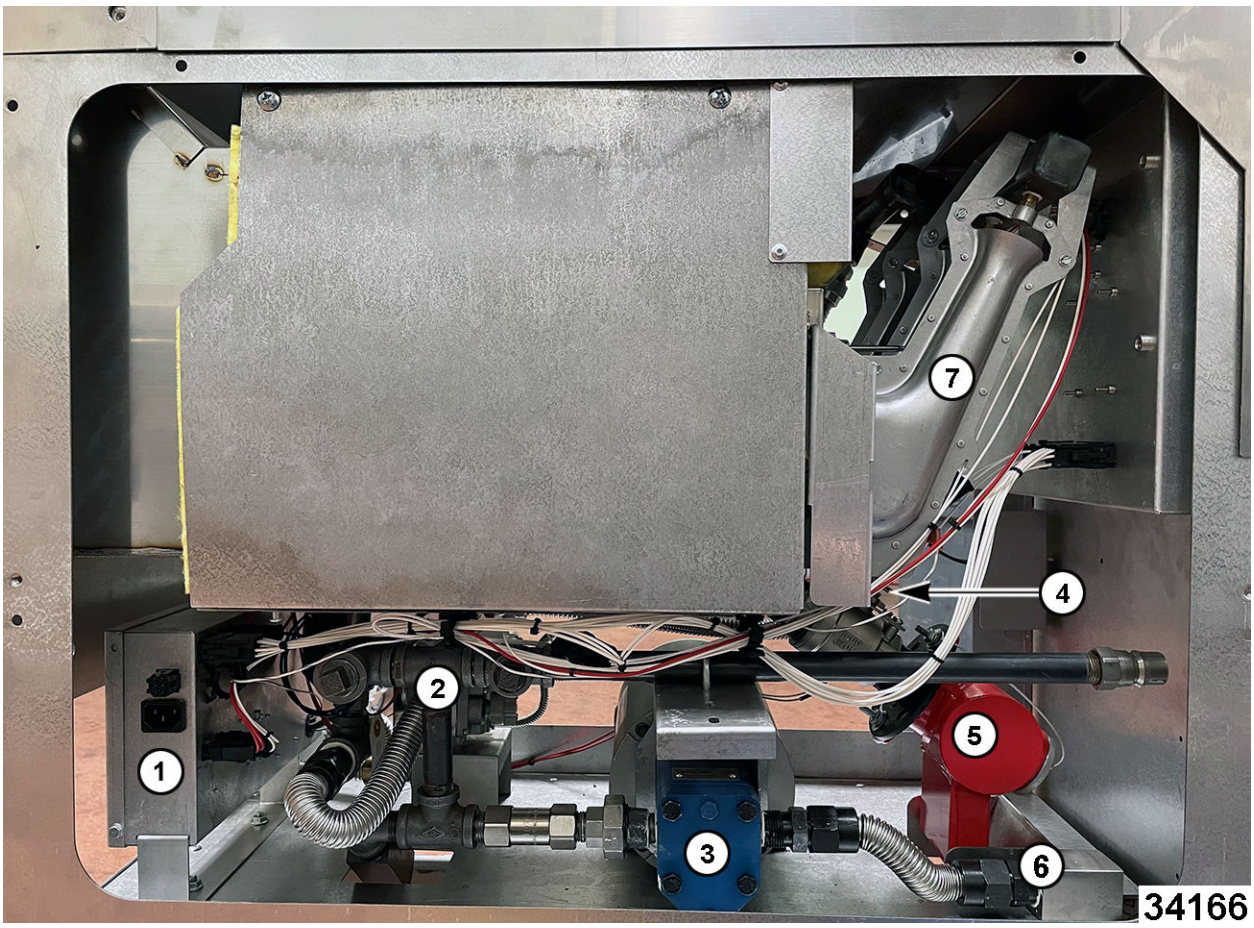


Fig. 165

ITEM	COMPONENT	FUNCTION
1	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).
2	Oil Return Piping	Discharge piping from filter pump, if oil return solenoid valve is open oil will be pumped back into tank, if closed oil can only be pumped through oil wand or optional rear oil discard port.
3	Pump Assembly and Motor	Operates pump to circulate oil through filtering system.
4	Flame Sense	Not visible, located above drain valve. The flame presence conducts and rectifies a micro amp flame sense current that is detected by the ignition control module.
5	Drain Manifold	Interconnects drain pipes from tanks on multi-tank (battery) fryers.
6	KleenScreen Suction Tube and Suction Block	Inlet for filter pump, contains O-ring to create seal when filter screen suction tube is inserted.
7	Burner Assembly	Supplies heat to heat exchanger.

COMPONENT LOCATION & FUNCTION (1VHG50AF / 75AF QUICKFRY) - STARTING SN 65026221

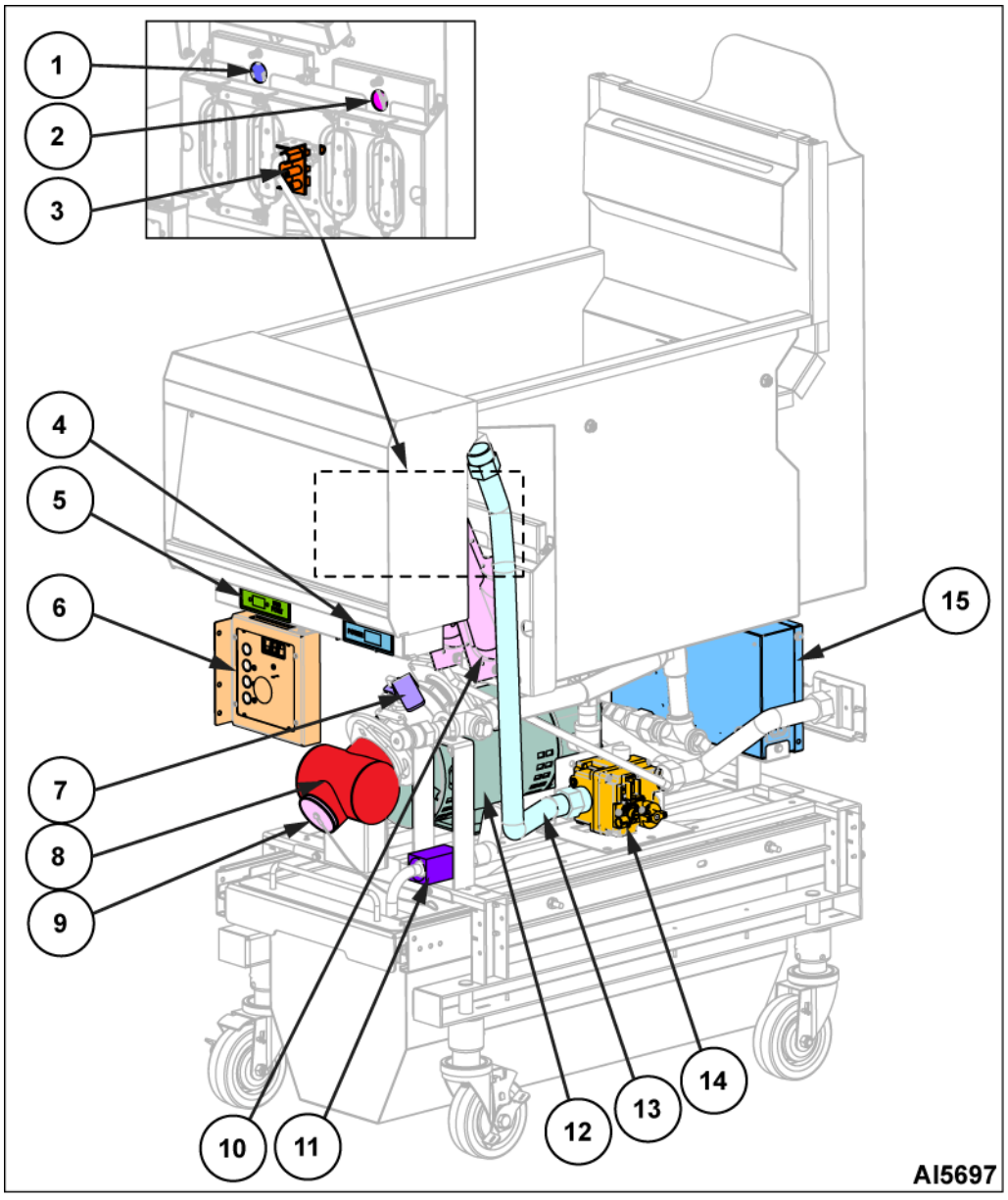


Fig. 166

ITEM	COMPONENT	FUNCTION
1	Temperature Probe	Senses temperature of oil. Converts the temperature into a resistance value which is monitored by the cooking control. The probe is an RTD (resistance temperature detector) of the Thermistor type. As temperature increases the resistance value decreases.
2	High Limit	Prevents the oil from reaching temperatures over 450°F (232.2°C) (auto reset @ 415°F (212.7°C). Serves as a backup

ITEM	COMPONENT	FUNCTION
		to the cooking control's high temperature alarm setting of 415°F (212.7°C) or more than 40°F (4.4°C) over setpoint, whichever occurs first (normal operation resumes when temperature falls below this point).
3	Igniter / Flame Sense / Pilot Burner Assembly	Ignites the main burners. **NOTE:** Located above drain valve.
4	Power Switch	Supplies power to control circuit for fryer operation and filtering.
5	USB Port	Used to update software and load menu programs.
6	Analog Control Panel	Monitors and evaluates input signals to the control: Activates heat output signal to maintain oil temperature and activates filter output signal to power filter pump relay. **NOTE:** By utilizing the same wiring harness connections A, D and C controls are interchangeable between fryers. However, A-control requires specific sheet metal to be properly mounted.
7	Drain Valve Handle	Opens and closes the drain ball valve to drain and filter oil
	Drain Valve Interlock Switch (DVI)	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
8	Drain Manifold	Interconnects drain pipes from tanks on mutli-tank (battery) fryers.
9	Boil-Out By-Pass Drain Plug	Installed for normal operation. Removed to install Boil-Out By-Pass Pipe during boil out procedure.
10	Burner Assembly	Supplies heat to heat exchanger.
11	Filter Pump Suction Block	When the filter pan is pushed in, the suction tube from the filter screen engages with the block. When the pump is on, this creates a suction that allows the oil to be pumped from the pan to the tank.
12	Filter Pump Motor	Operates pump to circulate oil through filtering system.
13	Gas Line (Flexible)	Supplies gas from gas combination valve to burner assembly.
14	Gas Combination Valve	Allows gas flow to the pilot when pilot valve coil is energized, gas flow to the burners when main valve coil is energized, and regulates gas manifold pressure.

ITEM	COMPONENT	FUNCTION
15	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).
PARTS NOT SHOWN		
	Ignition Control Module	Controls and monitors gas pilot ignition. Energizes pilot valve coil on the combination control valve and generates spark for pilot ignition. Monitors the presence of a flame and supplies an ignition status input signal to the cooking control.
	Control Interface Board	There are two different interface boards. One is the standard model which has a heat control Triac and K1 N.O. relay for the filter pump. The other optional interface board is for basket lift equipped fryers and has a heat control Triac and K1, K2, & K3 N.O. relays.
	Transformer	Supplies 24VAC to the cooking control, also supplies power to ignition control module. Transformer is energized when power switch is turned on.

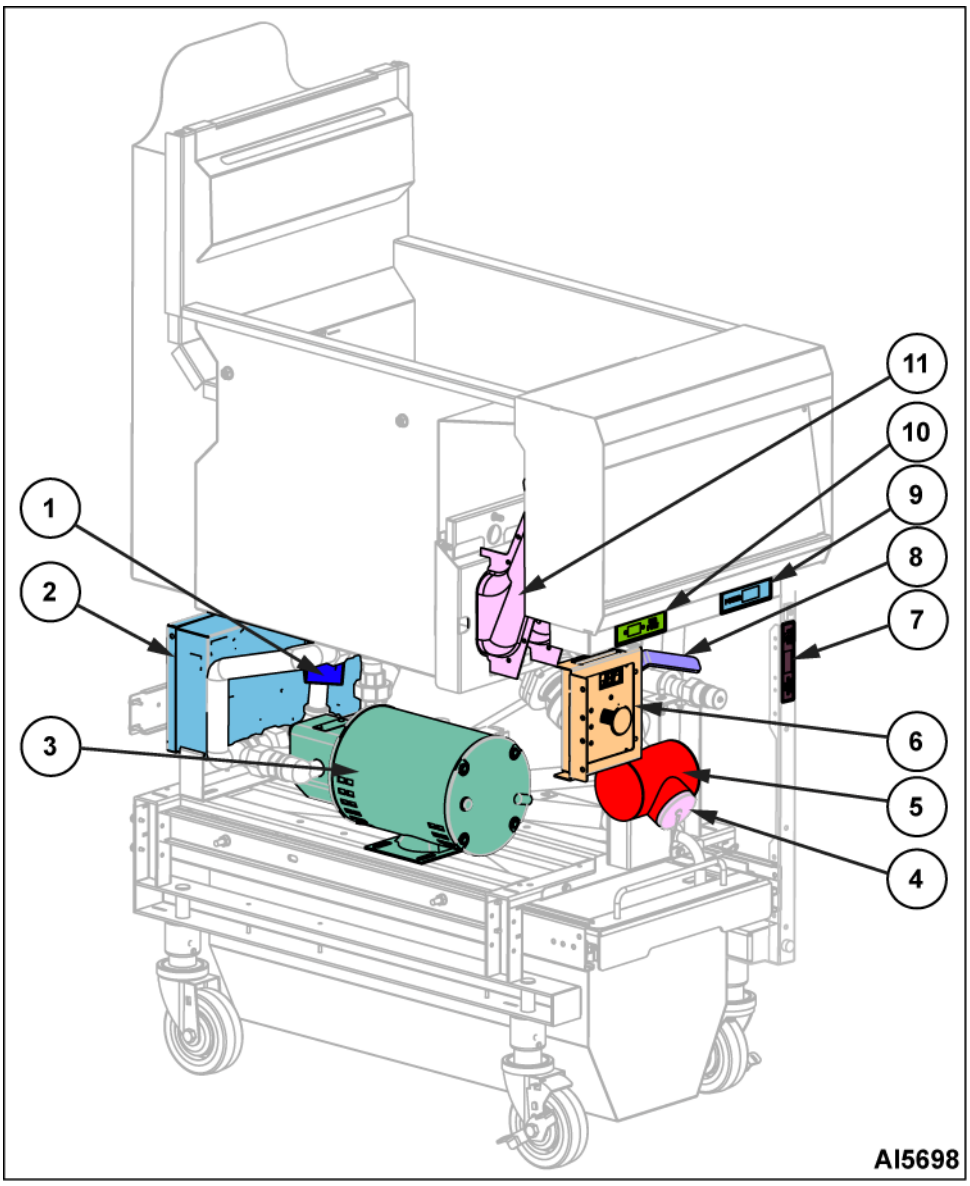


Fig. 167

ITEM	COMPONENT	FUNCTION
1	Fill Solenoid Valve	Opens when unit is filtering to allow oil to return to tank. After filtering, it closes to ensure oil stays in tank. When energized by the filter button, the solenoid valve opens to allow flow of oil to return to the tank. When disabled by the oil discard switch, the solenoid valve remains closed when the filter button is energized to allow 100% of oil flow to be discarded through the oil wand or by the optional rear oil discard port.
2	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).
3	Filter Pump Motor	Operates pump to circulate oil through filtering system.

ITEM	COMPONENT	FUNCTION
4	Boil-Out By-Pass Drain Plug	Installed for normal operation. Removed to install Boil-Out By-Pass Pipe during boil out procedure.
5	Drain Manifold	Interconnects drain pipes from tanks on multi-tank (battery) fryers.
6	Analog Control Panel	Monitors and evaluates input signals to the control: Activates heat output signal to maintain oil temperature and activates filter output signal to power filter pump relay. **NOTE:** By utilizing the same wiring harness connections A, D and C controls are interchangeable between fryers. However, A-control requires specific sheet metal to be properly mounted.
7	Filter Rinse / Filter Discard Switch	When activated, the oil discard switch disables the fill solenoid valve from opening to prevent oil from flowing back to the tank. This feature requires the oil wand to be connected to the front oil quick disconnect or a rear oil discard system connected to the optional rear oil discard quick disconnect.
8	Drain Valve Handle	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
	Drain Valve Interlock Switch (DVI)	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
9	Power Switch	Supplies power to control circuit for fryer operation and filtering.
10	USB Port	Used to update software and load menu programs.
11	Burner Assembly	Supplies heat to heat exchanger.

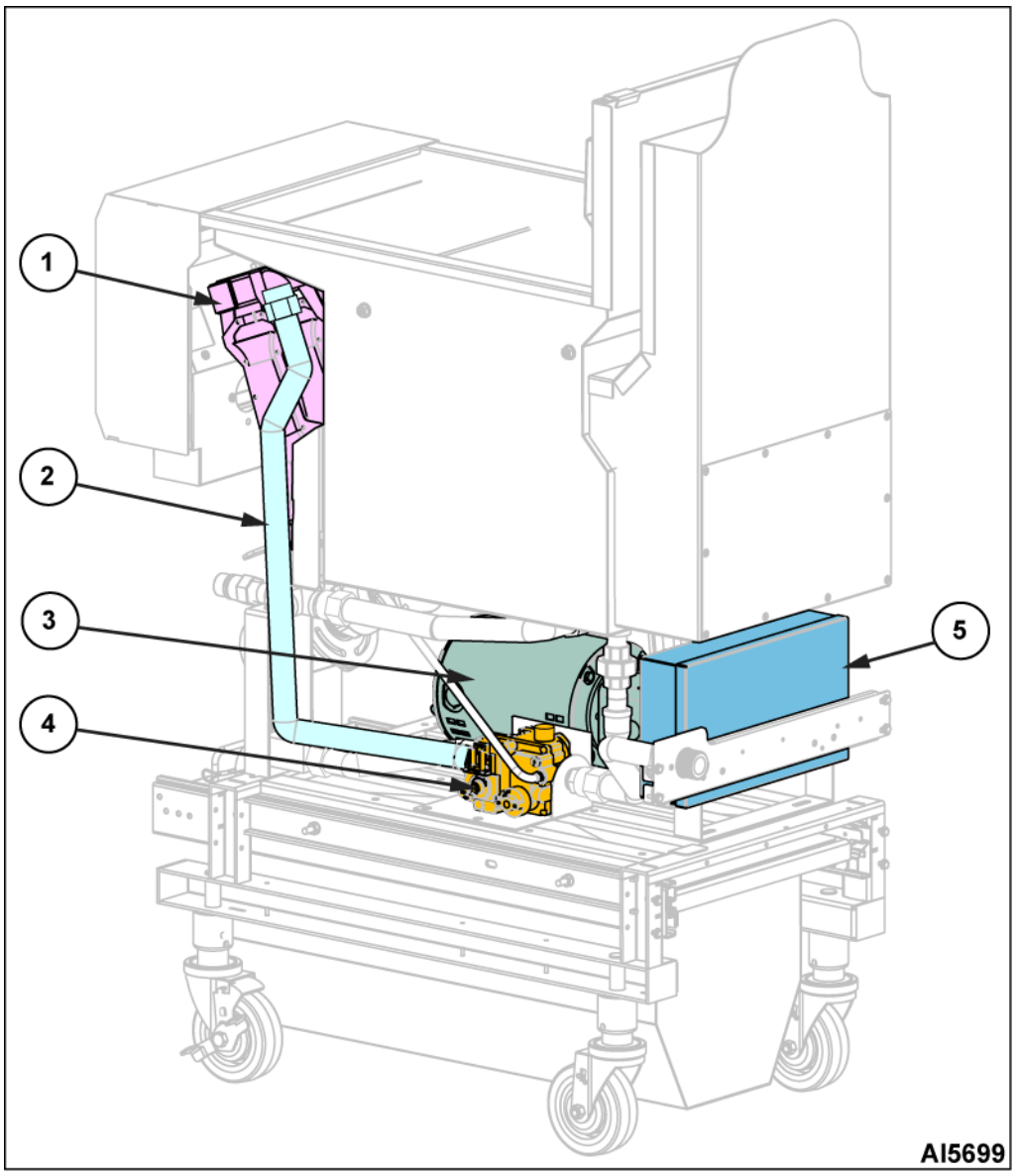


Fig. 168

ITEM	COMPONENT	FUNCTION
1	Burner Assembly	Supplies heat to heat exchanger.
2	Gas Line (Flexible)	Supplies gas from gas combination valve to burner assembly.
3	Filter Pump Motor	Operates pump to circulate oil through filtering system.
4	Gas Combination Valve	Allows gas flow to the pilot when pilot valve coil is energized, gas flow to the burners when main valve coil is energized, and regulates gas manifold pressure.
5	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).

COMPONENT LOCATION & FUNCTION (1VHG50CF / 75CF QUICKFRY) - STARTING SN 65026221

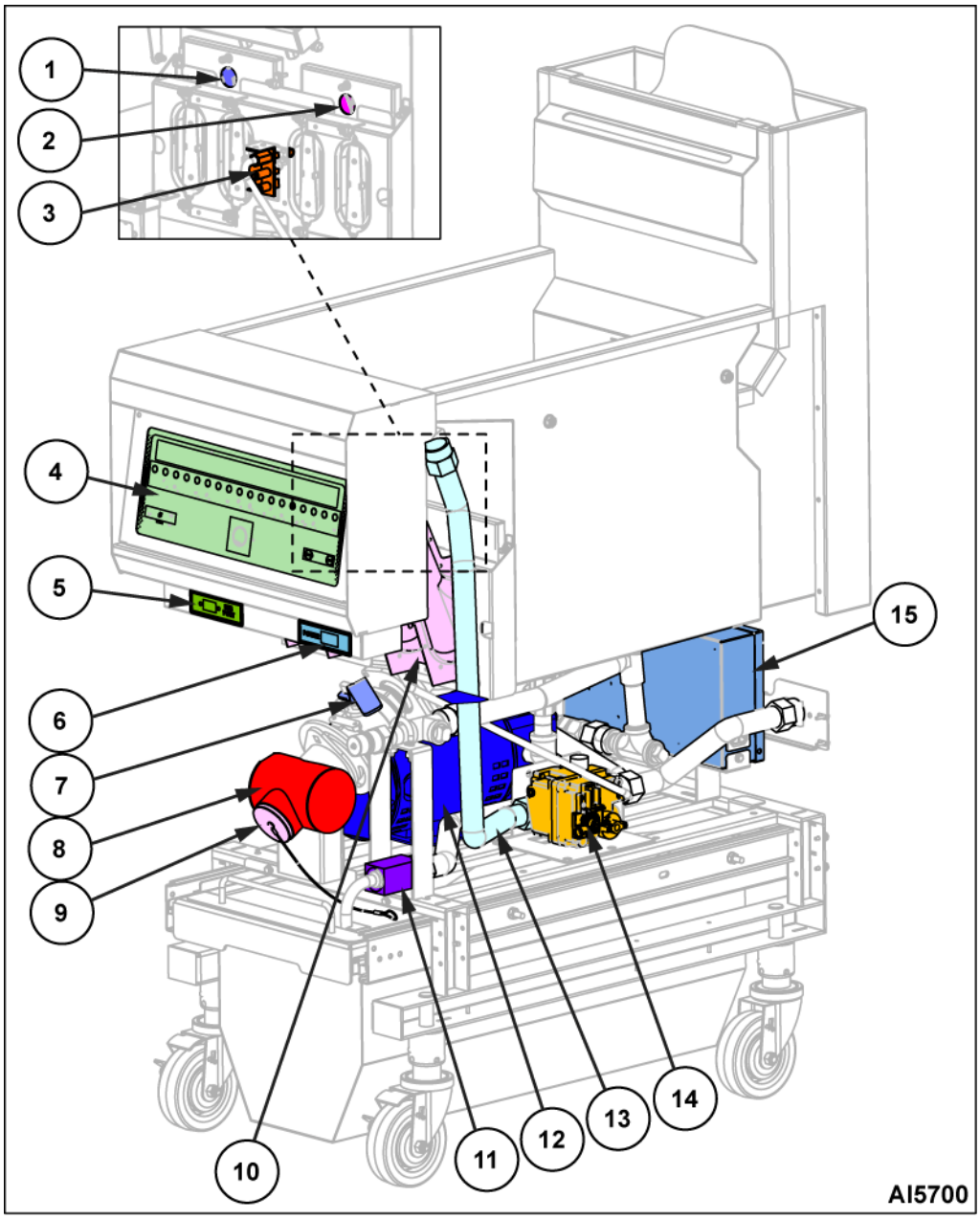


Fig. 169

ITEM	COMPONENT	FUNCTION
1	Temperature Probe	Senses temperature of oil. Converts the temperature into a resistance value which is monitored by the cooking control. The probe is an RTD (resistance temperature detector) of the Thermistor type. As temperature increases the resistance value decreases.

ITEM	COMPONENT	FUNCTION
2	High Limit	Prevents the oil from reaching temperatures over 450°F (232.2°C) (auto reset @ 415°F (212.7°C). Serves as a backup to the cooking control's high temperature alarm setting of 415°F (212.7°C) or more than 40°F (4.4°C) over setpoint, whichever occurs first (normal operation resumes when temperature falls below this point).
3	Igniter / Flame Sense / Pilot Burner Assembly	Ignites the main burners. **NOTE:** Located above drain valve.
4	Computer Controller	Monitors and evaluates input signals to the control: Activates heat output signal to maintain oil temperature and activates filter output signal to power filter pump relay. **NOTE:** By utilizing the same wiring harness connections A, D and C controls are interchangeable between fryers. However, A-control requires specific sheet metal to be properly mounted.
5	USB Port	Used to update software and load menu programs.
6	Power Switch	Supplies power to control circuit for fryer operation and filtering.
7	Drain Valve Handle	Opens and closes the drain ball valve to drain and filter oil.
	Drain Valve Interlock Switch (DVI)	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
8	Drain Manifold	Interconnects drain pipes from tanks on multi-tank (battery) fryers.
9	Boil-Out By-Pass Drain Plug	Installed for normal operation. Removed to install Boil-Out By-Pass Pipe during boil out procedure.
10	Burner Assembly	Supplies heat to heat exchanger.
11	Filter Pump Suction Block	When the filter pan is pushed in, the suction tube from the filter screen engages with the block. When the pump is on, this creates a suction that allows the oil to be pumped from the pan to the tank.
12	Filter Pump Motor	Operates pump to circulate oil through filtering system.
13	Gas Line (Flexible)	Supplies gas from gas combination valve to burner assembly.
14	Gas Combination Valve	Allows gas flow to the pilot when pilot valve coil is energized, gas flow to the burners when main valve coil is energized, and regulates gas manifold pressure.

ITEM	COMPONENT	FUNCTION
15	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).
PARTS NOT SHOWN		
	Ignition Control Module	Controls and monitors gas pilot ignition. Energizes pilot valve coil on the combination control valve and generates spark for pilot ignition. Monitors the presence of a flame and supplies an ignition status input signal to the cooking control.
	Control Interface Board	There are two different interface boards. One is the standard model which has a heat control Triac and K1 N.O. relay for the filter pump. The other optional interface board is for basket lift equipped fryers and has a heat control Triac and K1, K2, and K3 N.O. relays.
	Transformer	Supplies 24VAC to the cooking control, also supplies power to ignition control module. Transformer is energized when power switch is turned on.

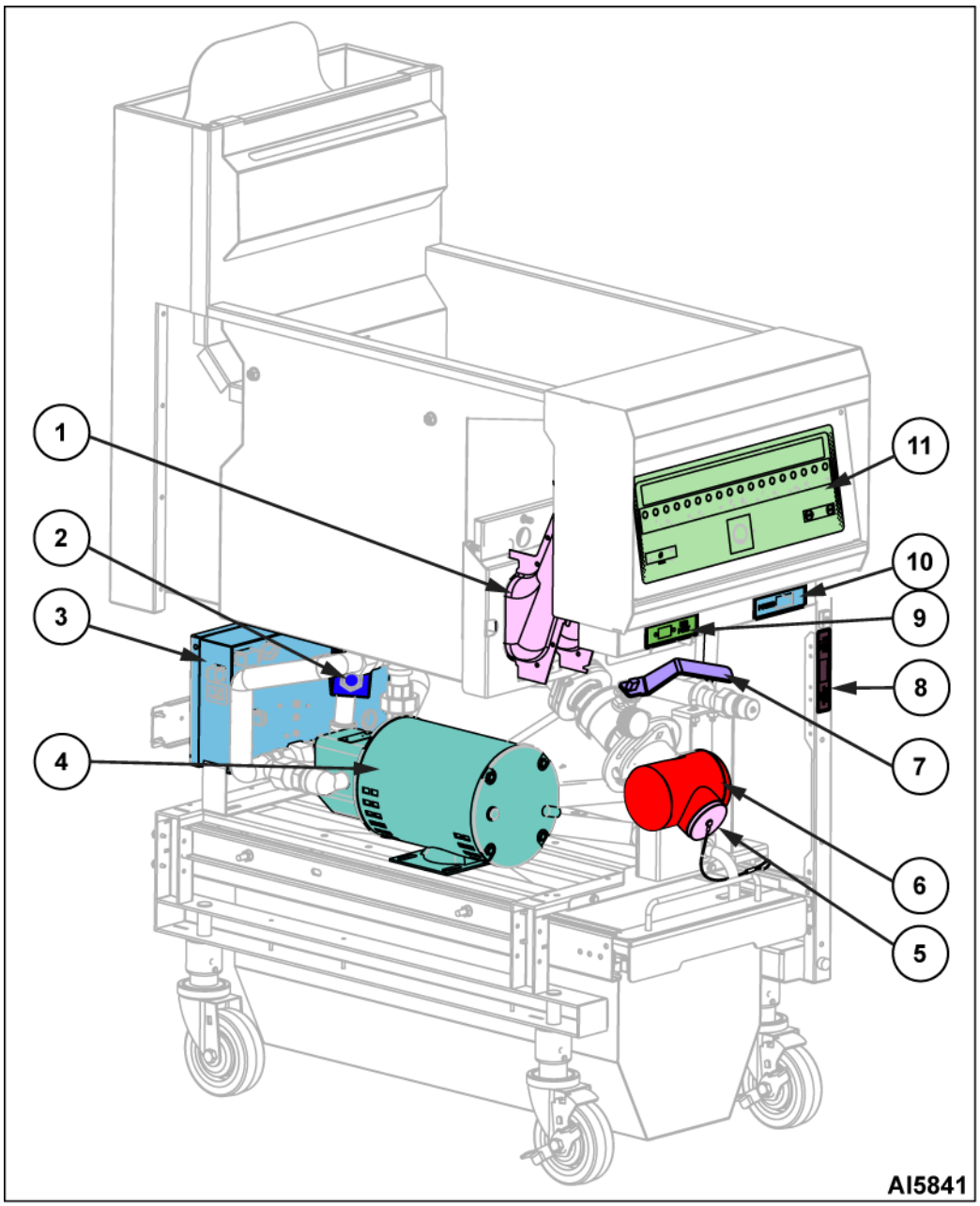


Fig. 170

ITEM	COMPONENT	FUNCTION
1	Burner Assembly	Supplies heat to heat exchanger.
2	Fill Solenoid Valve	Opens when unit is filtering to allow oil to return to tank. After filtering, it closes to ensure oil stays in tank. When energized by the filter button, the solenoid valve opens to allow flow of oil to return to the tank. When disabled by the oil discard switch, the solenoid valve remains closed when the filter button is energized to allow 100% of oil flow to be discarded through the oil wand or by the optional rear oil discard port.

ITEM	COMPONENT	FUNCTION
3	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).
4	Filter Pump Motor	Operates pump to circulate oil through filtering system.
5	Boil-Out By-Pass Drain Plug	Installed for normal operation. Removed to install Boil-Out By-Pass Pipe during boil out procedure.
6	Drain Manifold	Interconnects drain pipes from tanks on multi-tank (battery) fryers.
7	Drain Valve Handle	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
	Drain Valve Interlock Switch (DVI)	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
8	Filter Rinse / Filter Discard Switch	When activated, the oil discard switch disables the fill solenoid valve from opening to prevent oil from flowing back to the tank. This feature requires the oil wand to be connected to the front oil quick disconnect or a rear oil discard system connected to the optional rear oil discard quick disconnect.
9	USB Port	Used to update software and load menu programs.
10	Power Switch	Supplies power to control circuit for fryer operation and filtering.
11	Computer Controller	Monitors and evaluates input signals to the control: Activates heat output signal to maintain oil temperature and activates filter output signal to power filter pump relay. **NOTE:** By utilizing the same wiring harness connections A, D and C controls are interchangeable between fryers. However, A-control requires specific sheet metal to be properly mounted.

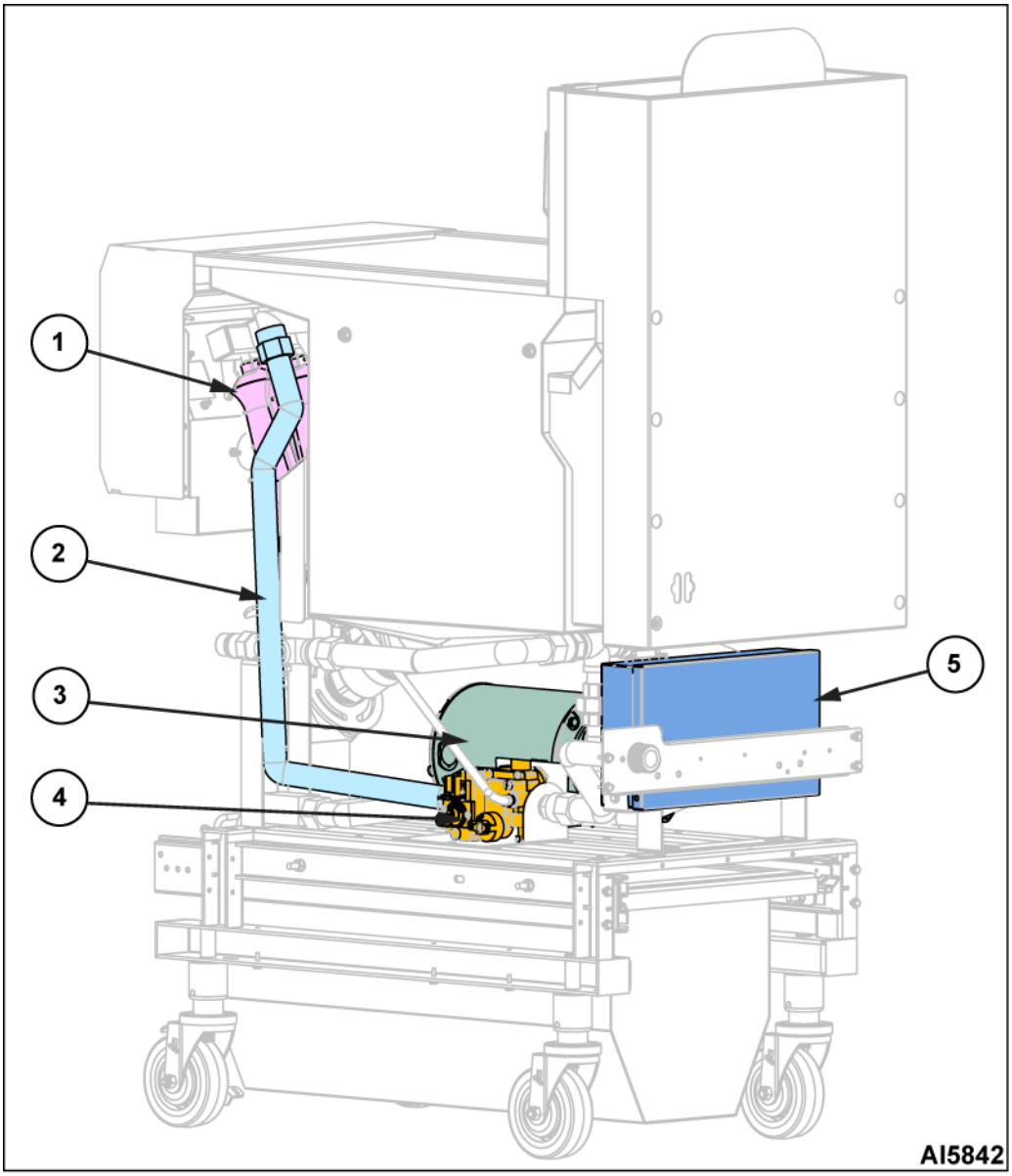


Fig. 171

ITEM	COMPONENT	FUNCTION
1	Burner Assembly	Supplies heat to heat exchanger.
2	Gas Line (Flexible)	Supplies gas from gas combination valve to burner assembly.
3	Filter Pump Motor	Operates pump to circulate oil through filtering system.
4	Gas Combination Valve	Allows gas flow to the pilot when pilot valve coil is energized, gas flow to the burners when main valve coil is energized, and regulates gas manifold pressure.
5	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).

COMPONENT LOCATION & FUNCTION (1VHG50DF / 75DF QUICKFRY) - STARTING SN 65026221

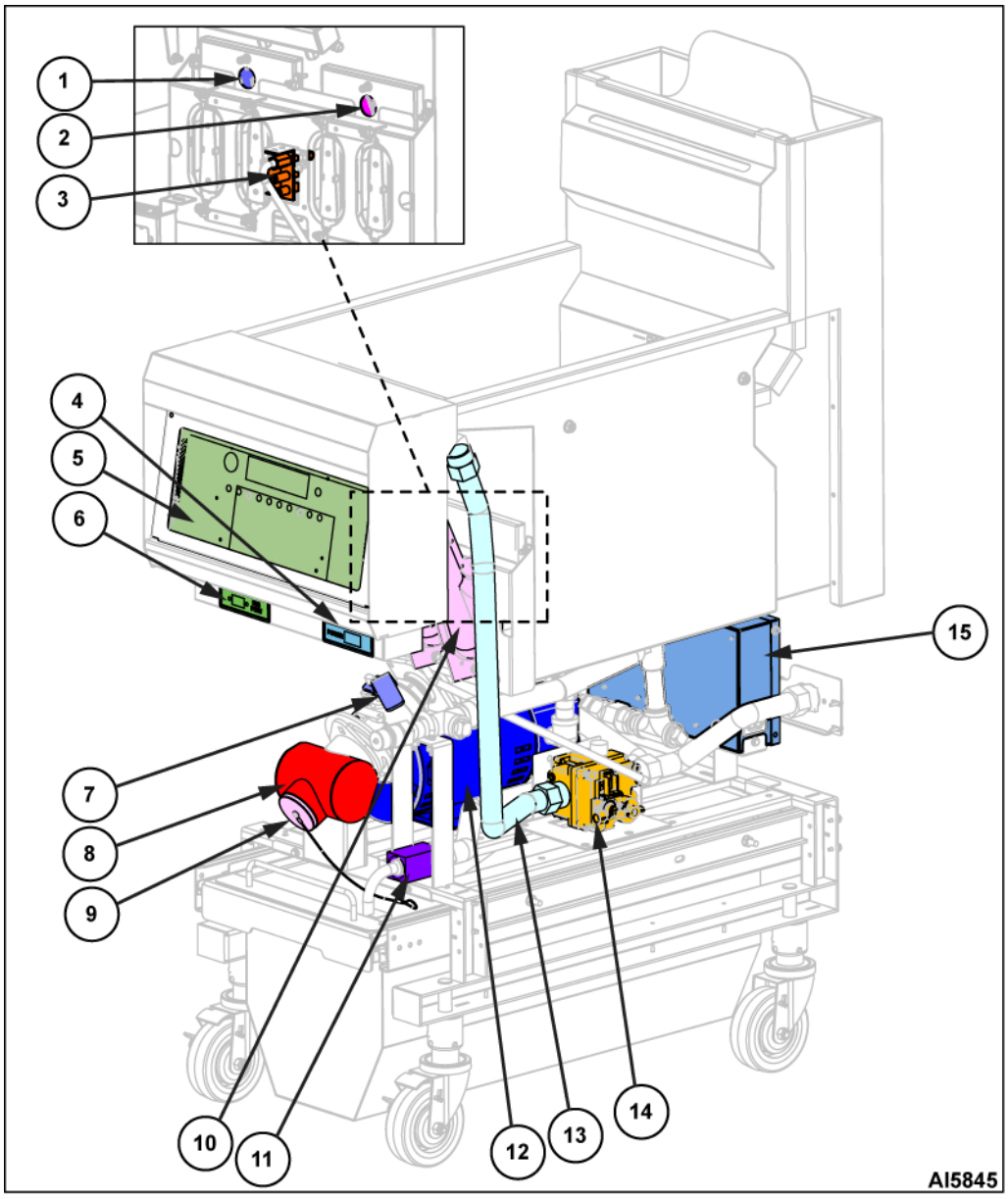


Fig. 172

ITEM	COMPONENT	FUNCTION
1	Temperature Probe	Senses temperature of oil. Converts the temperature into a resistance value which is monitored by the cooking control. The probe is an RTD (resistance temperature detector) of the Thermistor type. As temperature increases the resistance value decreases.
2	High Limit	Prevents the oil from reaching temperatures over 450°F (232.2°C) (auto reset @ 415°F (212.7°C). Serves as a backup

ITEM	COMPONENT	FUNCTION
		to the cooking control's high temperature alarm setting of 415°F (212.7°C) or more than 40°F (4.4°C) over setpoint, whichever occurs first (normal operation resumes when temperature falls below this point).
3	Igniter / Flame Sense / Pilot Burner Assembly	Ignites the main burners. **NOTE:** Located above drain valve.
4	Power Switch	Supplies power to control circuit for fryer operation and filtering.
5	Digital Controller	Monitors and evaluates input signals to the control: Activates heat output signal to maintain oil temperature and activates filter output signal to power filter pump relay. **NOTE:** By utilizing the same wiring harness connections A, D and C controls are interchangeable between fryers. However, A-control requires specific sheet metal to be properly mounted.
6	USB Port	Used to update software and load menu programs.
7	Drain Valve Handle	Opens and closes the drain ball valve to drain and filter oil.
	Drain Valve Interlock Switch (DVI)	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
8	Drain Manifold	Interconnects drain pipes from tanks on multi-tank (battery) fryers.
9	Boil-Out By-Pass Drain Plug	Installed for normal operation. Removed to install Boil-Out By-Pass Pipe during boil out procedure.
10	Burner Assembly	Supplies heat to heat exchanger.
11	Filter Pump Suction Block	When the filter pan is pushed in, the suction tube from the filter screen engages with the block. When the pump is on, this creates a suction that allows the oil to be pumped from the pan to the tank.
12	Filter Pump Motor	Operates pump to circulate oil through filtering system.
13	Gas Line (Flexible)	Supplies gas from gas combination valve to burner assembly.
14	Gas Combination Valve	Allows gas flow to the pilot when pilot valve coil is energized, gas flow to the burners when main valve coil is energized, and regulates gas manifold pressure.

ITEM	COMPONENT	FUNCTION
15	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).
PARTS NOT SHOWN		
	Ignition Control Module	Controls and monitors gas pilot ignition. Energizes pilot valve coil on the combination control valve and generates spark for pilot ignition. Monitors the presence of a flame and supplies an ignition status input signal to the cooking control.
	Control Interface Board	There are two different interface boards. One is the standard model which has a heat control Triac and K1 N.O. relay for the filter pump. The other optional interface board is for basket lift equipped fryers and has a heat control Triac and K1, K2, and K3 N.O. relays.
	Transformer	Supplies 24VAC to the cooking control, also supplies power to ignition control module. Transformer is energized when power switch is turned on.

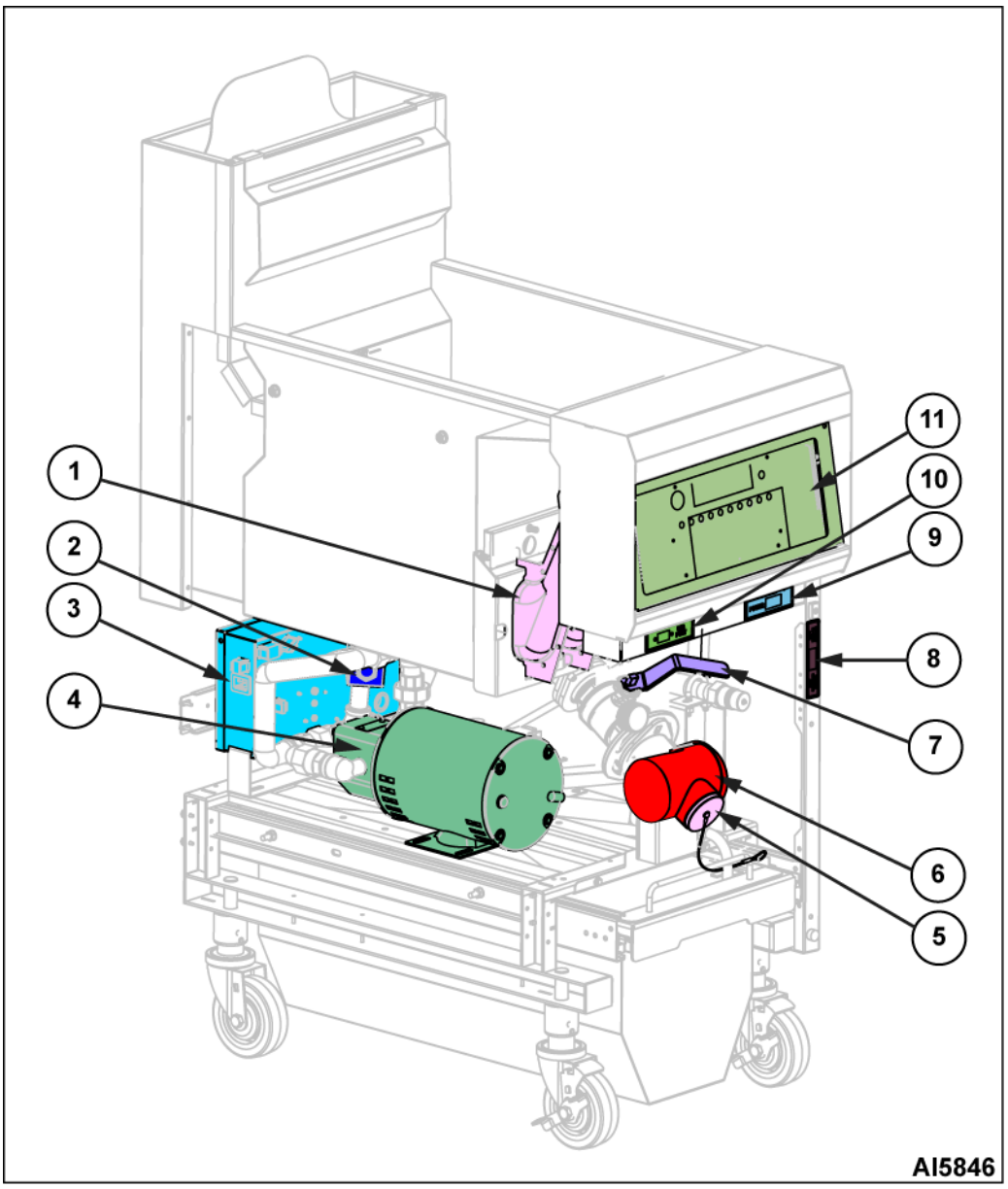


Fig. 173

ITEM	COMPONENT	FUNCTION
1	Burner Assembly	Supplies heat to heat exchanger.
2	Fill Solenoid Valve	Opens when unit is filtering to allow oil to return to tank. After filtering, it closes to ensure oil stays in tank. When energized by the filter key, the solenoid valve opens to allow flow of shortening to return to the tank. When disabled by the oil discard switch, the solenoid valve remains closed when the filter key is energized to allow 100% of oil flow to be discarded through the oil wand or by the optional rear oil discard port.
3	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).

ITEM	COMPONENT	FUNCTION
4	Filter Pump Motor	Operates pump to circulate oil through filtering system.
5	Boil-Out By-Pass Drain Plug	Installed for normal operation. Removed to install Boil-Out By-Pass Pipe during boil out procedure.
6	Drain Manifold	Interconnects drain pipes from tanks on multi-tank (battery) fryers.
7	Drain Valve Handle	Opens and closes the drain ball valve to drain and filter oil.
	Drain Valve Interlock Switch (DVI)	A magnetic reed switch mounted on the manual drain valve that supplies a drain valve position signal (open/closed) to the cooking control. When drain valve is open, the drain interlock input to the control is removed (magnetic reed switch contacts open). This prevents gas burners from coming on with the fry tank empty.
8	Filter Rinse / Filter Discard Switch	When activated, the oil discard switch disables the fill solenoid valve from opening to prevent oil from flowing back to the tank. This feature requires the oil wand to be connected to the front oil quick disconnect or a rear oil discard system connected to the optional rear oil discard quick disconnect.
9	Power Switch	Supplies power to control circuit for fryer operation and filtering.
10	USB Port	Used to update software and load menu programs.
11	Digital Controller	Monitors and evaluates input signals to the control: Activates heat output signal to maintain oil temperature and activates filter output signal to power filter pump relay. **NOTE:** By utilizing the same wiring harness connections A, D and C controls are interchangeable between fryers. However, A-control requires specific sheet metal to be properly mounted.

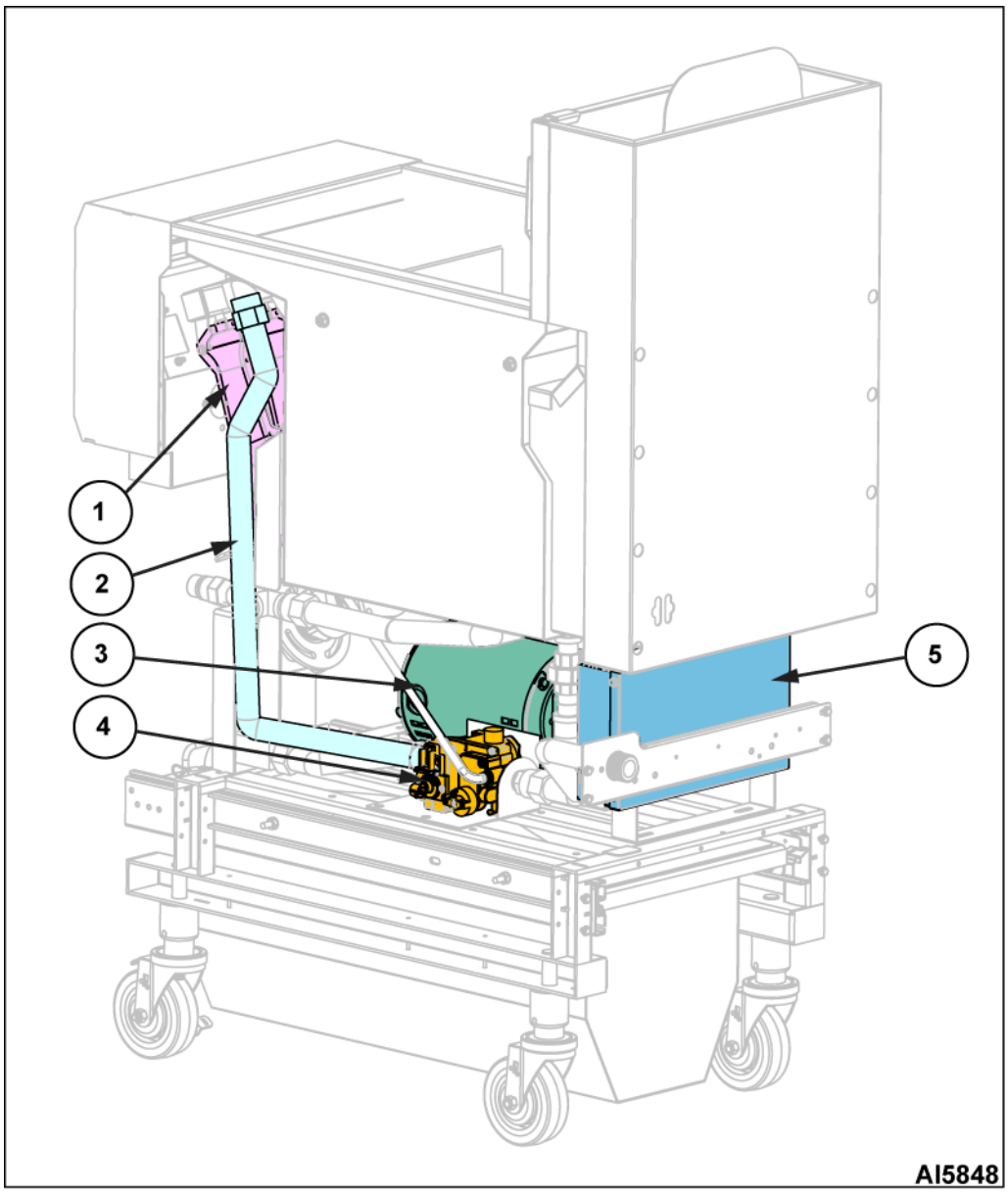


Fig. 174

ITEM	COMPONENT	FUNCTION
1	Burner Assembly	Supplies heat to heat exchanger.
2	Gas Line (Flexible)	Supplies gas from gas combination valve to burner assembly.
3	Filter Pump Motor	Operates pump to circulate oil through filtering system.
4	Gas Combination Valve	Allows gas flow to the pilot when pilot valve coil is energized, gas flow to the burners when main valve coil is energized, and regulates gas manifold pressure.
5	Power Box	Connects to incoming power supply. Contains transformer, ignition module, and relays for solenoid valve and filter pump (for units with filter option).

POWER SUPPLY BOX - STARTING SN 65026221

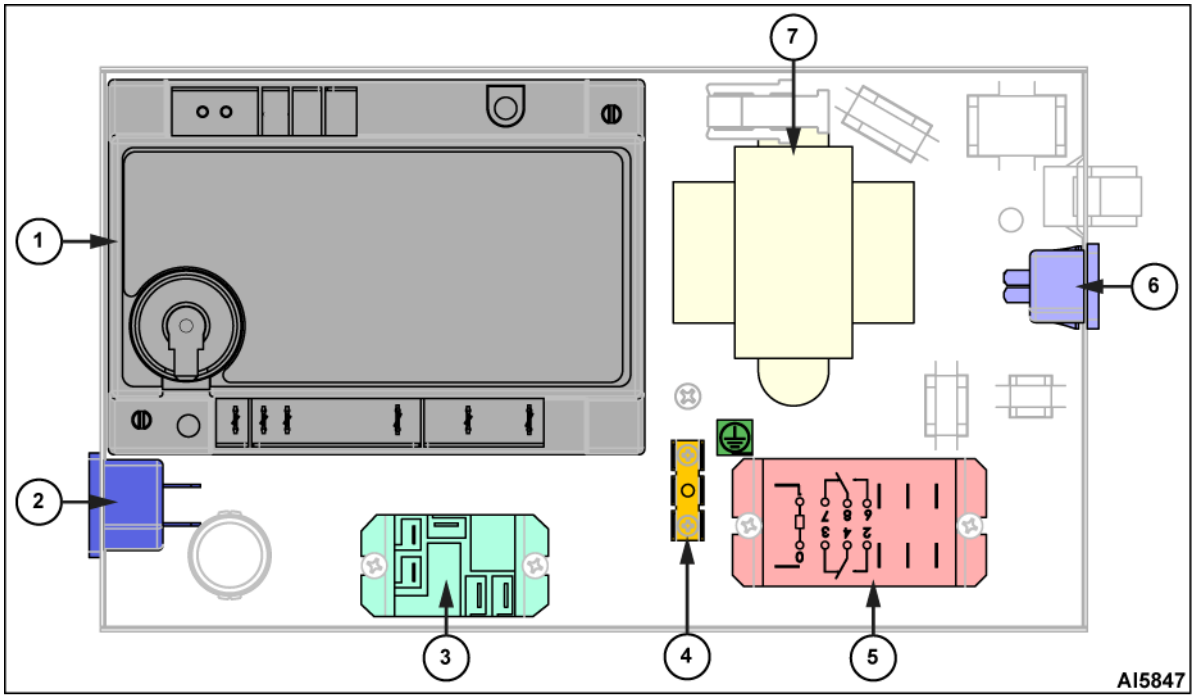


Fig. 175

ITEMS	ELECTRICAL CALLOUT	FUNCTION
1	Ignition Module	Controls and monitors gas pilot ignition. Energizes pilot valve coil on the combination gas valve and generates spark for pilot ignition. Monitors the presence of a flame and supplies an ignition status input signal to the cooking control.
2	Female Power Receptacle	Used to provide power source to other tanks on battery units, tanks can be daisy-chained to allow power to all units from one single power cord.
3	Fill Solenoid Relay (R2)	When 24VAC relay (R2) is energized by filter button, supplies 120VAC to the fill solenoid valve to open the valve and allow oil to flow through filter system.
4	Ground Lug	Connection point for ground wires.
5	Pump Motor Relay (120VAC) (R1)	When 24VAC relay (R2) is energized by filter button, supplies 120VAC to pump motor, and fill solenoid valve (through R2 fill relay N.C. contacts).
6	Male Power Receptacle	Connection for power cord to plug into wall outlet.
7	Transformer	Provides 24VAC to controller and control circuit components.

A20 & A30 - INTERFACE BOARD - STARTING 09/28/2023

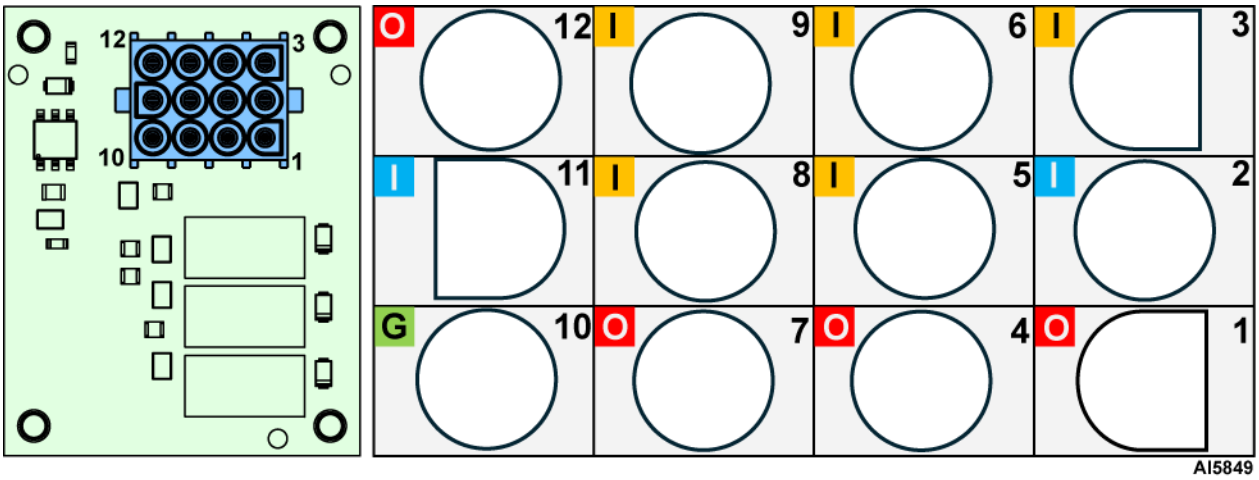


Fig. 176

Inputs (I)			Outputs (O)		
Pin No.	**Function**	**Voltage**	**Pin No.**	**Function**	**Voltage**
P2	Input to common terminal of relay(s) *	24VAC	P1	Output to filter pump relay coil in power supply box (PSB).	24VAC
P3	Input from controller to relay for Right Basket Lift (A20 boards only) **	24VDC	P4	Output to right basket lift relay coil at back of fryer (A20 boards only) **	24VAC
P5	Input from controller to relay for Left Basket Lift (A20 boards only) **	24VDC	P7	Output to left basket lift relay coil at back of fryer (A20 boards only) **	24VAC
P6	Input from controller to relay for filtering pump	24VDC	P12	Output from Triac to ignition module in power supply box (PSB) to start ignition sequence	24VAC
P8	Common for relay coils and Triac	24VDC			
P9	Input to trigger Triac on call for heat	24VDC			
P10	X2 potential / system ground	24VAC			
P11	Input to Triac common	24VAC			

* All boards will have at least (1) relay and Triac.

** Not all fryers will have a basket lift. A20 boards have basket lift, which have 3 relays.

A - CONTROL

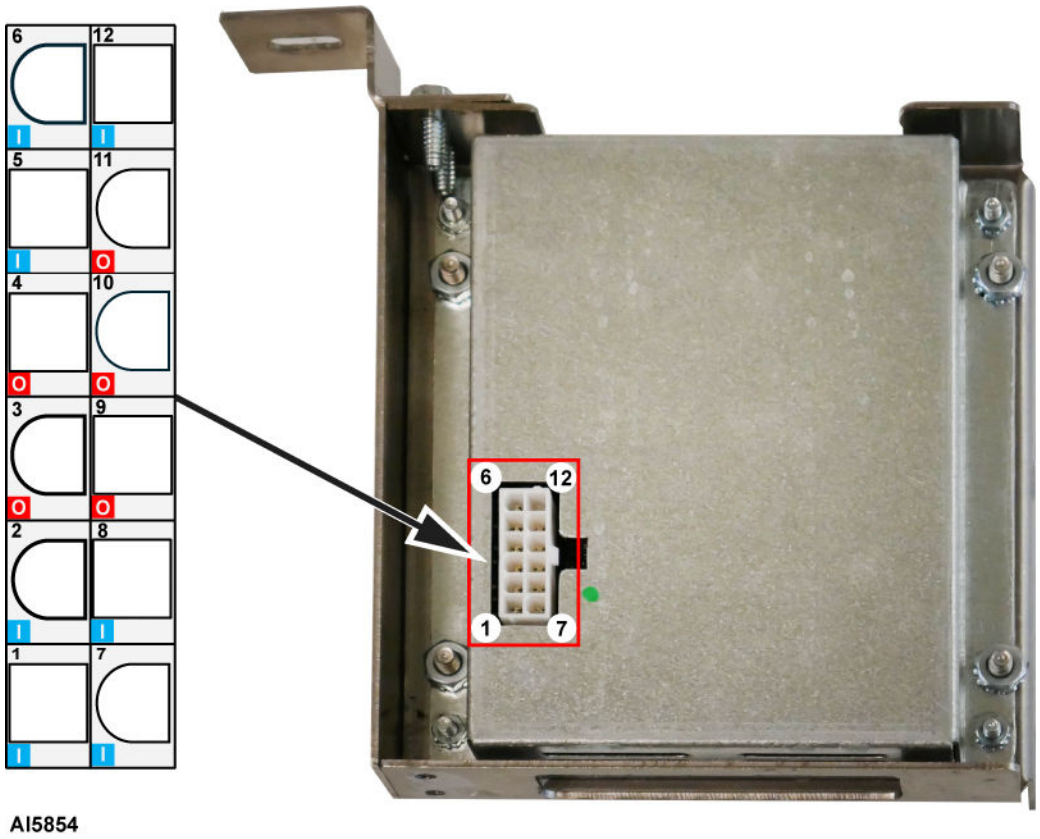


Fig. 177

Inputs			Outputs		
Connector Pin	**Function**	**Voltage**	**Connector Pin**		**Voltage**
1	Power Supply	24VAC	3	Input Common	24VAC
2	Ignition status	24VAC	4	Heat Demand	24VDC
5	N/A **NOTE:** Not used as of 09/01/2020.		9	Common	VDC
6	Probe High		10	Filter	24VDC
7	Power Supply	24VAC	11	N/A **NOTE:** Not used as of 09/01/2020.	
8	Drain Valve Status	24VAC			
12	Probe Low				

C & D CONTROL PIN-OUTS

INPUT AND OUTPUT CONNECTOR

Inputs (P1)			Outputs (P1)		
Connector Pin	**Function**	**Voltage**	**Connector Pin**	**Function**	**Voltage**
P1-1	Hot	24VAC	P1-4	Heat	24VDC
P1-2	Ignition Status	24VAC	P1-9	Common	24VDC
P1-3	Common	GND	P1-10	Filter	24VDC
P1-5	(NC)	*			
P1-6	Probe 1 High				
P1-7	Neutral				
P1-8	Drain Valve Status	24VAC			
P1-11	(NC)	*			
P1-12	Probe 1 Low				
Inputs (P2)			**Outputs (P2)**		
Connector Pin	**Function**	**Voltage**	**Connector Pin**	**Function**	**Voltage**
P2-1	(NC)	*	P2-4	Common	*
P2-2	Gas Relay Contact 2	*	P2-10	Right Basket Lift	24VDC
P2-3	Oil Pump	*	P2-11	Left Basket Lift	24VDC
P2-5	Common	*			
P2-6	(NC)	*			
P2-7	Probe 2 Low	*			
P2-8	(NC)	*			
P2-9	Gas Relay Contact1	*			
P2-12	Oil Valve	*			
P2-13	(NC)	*			
P2-14	Probe 2 High	*			

NOTE: * Not used as of 09/01/2020.

7. SEQUENCE OF OPERATION

SEQUENCE OF OPERATION VHG HEATING

1. Conditions.
   A. Fryer connected to correct supply voltage and properly grounded.
   B. Gas supply is on.
   C. Cooking oil is at proper level in fry tank and below last set temperature.
   D. Cooking control is set up properly and ready to use.
   E. Manual drain valve is closed (drain valve switch N.O. is closed).
   F. High limit thermostat is closed.
   G. 120VAC (hot) when plugged in.
      1) Basket Lift Connector P4, Basket Lift Relay Switch P5 (if applicable).
      2) 120VAC to NO of on/off switch, NO terminals of filter pump relay, commons of basket lift relays (if applicable).
2. Power switch turned ON and 120VAC circuit completed through.
   A. P1 coil terminal on basket lift relay (if applicable) (neutral).
   B. P1 coil terminal on basket lift interlock relay. When relay is operated closed neutral is sent to P4 connectors on basket lift motors (if applicable).
   C. Transformer P1 (C1-1).
3. Transformer energized and sends out 24VAC to:
   A. P2 (G2-2) on the interface board for relay power.
   B. P11 on the interface board for heat triac power.
   C. Drain switch through to P8 (E1-8) on controller 12-pin connector for drain status.
   D. P1 (E1-1) on controller 12-pin connector for main controller power.
4. Cooking control powers on, initializes and performs a diagnostic self-check.
5. Cooking control evaluates input signals from the drain switch and temperature probe.
   A. If drain is closed with 24VAC supplied in to P8(12-pin), temperature probe resistance value into P6/P12(12-pin) matches a call for heat, the Start (A control), V (D control) or CONFIRM (C control) button is pressed and/or the dry fire test is activated/passed;
      1) Cooking control sends 24VDC out P4(12-pin) into P9 of interface board.
6. Interface board sends 24VAC out P12 to TH/W on the ignition module.
7. Ignition module generates spark at igniter electrode.
   A. 24VAC sent out V1/PV1 terminal to COM terminal on high limit, through high limit to the + terminal on the gas valve pilot coil.
      1) Pilot valve opens and gas flows to the pilot.
      2) Pilot flame is established. A micro amp current is rectified to ignition module through the flame sensor and sparking stops.
8. If pilot flame is not established in 7 seconds, PILOT OUT (D & C controls only) displays, and ignition module continues to spark. If pilot flame is not established after 90 seconds displays;
   - A-control: PLt
   - D-control: IGNITION LOCKOUT
   - C-control: IGNITION LOCKOUT
   - D & C controls make a steady alarm tone indicating failure.

   The ignition module then stops sparking, locks out and the power switch must be cycled to start over at Step 2.
9. If pilot flame is established.
   A. 24VAC sent out from IND/MV1 terminal of ignition module to P2(12-pin) ignition status input of cooking controller and TH terminal of gas valve.
   B. The cooking controller displays:
      - A-control: Displays temperature setpoint and Heating indicator illuminated.
      - D-control: HEATING displayed and Heating indicator illuminated.
      - C-control: HEATING displayed and Heating indicator illuminated.
   C. Gas flows to burners and the burners ignite from the established pilot flame.

D. If a melt mode is programmed and oil is at or below 135 F, the controller will display:

- A-control: Melt indicator will flash to indicate active melt mode. If Melt is toggled, Melt briefly displays "S" for Solid, "L" for Liquid, and "no" for No Melt.
- D-control: Control displays "MELT S" for solid melt mode, "MELT L" for liquid melt mode, and "HEATING" for melt mode off.
- C-control: Control displays "MELT SOLID" for solid melt mode, "MELT LIQUID" for liquid melt mode, and "HEATING" for melt mode none.

and the sequence starts over at STEP 5. A.1.. The voltage to ignition module TH/W terminal will cycle on and off until the temperature exceeds 135°F (57.2°C).

Melt mode in VHG functions with these times:

- Solid:
  - 8 seconds heat on.
  - 26 seconds heat off.
- Liquid:
  - 16 seconds heat on.
  - 18 seconds heat off.

NOTE: The heat on timers start when the control receives flame prove signal.

10. Cooking control continues to evaluate input signals from the ignition module, drain switch and temperature probe.
    A. Burner heats oil in fry tank.
11. Oil reaches setpoint temperature.
    A. Cooking control removes 24VDC output from P4(12-pin) to interface board P9.
    B. Interface board removes 24VAC output from P12 to TH/W on the ignition module.
    C. Ignition module removes 24VAC output from V1/PV1 terminal to COM terminal on high limit, through the high limit to the + terminal on the gas valve pilot coil.
       1) Gas flow stops through gas valve pilot and pilot goes out.
    D. Ignition module removes 24VAC output from IND/MV1 terminal of ignition module to P2(12-pin) ignition status input of cooking controller and TH terminal of gas valve.
       1) Gas flow stops to burner and burner goes out.
12. When Cooking control calls for heat, sequence begins again at STEP 5.1.A.

SEQUENCE OF OPERATION VHG FILTERING

1. Conditions.
   A. Fryer connected to correct supply voltage and properly grounded.
   B. Gas supply is on.
   C. Power switch is ON.
   D. Cooking control is set up properly and ready to use.
   E. Manual drain valve is closed (drain valve switch N.O. is closed).
   F. Cooking oil is at proper level in fry tank and is between 300°F (148.8°C) (minimum) and 350°F (176.6°C) (maximum).
   G. 120 VAC to N.O. P2 and P6 of pump motor relay.
   H. Discard switch is set to USE HOSE TO RINSE & FILL.

NOTICE

Oil should not be allowed to filter outside of the 300°F (148.8°C) - 350°F (176.6°C) temperature range. At lower temperatures, the oil is thicker which may increase filtering time and place a greater load on the pump. At higher temperatures, oil seal life is decreased.

2. Open drain valve to fryer section in need of filtering and drain oil into the filter pan.
   A. Drain valve interlock switch contacts open breaking the 24VAC signal input on the cooking controller P8 12-pin connector.
   B. Cooking controller indicates C & D: DRAINING, A: drn, stops heating and normal operations.
3. Press the filter button and hold for approximately 3 seconds.
   A. 24VDC output from P10 on controller 12-pin to P6 of the interface board.
   B. Interface board supplies 24VAC output from P1 to the coil of the pump motor relay.
      1) Both sets of NO contacts on the pump motor relay close. 120 VAC passed

from the P4 pump motor relay thru NC contacts of solenoid fill valve relay to the solenoid fill valve.

2) The NC solenoid fill valve opens.

a. 120/240VAC is passed from the other pump motor relay contact (P8) to the pump motor (P1).

b. The pump motor starts and oil circulates through the system.

4. When filtering is complete, close the drain valve and allow the fry tank to refill.

A. Drain valve interlock switch contacts close to send 24VAC signal input to the cooking controller P8 of 12-pin connector.

B. The controller displays:

- A control: FILL VAt PrESS FILtEr
- D control: FILLING PUSH FLT
- C control: FILLING PRESS FILTER

5. When fry tank is full, press the filter button.

A. 24VDC output is removed from P10 on controller 12-pin to P6 of the interface board.

B. The interface board stops the 24VAC output from P1 to the coil on the pump motor relay.

C. Both sets of NO contacts on the pump motor relay open.

1) 120/240VAC stops from pump motor relay thru NC contacts of solenoid fill valve relay to the solenoid fill valve.

2) The NC solenoid fill valve closes.

3) 120 VAC is stopped from the other pump motor relay contact to the pump motor.

4) The pump motor stops.

5) Cooking controller displays:

- A control: VAt FULL? PrESS StArt
- D control: VAT FULL? PUSH V
- C control: VAT FULL? PUSH CONFIRM

6. Confirm the oil is at the proper level between the MIN and MAX marks on the fry tank. Press the Start Button (A-control), the V Button (D-control), or the CONFIRM Button (C-control) to resume normal operation.

8. DIAGRAMS

SCHEMATICS

VHG - Models A-C-D - Gas - 120V - 1PH - 976718-5C - AI4959

VHG - Models A-C-D - Gas - 120V - 1PH - 976718-5C - AI4959

VHG - Models A-C-D - Gas - 120V - 1PH - 976718-4C - AI4960

VHG - Models A-C-D - Gas - 120V - 1PH - 976718-4C - AI4960

WIRING DIAGRAMS

VHG A / C / D - Option Harness - Gas - 120VAC - 1PH - 976718-1G AI4961

VHG - Models A-C-D - Gas - 120V - 1PH - 976718-1G - AI4961

VHG A / C / D - Gas - 120VAC - 1PH - 976718-1G AI4962

VHG - Models A-C-D - Gas - 120V - 1PH - 976718-1G - AI4962

VHG A / C / D - Option Harness - Gas - 120VAC - 1PH - 976718-1J Page 2 - AI4963

VHG - Models A-C-D - Gas - 240V - 1PH - 976718-4G - AI4963

VHG A / C / D - Gas - 120VAC - 1PH - 976718-1J Page 2 - AI5996

VHG - Models A-C-D - QuickFry - Gas - 120V - 1PH - 976718-1J pg2 - AI5696

VHG A / C / D - Gas - 240VAC - 1PH - 976718-1G - AI5964

VHG - Models A-C-D - QuickFry - Gas - 240V - 1PH - 976718-1G - AI4964

9. TROUBLESHOOTING

TROUBLESHOOTING

ALL MODELS

SYMPTOMS	POSSIBLE CAUSES
Ignition lockout, continuous loud alarm.	1. Harness connection to gas valve. 2. Gas valve or gas pressure. 3. Gas supply valve closed. 4. All harness connections. 5. Igniter or igniter wire. 6. Interconnecting wiring malfunction. 7. Flame sense wire disconnected/damaged. 8. High limit. 9. Loss of ground.
Initial alarm then shut off.	1. Grounding status. 2. Check electrode. 3. Loose connection at power outlet. 4. All harness connections. 5. Failed control can also produce this error.
No spark.	1. Harness connections (check for flashing light in A control). 2. Probe lead wires. 3. Control failure. 4. Dry Fire Test being performed; wait 60 seconds. 5. Igniter Wire Damaged/Disconnected. 6. Interface Board Failure. 7. Ignition Module Failure. 8. Shorted Igniter. 9. Loss of ground.
Burner lights but will not maintain flame	1. Igniter/flame sense misaligned. 2. Insufficient gas pressure to gas valve or to manifold. 3. Gas supply valve not fully open. 4. Loss of ground.
Excessive heat **NOTE:** Assuming the control hasn't failed, all fryers have a built in High Temp alarm that alerts at >40F beyond setpoint or >415F, whichever occurs first.	1. Incorrect temperature offset selected. 2. Set temperature exceeding 390°F (198.8°C). 3. Temperature probe malfunction. 4. Cooking control malfunction.

ALL MODELS (Continued)

SYMPTOMS	POSSIBLE CAUSES
• A-control: Display message "HI". • D-control: Display message "HI TEMP" with alarm. • C-control: Display message "HIGH TEMP" with alarm.	5. Interface board malfunction. 6. Gas pressure incorrect. 7. Harness short circuit. 8. Exhaust flue obstructed. 9. Damaged high limit.
Low heat	1. Incorrect temperature offset selected. 2. Incorrect melt mode selected. 3. Cooking control malfunction. 4. Temperature probe malfunction. 5. High limit tripped. 6. Interface board malfunction. 7. Gas pressure incorrect.
Intermittent problems	1. High ambient temperatures. 2. Wiring connections loose.
No power to cooking control, fryer does not heat	1. Power switch off or malfunction. 2. Main circuit breaker off. 3. Transformer inoperative. 4. Interconnecting wiring malfunction.
High limit thermostat shutting down system	1. Oil level below minimum fill line. 2. Obstructed flue. **NOTE:** Causes burners to burn front of the tank and ruin most everything in the front of fryer. 3. Probe malfunction. 4. Control malfunction. 5. Bad high limit.
Excessive time to melt oil (more than 45 minutes)	1. Incorrect melt mode selected. 2. Melt cycle timing incorrect. 3. Rear gas valve not fully opened. 4. Insufficient gas pressure to gas valve or to manifold. 5. Probe malfunction. 6. Control malfunction.
Dry fire fry tank	1. Magnets are not aligned, control will not call for heat. 2. Incorrect button selection after draining and not refilling tank.

ALL MODELS (Continued)

SYMPTOMS	POSSIBLE CAUSES
	3. Incorrect button selection when starting fryer with empty tank. 4. Incorrect melt mode selection. 5. Control malfunction. 6. Probe malfunction.

ERROR CODES

Error Messages Displayed on Controllers

A style Controller Solid State w/Knob	C style Controller Computer	D style Controller Solid State	Description
PLt	PILOT OUT	PILOT OUT	PILOT OUT - If pilot is out, a message will be displayed and pilot will try to light for 90 seconds.
PLt	NO IGNITION	NO IGNITION	NO OR LOW GAS SUPPLY/PILOT IGNITION ISSUE – If no action is taken after 90 seconds, an alarm sounds continuously, heat demand is disabled, and any running cooking cycles are cancelled. The fryer must be turned off, then back on to re-initialize the control and to have normal functions resumed.
oP	PROBE OPEN	PROBE OPEN	OPEN PROBE – If an open probe is detected, the heat demand is disabled and any running cooking cycles are cancelled. All operator buttons are disabled.
SP	PROBE SHORT	PROBE SHORT	SHORTED PROBE – If a shorted probe is detected, heat demand is disabled, and any running cooking cycles are cancelled. All operator buttons are disabled.
HI	HI TEMP	HIGH TEMP	Hi TEMPERATURE – If the temperature is greater than or equal to 415°F (212°C) or 40°F above setpoint, heat demand is disabled, and any running cooking cycles are cancelled. All operator buttons are disabled.

KLEENSCREEN FILTERING SYSTEM

SYMPTOMS	POSSIBLE CAUSES
Oil not filtering, pump motor is on.	1. Filter screen plugged. 2. Missing or damaged O-rings. 3. Loose fittings or crack in pump supply line (suction leak). 4. Clog in filter system lines. **NOTE:** When all filtered oil is returned to the fry tank and filter power switch is off, open the filter drawer approximately 1". Allow the remaining oil in the line to drain into the filter tank to prevent possible clogging after the oil cools and solidifies. Close the filter drawer when complete. 5. Oil below 300°F (too thick). 6. Filter valve switch malfunction. **NOTE:** Ensure the discard hose switch is on the appropriate setting (with or without discard hose connected). 7. Filter solenoid valve mechanical or electrical malfunction. 8. Pump is inoperative.
Oil not discarding, pump motor on.	1. Filter screen plugged. 2. Missing or damaged O-rings. 3. Loose fittings or crack in pump supply line (suction leak). 4. Clog in filter system lines. **NOTE:** When all filtered oil is returned to the fry tank and filter power switch is off, open the filter drawer approximately 1". Allow the remaining oil in the line to drain into the filter tank to prevent possible clogging after the oil cools and solidifies. Close the filter drawer when complete. 5. Oil below 300°F (too thick). 6. Discard valve switch malfunction. **NOTE:** Ensure the discard hose switch is on the appropriate setting (with or without discard hose connected). 7. Discard valve mechanical malfunction. 8. Discard hose connection not fully engaged. 9. Pump is inoperative.
Pump motor is not running.	1. Filter power switch inoperative. 2. Thermal overload tripped. 3. No power to pump. 4. Loose or damaged wiring connections. 5. 6. Filter relay malfunction.

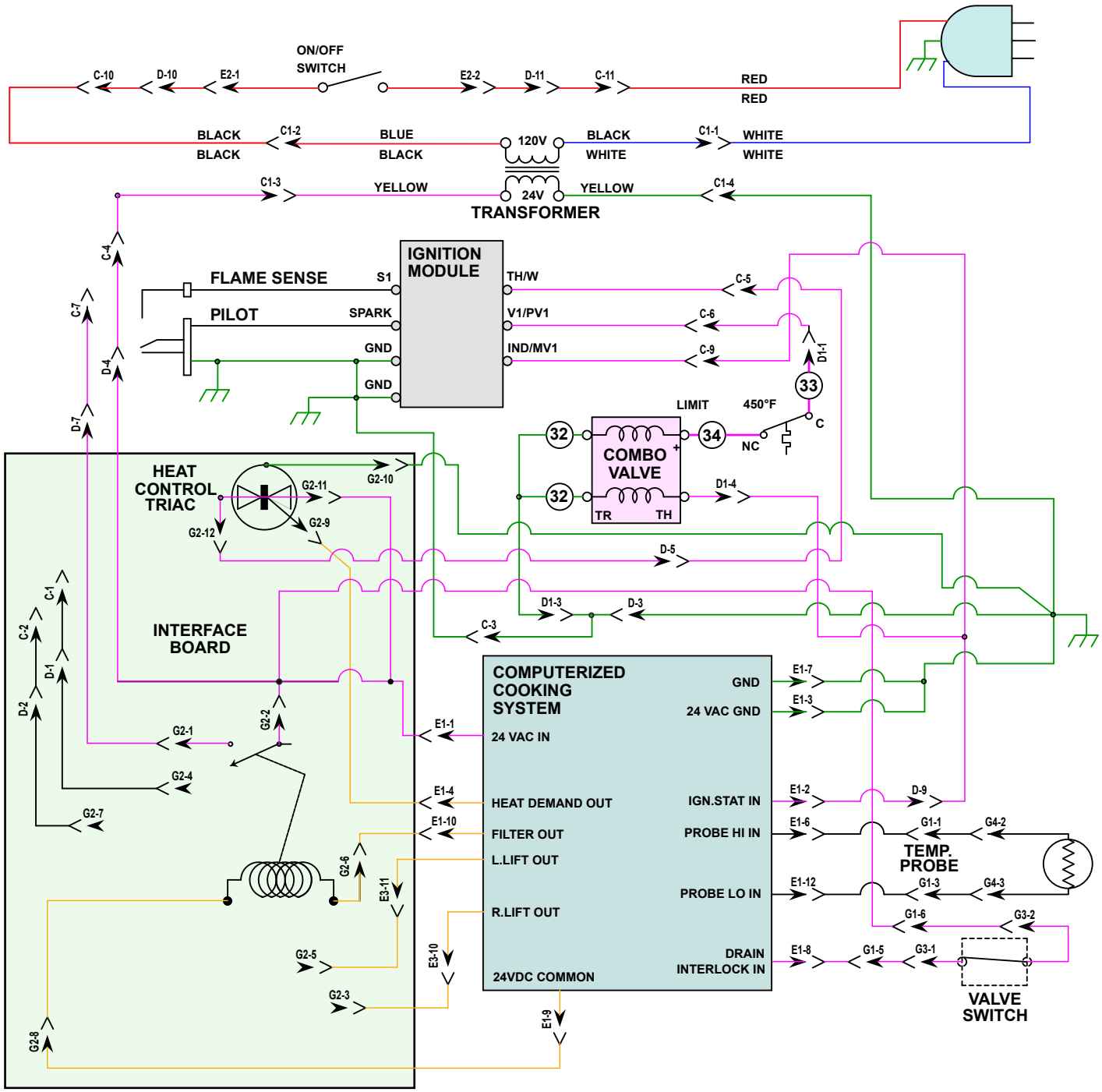
SYMPTOMS	POSSIBLE CAUSES
	7. Pump motor inoperative.

VHG PREVENTATIVE MAINTENANCE CHECKLIST

SCHEDULE	CHECK	ACTION
Weekly	Flue	• When cool, check flue and clear any obstructions.
Annually	Controller	• Check temperature calibration. • Check button function. • Check power switch function.

	Oil Leaks	• Fry tank weldment.
		• Return oil lines.
		• Drain manifold.
		  • Couplings.
		  • Drain valves.

	Oil Filter System	• Check pump motor function. • Check for oil leaks in return lines with pump under pressure. • Verify two o-rings are present in suction block receptacle. • Verify rinse/discard switch is functioning. • Verify all drain pan rollers and guides are in place and pan moves in and out smoothly.
	Operating Gas Pressure	• 3.5” W.C. for natural gas. • 10” W.C. for propane.
	Wiring	• Check power cord for damage. • Check internal wiring for damage/loose connections.
	Casters	• Check casters for damage.



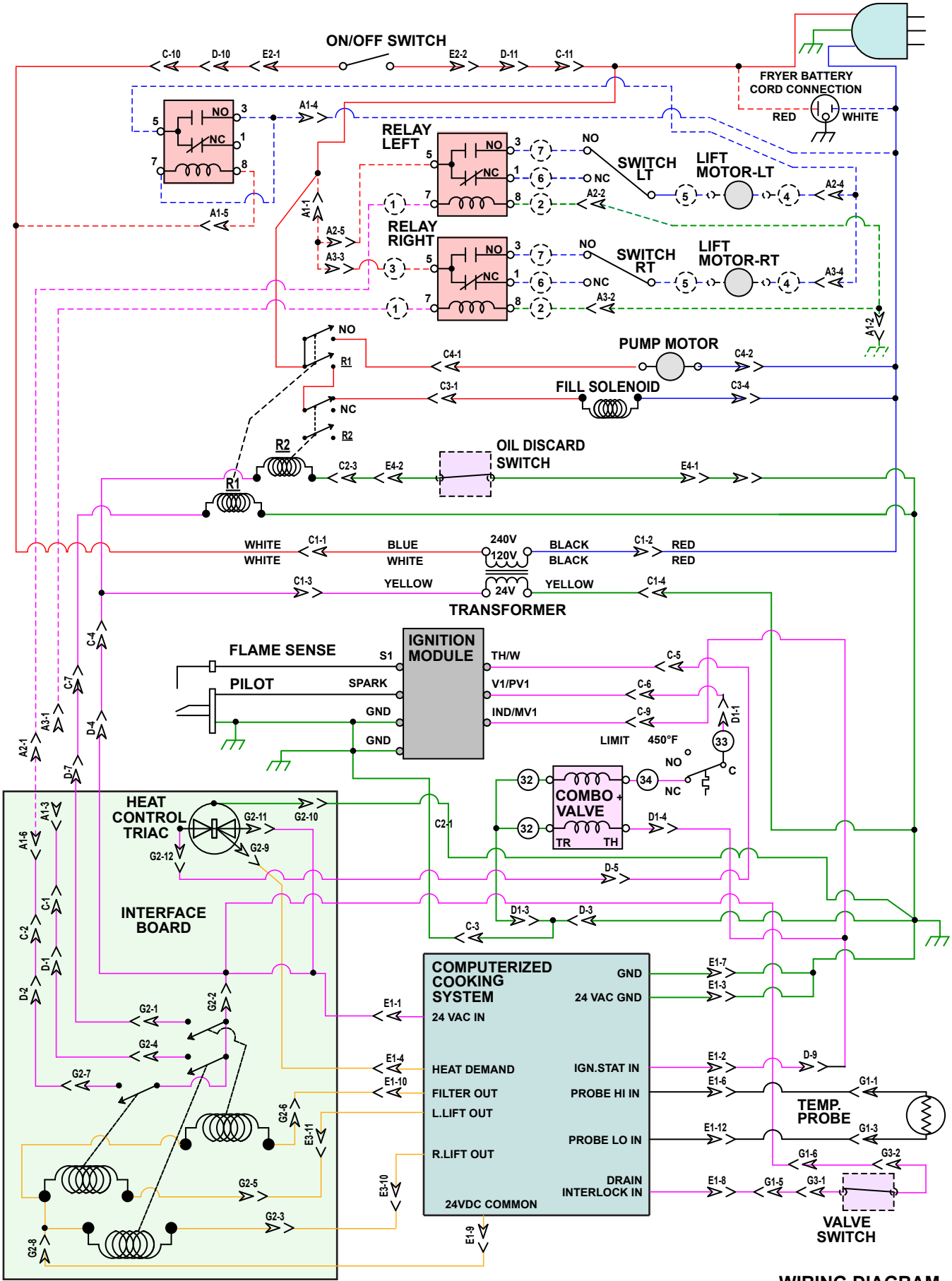
VOLTAGE WIRE COLORS

	L1
	NEU / COM
	GND
	24VAC
	24VDC

WIRING DIAGRAM,
VHG FRYER STANDALONE
120VAC, 1PH
VHG A MODEL
VHG D MODEL
VHG C MODEL

DERIVED FROM 00-976718-5 Rev. C

AI4959



WIRING DIAGRAM, VHG FRYER WITH OPTIONS 120VAC, 1PH

VHG A MODEL
VHG D MODEL
VHG C MODEL

DERIVED FROM 00-976718-4 Rev. C

AI4960

VOLTAGE WIRE COLORS

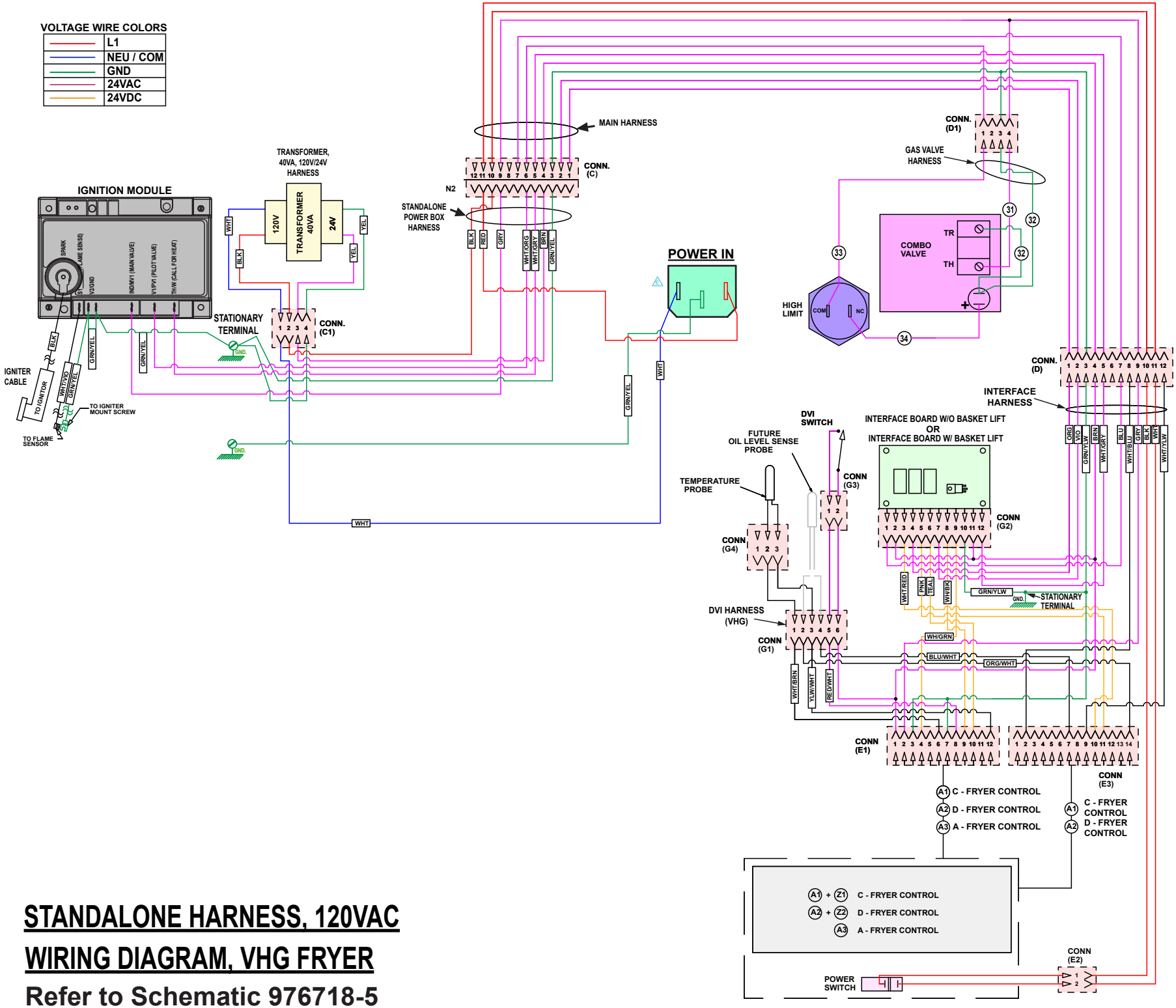
	L1
	NEU / COM
	GND
	24VAC
	24VDC

SOLENOID VALVE
CONN. (C3)
MAIN HARNESS
CONN. (C)
IGNITION MODULE
SPARK
S1 (FLAME SENSE)
V2/GND
IND/MV1 (MAIN VALVE)
V1/PV1 (PILOT VALVE)
THW (CALL FOR HEAT)
TRANS., 40VA 120V/24V HARNESS
120V
TRANSFORMER 40VA
24V
POWER BOX HARNESS OPTION
CONN. (C1)
STATIONARY TERMINAL
GND.
TO HEAT TRACE STRIPS
ROCKER SWITCH ASSEMBLY
HEAT TRACE ON/OFF SWITCH
IGNITER CABLE
TO IGNITOR
TO IGNITER MOUNT SCREW
TO FLAME SENSOR
HEAT TRACE ON JUMPER (OPT)
HEAT TRACE HARNESS
RELAY SWITCH 120V
BASKET LIFT HARNESS
CONN. (A)
CONN. (A1)
CONN. (A2)
CONN. (A3)
POWER OUT
SOLENOID VALVE RELAY SPST 24 VAC COIL
R2
RELAY 1 HP 120 VOLT
R1
CONN. (C4)
CONN. (C2)
HARNESS, PUMP MOTOR HARNESS (VHG)
SWITCH FILTER HARNESS
GEAR MOTOR
GEAR MOTOR
PUMP MOTOR
LEFT SIDE
RIGHT SIDE
OPTIONAL
BASKET LIFT CONTROL ASSEMBLY
REFER TO D-418519 FOR WIRING INFORMATION
(FOR SINGLE BASKET LIFT USE RH VIEW
FOR DUAL BASKET LIFT USE RH & LH VIEW)
POWER IN
HIGH LIMIT
COM
NC
CONN. (D1)
GAS VALVE HARNESS
COMBO VALVE
TR
TH
CONN. (D)
INTERFACE HARNESS
DVI SWITCH
FUTURE OIL LEVEL SENSE PROBE
TEMPERATURE PROBE
CONN (G3)
CONN (G4)
INTERFACE BOARD W/O BASKET LIFT
OR
INTERFACE BOARD W/ BASKET LIFT
CONN (G2)
GRN/YLW
STATIONARY TERMINAL
DVI HARNESS (VHG)
CONN (G1)
CONN (E1)
CONN (E3)
C - FRYER CONTROL
D - FRYER CONTROL
A - FRYER CONTROL
REAR OIL DISCARD SWITCH
CONN. (E4)
C - FRYER CONTROL
C-CONTROL CONNECTOR HARNESS
D - FRYER CONTROL
D-CONTROL CONNECTOR HARNESS
A - FRYER CONTROL
POWER SWITCH
CONN (E2)

SEE SCHEMATIC DECAL 976718-4

WIRING DIAGRAM, VHG FRYER
OPTION HARNESS, 120VAC, 1PH
VHG A MODEL
VHG D MODEL
VHG C MODEL
976718-1 REV. G

AI4961



STANDALONE HARNESS, 120VAC

WIRING DIAGRAM, VHG FRYER

Refer to Schematic 976718-5
Derived From 97618-1 Rev G

AI4962

VOLTAGE WIRE COLORS

	L1
	L2
	GND
	24VDC
	24VAC

SOLENOID VALVE
MAIN HARNESS
CONN. (C)
CONN. (C3)
POWER BOX HARNESS OPTION
IGNITION MODULE
SPARK
FLAME SENSE)
V2/GND
IN(MV)Y1 (MAIN VALVE)
V1/P/Y1 (PILOT VALVE)
TH/W (CALL FOR HEAT)
TRANSFORMER, 40VA, 208V/240V/24V HARNESS
208V 240V
TRANSFORMER 40VA
24V
BLU-240V
RED-208V
CONN. (C1)
STATIONARY TERMINAL
GND.
IGNITER CABLE
TO IGNITOR
TO IGNITER MOUNT SCREW
TO FLAME SENSOR
TO HEAT TRACE STRIPS
ROCKER SWITCH ASSEMBLY
HEAT TRACE ON/OFF SWITCH
RELAY SWITCH 120V
BASKET LIFT HARNESS
HEAT TRACE HARNESS
CONN. (A)
CONN. (A1)
CONN. (A2)
CONN. (A3)
POWER OUT
SOLENOID VALVE RELAY SPST 24 VAC COIL
R2
RELAY 1 HP 120 VOLT
R1
CONN. (C4)
CONN. (C2)
HARNESS, PUMP MOTOR HARNESS (VHG)
SWITCH FILTER HARNESS
CONN. (E4)
REAR OIL DISCARD SWITCH
GEAR MOTOR
GEAR MOTOR
PUMP MOTOR
LEFT SIDE
RIGHT SIDE
OPTIONAL
BASKET LIFT CONTROL ASSEMBLY
REFER TO D-418519 FOR WIRING INFORMATION
(FOR SINGLE BASKET LIFT USE RH VIEW
FOR DUAL BASKET LIFT USE RH & LH VIEW)

POWER IN

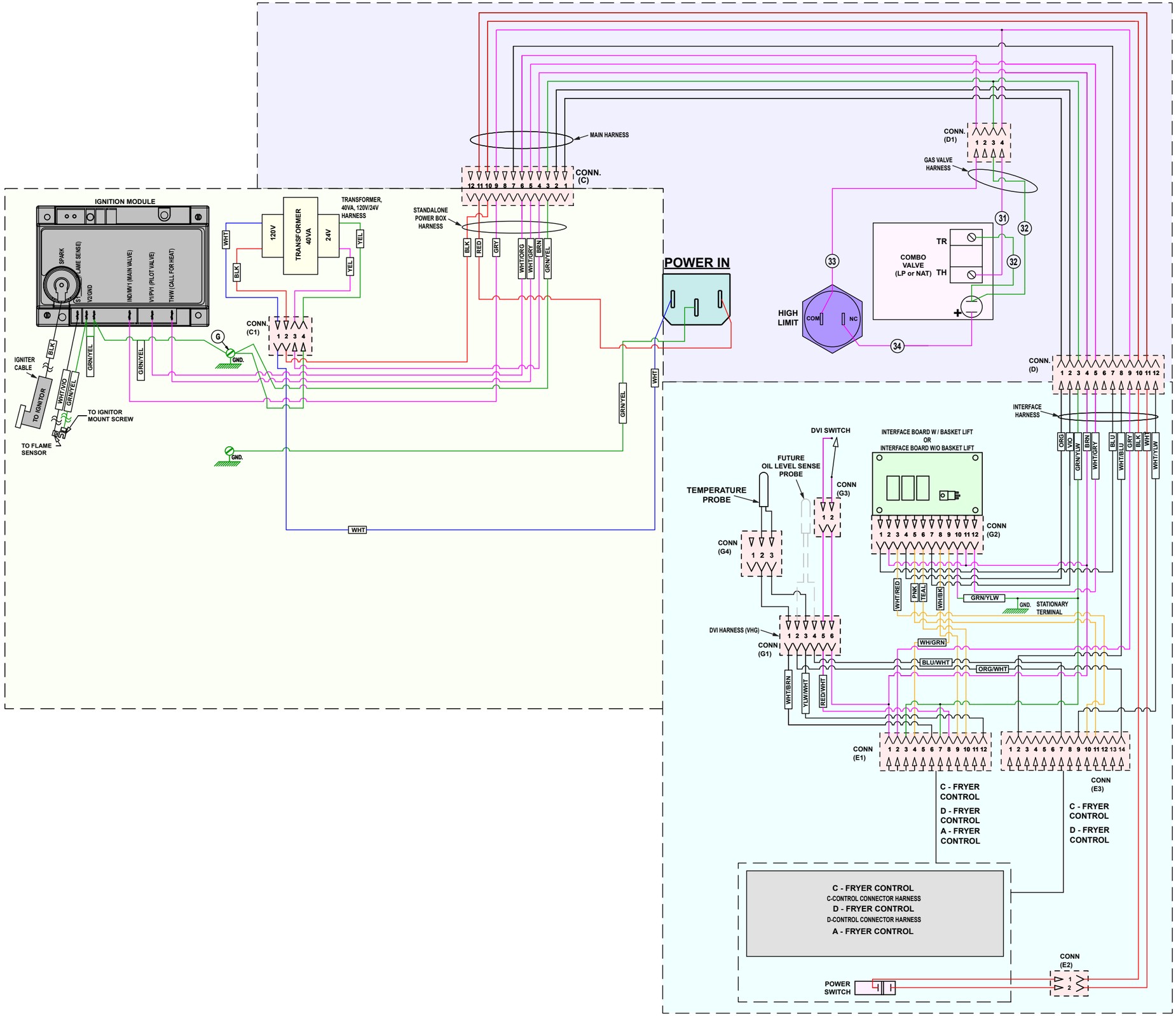
CONN. (D1)
GAS VALVE HARNESS
COMBO VALVE
TR
TH
HIGH LIMIT
COM
NC
CONN. (D)
INTERFACE HARNESS
DVI SWITCH
FUTURE OIL LEVEL SENSE PROBE
TEMPERATURE PROBE
CONN (G3)
CONN (G4)
INTERFACE BOARD W/O BASKET LIFT
OR
INTERFACE BOARD W/ BASKET LIFT
CONN (G2)
GRN/YLW
STATIONARY TERMINAL
GND
DVI HARNESS (VHG)
CONN (G1)
CONN (E1)
CONN (E3)
C - FRYER CONTROL
D - FRYER CONTROL
A - FRYER CONTROL
C - FRYER CONTROL
C-CONTROL CONNECTOR HARNESS
D - FRYER CONTROL
D-CONTROL CONNECTOR HARNESS
A - FRYER CONTROL
POWER SWITCH
CONN (E2)

SEE SCHEMATIC DECAL 976718-4

WIRING DIAGRAM, VHG FRYER
OPTION HARNESS, 240VAC, 1PH
VHG A MODEL
VHG D MODEL
VHG C MODEL
976718-1 REV. G
AI4963

VOLTAGE WIRE COLORS

	L1
	NEU / COM
	GND
	24VAC
	24VDC



SEE SCHEMATIC DECAL 976718-5

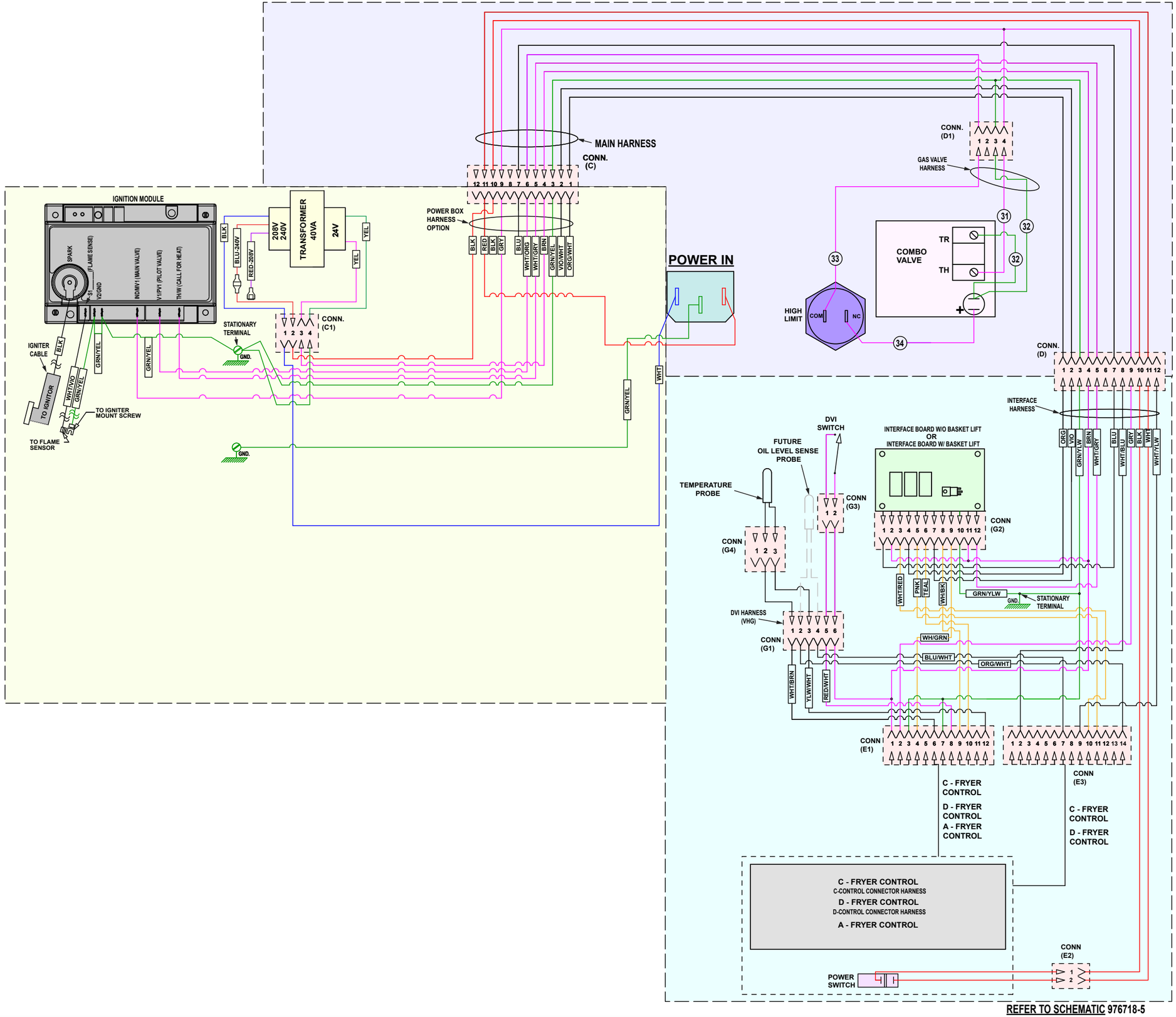
WIRING DIAGRAM, VHG FRYER
STANDALONE HARNESS, 120VAC, 1PH

VHG A MODEL
VHG D MODEL
VHG C MODEL
976718-1 REV J

AI5696

VOLTAGE WIRE COLORS

	L1
	L2
	GND
	24VDC
	24VAC



REFER TO SCHEMATIC 976718-5

WIRING DIAGRAM, VHG FRYER OPTION HARNESS, 240VAC, 1PH

VHG A MODEL
VHG D MODEL
VHG C MODEL
976718-1 REV. G

AI4964