



Parts Manual - 26479  
Revision K

Fill in appropriate fields that apply to this machine

Machine S/N: \_\_\_\_\_

1<sup>st</sup> Hose S/N: \_\_\_\_\_

2<sup>nd</sup> Hose S/N: \_\_\_\_\_

1<sup>st</sup> Pump S/N: \_\_\_\_\_

2<sup>nd</sup> Pump S/N: \_\_\_\_\_

Engine S/N: \_\_\_\_\_

Compressor S/N: \_\_\_\_\_

Gear Box S/N (Patcher): \_\_\_\_\_

Blower S/N (Magnum): \_\_\_\_\_

## Revisions

| Rev | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Date      |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| E   | Converted to Microsoft Word from Adobe Pagemaker.<br>Changed manual layout.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3/15/2015 |
| F   | Added pump maintenance section, hot oil pump part list, material pump rebuild kit. Corrected wand 41629 was 46129, changed 51390 to 51399, 51730 TO 52200, added new engine, and control box parts list                                                                                                                                                                                                                                                                                                                                                                 | 8/17/16   |
| G   | Applied revisions due to Control Box changes to add Crank Lockout and burner relay to replace frame solenoid                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 10/2/2017 |
| H   | Update warranty start to invoice date in sections 3.0 and 31. Corrected part number of item 4 of Fig. 9.19 to 29913. Added section 9.4 Optional Engine Cover and parts list. Revised 4.0 Machine Specifications. Added section 5.10 Overnight Heater Use. Revised Fig. 9.4 parts list item 15 part numbers. Revised Fig. 9.22 hydraulic diagram to correct agitator pump hose routing. Revised Fig. 9.15 item 9 and item 12 descriptions. Revised Fig. 9.16 item 1 and item 2 descriptions.                                                                             | 6/11/2018 |
| J   | Added section 2.4 for California Prop 65. Replaced wand figure in section 5.3. Changed figure and part number in section 9.18: 52201RN was 52201, 52201LN was 52201L, 52202N was 52202, and 52203N was 52203. Updated fig. 9.4. Changed item 1 to 42072 in Section 9.6. Added a section on changing engine air filter to Table 6-1. Added Section 6.22. Added part 41867 to section 6.16. Updated Section 9.22 with new separate fuel lines for burner. Changed figures 9.24, 9.25, 9.26, 9.27 DIN Plug locations and hose routing. Updated tool names in Section 10.0. | 2/2019    |
| K   | Update hydraulic pressure relief valve settings shown in figure 8.6. Pump pressure is 1000 psi; was 1500 psi. Agitator pressure is 1500 psi; was 1000 psi. Hot oil pump pressure is 800 psi; was 500 psi. Update part number of fuel tank in parts list 9.2, is: 47060N; was 46250.                                                                                                                                                                                                                                                                                     | 4/2019    |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |



**EZ1500 Series II Double Pumper Melter - Electric Hose  
PN 46500EB**

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## **Chapter 1 Introduction**

### **1.0 About This Manual**

This manual is supplied with each new Crafco EZ Series II 1500 Double Pumper Diesel Melter. The manual assists your machine operators in the proper use of the melter applicator and provides information about the machine's mechanical functions.

Your Crafco EZ Series II 1500 Double Pumper Diesel Melter is specially made to give excellent service and save maintenance expense. However, as with all specially engineered equipment, you get best results at minimum cost if you:

Operate your machine as instructed in this manual.

Maintain your machine regularly as stated in this manual.

### **1.1 How to use this manual:**

This manual is formatted to start each new chapter on the right page. There may be a blank page on the left page if the previous chapter ends on the right page.

If you are viewing this in a digital format (PDF) the following features are available:

1. The Table of Contents, List of Tables, and List of Figures are all hyperlinks, when left mouse clicked on section, table, or figure you will be sent to that page.
2. The blue highlighted text throughout the manual is a hyperlink, when left mouse clicked you will be sent to that page, table, or figure.
3. The panel to the left in the PDF is a bookmarks panel, if you left mouse click on any section/heading in the bookmarks panel you will be sent to that page.



## Chapter 2 Safety

### 2.0 Safety Precautions

For more in-depth safety information, please see Safety Manual (PN 26221) which comes with the machine. Or contact your nearest authorized Crafco Distributor at [crafco.com/Distributors](http://crafco.com/Distributors).

### 2.1 General Safety

- Crafco, Inc. assumes no liability for an accident or injury incurred through improper use of the machine.
- Read this manual thoroughly before operating the machine.
- Obey all CAUTION and WARNING signs posted on the machine.
- Make sure an operator fully knows how to operate the machine before using the machine.

### 2.2 Personal Safety

- The high operating temperatures of this machine and the sealant it contains requires that protective clothing, gloves, hard-soled shoes, and safety glasses or a face shield be worn at all times by operators of the machine.
- Prevent water from going into any part of the machine. If there is indication of water in the heat transfer oil system, warm heating oil to 250-300°F for 2 to 3 hours.
- Bodily contact with hot sealant or heat transfer oil can cause severe burns.
- If the mixer is not stopped before adding solid material, hot material can get on an operator's body and cause severe burns.
- Keep hands, feet, and clothing away from all moving parts.

### 2.3 Equipment or Operational Safety

- Do not operate the machine in buildings or work areas that do not have sufficient airflow.
- Shut-down the burner and the engine before refilling the fuel tank.
- Make sure mixer stops before adding solid material to the sealant tank. Lift the lid, place the material on the lid and close the lid. The mixer should restart automatically.
- Always keep a correctly maintained fire extinguisher near the machine and know how to use it.
- DO NOT heat transfer oil to a temperature of more than 525°F.
- DO NOT put too much heat transfer oil in the reservoir. The expansion of oil while it heats up can cause overflow. With the machine on level ground, check the oil each day before starting the burner. Add oil to the top mark on the dipstick if required (at 70°F). Use only recommended heat transfer oil. Change the oil after 500 hours of machine operation, or one year, whichever comes first.
- Follow the operating instructions for starting and shutting down the burner. Instructions are mounted on the control box on the machine.
- Calibrate the temperature control operation after each 50 hours of machine operation. Refer to section [6.11 Temperature control Calibration](#).
- Replace any hoses which show signs of wear, fraying or splitting.
- Make sure all fittings and joints are tight and do not leak each time the machine is used.
- Do not leave the machine unattended while the burner is lit.
- Tighten all bolts and screws every 100 hours of machine operation.

## Chapter 2 Safety

### 2.4 California Proposition 65

The state of California currently maintains a list of chemicals that can cause cancer, birth defects or other reproductive harm. Your CrafcO, Inc. equipment comes with the following warnings:

#### 2.4.1 All CrafcO, Inc. Equipment

 **WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)  
26471N

#### 2.4.2 All CrafcO, Inc. Equipment Using a Diesel Engine

 **WARNING:** Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to [www.P65warnings.ca.gov/diesel](http://www.P65warnings.ca.gov/diesel).

26307

## Chapter 2 Safety

### 2.5 Safety Symbols and Notices

Important safety symbols and notices are marked on the machine and in this manual. Failure to comply could result in equipment damage, operational malfunction, serious injury, or death. Please read and comply with all symbols and notices. The table below includes the most commonly used symbols and notices.

**Table 2-1 Safety Symbols and Notices**

| Symbol                                                                              | Item                        | Remarks                                                              |
|-------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------|
| <b>WARNING</b>                                                                      | Warning                     | Refers to possible bodily injury or death.                           |
| <b>CAUTION</b>                                                                      | Caution                     | Refers to possible equipment damage or operational malfunction.      |
|    | Severe Burn Hazard          | Hot material can cause severe burns.                                 |
|   | Protective Shoes            | Wear hard-soled work shoes.                                          |
|  | Protective Gloves           | Wear heat resistant gloves.                                          |
|  | Protective Face or Eye Wear | Wear face shield or safety glasses.                                  |
|  | Body Crush Hazard           | Do not stand between trailer and hitch when hooking melter to truck. |

## Chapter 2 Safety

**Table 2-2 Safety Symbols and Notices (continued)**

| Symbol                                                                             | Item           | Remark                                                                    |
|------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------|
|   | Crush Hazard   | Keep feet and legs clear.                                                 |
|   | Pinch Hazard   | Keep hands and feet clear.                                                |
|   | Exhaust Hazard | Avoid breathing engine exhaust.                                           |
|  | Read Manual    | Read and understand operator and safety manuals before operating machine. |

## Chapter 3 Warranty Information

### 3.0 Limited Warranty

Crafco, Inc., through Crafco or one of its affiliated distributors, will replace for the original purchaser free of charge any parts found upon examination by the factory at Chandler, Arizona, to be defective in material or workmanship. This warranty is for a period **two years** from the invoice date, but excludes engine or components, tires, and battery as these items are subject to warranties issued by their manufactures.

Crafco, Inc. shall not be liable for parts that have been damaged by accident, alteration, abuse, improper lubrication/maintenance, normal wear, or other cause beyond our control.

The warranty provided herein extends only to the repair and/or replacement of those components on the equipment covered above and does not cover labor costs. The warranty does not extend to incidental or consequential damages incurred as a result of any defect covered by this warranty.

All transportation and labor costs incurred by the purchaser in submitting or repairing covered components must be borne by the purchaser. Crafco, Inc. specifically disavows any other representation, warranty, or liability related to the condition or use of the product

#### CAUTION

Use of replacement parts other than genuine Crafco parts may impair the safety or reliability of your equipment and nullifies any warranty.

## Chapter 3 Warranty Information

### 3.1 Warranty Claim Instructions

Crafco, Inc. warrants parts and machinery purchased through Crafco or one of its affiliated distributors for two years from the invoice date. Wear items are not covered under the Crafco, Inc. limited warranty. A wear item is defined as but not limited to: material pumps, sealing tips, tires, etc.

If parts fail to function within two years of invoice date, a return authorization number (RA) must be obtained. If the part was purchased through Crafco, Inc., please contact Crafco returns department at [Returns@Crafco.com](mailto>Returns@Crafco.com) for an RA number or if purchased through a Crafco distributor please contact your distributor.

Note: if the part has a serial number associated with it, for example; a machine or electric hose or wand, this must be furnished when requesting the RA number. The customer will be emailed or faxed an RA form with all instructions to return the item to Crafco, Inc. See example. If the part is found to be within the one year warranty period and has not been abused or modified, a credit will be issued to the customer's account or credit card. The customer may request the part be replaced instead of a credit, if desired.

Note: All engine warranties are covered through the engine manufacturer. If you need information for a distributor in your area please contact us and we will direct you to the closest engine distributor.

All parts returned are tested and evaluated. If the part has been modified in anyway without prior consent from a Crafco, Inc. representative, warranty is void.

Please follow the instructions stated below when calling in a Warranty Claim. Failure to follow these procedures may be cause to void the warranty.

Call your local Crafco Distributor. If you do not know who your local distributor is, call a Crafco Customer Service Representative, (Toll Free 1-800-528-8242) for name, location and telephone number.

On contacting the distributor, be prepared to identify the serial number, model number, engine number, engine manufacturer, and the date of purchase if available.

Should the cause of the malfunction be a defective part, the Distributor will advise you of the procedure to follow for a replacement.

The warranty is valid only for parts, which have been supplied or recommended by Crafco, Inc.

If you have any additional questions regarding warrant repairs and parts, please do not hesitate to call toll free 1-800-528-8242.

For Warranty:  
Crafco, Inc.  
25527 South Arizona Avenue, Chandler, AZ  
85248  
Phone: (480) 655-8333 or (800) 528-8242  
Fax: (480) 655-1712

For all other inquires:  
Crafco, Inc.  
6165 W. Detroit Street  
Chandler, AZ 85226  
Phone: (602) 276-0406 or (800) 528-8242  
Fax: (480) 961-0513  
[CustomerService@crafco.com](mailto:CustomerService@crafco.com)

## Chapter 4 Machine Specifications

### 4.0 Machine Specifications

**Table 4-1 Machine Specifications**

| Specification                  | PN 46500EB                                                                     | PN 46500SB |
|--------------------------------|--------------------------------------------------------------------------------|------------|
| Vat capacity                   | 396 gallons                                                                    |            |
| Melt Capacity                  | 2800 lbs. per hour                                                             |            |
| Heat transfer oil required     | 45.0 gallons at 70°F                                                           |            |
| Tank construction              | Double boiler type                                                             |            |
| Tank opening size              | One 14" x 18", One 16" x 24"                                                   |            |
| Maximum heat input             | 329,430 BTUs                                                                   |            |
| Burner and temperature control | Diesel-forced air thermostatic control                                         |            |
| Engine Isuzu diesel            | Four cylinder Model 4LE2T – 48.0 BHP @ 2350 RPM                                |            |
| Drive Mechanism                | All hydraulic with forward and reverse on material pump. Fixed speed agitator. |            |
| Mixer                          | Full sweep mixer with 2 horizontal paddles, vertical risers                    |            |
| Axle Capacity                  | Dual 6,000lbs.                                                                 |            |
| Tires                          | ST235/85R16 Load Range E                                                       |            |
| Dry Weight Approximately       | 7,374lbs.                                                                      |            |
| Diesel tank Capacity           | 30 Gallons                                                                     |            |
| Hydraulic Tank Capacity        | 26 Gallons                                                                     |            |



## Chapter 5 Operating Instructions

### 5.0 Operating Instructions

The Crafco EZ 1500 Series II Double Pumper was developed to melt Crafco sealants. However, it works well with most road asphalt and federal specification crack or joint sealants.

**Note:** DO NOT attempt to operate the machine without using these and all other instructions.

### 5.1 Preparing the Machine for Start Up

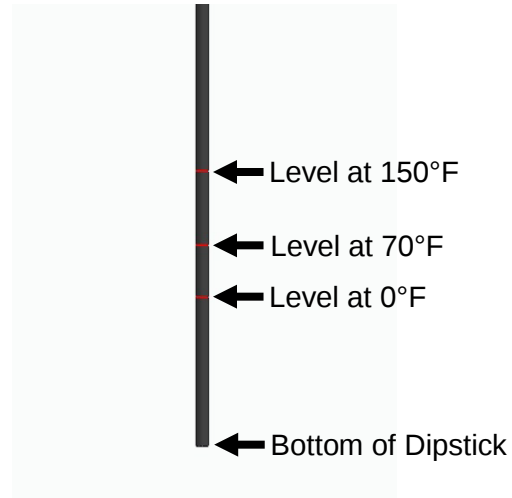
**Table 5-1 Preparing the Machine for Start Up**

| Step                                                                                | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                                   | Fill the engine fuel tank with diesel fuel.<br>Note: Use No. 1 Diesel fuel in cold weather and No. 2 Diesel fuel in warm weather                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 2                                                                                   | Check the oil level in the engine crankcase. (Refer to the manufacturer's instruction for the engine.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3                                                                                   | Check the hydraulic fluid level while at a temperature of 70°F. Add fluid if necessary. See <a href="#">Fig. 5.2 Hydraulic Fluid Level and Temp.</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4                                                                                   | With the machine on level surface, check the heat transfer oil level while at a temperature of 70°F (21.1°C). The oil should be at the full mark on the dipstick. There are two other full marks representing 0°F (-17.8°C) and 150°F (65.6°C). See <a href="#">Fig. 5.2 Dipstick</a> . The oil level changes with temperature due to expansion and contraction. DO NOT overfill or spillage may occur when the oil is heated and expands. See <a href="#">Fig. 5.3 Heat Transfer Oil Dipstick</a> .                                                                                                                                                                          |
| 5                                                                                   | Make sure all toggle switches are turned "OFF" and all temperature control dials are set to their minimum settings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>WARNING</b>                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|  | <p>The safe operation of this machine is the operator's responsibility.</p> <p>Use extreme care when operating this machine; safety is the result of being careful and paying attention to details. Remember the diesel flame is approximately 2,200°F. Some exposed parts of the machine reach 500°F, the sealant 400°F, and the hydraulic fluid 180°F.</p> <p>Always put on protective clothing, gloves, hard-soled shoes, and safety glasses or a face shield. Be sure that all joints and fittings are tight and leak proof. Immediately replace any hose, which shows any signs of wear, fraying, or splitting. Tighten all bolts, nuts, and screws every 100 hours.</p> |

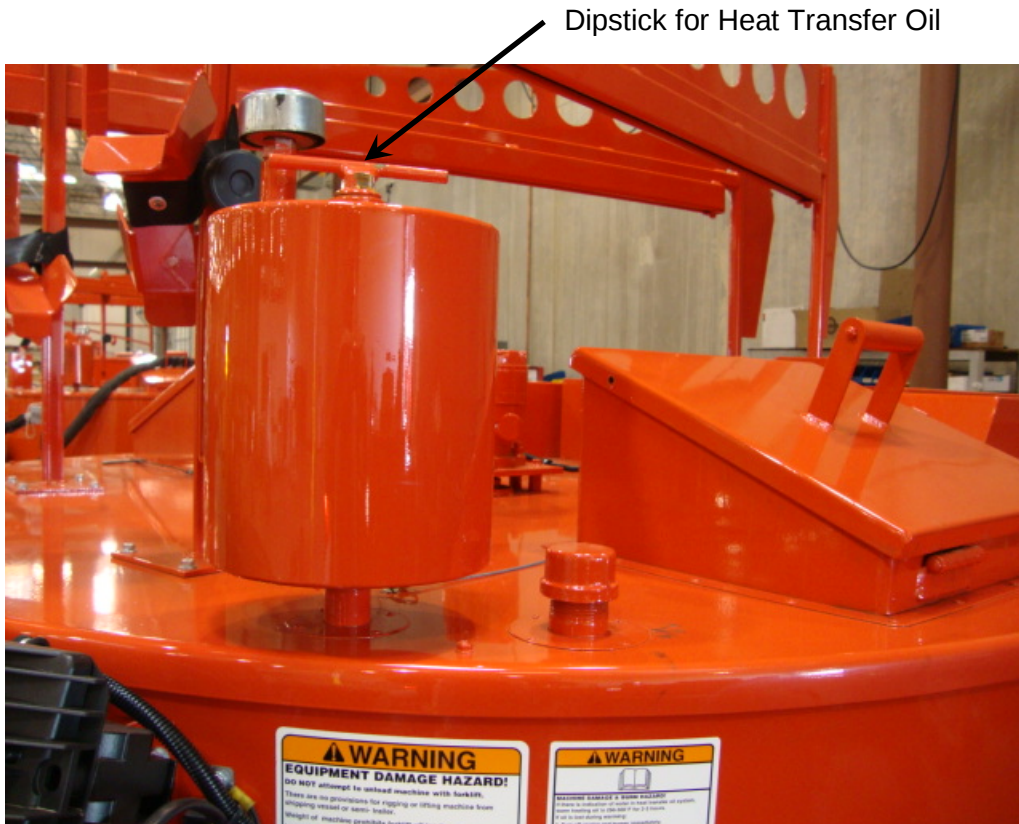
## Chapter 5 Operating Instructions



**Fig. 5.1 Hydraulic Fluid Level and Temp. Gauge**



**Fig. 5.2 Dipstick**



**Fig. 5.3 Heat Transfer Oil Dipstick**

## Chapter 5 Operating Instructions

### 5.2 Machine Start Up for Electric Hose

**Table 5-2 Starting the Burner for Electric Hose**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Fully open the exhaust stack cover.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2    | Turn the key to the "ON" position. Allow engine controller to boot up.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2a   | To start engine, press "Auto" then "RUN". Engine will preheat then start. The engine will start and run at 1000 RPM for 30 seconds, then the RPM will increase to medium RPM. When the material temperature reaches 275°F (135°C) the RPM will increase to high RPM which is full throttle.                                                                                                                                                                                                                                                                                        |
| 3    | Turn the "BURNER" toggle switch in the control box to the "ON" position. The red light marked "BURNER" will illuminate indicating that the material and hot oil temperatures are below set point. When the red light goes off this indicates the material or oil temperatures are up to the set point.<br><b>NOTE:</b> Just because this light is illuminated does not indicate the burner is actually working.                                                                                                                                                                    |
| 4    | Turn "HOSE SELECTOR" switch to "ELECTRIC".<br><b>Note:</b> Electric hose will only work if hose selector switch is in the electric hose position.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 5    | Set the heat transfer oil temperature at 500°F.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 6    | Set the material temperature to the manufacturer's recommended temperature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|      | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|      | If the burner fails ignition after 3 attempts the "BURNER LOCKOUT" alarm will sound. To reset burner, hold the "RESET" toggle switch in the "DOWN" position for 5 seconds, then release. The burner should ignite. If the burner still does not ignite, refer to <a href="#">8.0.1 Symptoms: Burner will Not Ignite</a> to determine the malfunction.                                                                                                                                                                                                                              |
|      | <b>Important:</b> The solid material in the tank melts first around the walls, bottom, and around the center tower of the tank. The material temperature sensor is located by the wall, therefore, it is possible that at the beginning of the melting process the indicated temperature reaches operating value, but the material between to the center tower and the outside wall of the tank is still solid. This is normal, and when the heated hose is ready for operation, most of the material in the tank will be melted and heated to the proper application temperature. |
| 7    | Allow the heat transfer oil to continue to heat.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 8    | When the material reaches 275°F, the mixer light will illuminate which indicates the mixer can be engaged by turning the toggle switch at the control panel to "FORWARD" position. If the mixer does not move, allow the material to heat longer.<br><b>Note:</b> Mixer speed is preset at the factory and cannot be adjusted. The mixer cannot be engaged until the material reaches 275°F.                                                                                                                                                                                       |
|      | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|      | Jamming the mixer can cause the hydraulic oil to overheat and damage the machine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 9    | The hose automatically turns "ON" when the material temperature reaches 275°F. The red light marked "HEATED HOSE" will illuminate when the hose control is calling for heat.                                                                                                                                                                                                                                                                                                                                                                                                       |

## Chapter 5 Operating Instructions

**Table 5-2.1 Starting the Burner for Electric Hose (continued)**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10   | To heat the driver's side hose, turn "ON" the power switch in the driver's side control box. Turn "HOSE SELECTOR" switch to "ELECTRIC".<br><b>Note:</b> Driver's side hose will not turn "ON" until material temperature reaches 275°F.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 11   | Adjust the temperature dials of each hose to the manufacturer's recommended temperature.<br><b>Note:</b> The hose reaches operating temperature in approximately 30 minutes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 12   | After each hose reaches the temperature set point, the light in the control boxes marked "HEATED HOSE" turns off.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13   | Once the hose reaches 325° F the red light marked "PUMP" will illuminate indicating that the temperature interlock will allow operation of material pump.<br><br><b>Important:</b> The hose must reach 325°F before dispensing can take place. If the hose does not dispense when the trigger is activated, allow the material to heat longer. If the hose still does not dispense, shut the machine down, locate and remove the plug in the line.<br><br>The oven must be at 300°F for 20 minutes before attempting to pump. The oven temperature can be regulated by opening the slide gate to increase temperature or close slide gate to decrease temperature. Slide gate is located on passenger side. |
| 14   | Remove hose and wand from transport position and place wand tip in shoebox.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 15   | When sealant reaches application temperature, open "TANK, and RECIRCULATION valves.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 16   | Reverse pump for 3-5 minutes by turning the pump toggle switch to "PUMP REVERSE". When pump turns freely, return switch to "ON ELECTRIC" position.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 17   | Depress wand trigger to recirculate material back into the tank to get material flowing freely through the pump. Ensure wand tip is fully inserted into the shoebox with the door closed until material is flowing freely.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 18   | When application of material is desired, open "APPLICATOR VALVE" and close "RECIRCULATION VALVE". See Table 5-8 Dispensing the Material – Electric Hose                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|      | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|      | DO NOT twist or kink the hose.<br>Avoid sharp bends and continuous twisting by maintaining a minimum 10-inch bend radius.<br>DO NOT use a setting on the hose controller if more than 400°F.<br>DO NOT move or bend the hose when cold: it can cause damage to the hose.<br>DO NOT leave the hose cycling for longer than 30 minutes without dispensing material; coking can occur and permanently damage the hose.<br>DO NOT remove the hose from the boom during operation or kinking will occur.                                                                                                                                                                                                         |
|      | <b>Important:</b> It is strongly recommended that the hose be stored in the boom (locked position) when not in use or when in transit. This will prevent twisting or kinking.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Chapter 5 Operating Instructions

### 5.3 About the Heated Hose, Wand, Valve, and Tip Guard

#### The Heated Hose

The heated hose supplied with the machine is Teflon-lined with steel over braid. It has a heating element, which runs the length of the hose to heat the material within the hose. The hose is covered with high temperature, durable rubber.

#### The Wand

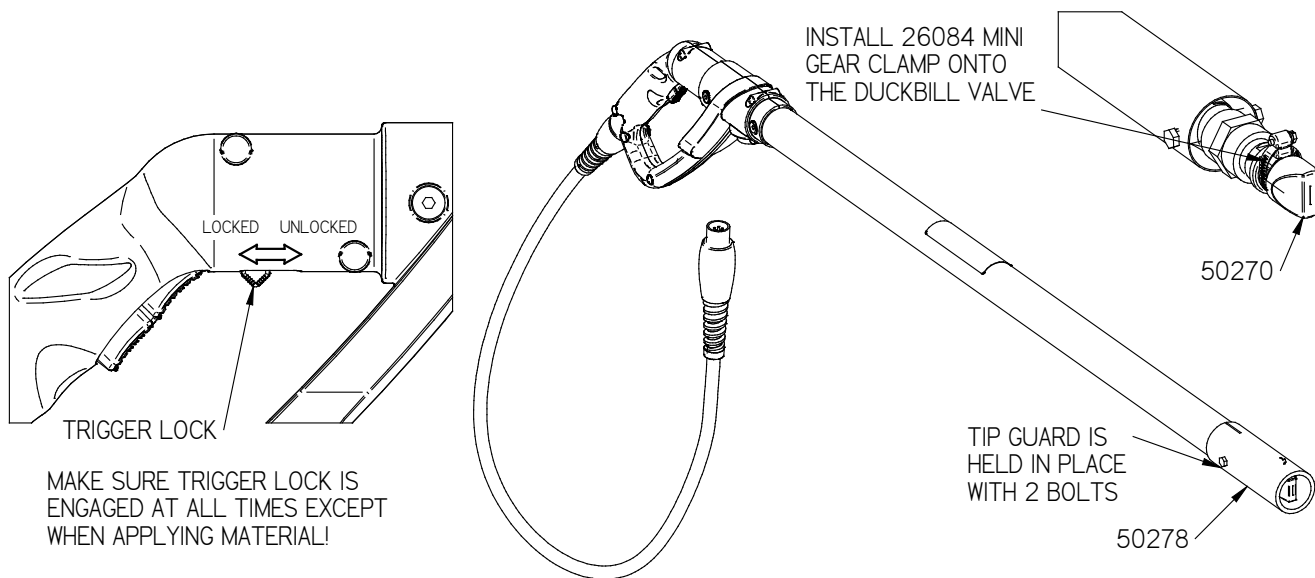
The wand has an aluminum tube to protect both the wand and the operator. The pistol grip actuator is equipped with an electric switch which, when depressed, sends a signal to actuate the pump. The wand is equipped with a trigger lock to prevent accidental pump actuation when it is not pumping material. The trigger must be in the “LOCKED” position at all times except when intentionally pumping material.

#### The Valve

The wand has a disposable duckbill valve on the end, which shuts off the flow of material when the pump is turned off and prevents excessive dripping of material. This valve also directs the material into a stream for easy application into the crack. Other sealing tips are available. See [10.0 Tools and Accessories](#) for other sealing tips and options.

#### Tip Guard

The wand has a Tip Guard installed at the factory only when a duckbill is installed. This Tip Guard is not required when using sealing disk or dripless tip adapter. The purpose of this guard is to prolong the life of the duckbill and to protect the operator in the event of a duckbill failure. Ensure this guard is installed properly before operating equipment. See below.



## Chapter 5 Operating Instructions

### 5.4 Electric Hose Care and Cautions

**Table 5-3 Electric Hose Care**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|      | Twisting and kinking of the electric hose (used on Super Shots, and EZ Series Melters) causes the hose to fail; the electric heating wires are shorted out to the metal hose cover and the hose stops heating.<br><br>This type of failure is not covered under the CrafcO warranty.                                                                                                                                                                                                                      |
| 1    | Set the hose temperature at 380°F, or manufacturer recommended operating temperature.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 2    | Allow the hose to be turned "ON" and heating for a minimum of 30 minutes.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3    | Make sure the hose swivel between the hose and wand moves freely.<br><b>Note:</b> Do not twist or bend the hose over sharp edges such as the edge of the frame or tank. CrafcO, Inc. recommends you do not work directly under the boom; this may cause damage to the hose.                                                                                                                                                                                                                               |
| 4    | Follow all machine instructions in this manual.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|      | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|      | Hose damage occurs if:<br>The hose is bent or moved when cold.<br>The hose is twisted or bent at a sharp radius.<br>The hose is moved before being heated a minimum of 30 minutes and set at 380°F.<br>The operator crosses over or under the hose causing the wires between the hose and wand connection to twist or wrap up.<br>The swivel is cold and is not flexible which can cause the hose to twist.<br>The wiring between the hose and the wand is pulled, stressed, or used to support the wand. |

### 5.5 Storing the Electric Hose for Transport

**Table 5-4 Hose for Transport Instructions**

| Step | Action                                                                                                                                                                                       |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Leave the hose in the boom, swing the boom clockwise (D.S. Hose) and counterclockwise (P.S. Hose) towards the front of the machine and lock the booms into position with the latch provided. |
| 2    | Place the wand in the wand holder and lock the wand into position with the latch provided.                                                                                                   |

## Chapter 5 Operating Instructions

### 5.6 Machine Start Up for Standard Hose

**Table 5-5 Starting the Burner for Standard Hose**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Fully open the exhaust stack cover.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2    | Turn the key to the "ON" position. Allow engine controller to boot up.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2a   | To start engine, press "Auto" then "RUN". Engine will preheat then start. The engine will start and run at 1000 RPM for 30 seconds, then the RPM will increase to medium RPM. When the material temperature reaches 275°F (135°C) the RPM will increase to high RPM which is full throttle.                                                                                                                                                                                                                                                                                        |
| 3    | Turn the "BURNER" toggle switch in the control box to the "ON" position. The red light marked "BURNER" will illuminate indicating that the material and hot oil temperatures are below set point. When the red light goes off this indicates the material or oil temperatures are up to the set point.<br><b>NOTE:</b> Just because this light is illuminated does not indicate the burner is actually working.                                                                                                                                                                    |
| 4    | Turn "HOSE SELECTOR" switch to "STANDARD".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 5    | Set the heat transfer oil temperature at 500°F.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 6    | Set the material temperature to the manufacturer's recommended temperature .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|      | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|      | If the burner fails ignition after 3 attempts the "BURNER LOCKOUT" alarm will sound. To reset burner, hold the "RESET" toggle switch in the "DOWN" position for 5 seconds, then release. The burner should ignite. If the burner still does not ignite, refer to <a href="#">8.0.1 Symptoms: Burner will Not Ignite</a> to determine the malfunction.                                                                                                                                                                                                                              |
|      | <b>Important:</b> The solid material in the tank melts first around the walls, bottom, and around the center tower of the tank. The material temperature sensor is located by the wall, therefore, it is possible that at the beginning of the melting process the indicated temperature reaches operating value, but the material between to the center tower and the outside wall of the tank is still solid. This is normal, and when the heated hose is ready for operation, most of the material in the tank will be melted and heated to the proper application temperature. |
| 7    | Allow the heat transfer oil to continue to heat.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 8    | When the material reaches 275°F, engage the mixer by turning the toggle switch at the control panel to "FORWARD" position. If the mixer does not move, allow the material to heat longer.<br><b>Note:</b> Mixer speed is preset at the factory and cannot be adjusted. The mixer cannot be engaged until the material reaches 275°F.                                                                                                                                                                                                                                               |
|      | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|      | Jamming the mixer can cause the hydraulic oil to overheat and damage the machine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Chapter 5 Operating Instructions

**Table 5-5.1 Starting the Burner for Standard Hose (continued)**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9    | <p>The pump light will come “ON” when the material temperature reaches 275°F indicating the temperature interlock will allow operation of either material pump.</p> <p><b>NOTE:</b> Hose temperature display will not read an accurate pumping temperature until sealant is being pumped through the hose.</p> <p><b>Important:</b> The oven must be at 300°F for 20 minutes before attempting to pump. The oven temperature can be regulated by opening the slide gate to increase temperature or close slide gate to decrease temperature. Slide gate is located on passenger side.</p> |
| 10   | To use the driver’s side hose, turn “ON” the power switch in the driver’s side control box. Turn “HOSE SELECTOR” switch to “STANDARD”.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 11   | When sealant reaches 325°F, open “TANK and RECIRCULATION valves, and close APPLICATOR VALVE”.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 12   | Reverse pump for 3-5 minutes by turning the pump toggle switch to “PUMP REVERSE” position. When pump turns freely in reverse, return switch to “ON STANDARD” position. This circulates hot material from bottom of tank back on top of cold material in the tank.                                                                                                                                                                                                                                                                                                                         |
| 13   | Increase heat transfer oil temperature to 500°F and material temperature to manufacturers recommended application temperature (Approx. 380°-400°F).                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 14   | When application of material is desired, remove hose from oven and connect to wand assembly (Hand tight only). Insert wand tip fully into shoebox with hand wand valve in “OPEN” position.                                                                                                                                                                                                                                                                                                                                                                                                |
| 15   | Open the “APPLICATOR VALVE”, close “RECIRCULATION VALVE”. See <a href="#">Table 5-9 Dispensing the Material – Standard hose</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Chapter 5 Operating Instructions

### 5.7 Loading Material into the Sealant Tank

This unit is equipped with a safety interlock system on the loading door. This system disables the mixer hydraulic system when the lid is open to stop the mixer from turning. This is a safety feature for the operator and should never be disabled for any reason.

#### CAUTION

Personal injury could occur if this safety system is disabled.

**Table 5-6 Loading Material into the Sealant Tank**

| Step                                                                              | Action                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>WARNING</b>                                                                                                                                                                                                                                               |
|                                                                                   | Following this procedure prevents hot material from getting on operators and causing severe burns. Never throw blocks of material directly into tank. Hot material splash hazard will result.                                                                |
| 1                                                                                 | To load material into the sealant tank first open the lid.                                                                                                                                                                                                   |
| 2                                                                                 | Place the solid material on the lid then close the lid. For approximate material volume see <a href="#">Table 5-7 Material Tank Depth Chart</a>                                                                                                              |
| 3                                                                                 | Continue adding solid material at intervals to allow the mixer to rotate without jamming.<br><b>Note:</b> If blocks of solid material are added too quickly, jamming results and slows down the melting process.                                             |
|                                                                                   | <b>Note:</b> When sealant placement volume is low, or the crew has stopped working for lunch, hot oil and material temperatures can equalize. To lower material temperature add a few blocks of cold sealant. This may not be an option if the tank is full. |

## Chapter 5 Operating Instructions

### 5.7.1 Material Tank Depth Chart

**Table 5-7 Material Tank Depth Chart**

| DEPTH OF MATERIAL TANK | CAPACITY IN GALLONS BOTTOM UP | CAPACITY IN LITERS BOTTOM UP | CAPACITY IN GALLONS TOP DOWN | CAPACITY IN LITERS TOP DOWN |
|------------------------|-------------------------------|------------------------------|------------------------------|-----------------------------|
| 1                      | 13.51                         | 51.14                        | 381.26                       | 1443.23                     |
| 2                      | 27.16                         | 102.81                       | 367.23                       | 1390.12                     |
| 3                      | 40.93                         | 154.94                       | 353.2                        | 1337.01                     |
| 4                      | 54.70                         | 207.06                       | 339.17                       | 1283.90                     |
| 5                      | 68.47                         | 259.19                       | 325.14                       | 1230.79                     |
| 6                      | 82.24                         | 311.31                       | 311.11                       | 1177.68                     |
| 7                      | 96.01                         | 363.44                       | 297.08                       | 1124.57                     |
| 8                      | 109.78                        | 415.56                       | 283.05                       | 1071.46                     |
| 9                      | 123.55                        | 467.69                       | 269.02                       | 1018.35                     |
| 10                     | 137.32                        | 519.81                       | 255.25                       | 966.23                      |
| 11                     | 151.09                        | 571.94                       | 241.48                       | 914.10                      |
| 12                     | 164.86                        | 624.06                       | 227.71                       | 861.98                      |
| 13                     | 178.63                        | 676.19                       | 213.94                       | 809.85                      |
| 14                     | 192.40                        | 728.31                       | 200.17                       | 757.73                      |
| 15                     | 206.17                        | 780.44                       | 186.4                        | 705.60                      |
| 16                     | 219.94                        | 832.56                       | 172.63                       | 653.48                      |
| 17                     | 233.71                        | 884.69                       | 158.86                       | 601.35                      |
| 18                     | 247.48                        | 936.81                       | 145.09                       | 549.23                      |
| 19                     | 261.28                        | 989.05                       | 131.32                       | 497.10                      |
| 20                     | 275.25                        | 1041.93                      | 117.55                       | 444.98                      |
| 21                     | 289.27                        | 1095.01                      | 103.78                       | 392.85                      |
| 22                     | 303.29                        | 1148.08                      | 90.01                        | 340.72                      |
| 23                     | 317.31                        | 1201.15                      | 76.24                        | 288.60                      |
| 24                     | 331.34                        | 1254.26                      | 62.47                        | 236.47                      |
| 25                     | 345.37                        | 1307.37                      | 48.7                         | 184.35                      |
| 26                     | 359.40                        | 1360.48                      | 34.93                        | 132.22                      |
| 27                     | 373.43                        | 1413.59                      | 21.16                        | 80.10                       |
| 28                     | 387.46                        | 1466.70                      | 7.39                         | 27.97                       |
| 28.56                  | 395.29                        | 1496.34                      | 0                            | 0.00                        |

## Chapter 5 Operating Instructions

### 5.8 Dispensing the Material

**Table 5-8 Dispensing the Material – Electric Hose**

| Step                                                                              | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | <b>WARNING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  | Put on protective clothing, gloves, hard-soled shoes, and face shield or safety glasses when operating or filling this machine. Read the entire manual before operating the machine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                   | Never point the wand at any part of the body or at any other person. Hot material can cause severe burns.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                   | <b>Important:</b> Some difficulty may be encountered when starting up on cold days. Although the wand is designed to heat the material all the way down to the tip, on cold days you can place the tip of the wand into the shoebox to facilitate material melting in the valve. Insert the wand tip for only a short time before proceeding.                                                                                                                                                                                                                                                                                                               |
| 1                                                                                 | When the material and hose have reached manufacturer's application temperature, you are ready to dispense material.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2                                                                                 | Turn the pump speed control to the lowest setting by turning the speed control knob fully clockwise.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3                                                                                 | Insert the wand tip into the shoebox, depress trigger on the wand and slowly increase pump speed until the pump motor starts to turn.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4                                                                                 | Adjust the pump speed for the desired flow rate for the application. The rate of flow may be varied while the pump is running.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                   | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                   | Never open flow control more than 2 full turns when using an electric hose as this will cause premature material pump wear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                   | <b>Important:</b> It may be necessary to use the recirculation with the electric hose anytime the machine is not going to be used for more than 5-10 minutes when the ambient temperature is below 40°F or not being used for 20-30 minutes in warmer weather. This is critical after material is up to operating temperature and burner is running intermittently, the oven will cool and all material in the plumbing and pump will solidify. To get the oven hot enough to start pumping again, add several blocks of sealant to lower the material temperature enough to cause burner to ignite. This may not be an option if the tank is already full. |

## Chapter 5 Operating Instructions

**Table 5-9 Dispensing the Material – Standard hose**

| Step                                                                              | Action                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>WARNING</b>                                                                    |                                                                                                                                                                                                                                                                                                              |
|  | <p>Put on protective clothing, gloves, hard-soled shoes, and face shield or safety glasses when operating or filling this machine. Read the entire manual before operating the machine.</p> <p>Never point the wand at any part of the body or at any other person. Hot material can cause severe burns.</p> |
| 1                                                                                 | When the material has reached manufacturer's application temperature, you are ready to dispense material.                                                                                                                                                                                                    |
| 2                                                                                 | Turn the pump speed control to the lowest setting by turning the speed control knob fully clockwise.                                                                                                                                                                                                         |
| 3                                                                                 | Insert the wand tip into the shoebox, open the ball valve on the wand and adjust the control valve to get close to the desired material flow for the application.                                                                                                                                            |
| 4                                                                                 | Open recirculation valve to get the desired flow rate.                                                                                                                                                                                                                                                       |
| 5                                                                                 | This method of operation will give maximum pump life. If the sealant does not flow from the applicator wand, close hand wand valve and place hose and wand back into the oven to allow the sealant to become more liquid, and then repeat procedure.                                                         |
| 6                                                                                 | Once sealant is flowing freely, reverse pump and install desired sealing tip or disk and you are ready to begin sealing. See Section <a href="#">10.0 Tools and Accessories</a> for other sealing tips and disks.                                                                                            |
| <b>CAUTION</b>                                                                    |                                                                                                                                                                                                                                                                                                              |
|                                                                                   | Extreme care should be taken when changing or installing sealing tips. Always engage pump reverse if sealant is hot. Hot sealant can cause severe skin burns.                                                                                                                                                |

### 5.9 Shutting Down and Cleaning Out the Machine

When shutting down the machine for the day, Crafco recommends leaving the melter about half full with material. This will give a fairly rapid heat up rate in the morning, but allows enough material to start dispensing right away when the material becomes molten.

## Chapter 5 Operating Instructions

**Table 5-10 Shutting Down with an Electric Hose**

| Step | Action                                                                                                                                           |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Leaving the hose in the boom, swing the boom clockwise towards the front of the machine and lock the boom into position with the latch provided. |
|      | <b>CAUTION</b>                                                                                                                                   |
|      | DO NOT kink or twist the hose or permanent damage may result.                                                                                    |
| 2    | Place the wand in the wand holder and lock the wand into position with the latch provided.                                                       |
| 3    | Reverse the pump while removing tip adapter and or duckbill. Continue to reverse for approximately 30 more seconds.                              |
| 4    | Close the "APPLICATOR VALVE" and "TANK VALVE".                                                                                                   |
| 5    | Turn the mixer toggle switch to the "OFF" position.                                                                                              |
| 6    | Turn the "Burner" switch to the "OFF" position.                                                                                                  |
| 7    | Stop the engine by pressing the "OFF" button once. This will throttle down the engine and shut it "OFF"                                          |
| 8    | Turn "OFF" key switch.                                                                                                                           |

**Table 5-11 Shutting Down with a Standard Hose**

| Step | Action                                                                                                  |
|------|---------------------------------------------------------------------------------------------------------|
| 1    | Close recirculation valve and reverse the pump for approximately 3 minutes.                             |
| 1a   | Remove wand from hose and wrap hose up in oven while reversing the pump.                                |
| 2    | Close the "APPLICATOR VALVE".                                                                           |
| 3    | Open recirculation valve. Close the "TANK VALVE".                                                       |
| 4    | Turn "Off" pump reverse switch.                                                                         |
| 5    | Turn the mixer toggle switch to the "OFF" position.                                                     |
| 6    | Turn the "Burner" switch to the "OFF" position.                                                         |
| 7    | Stop the engine by pressing the "OFF" button once. This will throttle down the engine and shut it "OFF" |
| 8    | <b>NOTE:</b> Ensure the hose is not touching the tank wall or plumbing.                                 |
| 9    | Turn "OFF" key switch.                                                                                  |

## Chapter 5 Operating Instructions

### 5.10 Overnight Heater Use

An overnight heater rod is available as an option. PN 24190 for 110V, and PN 24194 for 220V. The overnight heaters may be used to maintain an overnight heat transfer oil temperature of approximately 200-250°F (93.3°C)

**Table 5-12 Overnight Heater Use**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <b>WARNING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|      | The overnight heaters are for overnight use only. If the overnight heater is used, the material must be dispensed the next day. If the material can't be dispensed, the machine needs to be heated to mixing temperatures, and agitated to prevent settling. If you don't dispense the material after 1 nights use, you risk damaging the material and possibly the machine due to settled material, which can harden in the bottom of the material tank. |
| 1    | Attach each heater power cord to its own suitable extension cord.                                                                                                                                                                                                                                                                                                                                                                                         |
| 2    | Attach each extension cord to its own outlet rated for 15 amps minimum.                                                                                                                                                                                                                                                                                                                                                                                   |
|      | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|      | Certain machines may have 2 overnight heaters depending on the size of the material tank. Attaching both heaters to the same outlet will most likely pop the circuit breaker inline from the power source. Combining both heaters together will draw too much amperage for most common 15 amp circuits.                                                                                                                                                   |
|      | <b>WARNING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|      | Suitable extension cord size requirements for <b>110 Volt</b> use:<br>25-50 FT • 16-20 Amps • 12 Gauge (Heavy Duty) or 10 Gauge (Extra Heavy Duty)<br>100 FT • 16-20 Amps • 10 Gauge (Extra Heavy Duty)                                                                                                                                                                                                                                                   |
|      | Suitable extension cord size requirements for <b>220 Volt</b> use:<br>25-50 FT • 8-10 Amps • 14 Gauge (Medium Duty) or 12 Gauge (Heavy Duty)<br>100 FT • 8-10 Amps • 12 Gauge (Heavy Duty)                                                                                                                                                                                                                                                                |
|      | <b>Failure to use the correct size extension cord could result in damage and possible fire!</b>                                                                                                                                                                                                                                                                                                                                                           |
| 3    | Disconnect the heaters when using the machine's burner system.                                                                                                                                                                                                                                                                                                                                                                                            |
|      | <b>CAUTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|      | Do not use the heaters without heat transfer oil in the tank. Doing so will overheat and damage the heater, and it will have to be replaced.                                                                                                                                                                                                                                                                                                              |

## Chapter 5 Operating Instructions

### 5.11 Storing the Machine

Store the machine in an area where moisture cannot enter the heating system such as heat transfer oil tank, etc. Extended down time can cause moisture build up in the heating tank.

Evidence that moisture has collected in the heat transfer oil is a constant popping noise. If this popping noise is heard, warm the heat transfer oil to 300°F for two to three hours to evaporate the moisture. Failure to follow this procedure will cause the heat transfer oil to overflow the tank resulting in possible machine damage and/or personal injury.

Best practice is to check in the material tank prior to starting the burner. If water is present, try and remove as much as possible, heat the material to 300°F for two to three hours to evaporate the moisture. Failure to follow this procedure will cause the material to overflow the tank resulting in possible machine damage and/or personal injury.

Store the machine for longer periods with the material tank empty.



## Chapter 6 Maintenance Instructions

### 6.0 Maintenance Instructions

This chapter contains all normal maintenance instructions to properly maintain your machine.

#### 6.1 Engine

Refer to the manufacturer's operating and maintenance instructions for the engine.

#### 6.2 Hydraulic System

Check hydraulic fluid daily.

Change hydraulic filter every 250 hours of machine operation. Replace if necessary.

Change hydraulic fluid every 500 hours of operation.

#### 6.3 Heat Transfer Oil

Check the oil level at the start of every day.

Change the oil every 500 hours of machine operation or 1 year, whichever comes first. Failure to follow this oil change interval will result in machine damage.

#### 6.4 Wheel Bearing

Pack the wheel bearing every 24,000 miles or every two years, whichever comes first. Use a good grade of bearing grease.

#### 6.5 Material Sensor Tube

Check for heat transfer oil in tube every 50 hours of operation. 2 ounces required.

#### 6.6 Cleaning Material Tank and Sensor Area

The material tank needs to be cleaned every year or as needed for proper operation. As the machine is used, material builds up around the tank walls and sensor guard. The built up material prevents heat from getting to the fresh material and causes longer heat up times. The built up material will also prevent the material temperature sensor from reading as accurately because it becomes insulated from the fresh material. The coked material needs to be scraped or chipped from the tank walls. The area between the sensor and sensor guard needs to be cleaned also for proper temperature sensing. An air chisel with various sized blades usually works best to break up the material and remove it from the walls. Once the walls and sensor guard areas are cleaned, remove all the loose chunks from the tank, and vacuum out any smaller pieces.

#### 6.7 Pump Packing Adjustment and Replacement

Material pump packing should leak a small amount (5-10 drops per minute) during normal use. If packing adjustment is required, operate the pump under normal conditions before making any adjustments. Tighten packing gland nuts evenly (1-2 flats on the nut) until there is 5-10 drops per minute. **DO NOT OVER TIGHTEN** packing gland as that will shorten the life of the packing and wear out the sealing surfaces faster.

To replace packing, remove two nuts, packing gland clip, and packing gland halves. Use a packing hook to remove all seven of the packing rings. New packing rings should be installed one ring at a time, with the joints staggered 180° apart. Each ring should be seated firmly before the next ring is installed.

## Chapter 6 Maintenance Instructions

The packing gland nuts should first be evenly tightened with a wrench to seat the packing firmly in the stuffing box and against the shaft. **DO NOT** over tighten the packing. The gland nuts should then be backed off until finger tight. Follow adjusting pump packing at the beginning of this section.

### 6.8 Lug Nuts

Torque all nuts/bolts before first road use and after each wheel removal. Check and torque after the first 10 miles, 25 miles, and again at 50 miles. Check periodically thereafter.

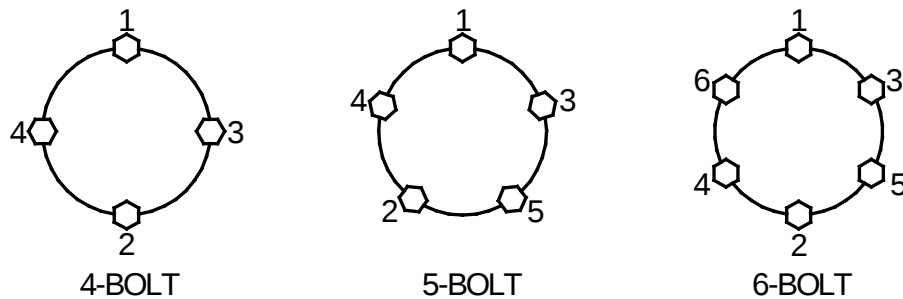
Torque in stages as follows:

First stage 20-25 foot-pound (ft-lb)

Second stage 50-60 foot pound (ft-lb)

Third stage 90-120 foot pound (ft-lb)

Tighten bolts and nuts in the sequence shown in [Fig. 6.1 Lug bolt Tightening Sequence](#)



**Fig. 6.1 Lug bolt Tightening Sequence**

### 6.9 Brakes

Check the brakes daily.

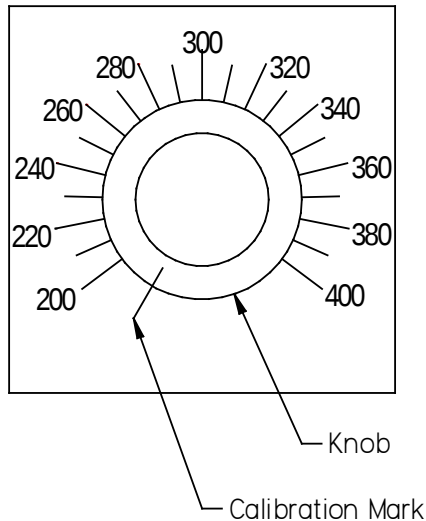
### 6.10 Tongue Jack

Lubricate the tongue jack, using a good grade of bearing grease.

### 6.11 Temperature control Calibration

Check the control knob calibration weekly. Calibrate by turning the knob counterclockwise. If the marks do not align, loosen screw in knob and align the line on the control knob with the calibration mark on the scale plate. (See [Fig. 6.2 Temperature Control Calibration](#))

## Chapter 6 Maintenance Instructions



**Fig. 6.2 Temperature Control Calibration**

### 6.12 Replacing Heat Transfer Oil

1. Drain oil by removing oil drain cap located under machine.
2. Open ball valve located rear driver's side of machine before refilling. This allows the air to escape the center column.
3. Fill tank with Heat Transfer Oil using the fill port near the overflow reservoir. Be careful to not overfill. Use the dipstick to measure your fill level.
4. Start burner and heat the heat transfer oil until one drop of oil comes out of ball valve.
5. Close ball valve immediately. **(CAUTION: HOT OIL WILL CAUSE SEVERE BURNS)**

**NOTE: THIS PROCEDURE IS NOT REQUIRED FOR DAILY OPERATION**

### 6.13 Cleaning the Melter

We recommend using Orange-Sol industrial cleaner for cleaning the exterior of the machine. The cleaner can be found at the following website; <https://www.orange-sol.com/industrial-formula/>.

## Chapter 6 Maintenance Instructions

### 6.14 Maintenance Chart

**Table 6-1 Maintenance Chart**

| Possible Cause           | Procedure                                                                                                                                                                                                                                                                                                                                                                                              | Hours                           |    |     |     |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----|-----|-----|
|                          |                                                                                                                                                                                                                                                                                                                                                                                                        | 8                               | 50 | 250 | 500 |
| Engine check oil level   | Refer to the manufacturer's instructions for the engine                                                                                                                                                                                                                                                                                                                                                | X                               |    |     |     |
| Engine Air Filter(s)     | Change the Primary filter when restriction indicator says to. Safety filter is there to protect engine if main filter becomes damaged and then the safety will see an increase in dust. Check the safety filter when changing the primary filter, if it shows excessive dirt or the restriction indicator is still high after servicing the primary filter then the safety filter needs to be changed. |                                 |    |     |     |
| Other engine maintenance | Refer to the manufacture's operating and maintenance instructions for the engine.                                                                                                                                                                                                                                                                                                                      |                                 |    |     |     |
| Material Sensor Tube     | Check for HTO fluid                                                                                                                                                                                                                                                                                                                                                                                    |                                 | X  |     |     |
|                          | Add                                                                                                                                                                                                                                                                                                                                                                                                    | As needed                       |    |     |     |
| Heat Transfer Oil        | Check                                                                                                                                                                                                                                                                                                                                                                                                  | X                               |    |     |     |
|                          | Change                                                                                                                                                                                                                                                                                                                                                                                                 |                                 |    |     | X   |
| Hydraulic Oil            | Check                                                                                                                                                                                                                                                                                                                                                                                                  | X                               |    |     |     |
|                          | Change                                                                                                                                                                                                                                                                                                                                                                                                 |                                 |    |     | X   |
| Hydraulic Oil Filter     | Change                                                                                                                                                                                                                                                                                                                                                                                                 |                                 |    | X   |     |
| Burner                   | Check burner box insulation                                                                                                                                                                                                                                                                                                                                                                            |                                 |    |     | X   |
|                          | Clean CAD cell.                                                                                                                                                                                                                                                                                                                                                                                        |                                 |    |     | X   |
|                          | Check Electrodes                                                                                                                                                                                                                                                                                                                                                                                       |                                 |    |     | X   |
|                          | Check Flame Retainer/Head                                                                                                                                                                                                                                                                                                                                                                              |                                 |    |     | X   |
|                          | Replace burner nozzle                                                                                                                                                                                                                                                                                                                                                                                  |                                 |    |     | X   |
| Wheel Bearings           | Clean and re-pack using a good grade of bearing grease                                                                                                                                                                                                                                                                                                                                                 | Every 24,000 miles or two years |    |     |     |
| Tongue Jack              | Grease using a good grade of bearing grease.                                                                                                                                                                                                                                                                                                                                                           | Once a year                     |    |     |     |
| Material Tank            | Scrape out built up material in the material tank                                                                                                                                                                                                                                                                                                                                                      | Once a year or as needed        |    |     |     |
| Material Sensor Guard    | Scrape out built up material around guard                                                                                                                                                                                                                                                                                                                                                              |                                 |    |     | X   |

For a list of parts required for maintenance see [Table 6-3 General Maintenance Parts](#).

## Chapter 6 Maintenance Instructions

### 6.15 Service Instructions

**Table 6-2 Service Instructions**

| Step | Action                                                                                                                                                                                             |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Do a general inspection of the machine at least once a week.                                                                                                                                       |
| 2    | Replace all worn or damaged parts.<br><b>Note:</b> Keep regular replacement items in stock for emergency repairs to prevent costly downtime. See <a href="#">Table 6-4 Recommended Spare Parts</a> |
| 3    | Make necessary adjustments and tighten all loose nuts or screws.                                                                                                                                   |
| 4    | Watch for leaks. Tighten fittings or repair as necessary.                                                                                                                                          |
| 5    | Clean the external surfaces of the machine at regular intervals.<br><b>Note:</b> Refer to the material manufacturer's instructions for recommendations.                                            |
| 6    | Follow the recommended maintenance per <a href="#">Table 6-1 Maintenance Chart</a>                                                                                                                 |

For service, find a list of authorized Distributors and service centers at [CrafcO.com/Distributors](http://CrafcO.com/Distributors).

### 6.16 General Maintenance Parts

**Table 6-3 General Maintenance Parts**

| Quantity                  | Description            | Machine | Part No.                  |
|---------------------------|------------------------|---------|---------------------------|
| 1                         | Fuel Filter            | All     | 47167N                    |
| 1                         | Pre Fuel Filter        | All     | 47176N                    |
| 1                         | Oil Filter             | All     | 47168N                    |
| 1                         | Air Filter             | All     | 47169N                    |
| 1                         | Nozzle, Burner         | All     | 42559                     |
| 1                         | Packing, Material Pump | All     | 29990S                    |
| 1                         | Hydraulic Oil Filter   | All     | 45438                     |
| <a href="#">Table 6-5</a> | Hydraulic Oil          | All     | <a href="#">Table 6-5</a> |
| <a href="#">Table 6-5</a> | Heat Transfer Oil      | All     | <a href="#">Table 6-6</a> |
| 1                         | Burner Fuel Filter     | All     | 41867                     |

## Chapter 6 Maintenance Instructions

### 6.17 Recommended Spare Parts

**Table 6-4 Recommended Spare Parts**

| Quantity | Description                           | Machine | Part No. |
|----------|---------------------------------------|---------|----------|
| 1        | Temperature Controller, Material      | 46500EB | 51672    |
| 1        | Temperature Controller, Electric Hose | 46500EB | 51691    |
| 1        | Temperature Controller, Hot Oil       | All     | 43391    |
| 1        | Temperature Controller, Material      | 46500SB | 43397    |
| 1        | DC Controller                         | All     | 42335    |
| 1        | Coupling, Fuel Pump                   | All     | 41970    |
| 1        | Electric Hose, 15'                    | 46500EB | 51731    |
| 1        | Relay                                 | All     | 51673    |

### 6.18 Recommended Fluids and Lubricants

**Table 6-5 Recommended Fluids and Lubricants**

| Application                                                                                               | Recommended                        | Full Point | Machine No.              |
|-----------------------------------------------------------------------------------------------------------|------------------------------------|------------|--------------------------|
| Fuel                                                                                                      | #1 Cold Climate<br>#2 Warm Climate | 30 Gals.   | All Models               |
| Engine Oil                                                                                                | Refer to engine manual             | 6.7 Qt.    | PN 46500SB<br>PN 46500EB |
| Hydraulic Oil                                                                                             | Shell AW Hydraulic 46              | 24 Gals.   | All Models               |
| Heat Transfer Oil                                                                                         | Shell Turbo T 68 (Group II)        | 48 Gals.   | All Models               |
| Legend:<br>PN 46500EB EZ1500 Double Pumper Electric Base<br>PN 46500SB EZ1500 Double Pumper Standard Base |                                    |            |                          |

## Chapter 6 Maintenance Instructions

### 6.19 Applicable Brands of Heat Transfer Oil

**Table 6-6 Applicable Brand of Heat Transfer Oil**

| Manufacturer          | Product Name                 | Crafco Heat Transfer Fluid  |
|-----------------------|------------------------------|-----------------------------|
| Chevron               | Heat Transfer Oil Grade 46   | Shell Turbo T 68 (Group II) |
| Citgo                 | Hytherm Oil 46               | Shell Turbo T 68 (Group II) |
| Conoco                | Hydroclear Heat Transfer Oil | Shell Turbo T 68 (Group II) |
| Fina                  | Vulcan Heat Transfer Oil 46  | Shell Turbo T 68 (Group II) |
| Lubrication Engineers | Heat Transfer Oil            | Shell Turbo T 68 (Group II) |
| Exxon Mobile          | Caloria HT 43                | Shell Turbo T 68 (Group II) |
| Mobil                 | Mobiltherm 43                | Shell Turbo T 68 (Group II) |
| Mobil                 | Mobiltherm 603               | Shell Turbo T 68 (Group II) |
| Phillips 66           | Heat Transfer Oil #3`        | Shell Turbo T 68 (Group II) |
| Phillips 66           | Magnus Oil 68                | Shell Turbo T 68 (Group II) |

### CAUTION

The heat transfer oil in this machine is a grade that has been tested and recommended by Crafco, Inc. Using a grade of oil not specifically recommended by Crafco, Inc., is cause for warranties to be voided.

All oils subjected to high temperatures deteriorate with time and lose many of their characteristics. Tests conducted by Crafco, Inc. have determined that for best results and safety, the heat transfer oil in this machine must be drained and replaced with Crafco, Inc. recommended oil after five hundred (500) hours of machine operation or one (1) year, whichever occurs first.

### 6.20 Typical Heat Transfer Oil Specifications

|                       |        |
|-----------------------|--------|
| ISO                   | 68     |
| Flash Point, COC      | 445°F  |
| Viscosity @ 100°F-SUS | 325    |
| Viscosity @ 210°F-SUS | 50     |
| Viscosity Index       | 95-100 |
| Pour Point            | 0°F    |
| Carbon residue        | 1%     |

## Chapter 6 Maintenance Instructions

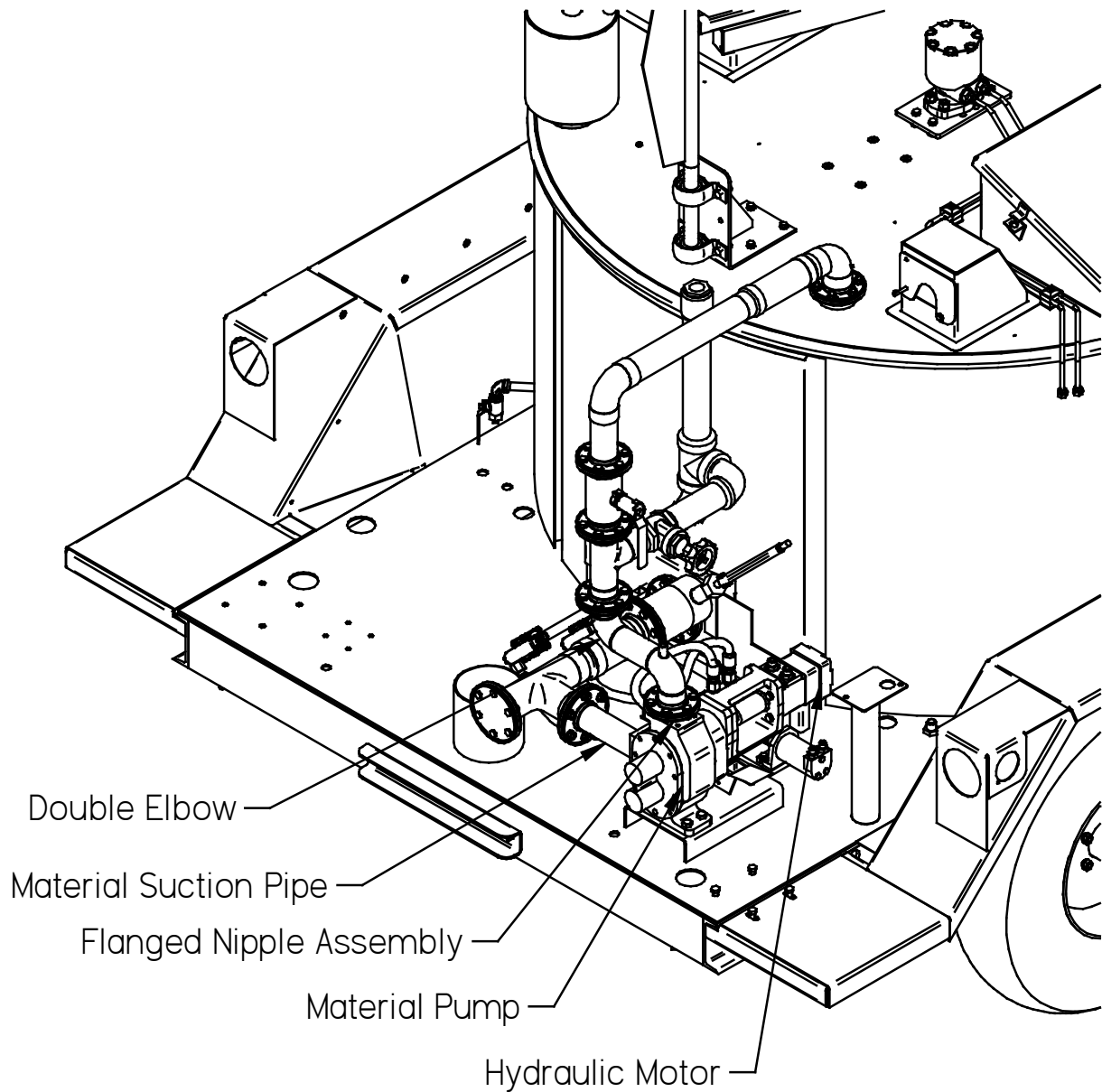
### 6.21 Material Pump Replacement

**Table 6-7 Material Pump Replacement**

| Step                                                                              | Action                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                                 | Close "TANK VALVE".                                                                                                                                                                                                                                                                                                                                                                                 |
| 2                                                                                 | Remove the front of the heat compartment. This is not necessary but will make the job easier.                                                                                                                                                                                                                                                                                                       |
|  | <b>WARNING</b>                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                   | The material in the sealant tank is extremely hot. Bodily contact with hot sealant can cause severe burns.                                                                                                                                                                                                                                                                                          |
| 3                                                                                 | Remove the side access panel.                                                                                                                                                                                                                                                                                                                                                                       |
| 4                                                                                 | Remove the 6 bolts from both flanges of the double elbow and remove double elbow.                                                                                                                                                                                                                                                                                                                   |
| 5                                                                                 | Remove the 6 bolts from the material suction pipe flange.                                                                                                                                                                                                                                                                                                                                           |
| 6                                                                                 | Remove the 4 bolts from the hydraulic motor and loosen setscrew in pump/motor coupling. Remove motor from pump motor mount.                                                                                                                                                                                                                                                                         |
| 7                                                                                 | Remove the 4 bolts from the pump base and remove pump from pump base.                                                                                                                                                                                                                                                                                                                               |
| 8                                                                                 | Remove the material suction pipe and the flanged nipple assembly from the material pump. Note orientation of bolt holes in flanges.                                                                                                                                                                                                                                                                 |
| 9                                                                                 | Install material suction pipe and flanged nipple assembly into new pump.                                                                                                                                                                                                                                                                                                                            |
| 10                                                                                | Install material pump onto pump base. The 6 hole flange gasket P/N 41043 will also need to be installed at this time using (6) 3/8-16 x 1" bolts, (2) flat washers per bolt (1 on each side of flange), lock washer, and upset hex nuts. Use (4) 1/2-13 x 1 3/4" bolts, flat washer, lock washer, and hex nuts to attach pump to pump base. Leave all hardware loose until everything is installed. |
| 11                                                                                | Install double elbow using new flange gaskets P/N 29050, 3/8-16 x 1" bolts, (2) flat washers per bolt (1 on each side of flange), lock washer, and upset hex nut. Leave all hardware loose until everything is installed.                                                                                                                                                                           |
| 12                                                                                | Install hydraulic motor on material pump using (4) 3/8-16 x 1 1/4" bolts and lock washers. Tighten setscrew on pump/motor coupling.                                                                                                                                                                                                                                                                 |
| 13                                                                                | Tighten all bolts and nuts.                                                                                                                                                                                                                                                                                                                                                                         |
| 14                                                                                | Replace heat compartment using (11) 1/4-20 x 3/4" bolts, flat washers, and lock washers.                                                                                                                                                                                                                                                                                                            |
| 15                                                                                | Replace access panel using (3) #10 x 3/8 Self Tapping Screw.                                                                                                                                                                                                                                                                                                                                        |

**Note:** Material pump rebuild kits are available, see page [9-36](#) and [9-37](#) for passenger side and driver side pumps. If the case bores are larger than 3.851" diameter and the end plates have any wear (not flat) then the rebuild kit may not work or wear properly.

**Chapter 6 Maintenance Instructions**



**Fig. 6.3 Material Pump Replacement**

## Chapter 6 Maintenance Instructions

### 6.22 Burner Fuel Filter Replacement

Follow the steps below to replace the burner fuel filter. See [Table 6-3 General Maintenance Parts](#) for part number information.

**Table 6-8 Burner Fuel Filter Replacement**

| Step | Action                                                                                                                                                                               |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | The machine should be off, and cooled to ambient temperature.                                                                                                                        |
| 2    | Place a drain pan below the burner fuel filter assembly.                                                                                                                             |
| 3    | Close the ball valve that is located inline before the burner fuel filter assembly.                                                                                                  |
| 4    | Unscrew the filter from the assembly using an oil filter or strap style wrench.                                                                                                      |
| 5    | Screw the new filter into place, and tighten by hand.                                                                                                                                |
| 6    | Open the ball valve to allow fuel to flow.                                                                                                                                           |
| 7    | Turn on the power key, and turn on the main power switch. The burner should self-prime and start. It may take a couple cycles to fill the new fuel filter and bleed the fuel system. |
| 8    | Once the burner is running, check for any fuel leaks, and tighten the filter if needed.                                                                                              |
| 9    | Turn off the main power switch and power key.                                                                                                                                        |

## Chapter 7 How to Use a Multimeter

### 7.0 How to Use a Multimeter

Melters use 12-volt direct current (DC) to power the burner, hydraulic valves, and trigger on electric wand. The DC power is from a 12-volt battery.

The electric hose and wand uses 24-volt 3-phase alternating current (AC). The AC power is from the generator which hangs under the radiator. This system has no reference to ground so there is no possibility of electrical shock unless you are between 2 of the phases. NOTE: ONLY CHECK AMPERAGE ON A HOSE WITH A CLAMP-ON AMP METER.

12-volt DC power has little danger of electrical shock. Care must still be taken when dealing with DC power systems because it is capable of producing large amounts of current.

### 7.1 Checking DC Voltage with a Multimeter

Connect the probes to the meter.

Set the range to a position that includes 12-volts or higher.

Touch the red probe to the positive side of accessory and black probe to ground. If the item you are checking has a ground wire attached then use that ground or you can use a non-painted surface on the frame.

### 7.2 Checking AC Voltage with Multimeter

Connect the probes to the meter (See Fig. 7.1 Standard Multimeter).

Set the range to a position that includes 24-volts or higher.

There are three steps to test the generator voltage. All 3 values should be in the range of 24-30 volts AC.

- Touch red probe to the white wire of the generator and the black probe to the green wire of the generator.
- Next move black probe to black wire.
- Then move red probe to green wire.

### 7.3 Checking Resistance (Ohms)

Connect probes to the meter (See Fig. 7.1 Standard Multimeter).

**Note:** When checking Ohms the circuit cannot be completed. This means one end of the wire will need to be disconnected.

#### 7.3.1 How to Check Wire Continuity

Set the meter to "Audible Continuity".

Now touch the probe to each end of the wire in question. The meter will read "0" on the screen and make an audible beep if the wire has continuity from end to end.

#### 7.3.2 How to Check RTD Sensor

Set dial to Ohms  $\Omega$ . If your meter has different ranges set to 2K or 2000 ohm range.

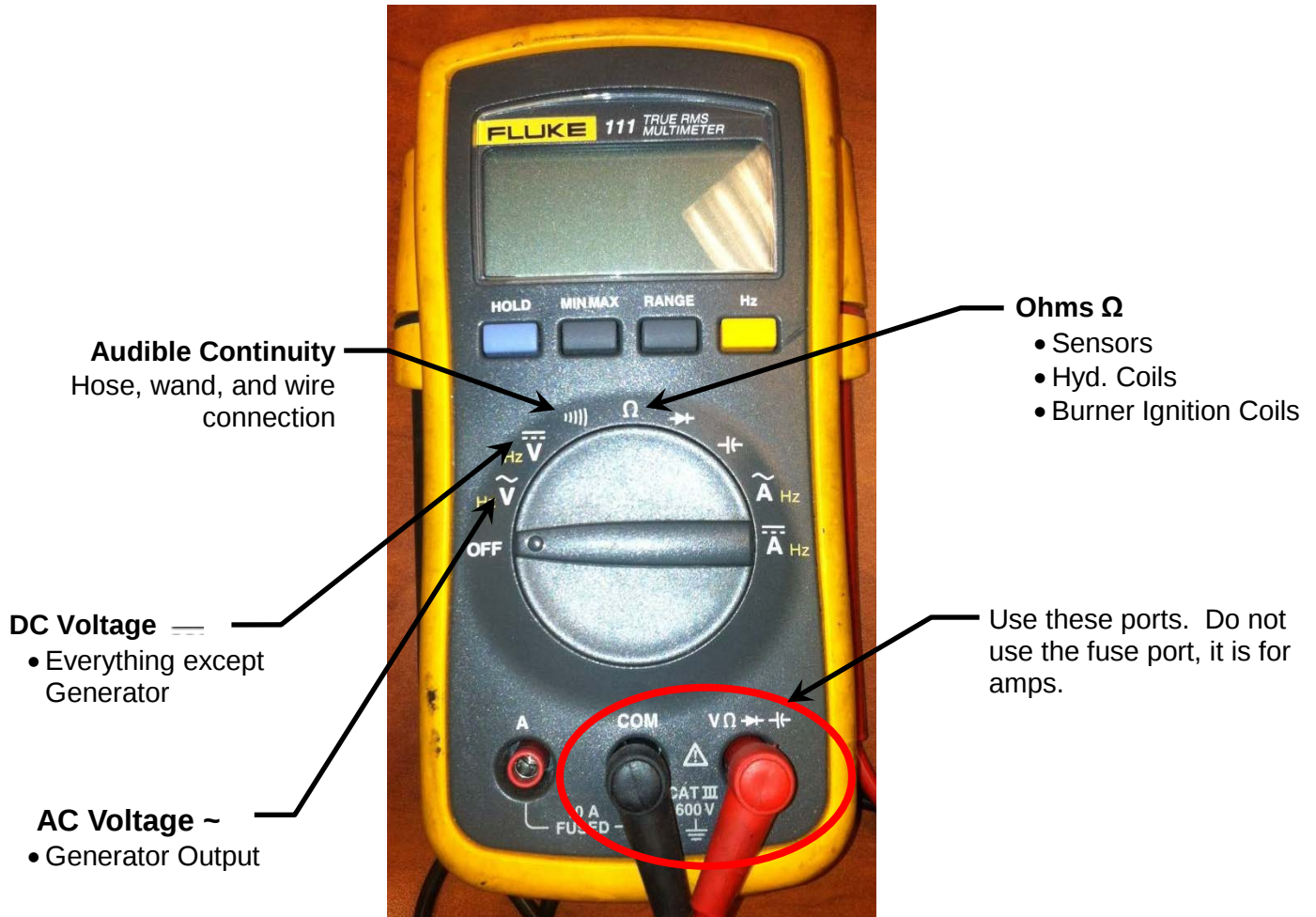
Touch one probe to each screw or wire of the sensor. The meter will read X.XX if in the 2K range or XXX.X if in the 2000 range.

## Chapter 7 How to Use a Multimeter

### 7.4 Checking Amperage

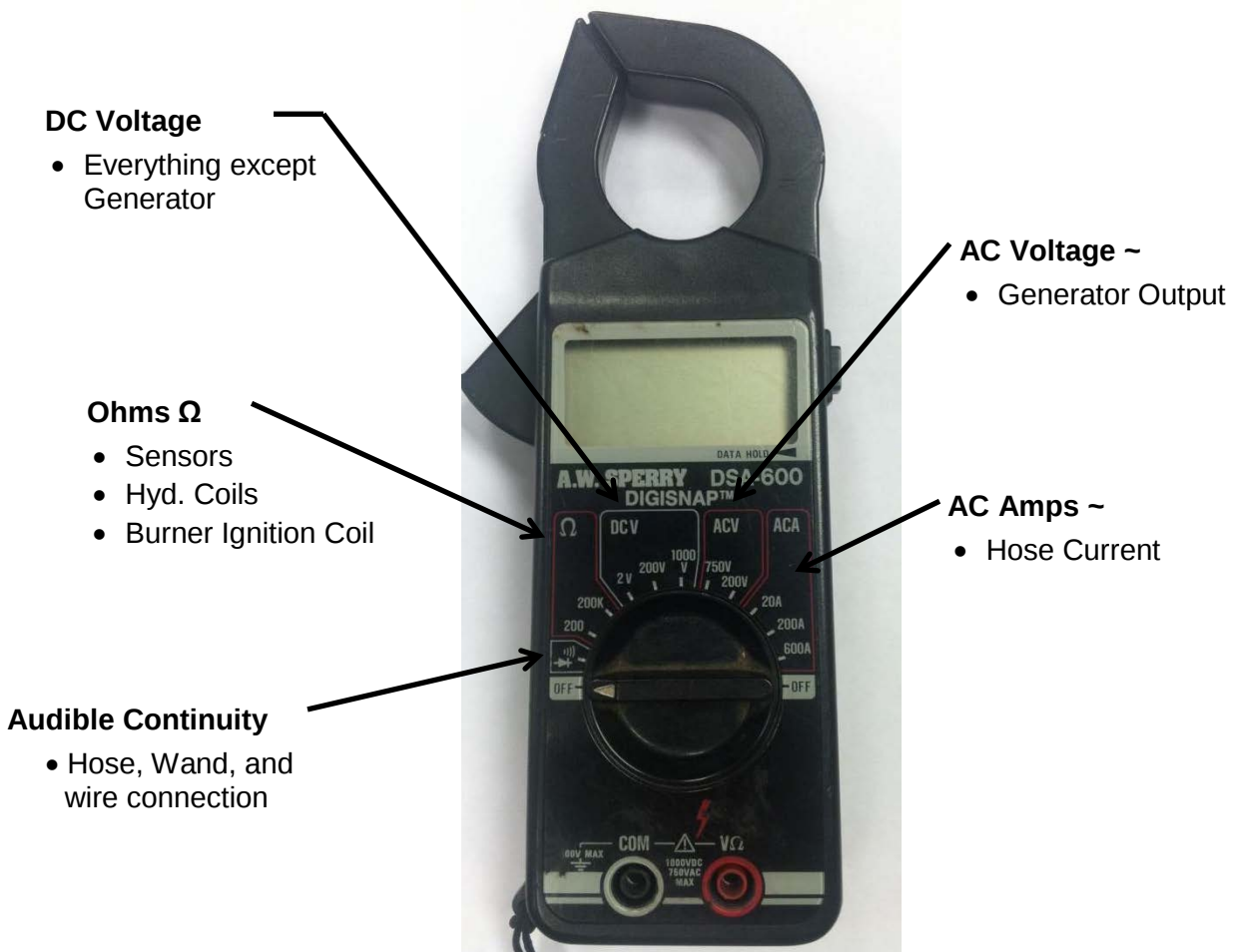
The Multimeter can be used to check amperages under 10 amps in AC or DC current.

When checking the amperage of the electric hose **always use a clamp-on amp meter** (See Fig. 7.2 Clamp – On Amp Meter/Multimeter). The amperage in the hose can reach as high as 35 amps. Clamp the meter around one wire at a time. Remember most clamp-on meters do not work on DC current.



**Fig. 7.1 Standard Multimeter**

## Chapter 7 How to Use a Multimeter



**Fig. 7.2 Clamp – On Amp Meter/Multimeter**



## Chapter 8 Troubleshooting

### 8.0 Burner Troubleshooting

#### 8.0.1. Symptoms: Burner will Not Ignite

**Table 8-1 Basic Visual Burner Troubleshooting**

| Step | Possible Cause                                                                                                                                                                                         | If . . .                                                                                                                                                                                                                                                                        |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is the engine running?<br><b>NOTE:</b> You can troubleshoot the burner without the engine running, but you must connect a battery charger to the battery and the ignition must be in the "ON" position | <ul style="list-style-type: none"> <li>• Yes, go to Step 2.</li> <li>• No, start the engine.</li> </ul>                                                                                                                                                                         |
| 2    | Is the "POWER" toggle switch in the "ON" position?                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Yes, go to Step3.</li> <li>• No, turn the toggle switch to the "ON"</li> </ul>                                                                                                                                                         |
| 3    | Is the red "Burner" light "ON"?                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Yes, go to Step 6.</li> <li>• No, go to <a href="#">Table 8-3 Burner Electrical Troubleshooting</a> Step 4</li> </ul>                                                                                                                  |
| 4    | Are both the Material and Hot Oil temperature dials set above the current temperatures?                                                                                                                | <ul style="list-style-type: none"> <li>• Yes, go to Step 4.</li> <li>• No, set the Material temperature according to the type of material you are using and the Hot Oil 100°F above the Material set point.</li> </ul>                                                          |
| 5    | Does either readout display a -1?<br><b>NOTE:</b> This occurs only when there is a short in the sensor circuit.                                                                                        | <ul style="list-style-type: none"> <li>• Yes, this indicates a short in the circuit. Check the RTD sensor for water under the cap causing a short. Also look for worn wires possibly shorting to frame between sensor and control box.</li> <li>• No, go to step 4a.</li> </ul> |
| 5a   | Does either readout display a 1?<br><b>NOTE:</b> This occurs only when the sensor circuit is not completed.                                                                                            | <ul style="list-style-type: none"> <li>• Yes, this indicates a break in one or both of the sensor wires between the RTD sensor and the PAKSTAT. Check for broken wires between sensor and PAKSTAT.</li> <li>• No, go to Step 6.</li> </ul>                                      |
| 6    | Is the circuit breaker tripped?                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Yes, reset by pushing in the button that popped out.</li> <li>• No go to Step 7.</li> </ul>                                                                                                                                            |
| 7    | Is the fuel level low or empty?                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Yes, fill with #2 diesel fuel. Then bleed the burner, see <a href="#">Table 8-12 Bleeding the Diesel Burner</a>.</li> <li>• No, go to Step8</li> </ul>                                                                                 |

## Chapter 8 Troubleshooting

**Table 8-2 Basic Visual Burner Troubleshooting (continued)**

| Step | Possible Cause                                                                                | If . . .                                                                                                                                                                                          |
|------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8    | Is there smoke coming out of the exhaust stack?                                               | <ul style="list-style-type: none"> <li>• Yes, go to <a href="#">Table 8-13 Sealant is Heating Slowly</a>.</li> <li>• No, go to Step 9.</li> </ul>                                                 |
| 9    | Is your burner working properly, but it seems to take a while to reach operating temperature? | <ul style="list-style-type: none"> <li>• Yes, go to <a href="#">Table 8-13 Sealant is Heating Slowly</a>.</li> <li>• No, Call CrafcO, Inc. and speak to a customer service technician.</li> </ul> |

**Note:** Use [Fig. 8.1 Diesel Burner Schematic](#) while troubleshooting the burner electrical system.

**Table 8-3 Burner Electrical Troubleshooting**

| Step | Possible Cause                                                                                                                                  | If . . .                                                                                                                                                                                                 |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is there 12Vdc between the yellow and black wires at the burner plug?                                                                           | <ul style="list-style-type: none"> <li>• Yes, go to Step 4.</li> <li>• No, go to Step 1a.</li> </ul>                                                                                                     |
| 1a   | Is there 12Vdc between the yellow wire on the burner relay in the control box and the black wire on the relay?                                  | <ul style="list-style-type: none"> <li>• Yes, check for poor connection or broken wire between the burner relay in the control box and the plug on the burner.</li> <li>• No, go to Step 1b.</li> </ul>  |
| 1b   | Is there 12Vdc between the WHT/RED wire on the burner relay in the control box and the black wire on the relay?                                 | <ul style="list-style-type: none"> <li>• Yes, go to Step 1c.</li> <li>• No, check for poor connection or broken wire between the burner relay in the control box and the burner reset switch.</li> </ul> |
| 2    | Is there 12Vdc between the circuit breaker (red wire going to frame solenoid) located under the battery and the ground lug on the battery tray? | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between circuit breaker and frame solenoid.</li> <li>• No, go to Step 2a.</li> </ul>                                       |
| 2a   | Is there 12Vdc between the circuit breaker (red wire going to battery positive cable) and the ground lug on the battery tray?                   | <ul style="list-style-type: none"> <li>• Yes, wait 15 seconds then repeat step 2.</li> <li>• If still no voltage then replace circuit breaker.</li> <li>• No, go to step 2b.</li> </ul>                  |
| 2b   | Check for loose or broken wires between circuit breaker and battery positive cable.                                                             | <ul style="list-style-type: none"> <li>• Yes, replace or repair damaged wire and repeat Step 3.</li> <li>• No, go to step 3.</li> </ul>                                                                  |

## Chapter 8 Troubleshooting

**Table 8-4 Burner Electrical Trouble shooting (continued)**

| Step | Possible Cause                                                                                                                                     | If . . .                                                                                                                                                                                                                                                                                                   |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3    | Is there 12Vdc between the positive and negative battery post? If this check is done while the engine is running the reading should be 13.8 volts. | <ul style="list-style-type: none"> <li>• Yes, then there should be 12Vdc on the battery side of the circuit breaker.</li> <li>• No, replace battery.</li> <li>• <b>NOTE:</b> If the reading is less than 13.8 volts while the engine is running the alternator needs to be rebuilt or replaced.</li> </ul> |
| 4    | Is there 12Vdc between the green wire in the burner plug and the black wire in the burner plug?                                                    | <ul style="list-style-type: none"> <li>• Yes, go to <a href="#">Table 8-9 Testing the DC Controller</a>.</li> <li>• No, go to step 4a.</li> </ul>                                                                                                                                                          |
| 4a   | Is there 12Vdc between green wire labeled "GRN-BRNR" on upper terminal blocks and nearby ground source (black wire).                               | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between burner plug and terminal block.</li> <li>• No, go to Step 5.</li> </ul>                                                                                                                                              |
| 5    | Is there 12Vdc between gray wire labeled "GRY-2" and nearby ground source?                                                                         | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to Step 5a.</li> </ul>                                                                                                                                                                                             |
| 5a   | Is there 12Vdc between terminal #7 gray wire and terminal #5 black wire of the hot oil PAKSTAT?                                                    | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between terminal block and terminal #7 of the hot oil PAKSTAT.</li> <li>• No, go to Step 5b.</li> </ul>                                                                                                                      |
| 5b   | Is there 12Vdc between terminal #6 gray wire and terminal #5 black wire of hot oil PAKSTAT?                                                        | <ul style="list-style-type: none"> <li>• Yes, replace hot oil PAKSTAT.</li> <li>• No, go to Step 6.</li> </ul>                                                                                                                                                                                             |
| 6    | Is there 12Vdc between gray wire labeled "GRY-3" on upper terminal blocks and a nearby ground source (black wire)?                                 | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between terminal block and terminal #6 of the hot oil PAKSTAT.</li> <li>• No, go to Step 6a.</li> </ul>                                                                                                                      |
| 6a   | Is there 12Vdc between gray wire labeled "GRY-1" on upper terminal blocks and a nearby ground source (black wire)?                                 | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to Step 7.</li> </ul>                                                                                                                                                                                              |
| 7    | Is there 12Vdc between terminal #4 gray wire and terminal #8 black wire of the material PAKSTAT?                                                   | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between terminal block and terminal #4 of the material PAKSTAT.</li> <li>• No, go to Step 7a.</li> </ul>                                                                                                                     |

## Chapter 8 Troubleshooting

**Table 8-5 Burner Electrical Trouble shooting (continued)**

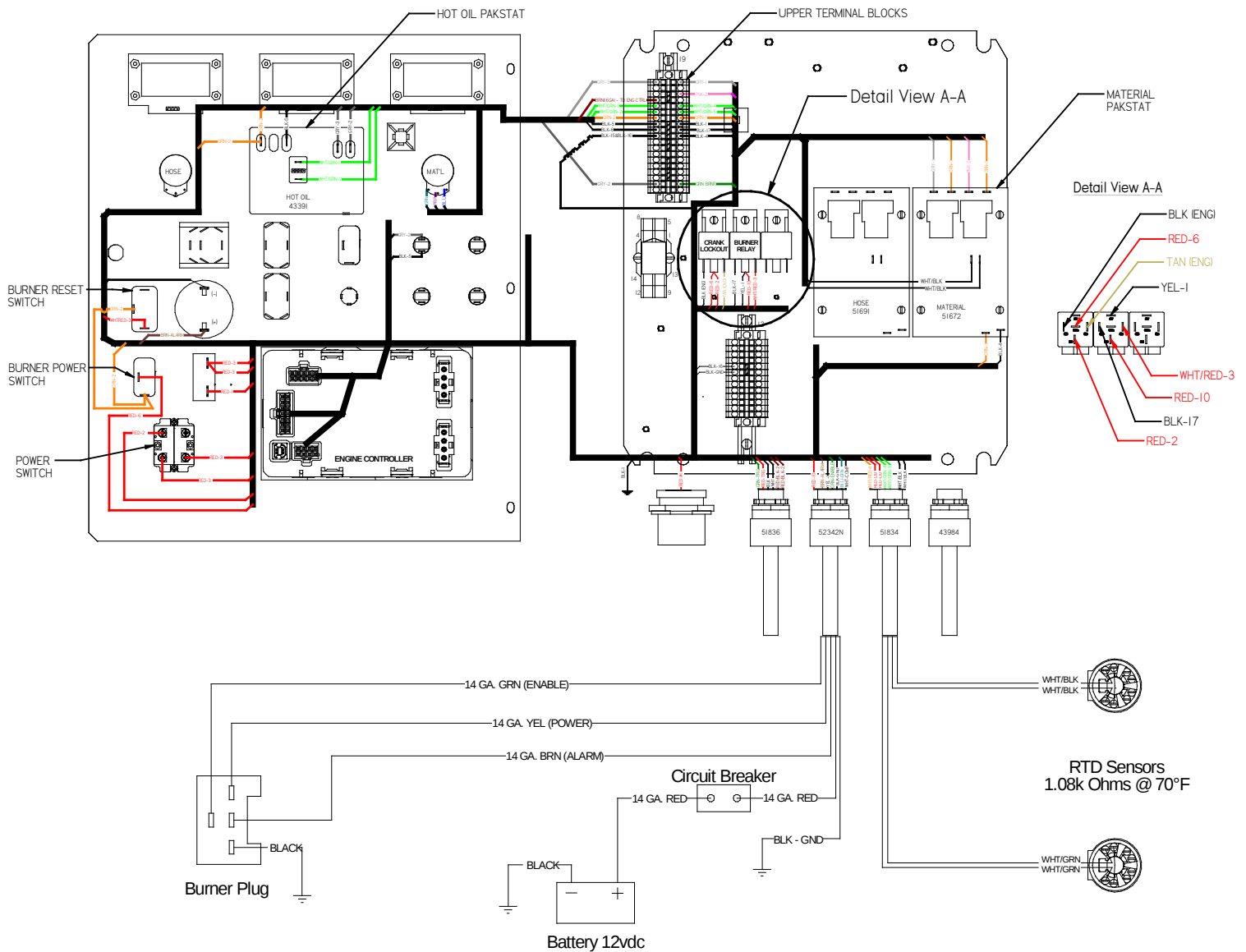
| Step | Possible Cause                                                                                                       | If . . .                                                                                                                                                                                                        |
|------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7a   | Is there 12Vdc between terminal #3 orange wire and terminal #8 black wire of the material PAKSTAT?                   | <ul style="list-style-type: none"> <li>• Yes, replace PAKSTAT.</li> <li>• No, go to step 7b.</li> </ul>                                                                                                         |
| 7b   | Is there 12Vdc between terminal #1 orange wire and terminal #8 black wire of the material PAKSTAT?                   | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between terminal #1 and #3 of material PAKSTAT.</li> <li>• No, go to Step 7c.</li> </ul>                                          |
| 7c   | Is there 12Vdc between terminal #9 orange wire and terminal #8 black wire of the material PAKSTAT?                   | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between terminal #9 and #1 of material PAKSTAT.</li> <li>• No, go to Step 8.</li> </ul>                                           |
| 8    | Is there 12Vdc between orange wire labeled "ORN-1" on upper terminal blocks and a nearby ground source (black wire)? | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between terminal #9 of the material PAKSTAT and terminal block.</li> <li>• No, go to Step 8a.</li> </ul>                          |
| 8a   | Is there 12Vdc between orange wire labeled "ORN-2" on upper terminal blocks and a nearby ground source (black wire)? | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to Step 9.</li> </ul>                                                                                                   |
| 9    | Is there 12Vdc between terminal #3 orange wire and terminal #5 black wire on hot oil PAKSTAT?                        | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between terminal #3 of the hot oil PAKSTAT and terminal block.</li> <li>• No, go to Step 10.</li> </ul>                           |
| 10   | Is there 12Vdc between top terminal (orange wire) of power switch and nearby ground source (black wire)?             | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between top terminal power switch and terminal #3 of the hot oil PAKSTAT.</li> <li>• No, go to Step 11.</li> </ul>                |
| 11   | Is there 12Vdc between bottom terminal (red wire) of power switch and nearby ground source (black wire)?             | <ul style="list-style-type: none"> <li>• Yes, replace switch.</li> <li>• No, go to Step 12.</li> </ul>                                                                                                          |
| 12   | Is there 12Vdc between top terminal of circuit breaker (red wire) and nearby ground source (black wire)?             | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between top terminal of circuit breaker and bottom terminal (red wire) of power switch.</li> <li>• No, go to Step 12a.</li> </ul> |

## Chapter 8 Troubleshooting

**Table 8-6 Burner Electrical Trouble shooting (continued)**

| Step | Possible Cause                                                                                                                                                               | If . . .                                                                                                                                                                                                                                                         |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12a  | Is there 12Vdc between bottom terminal of circuit breaker (red wire) and nearby ground source (black wire)?                                                                  | <ul style="list-style-type: none"> <li>• Yes, replace circuit breaker.</li> <li>• No, go to Step 13.</li> </ul>                                                                                                                                                  |
| 13   | Is there 12Vdc between the red wire on top-left terminal of ignition switch and nearby ground source (black wire)?                                                           | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between of ignition switch and bottom terminal of circuit breaker.</li> <li>• No, go to Step 13a.</li> </ul>                                                                       |
| 13a  | Is there 12Vdc between red wire on both red wires on the crank lockout relay in the control box (left relay next to the burner relay) and nearby ground source (black wire)? | <ul style="list-style-type: none"> <li>• Yes, power on one red wire only, replace the crank lockout relay..               <ul style="list-style-type: none"> <li>• No power on either red wire on the crank lockout relay, go to Step 14.</li> </ul> </li> </ul> |
| 14   | Is there 12Vdc between blue wire on starter solenoid and nearby ground source (black wire or bare metal on engine case)?                                                     | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between starter solenoid and ignition switch.</li> <li>• No, go to step 14a.</li> </ul>                                                                                             |
| 14a  | Check connections and condition of red battery cable?                                                                                                                        | <ul style="list-style-type: none"> <li>• Yes, there should be 12Vdc at all previous steps.</li> <li>• No, replace battery cable.</li> </ul>                                                                                                                      |

## Chapter 8 Troubleshooting



**Fig. 8.1 Diesel Burner Schematic**

## Chapter 8 Troubleshooting

### 8.0.2. Excessive Smoke Coming Out of Exhaust Stack

**Table 8-7 Smoke Coming Out of the Exhaust Stack**

| Step | Smoke Coming Out of the Exhaust Stack                                                                                                                                                                                                                                                                                                                                        |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | White smoke indicates that there is too much air being forced through the burner. Loosen the Air Shutter screw and rotate the Air Shutter counter clockwise to reduce air. Refer to <a href="#">Fig. 8.3 Diesel Burner Air Settings</a> , for the proper air settings and diagram.                                                                                           |
| 2    | Black smoke indicates that there is not enough air being forced through the burner. First check the air settings, if more air is required rotate Air Shutter clockwise. Refer to <a href="#">Fig. 8.3 Diesel Burner Air Settings</a>                                                                                                                                         |
| 3    | Refer to <a href="#">Fig. 8.3 Diesel Burner Air Settings</a> to locate the following components. Using a 7/16" wrench, remove the copper fuel line nut attached to the nozzle line. Next remove the locking nut for the nozzle tube. Then loosen the locking tabs on the ignition coil and open the ignition coil. Remove the nozzle line assembly.                          |
| 4    | Using <a href="#">Fig. 8.2 Diesel Burner Electrode Adjustment</a> , make sure the electrodes are in the correct position. Loosen the clamp holding the electrodes in place so they can be adjusted. Inspect the porcelain ceramic insulator for any cracks. Also check the tip of each of the electrodes to make sure they still have a sharp point and are not rounded off. |
| 5    | If it has been longer than 500 hours since the last time the burner nozzle was replaced, CrafcO recommends replacing the burner nozzle at this time.                                                                                                                                                                                                                         |
| 6    | Reassemble the burner, using the reverse order in Step 3.                                                                                                                                                                                                                                                                                                                    |
| 7    | Remove the burner box assembly by removing the four (4) 1/2" bolts, flat washer, lock washer, and nuts holding the burner box onto the trailer.                                                                                                                                                                                                                              |
| 7a   | Make sure the insulation inside the burner box is not soaked with diesel fuel.                                                                                                                                                                                                                                                                                               |
| 7b   | If the insulation is soaked with diesel fuel, you will need to replace the insulation.                                                                                                                                                                                                                                                                                       |
| 7c   | Reassemble the burner box.                                                                                                                                                                                                                                                                                                                                                   |

### 8.0.3. Burner Lights but Shuts Down After 15 Seconds

**Table 8-8 Burner Lights but Shuts Down After 15 Seconds**

| Step | Possible Cause                                            | If . . .                                                                                                                        |
|------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1    | Does the CAD EYE have soot or dirt on the lens?           | <ul style="list-style-type: none"> <li>• Yes, clean cad eye lens with a soft cloth.</li> <li>• No, go to Step 2.</li> </ul>     |
| 2    | Are the two yellow wires for the CAD EYE loose or broken? | <ul style="list-style-type: none"> <li>• Yes, repair or replace as needed.</li> <li>• No, go to Step 3.</li> </ul>              |
| 3    | Is the CAD EYE faulty?                                    | <ul style="list-style-type: none"> <li>• Yes, replace CAD EYE.</li> <li>• No, call a CrafcO Inc. service technician.</li> </ul> |

## Chapter 8 Troubleshooting

### 8.0.4. Testing the DC Controller

**Table 8-9 Testing the DC Controller**

| Step | Bench Test DC Controller                                                                                                                                                                                                                                                                                                        |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Remove all wire nuts attaching the DC Controller to the burner.                                                                                                                                                                                                                                                                 |
| 2    | Attach the black ground wire to the negative battery post.                                                                                                                                                                                                                                                                      |
| 3    | Attach the red wire to the positive battery post.                                                                                                                                                                                                                                                                               |
| 4    | Attach the white (Enable) wire to the positive battery post to start the test. (Genesis II Controllers will have a 15-second delay.) <ul style="list-style-type: none"> <li>• Orange (Blower Motor) wire should have 12Vdc (all the time).</li> <li>• Blue (Igniter) wire should have 12Vdc.</li> </ul>                         |
| 5    | Twist the yellow wires together (once voltage registers) on the orange, blue and purple wires. <ul style="list-style-type: none"> <li>• Orange (Blower Motor) wire should maintain 12Vdc.</li> <li>• Blue (Igniter) wire should lose voltage after 15 seconds.</li> <li>• Purple (Valve) wire should maintain 12Vdc.</li> </ul> |
| 6    | If any of the above tests fail, replace the DC Controller.                                                                                                                                                                                                                                                                      |

### 8.0.5. Burner Fuel Solenoid Testing

**Table 8-10 Burner Fuel Solenoid Test**

| Step | Fuel Solenoid Test                                                                                           |
|------|--------------------------------------------------------------------------------------------------------------|
| 1    | Remove cord set from fuel solenoid.                                                                          |
| 2    | Check the ohms between the terminals of fuel solenoid.                                                       |
| 3    | If the reading is between 15-25 ohms the coil is good.                                                       |
| 4    | If the reading is outside the above range or the meter indicates an open circuit, replace the fuel solenoid. |

## Chapter 8 Troubleshooting

### 8.0.6. Burner Ignition Coil Testing

**Table 8-11 Burner Ignition Coil Test**

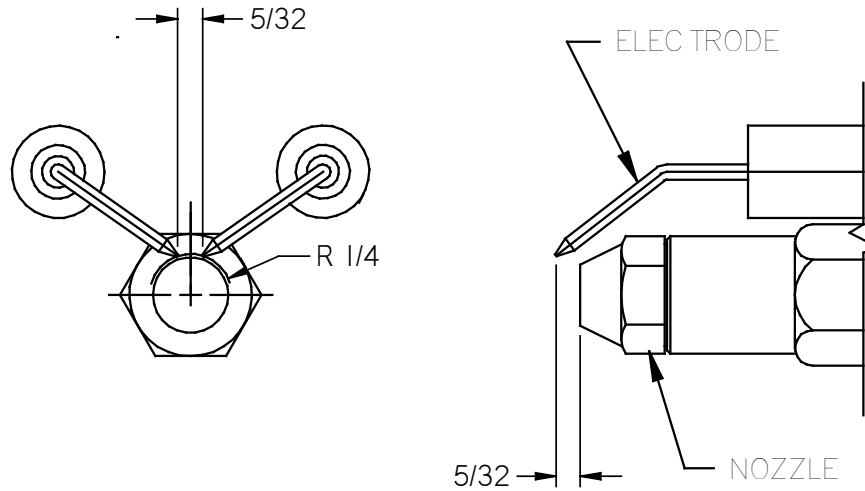
| Step | Ignition Coil Test                                                                                                                                                                                                                                                                     |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Make sure the burner is off. Open the ignition transformer (located above the blower) to expose the springs.                                                                                                                                                                           |
| 2    | Check resistance between each of the springs and the ground (exposed metal on the burner).                                                                                                                                                                                             |
| 3    | The meter should read less than 2000 ohms. (Take note of the readings, you will use them in Step 5.)                                                                                                                                                                                   |
| 4    | Check resistance between both springs. (Take note of the reading, you will use it in Step 5.)                                                                                                                                                                                          |
| 5    | The igniter should be replaced if: <ul style="list-style-type: none"> <li>• The difference between the two springs to ground resistance readings is greater than 20%.</li> <li>• Or the spring-to-spring resistance does not read approximately twice the spring to ground.</li> </ul> |

### 8.0.7. Bleeding the Diesel Burner

**Table 8-12 Bleeding the Diesel Burner**

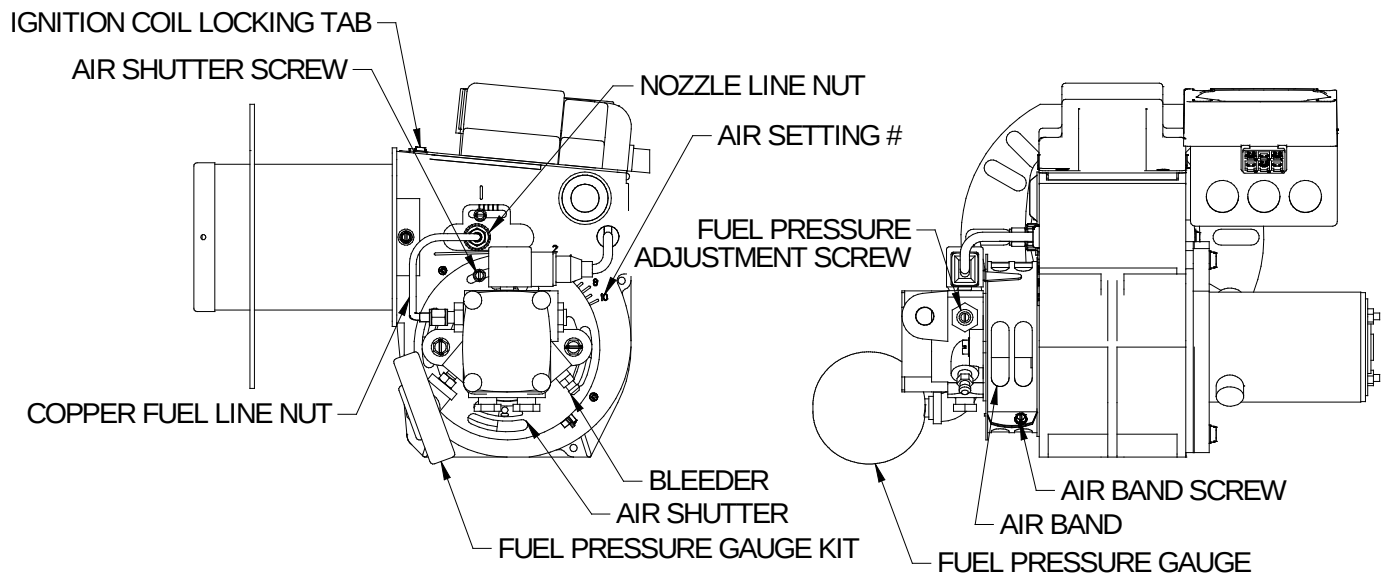
| Step | Bleeding the Diesel Burner                                                                                                                                                                                                                                                         |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Place an oil pan under the machine in front of the burner.                                                                                                                                                                                                                         |
| 2    | Using a 3/8" wrench, loosen the bleeder valve on the fuel pump refer to <a href="#">Fig. 8.3 Diesel Burner Air Settings</a> for bleeder location.                                                                                                                                  |
| 3    | Turn the ignition key to the "ON" position, then turn the power toggle switch to the "ON" position. Fuel should flow out of the bleeder valve. You want the fuel to be clear from any air bubbles, this may require you to turn the ignition key "OFF" and "ON" a couple of times. |
| 4    | Allow burner to cycle itself off 30 seconds.                                                                                                                                                                                                                                       |
| 5    | Tighten the bleeder valve.                                                                                                                                                                                                                                                         |

## Chapter 8 Troubleshooting



**Fig. 8.2 Diesel Burner Electrode Adjustment**

Air Shutter = 4  
Air Band = 4  
Fuel Pressure = 140 PSI  
Adjustment Plate = 3



**Fig. 8.3 Diesel Burner Air Settings**

## Chapter 8 Troubleshooting

### 8.1 Sealant is Heating Slowly

**Table 8-13 Sealant is Heating Slowly**

| Step | Sealant is Heating Slowly                                                                                                                                                                                                                                                                                                                                                                              |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | With the material level half or less, open the loading lid and inspect the inside edge of the material tank. Check if there is a buildup of old, dried out and hardened material along the top half of the material tank.                                                                                                                                                                              |
| 2    | If this is the case you will need to drain out (use up) the rest of the material inside the tank. When the tank is empty, use an air chisel to remove this built up material. Remove as much as possible all around the tank including the roof of the material tank. Remove all the old sealant chunks from the bottom of the material tank. This should be done every year or as conditions require. |
| 3    | Check your level of the heat transfer oil, the mark on the dipstick is for 70°F.                                                                                                                                                                                                                                                                                                                       |
| 4    | Check your records of the last service replacement of the heat transfer oil. If it has been longer than 500 hours, or one year, you need to change your oil.                                                                                                                                                                                                                                           |
| 5    | Many of Crafco, Inc. service centers can perform these service steps for you if you cannot. Call your local service center to find out if they can.                                                                                                                                                                                                                                                    |

## Chapter 8 Troubleshooting

### 8.2 Mixer Troubleshooting

#### 8.2.1 Symptom: Mixer Does Not Rotate

**Table 8-14 Basic Visual Mixer Troubleshooting**

| Step | Possible Cause                                                                                                                    | If . . .                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is the Material Temperature Display at or above 275°F?                                                                            | <ul style="list-style-type: none"> <li>• Yes, go to Step 2.</li> <li>• No, continue to allow the machine to heat. (Make sure the Material dial and the Hot Oil dial are set at operating temperatures.)</li> </ul>                                                                                                                                                                                                                         |
| 2    | Is the red "Mixer" light "ON"?                                                                                                    | <ul style="list-style-type: none"> <li>• Yes, go to Step 4.</li> <li>No, go to <a href="#">Table 8-15 Mixer Electrical Troubleshooting</a></li> </ul>                                                                                                                                                                                                                                                                                      |
| 3    | Is the loading door closed?                                                                                                       | <ul style="list-style-type: none"> <li>• Yes, go to Step 4.</li> <li>• No, shut the loading door.</li> </ul>                                                                                                                                                                                                                                                                                                                               |
| 4    | Is the "Mixer" toggle switch in the "Forward" position?                                                                           | <ul style="list-style-type: none"> <li>• Yes, go to Step 5.</li> <li>• No, move the toggle switch to the forward position.</li> </ul>                                                                                                                                                                                                                                                                                                      |
| 5    | Move the "Mixer" toggle switch to the "Reverse" position.<br>Is the agitator moving?                                              | <ul style="list-style-type: none"> <li>• Yes, allow mixer to reverse for 15 seconds and then move the "Mixer" toggle switch to the "Forward" position. Go to Step 6.</li> <li>No, go to <a href="#">Table 8-15 Mixer Electrical Troubleshooting</a></li> </ul>                                                                                                                                                                             |
| 6    | Open the Material loading door. Are there several unmelted blocks in the tank?                                                    | <ul style="list-style-type: none"> <li>• Yes, this may cause the agitator to jam. Use the mixer toggle switch to move the agitator forward and backward until the material melts enough to allow forward movement without jamming. CrafcO, Inc. recommends you add one to two blocks every three to four minutes during dispensing of product.</li> <li>• No, go to <a href="#">Table 8-15 Mixer Electrical Troubleshooting</a></li> </ul> |
| 7    | Is the hydraulic fluid level near the center of the sight gauge? Check at ambient temperature. See Fig. 5.1 Hydraulic Fluid Level | <ul style="list-style-type: none"> <li>Yes, go to <a href="#">Table 8-15 Mixer Electrical Troubleshooting</a></li> <li>• No, fill oil to the center of the sight gauge.</li> </ul>                                                                                                                                                                                                                                                         |

## Chapter 8 Troubleshooting

**Note:** Use [Fig. 8.5 Mixer Circuit](#) while troubleshooting the mixer electrical system.

**Table 8-15 Mixer Electrical Troubleshooting**

| Step | Possible Cause                                                                                                                                                                                                 | If . . .                                                                                                                                                                                                                                                                                                                                                                                                          |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is the amber light "ON" on the Din Plug when the "Mixer" toggle switch is in the "Forward" position? (For forward din plug location. Refer to <a href="#">Fig. 8.7 P.S. Hydraulic Valve Din Plug Layout</a> ). | <ul style="list-style-type: none"> <li>• Yes, then the mixer should be working. If it is not working see <a href="#">Table 8-18 Mixer Hydraulic Troubleshooting</a>.</li> <li>• No, go to step 1a.</li> </ul>                                                                                                                                                                                                     |
| 1a   | Unscrew the din plug center screw so you can pull the din plug up about 1/4" in order to check for voltage.<br>Is there 12Vdc from side post to side post?                                                     | <ul style="list-style-type: none"> <li>• Yes, the electrical system for the agitator is working properly, go to <a href="#">Table 8-18 Mixer Hydraulic Troubleshooting</a>. Also replace din plug at earliest convenience to retain visual troubleshooting ability.</li> <li>• No, go to step 2.</li> </ul>                                                                                                       |
| 2    | Is there 12Vdc between the "Mixer" toggle switch bottom post brown wire and nearby ground wire (black wire)? (With the "Mixer" toggle switch in the "Forward" position.)                                       | <ul style="list-style-type: none"> <li>• Yes, replace din plug.</li> <li>• No, go to Step 2a.</li> </ul>                                                                                                                                                                                                                                                                                                          |
| 2a   | Is there 12Vdc between the "Mixer" toggle switch center post red wire and nearby ground source (black wire)?                                                                                                   | <ul style="list-style-type: none"> <li>• Yes, replace mixer toggle switch</li> <li>• No, go to step 2b.</li> </ul>                                                                                                                                                                                                                                                                                                |
| 2b   | Is there 12Vdc at the lower terminal block red wire labeled Red-8 and Red Lid P.S.?                                                                                                                            | <p>Yes to both then check for loose connections or broken wires between terminal block and mixer switch.</p> <p>Yes to Red Lid P.S. and No to Red-8 replace terminal block.</p> <p>No, go to step 3.</p>                                                                                                                                                                                                          |
| 3    | Is there 12Vdc between the P.S. lid switch red wires and a nearby ground source?<br>(Check both red wires on the bottom of the lid switch with the lid closed.)                                                | <ul style="list-style-type: none"> <li>• Yes, on both red wires check for loose connections or broken wires between lid switch and terminal block.</li> <li>• Yes, on only one red wire when the lid is closed. Readjust the lid switch so that the lid completely depresses the switch, and then recheck for 12Vdc. If the same result happens, replace the lid switch.</li> <li>• No, go to step 3a.</li> </ul> |

## Chapter 8 Troubleshooting

**Table 8-16 Mixer Electrical Troubleshooting (continued)**

| Step | Possible Cause                                                                                                                                                  | If . . .                                                                                                                                                                                                                                                                                                                                                                                                               |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3a   | Is there 12Vdc between the D.S. lid switch red wires and a nearby ground source?<br>(Check both red wires on the bottom of the lid switch with the lid closed.) | <ul style="list-style-type: none"> <li>• Yes, on both red wires check for loose connections or broken wires between D.S. lid switch and P.S. lid switch.</li> <li>• Yes, on only one red wire when the lid is closed. Readjust the lid switch so that the lid completely depresses the switch, and then recheck for 12Vdc. If the same result happens, replace the lid switch.</li> <li>• No, go to step 4.</li> </ul> |
| 4    | Check for 12Vdc at red wire labeled Red Lid D.S. and pink wire labeled Pink-2 on terminal block and a nearby ground source (black wire).                        | <ul style="list-style-type: none"> <li>• Yes on both, check for loose connections or broken wires between D.S. lid switch and terminal block.</li> <li>• No on Red Lid D.S. and Yes on Pink-2, ensure yellow jumper bar is securely installed between the two terminal blocks.</li> <li>• No, go to step 4a.</li> </ul>                                                                                                |
| 4a   | Is there 12Vdc between the Material PAKSTAT terminal #2 pink wire and terminal #8 black ground wire?                                                            | <ul style="list-style-type: none"> <li>• Yes, check for loose connections or broken wires between PAKSTAT terminal #2 and terminal block.</li> <li>• No, go to Step 4b</li> </ul>                                                                                                                                                                                                                                      |
| 4b   | Is there 12Vdc between the Material PAKSTAT terminal #1 orange wire and terminal #8 black ground wire?                                                          | <ul style="list-style-type: none"> <li>• Yes, replace the Material PAKSTAT.</li> <li>• No, go to Step 4c.</li> </ul>                                                                                                                                                                                                                                                                                                   |
| 4c   | Is there 12Vdc between orange wire labeled ORN-1, terminal #9 and terminal #8 ground source (black wire)?                                                       | <ul style="list-style-type: none"> <li>• Yes, check for loose connections or broken wires between terminals #8 and #1.</li> <li>• No, go to step 5.</li> </ul>                                                                                                                                                                                                                                                         |
| 5    | Is there 12Vdc at orange wire labeled ORN-1 and ORN-2 on the upper terminal block?                                                                              | <ul style="list-style-type: none"> <li>• Yes on both, check for loose connections or broken wires between terminal block and material PAKSTAT.</li> <li>• Yes on ORN-2 and No on ORN-1 replace terminal block.</li> <li>• No on both, go to step 6.</li> </ul>                                                                                                                                                         |
| 6    | Is there 12Vdc between orange wire labeled ORN-2 terminal #3 and terminal #5 black ground of hot oil PAKSTAT?                                                   | <ul style="list-style-type: none"> <li>• Yes, check for loose connections or broken wires between terminal #3 and terminal block.</li> <li>• No, go to step 7.</li> </ul>                                                                                                                                                                                                                                              |

## Chapter 8 Troubleshooting

**Table 8-17 Mixer Electrical Troubleshooting (continued)**

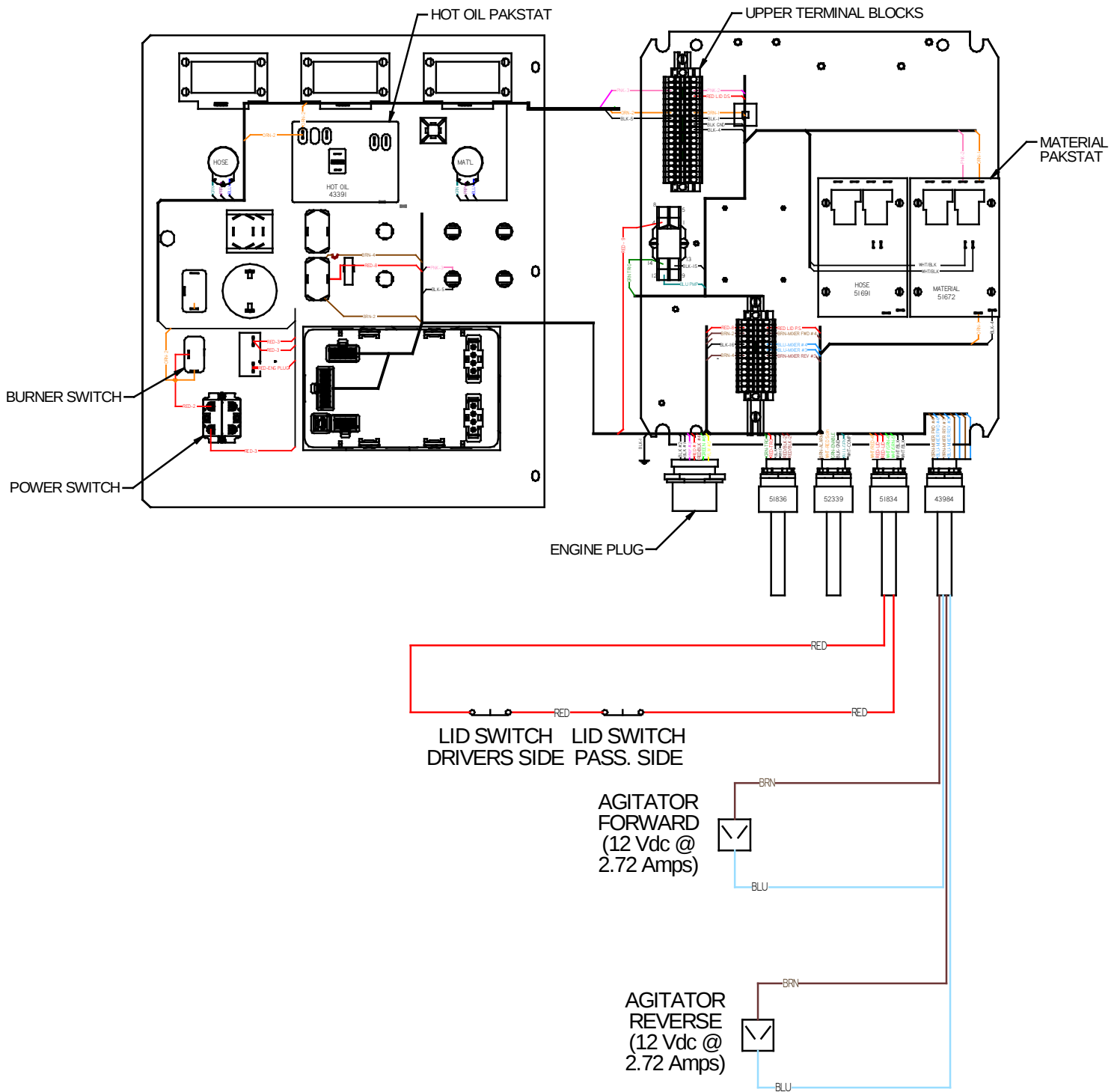
| Step | Possible Cause                                                                                                              | If . . .                                                                                                                                                                                  |
|------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7    | Is there 12Vdc between top terminal of the power switch and a nearby ground (black wire)?                                   | <ul style="list-style-type: none"> <li>• Yes, check for loose connections or broken wires between toggle switch and hot oil PAKSTAT terminal #3.</li> <li>• No, go to step 7a.</li> </ul> |
| 7a   | Is there 12Vdc between bottom terminal wire labeled RED-3 and a nearby ground source (black wire)?                          | <ul style="list-style-type: none"> <li>• Yes, replace toggle switch.</li> <li>• No, go to step 8.</li> </ul>                                                                              |
| 8    | Is there 12Vdc between the top terminal of circuit breaker red wire labeled RED-3 and nearby ground source (black wire)?    | <ul style="list-style-type: none"> <li>• Yes, check for loose connections or broken wires between circuit breaker and toggle switch.</li> <li>• No, go to step 8a.</li> </ul>             |
| 8a   | Is there 12Vdc between the bottom terminal of circuit breaker red wire labeled RED-2 and nearby ground source (black wire)? | <ul style="list-style-type: none"> <li>• Yes, replace circuit breaker</li> <li>• No, go to step 9.</li> </ul>                                                                             |
| 9    | Is there 12Vdc between ignition switch "ACC" terminal and nearby ground source (black wire)?                                | <ul style="list-style-type: none"> <li>• Yes, check for loose connections or broken wires between "ACC" terminal and circuit breaker.</li> <li>• No, go to Step 9a.</li> </ul>            |
| 9a   | Is there 12Vdc between "B" (blue wire) of ignition switch and nearby ground source (black wire)?                            | <ul style="list-style-type: none"> <li>• Yes, replace ignition switch.</li> <li>• No, go to Step 10.</li> </ul>                                                                           |
| 10   | Is there 12Vdc between blue wire on starter solenoid and nearby ground source (black wire or bare metal on engine case)?    | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between starter solenoid and ignition switch.</li> <li>• No, go to step 10a.</li> </ul>                      |
| 10a  | Check connections and condition of red battery cable?                                                                       | <ul style="list-style-type: none"> <li>• Yes, there should be 12Vdc at all previous steps.</li> <li>• No, replace battery cable.</li> </ul>                                               |

## **Chapter 8 Troubleshooting**



**Fig. 8.4 Checking Din Plug Voltage**

## Chapter 8 Troubleshooting



**Fig. 8.5 Mixer Circuit**

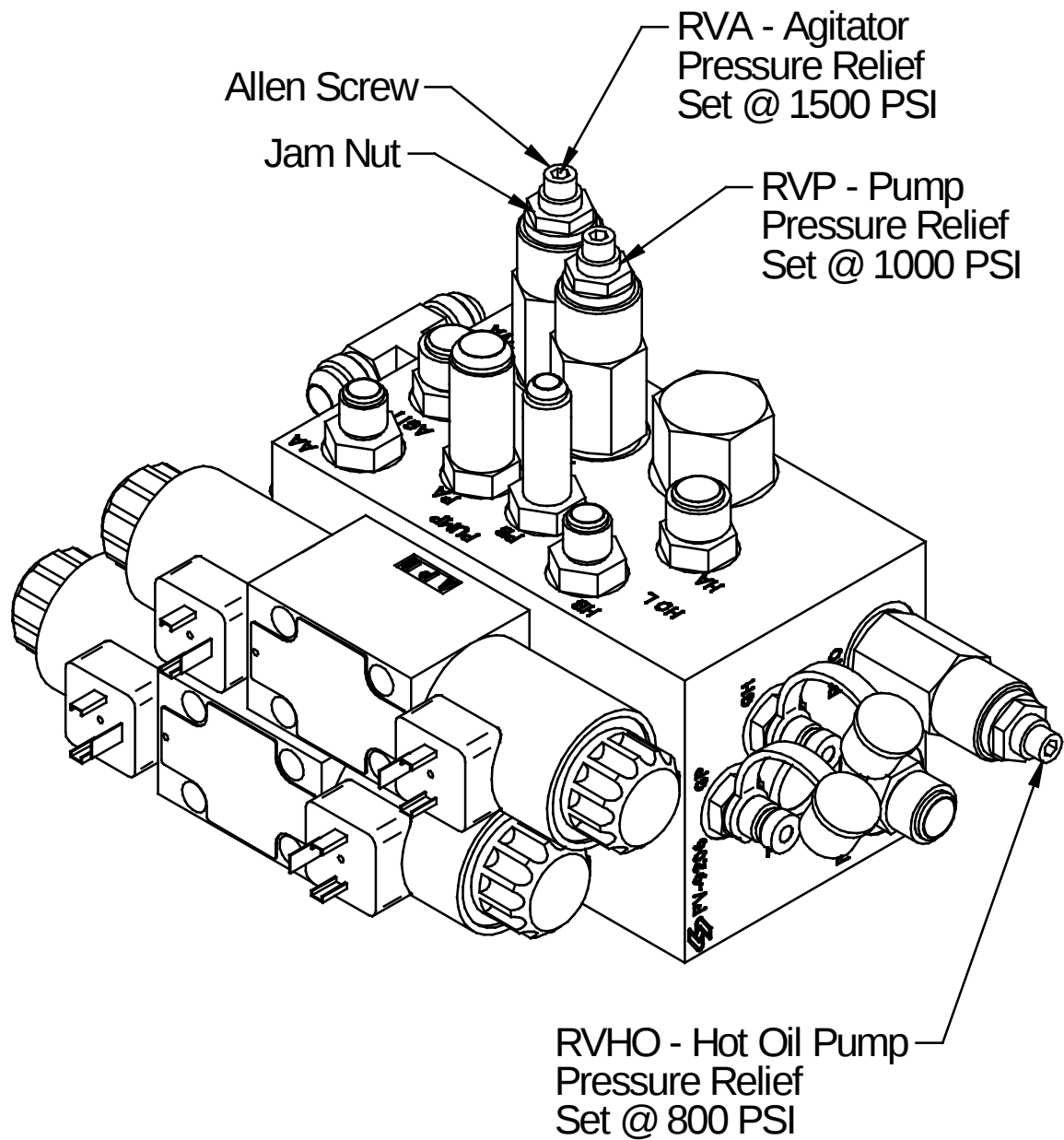
## Chapter 8 Troubleshooting

### 8.2.2 Mixer Hydraulic Troubleshooting

**Table 8-18 Mixer Hydraulic Troubleshooting**

| Step | Possible Cause                                                                                                                                                                                                                                                                                                                   | If . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Remove the din plug, then remove the coil by unscrewing the nut on top of the coil. With the coil removed, re-attach the din plug and energize the coil by moving the mixer switch to Forward or Reverse, then insert a screw driver into the center of the coil. Does the coil magnetize when the din plug amber light is "ON"? | <ul style="list-style-type: none"> <li>• Yes, go to Step 2.</li> <li>• No, replace the coil.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 2    | Is the relief pressure set correctly?<br><br>(Refer to <a href="#">Fig. 8.6 P.S. Hydraulic Valve Pressure Setting</a> , for pressure settings.)                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Yes, go to Step 3.</li> <li>• No, first turn "OFF" the Isuzu engine, then remove one of the two hydraulic hoses going to the agitator hydraulic motor, cap off the fitting on the motor and use a 3,000 PSI gauge with the proper JIC fitting, attach it to the hose. Start the Isuzu engine, turn "ON" the main power in the control box, move the "Mixer" toggle switch to the "Forward" position and read the pressure gauge. If the pressure needs to be adjusted use the pressure relief valve labeled "RVA", loosen the jam nut and adjust the pressure with the allen screw at the end of the relief. Turn clockwise to increase pressure and counter clockwise to decrease pressure, then tighten the jam nut to lock the pressure. Next turn "OFF" the Isuzu engine, remove the cap and pressure gauge, then re-attach the hose.</li> </ul> |
| 3    | Is the hydraulic flow 1.5 GPM from the hydraulic valve? If you do not have a flow meter, call a local hydraulic shop to run the test for you.                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• Yes, call Crafco, Inc. and speak to a customer service technician, you should have been able to find the problem.</li> <li>• No, replace the flow divider in the hydraulic valve.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4    | Is the hydraulic flow correct from the hydraulic pump? If you do not have a flow meter, call a local hydraulic shop to run the test for you. (Refer to <a href="#">Fig. 8.6 P.S. Hydraulic Valve Pressure Setting</a> for flow rate).                                                                                            | <ul style="list-style-type: none"> <li>• Yes, call Crafco, Inc. and speak to a customer service technician, you should have been able to find the problem.</li> <li>• No, replace the hydraulic pump.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

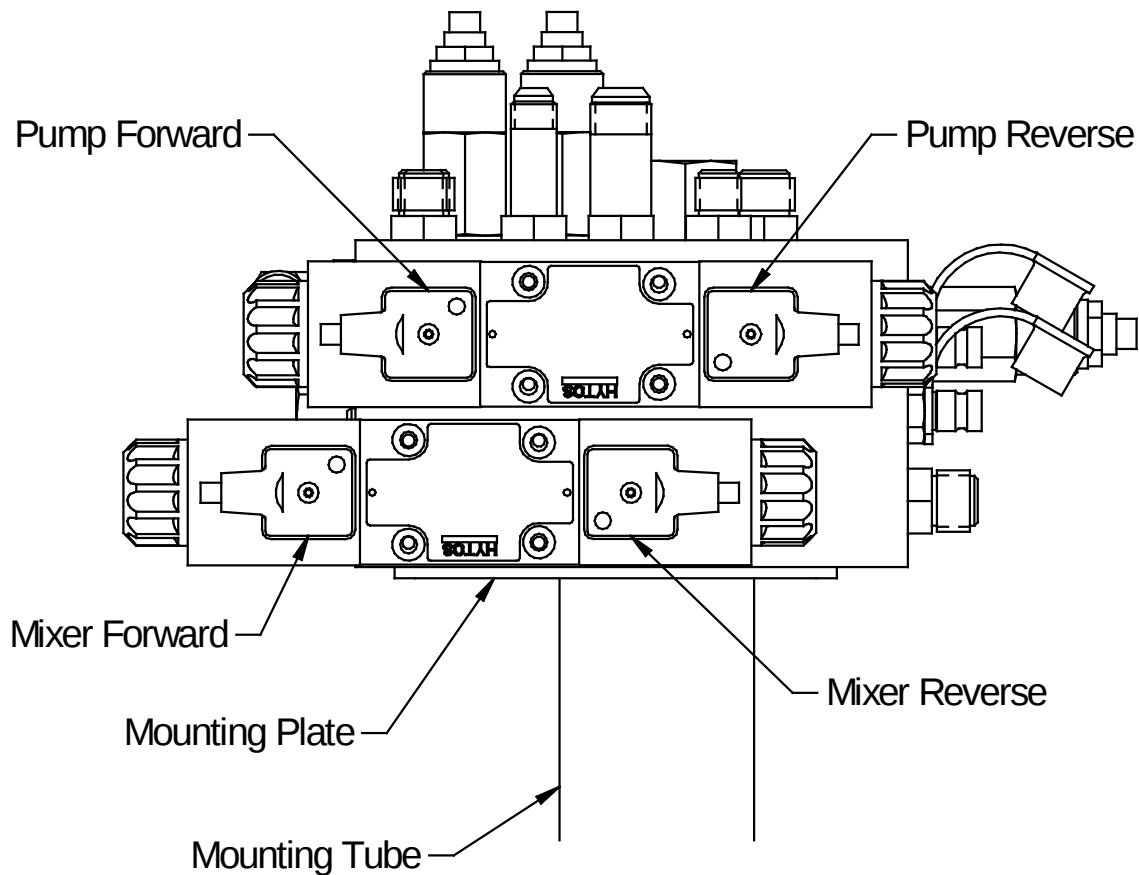
## Chapter 8 Troubleshooting



Agitation Direction = Counterclockwise  
Hydraulic Pump Flow P.S. EB/SB= 10.8 GPM @ 2400 RPM

**Fig. 8.6 P.S. Hydraulic Valve Pressure Setting**

## Chapter 8 Troubleshooting



**Fig. 8.7 P.S. Hydraulic Valve Din Plug Layout**

## Chapter 8 Troubleshooting

### 8.3 Hose Troubleshooting

#### 8.3.1 Symptom: Hose Does Not Heat

**Table 8-19 Basic Visual Hose Troubleshooting**

| Step | Possible Cause                                         | If . . .                                                                                                                                                                                                           |
|------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is the Material Temperature Display at or above 275°F? | <ul style="list-style-type: none"> <li>• Yes, go to Step 2.</li> <li>• No, continue to allow the machine to heat. (Make sure the Material dial and the Hot Oil dial are set at operating temperatures.)</li> </ul> |
| 2    | Is the red "HEATED HOSE" light "ON"?                   | <ul style="list-style-type: none"> <li>• Yes, go to <a href="#">Table 8-20 Hose Electrical Troubleshooting</a></li> <li>• No, allow the machine to heat material to 275°F.</li> </ul>                              |
| 2a   | Is the circuit breaker tripped?                        | <ul style="list-style-type: none"> <li>• Yes, reset the circuit breaker by pushing in the button which has popped out.</li> <li>• No, go to <a href="#">Table 8-20 Hose Electrical Troubleshooting</a></li> </ul>  |

**NOTE:** Use [Fig. 8.9 Hose Circuit Schematic](#) while troubleshooting the hose electrical system.

**Table 8-20 Hose Electrical Troubleshooting**

| Step | Possible Cause                                                                                                                                                                                                                     | If . . .                                                                                                                                                                                                       |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is there 12Vdc between "BATT" terminal of the generator and a nearby ground source (lug on battery tray)?                                                                                                                          | <ul style="list-style-type: none"> <li>• Yes, go to Step 2.</li> <li>• No, go to Step 6.</li> </ul>                                                                                                            |
| 2    | Is there 24Vac between the white, green, and black wires?<br><b>NOTE:</b> Do this test inside the junction box. Check between black and white, black and green, and green and white.                                               | <ul style="list-style-type: none"> <li>• Yes, go to Step 3</li> <li>• No, stop the engine, tighten the belt, restart engine and recheck output voltage.</li> <li>• Still no, replace the generator.</li> </ul> |
| 2a   | Check the three heating element wires (blue) in the junction box for 30 Amps cold or 20-22 Amps hot.<br><b>NOTE:</b> Always use a clamp-on amp meter to perform this test. Each wire should have the same amp reading (+/- 1 amp). | <ul style="list-style-type: none"> <li>• Yes, the hose should be working properly.</li> <li>• No, go to Step 3.</li> </ul>                                                                                     |

## Chapter 8 Troubleshooting

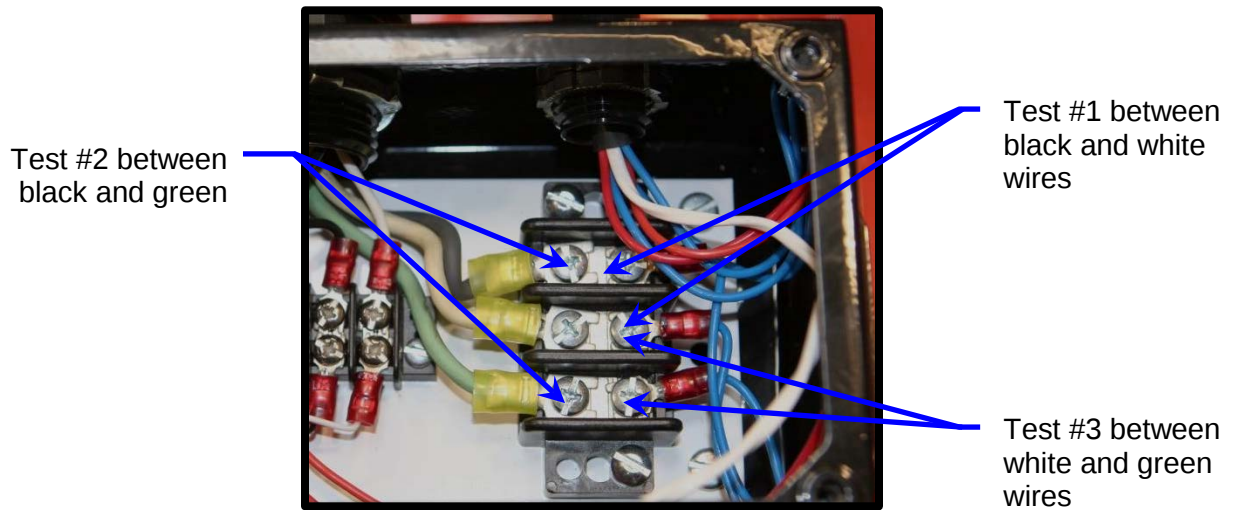
**Table 8-21 Hose Electrical Troubleshooting (continued)**

| Step | Possible Cause                                                                                                                                                                                                                                                                                                                                                                                                                                        | If . . .                                                                                                                                                                                                                                                                                                                           |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3    | Check for continuity in the hose from end to end. Disconnect the three blue heating element wires (blue) from the terminal block inside the junction box and disconnect the five pin plug between the hose and wand. Refer to <a href="#">Fig. 8.10 Junction Box Wiring</a> .<br><b>NOTE:</b> Check each letter “D”, “E”, and “A” with the three blue wires on the other end of the hose. There should only be continuity on one wire to each letter. | <ul style="list-style-type: none"> <li>• Yes, go to Step 3a.</li> <li>• No, either there was no continuity from one letter to the other end of the hose or there was more than one wire with continuity to a letter. This hose needs to be repaired or replaced. Contact CrafcO, Inc. to send back the hose for repair.</li> </ul> |
| 3a   | Check the RTD sensor in the hose against the readout in the control box. Disconnect the black and white wires from the terminal block in the junction box and test for ohms.<br>Refer to <a href="#">Table 8-24 RTD Sensor Ohms vs. Temperature</a>                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• Yes, the readout matches the table, go to Step 4.</li> <li>• No, this hose needs to be repaired or replaced. Contact CrafcO, Inc. to send back the hose for repair.</li> </ul>                                                                                                            |
| 4    | Check for continuity in the wand between “D”, “E”, and “A”.<br><b>NOTE:</b> Check between “D” and “E”, “D” and “A”, and “A” and “E”.                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Yes, go to Step 5.</li> <li>• No, this wand needs to be repaired or replaced. Contact CrafcO, Inc. to send back the wand for repair.</li> </ul>                                                                                                                                           |
| 5    | Is there 12Vdc between wire labeled “BLU-GEN” on the upper terminal block and nearby ground source (black wire)?                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken connections between terminal block “BATT” terminal of generator.</li> <li>• No, go to Step 6.</li> </ul>                                                                                                                                                   |
| 6    | Is there 12Vdc between Hose PAKSTAT blue wire terminal #4 and black wire terminal #8?                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal #4 and the terminal block.</li> <li>• No, go to Step 6a.</li> </ul>                                                                                                                                                                  |
| 6a   | Is there 12Vdc between Hose PAKSTAT terminal #3 Pink wire and terminal #8 black wire?                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• Yes, replace hose PAKSTAT.</li> <li>• No, go to Step 6b.</li> </ul>                                                                                                                                                                                                                       |
| 6b   | Is there 12Vdc between Hose PAKSTAT pink wire terminal #1 and black wire terminal #8?                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between terminal #1 and terminal #3.</li> <li>• No, go to Step 7.</li> </ul>                                                                                                                                                                         |
| 7    | Is there 12Vdc between pink wire labeled “PNK-1 on the upper terminal block and a nearby ground source (black wire)?                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal block and terminal #1.</li> <li>• No go to Step 7.</li> </ul>                                                                                                                                                                        |
| 7a   | Is there 12Vdc between pink wire labeled “PNK-4 and nearby ground source (black wire)?                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to Step 8.</li> </ul>                                                                                                                                                                                                                      |

## Chapter 8 Troubleshooting

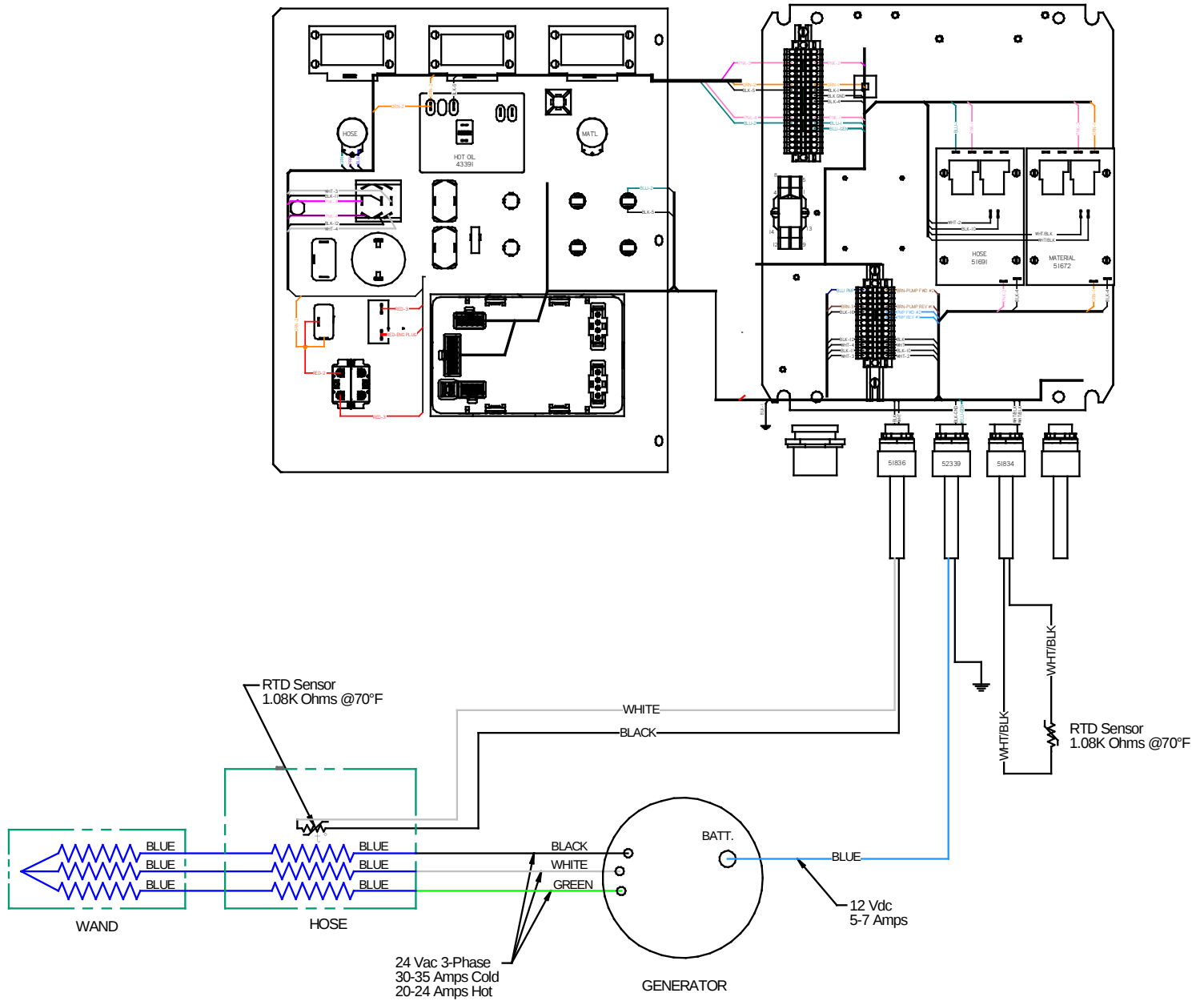
**Table 8-22 Hose Electrical Troubleshooting (continued)**

| Step | Possible Cause                                                                                                                        | If . . .                                                                                                                                                                                            |
|------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8    | Is there 12Vdc between the Hose Selector switch pink wire labeled "PNK-4 (bottom left terminal) and a near" ground source black wire? | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wires between switch and upper terminal block.</li> <li>• No, go to Step 8a.</li> </ul>                                     |
| 8a   | Is there 12Vdc between the Hose Selector switch pink wire Labeled "PNK-3" center left terminal and a nearby ground source.            | <ul style="list-style-type: none"> <li>• Yes, replace Hose Selector switch.</li> <li>• No, go to Step 9.</li> </ul>                                                                                 |
| 9    | Is there 12Vdc between pink wire labeled "PNK-3" on the upper terminal block and a nearby ground source black wire?                   | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal block and hose selector switch.</li> <li>• No go to Step 9a.</li> </ul>                               |
| 9a   | Is there 12Vdc between pink wire labeled "PNK-2" on upper terminal block and nearby ground source black wire?                         | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to <a href="#">Table 8-16 Mixer Electrical Troubleshooting (continued)</a> Steps 4a through 10a.</li> </ul> |



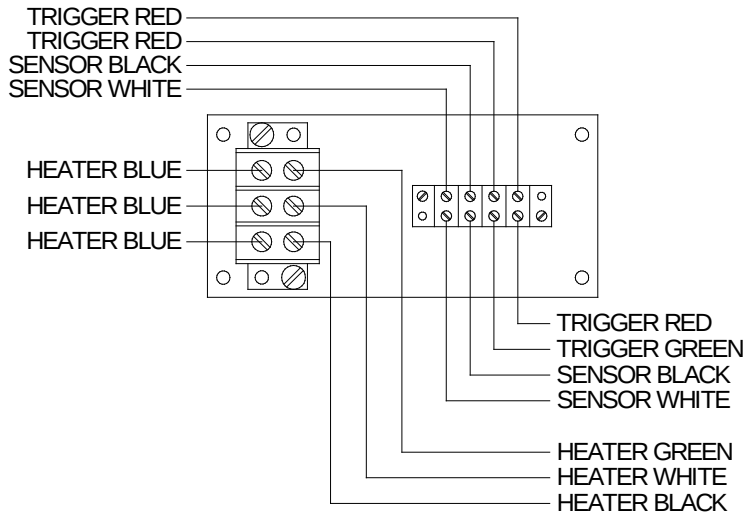
**Fig. 8.8 Junction Box Voltage Testing**

## Chapter 8 Troubleshooting

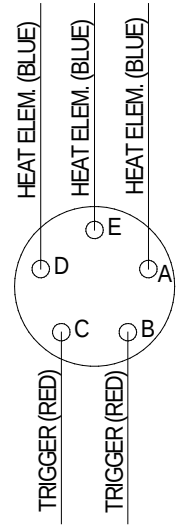


**Fig. 8.9 Hose Circuit Schematic**

## Chapter 8 Troubleshooting



KETTLE END



WAND END

**Fig. 8.10 Junction Box Wiring**

## Chapter 8 Troubleshooting

### 8.3.2 Symptom: Trigger is not working

**Table 8-23 Trigger is Not Working**

| Step | Possible Cause                                                                                                                                                                                                   | If . . .                                                                                                                                                                                                                                                                      |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <p>Check continuity between two red wires coming from the hose in junction box.</p> <p><b>NOTE:</b> These wires must be disconnected from the terminal block and the trigger depressed to perform this test.</p> | <ul style="list-style-type: none"> <li>• Yes, go to <a href="#">Table 8-26 Basic Visual P.S. Pump Troubleshooting</a> or <a href="#">Table 8-31 Basic Visual D.S. Pump Troubleshooting</a></li> <li>• No, go to Step 2.</li> </ul>                                            |
| 2    | <p>Disconnect the electrical connector between the hose and wand, check for continuity between C and B wand side.</p>                                                                                            | <ul style="list-style-type: none"> <li>• Yes, this hose needs to be repaired or replaced. Contact Crafco, Inc. to send back the hose for repair.</li> <li>• No, this wand needs to be repaired or replaced. Contact Crafco, Inc. to send back the hose for repair.</li> </ul> |

## Chapter 8 Troubleshooting

### 8.3.3 RTD Sensor Ohms vs. Temperature

Table 8-23 below shows what the ohm reading would be for a given temperature. The following are the instructions for using the table.

Measure the resistance (ohms) of the sensor in question with an ohm meter See [7.3 Checking Resistance \(Ohms\)](#) in [7.0 How to Use a Multimeter](#).

Find the reading in the chart (columns 0 through 9).

Follow the row to the left and get the temperature in 10°F increments, then follow the column up to get the 1°F increment. (For example, 1391 Ohms = 215°F)

**Table 8-24 RTD Sensor Ohms vs. Temperature**

| °F  | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0   | 930.3  | 932.5  | 934.7  | 936.9  | 939.1  | 941.3  | 943.4  | 945.6  | 947.8  | 950.0  |
| 10  | 952.2  | 954.3  | 956.5  | 958.7  | 960.9  | 963.0  | 965.2  | 967.4  | 969.6  | 971.8  |
| 20  | 973.9  | 976.1  | 978.3  | 980.5  | 982.6  | 984.8  | 987.0  | 989.1  | 991.3  | 993.5  |
| 30  | 995.7  | 997.8  | 1000.0 | 1002.2 | 1004.3 | 1006.5 | 1008.7 | 1010.9 | 1013.0 | 1015.2 |
| 40  | 1017.4 | 1019.5 | 1021.7 | 1023.9 | 1026.0 | 1028.2 | 1030.4 | 1032.5 | 1034.7 | 1036.9 |
| 50  | 1039.0 | 1041.2 | 1043.4 | 1045.5 | 1047.7 | 1049.8 | 1052.0 | 1054.2 | 1056.3 | 1058.5 |
| 60  | 1060.7 | 1062.8 | 1065.0 | 1067.1 | 1069.3 | 1071.5 | 1073.6 | 1075.8 | 1077.9 | 1080.1 |
| 70  | 1082.2 | 1084.4 | 1086.6 | 1088.7 | 1090.9 | 1093.0 | 1095.2 | 1097.3 | 1099.5 | 1101.6 |
| 80  | 1103.8 | 1106.0 | 1108.1 | 1110.3 | 1112.4 | 1114.6 | 1116.7 | 1118.9 | 1121.0 | 1123.2 |
| 90  | 1125.3 | 1127.5 | 1129.6 | 1131.8 | 1133.9 | 1136.1 | 1138.2 | 1140.4 | 1142.5 | 1144.7 |
| 100 | 1146.8 | 1149.0 | 1151.1 | 1153.2 | 1155.4 | 1157.5 | 1159.7 | 1161.8 | 1164.0 | 1166.1 |
| 110 | 1168.3 | 1170.4 | 1172.5 | 1174.7 | 1176.9 | 1179.0 | 1181.1 | 1183.3 | 1185.4 | 1187.5 |
| 120 | 1189.7 | 1191.8 | 1194.0 | 1196.1 | 1198.2 | 1200.4 | 1202.5 | 1204.6 | 1206.8 | 1208.9 |
| 130 | 1211.0 | 1213.2 | 1215.3 | 1217.5 | 1219.6 | 1221.7 | 1223.9 | 1226.0 | 1228.1 | 1230.3 |
| 140 | 1232.4 | 1234.5 | 1236.7 | 1238.9 | 1240.9 | 1243.0 | 1245.2 | 1247.3 | 1249.4 | 1251.6 |
| 150 | 1253.7 | 1255.8 | 1258.0 | 1260.1 | 1262.2 | 1264.3 | 1266.5 | 1268.6 | 1270.7 | 1272.8 |
| 160 | 1275.0 | 1277.1 | 1279.2 | 1281.3 | 1283.5 | 1285.6 | 1287.7 | 1289.8 | 1292.0 | 1294.1 |
| 170 | 1296.2 | 1298.3 | 1300.4 | 1302.6 | 1304.7 | 1306.8 | 1308.9 | 1311.0 | 1313.2 | 1315.3 |
| 180 | 1317.4 | 1319.5 | 1321.6 | 1323.8 | 1325.9 | 1328.0 | 1330.1 | 1332.2 | 1334.3 | 1336.5 |
| 190 | 1338.6 | 1340.7 | 1342.8 | 1344.9 | 1347.0 | 1349.1 | 1351.2 | 1353.4 | 1355.5 | 1357.6 |
| 200 | 1359.7 | 1361.8 | 1363.9 | 1366.0 | 1368.1 | 1370.2 | 1372.4 | 1374.5 | 1376.6 | 1378.7 |
| 210 | 1380.8 | 1382.9 | 1385.0 | 1387.1 | 1389.2 | 1391.3 | 1393.4 | 1395.5 | 1397.6 | 1399.7 |
| 220 | 1401.8 | 1403.9 | 1406.0 | 1408.1 | 1410.3 | 1412.4 | 1414.5 | 1416.6 | 1418.7 | 1420.8 |
| 230 | 1422.9 | 1425.0 | 1427.1 | 1429.2 | 1431.3 | 1433.4 | 1435.5 | 1437.6 | 1439.6 | 1441.7 |
| 240 | 1443.8 | 1445.9 | 1448.0 | 1450.1 | 1452.2 | 1454.3 | 1456.4 | 1458.5 | 1460.6 | 1462.7 |
| 250 | 1464.8 | 1466.9 | 1469.0 | 1471.1 | 1473.2 | 1475.3 | 1477.3 | 1479.4 | 1481.5 | 1483.6 |
| 260 | 1485.7 | 1487.8 | 1489.9 | 1492.0 | 1494.1 | 1496.1 | 1498.2 | 1500.3 | 1502.4 | 1504.5 |

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Table 8-25 RTD Sensor Ohms vs. Temperature (continued)

| °F  | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 270 | 1506.6 | 1508.7 | 1510.8 | 1512.8 | 1514.9 | 1517.0 | 1519.1 | 1521.2 | 1523.3 | 1525.3 |
| 280 | 1527.4 | 1529.5 | 1531.6 | 1533.7 | 1535.7 | 1537.8 | 1539.9 | 1542.0 | 1544.1 | 1546.1 |
| 290 | 1548.2 | 1550.3 | 1552.4 | 1554.5 | 1556.5 | 1558.6 | 1560.7 | 1562.8 | 1564.8 | 1566.9 |
| 300 | 1569.0 | 1571.1 | 1573.1 | 1575.2 | 1577.3 | 1579.4 | 1581.4 | 1583.5 | 1585.6 | 1587.7 |
| 310 | 1589.7 | 1591.8 | 1593.9 | 1595.9 | 1598.0 | 1600.1 | 1602.2 | 1604.2 | 1606.3 | 1608.4 |
| 320 | 1610.4 | 1612.5 | 1614.6 | 1616.6 | 1618.7 | 1620.8 | 1622.8 | 1624.9 | 1627.0 | 1629.0 |
| 330 | 1631.1 | 1633.2 | 1635.2 | 1637.3 | 1639.3 | 1641.4 | 1643.5 | 1645.5 | 1647.6 | 1649.7 |
| 340 | 1651.7 | 1653.8 | 1655.8 | 1657.9 | 1660.0 | 1662.0 | 1664.1 | 1666.1 | 1668.2 | 1670.2 |
| 350 | 1672.3 | 1674.4 | 1676.4 | 1678.5 | 1680.5 | 1682.6 | 1684.6 | 1686.7 | 1688.7 | 1690.8 |
| 360 | 1692.9 | 1694.9 | 1697.0 | 1699.0 | 1701.1 | 1703.1 | 1705.2 | 1707.2 | 1709.3 | 1711.3 |
| 370 | 1713.4 | 1715.4 | 1717.5 | 1719.5 | 1721.6 | 1723.6 | 1725.7 | 1727.7 | 1729.8 | 1731.8 |
| 380 | 1733.9 | 1735.9 | 1737.9 | 1740.0 | 1742.0 | 1744.1 | 1746.1 | 1748.2 | 1750.2 | 1752.3 |
| 390 | 1754.3 | 1756.3 | 1758.4 | 1760.4 | 1762.5 | 1764.5 | 1766.6 | 1768.6 | 1770.6 | 1772.7 |
| 400 | 1774.7 | 1776.8 | 1778.8 | 1780.8 | 1782.9 | 1784.9 | 1786.9 | 1789.0 | 1791.0 | 1793.1 |
| 410 | 1795.1 | 1797.1 | 1799.2 | 1801.2 | 1803.2 | 1805.3 | 1807.3 | 1809.3 | 1811.4 | 1813.4 |
| 420 | 1815.4 | 1817.5 | 1819.5 | 1821.5 | 1823.6 | 1825.6 | 1827.6 | 1829.6 | 1831.7 | 1833.7 |
| 430 | 1835.7 | 1837.8 | 1839.8 | 1841.8 | 1843.8 | 1845.9 | 1847.9 | 1849.9 | 1851.9 | 1854.0 |
| 440 | 1856.0 | 1858.0 | 1860.0 | 1862.1 | 1864.1 | 1866.1 | 1868.1 | 1870.2 | 1872.2 | 1874.2 |
| 450 | 1876.2 | 1878.2 | 1880.3 | 1882.3 | 1884.3 | 1886.3 | 1888.3 | 1890.4 | 1892.4 | 1894.4 |
| 460 | 1896.4 | 1898.4 | 1900.5 | 1902.5 | 1904.5 | 1906.5 | 1908.5 | 1910.5 | 1912.6 | 1914.6 |
| 470 | 1916.6 | 1918.6 | 1920.6 | 1922.6 | 1924.6 | 1926.6 | 1928.7 | 1930.7 | 1932.7 | 1934.7 |
| 480 | 1936.7 | 1938.7 | 1940.7 | 1942.7 | 1944.7 | 1946.8 | 1948.8 | 1950.8 | 1952.8 | 1954.8 |
| 490 | 1956.8 | 1958.8 | 1960.8 | 1962.8 | 1964.8 | 1966.8 | 1968.8 | 1970.8 | 1972.8 | 1974.8 |
| 500 | 1976.8 | 1978.8 | 1980.8 | 1982.9 | 1984.9 | 1986.9 | 1988.9 | 1990.9 | 1992.9 | 1994.9 |
| 510 | 1996.9 | 1998.9 | 2000.9 | 2002.9 | 2004.9 | 2006.9 | 2008.8 | 2010.8 | 2012.8 | 2014.8 |
| 520 | 2016.8 | 2018.8 | 2020.8 | 2022.8 | 2024.8 | 2026.8 | 2028.8 | 2030.8 | 2032.8 | 2034.8 |
| 530 | 2036.8 | 2038.8 | 2040.8 | 2042.8 | 2044.7 | 2046.7 | 2048.7 | 2050.7 | 2052.7 | 2054.7 |
| 540 | 2056.7 | 2058.7 | 2060.7 | 2062.7 | 2064.6 | 2066.6 | 2068.6 | 2070.6 | 2072.6 | 2074.6 |
| 550 | 2076.6 | 2078.5 | 2080.5 | 2082.5 | 2084.5 | 2086.5 | 2088.5 | 2090.4 | 2092.4 | 2094.4 |

## Chapter 8 Troubleshooting

### 8.4 Pump Troubleshooting

#### 8.4.1 Symptom: Material Does Not Dispense When the P.S. Pump is Activated

**Table 8-26 Basic Visual P.S. Pump Troubleshooting**

| Step | Possible Cause                                                                                                                                                                                                                                                                            | If . . .                                                                                                                                                                                                                                                                                                                                         |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is the Hose Temperature Display at or above 325°F?                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Yes, go to Step 2.</li> <li>• No, continue to allow the hose to heat. (Make sure the Hose dial is set at proper operating temperature.)</li> </ul>                                                                                                                                                      |
| 2    | Is the red "Pump" light "ON"?                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>• Yes, go to Step 3.</li> <li>• No, go to <a href="#">Table 8-27 P.S. Pump Electrical Troubleshooting</a>.</li> </ul>                                                                                                                                                                                     |
| 3    | Is the hose selector switch in the "ELECTRIC" position as well as the pump switch should be in "ON ELECTRIC" position?                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• Yes, go to Step 4.</li> <li>• No, move the toggle switches to the proper positions.</li> </ul>                                                                                                                                                                                                          |
| 4    | With the wand in the shoebox, pull the wand trigger and look at the material pump shaft coupler.<br>Is it spinning clockwise?                                                                                                                                                             | <ul style="list-style-type: none"> <li>• Yes, shut down machine and look for a plug in the plumbing.</li> <li>• No, adjust the material flow control to increase the flow.</li> <li>• Still no, go to Step 5.</li> </ul>                                                                                                                         |
| 5    | Inside the control box and under the front panel, find the relay cube for the pump. It is found near the middle, left-hand side of the box. It is a clear yellow cube with a green button facing the top of the control box. When the trigger is engaged does the green light illuminate? | <ul style="list-style-type: none"> <li>• Yes, this indicates that 12Vdc is reaching the relay coil. Go to <a href="#">Table 8-28 P.S. Pump Electrical Troubleshooting (continued)</a>, Step 5 to find the problem.</li> <li>• No, go to <a href="#">Table 8-27 P.S. Pump Electrical Troubleshooting</a>, Steps 2 to find the problem.</li> </ul> |
| 5    | Is the hydraulic fluid level near the center of the sight gauge when the machine is cold?<br>See Fig. 5.1 Hydraulic Fluid Level.                                                                                                                                                          | <ul style="list-style-type: none"> <li>• Yes, go to <a href="#">Table 8-27 P.S. Pump Electrical Troubleshooting</a>.</li> <li>• No, fill oil to the center of the sight gauge.</li> </ul>                                                                                                                                                        |

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**NOTE:** Use [Fig. 8.11 P.S. Pump Circuit Schematic](#) while troubleshooting the pump electrical system.

**Table 8-27 P.S. Pump Electrical Troubleshooting**

| Step | Possible Cause                                                                                                                                                                                                                                                                  | If . . .                                                                                                                                                                                                                                                                              |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is the amber light “ON” on the Din Plug when the trigger is actuated? For pump forward din plug location Refer to <a href="#">Fig. 8.7 P.S. Hydraulic Valve Din Plug Layout</a>                                                                                                 | <ul style="list-style-type: none"> <li>• Yes, then the pump should be working. If it is not working see <a href="#">Table 8-35 Pump Hydraulic Troubleshooting</a></li> <li>• No, go to Step 1a.</li> </ul>                                                                            |
| 1a   | Unscrew the center screw of the din plug so you can pull the din plug up 1/4” in order to check voltage.<br>Is there 12Vdc from side post to side post?                                                                                                                         | <ul style="list-style-type: none"> <li>• Yes, the electrical system for the pump is working properly. Refer to <a href="#">Table 8-35 Pump Hydraulic Troubleshooting</a>.</li> <li>• No, go to Step 4.</li> </ul>                                                                     |
| 2    | Is there 12Vdc between red wire labeled “TRIGGER RED” in junction box and nearby ground source?                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• Yes, go to Step 2a.</li> <li>• No, go to <a href="#">Table 8-29 P.S. Pump Electrical Troubleshooting (continued)</a> Step 10 for an Electric Hose.</li> <li>• No, for a Standard Hose is normal because this circuit is not used.</li> </ul> |
| 2a   | Is there 12Vdc between green wire labeled “TRIGGER GRN” in junction box and nearby ground source?<br><b>NOTE:</b> Wand trigger must be actuated during this test.                                                                                                               | <ul style="list-style-type: none"> <li>• Yes, go to Step 3.</li> <li>• No, see <a href="#">Table 8-23 Trigger is Not Working</a>.</li> </ul>                                                                                                                                          |
| 3    | Is there 12Vdc between green wire on terminal #14 of pump relay and black wire terminal #13 pump relay?<br><b>NOTE:</b> Wand trigger must be actuated during this test.                                                                                                         | <ul style="list-style-type: none"> <li>• Yes, go to Step 5.</li> <li>• No, check for loose or broken wire between relay and junction box.</li> </ul>                                                                                                                                  |
| 4    | Is there 12Vdc between the brown wire located on the lower set of terminal blocks, top right terminal and 5 <sup>th</sup> terminal down on the right blue ground wire?<br><b>NOTE:</b> Wand Trigger must be actuated or pump switch in “ON STANDARD” position during this test. | <ul style="list-style-type: none"> <li>• Yes, replace Din Plug.</li> <li>• No, go to Step 4a.</li> </ul>                                                                                                                                                                              |
| 4a   | Is there 12Vdc between the blue wire located on the lower set of terminal blocks, top left terminal and 5 <sup>th</sup> terminal down on the left black ground wire?<br><b>NOTE:</b> Trigger must be actuated or pump switch in “ON STANDARD” position during this test.        | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to Step 5.</li> </ul>                                                                                                                                                                         |

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**Table 8-28 P.S. Pump Electrical Troubleshooting (continued)**

| Step | Possible Cause                                                                                                                                                                                                           | If . . .                                                                                                                                                                                                                             |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5    | Is there 12Vdc between the blue wire on terminal #12 of pump relay and the black wire on terminal #13 of pump relay?<br><b>NOTE:</b> Trigger must be actuated or pump switch in "ON STANDARD" position during this test. | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal #12 and the terminal block.</li> <li>• No, go to Step 5a for Electric Hose.</li> <li>• No, go to Step 5b for Standard Hose.</li> </ul> |
| 5a   | Is there 12Vdc on red wire terminal #8 of pump relay and black wire terminal #13?                                                                                                                                        | <ul style="list-style-type: none"> <li>• Yes, replace relay.</li> <li>• Go to Step 6</li> </ul>                                                                                                                                      |
| 5b   | Is there 12Vdc on red wire terminal #4 of pump relay and black wire terminal #13?<br><b>NOTE:</b> This only applies to "ON STANDARD" position of pump switch.                                                            | <ul style="list-style-type: none"> <li>• Yes, replace relay.</li> <li>• No, go to Step 7.</li> </ul>                                                                                                                                 |
| 6    | Is there 12Vdc between red wire labeled RED-1 upper terminal block and a nearby ground source (black wire)?                                                                                                              | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal block and terminal #8.</li> <li>• No, go to Step 6a.</li> </ul>                                                                        |
| 6a   | Is there 12Vdc between red wire labeled RED-4 upper terminal block and nearby ground source (black wire)?                                                                                                                | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to <a href="#">Table 8-17 Mixer Electrical Troubleshooting (continued)</a> steps 9-10a.</li> </ul>                                           |
| 7    | Is there 12Vdc between red wire labeled RED-9 on top right hand terminal of pump switch and a nearby ground source?                                                                                                      | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between pump switch and pump relay.</li> <li>• No, go to Step 7a.</li> </ul>                                                                            |
| 7a   | Is there 12Vdc between purple wire labeled PRP-3 on center right hand terminal of pump switch and a nearby ground source (black wire)?                                                                                   | <ul style="list-style-type: none"> <li>• Yes, replace pump switch.</li> <li>• No, go to Step 8.</li> </ul>                                                                                                                           |
| 8    | Is there 12Vdc between purple wire labeled PRP-3 top left terminal of hose selector switch and nearby ground (black wire)?                                                                                               | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between hose selector switch and pump switch.</li> <li>• No go to Step 8a.</li> </ul>                                                                   |
| 8a   | Is there 12Vdc between pink wire labeled PNK-3 center left terminal of hose selector switch and nearby ground (black wire)?                                                                                              | <ul style="list-style-type: none"> <li>• Yes, replace hose selector switch.</li> <li>• No, go to Step 9.</li> </ul>                                                                                                                  |
| 9    | Is there 12Vdc between pink wire labeled PNK-3 upper terminal block and nearby ground (black wire)?                                                                                                                      | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal block and hose selector switch.</li> <li>• No, go to Step 9a.</li> </ul>                                                               |

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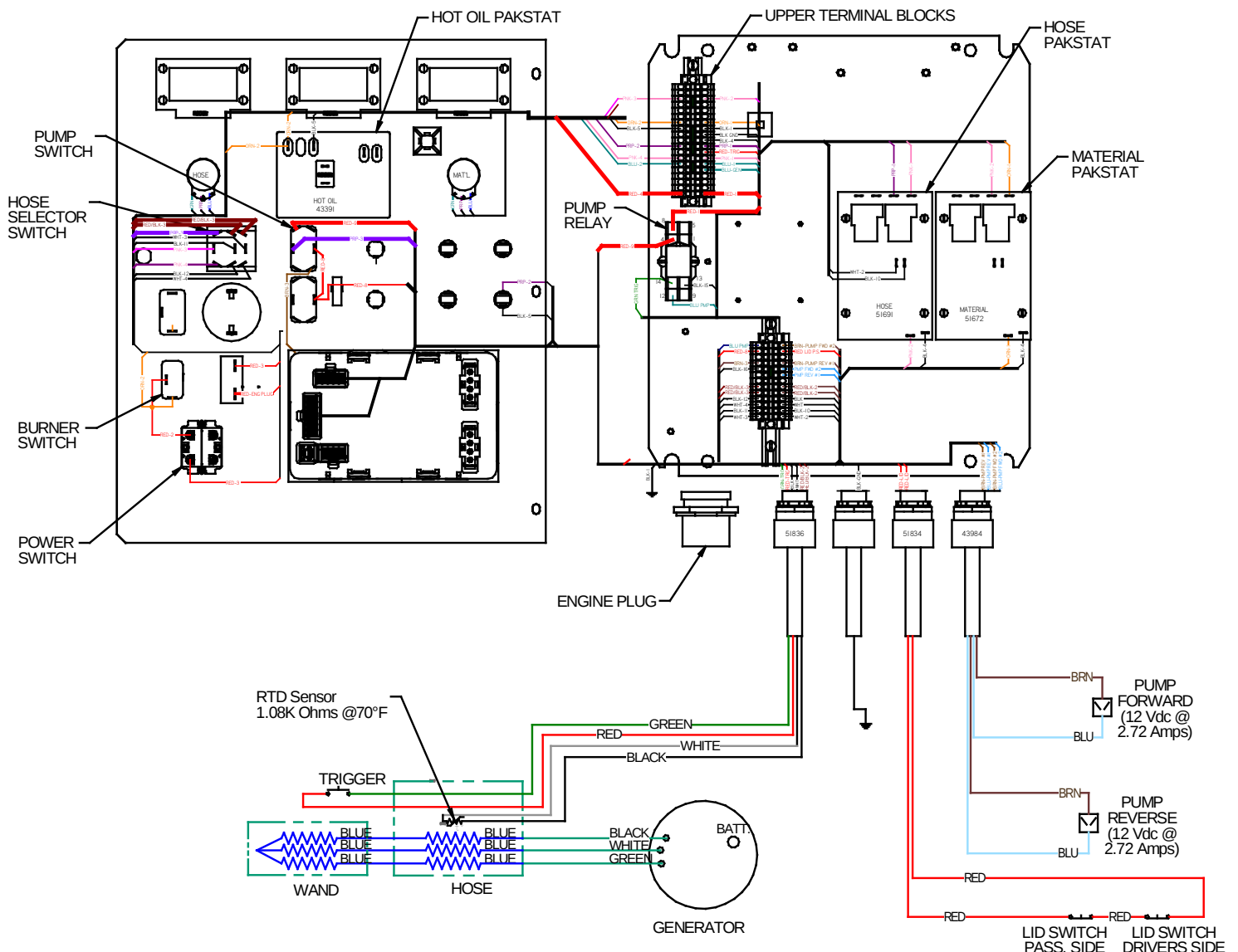
**Table 8-29 P.S. Pump Electrical Troubleshooting (continued)**

| Step | Possible Cause                                                                                                                       | If . . .                                                                                                                                                                                                                                       |
|------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9a   | Is there 12Vdc between pink wire labeled PNK-2 upper terminal block and nearby ground (black wire)?                                  | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to <a href="#">Table 8-16 Mixer Electrical Troubleshooting (continued)</a> Steps 4a through 10a.</li> </ul>                                            |
| 10   | Is there 12Vdc between red wire labeled "RED-TRIG" upper terminal block and nearby ground source (black wire)?                       | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal block and junction box.</li> <li>• No, go to Step 11.</li> </ul>                                                                                 |
| 11   | Is there 12Vdc between purple wire labeled "PRP-1" upper terminal block and nearby ground source (black wire)?                       | <ul style="list-style-type: none"> <li>• Yes, ensure the yellow jumper in the middle of the terminal blocks connected to the "PRP-1" and "RED-TRIG" wires is pushed in all the way.</li> <li>• No, Go to Step 12</li> </ul>                    |
| 12   | Is there 12Vdc between purple wire on terminal #2 of hose PAKSTAT and terminal #8 black ground wire?                                 | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between PAKSTAT and terminal block.<br/><b>NOTE:</b> This wire has a diode that could be bad and cause an open circuit.</li> <li>• No, go to Step 12a.</li> </ul> |
| 12a  | Is there 12Vdc between pink wire on terminal #1 of hose PAKSTAT and terminal #8 black ground wire?                                   | <ul style="list-style-type: none"> <li>• Yes, replace the hose PAKSTAT.</li> <li>• No, go to Step 13.</li> </ul>                                                                                                                               |
| 13   | Is there 12Vdc between pink wire labeled "PNK-1" upper terminal blocks and nearby ground source (black wire)?                        | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal blocks and hose PAKSTAT.</li> <li>• No, go to Step 13a</li> </ul>                                                                                |
| 13a  | Is there 12Vdc between pink wire labeled "PNK-4" upper terminal blocks and nearby ground source (black wire)?                        | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to Step 14.</li> </ul>                                                                                                                                 |
| 14   | Is there 12Vdc between pink wire labeled "PNK-4" lower left terminal of hose selector switch and nearby ground source (black wire)?  | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between hose selector switch and terminal block.</li> <li>• No, go to Step 14a.</li> </ul>                                                                        |
| 14a  | Is there 12Vdc between pink wire labeled "PNK-3" center left terminal of hose selector switch and nearby ground source (black wire)? | <ul style="list-style-type: none"> <li>• Yes, replace hose selector switch.</li> <li>• No, go to Step 15.</li> </ul>                                                                                                                           |

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**Table 8-30 P.S. Pump Electrical Troubleshooting (continued)**

| Step | Possible Cause                                                                                                      | If . . .                                                                                                                                                                                            |
|------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15   | Is there 12Vdc between pink wire labeled "PNK-3" on the upper terminal block and a nearby ground source black wire? | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal block and hose selector switch.</li> <li>• No go to Step 9a.</li> </ul>                               |
| 15a  | Is there 12Vdc between pink wire labeled "PNK-2" on upper terminal block and nearby ground source black wire?       | <ul style="list-style-type: none"> <li>• Yes, replace terminal block.</li> <li>• No, go to <a href="#">Table 8-16 Mixer Electrical Troubleshooting (continued)</a> Steps 4a through 10a.</li> </ul> |



**Fig. 8.11 P.S. Pump Circuit Schematic**

## Chapter 8 Troubleshooting

### 8.4.2 Symptom: Material Does Not Dispense When the D.S. Pump is Activated

**Table 8-31 Basic Visual D.S. Pump Troubleshooting**

| Step | Possible Cause                                                                                                                                                                                                                                                                            | If . . .                                                                                                                                                                                                                                                                                                                    |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is the Hose Temperature Display at or above 325°F?                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Yes, go to Step 2.</li> <li>• No, continue to allow the hose to heat. (Make sure the Hose dial is set at proper operating temperature.)</li> </ul>                                                                                                                                 |
| 2    | Is the red "Pump" light "ON"?                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>• Yes, go to Step 3.</li> <li>• No, go to <a href="#">Table 8-32 D.S. Pump Electrical Troubleshooting</a>.</li> </ul>                                                                                                                                                                |
| 3    | Is the hose selector switch in the "ELECTRIC" position as well as the pump switch should be in "ON ELECTRIC" position?                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• Yes, go to Step 4.</li> <li>• No, move the toggle switches to the proper positions.</li> </ul>                                                                                                                                                                                     |
| 4    | With the wand in the shoebox, pull the wand trigger and look at the material pump shaft coupler.<br>Is it spinning clockwise?                                                                                                                                                             | <ul style="list-style-type: none"> <li>• Yes, shut down machine and look for a plug in the plumbing.</li> <li>• No, adjust the material flow control to increase the flow.</li> <li>• Still no, go to Step 5.</li> </ul>                                                                                                    |
| 5    | Inside the control box and under the front panel, find the relay cube for the pump. It is found near the middle, left-hand side of the box. It is a clear yellow cube with a green button facing the top of the control box. When the trigger is engaged does the green light illuminate? | <ul style="list-style-type: none"> <li>• Yes, this indicates that 12Vdc is reaching the relay coil. Go to <a href="#">Table 8-32 D.S. Pump Electrical Troubleshooting</a>, Steps 3 through 9a to find the problem.</li> <li>• No, go to <a href="#">Table 8-32 D.S. Pump Electrical Troubleshooting</a>, Step 4.</li> </ul> |
| 6    | Is the hydraulic fluid level near the center of the sight gauge when the machine is cold?<br>See Fig. 5.1 Hydraulic Fluid Level                                                                                                                                                           | <ul style="list-style-type: none"> <li>• Yes, go to <a href="#">Table 8-32 D.S. Pump Electrical Troubleshooting</a>.</li> <li>• No, fill oil to the center of the sight gauge.</li> </ul>                                                                                                                                   |

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**NOTE:** Use Fig. 8.12 D.S. Pump Circuit Schematic while troubleshooting the pump electrical system.

**Table 8-32 D.S. Pump Electrical Troubleshooting**

| Step | Possible Cause                                                                                                                                                                                                              | If . . .                                                                                                                                                                                                                                                                              |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Is the amber light “ON” on the Din Plug when the trigger is actuated? For pump forward din plug location Refer to Fig. 8.13 D.S. Hydraulic Valve Din Plug Layout                                                            | <ul style="list-style-type: none"> <li>• Yes, then the pump should be working. If it is not working see <a href="#">Table 8-35 Pump Hydraulic Troubleshooting</a></li> <li>• No, go to Step 1a.</li> </ul>                                                                            |
| 1a   | Unscrew the center screw of the din plug so you can pull the din plug up 1/4” in order to check voltage.<br>Is there 12Vdc from side post to side post?                                                                     | <ul style="list-style-type: none"> <li>• Yes, the electrical system for the pump is working properly. Refer to <a href="#">Table 8-35 Pump Hydraulic Troubleshooting</a>.</li> <li>• No, go to Step 2.</li> </ul>                                                                     |
| 2    | Is there 12Vdc between red wire labeled “TRIGGER RED” in junction box and nearby ground source (black wire)?                                                                                                                | <ul style="list-style-type: none"> <li>• Yes, go to Step 2a.</li> <li>• No, go to <a href="#">Table 8-34 D.S. Pump Electrical Troubleshooting (continued)</a> Step 12 for an Electric Hose.</li> <li>• No, for a Standard Hose is normal because this circuit is not used.</li> </ul> |
| 2a   | Is there 12Vdc between green wire labeled “TRIGGER GRN” in junction box and nearby ground source (black wire)?<br><b>NOTE:</b> Wand trigger must be actuated during this test.                                              | <ul style="list-style-type: none"> <li>• Yes, go to Step 3.</li> <li>• No, see <a href="#">Table 8-20 Hose Electrical Troubleshooting</a> steps 10 through XX</li> </ul>                                                                                                              |
| 3    | Is there 12Vdc between green wire on terminal #14 of pump relay and black wire terminal #13 pump relay?<br><b>NOTE:</b> Wand trigger must be actuated during this test.                                                     | <ul style="list-style-type: none"> <li>• Yes, go to Step 4.</li> <li>• No, check for loose or broken wire between relay and junction box.</li> </ul>                                                                                                                                  |
| 4    | Is there 12Vdc between the brown wire located on the pump relay, bottom left terminal and black wire terminal #13?<br><b>NOTE:</b> Wand Trigger must be actuated or pump switch in “ON STANDARD” position during this test. | <ul style="list-style-type: none"> <li>• Yes, replace Din Plug.</li> <li>• No, go to Step 4a Electric Hose.</li> <li>• No, go to Step 4b Standard Hose.</li> </ul>                                                                                                                    |
| 4a   | Is there 12Vdc on red wire terminal #8 of pump relay and black wire terminal #13?                                                                                                                                           | <ul style="list-style-type: none"> <li>• Yes, replace relay.</li> <li>• Go to Step 5</li> </ul>                                                                                                                                                                                       |
| 4b   | Is there 12Vdc on red wire terminal #4 of pump relay and black wire terminal #13?<br><b>NOTE:</b> This only applies to “ON STANDARD” position of pump switch.                                                               | <ul style="list-style-type: none"> <li>• Yes, replace relay.</li> <li>• No, go to Steps 9 – 10a for standard hose pump issues.</li> </ul>                                                                                                                                             |

## Chapter 8 Troubleshooting

**Table 8-33 D.S. Pump Electrical Troubleshooting (continued)**

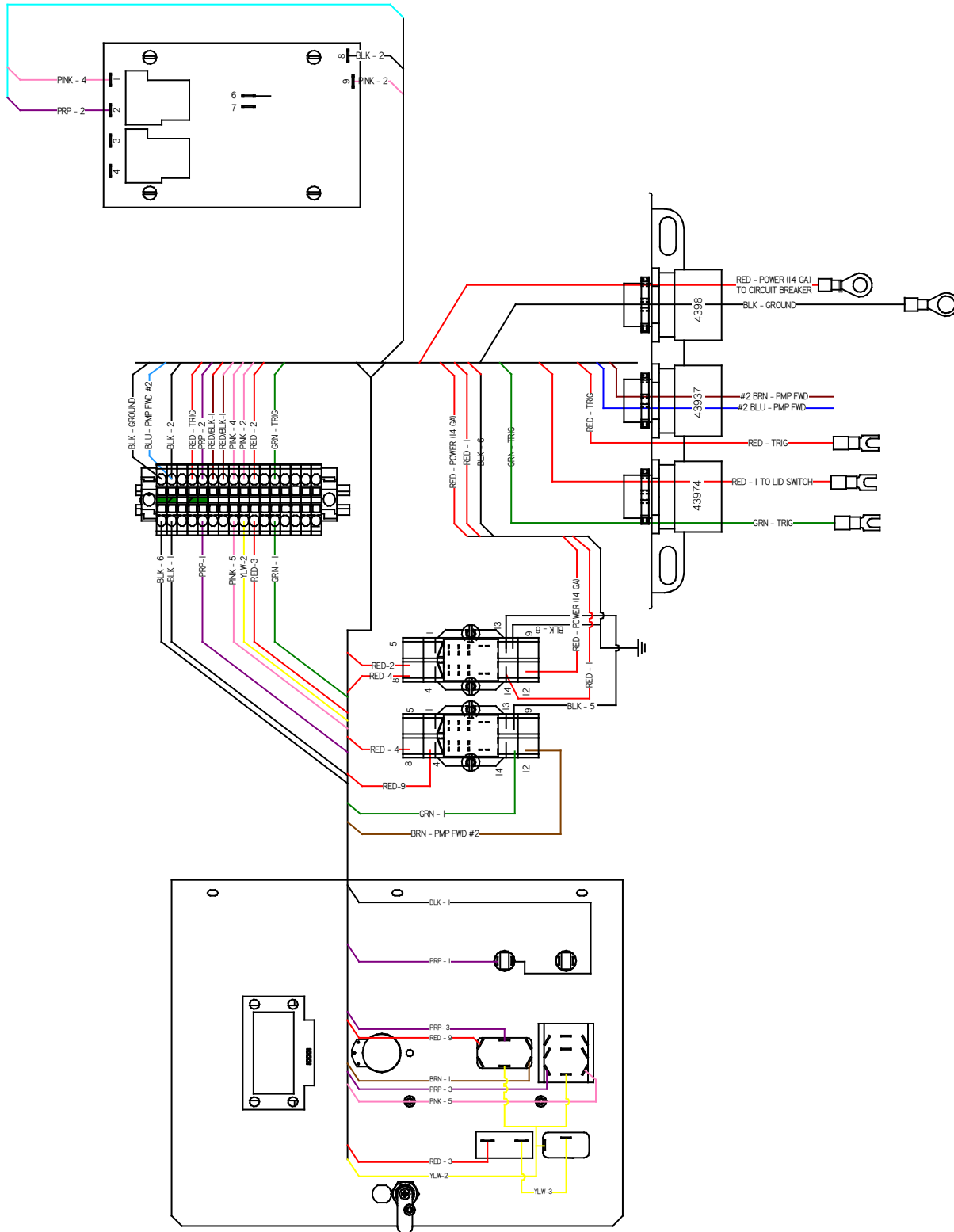
| Step | Possible Cause                                                                                                                                                                                        | If . . .                                                                                                                                                                                                                                                                                                   |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5    | Is there 12Vdc between red wire labeled "RED-4" power relay terminal #8 and a nearby ground source (black wire)?                                                                                      | <ul style="list-style-type: none"> <li>• Yes, replace relay.</li> <li>• No, go to Step 6a.</li> </ul>                                                                                                                                                                                                      |
| 5a   | Is there 12Vdc between red wire labeled "RED-POWER" on pump relay bottom left terminal #12 and nearby ground source (black wire)?                                                                     | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between power relay and terminal block.</li> <li>• No, go to <a href="#">Table 8-17 Mixer Electrical Troubleshooting (continued)</a> steps 9-10a.</li> </ul>                                                                  |
| 6    | Is there 12Vdc between red wire labeled "RED-POWER" on circuit breaker located under battery box and nearby ground Source (black wire)?                                                               | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between circuit breaker and power relay.</li> <li>• No, go to 6a</li> </ul>                                                                                                                                                   |
| 6a   | Is there 12Vdc between the circuit breaker (red wire going to battery positive cable) and the ground lug on the battery tray?                                                                         | <ul style="list-style-type: none"> <li>• Yes, wait 15 seconds then repeat step 7.</li> <li>• If still no voltage then replace circuit breaker.</li> <li>• No, go to step 6b.</li> </ul>                                                                                                                    |
| 6b   | Check for loose or broken wires between circuit breaker and battery positive cable.                                                                                                                   | <ul style="list-style-type: none"> <li>• Yes, replace or repair damaged wire and repeat Step 6a.</li> <li>• No, go to step 7.</li> </ul>                                                                                                                                                                   |
| 7    | Is there 12Vdc between the positive and negative battery post? If this check is done while the engine is running the reading should be 13.8 volts.                                                    | <ul style="list-style-type: none"> <li>• Yes, then there should be 12Vdc on the battery side of the circuit breaker.</li> <li>• No, replace battery.</li> <li>• <b>Note:</b> If the reading is less than 13.8 volts while the engine is running the alternator needs to be rebuilt or replaced.</li> </ul> |
| 8    | Is there 12Vdc between red wire labeled RED-9 on top right hand terminal of pump switch and a nearby ground source?<br><b>NOTE:</b> Pump switch must be in the "ON STANDARD" position of pump switch. | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between pump switch and pump relay.</li> <li>• No, go to Step 8a.</li> </ul>                                                                                                                                                  |
| 8a   | Is there 12Vdc between purple wire labeled PRP-3 on center right hand terminal of pump switch and a nearby ground source (black wire)?                                                                | <ul style="list-style-type: none"> <li>• Yes, replace pump switch.</li> <li>• No, go to Step 9.</li> </ul>                                                                                                                                                                                                 |
| 9    | Is there 12Vdc between purple wire labeled PRP-3 top left terminal of hose selector switch and nearby ground (black wire)?<br><b>NOTE:</b> Hose selector switch must be in "STANDARD" position.       | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between hose selector switch and pump switch.</li> <li>• No go to Step 9a.</li> </ul>                                                                                                                                         |

## Chapter 8 Troubleshooting

**Table 8-34 D.S. Pump Electrical Troubleshooting (continued)**

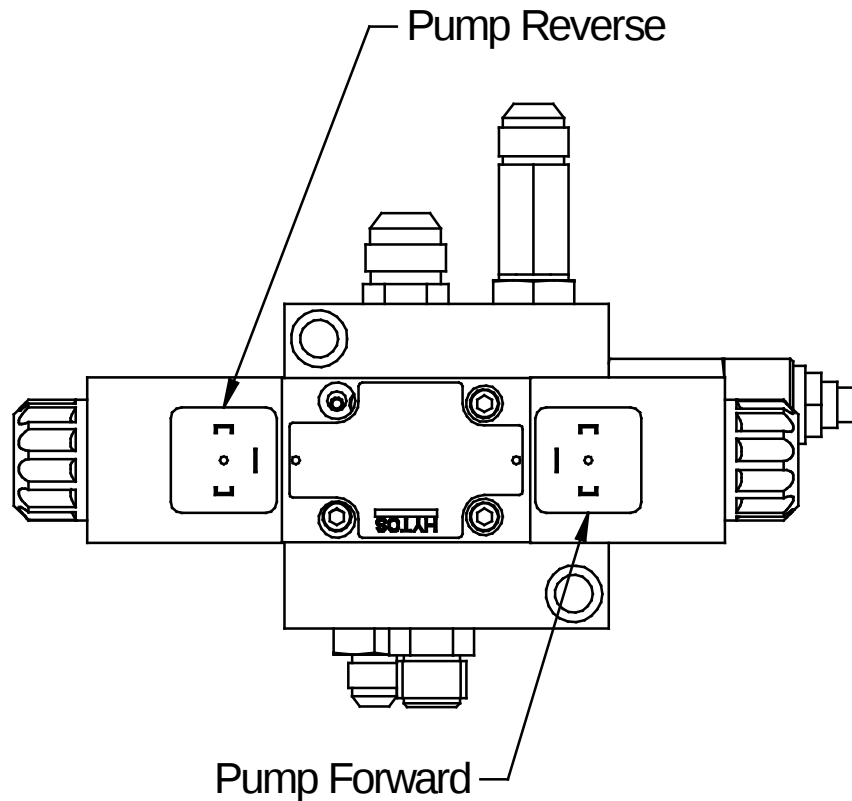
| Step | Possible Cause                                                                                                                         | If . . .                                                                                                                                                                                                                               |
|------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9a   | Is there 12Vdc between yellow wire labeled "YLW-2" center left terminal of hose selector switch and nearby ground source (black wire)? | <ul style="list-style-type: none"> <li>• Yes, replace hose selector switch.</li> <li>• No, go to Step 10.</li> </ul>                                                                                                                   |
| 10   | Is there 12Vdc between yellow wire labeled "YLW-2" on top terminal power switch and nearby ground source (black wire)?                 | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between power switch and hose selector switch.</li> <li>• No, go to Step 10a.</li> </ul>                                                                  |
| 10a  | Is there 12Vdc between yellow wire labeled "YLW-3" bottom terminal of power switch and nearby ground (black wire)?                     | <ul style="list-style-type: none"> <li>• Yes, replace power switch.</li> <li>• No, go to Step 11.</li> </ul>                                                                                                                           |
| 11   | Is there 12Vdc between yellow wire labeled "YLW-3" bottom terminal of circuit breaker and nearby ground source (black wire)?           | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between circuit breaker and power switch.</li> <li>• No, go to Step 11a.</li> </ul>                                                                       |
| 11a  | Is there 12Vdc between red wire labeled "RED-3" top terminal of circuit breaker and nearby ground source (black wire)?                 | <ul style="list-style-type: none"> <li>• Yes, replace circuit breaker</li> <li>• No, Go to Step 12</li> </ul>                                                                                                                          |
| 12   | Is there 12Vdc between red wire labeled "RED-3" on terminal blocks and nearby ground source (black wire)?                              | <ul style="list-style-type: none"> <li>• Yes, check for loose or broken wire between terminal block and circuit breaker.</li> <li>• No, go to Step 12a.</li> </ul>                                                                     |
| 12a  | Is there 12Vdc between red wire labeled "RED-2" on terminal blocks and nearby ground source (black wire)?                              | <ul style="list-style-type: none"> <li>• Yes, replace the terminal block.</li> <li>• No, go to Steps 5 - 7. Or call CrafcO, Inc. and speak to a customer service technician, you should have been able to find the problem.</li> </ul> |

## Chapter 8 Troubleshooting

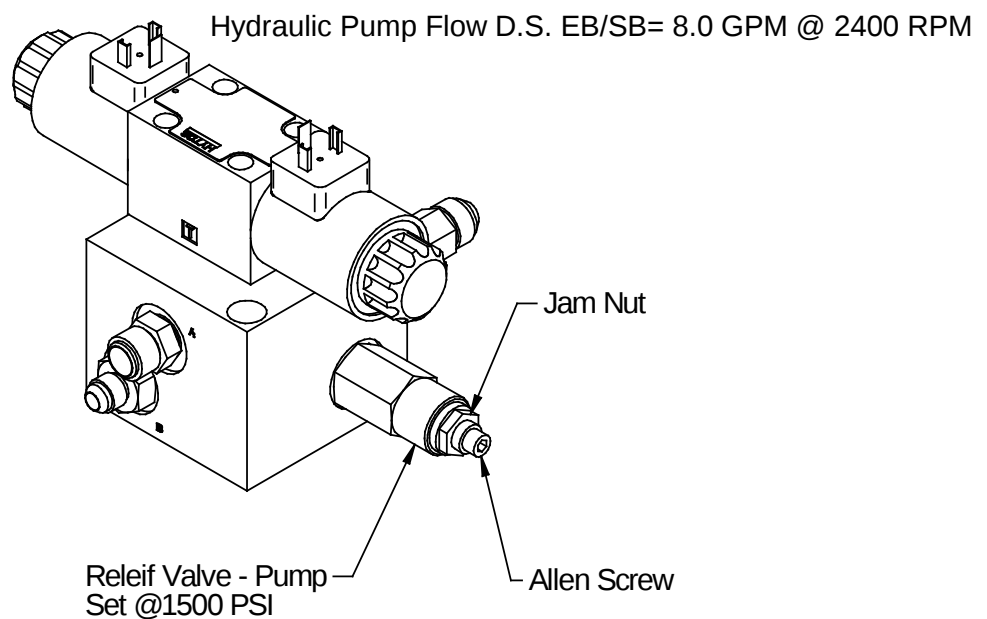


**Fig. 8.12 D.S. Pump Circuit Schematic**

## Chapter 8 Troubleshooting



**Fig. 8.13 D.S. Hydraulic Valve Din Plug Layout**



**Fig. 8.14 D.S. Hydraulic Valve Pressure Setting**

## Chapter 8 Troubleshooting

**Table 8-35 Pump Hydraulic Troubleshooting**

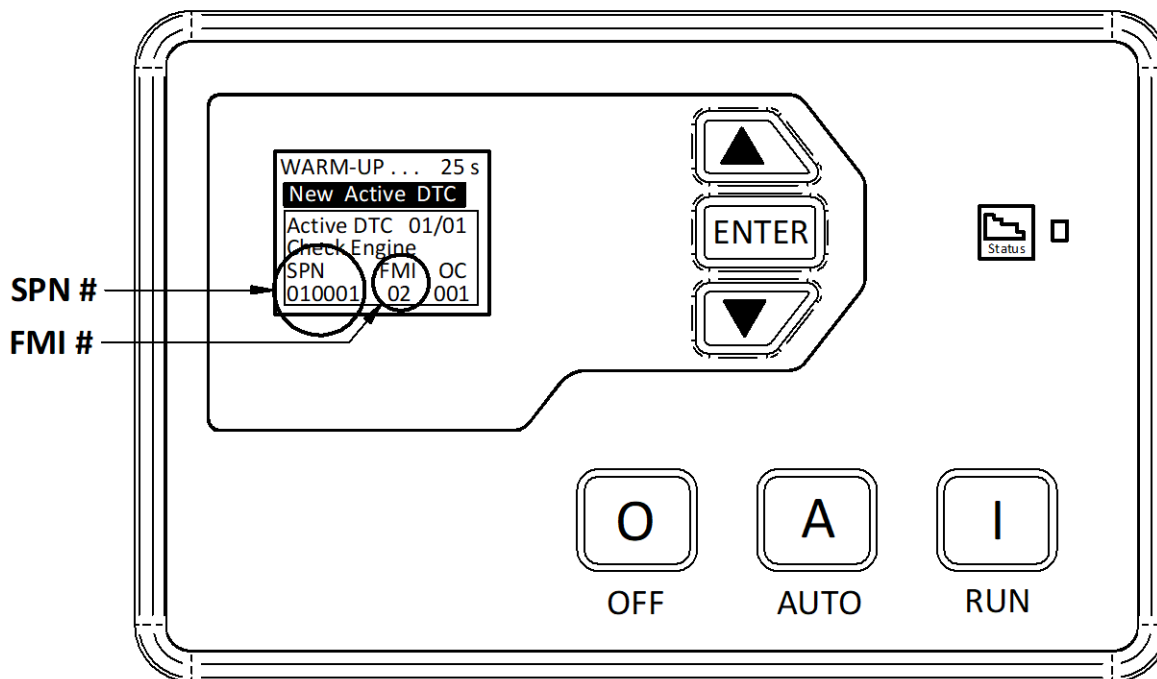
| Step | Possible Cause                                                                                                                        | If...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Does the coil magnetize when the din plug amber light is "ON"?                                                                        | <ul style="list-style-type: none"> <li>• Yes, go to Step 2.</li> <li>• No, remove the din plug, then remove the coil by unscrewing the nut on the end of the coil. With the coil removed reattach the din plug and place a metal screw driver in the center of the coil to see if the coil is magnetic. If it is not, recheck the din plug is plugged into the coil and the amber light is "ON". If still not magnetic replace the coil.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                        |
| 2    | Is the relief pressure set correctly?<br>(Refer to <a href="#">Fig. 8.6 P.S. Hydraulic Valve Pressure Setting</a> ).                  | <ul style="list-style-type: none"> <li>• Yes, go to Step 3.</li> <li>• No, first turn "OFF" the Isuzu engine, then remove one of the two hydraulic hoses going to the pump hydraulic motor, cap off the fitting on the motor and use a 3000 PSI gauge with the proper JIC fitting, attach it to the hose. Start the Isuzu engine, turn "ON" the main power in the control box, pull the wand trigger and read the pressure gauge. If the pressure needs to be adjusted use the pressure relief valve marked "RVP", loosen the jam nut and adjust the pressure with the allen screw at the end of the relief. Turn clockwise to increase pressure and counter clockwise to decrease pressure, then tighten the jam nut to lock pressure. Next turn "OFF" the Isuzu engine, remove the cap, pressure gauge and reattach the hose.</li> </ul> |
| 3    | Is the hydraulic flow correct from the hydraulic pump?<br>(Refer to <a href="#">Fig. 8.6 P.S. Hydraulic Valve Pressure Setting</a> ). | <ul style="list-style-type: none"> <li>• Yes, call CrafcO, Inc. and speak to a service technician, you should have been able to find the problem.</li> <li>• No, call a local hydraulic shop to see if they can run a hydraulic pump flow test, using the information in <a href="#">Fig. 8.6 P.S. Hydraulic Valve Pressure Setting</a>.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Chapter 8 Troubleshooting

### 8.5 Engine Diagnostic Trouble Codes (DTC)

#### 8.6 How to use the Diagnostic Trouble Code Table

The engine supplied on the EZ 1500 Series II Double Pumper machine is capable of displaying Diagnostic Trouble Codes (DTC) on the engine control panel display. If your engine displays a DTC, most likely you will have to contact your local engine repair center for service. To locate your closest engine repair center, please go here: <http://www.isuzuengines.com/#!/network> or call 734-582-9470 and they can help you locate your closest repair center. To use the table, find the SPN and FMI # from the control panel screen, and match it to the first column in the table listed as "SPN-FMI". Please see the following figure below:



**YOUR SPN-FMI # IS "10001-2". FIND ON THE TABLE BELOW**

**10001-2 = EGR position sensor malfunction**

**Fig. 8.15 Engine Control Display DTC**

#### 8.6.1 Engine DTC Table (46500EB, 46500SB)

**Table 8-36 Engine DTC Table PN 46500EB, 46500SB**

| <b>SPN-FMI</b> | <b>Failure Type</b>                                  |
|----------------|------------------------------------------------------|
| 10001-13       | EGR zero-point learning malfunction                  |
| 10001-2        | EGR position sensor malfunction                      |
| 10002-2        | EGR valve control malfunction                        |
| 10003-2        | Injection nozzle common 1 driving system malfunction |
| 10004-2        | Injection nozzle common 2 driving system malfunction |
| 10005-1        | Charge circuit malfunction bank 1                    |

## Chapter 8 Troubleshooting

**Table 8-37 Engine DTC Table PN 46500EB, 46500SB (Continued)**

|         |                                                             |
|---------|-------------------------------------------------------------|
| 10006-1 | Charge circuit malfunction bank 2                           |
| 10007-2 | CPU monitoring IC malfunction                               |
| 10008-2 | A/D conversion malfunction                                  |
| 10009-2 | 5V power supply 3 voltage malfunction                       |
| 100-1   | Engine oil pressure drop                                    |
| 10010-2 | 5V power supply 4 voltage malfunction                       |
| 10013-2 | EEPROM malfunction                                          |
| 100-3   | Engine oil press sensor malfunction (high voltage)          |
| 10032-2 | QR code malfunction                                         |
| 10033-2 | RAM malfunction                                             |
| 100-4   | Engine oil press sensor malfunction (low voltage)           |
| 10045-2 | ADIC malfunction                                            |
| 10050-2 | Injector IC malfunction                                     |
| 10051-2 | Injector IC communicate malfunction                         |
| 10052-2 | Injector IC check sum malfunction                           |
| 102-3   | Boost pressure sensor malfunction (high voltage)            |
| 102-4   | Boost pressure sensor malfunction (low voltage)             |
| 105-3   | Boost temp sensor malfunction (high voltage)                |
| 105-4   | Boost temp sensor malfunction (low voltage)                 |
| 1077-2  | CPU malfunction                                             |
| 1079-2  | 5V power supply 1 voltage malfunction                       |
| 1080-2  | 5V power supply 2 voltage malfunction                       |
| 108-3   | Baro pressure sensor malfunction (high voltage)             |
| 108-4   | Baro pressure sensor malfunction (low voltage)              |
| 110-0   | Over heat                                                   |
| 110-3   | Water temp sensor malfunction (high voltage)                |
| 110-4   | Water temp sensor malfunction (low voltage)                 |
| 1131-3  | Manifold temp sensor malfunction (high voltage)             |
| 1131-4  | Manifold temp sensor malfunction (low voltage)              |
| 1239-1  | Common rail pressure down (No pump pressure feed)           |
| 1239-17 | Common rail pressure down (pump pressure feed insufficient) |
| 1347-3  | SCV driving system + B short                                |
| 1347-4  | SCV driving system disconnection, GND short                 |
| 1381-3  | Fuel filter clogging sensor malfunction (high voltage)      |
| 1381-4  | Fuel filter clogging sensor malfunction (low voltage)       |
| 1485-5  | Main relay system malfunction (not connected)               |
| 1485-6  | Main relay system malfunction (not disconnected)            |
| 157-15  | Common rail pressure malfunction (pump over pressure feed)  |
| 157-3   | Common rail press sensor malfunction (high voltage)         |
| 157-4   | Common rail press sensor malfunction (low voltage)          |
| 158-3   | Battery system high voltage malfunction                     |
| 172-3   | Intake air temp sensor malfunction (high voltage)           |
| 172-4   | Intake air temp sensor malfunction (low voltage)            |
| 174-3   | Fuel temp sensor malfunction (high voltage)                 |
| 174-4   | Fuel temp sensor malfunction (low voltage)                  |
| 190-0   | Over run                                                    |

## Chapter 8 Troubleshooting

**Table 8-38 Engine DTC Table PN 46500EB, 46500SB (Continued)**

|        |                                                   |
|--------|---------------------------------------------------|
| 628-2  | ROM malfunction                                   |
| 633-7  | Pressure limited open                             |
| 636-2  | Cam sensor malfunction (no signal)                |
| 636-7  | Cam sensor phase shifting                         |
| 639-19 | CAN Bus malfunction                               |
| 651-5  | Injection nozzle 1 driving system disconnection   |
| 652-5  | Injection nozzle 2 driving system disconnection   |
| 653-5  | Injection nozzle 3 driving system disconnection   |
| 654-5  | Injection nozzle 4 driving system disconnection   |
| 676-5  | Glow relay malfunction                            |
| 677-5  | Starter cut relay malfunction                     |
| 723-2  | Crank sensor malfunction (no or abnormal signal)  |
| 91-2   | Accelerator sensor 1-2 comparison malfunction     |
| 91-3   | Accelerator sensor 1-2 malfunction (high voltage) |
| 91-4   | Accelerator sensor 1-2 malfunction (low voltage)  |
| 968-2  | Idle up down switch malfunction                   |



## Chapter 9 Illustrated Parts List

### 9.0 About the Illustrated Parts List

The Illustrated Parts List (IPL) is designed to help technical service or maintenance personnel correctly identify orderable replacement parts.

The figure and table titles reference the part number (PN) to which they apply. The PN's for each of the EZ 1500 Series II Diesel Melter machine models are as follows:

EZ1500 Series II Electric Base Diesel Melter PN46500EB

EZ1500 Series II Standard Base Diesel Melter PN46500SB

Illustrations are designed to show general shape and size of a part and the relationship that part has to other parts. Actual size and shape of parts or components may differ or vary from the actual part or component.

### 9.1 Ordering Crafco Parts

Crafco distributors and Crafco Pavement Preservation Supply Centers are strategically located throughout the United States. Parts can be ordered from your local Crafco distributor or directly from Crafco, Inc. if a distributor is not available in your area.

When ordering parts, give the following information:

- Part Number
- Machine Model
- Serial Number

Write, call, or Fax Crafco, Inc. at the following:

Crafco, Inc. Headquarters

6165 W. Detroit St.

Chandler, AZ 85226

Phone: (602) 276-0406

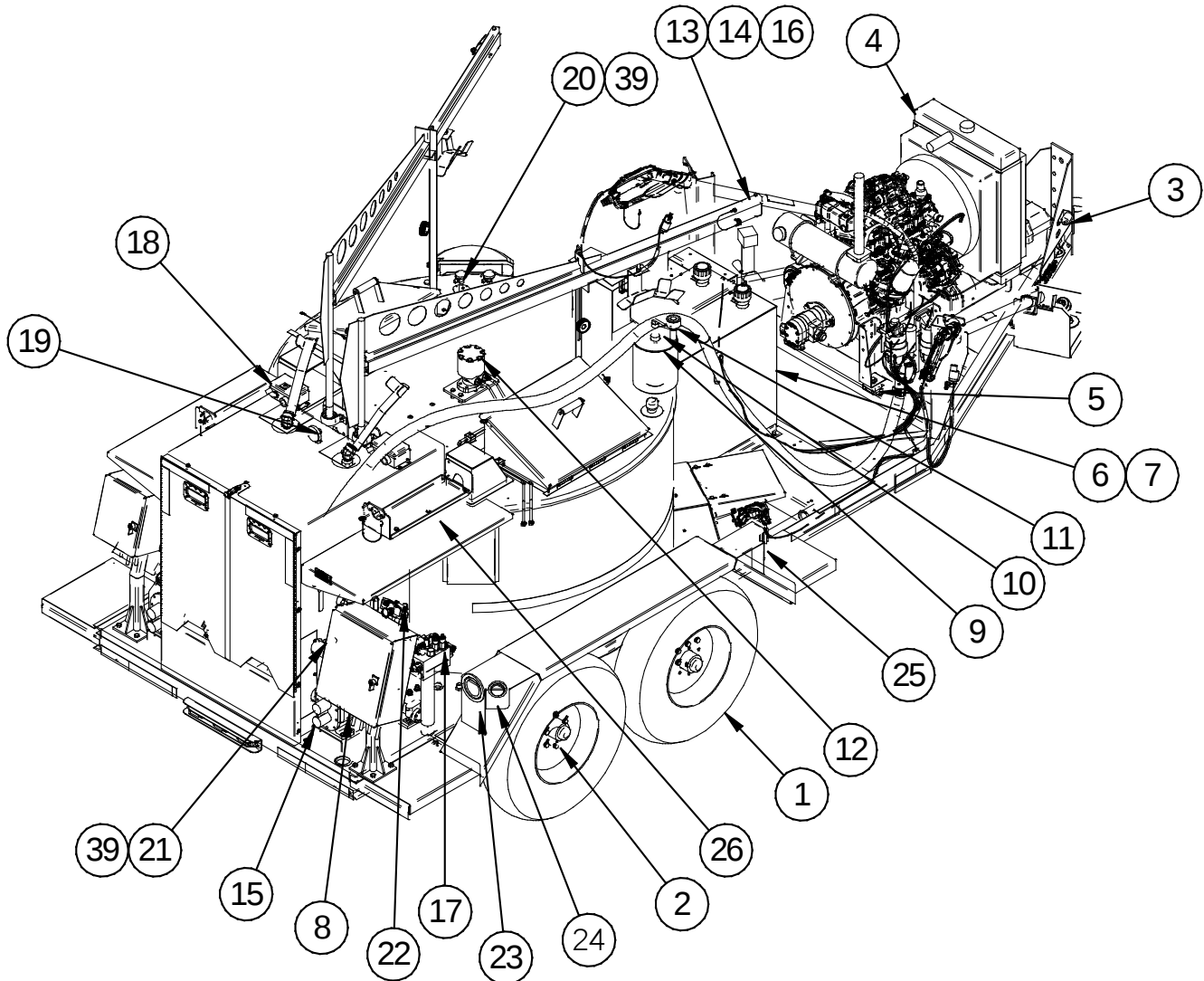
Toll Free: (800) 528-8242

Fax: (480) 961-0513

Visit our website at [www.crafco.com](http://www.crafco.com)

## Chapter 9 Illustrated Parts List

### 9.2 EZ1500 Series II Double Pumper Parts List

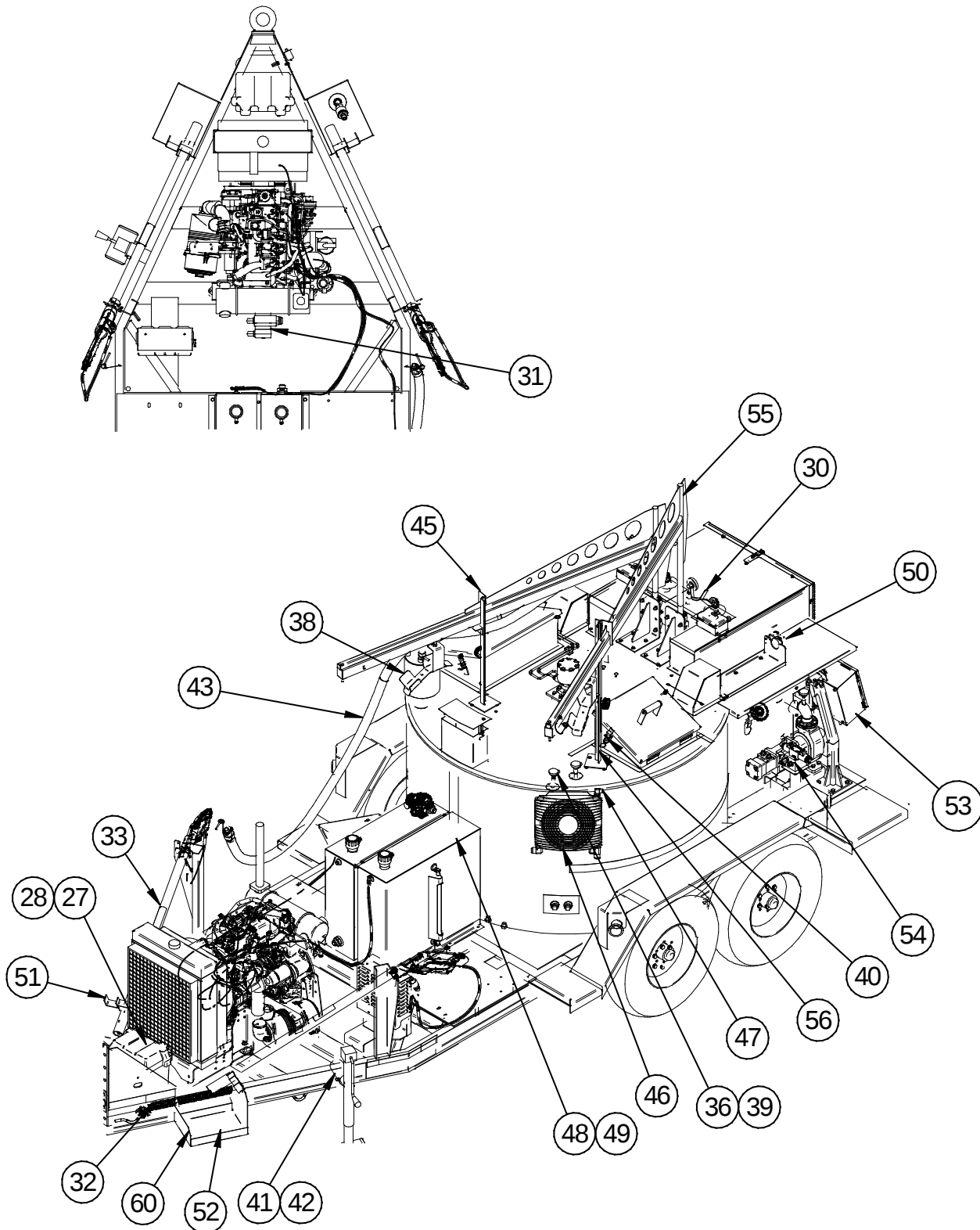


**Fig. 9.1 EZ1500 Series II Double Pumper Melter**

## Chapter 9 Illustrated Parts List

| FIG.     | ITEM | PART NO. | DESCRIPTION                            | QTY. |
|----------|------|----------|----------------------------------------|------|
| Fig. 9.1 | 1    | 90100    | TIRE AND WHEEL ASSEMBLY                | 4    |
|          | 2    | 45704    | TORSIONAL AXLE ASSEMBLY                | 2    |
|          | 3    | 23117    | BREAKAWAY SWITCH                       | 1    |
|          | 4    | 47107    | ENGINE ASSEMBLY – 46500EB              | 1    |
|          | 4    | 47110    | ENGINE ASSEMBLY – 46500SB              | 1    |
|          | 5    | 46473    | ISOMOUNT                               | 4    |
|          | 6    | 46255    | HYDRAULIC TANK ASSEMBLY                | 1    |
|          | 7    | 45498    | HYDRAULIC FILTER ASSEMBLY              | 1    |
|          | 7a   | 45438    | HYDRAULIC FILTER ELEMENT               | 1    |
|          | 7b   | 45440    | O-RING, HYDRAULIC FILTER               | 1    |
|          | 7c   | 45497    | GASKET, HYDRAULIC FILTER               | 1    |
|          | 7d   | 45437    | GAUGE, HYDRAULIC FILTER                | 1    |
|          | 8    | 47210    | CONTROL BOX ASSY., P.S. – EB           | 1    |
|          | 8    | 47215    | CONTROL BOX ASSY., P.S. – SB           | 1    |
|          | 9    | 43355    | OVERFLOW TANK                          | 1    |
|          | 10   | 46450    | DIPSTICK                               | 1    |
|          | 11   | 26025    | AIR BREATHER                           | 1    |
|          | 12   | 45706    | MOTOR, HYDRAULIC – AGITATOR            | 1    |
|          | 13   | 46010    | BOOM, PASSENGER SIDE – HOSE            | 1    |
|          | 14   | 45579    | BASE, BOOM                             | 1    |
|          | 15   | 42070    | MATERIAL PUMP ASSEMBLY, P.S. JACKETED  | 1    |
|          | 16   | 45553    | BEARING, BOOM                          | 2    |
|          | 17   | 45433    | HYDRAULIC CONTROL VALVE ASSEMBLY, P.S. | 1    |
|          | 18   | 44027    | JUNCTION BOX ASSEMBLY                  | 2    |
|          | 19   | 25057    | GAUGE, HOSE COMPARTMENT                | 1    |
|          | 20   | 43465    | SENSOR, MATERIAL                       | 1    |
|          | 21   | 56940    | SENSOR, RTD – PUMPING TEMPERATURE      | 2    |
|          | 22   | 46060    | REGULATOR, FLOW                        | 2    |
|          | 23   | 32363    | TAIL LIGHT, STOP, TURN, AND TAIL       | 2    |
|          | 24   | 24040    | SIDE MARKER, RED                       | 2    |
|          | 25   | 24041    | CLEARANCE MARKER, YELLOW               | 4    |
|          | 26   | 46707    | SUPPORT ASSEMBLY, P.S. WAND            | 1    |

**Chapter 9 Illustrated Parts List**

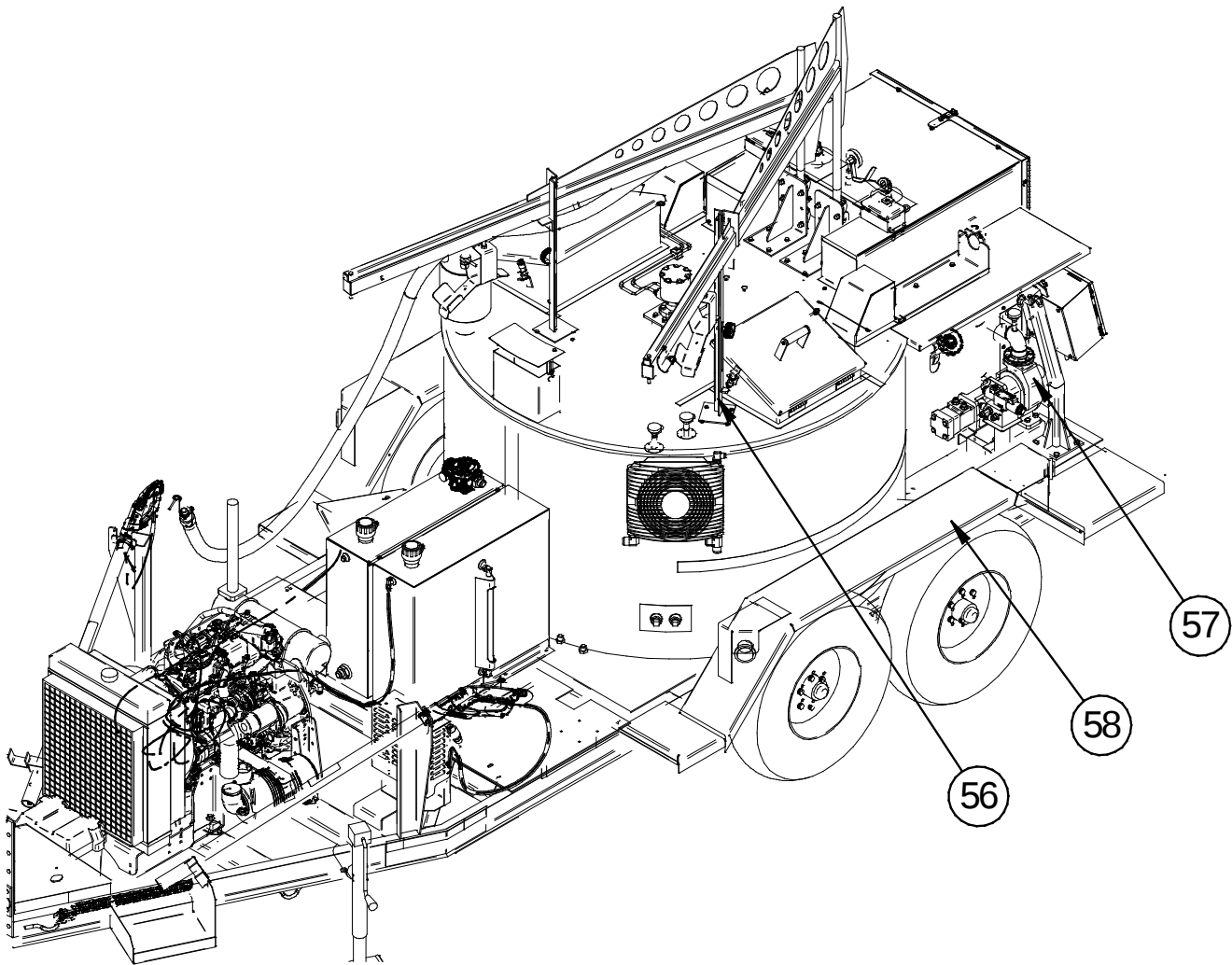


**Fig. 9.2 EZ1500 Series II Double Pumper Melter**

## Chapter 9 Illustrated Parts List

| FIG.     | ITEM | PART NO. | DESCRIPTION                           | QTY.     |
|----------|------|----------|---------------------------------------|----------|
| Fig. 9.2 | 27   | 24000    | BATTERY                               | 1        |
|          | 28   | 24002    | BATTERY BOX                           | 1        |
|          | 29   | 27048    | SWIVEL, STANDARD HOSE (Not Shown)     | OPT.     |
|          | 30   | 46340    | SUPPORT, ELECTRIC HOSE                | 1        |
|          | 31   | 45490    | HYDRAULIC PUMP ASSEMBLY – EB/SB       | 1        |
|          | 32   | 20130    | SAFETY CHAIN                          | 2        |
|          | 33   | 52200    | WAND ASSEMBLY – ELECTRIC              | OPT.     |
|          | 34   | 41629    | WAND – STANDARD HOSE (Not Shown)      | OPT.     |
|          | 35   | 41208    | HANDLE W/ VALVE, STANDARD (Not Shown) | OPT.     |
|          | 36   | 52345N   | SENSOR, HOT OIL                       | 1        |
|          | 37   | 42559    | NOZZLE, BURNER (Not Shown)            | 1        |
|          | 38   | 46053    | HOSE HANGER                           | 2        |
|          | 39   | 51065    | CORD GRIP                             | 4        |
|          | 40   | 39608    | SWITCH, LID                           | 2        |
|          | 41   | 23095    | BUSHING, JACK ASSEMBLY                | 1        |
|          | 42   | 23082    | JACK ASSEMBLY, 7000#                  | 1        |
|          | 43   | 52400    | ELECTRIC HEATED HOSE ASSEMBLY, 15'    | OPT.     |
|          | 44   | 27009    | HOSE, 20' SEALANT (Not Shown)         | OPT.     |
|          | 45   | 46263    | BOOM LOCK ASSEMBLY, P.S.              | 1        |
|          | 46   | 45762    | HYDRAULIC OIL COOLER                  | 1        |
|          | 47   | 45542    | TEMPERATURE SWITCH, COOLER            | 1        |
|          | 48   | 47060N   | DIESEL FUEL TANK ASSEMBLY             | 1        |
|          | 49   | 44191    | TUBING, SIGHT GLASS                   | 1.75 ft. |
|          | 50   | 46747    | SUPPORT ASSEMBLY, D.S. WAND           | 1        |
|          | 51   | 46041    | DRIP PAN, P.S.                        | 1        |
|          | 52   | 46580    | DRIP PAN, D.S.                        | 1        |
|          | 53   | 46710    | CONTROL BOX ASSY., D.S. – EB          | 1        |
|          | 53   | 46720    | CONTROL BOX ASSY., D.S. – SB          | 1        |
|          | 54   | 45445    | HYDRAULIC VALVE ASSY., D.S. PUMP      | 1        |
|          | 55   | 46632    | BOOM ASSY, D.S.                       | 1        |

## Chapter 9 Illustrated Parts List



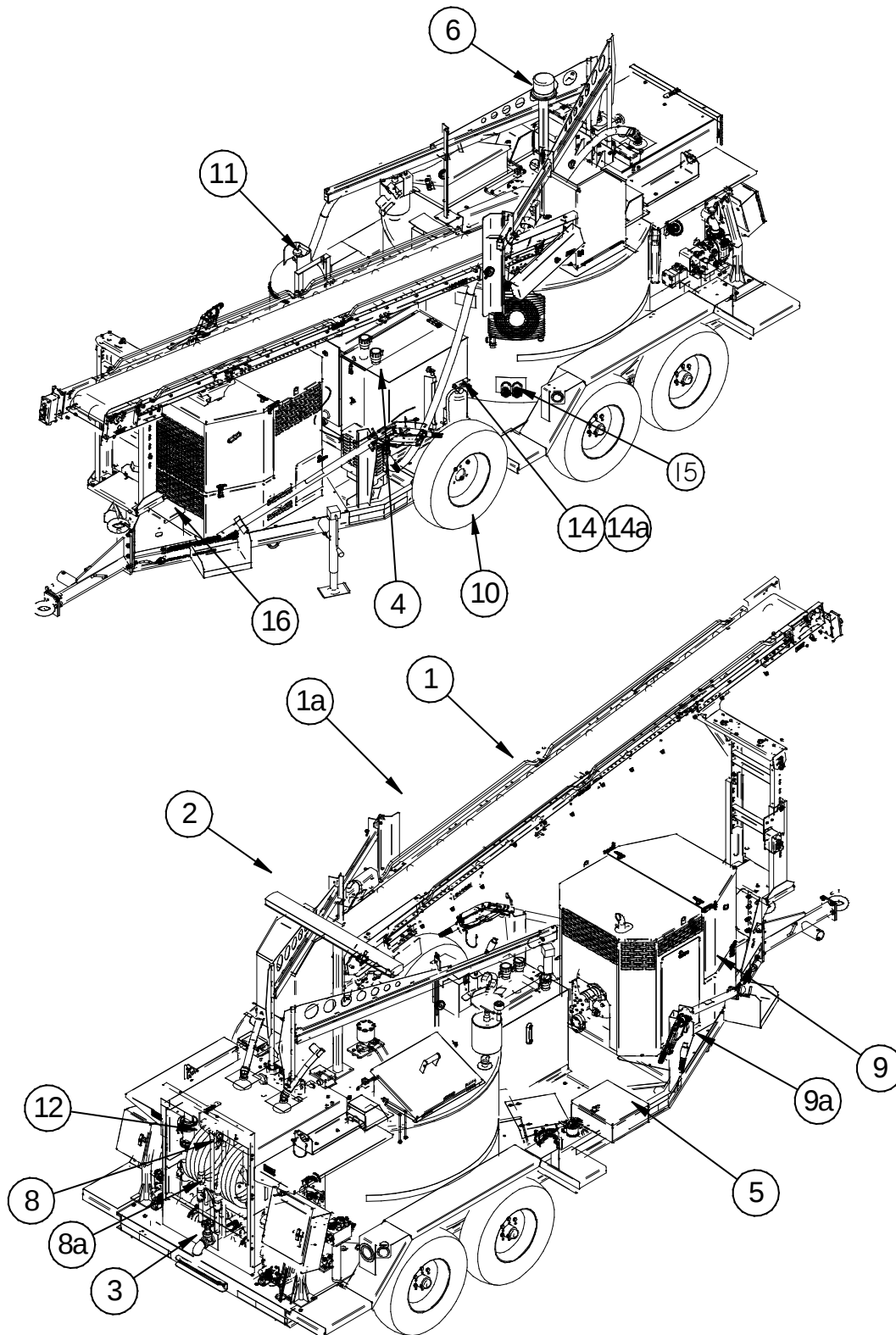
**Fig. 9.3 EZ1500 Series II Double Pumper Melter**

**Chapter 9 Illustrated Parts List**

| FIG.     | ITEM | PART NO. | DESCRIPTION                           | QTY. |
|----------|------|----------|---------------------------------------|------|
| Fig. 9.3 | 56   | 46742    | BOOM LOCK ASSEMBLY, D.S.              | 1    |
|          | 57   | 42072    | MATERIAL PUMP ASSEMBLY, D.S. JACKETED | 1    |
|          | 58   | 46572    | FENDER ASSEMBLY                       | 2    |

## Chapter 9 Illustrated Parts List

### 9.3 Machine Options



**Fig. 9.4 EZ1500 Series II Melter Options**

## Chapter 9 Illustrated Parts List

| FIG.     | ITEM | PART NO.  | DESCRIPTION                       | QTY. |
|----------|------|-----------|-----------------------------------|------|
| Fig. 9.4 | 1    | 51399     | CONVEYOR ASSEMBLY                 | 1    |
|          | 1a   | 46614     | BOOM LOCK, CONVEYOR               | 1    |
|          | 2    | 46726K††† | ARROW BOARD                       | 1    |
|          | 3    | 41930     | KIT, GRAVITY FEED                 | 1    |
|          | 4    | 47000     | FUEL TANK, 60 GALLON              | 1    |
|          | 5    | 46260††   | TOOL BOX                          | 1    |
|          | 6    | 46170K††† | STROBE LIGHT KIT                  | 1    |
|          | 7    | 46160K††† | LIGHT BAR KIT (NOT SHOWN)         | 1    |
|          | 8    | 41629     | HAND WAND ASSEMBLY                | 2    |
|          | 8a   | 41208     | HANDLE ASSEMBLY W/ VALVE          | 2    |
|          | 9    | 47500     | ENGINE COVER ASSEMBLY             | 1    |
|          | 9a   | 47521N    | SUPPORT, ENGINE COVER             | 2    |
|          | 10   | 42743     | KIT, SPARE TIRE                   | 1    |
|          | 11   | 41259K††  | KIT, 100# PROPANE TANK            | 1    |
|          | 12   | 27009     | 20' SEALANT HOSE                  | 2    |
|          | 13   | 26119     | 3/8" SAFETY HOOK (NOT SHOWN)      | 2    |
|          | 14   | 26058     | FIRE EXTINGUISHER W/ COVER        | 1    |
|          | 14a  | 26059     | BRACKET, FIRE EXTINGUISHER        | 1    |
|          | 15   | 24190K    | HEATER, FIREROD, 110V             | 2    |
|          | 15   | 24194K    | HEATER, FIREROD, 220V             | 2    |
|          | 16   | 24086     | BATTERY BOX, LOCKABLE             | 1    |
|          | 17   | 27048†    | SWIVEL, STANDARD HOSE (Not Shown) | 2    |
|          | 18   | 45650     | HOT AIR LANCE (NOT SHOWN)         | 1    |

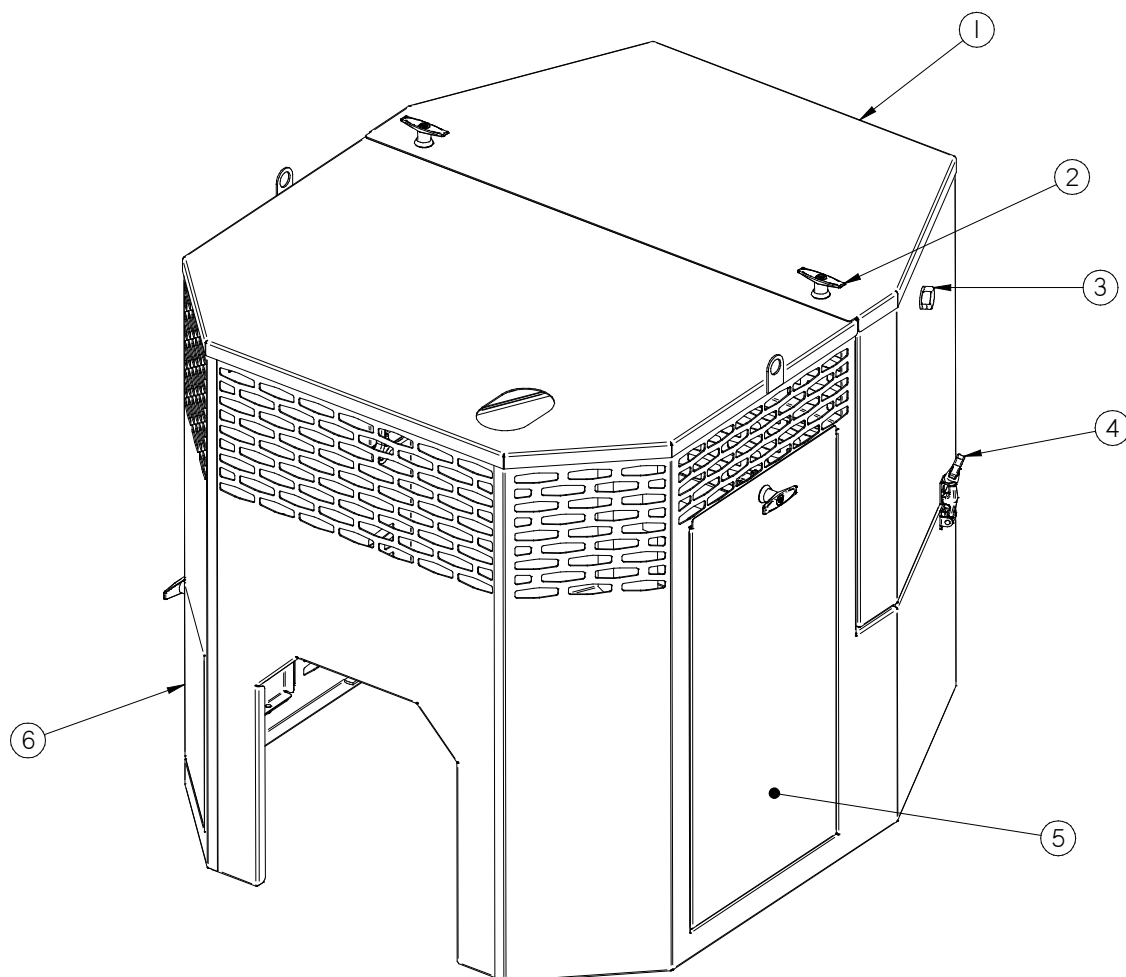
†This item is recommended for standard hose connection in the heat compartment. One required per hose.

††Only one of these can be installed on the machine.

†††Only one of these can be installed on the machine.

## Chapter 9 Illustrated Parts List

### 9.4 Optional Engine Cover

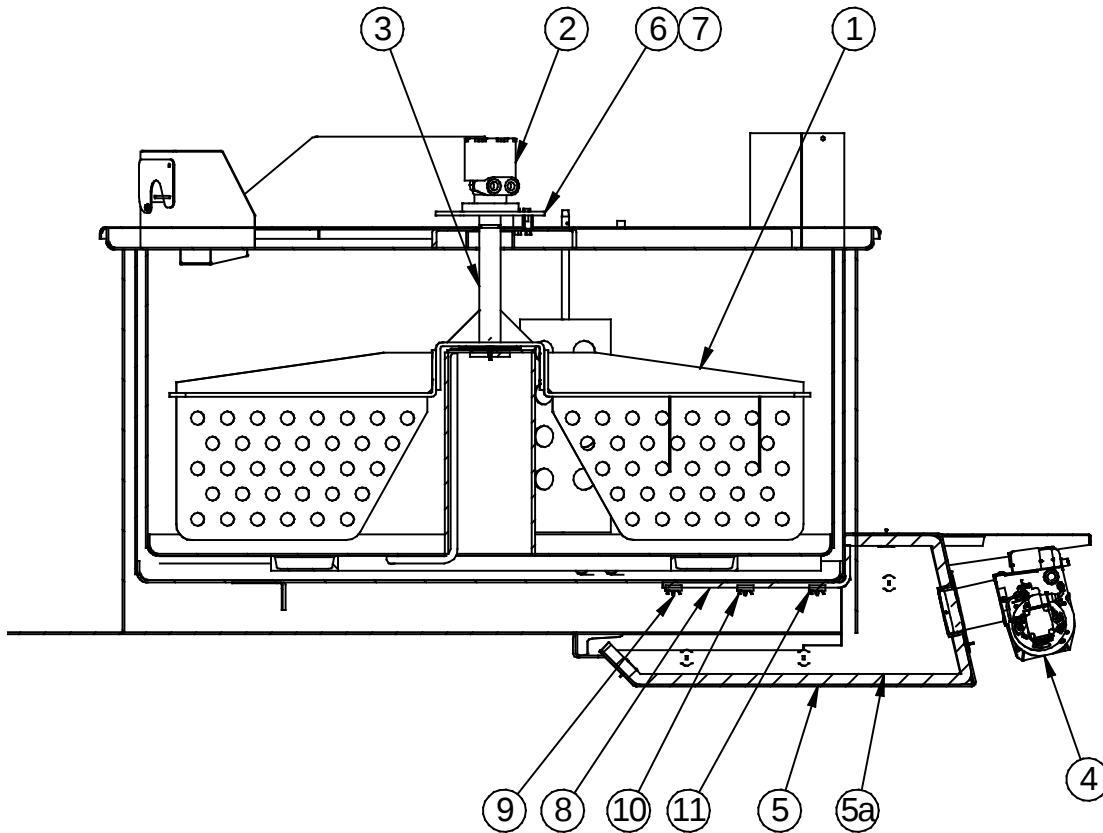


**Fig. 9.5 Optional Engine Cover**

| FIG.     | ITEM | PART NO. | DESCRIPTION                          | QTY. |
|----------|------|----------|--------------------------------------|------|
| Fig. 9.5 | 1    | 47500N   | OPTIONAL ENGINE COVER, 4LE2 ENGINE   | 1    |
|          | 2    | 47510N   | LATCH, COMPRESSION, W/ KEY           | 4    |
|          | 3    | 43746    | NEOPRENE HANDLE TRIM                 | 2    |
|          | 4    | 45600    | RUBBER REPLACEMENT LATCH             | 2    |
|          | 5    | 47506N   | PASS SIDE DOOR                       | 1    |
|          | 6    | 47507N   | AIR CLEANER DOOR                     | 1    |
|          | N/A  | 47509N   | RADIATOR SEAL KIT                    | 1    |
|          | N/A  | 47519N   | WEATHERSTRIP, BULB STYLE (FOR HOOD)  | 9 FT |
|          | N/A  | 47511N   | WEATHERSTRIP, FLAT (FOR DOORS)       | 6 FT |
|          | N/A  | 47525N   | OPTIONAL ENGINE COVER INSULATION KIT | 1    |
|          | N/A  | 47521N   | SUPPORT PLATE, 4LE2 ENGINE COVER     | 2    |

## Chapter 9 Illustrated Parts List

### 9.5 Tank Assembly

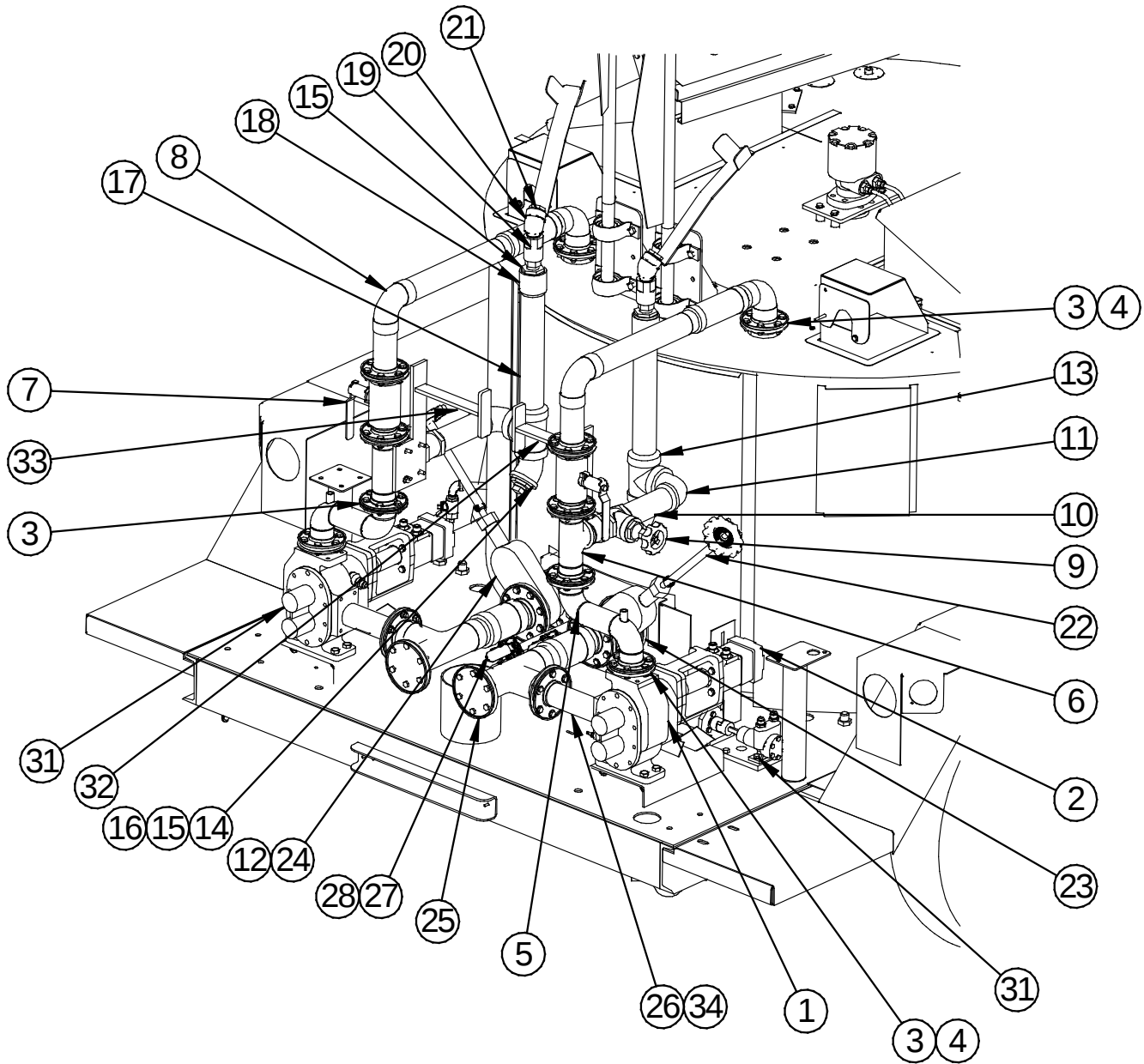


**Fig. 9.6 Tank Detail**

| FIG.     | ITEM | PART NO. | DESCRIPTION                   | QTY. |
|----------|------|----------|-------------------------------|------|
| Fig. 9.6 | 1    | 46531    | PADDLE, AGITATOR              | 2    |
|          | 2    | 45706    | MOTOR, HYDRAULIC – AGITATOR   | 1    |
|          | 3    | 46050    | SHAFT ASSEMBLY – AGITATOR     | 1    |
|          | 4    | 46380    | BURNER, 14 VOLT DIESEL        | 1    |
|          | 5    | 46495    | BURNER BOX ASSEMBLY, EXTENDED | 1    |
|          | 5a   | 46489    | BURNER BOX INSULATION KIT     | 1    |
|          | 6    | 42573    | MOUNTING PLATE – MOTOR        | 1    |
|          | 7    | 40030    | SPACER, MOTOR                 | 4    |
|          | 8    | 46192    | INSULATION, TANK BOTTOM       | 1    |
|          | 9    | 43107    | WASHER, INCONEL               | 11   |
|          | 10   | 43166    | STUD, SHORT INCONEL WELD      | 11   |
|          | 11   | 46193    | SPACER, INSULATION            | 9    |

**Chapter 9 Illustrated Parts List**

**9.6 Plumbing Assembly**

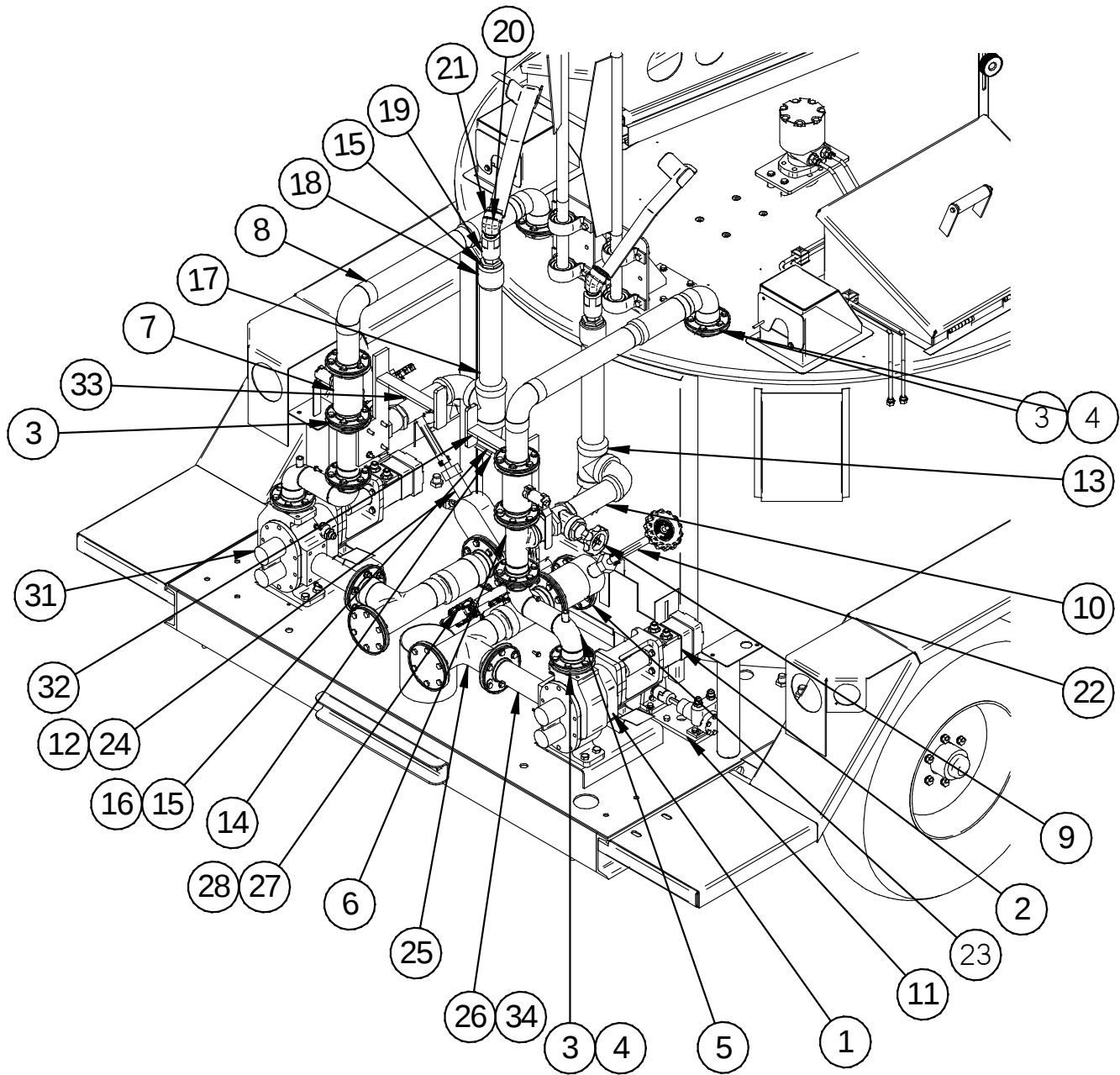


**Fig. 9.7 Plumbing**

## Chapter 9 Illustrated Parts List

| FIG.     | ITEM | PART NO. | DESCRIPTION                             | QTY. |
|----------|------|----------|-----------------------------------------|------|
| Fig. 9.7 | 1    | 42070    | MATERIAL PUMP ASSEMBLY, P.S. JACKETED   | 1    |
|          | 2    | 22027    | HYDRAULIC MOTOR                         | 2    |
|          | 3    | 22030    | NIPPLE ASSEMBLY, FLANGED                | 6    |
|          | 4    | 29050    | GASKET, 2" CIRCULAR FLANGED             | 9    |
|          | 5    | 46547    | ELBOW, DOUBLE                           | 2    |
|          | 6    | 46644    | FLANGED TEE                             | 2    |
|          | 7    | 41246    | VALVE, 2" BALL                          | 2    |
|          | 8    | 46642    | PIPING ASSEMBLY, UPPER                  | 2    |
|          | 9    | 29270    | VALVE, 2" GATE                          | 2    |
|          | 10   | 28110    | NIPPLE, 2" NPT X 8" LG.                 | 2    |
|          | 11   | 28243    | ELBOW, 2" STREET                        | 2    |
|          | 12   | 29060    | GASKET, 3" CIRCULAR FLANGED             | 4    |
|          | 13   | 28258    | TEE, 2" PIPE                            | 2    |
|          | 14   | 28242    | ELBOW, 2" 45° STREET                    | 2    |
|          | 15   | 28358    | BUSHING, 2" X 1" HEX HEAD REDUCER       | 4    |
|          | 16   | 28285    | PLUG, 1" SQ. HEAD PIPE                  | 2    |
|          | 17   | 28190    | NIPPLE, 2" NPT X 14 1/2" LG.            | 2    |
|          | 18   | 28183    | COUPLING, 2" PIPE                       | 2    |
|          | 19   | 27048    | SWIVEL, 1" PIPE                         | 2    |
|          | 20   | 28225    | ELBOW, 1" STREET                        | 2    |
|          | 21   | 28351    | BUSHING, 1" X 3/4" HEX HEAD REDUCER     | 2    |
|          | 22   | 46509    | EXTENSION, VALVE HANDLE                 | 2    |
|          | 23   | 46570    | DRAIN PIPE EXTENSION                    | 2    |
|          | 24   | 29292    | VALVE, 3" FLANGED GATE                  | 2    |
|          | 25   | 46645    | PIPE ASSEMBLY, MATERIAL SUCTION         | 2    |
|          | 26   | 46549    | MATERIAL PIPE ASSEMBLY, PUMP SUCTION    | 2    |
|          | 27   | 41499    | VALVE, HOT OIL                          | 2    |
|          | 28   | 29845    | ADAPTER                                 | 2    |
|          | 29   | 41404    | FLEX HOSE ASSEMBLY, HOT OIL (Not Shown) | 3    |
|          | 30   | 41403    | FLEX HOSE ASSEMBLY, HOT OIL (Not Shown) | 1    |
|          | 31   | 41696    | HOT OIL PUMP AND MOTOR ASSEMBLY         | 1    |

**Chapter 9 Illustrated Parts List**



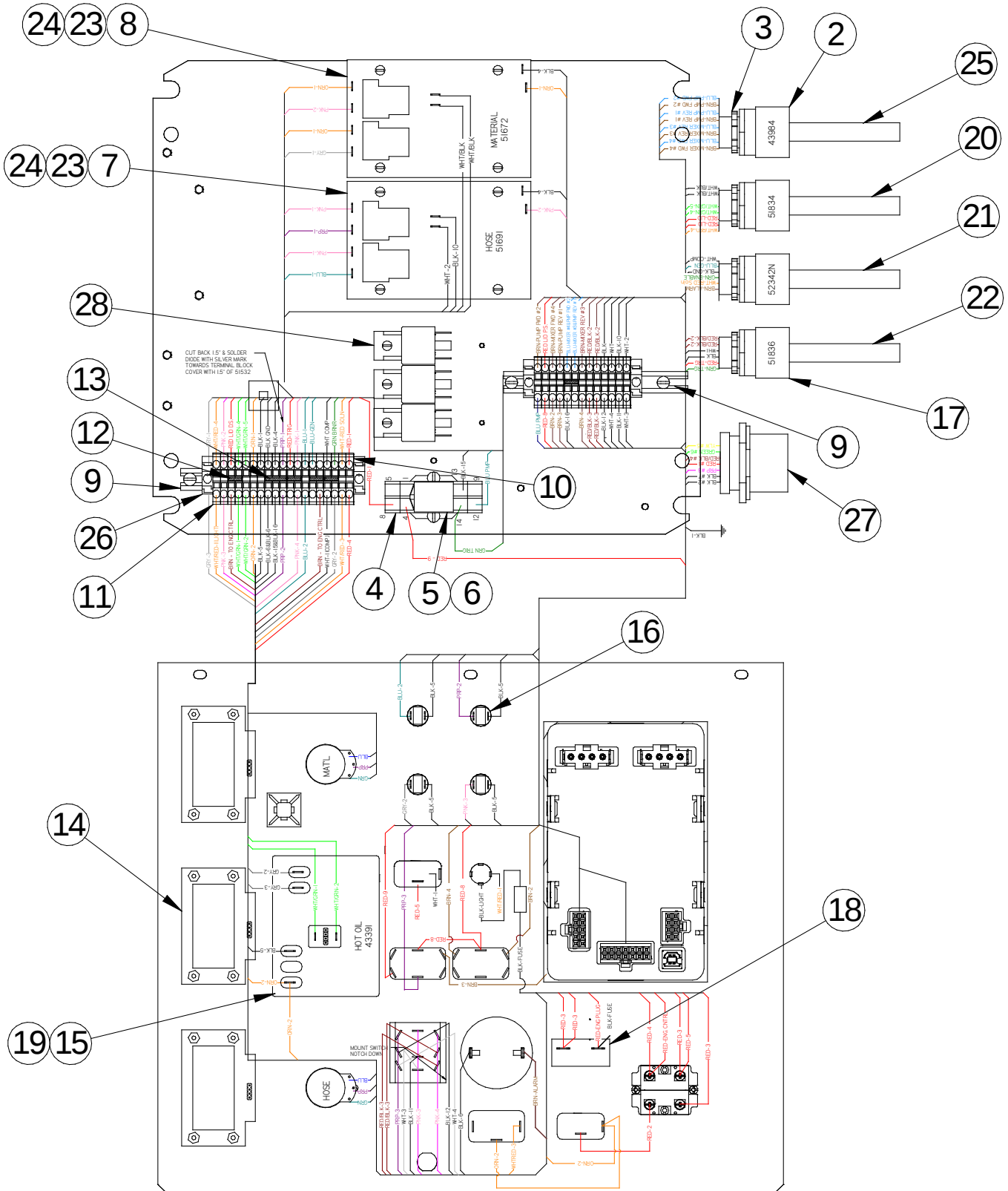
**Fig. 9.8 Plumbing**

## Chapter 9 Illustrated Parts List

| FIG.     | ITEM | PART NO. | DESCRIPTION                            | QTY. |
|----------|------|----------|----------------------------------------|------|
| Fig. 9.8 | 31   | 42072    | MATERIAL PUMP ASSEMBLY, D.S., JACKETED | 1    |
|          | 32   | 46638    | HOSE HANGER ASSEMBLY                   | 1    |
|          | 33   | 46635    | HOSE HANGER, D.S.                      | 1    |
|          | 34   | 41043    | GASKET, 2.5" FLANGED                   | 2    |

**Chapter 9 Illustrated Parts List**

**9.7 Control Box Assembly – Electric Hose**



**Fig. 9.9 Control Box Assembly 46500EB**

## Chapter 9 Illustrated Parts List

| FIG.     | ITEM | PART NO. | DESCRIPTION                       | QTY. |
|----------|------|----------|-----------------------------------|------|
| Fig. 9.9 | 1    | 47203    | ENCLOSURE (NOT SHOWN)             | 1    |
|          | 2    | 24024    | CORD CONNECTOR                    | 1    |
|          | 3    | 50280    | 1/2" CONDUIT NUT                  | 4    |
|          | 4    | 51662    | SOCKET, RELAY                     | 1    |
|          | 5    | 51661    | RELAY                             | 1    |
|          | 6    | 51663    | HOLD DOWN SPRING                  | 1    |
|          | 7    | 51691    | TEMPERATURE CONTROLLER, 400°/325° | 1    |
|          | 8    | 51672    | TEMPERATURE CONTROLLER, 400°/275° | 1    |
|          | 9    | 51803    | MOUNTING RAIL                     | 2    |
|          | 10   | 51802    | END PLATE                         | 2    |
|          | 11   | 51800    | FEED THROUGH TERMINAL             | 32   |
|          | 12   | 51801    | JUMPER, 2-POLE                    | 4    |
|          | 13   | 51804    | JUMPER, 3-POLE                    | 1    |
|          | 14   | 50251    | READOUT, DIGITAL                  | 3    |
|          | 15   | 43391    | TEMPERATURE CONTROLLER 150°-550°  | 1    |
|          | 16   | 51651    | LIGHT, 12VDC                      | 4    |
|          | 17   | 24021    | CORD CONNECTOR                    | 3    |
|          | 18   | 51665    | CIRCUIT BREAKER, 15 AMP           | 1    |
|          | 19   | 50593    | KNOB, TEMP CONTROL (NOT SHOWN)    | 3    |
|          | 20   | 51834    | CABLE ASSEMBLY, SENSOR            | 1    |
|          | 21   | 52339    | CABLE ASSEMBLY, ENGINE            | 1    |
|          | 22   | 51836    | CABLE ASSEMBLY, TRIGGER/SENSOR    | 1    |
|          | 23   | 51684    | RIBBON CABLE, 36" (NOT SHOWN)     | 2    |
|          | 24   | 51670    | SPACER, TEMPERATURE CONTROLLER    | 8    |
|          | 25   | 43984    | CABLE ASSEMBLY, VALVE             | 1    |
|          | 26   | 51805    | END BRACKET                       | 4    |
|          | 27   | 47211    | HARNESS, CONTROLLER               | 1    |
|          | 28   | 51673    | RELAY                             | 3    |

## 9.8 Control Box Assembly, D.S. –Electric Hose



## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                       | QTY. |
|-----------|------|----------|-----------------------------------|------|
| Fig. 9.10 | 1    | 44860    | ENCLOSURE (NOT SHOWN)             | 1    |
|           | 2    | 24021    | CORD CONNECTOR                    | 3    |
|           | 3    | 50280    | 1/2" CONDUIT NUT                  | 3    |
|           | 4    | 51662    | SOCKET, RELAY                     | 2    |
|           | 5    | 51661    | RELAY                             | 2    |
|           | 6    | 51663    | HOLD DOWN SPRING                  | 2    |
|           | 7    | 51672    | TEMPERATURE CONTROLLER, 400°/275° | 1    |
|           | 8    | 51803    | MOUNTING RAIL                     | 2    |
|           | 9    | 51802    | END PLATE                         | 2    |
|           | 10   | 51800    | FEED THROUGH TERMINAL             | 16   |
|           | 11   | 51805    | END BRACKET                       | 2    |
|           | 12   | 51801    | JUMPER, 2-POLE                    | 2    |
|           | 13   | 50251    | READOUT, DIGITAL                  | 1    |
|           | 14   | 51651    | LIGHT, 12VDC                      | 2    |
|           | 15   | 51811    | SWITCH, HOSE SELECTOR             | 2    |
|           | 16   | 32522    | SWITCH, PUMP                      | 1    |
|           | 17   | 50593    | KNOB, TEMP CONTROL (NOT SHOWN)    | 1    |
|           | 18   | 43974    | CABLE ASSEMBLY, SENSOR            | 1    |
|           | 19   | 43981    | CABLE ASSEMBLY, TRIGGER           | 1    |
|           | 20   | 51684    | RIBBON CABLE, 36" (NOT SHOWN)     | 1    |
|           | 21   | 51670    | SPACER, TEMPERATURE CONTROLLER    | 4    |
|           | 22   | 43937    | CABLE ASSEMBLY, VALVE             | 1    |
|           | 23   | 51665    | CIRCUIT BREAKER                   | 1    |
|           | 24   | 50719    | SWITCH, POWER                     | 1    |

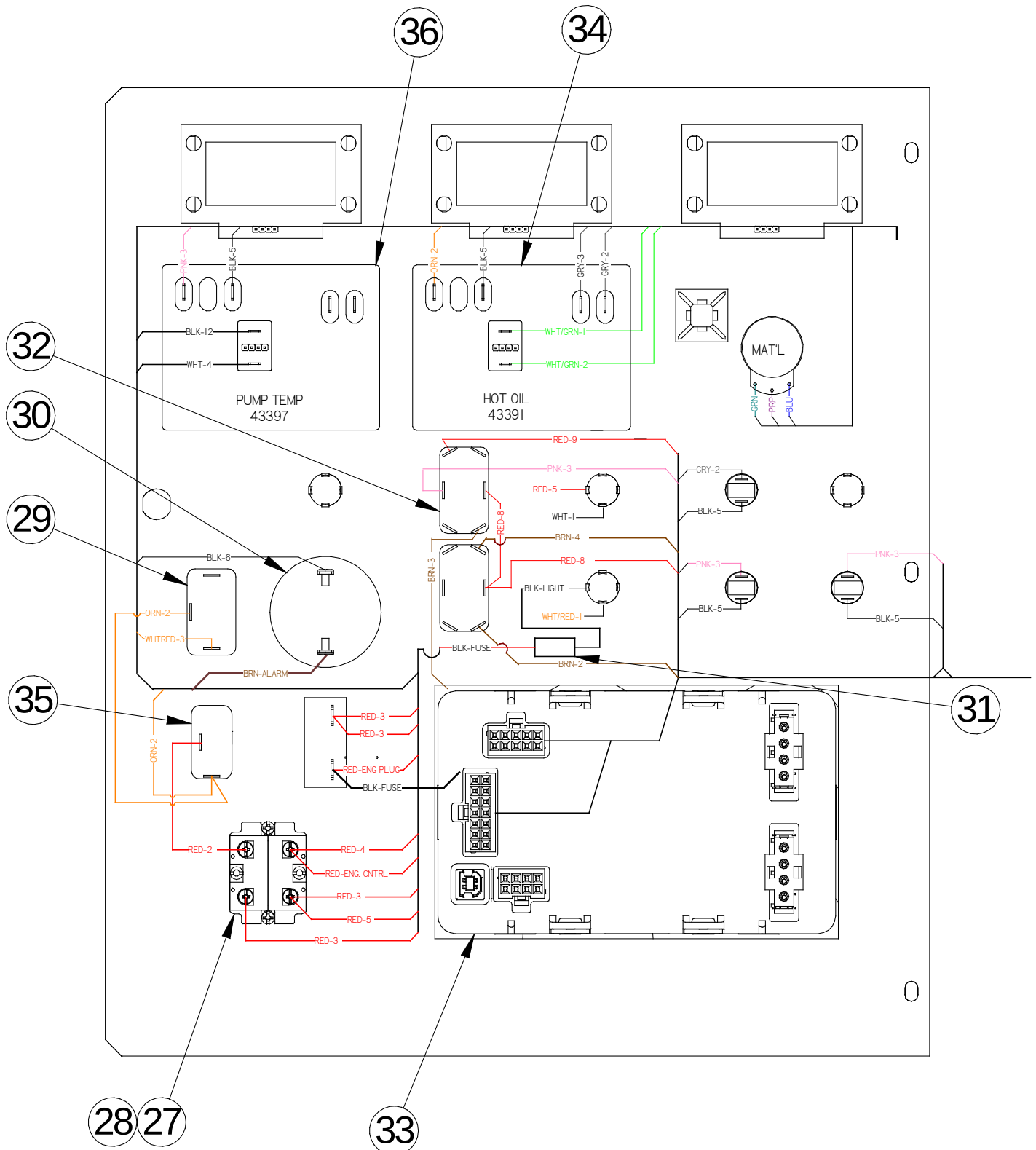
## 9.9 Control Box Assembly – Standard Hose



## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                       | QTY. |
|-----------|------|----------|-----------------------------------|------|
| Fig. 9.11 | 1    | 47203    | ENCLOSURE (NOT SHOWN)             | 1    |
|           | 2    | 24024    | CORD CONNECTOR                    | 1    |
|           | 3    | 50280    | 1/2" CONDUIT NUT                  | 4    |
|           | 4    | 51662    | SOCKET, RELAY                     | 1    |
|           | 5    | 51661    | RELAY                             | 1    |
|           | 6    | 51663    | HOLD DOWN SPRING                  | 1    |
|           | 7    | 51672    | TEMPERATURE CONTROLLER, 400°/275° | 1    |
|           | 8    | 51803    | MOUNTING RAIL                     | 2    |
|           | 9    | 51802    | END PLATE                         | 2    |
|           | 10   | 51800    | FEED THROUGH TERMINAL             | 23   |
|           | 11   | 51801    | JUMPER, 2-POLE                    | 2    |
|           | 12   | 51804    | JUMPER, 3-POLE                    | 1    |
|           | 13   | 50251    | READOUT, DIGITAL                  | 3    |
|           | 14   | 43391    | TEMPERATURE CONTROLLER 150°-550°  | 1    |
|           | 15   | 51651    | LIGHT, 12VDC                      | 3    |
|           | 16   | 24021    | CORD CONNECTOR                    | 3    |
|           | 17   | 51665    | CIRCUIT BREAKER, 15 AMP           | 1    |
|           | 18   | 50593    | KNOB, TEMP CONTROL (NOT SHOWN)    | 3    |
|           | 19   | 51834    | CABLE ASSEMBLY, SENSOR            | 1    |
|           | 20   | 52342N   | CABLE ASSEMBLY, CHASSIS           | 1    |
|           | 21   | 51836    | CABLE ASSEMBLY, TRIGGER/SENSOR    | 1    |
|           | 22   | 51684    | RIBBON CABLE, 36" (NOT SHOWN)     | 1    |
|           | 23   | 51670    | SPACER, TEMPERATURE CONTROLLER    | 4    |
|           | 24   | 43984    | CABLE ASSEMBLY, VALVE             | 1    |
|           | 25   | 51805    | END BRACKET                       | 4    |
|           | 26   | 47211    | HARNESS, CONTROLLER               | 1    |
|           | 27   | 51673    | RELAY                             | 3    |

**Chapter 9 Illustrated Parts List**



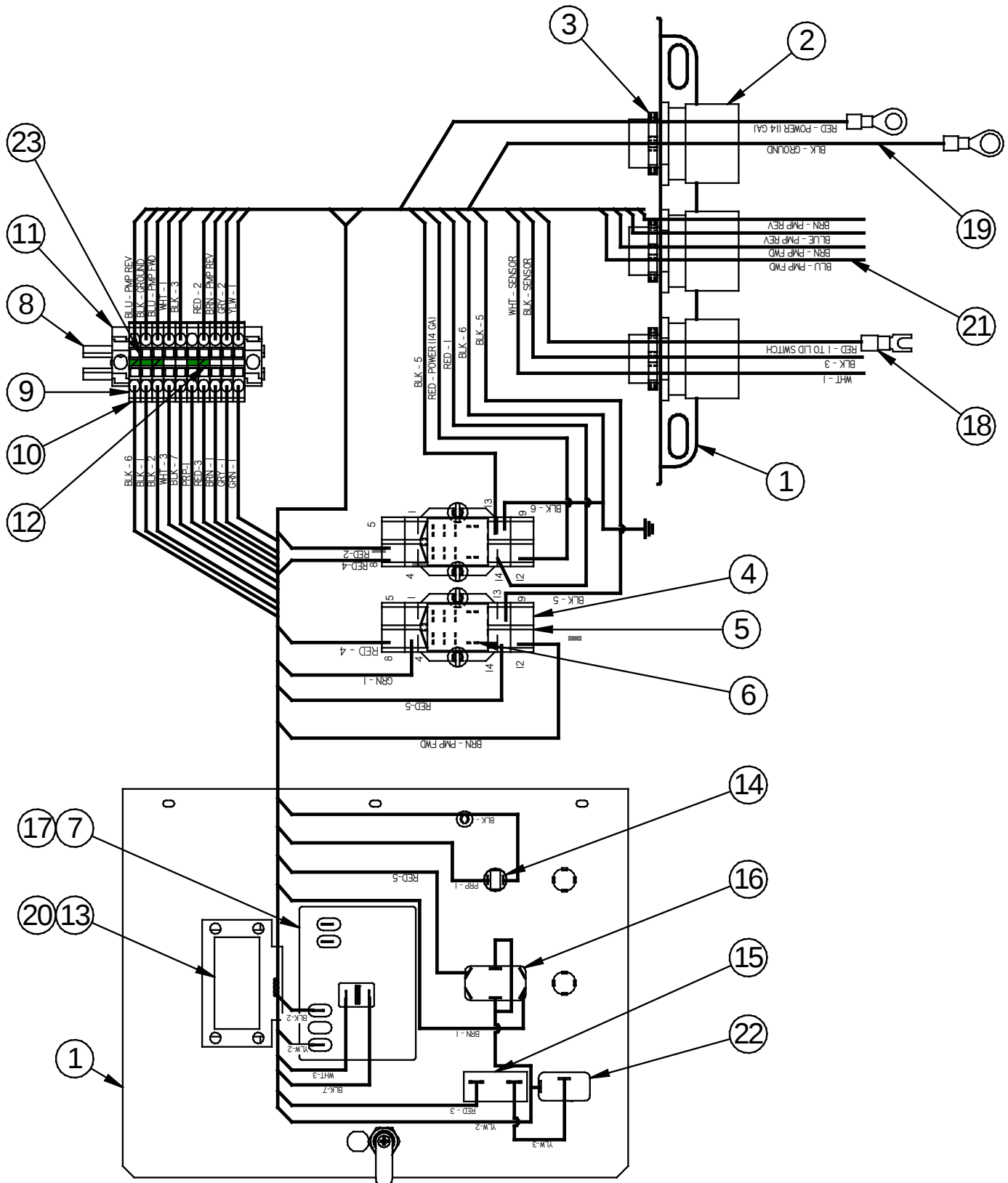
**Fig. 9.12 Control Box Assembly: 46500SB**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                      | QTY. |
|-----------|------|----------|----------------------------------|------|
| Fig. 9.12 | 27   | 46239    | SWITCH, ON/OFF, W/ KEY           | 1    |
|           | 28   | 51852    | CONTACT BLOCK, N.O.              | 2    |
|           | 29   | 52338    | SWITCH, SPST ON(ON)              | 1    |
|           | 30   | 46494    | ALARM, PIEZO                     | 1    |
|           | 31   | 32532    | FUSE ASSY., STROBE LIGHT         | 1    |
|           | 31a  | 32508    | FUSE, 15A (INCLUDED IN 32532)    | 1    |
|           | 32   | 32522    | SWITCH, DPDT ON-OFF-ON           | 1    |
|           | 33   | 47209    | CONTROLLER, ENGINE               | 1    |
|           | 34   | 51698    | CABLE, 5" RIBBON (NOT SHOWN)     | 2    |
|           | 35   | 50719    | SWITCH, TOGGLE SPST              | 1    |
|           | 36   | 43397    | TEMPERATURE CONTROLLER 100°-400° | 1    |

**Chapter 9 Illustrated Parts List**

**9.10 Control Box Assembly, D.S. – Standard Hose**



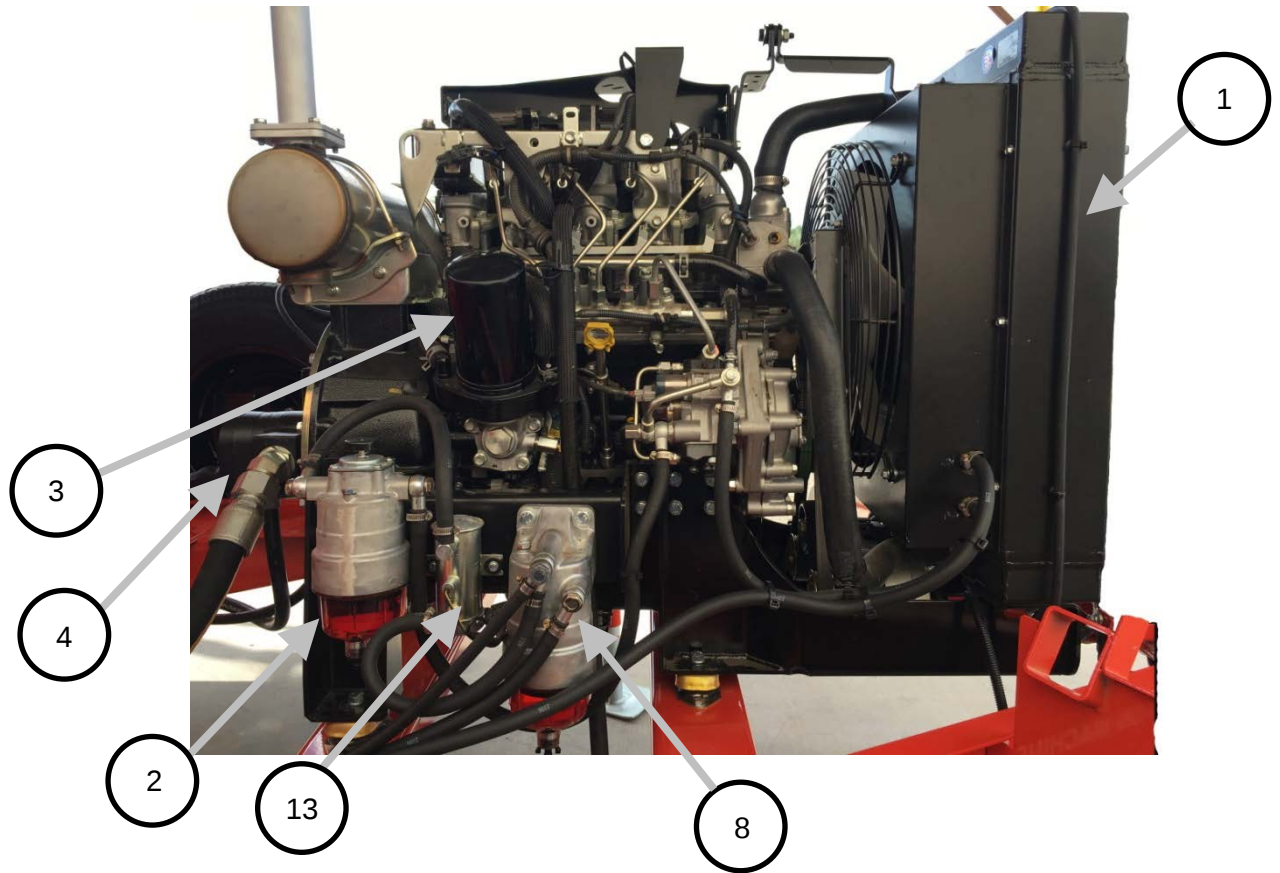
**Fig. 9.13 Control Box Assembly, D.S. – Standard Hose**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                    | QTY. |
|-----------|------|----------|--------------------------------|------|
| Fig. 9.13 | 1    | 44860    | ENCLOSURE (NOT SHOWN)          | 1    |
|           | 2    | 24021    | CORD CONNECTOR                 | 3    |
|           | 3    | 50280    | 1/2" CONDUIT NUT               | 3    |
|           | 4    | 51662    | SOCKET, RELAY                  | 2    |
|           | 5    | 51661    | RELAY                          | 2    |
|           | 6    | 51663    | HOLD DOWN SPRING               | 2    |
|           | 7    | 43397    | TEMPERATURE CONTROLLER, 400°   | 1    |
|           | 8    | 51803    | MOUNTING RAIL                  | 2    |
|           | 9    | 51802    | END PLATE                      | 1    |
|           | 10   | 51800    | FEED THROUGH TERMINAL          | 8    |
|           | 11   | 51805    | END BRACKET                    | 2    |
|           | 12   | 51801    | JUMPER, 2-POLE                 | 1    |
|           | 13   | 50251    | READOUT, DIGITAL               | 1    |
|           | 14   | 51651    | LIGHT, 12VDC                   | 2    |
|           | 15   | 51665    | CIRCUIT BREAKER                | 1    |
|           | 16   | 32522    | SWITCH, PUMP                   | 1    |
|           | 17   | 50593    | KNOB, TEMP CONTROL (NOT SHOWN) | 1    |
|           | 18   | 51819    | CABLE ASSEMBLY, SENSOR         | 1    |
|           | 19   | 43981    | CABLE ASSEMBLY, TRIGGER        | 1    |
|           | 20   | 51698    | RIBBON CABLE, 5" (NOT SHOWN)   | 1    |
|           | 21   | 43937    | CABLE ASSEMBLY, VALVE          | 1    |
|           | 22   | 50719    | SWITCH, POWER                  | 1    |

## Chapter 9 Illustrated Parts List

### 9.11 Engine Assembly – 46500SB



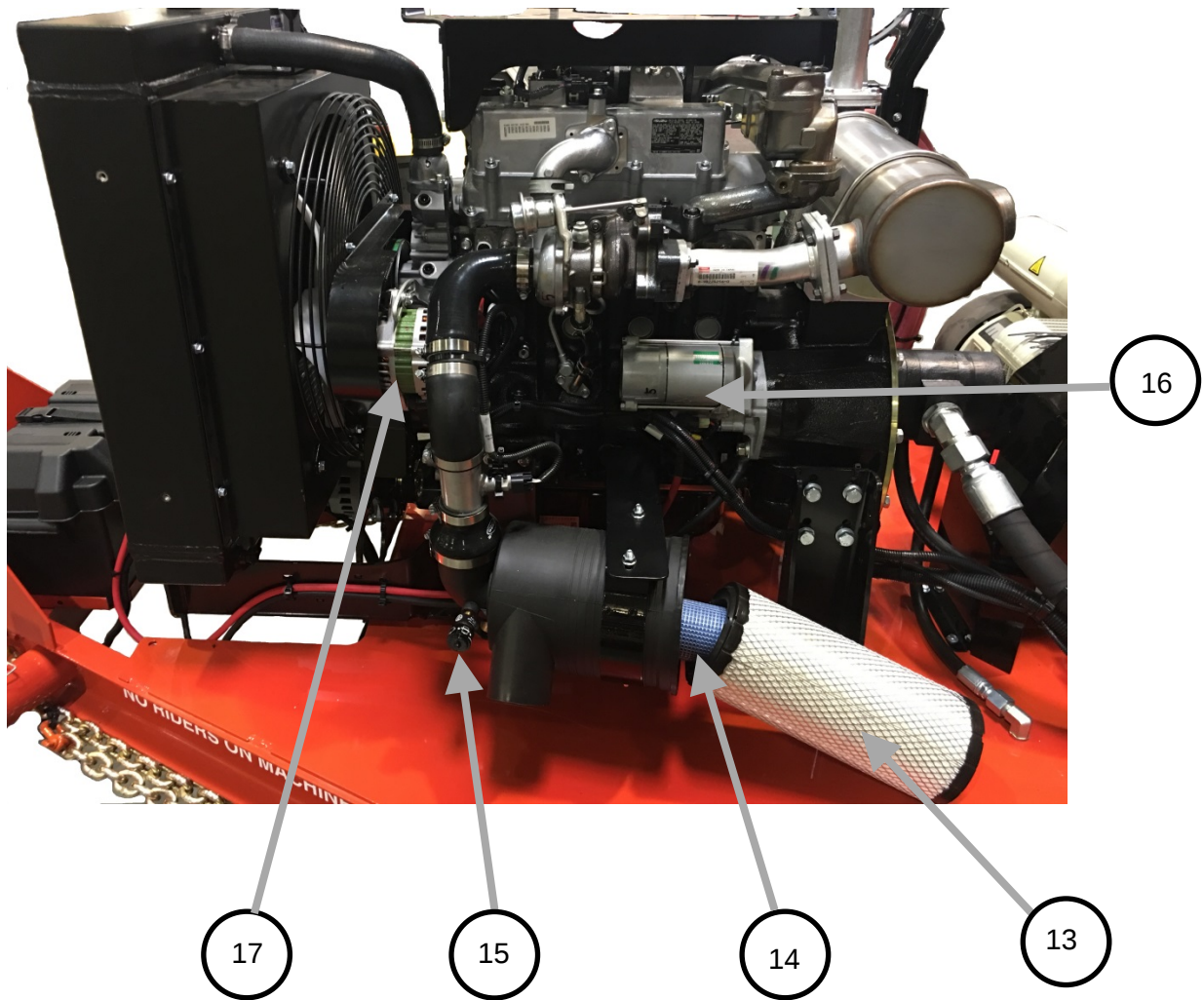
**Fig. 9.14 Engine Assembly - 46500SB**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                    | QTY. |
|-----------|------|----------|--------------------------------|------|
| Fig. 9.14 | 1    | 47110    | 44.0 HP ENGINE                 | 1    |
|           | 2    | 47167N   | FUEL FILTER                    | 1    |
|           | 3    | 47168N   | OIL FILTER                     | 1    |
|           | 4    | 45490    | HYDRAULIC PUMP                 | 1    |
|           | 5    | 47173N   | WORKSHOP MANUAL (Not Shown)    | OPT. |
|           | 6    | 47171N   | MANUAL, PARTS (Not Shown)      | OPT. |
|           | 7    | 47172N   | OWNERS MANUAL (Not Shown)      | 1    |
|           | 8    | 47176N   | FILTER, FUEL PRE               | 1    |
|           | 9    | 47177N   | BELT, ENGINE FAN (Not Shown)   | 1    |
|           | 10   | 47181N   | THERMOSTAT (Not Shown)         | 1    |
|           | 11   | 47182N   | PUMP, WATER (Not Shown)        | 1    |
|           | 12   | 47212N   | HARNESS, EXTENSION (Not Shown) | 1    |
|           | 13   | 47185N   | FUEL PUMP                      | 1    |

## Chapter 9 Illustrated Parts List

### 9.12 Engine Assembly Air Filter Side – 46500SB and 46500EB



**Fig. 9.15 Engine Assembly – 46500SB/EB Air Filter Side**

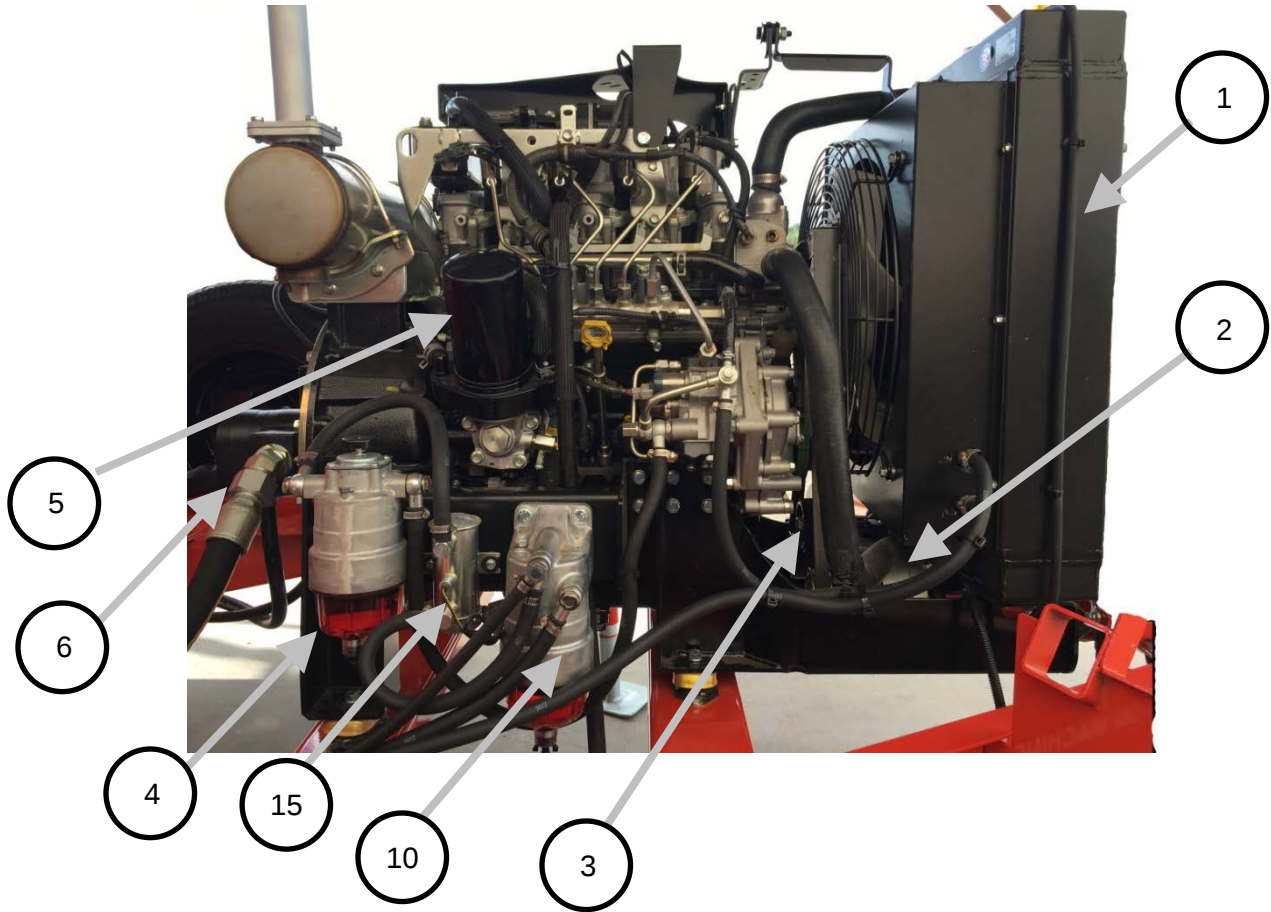
## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION           | QTY. |
|-----------|------|----------|-----------------------|------|
| Fig. 9.15 | 13   | 47169N   | AIR FILTER ELEMENT    | 1    |
|           | 14   | 47186N   | SAFETY ELEMENT        | 1    |
|           | 15   | 47175N   | RESTRICTION INDICATOR | 1    |
|           | 16   | 47179N   | STARTER               | 1    |
|           | 17   | 47180N   | ALTERNATOR, ENGINE    | 1    |

**NOTE:** These part number correspond to both engine layouts, PN's 47110 and 47107

**Chapter 9 Illustrated Parts List**

**9.13 Engine Assembly – 46500EB**



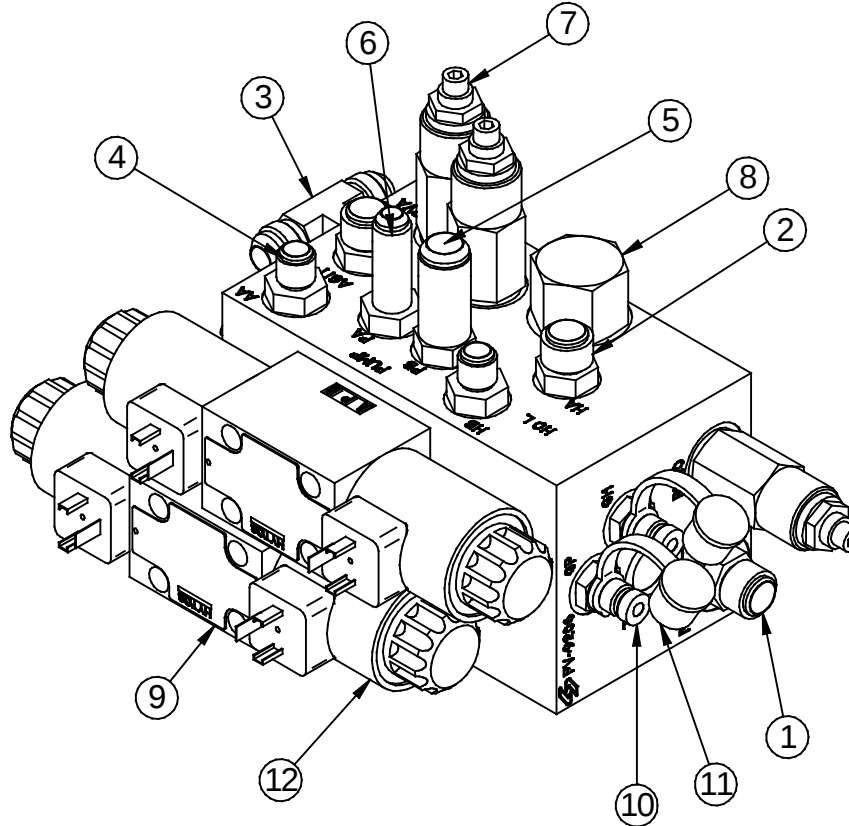
**Fig. 9.16 Engine Assembly - 46500EB**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                      | QTY. |
|-----------|------|----------|----------------------------------|------|
| Fig. 9.16 | 1    | 47107    | 44.0 HP ENGINE W/ DUAL GENERATOR | 1    |
|           | 2    | 46322    | GENERATOR, 24VAC                 | 2    |
|           | 3    | 47174N   | BELT, DRIVE – GENERATOR          | 1    |
|           | 3a   | 47170N   | TENSIONER, BELT (Not Shown)      | 1    |
|           | 4    | 47167N   | FUEL FILTER                      | 1    |
|           | 5    | 47168N   | OIL FILTER                       | 1    |
|           | 6    | 45490    | HYDRAULIC PUMP                   | 1    |
|           | 7    | 47173N   | WORKSHOP MANUAL (Not Shown)      | OPT. |
|           | 8    | 47171N   | MANUAL, PARTS (Not Shown)        | OPT. |
|           | 9    | 47172N   | OWNERS MANUAL (Not Shown)        | 1    |
|           | 10   | 47176N   | FILTER, FUEL PRE                 | 1    |
|           | 11   | 47177N   | BELT, ENGINE FAN (Not Shown)     | 1    |
|           | 12   | 47181N   | THERMOSTAT (Not Shown)           | 1    |
|           | 13   | 47182N   | PUMP, WATER (Not Shown)          | 1    |
|           | 14   | 47212N   | HARNESS, EXTENSION (Not Shown)   | 1    |
|           | 15   | 47185N   | FUEL PUMP                        | 1    |

## Chapter 9 Illustrated Parts List

### 9.14 Hydraulic Control Valve Assembly – Passenger Side

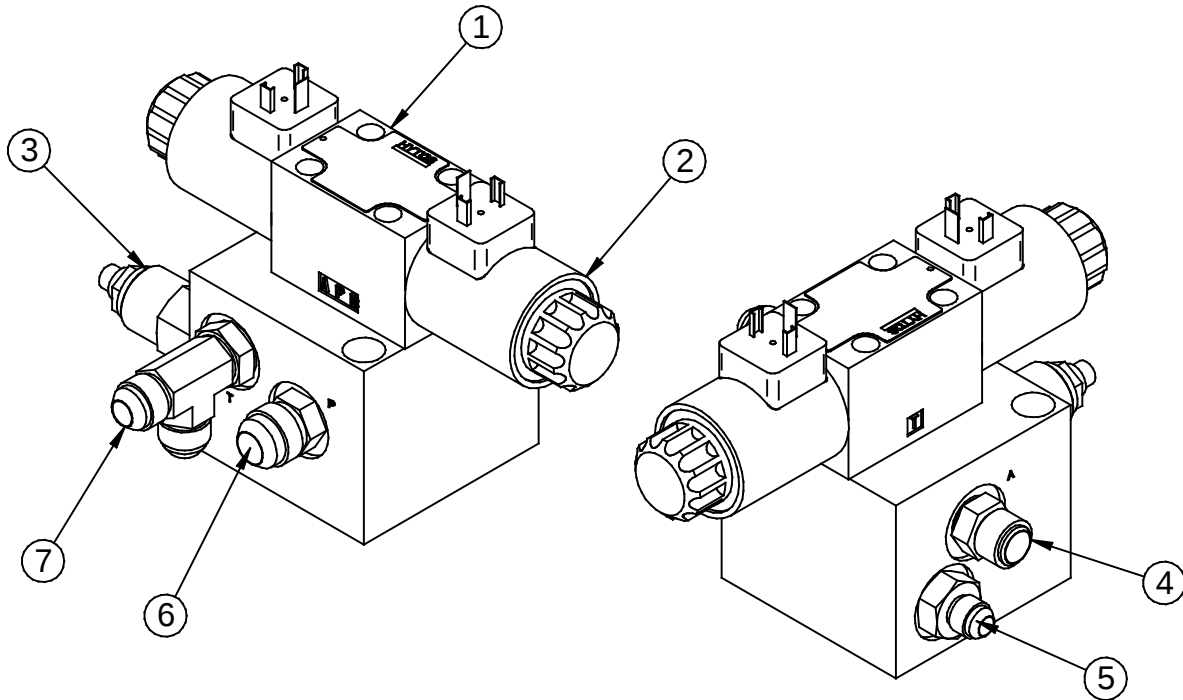


**Fig. 9.17 Hydraulic Control Valve P.S**

| FIG.      | ITEM | PART NO. | DESCRIPTION                     | QTY. |
|-----------|------|----------|---------------------------------|------|
| Fig. 9.17 | 1    | 29896    | 3/4-16 ORB X #8 JIC STR.        | 1    |
|           | 2    | 29919    | 9/16-18 ORB X #8 JIC STR.       | 3    |
|           | 3    | 29976    | 3/4-16 ORB X #8 JIC BRANCH TEE  | 1    |
|           | 4    | 40311    | 9/16-18 ORB X #6 JIC STR.       | 2    |
|           | 5    | 40320    | 9/16-18 ORING X #8 JIC STR.     | 2    |
|           | 6    | 40308    | 9/16-18 ORB X #6 JIC LONG STR.  | 1    |
|           | 7    | 45417    | RELIEF VALVE                    | 3    |
|           | 8    | 45416    | FLOW DIVIDER                    | 2    |
|           | 9    | 45418    | VALVE, DIRECTIONAL, REX ROTH    | 2    |
|           | 10   | 45414    | FITTING, TEST POINT             | 3    |
|           | 11   | 45413    | CAP, DUST – TEST POINT          | 3    |
|           | 12   | 45436    | COIL, HYDRAULIC VALVE, REX ROTH | 4    |

## Chapter 9 Illustrated Parts List

### 9.15 Hydraulic Control Valve – Drivers Side

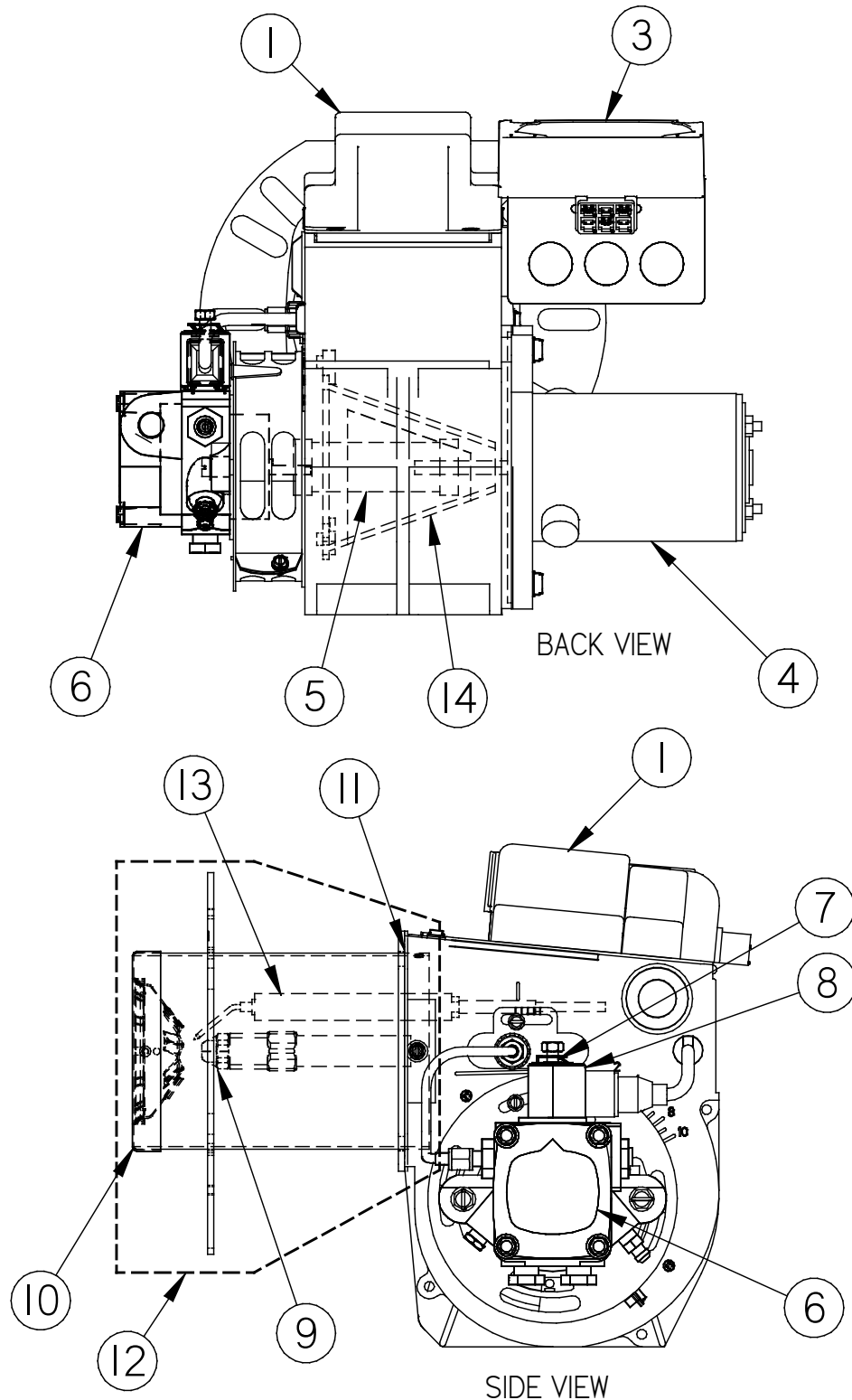


**Fig. 9.18 Hydraulic Control Valve, D.S.**

| FIG.      | ITEM | PART NO. | DESCRIPTION                     | QTY. |
|-----------|------|----------|---------------------------------|------|
| Fig. 9.18 | 1    | 45418    | VALVE, DIRECTIONAL, REX ROTH    | 1    |
|           | 2    | 45436    | COIL, HYDRAULIC VALVE, REX ROTH | 2    |
|           | 3    | 45417    | RELIEF VALVE                    | 1    |
|           | 4    | 29897    | 3/4-16 ORB X #8 JIC STR.        | 1    |
|           | 5    | 29998    | 3/4-16 ORB X #6 JIC STR.        | 1    |
|           | 6    | 29908    | 3/4-16 ORB X #10 JIC STR.       | 1    |
|           | 7    | 29932    | 3/4-16 ORB X #8 JIC RUN TEE.    | 1    |

## Chapter 9 Illustrated Parts List

### 9.16 Burner Assembly



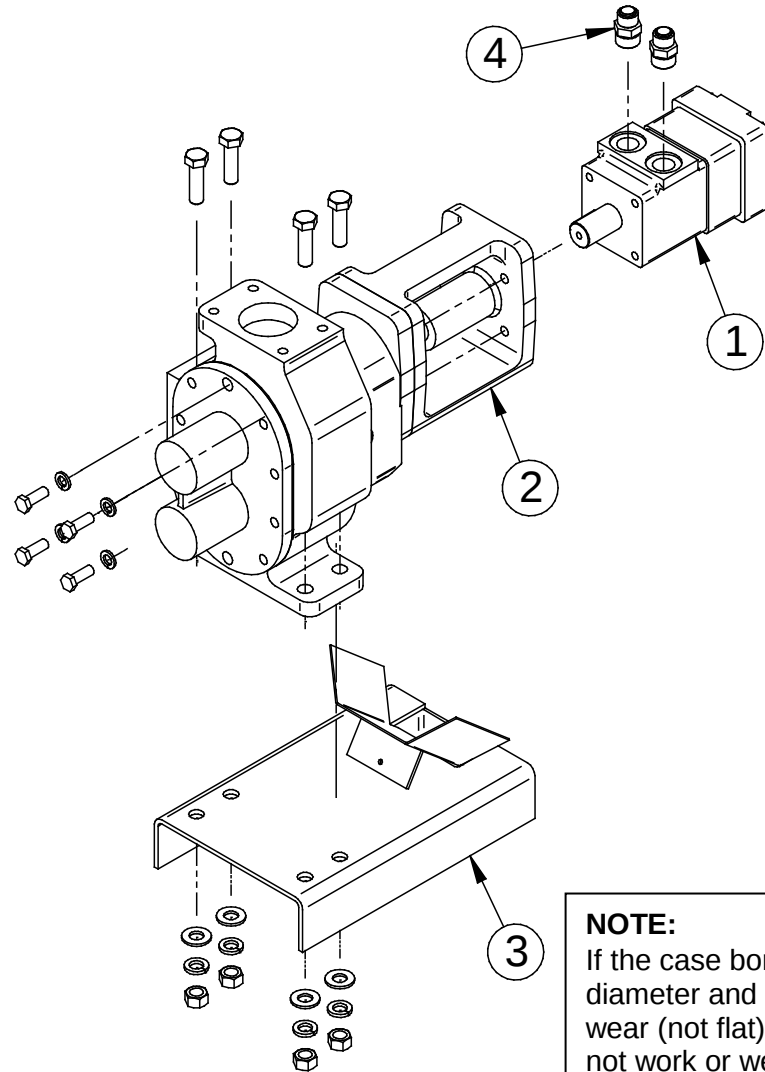
**Fig. 9.19 Diesel Burner**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                        | QTY. |
|-----------|------|----------|------------------------------------|------|
| Fig. 9.19 | 1    | 41949    | IGNITION TRANSFORMER               | 1    |
|           | 2    | 41870    | CAD EYE (NOT SHOWN)                | 1    |
|           | 3    | 42335    | DC CONTROLLER                      | 1    |
|           | 4    | 41890    | BLOWER MOTOR                       | 1    |
|           | 5    | 41970    | COUPLING, FUEL PUMP                | 1    |
|           | 6    | 41892    | PUMP, FUEL                         | 1    |
|           | 7    | 41932    | VALVE STEM, FUEL SOLENOID          | 1    |
|           | 8    | 41933    | COIL, FUEL SOLENOID                | 1    |
|           | 9    | 42559    | NOZZLE                             | 1    |
|           | 10   | 41953N   | STD HEAD, F22, BURNER              | 1    |
|           | 11   | 41964N   | GASKET, AIR TUBE TO HOUSING        | 1    |
|           | 12   | 46381N   | AIR TUBE W/ HEAD & ELECTRODE MOUNT | 1    |
|           | 13   | 41993    | ELECTRODE ASSY (COMES WITH 2)      | 1    |
|           | 14   | 41966N   | AIR GUIDE, BURNER                  | 1    |

**Chapter 9 Illustrated Parts List**

**9.17 45242 Material Pump Assembly – Passenger Side**

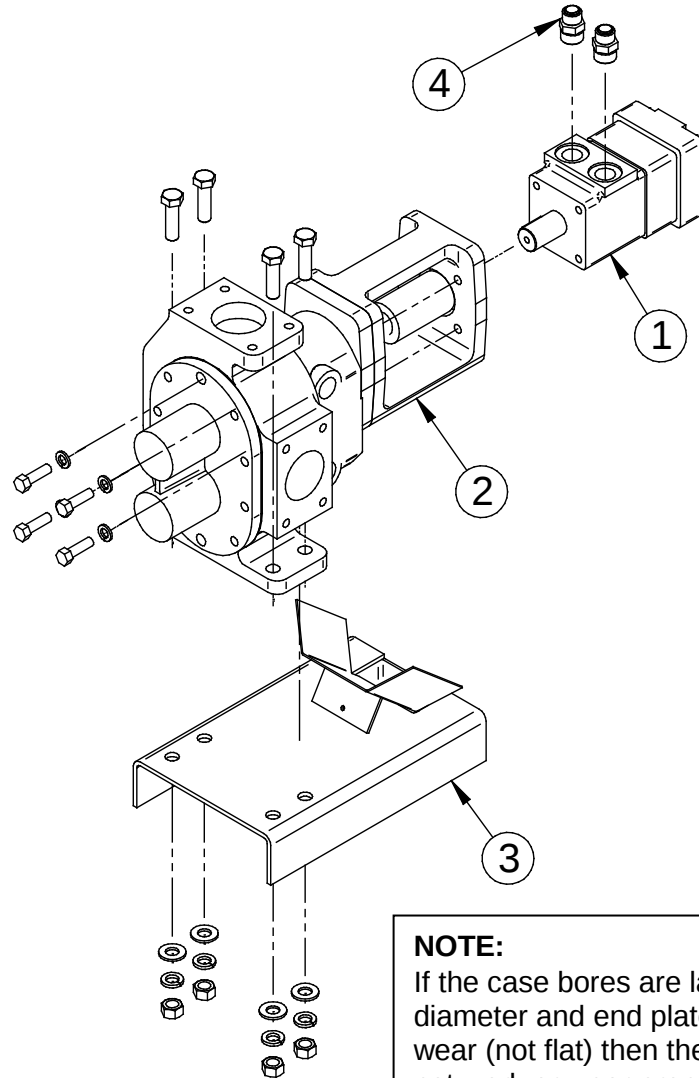


**Fig. 9.20 Material Pump Assembly, P.S.**

| FIG.      | ITEM | PART NO. | DESCRIPTION                             | QTY. |
|-----------|------|----------|-----------------------------------------|------|
| Fig. 9.20 | 1    | 22027    | MOTOR, HYDRAULIC                        | 1    |
|           | 2    | 42070    | MATERIAL PUMP ASSEMBLY, JACKETED – P.S. | 1    |
|           | 2a   | 29990S   | PACKING RING (SET OF 7)                 | 1    |
|           | 3    | 43129    | MOUNTING PLATE ASSEMBLY                 | 1    |
|           | 4    | 29913    | FITTING, #10 ORB X #8JIC STRAIGHT       | 2    |
|           | 5    | 42073N   | PUMP REBUILD KIT (SEE NOTE)             | -    |

## Chapter 9 Illustrated Parts List

### 9.18 Material Pump Assembly – Drivers Side

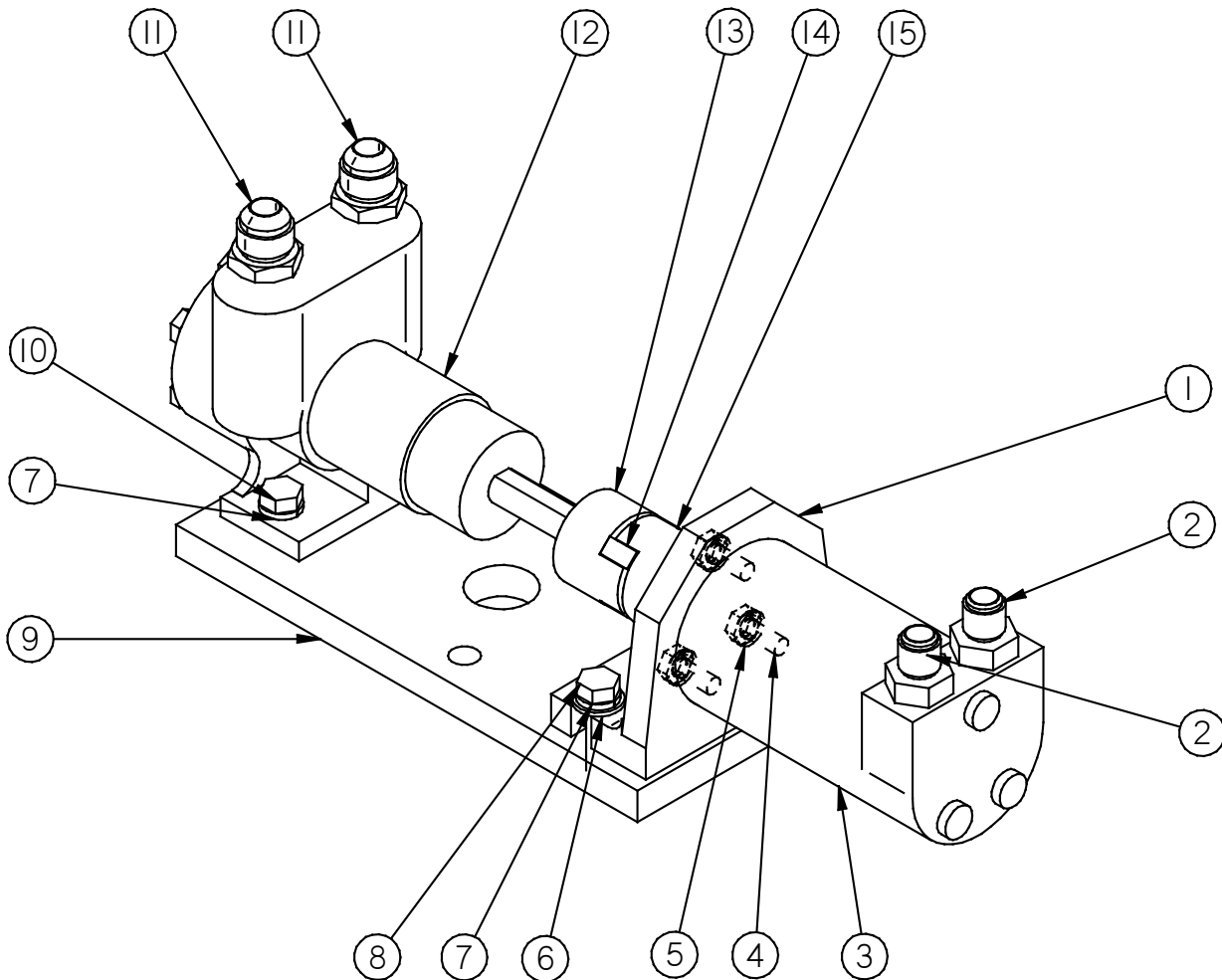


**Fig. 9.21 Material Pump Assembly, D.S.**

| FIG.      | ITEM | PART NO. | DESCRIPTION                             | QTY. |
|-----------|------|----------|-----------------------------------------|------|
| Fig. 9.21 | 1    | 22027    | MOTOR, HYDRAULIC                        | 1    |
|           | 2    | 42072    | MATERIAL PUMP ASSEMBLY, JACKETED – D.S. | 1    |
|           | 2a   | 29990S   | PACKING RING (SET OF 7)                 | 1    |
|           | 3    | 43129    | MOUNTING PLATE ASSEMBLY                 | 1    |
|           | 4    | 29913    | FITTING, #10 ORB X #8 JIC STRAIGHT      | 2    |
|           | 5    | 42073N   | PUMP REBUILD KIT (SEE NOTE)             | -    |

## Chapter 9 Illustrated Parts List

### 9.19 Hot Oil Pump and Motor Assembly



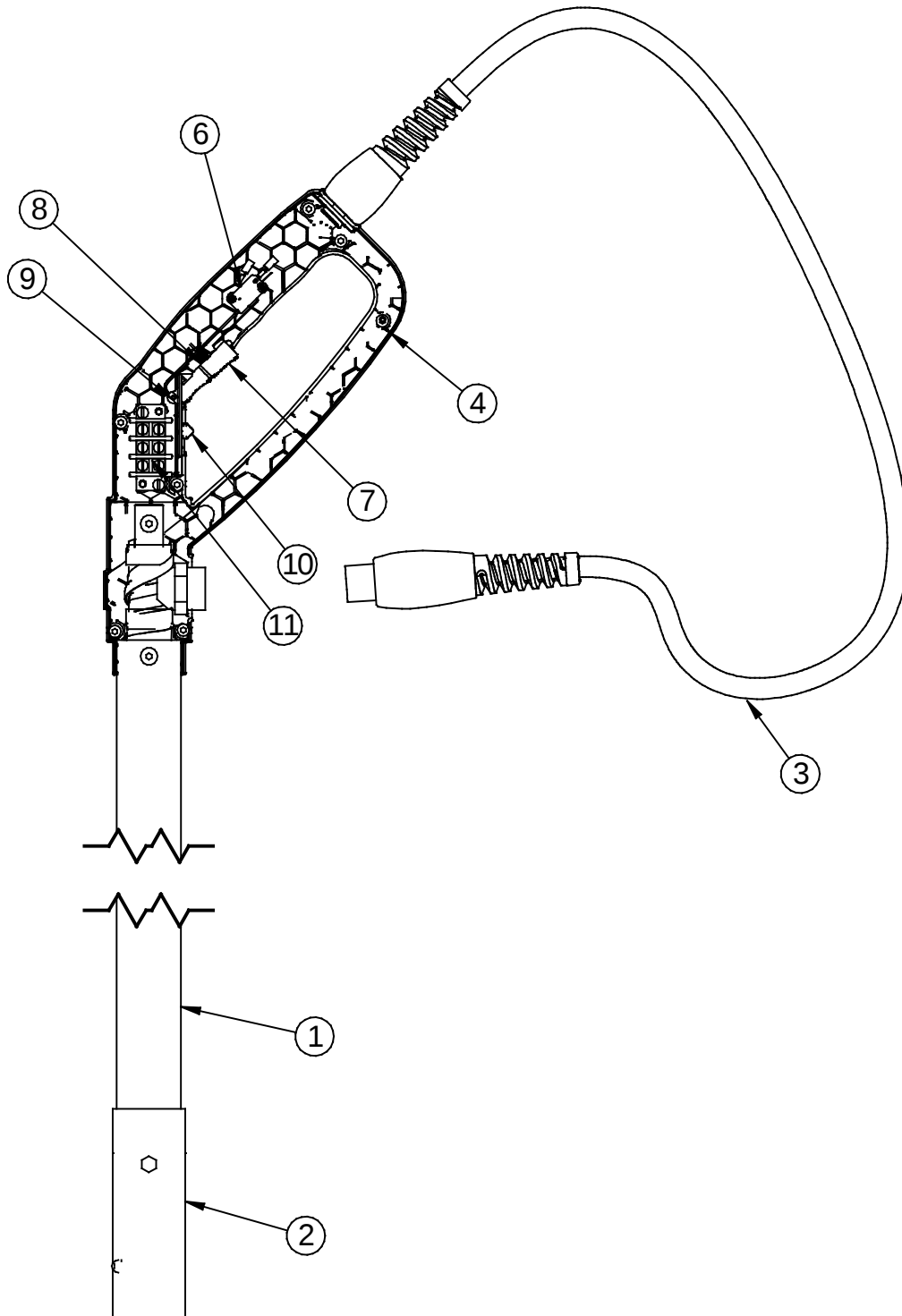
**Fig. 9.22 Hot Oil Pump and Motor Assembly**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NUMBER | QTY | DESCRIPTION                          |
|-----------|------|-------------|-----|--------------------------------------|
| Fig. 9.22 | 1    | 22303       | 1   | HYD. MOTOR MNTG BRACKET              |
|           | 2    | 40311       | 2   | STRAIGHT THREAD ADAPTER              |
|           | 3    | 22302       | 1   | HYDRAULIC MOTOR                      |
|           | 4    | 28850       | 3   | 1/4-28 X 5/8" HEX SCREW              |
|           | 5    | 28645       | 3   | 1/4" SPLIT WASHER                    |
|           | 6    | 28671       | 2   | 5/16" SAE FLAT WASHER                |
|           | 7    | 28646       | 4   | 5/16" LOCK WASHER                    |
|           | 8    | 28717       | 2   | 5/16-18 X 1 1/4" BOLT                |
|           | 9    | 41689       | 1   | H.O. MOUNTING PLATE                  |
|           | 10   | 28715       | 2   | 5/16-18 X 3/4" BOLT                  |
|           | 11   | 29844       | 2   | ADAPTER, JIC MP 8MJ-8MP              |
|           | 12   | 41280       | 1   | HOT OIL CIRCULATING PUMP             |
|           | 13   | 41180       | 1   | COUPLING HALF, 1/2" BORE             |
|           | 14   | 41182       | 1   | SPIDER FOR COUPLING                  |
|           | 15   | 41695       | 1   | COUPLING HALF, 5/8" BORE             |
|           | NS   | 45622       | 1   | OIL PUMP REBUILD KIT, INCLUDES BELOW |
|           |      | -           | 6   | SCREWS                               |
|           |      | -           | 1   | IDLER PIN                            |
|           |      | -           | 1   | HEAD                                 |
|           |      | -           | 1   | IDLER                                |
|           |      | -           | 3   | PACKING GLANDS                       |
|           | NS   | 45621       | 1   | OIL PUMP SEAL KIT, INCLUDES BELOW    |
|           |      | -           | 1   | NUT                                  |
|           |      | -           | 1   | OTR GLAND                            |
|           |      | -           | 3   | PACKING GLANDS                       |
|           |      | -           | 1   | INNER GLAND                          |
|           |      | -           | 1   | SPRING                               |
|           |      | -           | 2   | HEAD GASKETS                         |
|           | NS   | 45620       | 1   | 3 PACKING GLAND RINGS, OIL PUMP      |

## Chapter 9 Illustrated Parts List

### 9.20 Wand Assembly



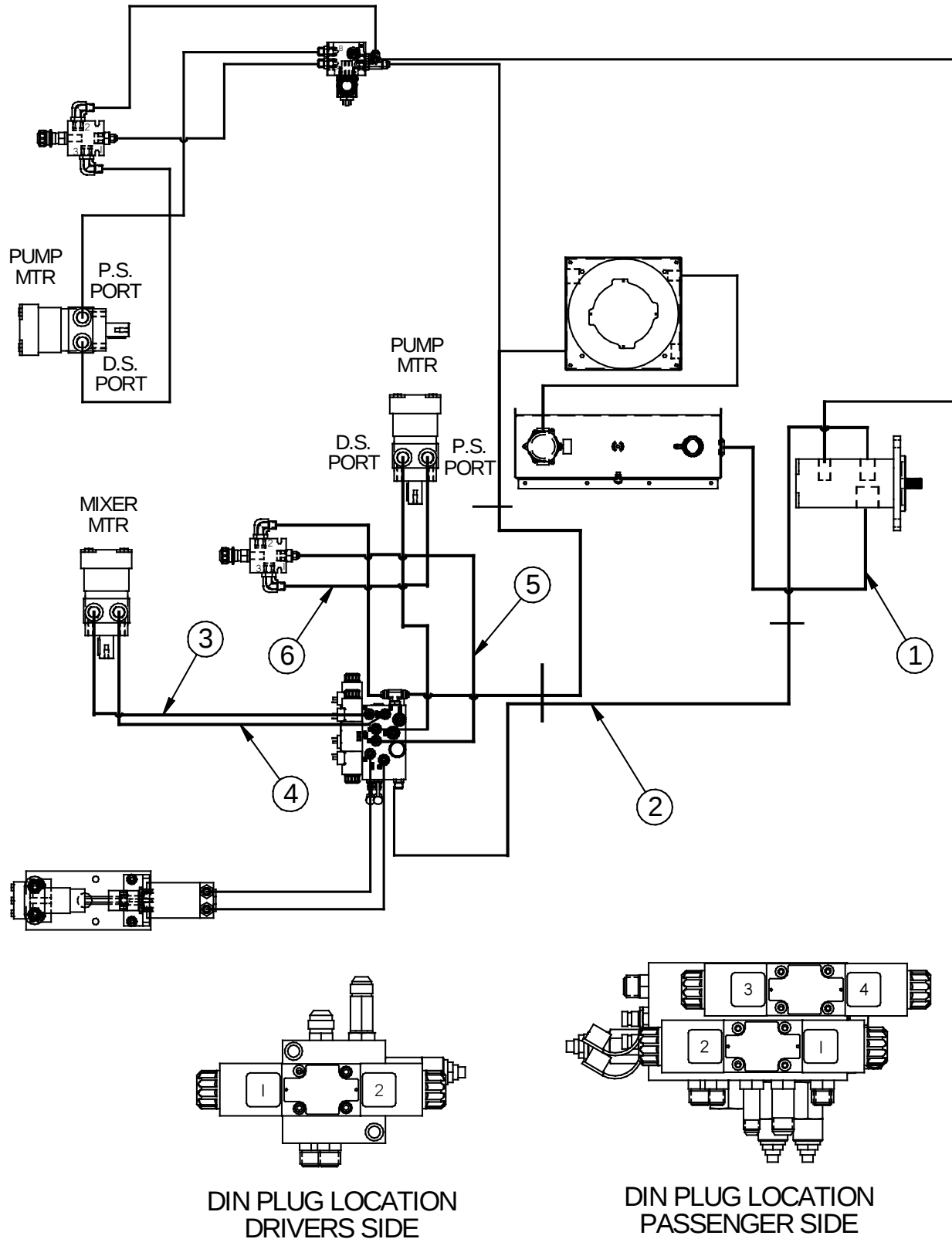
**Fig. 9.23 Wand Assembly**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                            | QTY. |
|-----------|------|----------|----------------------------------------|------|
| Fig. 9.23 | 1    | 52204    | COVER, WAND                            | 1    |
|           | 2    | 50278    | TIP GUARD, LONG CLAMP ON               | 1    |
|           | 3    | 52206    | CORD ASSEMBLY                          | 1    |
|           | 4    | 52201RN  | HANDLE, WAND – RIGHT (W/INSERTS) GEN 2 | 1    |
|           | 5    | 52201LN  | HANDLE, WAND – LEFT (NOT SHOWN) GEN 2  | 1    |
|           | 6    | 52208    | SWITCH, WAND                           | 1    |
|           | 7    | 52202N   | ACTUATOR, TRIGGER GEN 2                | 1    |
|           | 8    | 52207    | SPRING, ACTUATOR                       | 1    |
|           | 9    | 52209    | PIN, ACTUATOR                          | 1    |
|           | 10   | 52203N   | LOCK, TRIGGER GEN 2                    | 1    |
|           | 11   | 51656    | TERMINAL STRIP                         | 1    |

## Chapter 9 Illustrated Parts List

### 9.21 Hydraulic Diagram

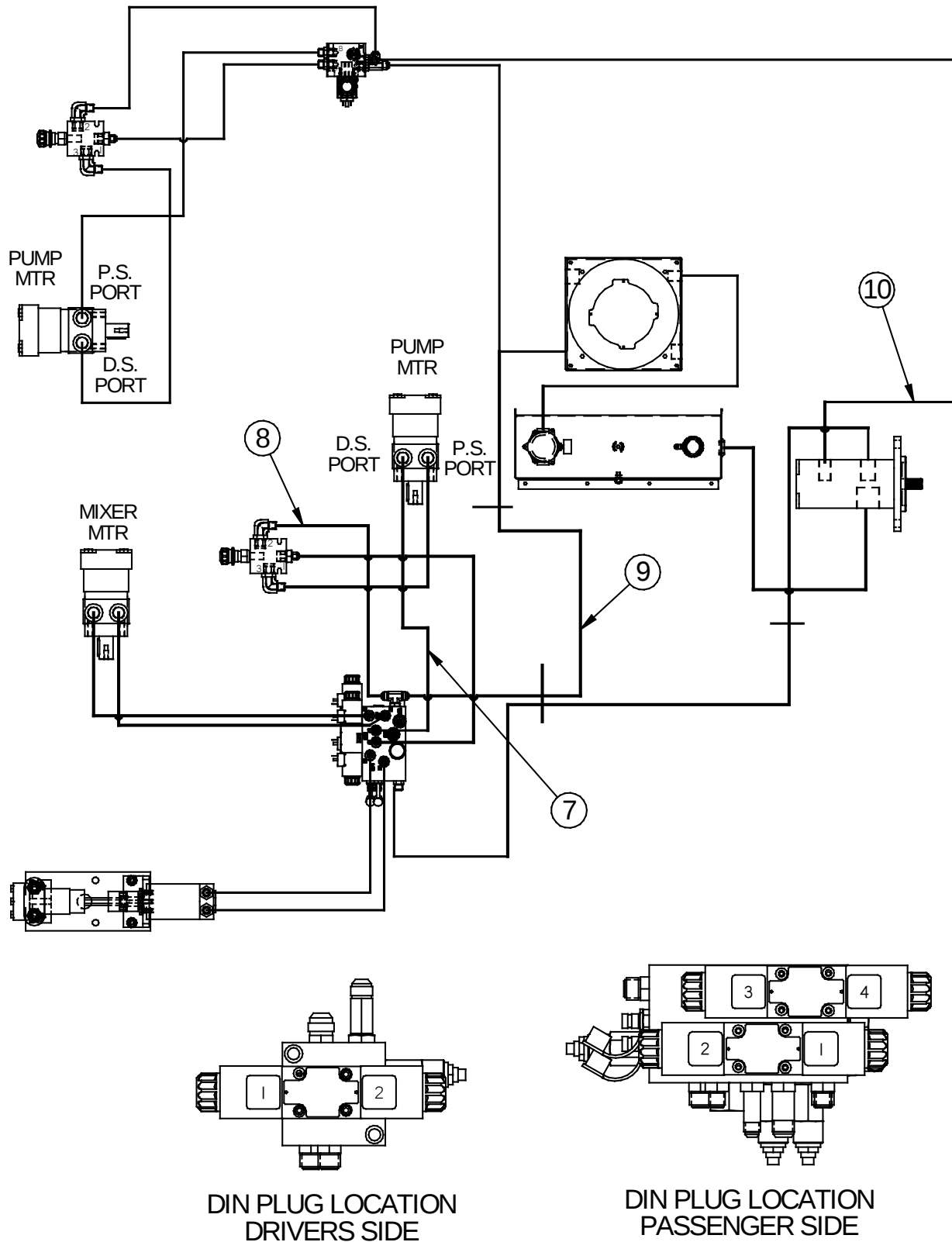


**Fig. 9.24 Hydraulic Diagram**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM     | PART NO.                                                        | DESCRIPTION                     | QTY |
|-----------|----------|-----------------------------------------------------------------|---------------------------------|-----|
| Fig. 9.24 | <b>1</b> | <b>HYDRAULIC RESERVOIR TO HYDRAULIC PUMP SUCTION PORT</b>       |                                 |     |
|           |          | 2988                                                            | FITTING, #20 ORB X #20 JIC 45°  | 1   |
|           |          | 20G4H 20G-20FJX45 20G-20FJX 25                                  | HYDRAULIC HOSE                  | 1   |
|           |          | 29885                                                           | FITTING, #20 ORB X #20 JIC STR. | 1   |
|           | <b>2</b> | <b>HYDRAULIC PUMP TO HYDRAULIC VALVE "P" PORT</b>               |                                 |     |
|           |          | 29821                                                           | FITTING, #12 ORB X #10 JIC STR. | 1   |
|           |          | 8M3K 8G-10FJX90S 8G-10FJX 24                                    | HYDRAULIC HOSE                  | 1   |
|           |          | 29805                                                           | FITTING, #10 JIC BULKHEAD       | 1   |
|           |          | 29807                                                           | NUT, BULKHEAD FITTING           | 1   |
|           |          | 46433                                                           | TUBE, HYDRAULIC PRESSURE        | 1   |
|           |          | 8M3K 8G-8FJX90S 8G-10FJX 31                                     | HYDRAULIC HOSE                  | 1   |
|           |          | 29897                                                           | FITTING, #12 ORB X #8 JIC STR.  | 1   |
|           | <b>3</b> | <b>HYDRAULIC VALVE "AA" PORT TO AGITATOR MOTOR REAR PORT</b>    |                                 |     |
|           |          | 40311                                                           | FITTING, #6 ORB X #6 JIC STR.   | 1   |
|           |          | 6M3K 6G-6FJX90S 6G-FJX 34                                       | HYDRAULIC HOSE                  | 1   |
|           |          | 29808                                                           | FITTING, #6 JIC X #6 JIC UNION  | 1   |
|           |          | 46504                                                           | TUBE, HYDRAULIC PRESSURE        | 1   |
|           |          | 22029                                                           | FITTING, #10 ORB X #6 JIC STR.  | 1   |
|           | <b>4</b> | <b>AGITATOR MOTOR (FRONT PORT) TO HYDRAULIC VALVE "AB" PORT</b> |                                 |     |
|           |          | 22029                                                           | FITTING, #10 ORB X #6 JIC STR.  | 1   |
|           |          | 46503                                                           | TUBE, HYDRAULIC RETURN          | 1   |
|           |          | 29808                                                           | FITTING, #6 JIC X #6 JIC UNION  | 1   |
|           |          | 6M3K 6G-6FJX 6G-8FJX90S 35                                      | HYDRAULIC HOSE                  | 1   |
|           |          | 29919                                                           | FITTING, #6 ORB X #8 JIC        | 1   |
|           | <b>5</b> | <b>HYDRAULIC VALVE "PA" TO FLOW CONTROL #1 PORT</b>             |                                 |     |
|           |          | 40308                                                           | FITTING, #6 ORB X #6 JIC LONG   | 1   |
|           |          | 6M3K 6G-6FJX90L 6G-8FJX 16                                      | HYDRAULIC HOSE                  | 1   |
|           |          | 29896                                                           | FITTING, #8 ORB X #8 JIC 90°    | 1   |
|           | <b>6</b> | <b>FLOW CONTROL #3 PORT TO PUMP MOTOR (PASS. SIDE PORT)</b>     |                                 |     |
|           |          | 29896                                                           | FITTING, #8 ORB X #8 JIC 90°    | 1   |
|           |          | 8M3K 8G-8FJX90L 8G-8FJX 31                                      | HYDRAULIC HOSE                  | 1   |
|           |          | 29913                                                           | FITTING, #10 ORB X #8 JIC STR.  | 1   |

**Chapter 9 Illustrated Parts List**

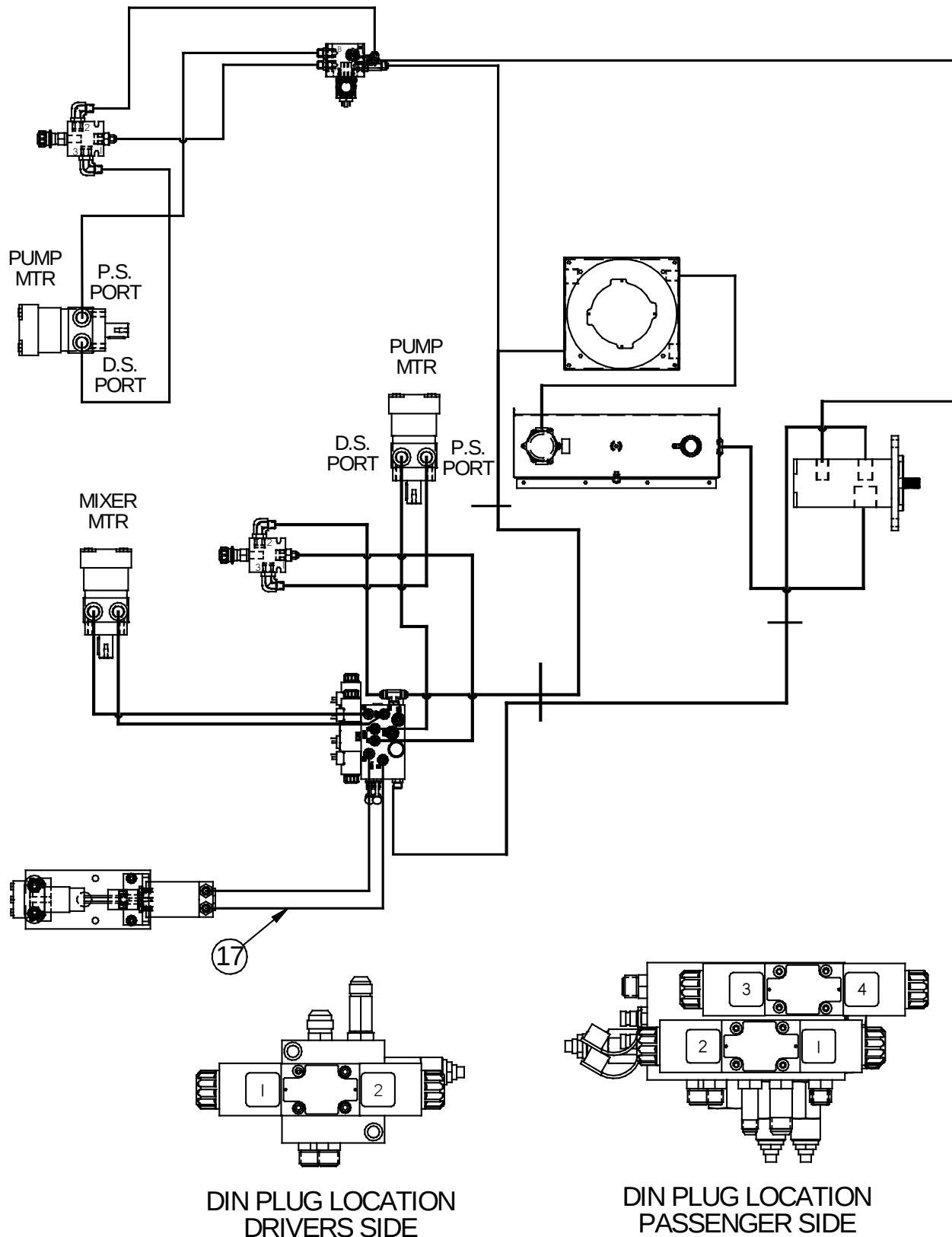


**Fig. 9.25 Hydraulic Diagram**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM      | PART NO.                                                             | DESCRIPTION                       | QTY. |
|-----------|-----------|----------------------------------------------------------------------|-----------------------------------|------|
| Fig. 9.25 | <b>7</b>  | <b>PUMP MOTOR (OVEN SIDE PORT) TO HYDRAULIC VALVE "PB" PORT</b>      |                                   |      |
|           |           | 29913                                                                | FITTING, #10 ORB X #8 JIC STR.    | 1    |
|           |           | 8M3K 8G-8FJX 8G-8FJX90S 17                                           | HYDRAULIC HOSE                    | 1    |
|           |           | 40320                                                                | FITTING, #6 ORB X #8 JIC STR.LONG | 1    |
|           | <b>8</b>  | <b>FLOW CONTROL #2 PORT TO HYDRAULIC VALVE TANK PORT</b>             |                                   |      |
|           |           | 29896                                                                | FITTING, #8 ORB X #8 JIC STR.     | 1    |
|           |           | 8M3K 8G-8FJX 8G-8FJX 44                                              | HYDRAULIC HOSE                    | 1    |
|           |           | 29976                                                                | FITTING, #8 ORB BRANCH TEE        | 1    |
|           | <b>9</b>  | <b>HYDRAULIC VALVE TANK PORT TO HYDRAULIC OIL COOLER</b>             |                                   |      |
|           |           | 29976                                                                | FITTING, #8 ORB BRANCH TEE        | 1    |
|           |           | 8M3K 8G-8FJX90S 8G-10FJX 27                                          | HYDRAULIC HOSE                    | 1    |
|           |           | 29805                                                                | FITTING, #10 JIC BULKHEAD         | 1    |
|           |           | 29807                                                                | NUT, BULKHEAD FITTING             | 1    |
|           |           | 46432                                                                | TUBE, HYDRAULIC RETURN            | 1    |
|           |           | 29805                                                                | FITTING, #10 JIC BULKHEAD         | 1    |
|           |           | 29807                                                                | NUT, BULKHEAD FITTING             | 1    |
|           |           | 12M3K 12G-10FJX 12G-16FJX 29                                         | HYDRAULIC HOSE                    | 1    |
|           |           | 29951                                                                | FITTING, #16 ORB X #16 JIC STR.   | 1    |
|           | <b>10</b> | <b>HYDRAULIC PUMP PRESS. (REAR PORT) TO HYDRAULIC VALVE "P" PORT</b> |                                   |      |
|           |           | 29842                                                                | FITTING, #12 ORB X #10 JIC 90°    | 1    |
|           |           | 10M3K 19G-10FJX 10G-10FJX 25                                         | HYDRAULIC HOSE                    | 1    |
|           |           | 29805                                                                | FITTING, #10 JIC BULKHEAD         | 1    |
|           |           | 29807                                                                | NUT, BULKHEAD FITTING             | 1    |
|           |           | 46435                                                                | TUBE, HYDRAULIC RETURN            | 1    |
|           |           | 29805                                                                | FITTING, #10 JIC BULKHEAD         | 1    |
|           |           | 29807                                                                | NUT, BULKHEAD FITTING             | 1    |
|           |           | 10M3K 19G-10FJX 10G-10FJX 25                                         | HYDRAULIC HOSE                    | 1    |
|           |           | 29908                                                                | FITTING, #8 ORB X #8 JIC 90°      | 1    |

**Chapter 9 Illustrated Parts List**

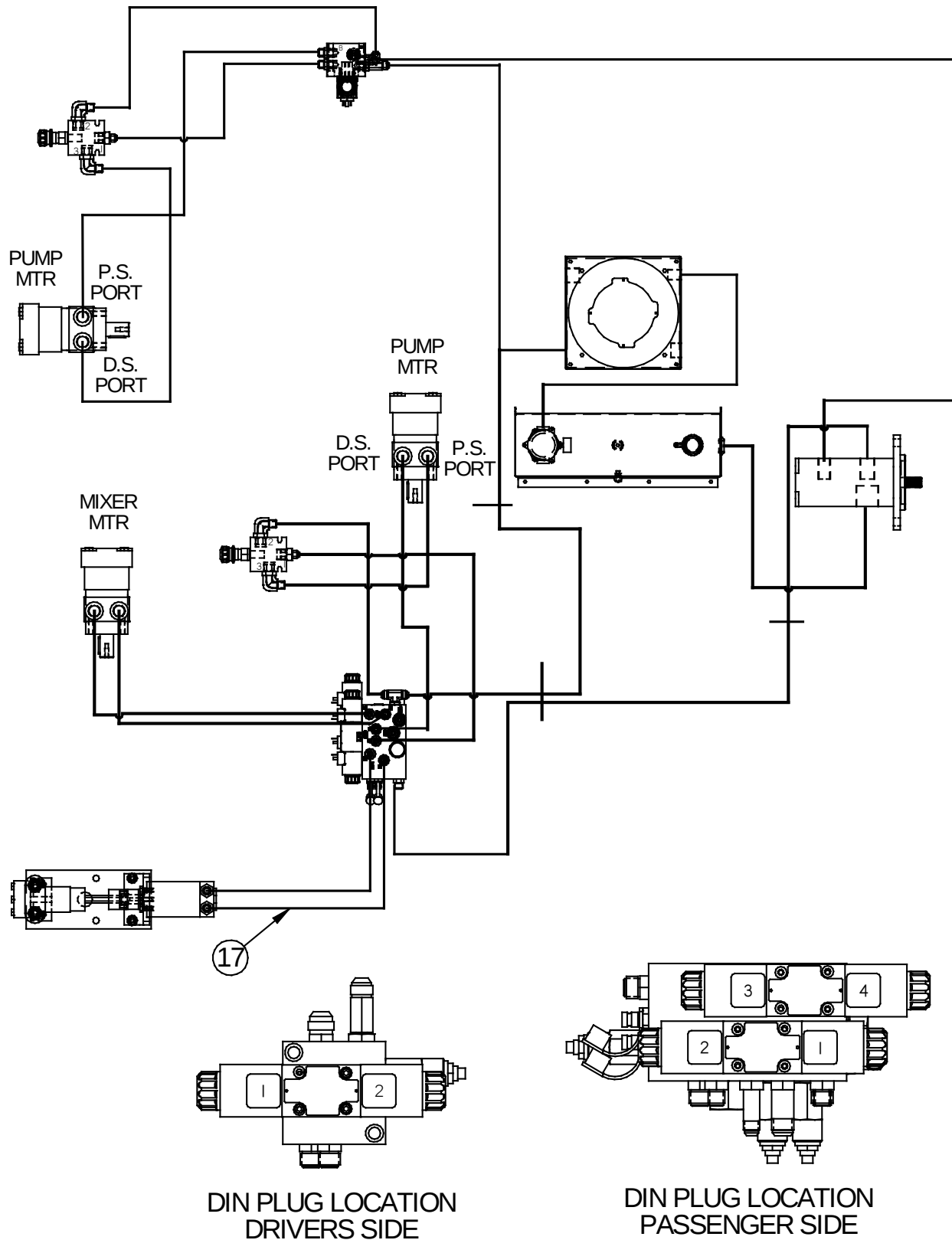


**Fig. 9.26 Hydraulic Diagram**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM      | PART NO.                                                          | DESCRIPTION                     | QTY. |
|-----------|-----------|-------------------------------------------------------------------|---------------------------------|------|
| Fig. 9.26 | <b>11</b> | <b>HYDRAULIC VALVE "A" PORT TO FLOW CONTROL #1 PORT</b>           |                                 |      |
|           |           | 29897                                                             | FITTING, #8 ORB X #8 JIC STR.   | 1    |
|           |           | 8M3K 8G-8FJX 8G-8FJX 23                                           | HYDRAULIC HOSE                  | 1    |
|           |           | 29896                                                             | FITTING, #8 ORB X #8 JIC 90°    | 1    |
|           | <b>12</b> | <b>FLOW CONTROL #3 PORT TO PUMP MOTOR DRIVER SIDE PORT</b>        |                                 |      |
|           |           | 29896                                                             | FITTING, #8 ORB X #8 JIC 90°    | 1    |
|           |           | 8M3K 8G-8FJX90S 8G-8FJX 25                                        | HYDRAULIC HOSE                  | 1    |
|           |           | 29913                                                             | FITTING, #10 ORB X #8 JIC STR.  | 1    |
|           | <b>13</b> | <b>PUMP MOTOR PASSENGER SIDE PORT TO HYDRAULIC VALVE "B" PORT</b> |                                 |      |
|           |           | 29913                                                             | FITTING, #10 ORB X #8 JIC STR.  | 1    |
|           |           | 8M3K 8G-8FJX90S 8G-8FJX 20                                        | HYDRAULIC HOSE                  | 1    |
|           |           | 29897                                                             | FITTING, #8 ORB X #8 JIC STR.   | 1    |
|           | <b>14</b> | <b>FLOW CONTROL #2 PORT TO HYDRAULIC OIL COOLER</b>               |                                 |      |
|           |           | 29896                                                             | FITTING, #8 ORB X #8 JIC 90°    | 1    |
|           |           | 8M3K 8G-8FJX 8G-8FJX 44                                           | HYDRAULIC HOSE                  | 1    |
|           |           | 29932                                                             | FITTING, #12 ORB RUN TEE        | 1    |
|           |           | 8M3K 8G-8FJX 8G-10FJX 21                                          | HYDRAULIC HOSE                  | 1    |
|           |           | 29805                                                             | FITTING, #10 JIC BULKHEAD       | 1    |
|           |           | 29807                                                             | NUT, BULKHEAD FITTING           | 1    |
|           |           | 46436                                                             | TUBE, HYDRAULIC RETURN          | 1    |
|           |           | 29805                                                             | FITTING, #10 JIC BULKHEAD       | 1    |
|           |           | 29807                                                             | NUT, BULKHEAD FITTING           | 1    |
|           |           | 12M3K 12G-10FJX 12G-16FJX90S 26                                   | HYDRAULIC HOSE                  | 1    |
|           |           | 29951                                                             | FITTING, #16 ORB X #16 JIC STR. | 1    |
|           | <b>15</b> | <b>HYDRAULIC OIL COOLER TO HYDRAULIC OIL TANK</b>                 |                                 |      |
|           |           | 29820                                                             | FITTING, #16 ORB X #16 JIC STR. | 1    |
|           |           | 16M3K 16G-16FJX90S 16G-16FJX 37                                   | HYDRAULIC HOSE                  | 1    |
|           |           | 29818                                                             | FITTING, #20 ORB X #16 JIC STR. | 1    |
|           | <b>16</b> | <b>HYDRAULIC VALVE (HA PORT) TO HYDRAULIC OIL PUMP</b>            |                                 |      |
|           |           | 29919                                                             | FITTING, #6 ORB X #8 JIC        | 1    |
|           |           | 6M3K 6G-6FJX 6G-6FJX90S 20                                        | HYDRAULIC HOSE                  | 1    |
|           |           | 22029                                                             | FITTING, #10 ORB X #6 JIC       | 1    |

## Chapter 9 Illustrated Parts List



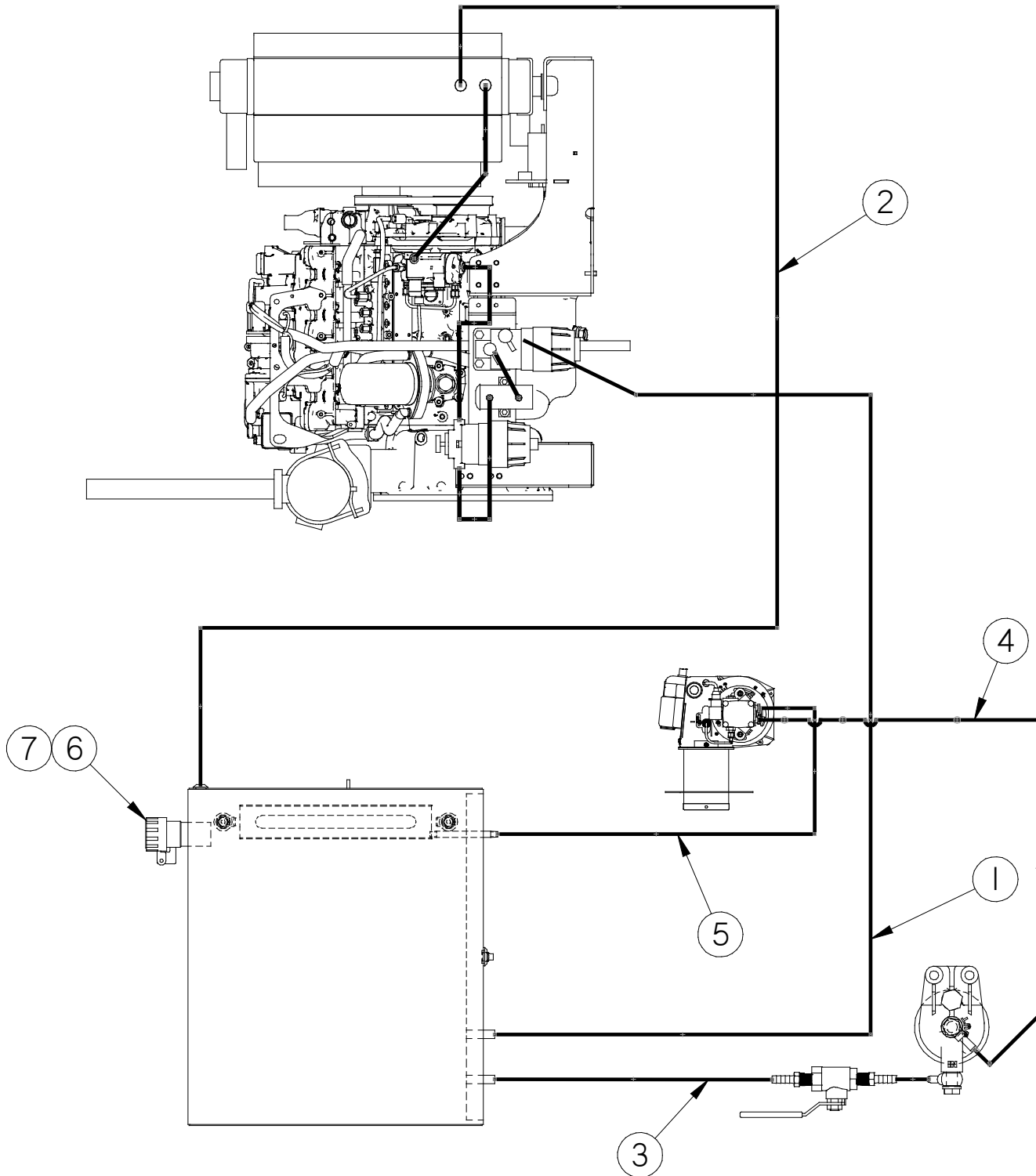
**Fig. 9.27 Hydraulic Diagram**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO.                                               | DESCRIPTION                   | QTY. |
|-----------|------|--------------------------------------------------------|-------------------------------|------|
| Fig. 9.27 | 17   | <b>HYDRAULIC OIL PUMP TO HYDRAULIC VALVE (HB PORT)</b> |                               |      |
|           |      | 22029                                                  | FITTING, #10 ORB X #6 JIC     | 1    |
|           |      | 6M3K 6G-6FJX 6G-8FJX90S 22                             | HYDRAULIC HOSE                | 1    |
|           |      | 40311                                                  | FITTING, #6 ORB X #6 JIC STR. | 1    |

## Chapter 9 Illustrated Parts List

### 9.22 Diesel Fuel Schematic



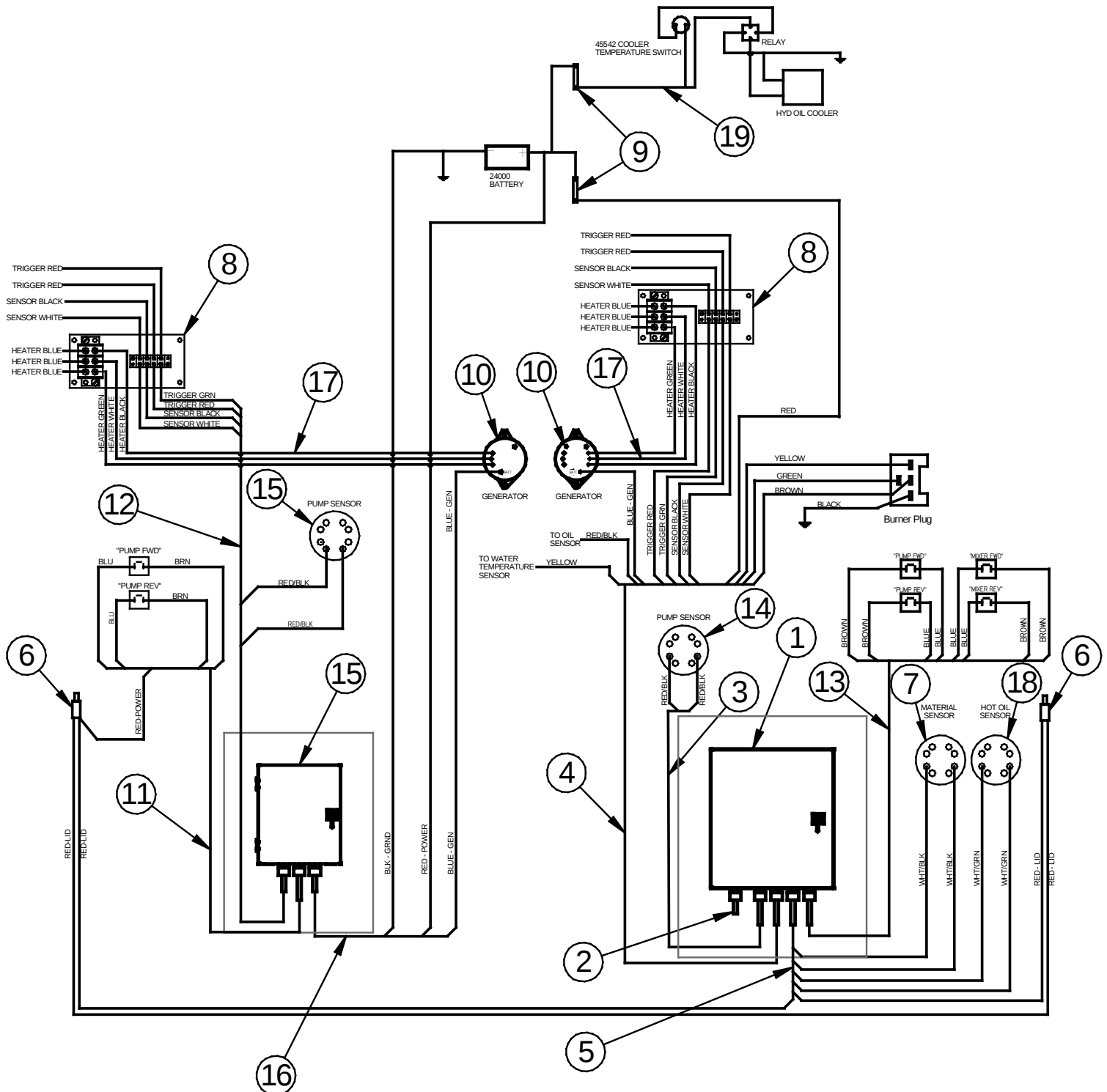
**Fig. 9.28 Diesel Fuel Schematic**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM                                                       | PART NO. | DESCRIPTION                          | QTY. |
|-----------|------------------------------------------------------------|----------|--------------------------------------|------|
| Fig. 9.28 | <b>1. DIESEL FUEL TANK TO ENGINE FUEL FILTER "IN" PORT</b> |          |                                      |      |
|           |                                                            | 26753    | FITTING, 1/4 MPT X 3/8 JIC ELBOW     | 1    |
|           |                                                            | 26754    | FITTING, #6 HOSE PUSH-ON             | 1    |
|           |                                                            | 29643    | HOSE, 3/8 x 65" FUEL LINE            | 1    |
|           |                                                            | 26079    | CLAMP, GEAR                          | 2    |
|           |                                                            | -        | BANJO FITTING                        | REF. |
|           | <b>2. ENGINE RETURN LINE TO DIESEL FUEL TANK</b>           |          |                                      |      |
|           |                                                            | 29644    | HOSE, 3/8 x 110" FUEL LINE           | 1    |
|           |                                                            | 26754    | FITTING, #6 HOSE PUSH-ON             | 1    |
|           |                                                            | 26753    | FITTING, 1/4 MPT X 3/8 JIC ELBOW     | 1    |
|           |                                                            | 26079    | CLAMP, GEAR                          | 2    |
|           | <b>3. DIESEL FUEL TANK TO BURNER FUEL FILTER</b>           |          |                                      |      |
|           |                                                            | 26782    | FITTING, 1/4" MPT X 5/16 JIC ELBOW   | 1    |
|           |                                                            | 26767    | FITTING, #5 HOSE PUSH-ON             | 1    |
|           |                                                            | 47233N   | HOSE, 5/16 x 59" FUEL LINE           | 1    |
|           |                                                            | 29984    | HOSE BARB, 1/4MPT X 5/16 HOSE        | 1    |
|           |                                                            | 29195    | BALL VALVE, 1/4 NPT                  | 1    |
|           |                                                            | 29984    | HOSE BARB, 1/4MPT X 5/16 HOSE        | 1    |
|           |                                                            | 47234N   | HOSE ASSEMBLY, 5/16 X 14"            | 1    |
|           |                                                            | 47345N   | FILTER ASSEMBLY                      | 1    |
|           | <b>4. BURNER FUEL FILTER TO BURNER INLET</b>               |          |                                      |      |
|           |                                                            | 47231N   | HOSE ASSEMBLY, 5/16 X 12"            | 1    |
|           |                                                            | 26767    | FITTING, #5 HOSE PUSH-ON             | 1    |
|           |                                                            | 26756N   | ADAPTER, 5/16 JIC X 1/4NPT           | 1    |
|           | <b>5. BURNER RETURN LINE TO DIESEL TANK</b>                |          |                                      |      |
|           |                                                            | 26756N   | ADAPTER, 5/16 JIC X 1/4NPT           | 1    |
|           |                                                            | 26767    | FITTING, #5 HOSE PUSH-ON             | 1    |
|           |                                                            | 47232N   | HOSE ASSEMBLY, 5/16 X 62"            | 1    |
|           |                                                            | 26767    | FITTING, #5 HOSE PUSH-ON             | 1    |
|           |                                                            | 47497N   | FITTING, 1/4" FPT X 5/16 JIC ELBOW   | 1    |
|           | 6                                                          | 43758N   | FILLER CAP, RPLCMNT, FUEL-HYD TANKS  | 1    |
|           | 7                                                          | 43723N   | GASKET, NARROW STYLE, FOR FILLER CAP | 1    |

## Chapter 9 Illustrated Parts List

### 9.23 Electrical Schematic – Electric Hose



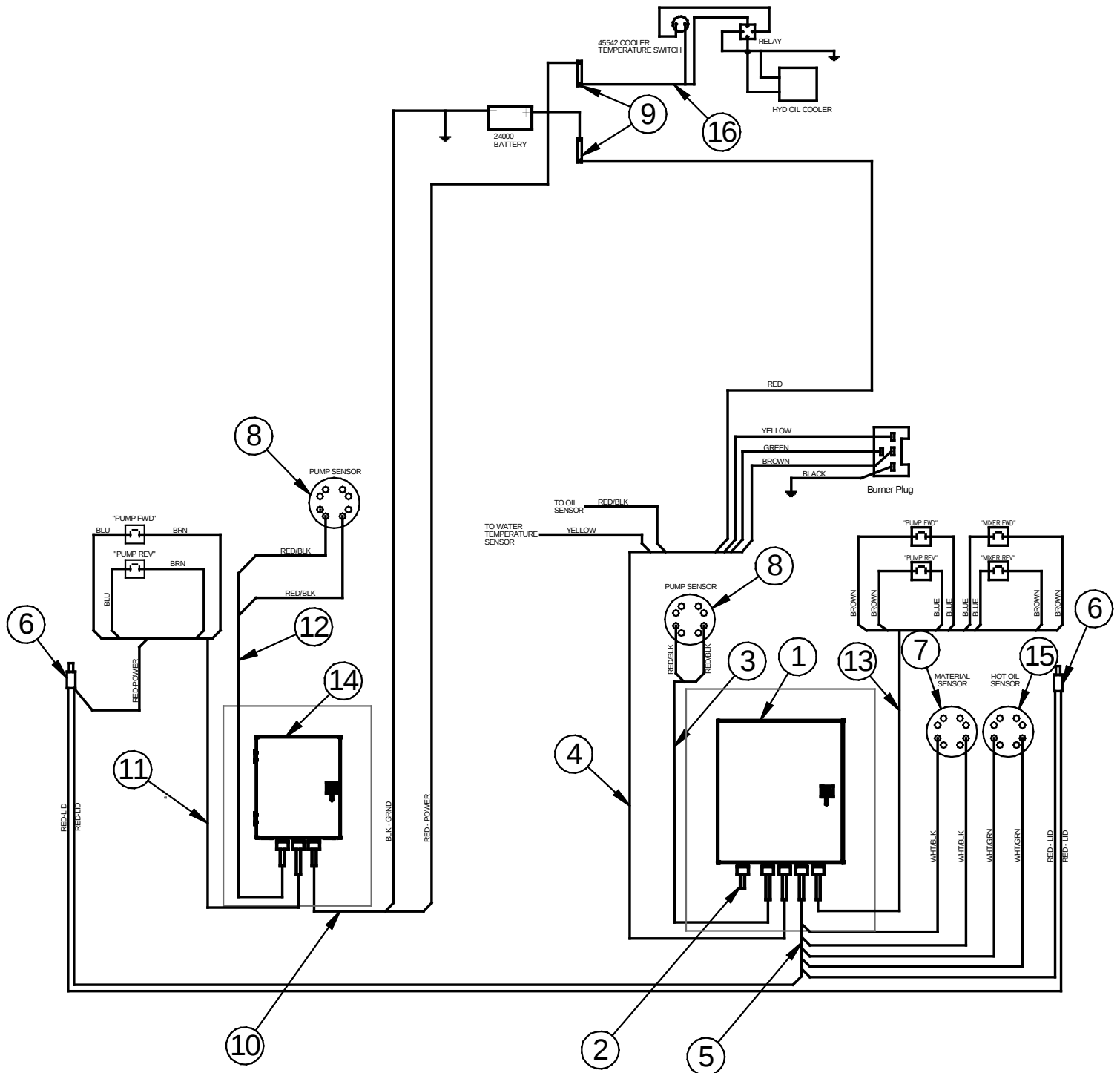
**Fig. 9.29 Electrical Schematic 46500EB**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                       | QTY. |
|-----------|------|----------|-----------------------------------|------|
| Fig. 9.29 | 1    | 47210    | CONTROL BOX ASSEMBLY, P.S.        | 1    |
|           | 2    | 47212    | HARNESS, ENGINE EXTENSION         | 1    |
|           | 3    | 51836    | CABLE ASSEMBLY, TRIGGER – P.S.    | 1    |
|           | 4    | 52342N   | CABLE ASSEMBLY, CHASSIS – P.S.    | 1    |
|           | 5    | 51834    | CABLE ASSEMBLY, SENSOR – P.S.     | 1    |
|           | 6    | 39608    | LID SWITCH                        | 2    |
|           | 7    | 43465    | SENSOR, MATERIAL                  | 1    |
|           | 8    | 44027    | JUNCTION BOX, HOSE                | 2    |
|           | 9    | 31512    | CIRCUIT BREAKER                   | 2    |
|           | 10   | 46322    | GENERATOR                         | 2    |
|           | 11   | 43937    | CABLE ASSEMBLY, VALVE – D.S.      | 1    |
|           | 12   | 43974    | CABLE ASSEMBLY, SENSOR – D.S.     | 1    |
|           | 13   | 43984    | CABLE ASSEMBLY, VALVE – P.S.      | 1    |
|           | 14   | 56940    | SENSOR, RTD – PUMPING TEMPERATURE | 2    |
|           | 15   | 46710    | CONTROL BOX ASSEMBLY, D.S.        | 1    |
|           | 16   | 43981    | CABLE ASSEMBLY, TRIGGER – D.S.    | 1    |
|           | 17   | 43947    | CABLE ASSEMBLY, HOSE              | 2    |
|           | 18   | 52345    | SENSOR, HOT OIL                   | 1    |
|           | 19   | 45569    | HARNESS, HYD. OIL COOLER          | 1    |

## Chapter 9 Illustrated Parts List

### 9.24 Electrical Schematic – Standard Hose



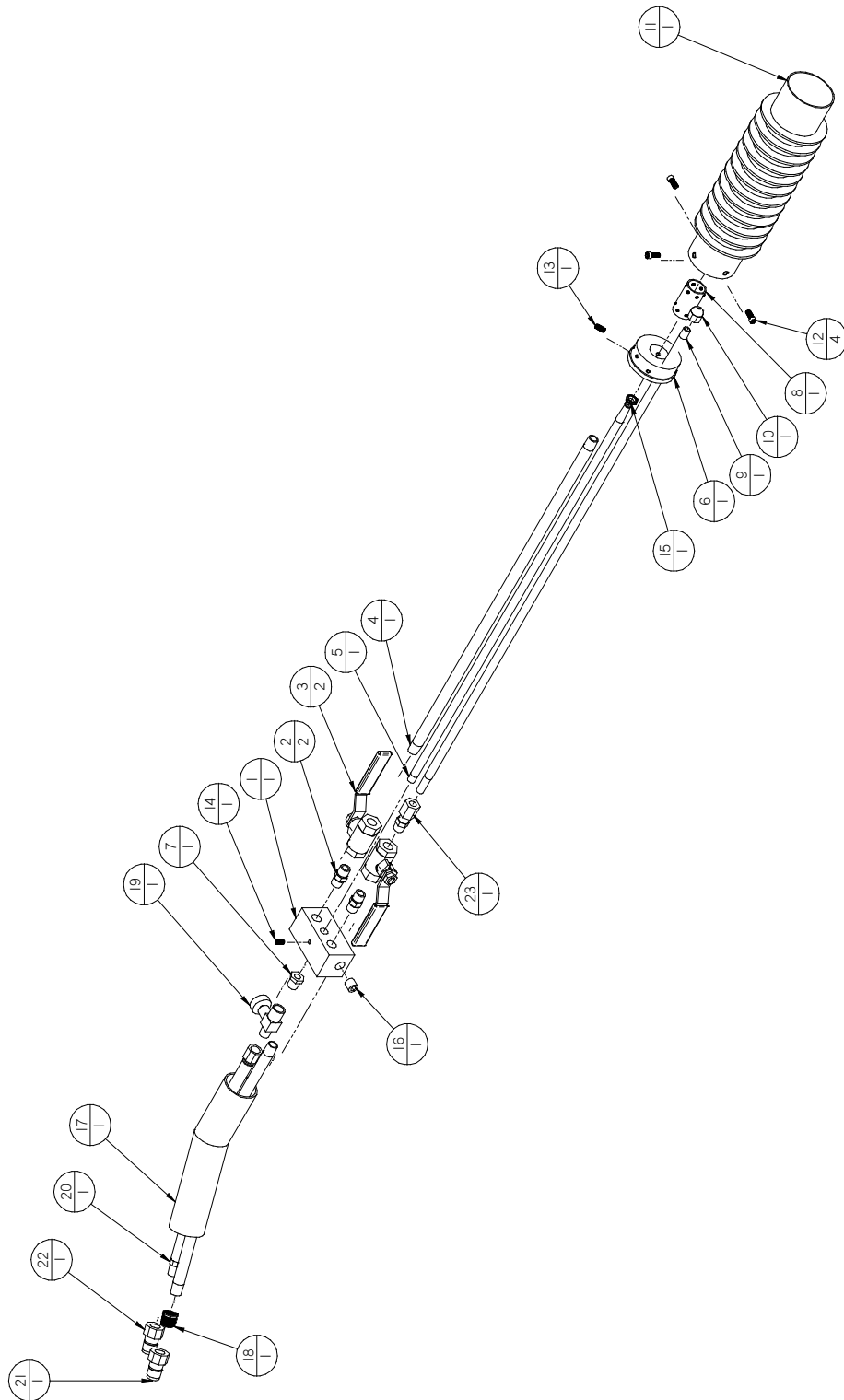
**Fig. 9.30 Electrical Schematic – 46500SB**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                       | QTY. |
|-----------|------|----------|-----------------------------------|------|
| Fig. 9.30 | 1    | 47215    | CONTROL BOX ASSEMBLY, P.S.        | 1    |
|           | 2    | 47212    | HARNESS, ENGIE EXTENSION          | 1    |
|           | 3    | 51836    | CABLE ASSEMBLY, TRIGGER – P.S.    | 1    |
|           | 4    | 52342N   | CABLE ASSEMBLY, CHASSIS – P.S.    | 1    |
|           | 5    | 51834    | CABLE ASSEMBLY, SENSOR – P.S.     | 1    |
|           | 6    | 39608    | LID SWITCH                        | 2    |
|           | 7    | 43465    | SENSOR, RTD                       | 1    |
|           | 8    | 55120    | SENSOR, RTD – PUMPING TEMPERATURE | 2    |
|           | 9    | 31512    | CIRCUIT BREAKER                   | 1    |
|           | 10   | 43981    | CABLE ASSEMBLY, TRIGGER – D.S.    | 1    |
|           | 11   | 43937    | CABLE ASSEMBLY, VALVE – D.S.      | 1    |
|           | 12   | 51819    | CABLE ASSEMBLY, SENSOR – D.S.     | 1    |
|           | 13   | 43984    | CABLE ASSEMBLY, VALVE – P.S.      | 1    |
|           | 14   | 46720    | CONTROL BOX ASSEMBLY, D.S.        | 1    |
|           | 15   | 52345    | SENSOR, HOT OIL                   | 1    |
|           | 16   | 45569    | HARNESS, HYD. OIL COOLER          | 1    |

## Chapter 9 Illustrated Parts List

### 9.25 Hot Air Lance



**Fig. 9.31 Hot Air Lance (Option)**

## Chapter 9 Illustrated Parts List

| FIG.      | ITEM | PART NO. | DESCRIPTION                              | QTY. |
|-----------|------|----------|------------------------------------------|------|
| Fig. 9.31 | 1    | 45651    | MIXING BLOCK                             | 1    |
|           | 2    | 51401    | NIPPLE, 1/4 NPT HEX                      | 2    |
|           | 3    | 29195    | VALVE, 1/4" BALL                         | 2    |
|           | 4    | 45656    | AIR MIXER TUBE                           | 1    |
|           | 5    | 45658    | PROPANE TUBE W/ ORFICE                   | 1    |
|           | 6    | 45652    | BURNER BASE                              | 1    |
|           | 7    | 28340    | BUSHING, 1/4" NPT X 1/8" NPT             | 1    |
|           | 8    | 45654    | PRIMARY BURNER TUBE                      | 1    |
|           | 9    | 45657    | AIR LANCE TUBE                           | 1    |
|           | 10   | 45668    | AIR ORFICE "A" - .125"                   | 1    |
|           | 11   | 45653    | MAIN BURNER TUBE                         | 1    |
|           | 12   | 45670    | SCREW, #10-32 X 1/2" ALLEN SCREW         | 4    |
|           | 13   | 45672    | SCREW, #10-32 X 1/2" ALLEN SET           | 1    |
|           | 14   | 45671    | SCREW, 1/4-20 X 3/8" ALLEN SET           | 1    |
|           | 15   | 45669    | NUT, 1/8-27 JAM                          | 1    |
|           | 16   | 27990    | PLUG, 1/4" COUNTERSUNK                   | 1    |
|           | 17   | 45655    | HANDLE ASSEMBLY                          | 1    |
|           | 18   | 45663    | BUSHING, 3/8" NPT X 1/4" NPT REDUCER     | 1    |
|           | 19   | 45659    | VALVE, NEEDLE                            | 1    |
|           | 20   | 45675    | HOSE ASSEMBLY, PROPANE                   | 1    |
|           | 21   | 45679    | COUPLING, 1/4" FPT X M                   | 1    |
|           | 22   | 45681    | COUPLING, 1/4" NPT X FM                  | 1    |
|           | 23   | 45664    | FITTING, 1/4" NPT X 3/8 JIC FERRULE LOCK | 1    |



## **Chapter 10 Tools and Accessories**

### **10.0 Tools and Accessories**



**Crafcro Applicator Disk**  
27162 – 3" Disk Assembly  
27163 – 4" Disk Assembly  
27164 – 6" Disk Assembly



**Crafcro Swivel Disk Applicator**  
27120 – 3" Swivel Applicator  
27130 – 4" Swivel Applicator



**Crafcro Sealing Foot/Flush**  
27154 – 1/4" Flush  
27155 – 3/8" Flush



**Crafcro Sealing Foot/Protruded**  
27159 – 1/4" Protruding  
27160 – 3/8" Protruding



**Crafcro Joint Sealing Tip**  
27146 – 1/4" Sealing Tip  
27147 – 3/8" Sealing Tip



**Crafcro Round Sealing Tip**  
27170 – 3/8" Sealing Tip  
27171 – 1/2" Sealing Tip



**Crafcro Cold Air Lance - 42648**

**Chapter 10 Tools and Accessories**



**Crafc Heavy Duty Squeegee with  
Aluminum Handle - 27199**  
27195 – Replacement Blade



**Crafc Pour Pot with Wheels - 40200**



**Super Shot Drip Stopper**  
Use with 50270 Duckbill  
27114 – Tip Adapter  
27115 – Shroud, Tip Adapter



**Crafc Hand Held Pour Pot - 40201**



**Crafc Duckbill - 50270**



**Crafc High Velocity Heat  
Lance - 45650**

## **Chapter 10 Tools and Accessories**



**Crafc Low Velocity Heat  
Lance - 32259**



**Crafc Hand Torch**  
**W/ 20ft. Hose – 25012**  
**W/ 12ft. Hose – 25016**  
**W/ 50ft. Hose – 25021**







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