

25DZ SERIES 001-058

SERVICE MANUAL

**ISSUED JANUARY 2021** 

TP1NYD40-SM-0121



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# **MARNING**

IF INCORRECTLY USED, THIS EQUIPMENT CAN CAUSE SEVERE INJURY. THOSE WHO USE AND MAINTAIN THE EQUIPMENT SHOULD BE TRAINED IN ITS PROPER USE, WARNED OF ITS DANGERS, AND SHOULD READ AND FULLY UNDERSTAND THIS ENTIRE MANUAL BEFORE ATTEMPTING TO SET UP, OPERATE, ADJUST OR SERVICE THE EQUIPMENT. KEEP THIS MANUAL FOR FUTURE REFERENCE

#### IMPORTANT SAFETY NOTICE

Proper service and repair are important to the safe, reliable operation of the Heil Co.'s products. Service procedures recommended by Heil are described in this service manual and are effective for performing service operations. Some of these service operations may require the use of tools or blocking devices specially designed for the purpose. Special tools should be used when and as recommended. It is important to note that some warnings against the use of specific methods that can damage the product or render it unsafe are stated in the service manual. It is also important to understand these warnings are not exhaustive. Heil could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each method. Consequently, Heil has not undertaken any such broad evaluations. Accordingly, anyone who uses service procedures or tools which are not recommended by Heil must first satisfy himself thoroughly that neither his safety nor the product safety will be jeopardized by the method he selects.

"Heil Environmental, as manufacturer of the equipment that is covered by this manual, is providing a product to the user who has acknowledged to have superior knowledge of the conditions of the use to which the product will be put. Heil Environmental relies upon the user's superior knowledge in specifying any changes or modifications including, but not limited to, the inclusion or non inclusion of options that are required by the user and the Heil product, and for the particular application of the user relative to the Heil product."

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# **SERVICE MANUAL**

# **BODY AND TAILGATE**

#### **Service Manual**

#### INTRODUCTION

The following sections are a guide for maintenance and service of the Heil unit. The sections cover preventive maintenance, adjustment, and troubleshooting hints. Before performing maintenance, check the work area carefully to find all the hazards present and make sure all necessary safeguards or safety devices are used to protect all persons and equipment involved. In order to diagnose a problem quickly and effectively, a service person must be thoroughly familiar with the machine.

This section explains the system and its major components. Diagrams and schematics of the electrical and hydraulic systems are in the Service Manual Schematics section.



#### **IMPORTANT!**

- Before starting any maintenance, study this section of the manual.
- Read all hazard warnings and decals on the unit.
- Clear the area of other persons before performing any maintenance.
- Know and understand safe use of all controls.
- It is your responsibility to understand and follow manufacturer's instructions on equipment and care.

#### SERVICE/PARTS ASSISTANCE

Assistance in troubleshooting repair and service is available by contacting the authorized Heil Dealer in your area. Parts are available at your Heil Dealer or through Heil. Heil personnel are trained to give prompt, professional assistance.

ALWAYS give the unit serial number in all correspondence relating to the equipment.

See the back cover of this manual for Heil contact information.

#### PRECAUTIONARY STATEMENTS

Listed below are the definitions for the various levels of hazards. It is important that the operators of this equipment and people who service units read and understand all warnings as they relate to this equipment operation.

- DANGER indicates a hazardous situation, which if not avoided WILL result in DEATH or SERIOUS INJURY if you do
  not follow proper instructions.
- WARNING indicates a hazardous situation, which if not avoided COULD result in DEATH OR SERIOUS INJURY if you
  do not follow proper instructions.
- CAUTION indicates a hazardous situation, which if not avoided COULD result in MINOR to MODERATE INJURY if you
  do not follow proper instructions.
- NOTICE addresses practices not related to personal injury, such as property damage or damage to the equipment.

The following warnings are generally in the Operator's Manual for each specific unit or are generic safety messages if an Operator's Manual does not have these safety messages. Other safety alert messages may be in other sections of the Parts and Service Manual or in an Operator's Manual. You must read and obey all safety alert messages in any manual produced by Heil to support your unit.

# **M** WARNING

Failure to follow all instructions and safety precautions in this manual, in the Service Manual, in other manufacturer's manuals and on the safety decals attached to the product could result in serious injury or death to operators or bystanders and/or damage to property. Do not operate this vehicle before you read and understand the Operation Manual, the Parts Service Manual for this unit, other applicable manufacturer's manuals and the safety decals on the product. Each operator of this unit must read and understand all directions in this manual before they first operate this vehicle. Keep this manual in the cab for new operators and to remind all operators about safe use.

### **A** DANGER

Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand all of the instructions in this manual. Failure to do so can result in death or serious injury to operators or bystanders.

# A DANGER

Make sure the unit is on firm, stable ground before you raise the body and clear the area of all unnecessary people. Do not prop a body unless it is on firm, stable ground. A unit not on firm, stable ground can roll when raising or propping the body. This can cause death or serious injury to you or bystanders.

### **A** DANGER

Always prop the tailgate when you leave it raised for maintenance, service or cleaning procedures. Any part of your body between the unit's body and the tailgate while you prop the tailgate or when the tailgate is propped is dangerous. Death or serious injury can occur if any part of your body is between the tailgate and the body if the tailgate suddenly closes.

# A DANGER

A tailgate in motion is dangerous. Serious injury or death can occur if a person is struck by a moving tailgate or becomes trapped between the tailgate and the body. Clear the area near the tailgate of all unnecessary people before you lower the tailgate.

### **A** DANGER

The packer and crusher panels are dangerous. They can cause death or serious injury if a person is inside the hopper. Make sure no one is inside the hopper before you begin a packer or crusher function. Put the unit in the Lock-Out/Tag-Out mode if it is necessary to enter the hopper area.

# **A** DANGER

Keep all parts of your body out from underneath the unit's body and away from the cylinders when raising or lowering the body. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body.

### **A** DANGER

Do not raise a body that has refuse while you do maintenance or service procedures. Refuse in the body can make the unit unstable. Always unload refuse from the body before you raise it for maintenance or service procedures. Always use the body props when you raise the body for maintenance or service procedures.

# **A** DANGER

A full or partially full load of refuse is dangerous while you lower the body with inoperative controls. Refuse in the body can make the unit unstable and cause it to overturn. Serious injury or death can occur if the unit overturns due to instability caused by the loaded refuse. REMOVE the refuse before you block the body.

# **A** DANGER

Lifting equipment that does not have sufficient lifting capability is dangerous. Equipment can fail and cause death or serious injury to the operator or bystanders. Make sure the lifting equipment has sufficient lifting capability and clear ALL persons not involved with the procedure away from the area.

# A DANGER

The lifting equipment can fail. Serious injury or death can occur if the lifting equipment breaks and the body falls or the unit rolls over. Do not place your body or limbs between the unit's body and chassis while you remove the body-supporting timbers. Be attentive and prepared to move quickly away from the unit in the event there is an equipment failure.

# **A** DANGER

Contact of the unit with overhead electric lines is dangerous. Death or serious injury can occur. Make sure there is adequate overhead clearance before you raise the container. If the unit does make contact with overhead electric lines do not touch any metal in the cab. Stay in the unit until help arrives..

# **WARNING**

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, or when you go in the hopper, climb in or on the body or on equipment. Equipment can be operated when the unit is not in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, equipment operated while you do maintenance or service procedures, go in the hopper or climb in or on the body or on equipment can cause death or serious injury.

# **WARNING**

Moving equipment can be dangerous to bystanders. Death or serious injury can occur if a person is in the wrong area or is not attentive to the operations. Clear the area of all unnecessary people before you operate the controls.

# **WARNING**

Raising the body with the tailgate closed can damage the underride bumper. The under ride bumper can hit the ground when the tailgate is not fully raised before you raise the body. Death or serious injury can occur and also cause damage to the unit.

### **WARNING**

Clear all people of the area before you lift a refuse container. Make sure the refuse is secure in the refuse container before you lift the container. Loose refuse can fall and cause death or serious injury.

# **WARNING**

The hydraulic fluid can be under pressure and can spray while you open the connection. Hydraulic fluid can cause damage to your eyes, hands or skin. Wear protective eye glasses, gloves and other clothing as necessary to protect you from the hydraulic fluid.

# **M** WARNING

A unit that needs service or repair can malfunction and create a dangerous condition. A part failure during operation can cause death or serious injury to a person or damage to the unit. Repair or replace any failed or defective part immediately

# **WARNING**

Improper dumping of the refuse can cause the unit to tip or rollover. Death or serious injury can occur if the unit rolls or tips over. Empty as much refuse as you can with the packer panel before you raise the body.

# **M** WARNING

Do not move the unit forward or backwards excessively fast (lurch) to dump the refuse load. Excessively fast movements with the body raised can make the body unstable and tip or roll the unit over. This can result in death or serious injury to the operator and damage the unit. Use only sufficient movement to loosen the load so that it will leave the body.

# **MARNING**

Isopropyl alcohol is flammable and is harmful to eyes and skin. Keep isopropyl alcohol away from heat or open sources of ignition. Flush eyes and skin with water for 15 minutes after contact. Seek immediate medical help.

# **WARNING**

A container that is not locked to the container lift mechanism is dangerous. The container can fall off the container lift mechanism and cause death or serious injury. Make sure you engage and lock the container latch bars before you lift the container.

# **WARNING**

Grabbing a refuse container with too much pressure can damage the container. Pieces of the container can "fly" off the container and cause moderate or minor injury to a bystander. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.

#### NOTICE

Do not move the unit forward or backwards excessively fast (lurch) to dump the refuse load. Excessively fast movements with the body raised puts a very high load on the body raise cylinders and could damage one or both cylinders and make the body unstable unable to lower. Inspect the cylinders after you dump each load and replace if necessary.

#### NOTICE

Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand the instructions in this manual. Failure to do so can result in damage to the unit or other property. If you do not understand a procedure or instruction, tell the owner or the designated person immediately. Do not operate the unit if you do not understand all procedures and instructions in this manual. The owner or designated person can contact your Heil dealer or Heil for additional help. See the Operator's Manual or Service Manual for contact information.

#### NOTICE

Grabbing a refuse container with too much pressure can damage the container. The container can become unusable. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.

#### NOTICE

Always use your employer's Lock-Out/Tag-Out procedures. If your employer does not have Lock-Out/Tag-Out procedures, use the procedures that follow. Contact your supervisor or ESG Technical Service if you have any questions about Lock-Out/Tag-Out procedures.

#### **NOTICE**

You can order Lock-Out/Tag-Out Tags through your Heil Dealer or through Heil.

#### LOCK-OUT/TAG-OUT PROCEDURES

#### NOTICE

Always use your employer's Lock-Out/Tag-Out procedures. If your employer does not have Lock-Out/Tag-Out procedures, use the procedures that follow. Contact your supervisor or Heil Technical Service if you have any questions about Lock-Out/Tag-Out procedures.

Put the unit in a Lock-Out/Tag-Out mode:

- BEFORE you enter the unit's body
- BEFORE you do maintenance, repair or cleaning procedures on the unit.



Figure 1. Lock-Out/Tag-Out (Do Not Operate)
Tag

#### Follow These Steps:

- 1. APPLY the brakes. MAKE SURE the brakes do not let the unit move and they work properly.
- 2. Chock all wheels.
- 3. SET the tailgate props when you raise the tailgate for service, maintenance or cleaning.
- 4. SET the body props when you raise the body for service, maintenance or cleaning.
- 5. When there are in-cab controls, turn the ignition switch to ON then:
  - a. Move the switches of the hydraulic controls. This relieves the pressure in the cylinders.
  - b. Turn the ignition switch to OFF.
- 6. When there are no in-cab controls, move the outside control levers to relieve the pressure in the cylinders.
- 7. Put a LOCK-OUT/TAG-OUT Tag onto the steering wheel.
- 8. Remove the ignition key from the cab, lock the vehicle, and put the key in a secure location.
- 9. You can order Lock-Out/Tag-Out Tags (Part Number 212-1586) through your Heil Dealer or through Heil.

#### STORING REFUSE IN THE BODY

Heil does not recommend storing refuse in the body overnight. The different types of debris and corrosive elements usually collected can cause severe corrosion inside the body decreasing the life of your body. This corrosion can affect unloading and decrease the structural life of the body. In addition, storing refuse in the body overnight can increase the risk of fire.

#### MAINTENANCE/LUBRICATION INFORMATION

Before performing maintenance, check the job carefully to find all the hazards present and make sure all safe guards or safety devices are in place to protect all persons and equipment involved.

#### GREASE LUBRICANT RECOMMENDATION

Use a grease gun. Before engaging grease gun, clean the fitting. Always pump enough grease to purge the joint of contaminated grease and wipe off the excess grease. Lubricate a unit as given on the lubrication decal on the unit and in the Parts and Service Manual and Operator's Manual. Use NLGI 000 grease.

#### OIL LUBRICANT RECOMMENDATION

Use only non-detergent engine oil to lubricate all moveable mechanical parts not furnished with grease fittings. Apply sufficient oil to give good lubrication, but do not bathe parts in oil. Always wipe off excess oil.

#### HYDRAULIC OIL SPECIFICATIONS

Heil hydraulic oil (MV32) contains the following specifications.

| Gravity                          | API (ASTM D-287) 31.0   |
|----------------------------------|---|
| Specific Gravity @ 60°F (15.6°C) | (ASTM D-287) 0.8780   |
| Flash Point                      | (ASTM D-92) 410°F   |
| Pour Point                       | (ASTM D-97) -60°F   |
| Viscosity<br>@100°F<br>@210°F    | SUS (ASTM D-445 & ASTM D-2161) 153<br>SUS (ASTM D-445 & ASTM D-2161) 47.3 |
| Viscosity Index                  | (ASTM D-2270) 155   |
| Rust Protection                  | (ASTM D-665 A & B) Pass   |
| Foam Test                        | (ASTM D-892) Pass   |
| Four-Ball Wear Test              | (ASTM D-4172) (40kg, 1800RPM, 130°F, 1 hr) 0.66                           |
| Zinc %wt.                        | (XRF) .04   |

The following oils by brand name are approved for use in the hydraulic system on this equipment and considered to be all temperature hydraulic fluids.

- Shell Tellus T32
- Mobil DTE 13M
- Texaco Rando HDZ 32

#### STANDARD TORQUE DATA FOR NUTS AND BOLTS

The following recommended torque data is for use as a general guideline. Recommended torque, in foot pounds, for all Standard Application nuts and bolts provided in the following table.

#### **NOTICE**

Torque specifications on a drawing override torque values in the Standard Torque Data for Nuts and Bolts Table.

- All thread surfaces are clean and lubricated with SAE-30 engine oil. See notice above.
- · Joints are rigid, that is no gaskets or compressible materials are used
- When re-using nuts or bolts use minimum torque values

| STANDARD TORQUE DATA FOR NUTS AND BOLTS TABLE |                        |                                    |       |   |        |  |  |
|---|------------------------|------------------------------------|-------|---|--------|--|--|
| Bolt Size<br>(D)                              | Nut Type<br>(STD/Lock) | Thread<br>Turns per<br>Inch<br>(p) | Grade | Heil Plain Dry<br>Condition<br>Torque Value<br>(ft-lbs) | Torque | Heil<br>Lubricated<br>Fastener<br>Torque Value<br>(ft-lbs) | Heil<br>Deformed<br>Lock Nut<br>Torque Value<br>(ft-lbs) |
| 1/4   | STD                    | 20                                 | 5     | 9   | 8      | 6  |  |
| 0.25  |                        |                                    | 8     | 13  | 12     | 8  |  |
|   |                        | 28                                 | 5     | 10  | 9      | 7  |  |
|   |                        |                                    | 8     | 15  | 13     | 10   |  |
|   | Lock                   | 20                                 | 5     |   |        |  | 6  |
|   |                        |                                    | 8     |   |        |  | 8  |
|   |                        | 28                                 | 5     |   |        |  | 7  |
|   |                        |                                    | 8     |   |        |  | 10   |
| 5/16  | STD                    | 18                                 | 5     | 19  | 17     | 12   |  |
| .3125   |                        |                                    | 8     | 27  | 24     | 17   |  |
|   |                        | 24                                 | 5     | 21  | 19     | 14   |  |
|   |                        |                                    | 8     | 29  | 27     | 19   |  |
|   | Lock                   | 18                                 | 5     |   |        |  | 12   |
|   |                        |                                    | 8     |   |        |  | 17   |
|   |                        | 24                                 | 5     |   |        |  | 14   |
|   |                        |                                    | 8     |   |        |  | 19   |
| 3/8   | STD                    | 16                                 | 5     | 33  | 30     | 22   |  |
| .375  |                        |                                    | 8     | 47  | 42     | 31   |  |
|   |                        | 24                                 | 5     | 38  | 34     | 25   |  |
|   |                        |                                    | 8     | 54  | 48     | 35   |  |
|   | Lock                   | 16                                 | 5     |   |        |  | 22   |
|   |                        |                                    | 8     |   |        |  | 31   |

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| Bolt Size<br>(D) | Nut Type<br>(STD/Lock) | Thread<br>Turns per<br>Inch<br>(p) | Grade | Heil Plain Dry<br>Condition<br>Torque Value<br>(ft-lbs) | Torque | Heil<br>Lubricated<br>Fastener<br>Torque Value<br>(ft-lbs) | Heil<br>Deformed<br>Lock Nut<br>Torque Value<br>(ft-lbs) |
|------------------|------------------------|------------------------------------|-------|---|--------|--|--|
|                  |                        | 24                                 | 5     |   |        |  | 25   |
|                  |                        |                                    | 8     |   |        |  | 35   |
| 7/16             | STD                    | 14                                 | 5     | 53  | 48     | 35   |  |
| .4375            |                        |                                    | 8     | 76  | 68     | 49   |  |
|                  |                        | 20                                 | 5     | 60  | 54     | 39   |  |
|                  |                        |                                    | 8     | 84  | 76     | 55   |  |
|                  | Lock                   | 14                                 | 5     |   |        |  | 35   |
|                  |                        |                                    | 8     |   |        |  | 49   |
|                  |                        | 20                                 | 5     |   |        |  | 39   |
|                  |                        |                                    | 8     |   |        |  | 55   |
| 1/2              | STD                    | 13                                 | 5     | 82  | 73     | 53   |  |
| .500             |                        |                                    | 8     | 115   | 104    | 75   |  |
|                  |                        | 20                                 | 5     | 92  | 83     | 60   |  |
|                  |                        |                                    | 8     | 130   | 117    | 84   |  |
|                  | Lock                   | 13                                 | 5     |   |        |  | 53   |
|                  |                        |                                    | 8     |   |        |  | 75   |
|                  |                        | 20                                 | 5     |   |        |  | 60   |
|                  |                        |                                    | 8     |   |        |  | 84   |
| 9/16             | STD                    | 12                                 | 5     | 118   | 106    | 77   |  |
| .5625            |                        |                                    | 8     | 166   | 150    | 108  |  |
|                  |                        | 18                                 | 5     | 131   | 118    | 85   |  |
|                  |                        |                                    | 8     | 186   | 167    | 121  |  |
|                  | Lock                   | 12                                 | 5     |   |        |  | 77   |
|                  |                        |                                    | 8     |   |        |  | 108  |
|                  |                        | 18                                 | 5     |   |        |  | 85   |
|                  |                        |                                    | 8     |   |        |  | 121  |
| 5/8              | STD                    | 11                                 | 5     | 162   | 146    | 106  |  |
| .625             |                        |                                    | 8     | 230   | 207    | 149  |  |
|                  |                        | 18                                 | 5     | 184   | 166    | 120  |  |
|                  |                        |                                    | 8     | 260   | 234    | 169  |  |
|                  | Lock                   | 11                                 | 5     |   |        |  | 106  |
|                  |                        |                                    | 8     |   |        |  | 149  |

#### **Service Manual**

## STANDARD TORQUE DATA FOR NUTS AND BOLTS TABLE

| Bolt Size<br>(D) | Nut Type<br>(STD/Lock) | Thread<br>Turns per<br>Inch<br>(p) | Grade | Heil Plain Dry<br>Condition<br>Torque Value<br>(ft-lbs) | Torque | Heil<br>Lubricated<br>Fastener<br>Torque Value<br>(ft-lbs) | Heil<br>Deformed<br>Lock Nut<br>Torque Value<br>(ft-lbs) |
|------------------|------------------------|------------------------------------|-------|---|--------|--|--|
|                  |                        | 18                                 | 5     |   |        |  | 120  |
|                  |                        |                                    | 8     |   |        |  | 169  |
| 3/4              | STD                    | 10                                 | 5     | 288   | 260    | 188  |  |
| 0.750            |                        |                                    | 8     | 408   | 367    | 265  |  |
|                  |                        | 16                                 | 5     | 322   | 290    | 209  |  |
|                  |                        |                                    | 8     | 455   | 409    | 295  |  |
|                  | Lock                   | 10                                 | 5     |   |        |  | 188  |
|                  |                        |                                    | 8     |   |        |  | 265  |
|                  |                        | 16                                 | 5     |   |        |  | 209  |
|                  |                        |                                    | 8     |   |        |  | 295  |
| 7/8              | STD                    | 9                                  | 5     | 465   | 418    | 302  |  |
| 0.8750           |                        |                                    | 8     | 657   | 591    | 427  |  |
|                  |                        | 14                                 | 5     | 513   | 461    | 333  |  |
|                  |                        |                                    | 8     | 724   | 652    | 471  |  |
|                  | Lock                   | 9                                  | 5     |   |        |  | 302  |
|                  |                        |                                    | 8     |   |        |  | 427  |
|                  |                        | 14                                 | 5     |   |        |  | 333  |
|                  |                        |                                    | 8     |   |        |  | 471  |
| 1                | STD                    | 8                                  | 5     | 697   | 627    | 453  |  |
| 1.0000           |                        |                                    | 8     | 984   | 886    | 640  |  |
|                  |                        | 14                                 | 5     | 782   | 704    | 508  |  |
|                  |                        |                                    | 8     | 1105  | 994    | 718  |  |
|                  | Lock                   | 8                                  | 5     |   |        |  | 453  |
|                  |                        |                                    | 8     |   |        |  | 640  |
|                  |                        | 14                                 | 5     |   |        |  | 508  |
|                  |                        |                                    | 8     |   |        |  | 718  |
| 1-1/8            | STD                    | 7                                  | 5     | 869   | 782    | 565  |  |
| 1.1250           |                        |                                    | 8     | 1395  | 1256   | 907  |  |
|                  |                        | 12                                 | 5     | 975   | 877    | 634  |  |
|                  |                        |                                    | 8     | 1564  | 1408   | 1017   |  |
|                  | Lock                   | 7                                  | 5     |   |        |  | 565  |
|                  |                        |                                    | 8     |   |        |  | 907  |

#### **Service Manual**

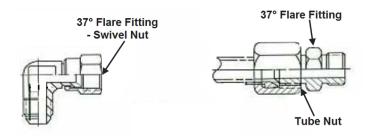
| STANDARD         | TORQUE DATA            | FOR NUTS                           | AND B | OLTS TABLE  |        |  |  |
|------------------|------------------------|------------------------------------|-------|---|--------|--|--|
| Bolt Size<br>(D) | Nut Type<br>(STD/Lock) | Thread<br>Turns per<br>Inch<br>(p) | Grade | Heil Plain Dry<br>Condition<br>Torque Value<br>(ft-lbs) | Torque | Heil<br>Lubricated<br>Fastener<br>Torque Value<br>(ft-lbs) | Heil<br>Deformed<br>Lock Nut<br>Torque Value<br>(ft-lbs) |
|                  |                        | 12                                 | 5     |   |        |  | 634  |
|                  |                        |                                    | 8     |   |        |  | 1017   |
| 1-1/4            | STD                    | 7                                  | 5     | 1227  | 1104   | 797  |  |
| 1.2500           |                        |                                    | 8     | 1969  | 1772   | 1280   |  |
|                  |                        | 12                                 | 5     | 1358  | 1222   | 883  |  |
|                  |                        |                                    | 8     | 2179  | 1961   | 1417   |  |
|                  | Lock                   | 7                                  | 5     |   |        |  | 797  |
|                  |                        |                                    | 8     |   |        |  | 1280   |
|                  |                        | 12                                 | 5     |   |        |  | 883  |
|                  |                        |                                    | 8     |   |        |  | 1417   |
| 1-3/8            | STD                    | 6                                  | 5     | 1608  | 1447   | 1045   |  |
| 1.3750           |                        |                                    | 8     | 2580  | 2322   | 1677   |  |
|                  |                        | 12                                 | 5     | 1830  | 1647   | 1190   |  |
|                  |                        |                                    | 8     | 2938  | 2644   | 1909   |  |
|                  | Lock                   | 6                                  | 5     |   |        |  | 1045   |
|                  |                        |                                    | 8     |   |        |  | 1677   |
|                  |                        | 12                                 | 5     |   |        |  | 1190   |
|                  |                        |                                    | 8     |   |        |  | 1909   |
| 1-1/2            | STD                    | 6                                  | 5     | 2134  | 1921   | 1387   |  |
| 1.5000           |                        |                                    | 8     | 3425  | 3083   | 2226   |  |
|                  |                        | 12                                 | 5     | 2401  | 2161   | 1561   |  |
|                  |                        |                                    | 8     | 3854  | 3468   | 2505   |  |
|                  | Lock                   | 6                                  | 5     |   |        |  | 1387   |
|                  |                        |                                    | 8     |   |        |  | 2226   |
|                  |                        | 12                                 | 5     |   |        |  | 1561   |
|                  |                        |                                    | 8     |   |        |  | 2505   |

#### **BOLT TYPE IDENTIFICATION CHART**

| IH<br>Type | S.A.E.<br>Grade | Description   | Bolt Head<br>Marking** |
|------------|-----------------|---|------------------------|
| 1          | 1 or 2          | No radial lines.<br>Low or medium carbon steel not heat treated.<br>NOT USED, replace with same grade bolt. | $\bigcirc$             |
| 5          | 5               | Three radial lines. Quenched and tempered medium carbon steel.  | $\bigcirc$             |
| 8          | 8               | Six radial lines.<br>Quenched and tempered special carbon or alloy steel                                    |                        |

#### **TORQUE FOR HYDRAULIC FITTINGS**

| 37 Degree Flare (JIC) Fittings |                       |                        |  |  |  |  |
|--------------------------------|-----------------------|------------------------|--|--|--|--|
| SET WRENCH TO                  |                       |                        |  |  |  |  |
| Nominal Tube OD                | Torque Wrench Setting | Alternate Torque Units |  |  |  |  |
| 1/8"                           | 6.5 ft-lbs.           | 80 in-lbs.             |  |  |  |  |
| 3/16"                          | 9 ft-lbs.             | 110 in-lbs.            |  |  |  |  |
| 1/4"                           | 12.5 ft-lbs           | 150 in-lbs.            |  |  |  |  |
| 5/16"                          | 16.5 ft-lbs           | 200 in-lbs.            |  |  |  |  |
| 3/8"                           | 21 ft-lbs             | 250 in-lbs.            |  |  |  |  |
| 1/2"                           | 41 ft-lbs             | 490 in-lbs.            |  |  |  |  |
| 5/8"                           | 64 ft-lbs             | 770 in-lbs.            |  |  |  |  |
| 3/4"                           | 89 ft-lbs             | 1070 in-lbs.           |  |  |  |  |
| 7/8"                           | 105 ft-lbs            | 1260 in-lbs.           |  |  |  |  |
| 1"                             | 130 ft-lbs            | 1560 in-lbs.           |  |  |  |  |
| 1-1/4"                         | 142.5 ft-lbs          | 1710 in-lbs.           |  |  |  |  |
| 1-1/2"                         | 178.5 ft-lbs          | 2140 in-lbs.           |  |  |  |  |
| 2"                             | 250 ft-lbs            | 3000 in-lbs.           |  |  |  |  |



#### **BATTERY DISCONNECT SWITCH**

The battery box is typically located on the streetside of the chassis frame near the front of the body, however it can be mounted at a different location on different chassis. Become familiar with the location of the battery box and battery disconnect switch on your unit.

- 1. You must turn the battery disconnect switch to the OFF position whenever the unit is shut off for any length of time especially when the unit will be left unattended.
- 2. You must turn the battery disconnect switch to the ON position whenever you will use the unit.
- 3. You must check the position of the battery disconnect switch as part of the daily inspection.

#### NOTICE

Battery cables must be securely anchored and not rubbing other equipment. Cable insulation must be free of damage and abrasion. Inspect weekly.

#### NOTICE

Always disconnect the battery before welding on the chassis or body.

#### INSPECT PROXIMITY SWITCHES

See **Proximity Switch Troubleshooting** for recommended procedures for inspecting proximity switches.

#### PROXIMITY SWITCH TROUBLESHOOTING

When one or more of a unit's functions do not operate properly and there are proximity switches in the circuits of the unit for these functions, refer to the following table as a guide to find the problem(s).

#### **NOTICE**

Heil proximity switches have a Light Emitting Diode (LED) on the switch to indicate that the switch is sensing metal. The light changes color when the switch senses metal. Green indicates the switch is ON. Yellow indicates the switch senses metal. Some proximity switches only have the yellow light.

| PROXIMITY SWITCH TROUBLESHOOTING TABLE   |  |  |  |  |  |
|--|--|--|--|--|--|
| Probable Cause   | Remedy   |  |  |  |  |
| Loose or corroded electrical connections.  | Replace the electrical connections.  |  |  |  |  |
| <ul> <li>Damaged Switch</li> <li>A. Cracked Ferrite core causing the fine internal wire to break.</li> <li>B. Cracked Ferrite core – but wire is not broken – the sensitivity of switch will increase which causes sensing distance to increase or switch work intermittently as the temperature changes.</li> </ul> | <ul> <li>DO NOT strike switch to make it work.</li> <li>DO NOT damage the switch when you adjust it.</li> <li>DO NOT adjust switch too close to the metal it is sensing.</li> </ul>                              |  |  |  |  |
| Voltage spikes from truck chassis electrical system will break down the internal electronics of the proximity switch.  | <ol> <li>Make sure the power source from the chassis manufacturer is clean.</li> <li>The body electrical system is protected from voltage spikes.</li> </ol>   |  |  |  |  |
| Improper Sensing Range   | Adjust proximity switches to sense metal as follows:  PROX. SWITCH METAL  18 MM MAX. 3/16" SENSING DISTANCE  30 MM MAX. 3/8" SENSING DISTANCE  |  |  |  |  |
| If the controller input light stays on when a switch is unplugged (the signal wire is carrying +12V DC)  | Check the proximity switch electrical circuits for the source of the problem.  |  |  |  |  |
| If proximity switch LED light is NOT ON.   | Check the fuse relay block (Half/Packs with IFM controllers). The fuse/relay box is located in the cab. Or Check the in-line fuses (Side Loaders with IFM controllers) The in-line fuses are located in the cab. |  |  |  |  |
|  | 2. Unplug proximity switch.  |  |  |  |  |
|  | Check the power wire (terminal C) for +12 VDC with a multi-meter.  |  |  |  |  |
|  | Check ground signal with multi-meter for continuity to chassis ground.   |  |  |  |  |
|  | Check the signal wire for continuity to appropriate controller input terminal. (Refer to SM9.)   |  |  |  |  |
|  | 6. If all three (3) wires are good, replace the proximity switch.  |  |  |  |  |

#### PROXIMITY SWITCH ADJUSTMENTS

# **A** DANGER

Before entering the body area, place the unit in Lock-Out/Tag-Out mode. See Service Manual Section 1 for the Lock-Out/Tag-Out Procedure. By these proper steps not being taken, it may result in injury or death.

#### NOTICE

The LED indicator light on the side of the switch will be OFF; the indicating switch is in an open position.

#### NOTICE

The LED indicator light on the side of the switch will be ON, the indicating switch is in a closed position.

#### A. Throttle Advance Switch Adjustment

- 1. With the blade and slide spools in neutral position, proximity switch striker should be centred directly in front of and 3/16" away from the face of the proximity switch. See Figure 11 Slide Panel.
- 2. Moving the proximity switch striker away from the switch by shifting one slide or blade panel spools in either direction will cause the proximity switch to close and actuate the throttle advance.
- 3. Adjust the switch by loosening the clamp mounting hardware and moving the switch to within 3/16" from striker.
- 4. Tighten clamp after adjustment has been made.

#### B. Tailgate Raise/Unlock Alarm Switch Adjustment

This switch is used to indicate the tailgate has been unlocked and raised to the open position.

- 1. When the tailgate is unlocked and raised, the proximity switch will close and cause the tailgate alarm to sound. See Figure 12 Slide Retract Proximity Switch.
  - a. When tailgate is open, power is sent to alarm.
  - b. When tailgate is CLOSED, power is off from alarm.
- 2. When tailgate is lowered and locked, proximity switch will open and the alarm will stop.
- 3. Adjust the switch by loosening the clamp mounting hardware and moving the switch to within 3/16" from striker.
- 4. Tighten clamp after adjustment has been made.

#### C. Slide Retract Switch Adjustment

- 1. Start engine and engage PTO (or front mount pump).
- 2. Using the slide control mechanism, position slide to fully in (retracted) position.
- 3. Place unit in LOTO
- 4. Adjust proximity switch to sense striker in this position. Adjustments are made by loosening the striker, and positioning it 3/16" away from the proximity switch.
- 5. Remove unit from LOTO
- 6. Start engine and engage PTO (or front mount pump).
- 7. Run full slide panel cycle (in and out) to verify adjustment of proximity striker.

#### PROXIMITY SWITCH ADJUSTMENTS (CONTINUED)

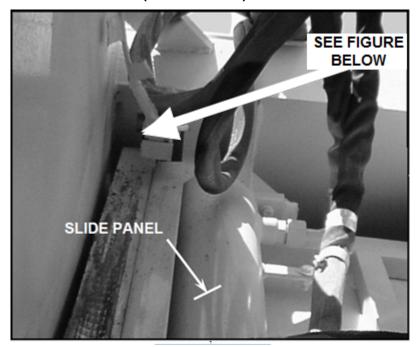


Figure 2

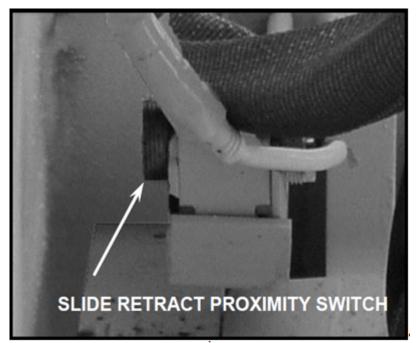


Figure 3

#### **DECALS ON THE UNIT**

Make sure you can read all hazard and instruction decals. Clean decals if you cannot read the words. See for directions on cleaning decals.

Replace any decal that is damaged, missing, or is not readable.

When you replace a part that has a decal, make sure a new decal is installed on the new part. See the Parts and Service manual for a complete decal kit and individual decals. Order the decal kit or individual decals from your Heil Dealer or from Heil.

#### **DECAL CARE**

It is important that the decals are properly cleaned to make sure that they are readable and do not come off the unit. Use the following steps to clean the decals.

#### A. General Instructions

Following these instructions helps the decals adhere longer.

- · Wash the decals with a blend of mild car wash detergent and clean water
- · Rinse with clean water
- Let the vehicle air-dry or dry with a micro-fiber cloth
- Do not allow fuels to stay in contact with the decal for an extended period of time. Remove the fuel contamination as
  quickly as possible
- Do not use carnauba-based wax over the decals
- Do not use a mechanical brush while washing the decals.

#### B. Pressure Washer Precautions

Pressure washing can cause damage to decals. It can cause the edges of the decals to lift and peel the decal away from the unit. Over time, the decal can fade, crack or chip away.

Use pressure washing only when other cleaning methods are not effective. If you use a pressure washer, use the following precautions.

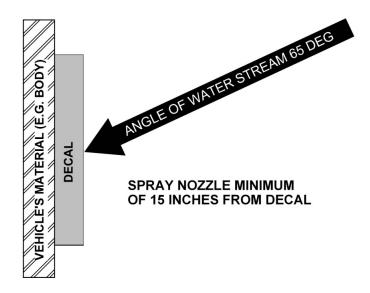
- Spray nozzle opening: 40° wide pattern
- Spray angle: 65° from vehicle's body (do not use sharp angles this can lift the decals from the unit)
- Distance of nozzle to decal: 15" minimum
- Water pressure: <= 800 psi
- · Length of time: not more than 30 sec.
- NEVER use a "turbo pressure nozzle".

#### C. Remove Difficult Debris

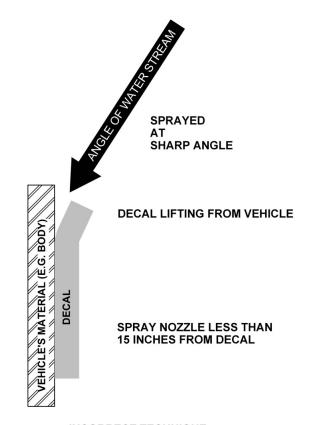
When normal cleaning procedures do not remove difficult debris from the decals, try the following:

- Spot clean the decal with Isopropyl Alcohol and a micro-fiber cloth (rag)
- If these methods do not work on a problem area, call a Heil Dealer or Heil Customer Support.

#### **DECAL CARE (CONTINUED)**

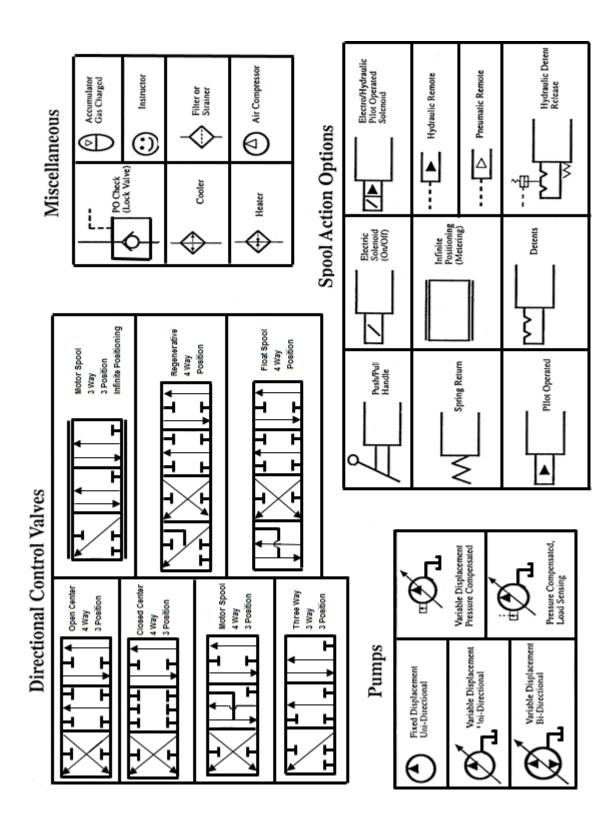


RECOMMENDED TECHNIQUE
Figure 4. Recommended Technique

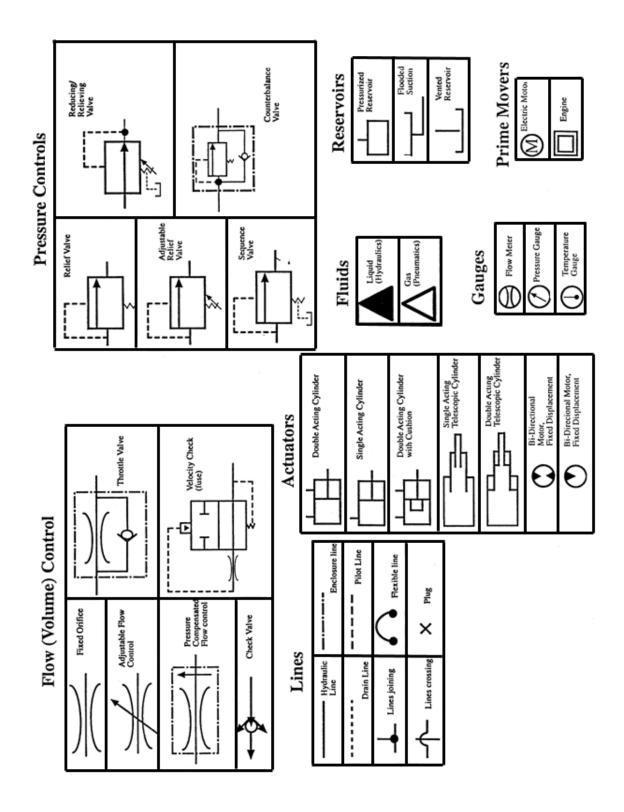


INCORRECT TECHNIQUE
Figure 5. Incorrect Technique

#### **HYDRAULIC SYMBOLS**



#### **HYDRAULIC SYMBOLS (CONTINUED)**



#### **ELECTRICAL SYMBOLS**

# SYMBOL DEFINITIONS

IIII BATTERY

✓ FUSE

SOLENOID

(CR1) CONTACT RELAY

NORMALLY OPEN CONTACT OF CR1

NORMALLY CLOSED CONTACT OF CR1

INDICATOR LIGHT (GREEN)

PUSH BUTTON SWITCH NORMALLY CLOSED

. PUSH BUTTON SWITCH NORMALLY OPEN

TOGGLE SWITCH

 → DIODE

PRESSURE SWITCH

" LIMIT SWITCH NORMALLY OPEN

LIMIT SWITCH NORMALLY CLOSED

 $\dashv$  CAPACITOR

#### SIDE ACCESS DOOR

A hinged side access door is installed on both sides of the body and provides access to the body area for cleanout purposes. Be sure doors are closed and latched properly at all times.

# **A** DANGER

Before entering the body area, place the unit in Lock-Out/Tag-Out. See Service Manual Section 8 for Lock-Out/Tag-out Procedure. When the unit is in Lock-Out/Tag-Out the engine will be off, brakes will be set, all wheels will be chocked and the Lock-Out tag will be placed on steering wheel. The body SHOULD NOT be entered without the Lock-Out/Tag-Out Procedure being in place.

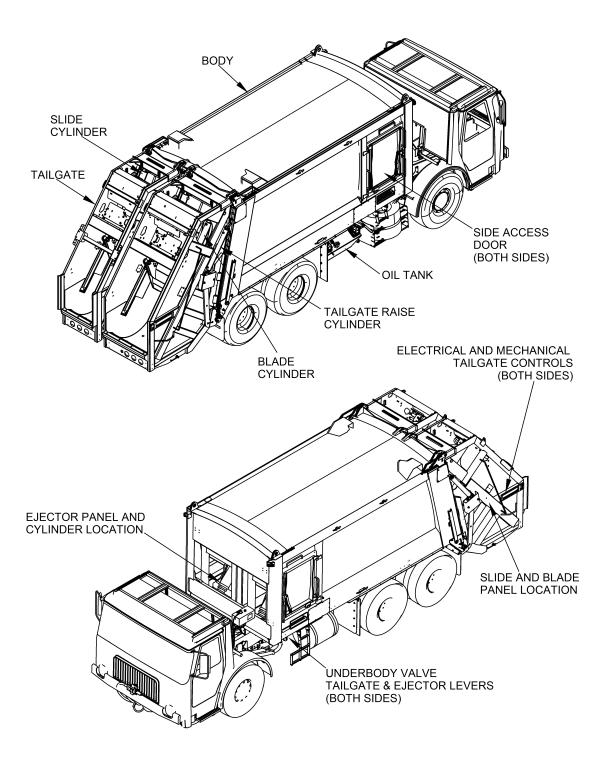
### **A** DANGER

Keep the access door closed when packer/ejector is in operation and in motion. Failure to do so may result in injury or death.



Figure 6. Side Access Door

#### **BODY AND TAILGATE NOMENCLATURE**



# MAINTENANCE AND ADJUSTMENT

#### **UNIT SPECIFICATIONS**

| Hydraulic Oil Tank Hydraulic In-Tank Oil Filter Hydraulic Oil Tank Suction Strainer Hydraulic Pump Main System Relief Pressure Setting |  |
|--|--|
| Tailgate Valve: Blade (Hydraulic Detent) Slide (Hydraulic/Electric Detent) Blade Back Off  |  |
| Port Relief (Both Sides of Eject Cylinder)   |  |
| Port Relief (Tailgate Cylinder Base End)   |  |

#### **BODY DAILY CHECKLIST**

Make sure you perform a daily check of the unit. Refer to the Operator's Manual for the Daily Checklist. Many checks in the Daily Checklist are maintenance related, such as checking tire pressures and hoses for wear and damage.

| DAILY CHECKLIST MAINTENANCE ITEMS   |  |  |  |  |
|---|--|--|--|--|
| ITEM  | REQUIRED ACTION  |  |  |  |
| Low air pressure in tires   | Inflate the tire to the correct air pressure given on the tire.                                |  |  |  |
| Worn tire   | Replace when the wear is greater than allowed by law or before the tread is no longer visible. |  |  |  |
| Damaged tire  | Replace immediately <b>BEFORE</b> going on route.  |  |  |  |
| Hydraulic pump leaks  | Determine the cause of the leak and repair immediately.  |  |  |  |
| Damaged hydraulic pump  | Repair or replace <b>IMMEDIATELY</b> .   |  |  |  |
| Loose or missing hardware for the hydraulic pump                              | Tighten loose hardware. Replace missing hardware immediately.                                  |  |  |  |
| Damaged decal or decal not readable   | Replace decal immediately.   |  |  |  |
| Low level of hydraulic oil  | Fill the hydraulic oil tank immediately.   |  |  |  |
| Worn or damaged hoses   | Replace immediately.   |  |  |  |
| Leaks at cylinders, hoses or fittings   | Tighten loose connection.  |  |  |  |
| Loose or missing hardware   | Tighten loose connections. Replace missing hardware.   |  |  |  |
| Worn fiber guards   | Replace hoses/fittings as necessary. Install new fiber guard on new hoses.                     |  |  |  |
| Worn or damaged tailgate lock components                                      | Replace worn or damaged components.  |  |  |  |
| Loose or missing tailgate lock hardware                                       | Tighten loose hardware. Replace missing hardware.  |  |  |  |
| Damaged tailgate seal   | Replace seal.  |  |  |  |
| Body structure has loose or missing hardware                                  | Tighten loose hardware. Replace missing hardware.  |  |  |  |
| Body structure has cracked weld joints  | Repair immediately.  |  |  |  |
| Body mounting brackets have loose hardware, damaged hardware or cracked welds | Tighten loose hardware. Replace missing hardware. Repair cracked welds.                        |  |  |  |
| Air regulator   | 90 PSI, typically located at front of body.  |  |  |  |

#### **BODY PREVENTIVE MAINTENANCE CHART**

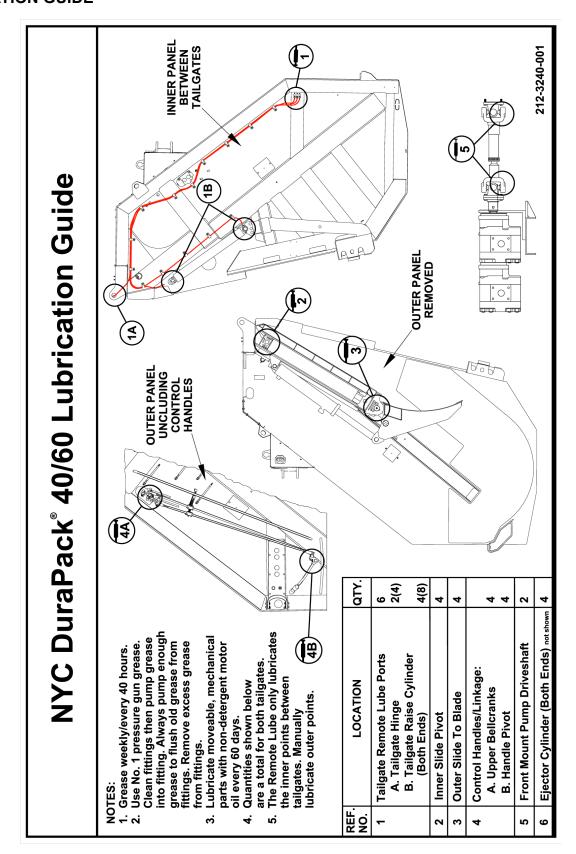
Preventive maintenance must be performed to ensure the safe and reliable operation of your unit. Use the chart below as a guideline for when essential items should checked and serviced. Severe use or adverse conditions may require more frequent maintenance.

| BODY PREVENTIVE MAINTENANCE CHART                 |           |      |         |        |    |  |  |  |
|---|-----------|------|---------|--------|----|--|--|--|
|   |           | *HOU | RS OF C | PERATI | ON |  |  |  |
| COMPONENT/SYSTEM 8 40 200 1000 2000 CHECK/SERVICE |           |      |         |        |    |  |  |  |
| Hydraulic System                                  | <b>Y</b>  |      |         |        |    | Check oil level – add if necessary   |  |  |
|   |           |      |         |        |    | Check cylinders, pump, hoses, tubes, fittings, and adapters for leaks. Check hoses for cracks, crushes, and cover blisters. Repair or replace if necessary with genuine Heil parts. Any replacement hose should be the same size and pressure rating as listed on the original OEM hose. |  |  |
|   |           | M    |         |        |    | Check Control valve seals for leaks.<br>Repair or replace if necessary.  |  |  |
|   |           |      |         | V      |    | Replace filter after first 30 days of operation, then every 6 months or 1000 hours of operation OR when filter bypass light is ON.   |  |  |
|   |           |      |         | V      |    | Replace tank breather/filter every time you replace filter element.  |  |  |
|   |           |      |         |        |    | Drain, flush, and refill.<br>Change filter element.  |  |  |
| Electrical, Battery Cables                        | <b>Y</b>  |      |         |        |    | Check for proper operation.  |  |  |
|   |           |      |         |        |    | Check battery cables from battery to starter for loose cables, rubbing or damage and abrasions to cables. Replace if necessary.  |  |  |
| Operator Controls                                 | $\square$ |      |         |        |    |  |  |  |
| Front Mount Pump or Power Take-<br>Off (PTO)      |           | V    |         |        |    | Check seals for leaks and operation. Replace if necessary  |  |  |
|   |           |      |         |        |    | Check drive line for smooth operation. Replace as necessary.   |  |  |
|   |           |      |         |        |    | Check set screws for tightness. Tighten as necessary.  |  |  |
|   |           | M    |         |        |    | Make sure keys are in place.<br>Replace if necessary.  |  |  |
|   |           |      |         |        |    | Remove the pump's 40blt flange about 2 inches from the PTO and apply grease to female pilot of PTO pump flange. Failure to lubricate female pilot of PTO as given may cause damage to the pump shaft.  |  |  |
|   |           |      |         |        | V  | Drain, flush and refill.<br>Change filter element.   |  |  |

#### **Service Manual**

| BODY PREVENTIVE MAINTENANCE CHART  |   |      |         |        |      |  |
|--|---|------|---------|--------|------|--|
|  | _ | *HOU | RS OF C | PERATI | ON   |  |
| COMPONENT/SYSTEM   | 8 | 40   | 200     | 1000   | 2000 | CHECK/SERVICE                                      |
| Grease Fittings  |   |      |         |        |      | Lubricate as shown on Body Lube Chart.             |
| Body Undercoating  |   |      |         |        | V    | Inspect body undercoating and repair as necessary. |
| * Daily = 8 hrs. Weekly = 40 hrs. Monthly = 200 hrs. 6 Months = 1000 hrs. Yearly = 2000 hrs. |   |      |         |        |      |  |

#### **LUBRICATION GUIDE**



#### PACK/EJECT CYLINDERS MAINTENANCE

Heil Environmental recommends completing the following tasks to make sure the pack/eject cylinders are working properly and not damaged.



Make sure that the unit is in Lock-Out/Tag-Out mode before you perform maintenance/service procedures, or when you enter or climb on the hopper/body/related assemblies. Equipment is operational when the unit is not in Lock-Out/Tag-Out mode. Equipment operated while you do maintenance or service procedures can cause serious injury or death so also make sure to clear the area around the unit of all bystanders.

#### DO

#### **DAILY**

- 1. Remove all trash, metal, etc. from behind the packer panel.
- Visually inspect packer tracks and hopper floor for excessive wear or damage. Repair or replace if necessary

#### **WEEKLY**

- 1. Inspect pack/eject cylinder pins (both ends) for wear or damage. Replace if necessary.
- 2. Grease all pins.

#### DO NOT

- 1. Damage cylinder rod by striking it with any piece of metal, shovel, etc, when cleaning behind the panel.
- Leave trash, metal, etc. behind the packer panel to accumulate as damage to cylinder may occur.



Failure to follow these instructions can result in damage to the Heil body, truck chassis or can cause personal injury!

#### HYDRAULIC SYSTEM

## **A** CAUTION

Contamination is a hydraulic system's worst enemy. Do not let dirt enter the system. Use a clean rag and remove dirt or other contamination around any system component before you disconnect or remove it. While you fill the reservoir, filter the oil through a 200 mesh (or finer) screen. Never use a cloth to filter the oil.

#### NOTICE

The oil tank is mounted behind the chassis cab. Fill it to the level indicated on the sight gauge or between the two lines on the oil level decal. DO NOT overfill, overfilling will cause breather element to fail.

#### A. Hydraulic Oil Tank

The hydraulic tank for the system is bolted to the front head of the body. The hydraulic pump is located below the truck chassis.

#### B. Hydraulic Pump

The pump takes oil through a strainer at the bottom of the tank and sends oil to a 2-section valve under the body. A high pressure carryover in the under body valve sends the oil to a control valve on the tailgate. From the tailgate valve, the oil returns through the filter into the tank.

#### COLD WEATHER WARM-UP PROCEDURE

When ambient air temperature is cold (below 0 degrees F), it is necessary to warm up the unit's hydraulic oil before you start your daily route operation or to check the oil level. The hydraulic oil is sufficiently warmed when the temperature is between 120° and 160°F.

# **M** WARNING

Moving parts on the unit are dangerous. Serious injury or death can occur if a person is struck by the equipment. Clear all people from the area before you operate the unit

Follow the steps below to warm up the hydraulic oil.

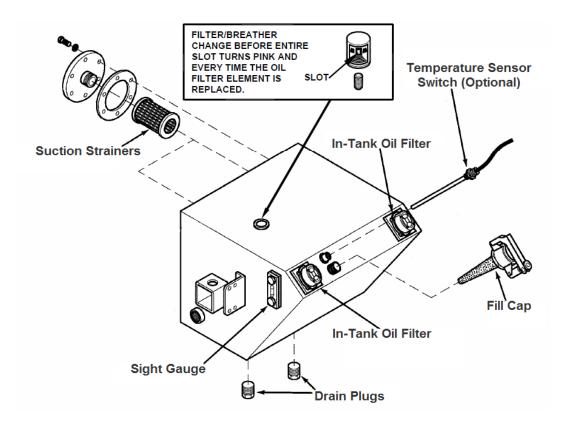
- 1. START the TRUCK and let the engine idle.
- 2. APPLY the PARKING BRAKE and make sure it holds.
- 3. ENGAGE the HYDRAULIC PUMP for approximately five minutes.
- 4. MAKE SURE the AREA IS CLEAR of all unnecessary people BEFORE you operate the controls.
- 5. OPERATE the PACKER EXTEND and PACKER RETRACT functions through ten (10) cycles while the engine idles. See the Operator's Manual for operation instructions.
- 6. Make sure the oil temperature on the site gauge is between 120° and 160°F. If not, repeat step 5.
- 7. Check for fluid leaks. Repair if necessary.
- 8. The unit is now ready to go on route.

#### PREPARING THE UNIT TO CHECK THE OIL LEVEL

Before checking the oil level or adding oil, make sure the unit is in the following position with all cylinders collapsed:

- Truck on level ground
- Tailgate and Body fully down and locked
- Ejector Panel at the front of the body
- Packer Panel in the in-transit position with all cylinders retracted

The oil tank is mounted behind the chassis cab. The oil level in the standard tank must be kept between the low and full marks as indicated on the sight gauge. See the figure below.



#### **CHECK OIL LEVEL**

Check the hydraulic oil level (after warning up the oil) daily or every eight (8) hours, whichever comes first. Fill as necessary.

<u>Important</u>: Contamination is a hydraulic system's worst enemy. Do not let dirt enter the system. Use a clean rag and remove dirt or other contamination around any system component before you disconnect or remove it. While you fill the reservoir, filter the oil through a 200 mesh (or finer) screen. Never use a cloth to filter the oil.

#### WHEN TO CHANGE OIL FILTER ELEMENT

Change the filter more often under certain conditions such as an extremely dusty atmosphere or area. Use only Heil replacement filters. Purchase the filter element from your local Heil distributor.

Change the filter element every 1000 hours or every six (6) months or when indicated by the filter monitor light located in the cab.

#### CHANGE HYDRAULIC OIL FILTER ELEMENT

To change the hydraulic oil filter, refer to the figure below and follow these steps:

- 1. Remove nuts and filter cover.
- 2. Remove the filter element with the by-pass assembly and discard as required.
- 3. Clean the housing with a clean, lint-free cloth.
- 4. Check the o-ring and gasket. Replace them if necessary.
- 5. Lubricate all o-rings and gaskets.
- 6. Install new element.
- 7. Reinstall cover with nuts. Torque nuts to 13 in/lbs.

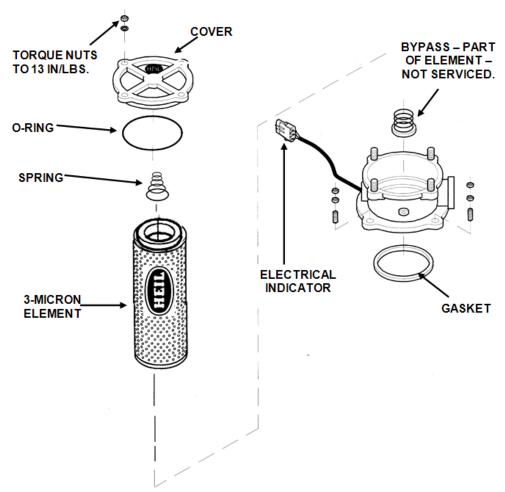


Figure 7. Hydraulic Oil Filter

#### DRAIN AND CLEAN THE HYDRAULIC OIL TANK

Change the hydraulic oil at least annually or every 2000 hours of operating time, whichever comes first.

Remember that almost all hydraulic system malfunctions can be traced to dirt in the fluid. When working with the hydraulic system, the hands, tools, working area and parts must be as clean as possible.

## **A** CAUTION

Wear proper eye protection when you are working on or around hydraulic lines or components. Wear proper eye protection and avoid contact with hydraulic oil if possible. Never check for oil leaks with your hands.

To drain and clean the hydraulic oil tank, follow these steps:

1. Disengage the pump, shut off the engine and remove the ignition key.

## **WARNING**

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, or when you go in the hopper, climb in or on the body or on equipment. Equipment can be operated when the unit is not in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, equipment operated while you do maintenance or service procedures, go in the hopper or climb in or on the body or on equipment can cause serious injury or death.

#### NOTICE

If your employer or company has Lock-Out/Tag-Out procedures that are different from the following procedures, use your employer's or company's procedures. If your employer or company does not have Lock-Out/Tag-Out procedures, use the procedures that follow.

- 2. Contact your supervisor if you have any questions about Lock-Out/Tag-Out procedures. If your supervisor has any questions, that person can contact ESG Technical Service. Perform the **Lock Out/Tag Out procedures** 11.
- 3. Remove the fill cap from the top of the tank.
- 4. Remove the drain plug from the bottom of the tank so that the oil drains into a container.
- 5. While fluid is draining from the tank, remove and replace the filter/breather assembly. Change the assembly every time the in-tank filter is replaced.
- 6. To drain the entire hydraulic system, disconnect all hoses at the adapter and drain the hoses into a container.
- 7. Remove and replace the in-tank filter as described in Change the Hydraulic Oil Filter.
- 8. Remove the outlet flange and 100 mesh suction strainer to gain access to the tank inside.
- 9. Remove sediment from the tank bottom.
- 10. Install the outlet flange with a new gasket and the 100 mesh suction strainer into the tank.
- 11. Install the drain plug in the tank bottom.
- 12. Reconnect and tighten all hose connections that were disconnected.

#### DRAIN AND CLEAN THE HYDRAULIC OIL TANK (CONTINUED)

#### NOTICE

Before filling the tank be sure the funnel is clean and 200 mesh (or finer) screen is used to strain the hydraulic oil.

- 13. Fill tank with recommended oil, checking the sight gauge as you fill. Refer to **Hydraulic Oil Specifications** 13.
- 14. Check the entire system to make sure all connections are tight and no leaks are found.
- 15. Start the truck's engine and engage the pump.

## **M** WARNING

Moving equipment can be dangerous to bystanders. Serious injury or death can occur if a person is in the wrong area or is not attentive to the operations. Clear the area of all unnecessary people before you operate the controls.

- 16. Operate the packing panel through 10 cycles to be sure all air is out of the circuits.
- 17. Operate the automated container lift mechanism.
- 18. Operate tailgate full up and full down.
- 19. Operate body raise (dump units) full up and full down.
- 20. With the packing panel in the retracted position and lift in the in-transit position, check tank oil level. If necessary, add recommended as described under **Check Oil Level** 39.

#### PURGE THE HYDRAULIC SYSTEM

If the hydraulic system becomes contaminated because of component failure or some other reason, you must purge the hydraulic system.

To purge the system, follow these steps:

- 1. Extend the packer/ejector cylinder to lower the oil level in the tank.
- 2. Remove and replace the in-tank oil filter element in the tank.
- 3. Engage the packer/ejector control lever and allow the oil to circulate through the new filter, cleaning the oil.

#### NOTICE

Before filling the tank be sure the funnel is clean and 200 mesh (or finer) screen is used to strain the hydraulic oil.

4. Repeat the procedure as necessary until the system is purged.

#### NOTICE

If contaminated hydraulic oil reaches the cylinders, the unit may need to be removed from service until the contamination is removed. For more information, contact the Heil Technical Services.

#### PRESSURE ADJUSTMENT PROCEDURES

## **A** DANGER

Stand clear when packing mechanism is in motion. Standing close to the unit when it is in motion or operation may result in injury or death.

## **A** DANGER

Do not stand in the hopper or on the hopper sill while adjustments are being made on the packing mechanism with the unit running. Doing this may result in injury or death.

## **A** CAUTION

Always remove dirt and grease from around the main relief valve. Leaving a build up of dirt or grease may result in damage to the valve.

# A CAUTION

Be careful not to force the adjusting screw or it may deform the internal adjusting rod and make the valve inoperative.

Install accurate 0-5000 PSI glycerine filled pressure gauge in the gauge port at the underbody valve.

#### A. Before Starting Adjustments

If hydraulic oil temperature is not a minimum of 100 degrees F, warm oil by:

- 1. Tailgate must be down and locked.
- 2. HOLD throttle advance switch. Unit Throttle advance is used to activate the hydraulic pump. The pump will not be engaged unless the throttle advance is active.
- 3. MOVE ejector panel IN and OUT through 5 cycles.
- 4. RUN tailgate packing mechanism through 10 cycles.
- 5. Repeat steps (2)–(4) until oil temperature reaches 100 degrees F.

#### B. Order of Adjustment Procedures

- 1. Tailgate Valve
  - (a) Blade Detent
  - (b) Slide Detent
- 2. Underbody Valve Main Relief

#### C. Tailgate Valve

The packing mechanism is controlled by an electrical panel (Standard) or two levers (Optional) at both corners of the tailgate. The electrical panel (Standard) or two levers (Optional) operate the lower panel (blade) and upper panel. Refer to Operator's Manual for proper operations of controls.

All adjustments must be made with Throttle Advance Engaged:

- 1. Start engine and engage PTO (or front mount pump). Pump will not engage until Throttle advance is activated.
- 2. Position the upper panel in fully out position.
- 3. Turn PTO (or front mount pump) OFF.

#### PRESSURE ADJUSTMENT PROCEDURES (CONTINUED)

- 4. Turn engine ignition OFF, remove keys and follow the Lock-Out/Tag-Out procedure in Service Manual Section 1.
- 5. All mechanical linkage must be free of any binding. Move blade spool by hand in either direction if needed.
- 6. Remove any dirt or grease around the underbody valve main relief.
- 7. Decrease the main relief pressure on the underbody valve by:
  - (a) Remove dome nut.
  - (b) Loosen lock nut.
  - (c) Turn adjusting screw out (counter-clockwise) of body valve four times to decrease the pressure setting.
- 8. Take unit out of Lock-Out/Tag-Out and start engine.
- 9. Engage the pump and turn throttle switch ON.
- 10.ENGAGE blade control mechanism to shift spool in either direction.
- 11. Blade should complete movement and remain engaged (should not detent).
- 12.If Blade detents:
  - (a) Manually shift control mechanism to disengage blade function.
  - (b) Adjust Main Relief adjusting screw out (counter-clockwise) 1 additional turn.
  - (c) Repeat steps (10) and (11).
- 13. Slowly turn main relief adjusting screw IN to increase pressure. Watch the pressure gauge to see what the pressure is when the spool kicks out or detents (returns to neutral). The correct kick out pressure is 2350 PSI.
- 14. If the setting is incorrect, place unit in Lock-Out/Tag-Out.
- 15.remove the rubber plug from the end of the blade spool to expose the detent release adjusting screw.
- 16. Insert a screwdriver and turn adjusting screw in to the spool (clockwise) to increase the kick out pressure or turn adjusting screw out of the spool (counter clockwise) to decrease pressure.
- 17. Repeat steps 8 thru 12 to check results.
- 18. Decrease the main relief pressure on the underbody valve by turning the adjusting screw out (counter clockwise) of the body valve four times to decrease the pressure setting.
- 19. Engage slide out control mechanism.
- 20. Slide should complete out movement and remain engaged (should not detent).
- 21. If Slide detents:
  - (a) Manually shift control mechanism to disengage blade function.
  - (b) Adjust Main Relief adjusting screw out (counter-clockwise) 1 additional turn.
- 22. Repeat steps (19) and (20).
- 23. Slowly turn main relief adjusting screw IN to increase pressure. Watch the pressure gauge to see what the pressure is when the spool kicks out of detent (returns to neutral). The correct kick out pressure is 2350 PSI.
- 24. If the setting is incorrect, place unit in Lock-Out/Tag-Out.
- 25.remove the rubber plug from the end of the slide spool to expose the detent release adjusting screw.
- 26. Insert a screwdriver and turn adjusting screw in to the spool (clockwise) to increase the kick out pressure or turn adjusting screw out of the spool (counter clockwise) to decrease pressure.
- 27. Repeat steps 18 thru 23 to check results.

#### PRESSURE ADJUSTMENT PROCEDURES (CONTINUED)

# A DANGER

Do not apply torque beyond this point, as damage to the adjusting screw could occur. If this happens, adjusting screw will not operate properly and remain at maximum pressure even when the setting is lowered.

#### D. Underbody Valve - Main Relief

Steps to adjust the underbody valve - Main Relief

- 1. Move tailgate with control panel to lower and hold, while reading the main system pressure gauge.
- 2. It should read 2500 PSI.
- 3. Loosen lock nut.
- 4. Turn adjusting screw out of body (counter clockwise) to decrease the pressure or turn screw in (clockwise) to increase the pressure.
- 5. Tighten lock nut on Main Relief Valve.
- 6. Recheck system pressure.
- 7. Remove pressure gauge.
- 8. Check for any leaks.

#### LOW OIL/HIGH TEMPERATURE/FILTER BY-PASS INDICATORS

The hydraulic oil in the tank is monitored by sensors for low on oil, oil temperature and the filter needing to be changed.

#### A. Low Oil Indicator

Means the hydraulic oil tank is low on oil and oil needs to be added to the tank. The hydraulic pump will shut off.

#### B. High Temperature Indicator

This measures the oil temperature in the tank. If light illuminates, the oil temperature is approximately 200°F and a hydraulic system problem has occurred (dirty oil or low oil level). The pump will shut off.

#### C. Filter By-Pass Indicator

This measures the cleanliness of the oil filter element. Light will illuminate when element is clogged and the hydraulic pump will shut off if filter element is not changed.

#### **AUXILIARY QUICK DISCONNECT HOOK-UP**

If the unit has hydraulic system trouble and is unable to use the hydraulic system, either body can be emptied of refuse by hooking up an auxiliary pump system to the quick disconnect on the unit. The suction line disconnect is located at the back of the oil tank. See the figure below.



Never connect a disabled unit to another unit as the system is designed for auxiliary pump usage only. Doing this may result in damage to the unit or injury to a person.

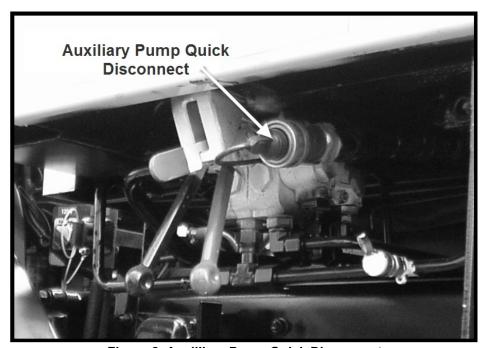


Figure 8. Auxilliary Pump Quick Disconnect

#### **BLADE BACK-OFF RELIEF VALVE**

A relief is provided in the tailgate valve to allow the lower panel to back off slightly (2 to 5 inches of cylinder stroke) during the final stages of packing the load.

If the cylinders back-off excessively (5 to 7 inches of cylinder stroke) the back-off relief needs to be replaced.

#### UNDERBODY VALVE WITH RESISTANCE RELIEF

The resistance valve is located in the ejector section of the underbody valve and preset at 2250 PSI. See Figure 5.

#### A. Resistance Relief

- 1. When the upper panel moves refuse from the hopper into the body, resistance will begin to increase.
- 2. As resistance increases, pressure passes through 2250 PSI. The valve will open momentarily allowing the ejector panel to slide back into the body for refuse to enter.
- 3. The valve will close when the slide kicks out at 2500 PSI.

#### B. Packing Loads

When packing loads, the operator may encounter one of these situations:

- 1. When packing a light load, the panel may move approximately one inch.
- 2. If packing a heavy load the panel may move as much as three inches, depending on refuse moisture content.
- 3. If load is too light, be sure system pressure is correct and the slide and blade kick outs are properly set.

#### C. Valve Adjustment

If adjustment is to the resistance relief is required, follow these steps:

- 1. Loosen lock nut on the adjustment screw.
- 2. If loads are light and the ejector panel reached the front of the body, turn adjustment screw in (clockwise) 1/8 turn.
- 3. Tighten lock nut and check load weights.

#### **UNDERBODY VALVE WITH RESISTANCE RELIEF (CONTINUED)**

- 4. If ejector panel stalled before reaching the front of the body, turn adjusting screw out (counter clockwise) 1/8 turn.
- 5. Repeat steps 1 thru 4 to increase or decrease resistance as necessary to get desired payloads. See Figures below:

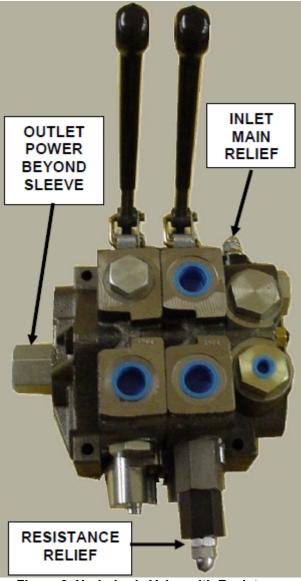


Figure 9. Underbody Valve with Resistance Relief

#### **UNDERBODY VALVE WITH RESISTANCE RELIEF (CONTINUED)**

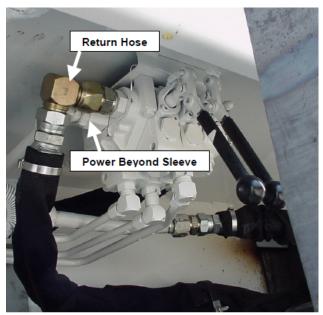


Figure 10. Underbody Valve: Return Hose and Power Beyond Sleeve



Figure 11. Underbody Valve: Main Relief Valve, Pressure Gauge Port and Resistance Valve

#### SNOW PLOW VALVE ADJUSTMENT

The snow plow has two pressure adjustments and is set at 2000 PSI for raising the snow plow and 800 PSI for lowering the snow plow. See the figure below.

#### A. Before Starting Adjustments

- 1. The hydraulic oil must be at or near operating temperature before attempting pressure adjustments.
- 2. These adjustments require at least two people.
- 3. Tools required include (1) 3/4" open end wrench and (1) 5/32" allen wrench.
- 4. TURN the Packer and snow plow switches OFF.
- 5. SET the chassis parking brake and make sure it is holding.
- 6. START the engine.

#### B. Adjustment Procedures

- 1. INSTALL an accurate 0-5000 PSI glycerine filled pressure gauge into the gauge disconnect on the snow plow.
- REMOVE the protective caps on the relief valves.
- 3. TURN on the snow plow switch and place the snow plow Raise/Lower toggle switch to raise position.
- 4. Using the allen wrench, turn clockwise on the adjusting screw to raise the pressure or turn counter clockwise on the adjusting screw to LOWER the pressure until the pressure reads 2000 PSI +/- 100.
- 5. Place the Raise/Lower toggle switch to LOWER position.
- 6. Using the allen wrench, turn clockwise on the adjusting screw to RAISE the pressure or turn counter clockwise on the adjusting screw to lower the pressure until the pressure reads 800 PSI +/-100.
- 7. TIGHTEN the lock nuts and reposition the protective caps on the relief valves when the correct pressures are attained.
- 8. REMOVE the pressure gauge and turn the engine off.

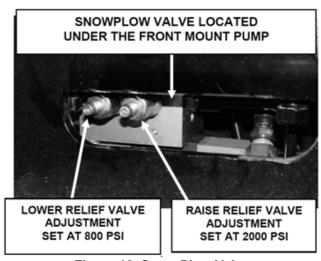


Figure 12. Snow Plow Valve

#### WELDING AND ELECTRONIC DEVICES / ELECTRICAL LUBRICANTS

Before welding on any unit with electronic devices like the Cortex Controller™, electronic control units (ECUs), and proximity switches complete the following procedures.

## **WARNING**

Never weld on a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with inert gas. See Service Manual Section 1.

- · Disconnect all battery connections.
- Place welding ground as close as possible to the area that is being repaired.
- Disconnect the Cortex Controller and all other electronic control units (ECUs).
- If welding within 24 inches of a proximity switch, remove the switch from the unit.

#### **NOTICE**

Failure to follow these procedures may cause damage to the devices. The damage comes from the inability of the devices to withstand the amperage, open circuit voltage and magnetic flux a welder can produce.

#### **Electrical Anti-Corrosion Lubricant**

It is very important that all Packard connectors are properly lubricated. The following compounds, by brand name, or functional equivalents, are approved for use.

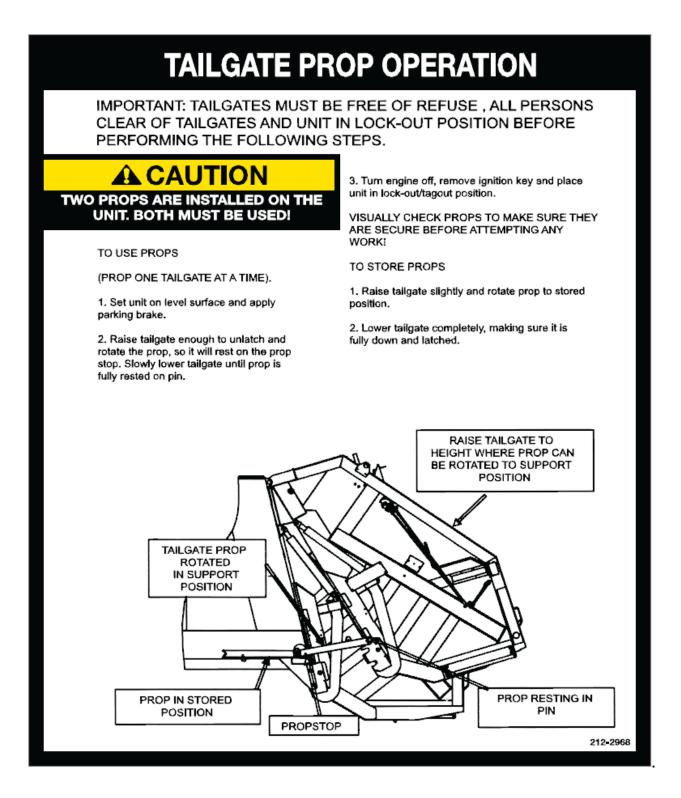
- Truck-Lite Corrosion Preventive Compound
- GB ox-gard, anti-oxidant compound
- Burndy Penetrox A electrical joint compound.

These lubricants may be obtained at an electrical supply store.

#### REPAIRING CRACKED WELD JOINTS

Repair all cracked weld joints immediately after finding cracked weld joints. If you are unsure of the proper repair procedure, call Heil Technical Services at 866-310-4345.

#### TAILGATE PROP OPERATION



#### TAILGATE UNLOCKED AND TAILGATE LOCKED INSPECTIONS

Listed are the steps required to ensure the tailgate is locked on the unit. See Figures 15 Tailgate Locked and 16 Tailgate Unlocked on the next page.

#### **NOTICE**

The operator of the unit should always check the unit to make sure everything is latched and secure before operation. Not doing so may cause damage to the unit or an injury to a person.

#### A. Pre-Trip Inspection

- 1. RED indicator arrows are aligned on the locking arm and the body anchor.
- 2. Locking pin is installed in the hole.
- 3. The RED tailgate operating lever on the underbody control valve is in the center (neutral position).
- 4. The large indicator light and alarm in the cab are OFF.

#### B. Tailgate Unlock/Raise Procedure

- 1. Remove the lock pin and store in the keeper provided.
- 2. Unlock and raise the tailgate by PULLING the red rear handle on the underbody valve. It takes 6 seconds for the tailgate to unlock and begin to rise. See Figure 15 Tailgate Lock and 16 Unlock.
- 3. Continue to PULL and HOLD the handle to raise tailgate completely. This takes approximately 35 seconds.

#### C. Tailgate Lock/Lower Procedure

- 1. To lower the raised tailgate, PUSH and HOLD the rear red handle on the underbody valve. From the fully raised position it will take approximately 28 seconds to lower the tailgate to position.
- 2. Continue to PUSH and HOLD the valve handle until the indicator arrows are aligned and the indicator light and alarm (in cab) are off.
- 3. Remove the locking pin from the keeper and install the pin into the anchor hole.

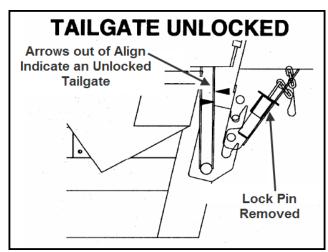


Figure 13. Tailgate Unlocked

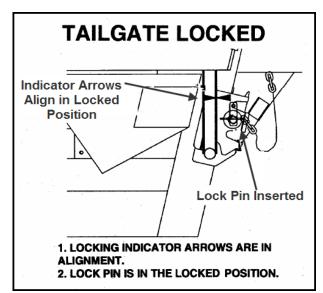


Figure 14. Tailgate Locked

#### TAILGATE CONTROL LEVER ALIGNMENT

The tailgate control handles should be in line when in the neutral position. Adjustments can only be made to blade control rod. See the figure below.

If Handle is Out of Align:

- 1. Loosen jam nuts on blade control adjusting rod.
- 2. Turn rod clockwise to shorten or counter clockwise to lengthen, to raise or lower control handle.

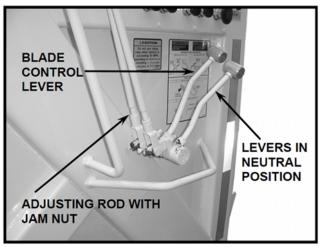


Figure 15 TAILGATE CONTROL LEVER

#### **INSPECT PROXIMITY SWITCHES**

See **Proximity Switch Troubleshooting** for recommended procedures for inspecting proximity switches.

#### **TAILGATE LUBRICATION**

See Grease Lubrication Recommendation and Body Lubrication Guidein this section.

#### **CLEAN AND INSPECT THE TAILGATE SEAL**

Periodically check the tailgate seal to make sure it mates properly with the body and inspect for possible wear, damage or leaking. Replace the seal as necessary. See the figure below.

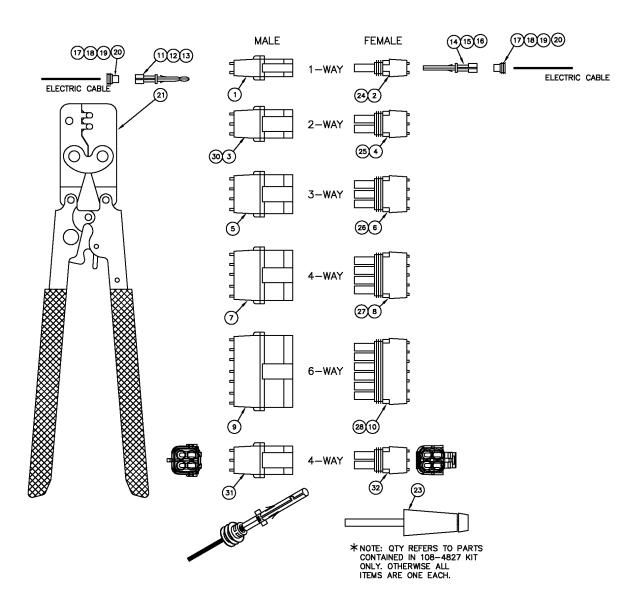


Figure 16. Tailgate Seal

# **SCHEMATICS**

**Service Manual** 

### **PACKARD CONNECTION KIT, 108-4827**



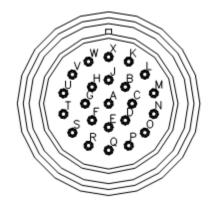
#### **Service Manual**

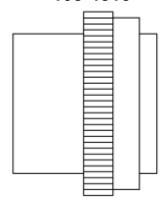
## **PACKARD CONNECTION KIT, 108-4827**

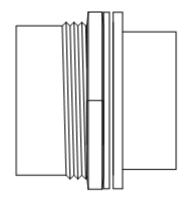
| ITEM | PART NO.     | DESCRIPTION                   | EFF | QTY |
|------|--------------|-------------------------------|-----|-----|
| -    | 108-4827     | KIT, Packard connection       |     | REF |
| 1    | 108-4827-001 | CONNECTION, 1-Way Male        |     | 20  |
| 2    | 108-4827-002 | CONNECTION, 1-Way Female      |     | 20  |
| 3    | 108-4827-003 | CONNECTION, 2-Way Male        |     | 20  |
| 4    | 108-4827-004 | CONNECTION, 2-Way Female      |     | 20  |
| 5    | 108-4827-005 | CONNECTION, 3-Way Male        |     | 20  |
| 6    | 108-4827-006 | CONNECTION, 3-Way Female      |     | 20  |
| 7    | 108-4827-007 | CONNECTION, 4-Way Male        |     |     |
| 8    | 108-4827-008 | CONNECTION, 4-Way Female      |     | 20  |
| 9    | 108-4827-009 | CONNECTION, 6-Way Male        |     | 20  |
| 10   | 108-4827-010 | CONNECTION, 6-Way Female      |     | 20  |
| 11   | 108-4827-110 | TERMINAL, Male (18-20 AWG)    |     |     |
| 12   | 108-4827-111 | TERMINAL, Male (16-14 AWG)    |     |     |
| 13   | 108-4827-112 | TERMINAL, Male (10-12 AWG)    |     |     |
| 14   | 108-4827-120 | TERMINAL, Female (18-20 AWG)  |     | 60  |
| 15   | 108-4827-121 | TERMINAL, Female (16-14 AWG)  |     | 200 |
| 16   | 108-4827-122 | TERMINAL, Female (10-12 AWG)  |     | 60  |
| 17   | 108-4827-130 | SEAL, Cable – (20 GA)         |     |     |
| 18   | 108-4827-131 | SEAL, Cable – (18 GA)         |     |     |
| 19   | 108-4827-132 | SEAL, Cable – (16-14 GA)      |     |     |
| 20   | 108-4827-133 | SEAL, Cable – (12 GA)         |     |     |
| 21   | 108-4827-134 | PLUG, Cavity                  |     |     |
| 22   | 108-4828-001 | TOOL, Installation            |     |     |
| 23   | 108-4828-002 | TOOL, Removal                 |     |     |
| 24   | 108-4827-014 | SEAL, 1-Way Female Connection |     |     |
| 25   | 108-4827-015 | SEAL, 2-Way Female Connection |     |     |
| 26   | 108-4827-016 | SEAL, 3-Way Female Connection |     |     |
| 27   | 108-4827-017 | SEAL, 4-Way Female Connection |     |     |
| 28   | 108-4827-018 | SEAL, 6-Way Female Connection |     |     |
| 29   | 108-4827-200 | GREASE, Trucklite, NYK        |     |     |
| 30   | 108-4827-020 | CONNECTION, 2-Way Male        |     |     |
| 31   | 108-4827-211 | CONNECTION, 4 Way Male        |     |     |
| 32   | 108-4827-212 | CONNECTION, 4 Way Female      |     | A/R |

**Service Manual** 

## CONNECTORS, PLUGS, PINS AND ACCESSORIES FOR DEUTSCH ELECTRICAL PARTS, 108-4815







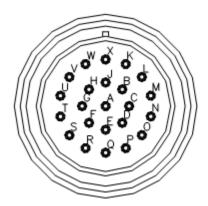
#### PINS AND SOCKETS

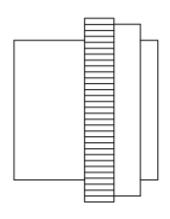
| 108 <del>-4</del> 815-101  | PIN (6 GA)              |
|--|-------------------------|
| 108-4815-102   | SOCKET (6 GA)           |
| 108-4815-103   | SEALING PLUG (6 GA)     |
| 108-4815-104   | PIN (8-10 GA)           |
| 108-4815-105   | SOCKET (8-10 GA)        |
| 108-4815-106   | SEALING PLUG (8-10 GA)  |
| 108-4815-107   | PIN (12-14 GA)          |
| 108-4815-108   | SOCKET (12-14 GA)       |
| 108-4815-101<br>108-4815-102<br>108-4815-103<br>108-4815-104<br>108-4815-105<br>108-4815-106<br>108-4815-107<br>108-4815-108<br>108-6461-100<br>108-4815-111<br>108-6461-100<br>108-4815-112<br>108-4815-113<br>108-4815-114<br>108-4815-300<br>108-4815-301<br>108-4815-302 | SEALING PLUG (12-14 GA) |
| 108 <del>-4</del> 815-110  | PIN (16-18 GA)          |
| 108-4515-111   | SOCKET (16-18 GA)       |
| 108-6461-100   | SEALING PLUG (16-18 GA) |
| 108-4815-112   | PIN (20-24 GA)          |
| 108-4815-113   | SOCKET (20-24 GA)       |
| 108-4815-114   | SEALING PLUG (20-24 GA) |
| 108-4815-300   | SOCKET (10 GA)          |
| 108-4815-301   | SOCKET (12-14 GA)       |
| 108-4815-302   | SOCKET (12-16 GA)       |
| 108-4815-303   | SOCKET (14-18 GA)       |
| 108-4815-303<br>108-4815-304<br>108-4815-400<br>108-4815-401<br>108-4815-402   | SOCKET (16-22 GA)       |
| 108-4815-400   | PIN (10 GA)             |
| 108 <del>-4</del> 815 <del>-4</del> 01   | PIN (12-14 GA)          |
| 108-4815-402   | PIN (12-16 GA)          |
| 100-4015-403   | PIN (14-18 GA)          |
| 108-4815-404   |                         |
| 108-4815-405   | PIN (16-18 GA)          |
| 108-4815-407   | SOCKET (16-18 GA)       |
|  |                         |

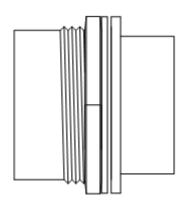
#### **GOLD PINS & SOCKETS**

| PIN (12-14 GA)    |
|-------------------|
| SOCKET (12-14 GA) |
| PIN (14-16 GA)    |
| SOCKET (14-16 GA) |
| PIN (16-18 GA)    |
| SOCKET (16-18 GA) |
| PIN (20-24 GA)    |
| SOCKET (20-24 GA) |
|                   |

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#### PLASTIC CONNECTOR SHELLS

| 108-4815-018 | 8 (Socket) PLUG (12 GA) |
|--------------|-------------------------|
| 108-4815-020 | 21-PIN RÉCEPTACLE       |
| 108-4815-021 | 21-PIN SOCKET           |
| 108-4815-022 | 19-PIN RECEPTACLE       |
| 108-4815-023 | 19-PIN SOCKET           |
| 108-4815-024 | 23-PIN RECEPTACLE       |
| 108-4815-025 | 23-PIN SOCKET           |
| 108-4815-030 | 31 PIN RECEPTACLE       |
| 108-4815-031 | 31 SOCKET PLUG          |
| 108-4815-032 | 16 PIN PLUG             |
| 108-4815-033 | 16 SOCKET RECEPTACLE    |
| 108-4815-034 | 16 PIN RECEPTACLE       |
| 108-4815-035 | 16 SOCKET RECEPTACLE    |
| 108-4815-036 | 16 PIN RECEPTACI E      |

108-4815-036 16 PIN RECEPTACLE
108-4815-037 29 PIN RECEPTACLE
108-4815-038 9 SOCKET RECEPTACLE
108-4815-068 29 SOCKET PLUG WITH RING ADAPTER
108-4815-069 9 SOCKET PLUG WITH RING ADAPTER
108-4815-070 8 PIN RECEPTACLE (12-16)

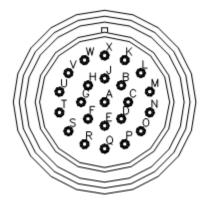
108-4815-071 8 PIN PLUG (12-16) 108-4815-420 21 PIN RECEPTACLE 108-4815-430 31 PIN RECEPTACLE 108-4815-424 23 PIN RECEPTACLE 108-4815-425 9 PIN PLUG 108-4815-432 9 PIN RECEPTACLE 108-4815-431 21 PIN PLUG

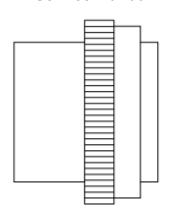
108-4815-019 14 PIN PLUG 108-4815-200 47 PIN PLUG 108-4815-201 47 PIN RECEPTACLE 108-4815-202 47 PIN RECEPTACLE 108-4815-203 21 PIN PLUG

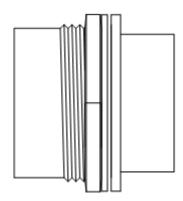
#### **ACCESSORIES**

| 108-4815-150 | PANEL NUT, 24 SHELL       |
|--------------|---------------------------|
| 108-4815-151 | LOCKWASHER, 24 SHELL      |
| 108-4815-152 | STRAIN RELIEF STRAIGHT 24 |
| 108-4815-153 | STRAIN RELIEF 90° 24      |
| 108-4815-154 | PANEL NUT, 18 SHELL       |
| 108-4815-155 | LOCKWASHER, 18 SHELL      |
| 108-4815-156 | STRAIN RELIEF STRAIGHT 18 |
| 108-4815-157 | STRAIN RELIEF 90° 18      |

#### **Service Manual**







#### **ACCESSORIES - Continued**

| 108-4815-158<br>108-4815-159 | REMOVAL TOOL (6 GA)<br>REMOVAL TOOL (8-10 GA) |
|------------------------------|---|
| 108-4815-160                 | REMOVAL TOOL (12-14 GA)                       |
| 108 <del>-4</del> 815-161    | REMOVAL TOOL (16-18 GA)                       |
| 108-4815-162                 | REMOVAL TOOL (20-24 GA)                       |
| 108-4815-163                 | CRIMP TOOL (12-24 GA)                         |
| 108-4815-164                 | CRIMP TOOL (6-10 GA)                          |
| 108-4815-165                 | RECEPTACLE CAP. 18 PIN                        |
| 108-4815-166                 | RECEPTACLE CAP, 24 PIN                        |
| 108-4815-167                 | PLUG CAP, 18 PIN                              |
| 108-4815-168                 | PLUG CAP, 24 PIN                              |
| 108-4815-169                 | ***   |
| 108-4815-170                 | DT SCREWDRIVER TOOL                           |
| 108-4815-180                 | PANEL NUT, 18 SHELL                           |
| 108-4815-181                 | LOCKWASHER, 18 SHELL                          |
| 108-4815-186                 | BACKSHELL, 90°, 24 SHELL                      |
| 108-4815-187                 | BACKSHELL, STRAIGHT, 24                       |
| 108-4815-188                 | LG COMPRESSION BACKSHELL                      |
| 108-4815-189                 | LG COMPRESSION NUT                            |
| 108-4815-190                 | SM COMPRESSION BACKSHELL                      |
| 108-4815-191                 | SM COMPRESSIONS NUT                           |
| 108-4815-192                 | BACKSHELL, 90°, 18 SHELL                      |
| 108-4815-193                 | BACKSHELL, STRAIGHT 18                        |
|                              |   |

#### KIT 108-4815 IS COMPRISED OF THE FOLLOWING:

- 108-4815-021
- 108-4815-121
- 108-4815-124
- 108-4815-150
- 108-4815-151

#### KIT 108-4815-027 IS COMPRISED OF THE FOLLOWING:

- 108-4815-021
- 108-4815-121
- 108-4815-125

#### **Service Manual**

## **DEUTSCH CONNECTION KIT, 108-6461-PC**

| ITEM | PART NO.       | DESCRIPTION              | EFF | QTY |  |
|------|----------------|--------------------------|-----|-----|--|
| _    | 108-6461-PC    | KIT, Deutsch Connection  |     | REF |  |
| 1    | 108-6461-003P  | PLUG, 3-Way              |     | 15  |  |
| 2    | 108-6461-003PW | WEDGE, 3-Way Plug        |     | 15  |  |
| 3    | 108-6461-003PB | BOOT, 3-Way Plug         |     | 15  |  |
| 4    | 108-6461-003R  | RECEPTACLE, 3-Way        |     | 15  |  |
| 5    | 108-6461-003RW | WEDGE, 3-Way Receptacle  |     | 15  |  |
| 6    | 108-6461-003RB | BOOT, 3-Way Receptacle   |     |     |  |
| 7    | 108-6461-004P  | PLUG, 4-Way              |     |     |  |
| 8    | 108-6461-004PW | WEDGE, 4-Way Plug        |     | 3   |  |
| 9    | 108-6461-004PB | BOOT, 4-Way Plug         |     |     |  |
| 10   | 108-6461-004R  | RECEPTACLE, 4-Way        |     |     |  |
| 11   | 108-6461-004RW | WEDGE, 4-Way Receptacle  |     | 3   |  |
| 12   | 108-6461-004RB | BOOT, 4-Way Receptacle   |     |     |  |
| 13   | 108-6461-006P  | PLUG, 6-Way              |     | 3   |  |
| 14   | 108-6461-006PW | WEDGE, 6-Way Plug        |     |     |  |
| 15   | 108-6461-006PB | BOOT, 6-Way Plug         |     |     |  |
| 16   | 108-6461-006R  | RECEPTACLE, 6-Way        |     |     |  |
| 17   | 108-6461-006RW | WEDGE, 6-Way Receptacle  |     |     |  |
| 18   | 108-6461-006RB | BOOT, 6-Way Receptacle   |     |     |  |
| 19   | 108-6461-008P  | PLUG, 8-Way              |     |     |  |
| 20   | 108-6461-008PW | WEDGE, 8-Way Plug        |     |     |  |
| 21   | 108-6461-008PB | BOOT, 8-Way Plug         |     |     |  |
| 22   | 108-6461-008R  | RECEPTACLE, 8-Way        |     |     |  |
| 23   | 108-6461-008RW | WEDGE, 8-Way Receptacle  |     |     |  |
| 24   | 108-6461-008RB | BOOT, 8-Way Receptacle   |     |     |  |
| 25   | 108-6461-012P  | PLUG, 12-Way             |     |     |  |
| 26   | 108-6461-CPW   | WEDGE, 12-Way Plug       |     |     |  |
| 27   | 108-6461-CPB   | BOOT, 12-Way Boot        |     | 3   |  |
| 28   | 108-6461-012R  | RECEPTACLE, 12-Way       |     |     |  |
| 29   | 108-6461-CRW   | WEDGE, 12-Way Receptacle |     |     |  |
| 30   | 108-6461-CRB   | BOOT, 12-Way Receptacle  |     |     |  |
| 31   | 108-6461-100   | PLUG, Sealing            |     |     |  |
| 32   | 108-6461-101   | PIN, Gold Plated         |     |     |  |
| 33   | 108-6461-102   | SOCKET, Gold Plated      |     |     |  |
| 34   | 108-6461-200   | CRIMPER, Production      |     |     |  |
| 35   | 108-6461-201   | CRIMPER, Field Kit       |     |     |  |
| 36   | 108-6461-202   | REMOVAL TOOL             |     |     |  |
|      |                |                          |     |     |  |

#### **Service Manual**

## **DEUTSCH DT SERIES CONNECTOR KITS, 108-8411**

| ITEM | PART NO.     | DESCRIPTION                        | QTY |
|------|--------------|------------------------------------|-----|
| _    | 108-8411     | KITS, Deutsch Connector, DT Series | REF |
| 1    | 108-8411-001 | KIT, Deutsch Connector, DT Series  | REF |
| -    | 108-8411-02R | RECEPTACLE, 2-Way                  | 1   |
| -    | 108-4815-120 | PIN, Gold 12 AWG                   | 2   |
| -    | 108-8411-2RW | RECEPTACLE, 2-Way Wedge            | 1   |
| -    | 108-6461-100 | PLUG, Sealing                      | 2   |
| -    | 108-8411-2RB | BOOT, Receptacle                   |     |
| 2    | 108-8411-002 | KIT, Deutsch Connector, DT Series  | REF |
| -    | 108-8411-02P | PLUG, 2-Way                        |     |
| -    | 108-4815-121 | PIN, Gold 12 AWG                   |     |
| -    | 108-8411-2PW | PLUG, 2-Way Wedge                  |     |
| -    | 108-6461-100 | PLUG, Sealing                      |     |
| -    | 108-8411-2RB | BOOT, Plug                         |     |
| 3    | 108-8411-003 | KIT, Deutsch Connector, DT Series  | REF |
| -    | 108-8411-04R | RECEPTACLE, 4-Way                  |     |
| -    | 108-4815-120 | PIN, Gold 12 AWG                   | 4   |
| _    | 108-8411-4RW | RECEPTACLE, 4-Way Wedge            |     |
| -    | 108-6461-100 | PLUG, Sealing                      |     |
| _    | 108-8411-4RB | BOOT, Receptacle                   |     |
| 4    | 108-8411-004 | KIT, Deutsch Connector, DT Series  |     |
| -    | 108-8411-04P | PLUG, 4-Way                        |     |
| _    | 108-4815-121 | PIN, Gold 12 AWG                   |     |
| -    | 108-8411-4PW | PLUG, 4-Way Wedge                  |     |
| _    | 108-6461-100 | PLUG, Sealing                      |     |
| -    | 108-8411-4PB | BOOT, Plug                         |     |
| 5    | 108-8411-005 | KIT, Deutsch Connector, DT Series  |     |
| -    | 108-8411-22R | RECEPTACLE, 2-Way Mounted          | 1   |
| -    | 108-4815-120 | PIN, Gold 12 AWG                   | 2   |
| -    | 108-8411-2RW | RECEPTACLE, 2-Way Wedge            |     |
| -    | 108-6461-100 | PLUG, Sealing                      |     |
| _    | 108-8411-2RB | BOOT, Receptacle                   |     |
| 6    | 108-8411-006 | KIT, Deutsch Connector, DT Series  |     |
| _    | 108-8411-24R | RECEPTACLE, 4-Way Mounted          |     |
| _    | 108-4815-120 | PIN, Gold 12-AWG                   |     |
| _    | 108-8411-4RW | RECEPTACLE, 4-Way Wedge            |     |
| _    | 108-6461-100 | PLUG, Sealing                      |     |
| _    | 108-8411-4RB | BOOT. Receptacle                   |     |

#### **Service Manual**

## **DEUTSCH DT SERIES CONNECTOR KITS - BOOT, 108-6461**

| ITEM | PART NO.     | DESCRIPTION                         | EFF | QTY |
|------|--------------|-------------------------------------|-----|-----|
| _    | 108-6461     | KITS, Deutsch Connection, DT Series |     | REF |
| 1    | 108-6461-3PB | BOOT, 3-Way Plug                    |     | A/R |
| 2    | 108-6461-3RB | BOOT, 3-Way Receptacle              |     |     |
| 3    | 108-6461-4PB | BOOT, 4-Way Plug                    |     | A/R |
| 4    | 108-6461-4RB | BOOT, 4-Way Receptacle              |     |     |
| 5    | 108-6461-6PB | BOOT, 6-Way Plug                    |     | A/R |
| 6    | 108-6461-6RB | BOOT, 6-Way Receptacle              |     |     |
| 7    | 108-6461-8PB | BOOT, 8-Way Plug                    |     | A/R |
| 8    | 108-6461-8RB | BOOT, 8-Way Receptacle              |     |     |
| 9    | 108-6461-CPB | BOOT, 12-Way Plug                   |     |     |
| 10   | 108-6461-CRB | BOOT, 12-Way Receptacle             |     |     |
| 11   | 108-6461-2PB | BOOT, 2-Way Plug                    |     | A/R |
| 12   | 108-6461-2RB | BOOT 2-Way Recentacle               | _   | A/R |

#### **Service Manual**

## **DEUTSCH DT SERIES CONNECTOR KITS - STRAIGHT, 108-6461**

| ITEM | PART NO.      | DESCRIPTION                                 | EFF | QTY |
|------|---------------|---|-----|-----|
| _    | 108-6461      | KITS, Deutsch Connection, DT Series         |     | REF |
| 1    | 108-6461-001  | KIT, Deutsch Connector, DT Series, Straight |     |     |
| -    | 108-6461-03P  | PLUG, 3-Way                                 |     | 1   |
| -    | 108-6461-3PW  | PLUG, 3-Way Wedge                           |     | 1   |
| -    | 108-6461-102  | SOCKET, Gold Plated                         |     | 3   |
| -    | 108-6461-100  | PLUG, Sealing                               |     |     |
| -    | 108-6461-027  | PLUG, 3-Way Straight Backshell              |     | 1   |
| 2    | 108-6461-002  | KIT, Deutsch Connector, DT Series, Straight |     | REF |
| -    | 108-6461-03R  | RECEPTACLE, 3-Way                           |     | 1   |
| _    | 108-6461-3RW  | RECEPTACLE, 3-Way Wedge                     |     |     |
| -    | 108-6461-101  | PIN, Gold Plated                            |     |     |
| -    | 108-6461-100  | PLUG, Sealing                               |     |     |
| -    | 108-6461-015  | RECEPTACLE, 3-Way Straight Backshell        |     | 1   |
| 3    | 108-6461-003  | KIT, Deutsch Connector, DT Series, Straight |     | REF |
| _    | 108-6461-04P  | PLUG, 4-Way                                 |     |     |
| -    | 108-6461-4PW  | PLUG, 4-Way Wedge                           |     |     |
| _    | 108-6461-102  | SOCKET, Gold Plated                         |     |     |
| _    | 108-6461-100  | PLUG, Sealing                               |     |     |
| _    | 108-6461-029  | PLUG, 4-Way Straight Backshell              |     |     |
| 4    | 108-6461-004  | KIT, Deutsch Connector, DT Series, Straight |     | REF |
| -    | 108-6461-04R  | RECEPTACLE, 4-Way                           |     |     |
| -    | 108-6461-4RW  | RECEPTACLE, 4-Way Wedge                     |     | 1   |
| -    | 108-6461-101  | PIN, Gold Plated                            |     |     |
| -    | 108-6461-100  | PLUG, Sealing                               |     | 1   |
| -    | 108-6461-017  | RECEPTACLE, 4-Way Straight Backshell        |     | 1   |
| 5    | 108-6461-005  | KIT, Deutsch Connector, DT Series, Straight |     | REF |
| -    | 108-6461-06P  | PLUG, 6-Way                                 |     |     |
| -    | 108-6461-6PW  | PLUG, 6-Way Wedge                           |     | 1   |
| -    | 108-6461-102  | SOCKET, Gold Plated                         |     |     |
| -    | 108-6461-100  | PLUG, Sealing                               |     |     |
| -    | 108-6461-031  | PLUG, 6-Way Straight Backshell              |     | 1   |
| 6    | 108-6461-006  | KIT, Deutsch Connector, DT Series, Straight |     | REF |
| -    | 108-6461-06R  | RECEPTACLE, 6-Way                           |     | 1   |
| -    | 108-6461-6RW  | RECEPTACLE, 6-Way Wedge                     |     | 1   |
| -    | 108-6461-101  | PIN, Gold Plated                            |     |     |
| -    | 108-6461-100  | PLUG, Sealing                               |     |     |
| -    | 108-6461-019  | RECEPTACLE, 6-Way Straight Backshell        |     | 1   |
| 7    | 108-6461-007  | KIT, Deutsch Connector, DT Series, Straight |     | REF |
| -    | 108-6461-08P  | PLUG, 8-Way                                 |     |     |
| -    | 108-6461-08PW | PLUG, 8-Way Wedge                           |     |     |
| -    | 108-6461-102  | SOCKET, Gold Plated                         |     |     |
| -    | 108-6461-100  | PLUG, Sealing                               |     |     |
| _    | 108-6461-033  | PLUG 8-Way Straight Backshell               |     |     |

#### **Service Manual**

## **DEUTSCH DT SERIES CONNECTOR KITS - STRAIGHT - 108-6461, CONTINUED**

| ITEM | PART NO.     | DESCRIPTION                                 | EFF | QTY |
|------|--------------|---|-----|-----|
| _    | 108-6461     | KITS, Deutsch Connection, DT Series         |     | REF |
| 8    | 108-6461-008 | KIT, Deutsch Connector, DT Series, Straight |     |     |
| -    | 108-6461-08R | RECEPTACLE, 8-Way                           |     | 1   |
| -    | 108-6461-8RW | RECEPTACLE, 8-Way Wedge                     |     | 1   |
| -    | 108-6461-101 | PIN, Gold Plated                            |     | 8   |
| -    | 108-6461-100 | PLUG, sealing                               |     | 1   |
| -    | 108-6461-021 | RECEPTACLE, 8-Way Straight Backshell        |     |     |
| 9    | 108-6461-009 | KIT, Deutsch Connector, DT Series, Straight |     |     |
| -    | 108-6461-12P | PLUG, 12-Way                                |     | 1   |
| -    | 108-6461-CPW | PLUG, 12-Way Wedge                          |     | 1   |
| -    | 108-6461-102 | SOCKET, Gold Plated                         |     |     |
| -    | 108-6461-100 | PLUG, Sealing                               |     | 3   |
| -    | 108-6461-035 | PLUG, 12-Way Straight Backshell             |     | 1   |
| 10   | 108-6461-010 | KIT, Deutsch Connector, DT Series, Straight |     |     |
| -    | 108-6461-12R | RECEPTACLE, 12-Way                          |     | 1   |
| -    | 108-6461-CRW | RECEPTACLE, 12-Way Wedge                    |     | 1   |
| -    | 108-6461-101 | PIN, Gold Plated                            |     | 12  |
| -    | 108-6461-100 | PLUG, Sealing                               |     | 3   |
| -    | 108-6461-023 | RECEPTACLE, 12-Way Straight Backshell       |     |     |
| 11   | 108-6461-011 | KIT, Deutsch Connector, DT Series, Straight |     |     |
| -    | 108-6461-02P | PLUG, 2-Way                                 |     |     |
| -    | 108-6461-2PW | PLUG, 2-Way Wedge                           |     | 1   |
| -    | 108-6461-102 | SOCKET, Gold Plated                         |     |     |
| -    | 108-6461-100 | PLUG, Sealing                               |     |     |
| -    | 108-6461-025 | PLUG, 2-Way Straight Backshell              |     |     |
| 12   | 108-6461-012 | KIT, Deutsch Connector, DT Series, Straight |     |     |
| -    | 108-6461-02R | RECEPTACLE, 2-Way                           |     |     |
| -    | 108-6461-2RW | RECEPTACLE, 2-Way Wedge                     |     |     |
| -    | 108-6461-101 | PIN, Gold Plated                            |     |     |
| -    | 108-6461-100 | PLUG, Sealing                               |     |     |
| -    | 108-6461-013 | RECEPTACLE, 2-Way Straight Backshell        |     |     |
| 13   | 108-7142     | KIT, 12-Way Panel Mount Receptacle          |     | REF |

#### **Service Manual**

## **DEUTSCH DT SERIES CONNECTOR KITS - 90° - 108-6461, CONTINUED**

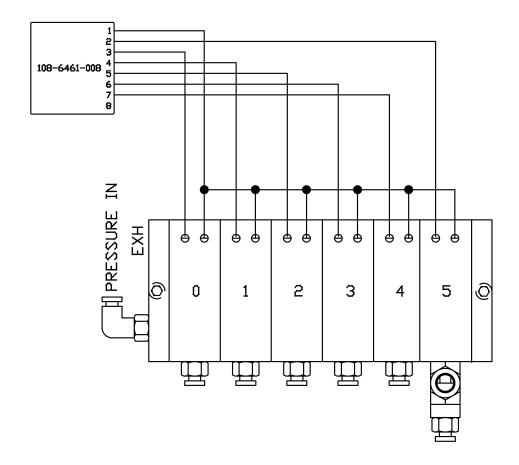
| ITEM | PART NO.     | DESCRIPTION                            | EFF | QTY |
|------|--------------|--|-----|-----|
| -    | 108-6461     | KITS, Deutsch Connection, DT Series    |     | REF |
| 1    | 108-6461-041 | KIT, Deutsch Connector, DT Series, 90° |     | REF |
| -    | 108-6461-03P | PLUG, 3-Way                            |     | 1   |
| -    | 108-6461-3PW | PLUG 3-Way Wedge                       |     | 1   |
| -    | 108-6461-102 | SOCKET, Gold Plated                    |     | 3   |
| -    | 108-6461-100 | PLUG, Sealing                          |     | 2   |
| -    | 108-6461-028 | PLUG, 3-Way, 90° Backshell             |     | 1   |
| 2    | 108-6461-042 | KIT, Deutsch Connector, DT Series, 90° |     |     |
| -    | 108-6461-03R | RECEPTACLE, 3-Way                      |     |     |
| -    | 108-6461-3RW | RECEPTACLE, 3-Way Wedge                |     |     |
| -    | 108-6461-101 | PIN, Gold Plated                       |     |     |
| -    | 108-6461-100 | PLUG, Sealing                          |     | 2   |
| -    | 108-6461-016 | RECEPTACLE, 3-Way 90° Backshell        |     | 1   |
| 3    | 108-6461-043 | KIT, Deutsch Connector, DT Series, 90° |     |     |
| -    | 108-6461-04P | PLUG, 4-Way                            |     |     |
| -    | 108-6461-4PW | PLUG, 4-Way Wedge                      |     |     |
| -    | 108-6461-102 | SOCKET, Gold Plated                    |     |     |
| -    | 108-6461-100 | PLUG, Sealing                          |     | 1   |
| -    | 108-6461-030 | PLUG, 4-Way 90° Backshell              |     | 1   |
| 4    | 108-6461-044 | KIT, Deutsch Connector, DT Series, 90° |     | REF |
| -    | 108-6461-04R | RECEPTACLE, 4-Way                      |     |     |
| -    | 108-6461-4RW | RECEPTACLE, 4-Way Wedge                |     | 1   |
| -    | 108-6461-101 | PIN, Gold Plated                       |     |     |
| -    | 108-6461-100 | PLUG, Sealing                          |     | 1   |
| -    | 108-6461-018 | RECEPTACLĚ, 4-Way 90° Backshell        |     | 1   |
| 5    | 108-6461-045 | KIT, Deutsch Connector, DT Series, 90° |     |     |
| -    | 108-6461-06P | PLUG, 6-Way                            |     |     |
| -    | 108-6461-6PW | PLUG, 6-Way Wedge                      |     |     |
| -    | 108-6461-102 | SOCKET, Gold Plated                    |     |     |
| -    | 108-6461-100 | PLUG, Sealing                          |     | 1   |
| -    | 108-6461-032 | PLUG, 6-Way 90° Backshell              |     | 1   |
| 6    | 108-6461-046 | KIT, Deutsch Connector, DT Series, 90° |     |     |
| -    | 108-6461-06R | RECEPTACLE, 6-Way                      |     |     |
| -    | 108-6461-6RW | RECEPTACLE, 6-Way Wedge                |     |     |
| -    | 108-6461-101 | PIN, Gold Plated                       |     |     |
| -    | 108-6461-100 | PLUG, Sealing                          |     | 1   |
| -    | 108-6461-020 | RECEPTACLE, 6-way 90° Backshell        |     | 1   |
| 7    | 108-6461-047 | KIT, Deutsch Connector, DT Series, 90° |     |     |
| -    | 108-6461-08P | PLUG, 8-Way                            |     |     |
| -    | 108-6461-8PW | PLUG, 8-Way Wedge                      |     |     |
| -    | 108-6461-102 | SOCKET, Gold Plated                    |     |     |
| -    | 108-6461-100 | PLUG, Sealing                          |     |     |
| -    | 108-6461-034 | PLUG, 8-Way 90° Backshell              |     | 1   |

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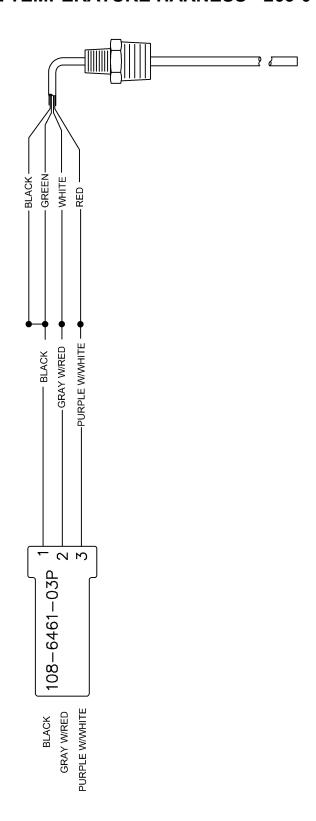
## **DEUTSCH DT SERIES CONNECTOR KITS - 90° - 108-6461, CONTINUED**

| ITEM | PART NO.     | DESCRIPTION                            | EFF | QTY |
|------|--------------|--|-----|-----|
| _    | 108-6461     | KITS, Deutsch Connection, DT Series    |     | REF |
| 8    | 108-6461-048 | KIT, Deutsch Connector, DT Series, 90° |     | REF |
| -    | 108-6461-08R | RECEPTACLE, 8-Way                      |     |     |
| -    | 108-6461-8RW | RECEPTACLE, 8-Way Wedge                |     | 1   |
| -    | 108-6461-101 | PIN, Gold Plated                       |     |     |
| -    | 108-6461-100 | PLUG, Sealing                          |     |     |
| -    | 108-6461-022 | RECEPTACLE, 8-Way 90° Backshell        |     | 1   |
| 9    | 108-6461-049 | KIT, Deutsch Connector, DT Series, 90° |     | REF |
| -    | 108-6461-12P | PLUG, 12-Way                           |     |     |
| -    | 108-6461-CPW | PLUG, 12-Way Wedge                     |     |     |
| -    | 108-6461-102 | SOCKET, Gold Plated                    |     |     |
| -    | 108-6461-100 | PLUG, Sealing                          |     | 3   |
| -    | 108-6461-036 | PLUG, 12-Way 90° Backshell             |     |     |
| 10   | 108-6461-050 | KIT, Deutsch Connector, DT Series, 90° |     |     |
| -    | 108-6461-12R | RECEPTACLE, 12-Way                     |     | 1   |
| -    | 108-6461-CRW | RECEPTACLE, 12-Way Wedge               |     | 1   |
| -    | 108-6461-101 | PIN, Gold Plated                       |     | 12  |
| -    | 108-6461-100 | PLUG, Sealing                          |     |     |
| -    | 108-6461-024 | RECEPTACLE, 12-Way 90° Backshell       |     |     |
| 11   | 108-6461-051 | KIT, Deutsch Connector, DT Series, 90° |     |     |
| -    | 108-6461-02P | PLUG, 2-Way                            |     |     |
| -    | 108-6461-2PW | PLUG, 2-Way Wedge                      |     |     |
| -    | 108-6461-102 | SOCKET, Gold Plated                    |     | 2   |
| _    | 108-6461-100 | PLUG, Sealing                          |     |     |
| _    | 108-6461-026 | PLUG, 2-Way 90° Backshell              |     |     |
| 12   | 108-6461-052 | KIT, Deutsch Connector, DT Series, 90° |     |     |
| _    | 108-6461-02R | RECEPTACLE, 2-Way                      |     |     |
| _    | 108-6461-2RW | RECEPTACLE, 2-Way Wedge                |     |     |
| _    | 108-6461-101 | PIN, Gold Plated                       |     |     |
| _    | 108-6461-100 | PLUG, Sealing                          |     |     |
| _    | 108-6461-014 | RECEPTACLE, 2-Way 90° Backshell        |     |     |

#### **SOLENOID VALVE SCHEMATIC ASSEMBLY - 108-8503-SCH**

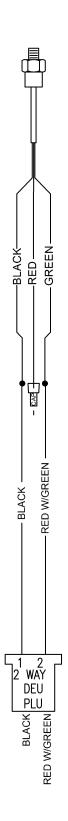


#### **OIL TEMPERATURE HARNESS - 263-0456**



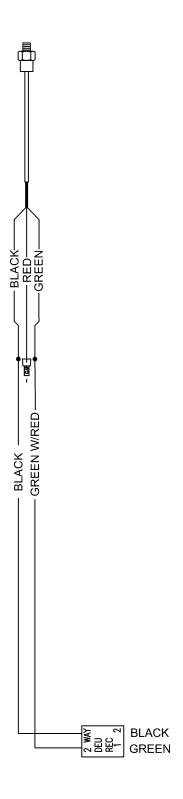
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#### **RIGHT OIL FILTER MONITOR HARNESS - 263-0457**



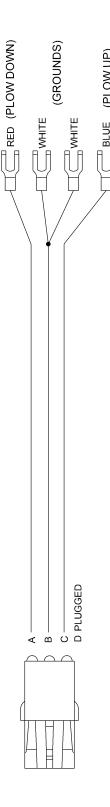
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#### **LEFT OIL FILTER MONITOR HARNESS - 263-0458**



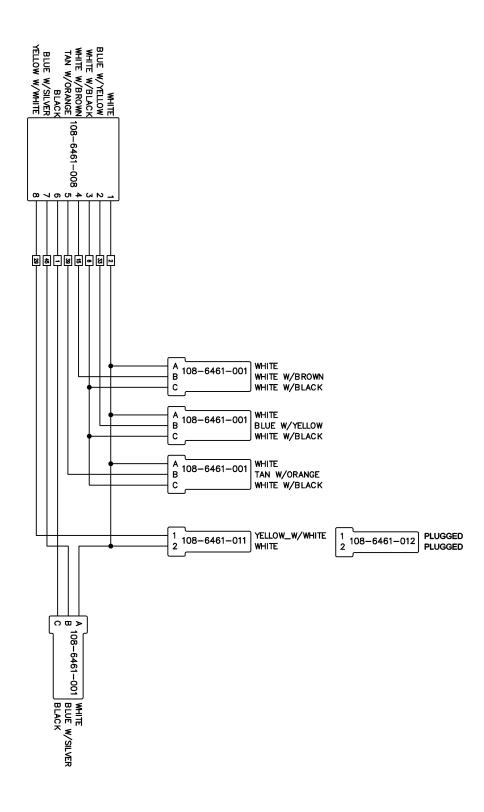
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#### **SNOW PLOW VALVE HARNESS - 263-1431**



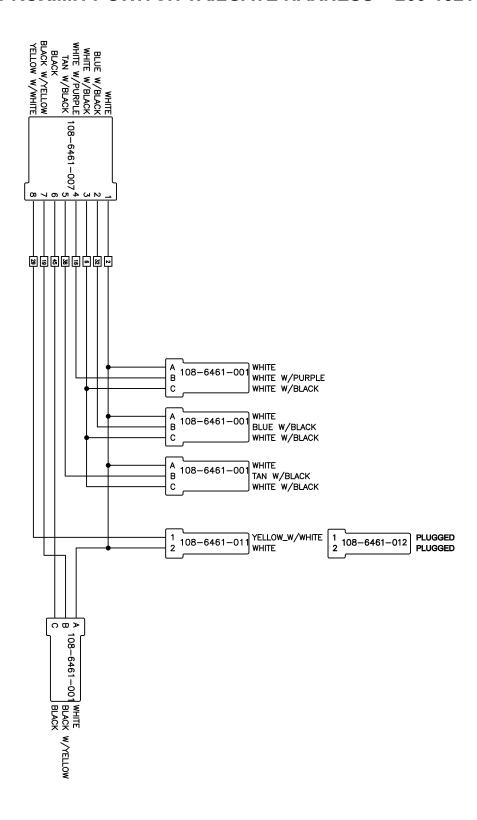
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#### SS PROXIMITY SWITCH TAILGATE HARNESS - 263-1521-001

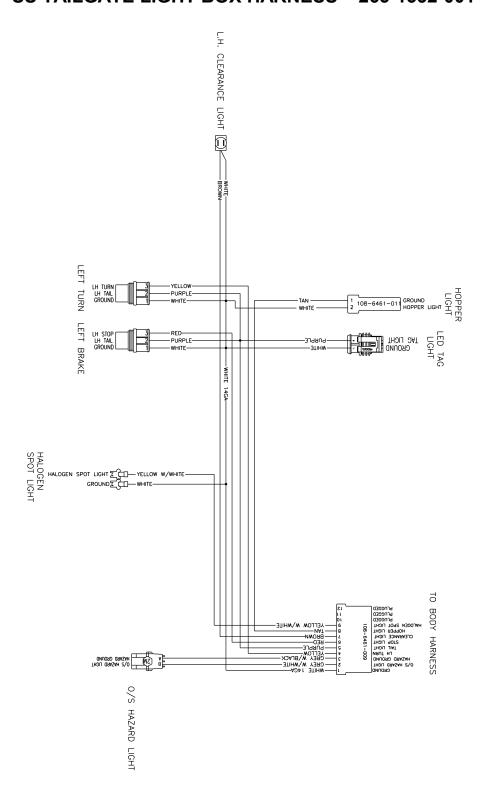


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#### CS PROXIMITY SWITCH TAILGATE HARNESS - 263-1521-002

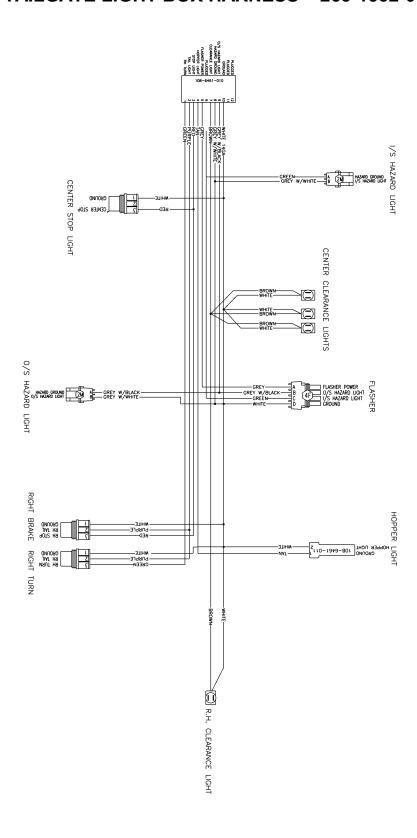


#### SS TAILGATE LIGHT BOX HARNESS - 263-1532-001

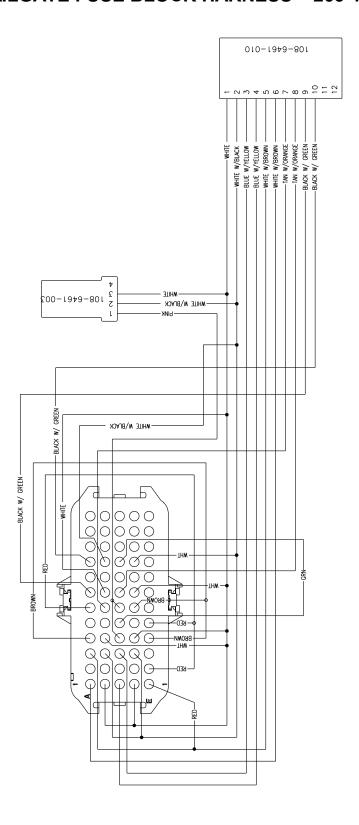


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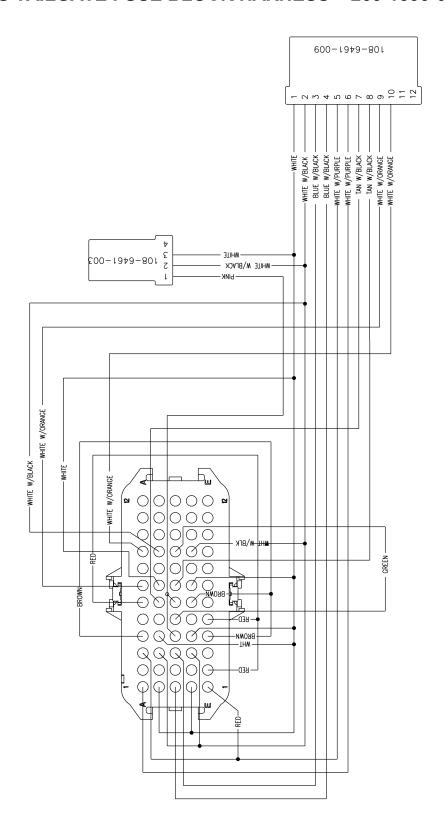
#### CS TAILGATE LIGHT BOX HARNESS - 263-1532-002



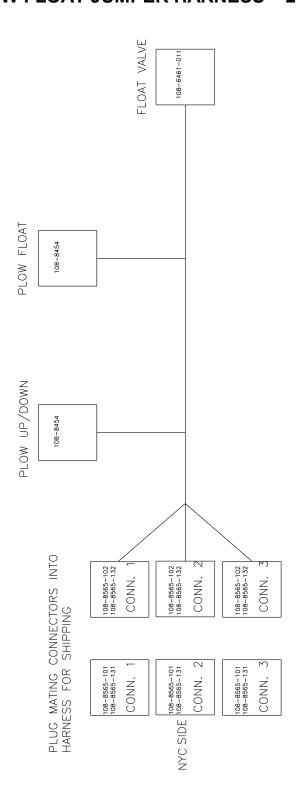
#### SS TAILGATE FUSE BLOCK HARNESS - 263-1533-001



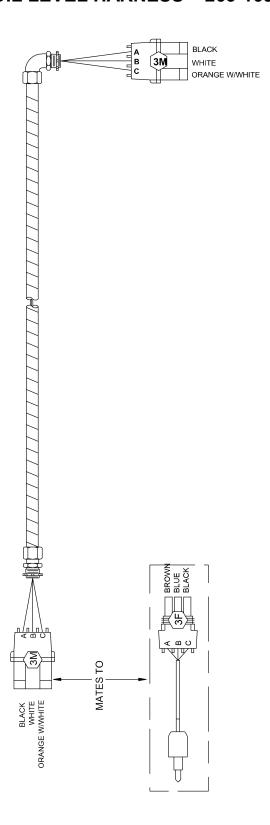
#### CS TAILGATE FUSE BLOCK HARNESS - 263-1533-002



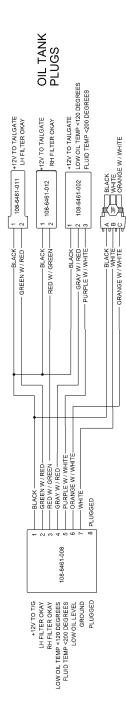
# PLOW FLOAT JUMPER HARNESS – 263-1652



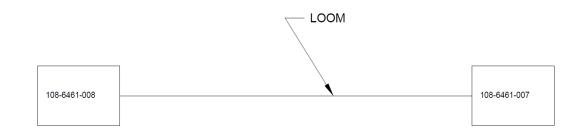
#### OIL LEVEL HARNESS - 263-1695

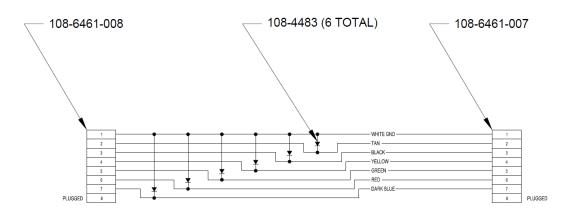


#### **OIL TANK BODY HARNESS - 263-1696**

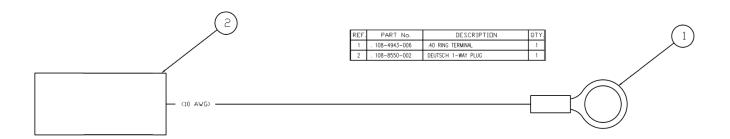


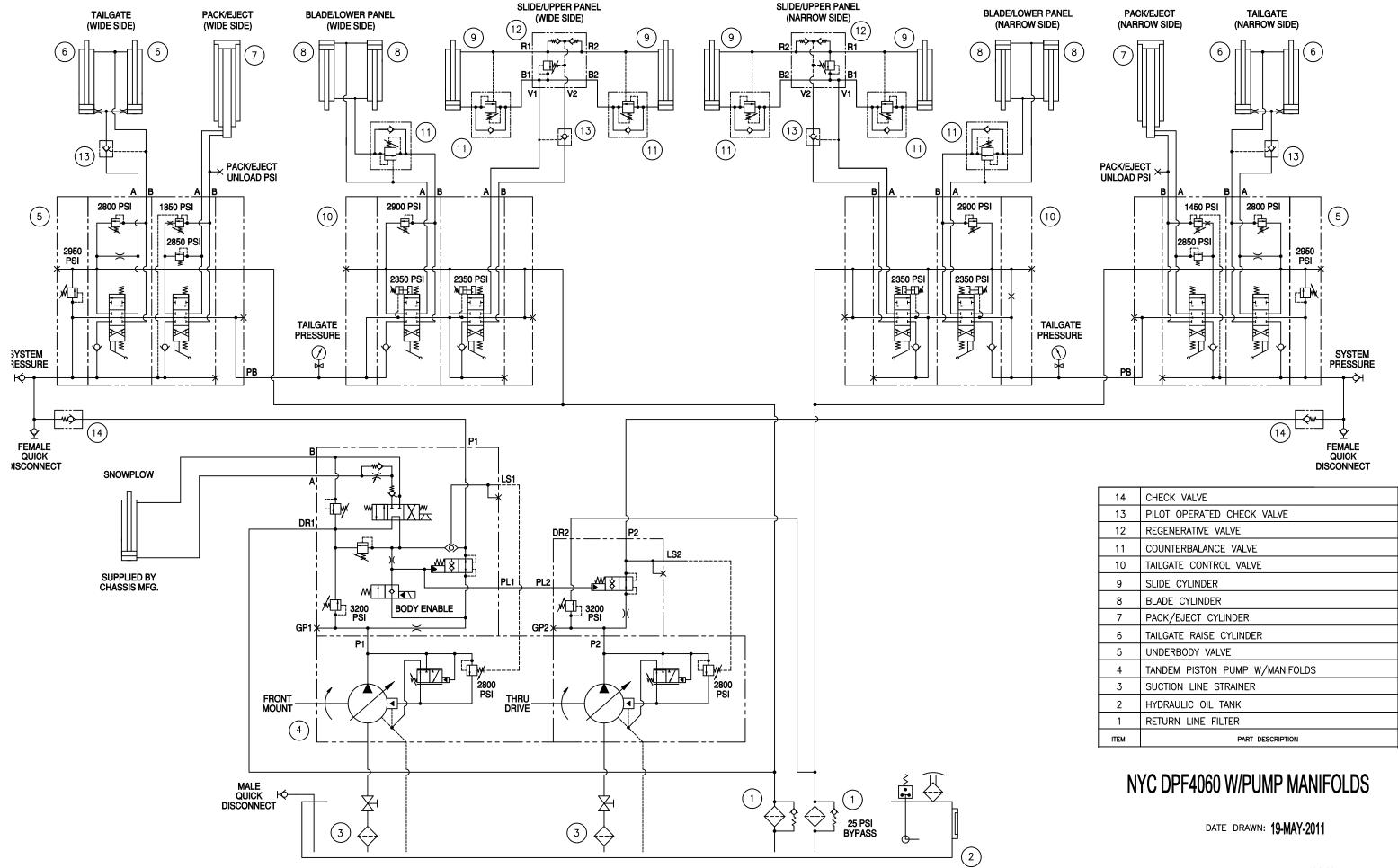
#### **TAILGATE DIODE ADAPTER HARNESS - 263-1834-001**



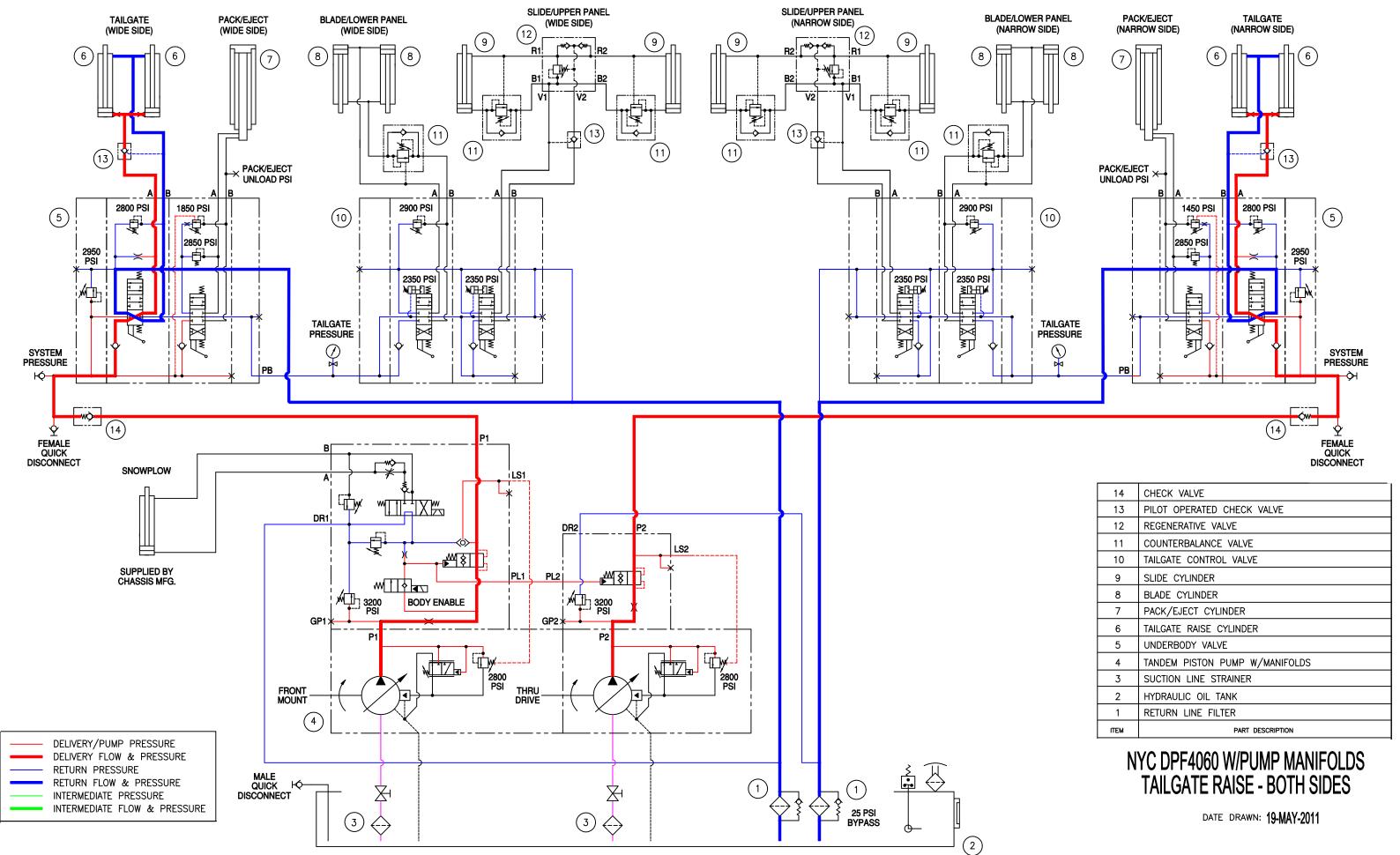


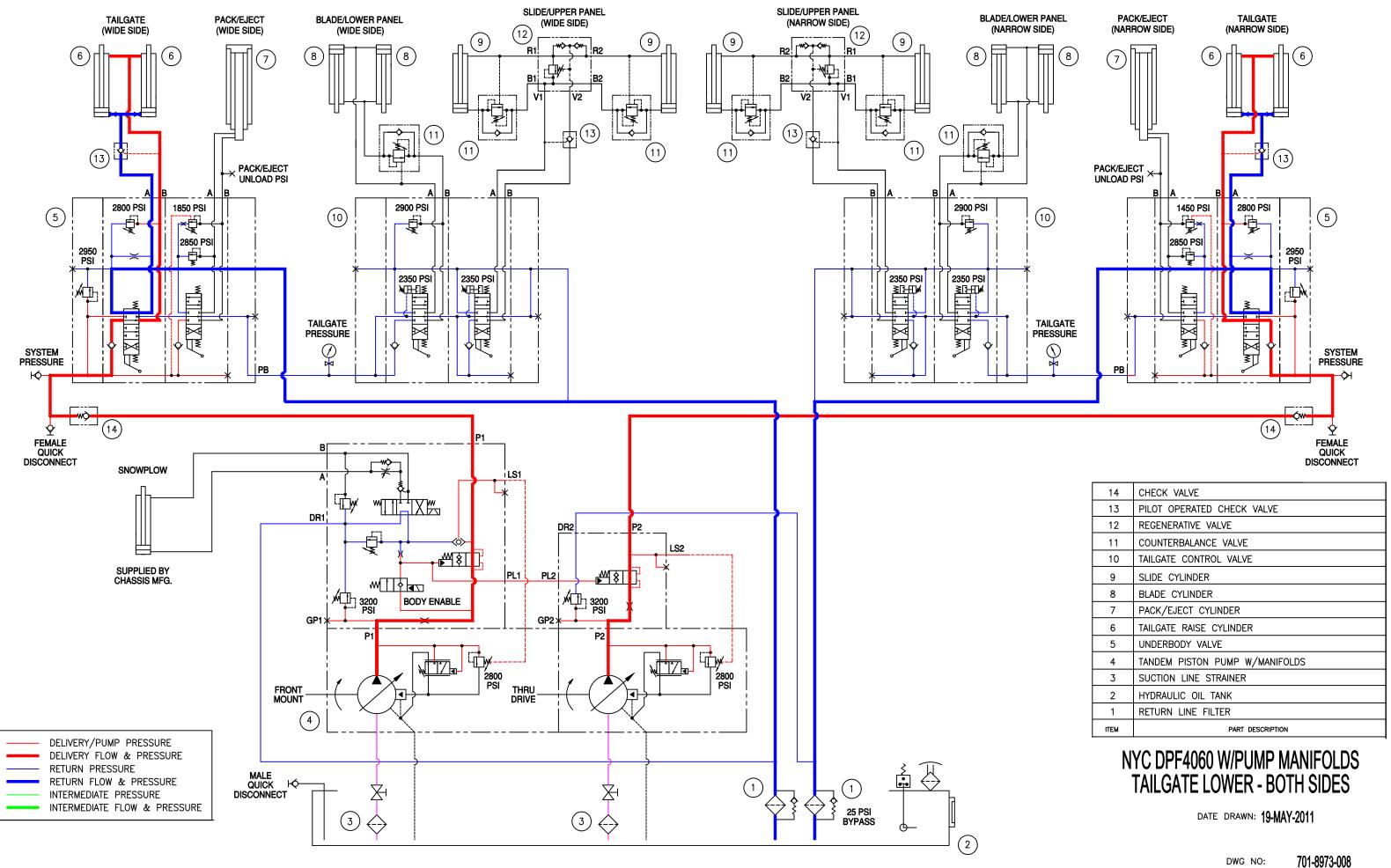
#### **GROUND PIGTAIL NYC SPLIT GATE HARNESS - 263-1697-002**



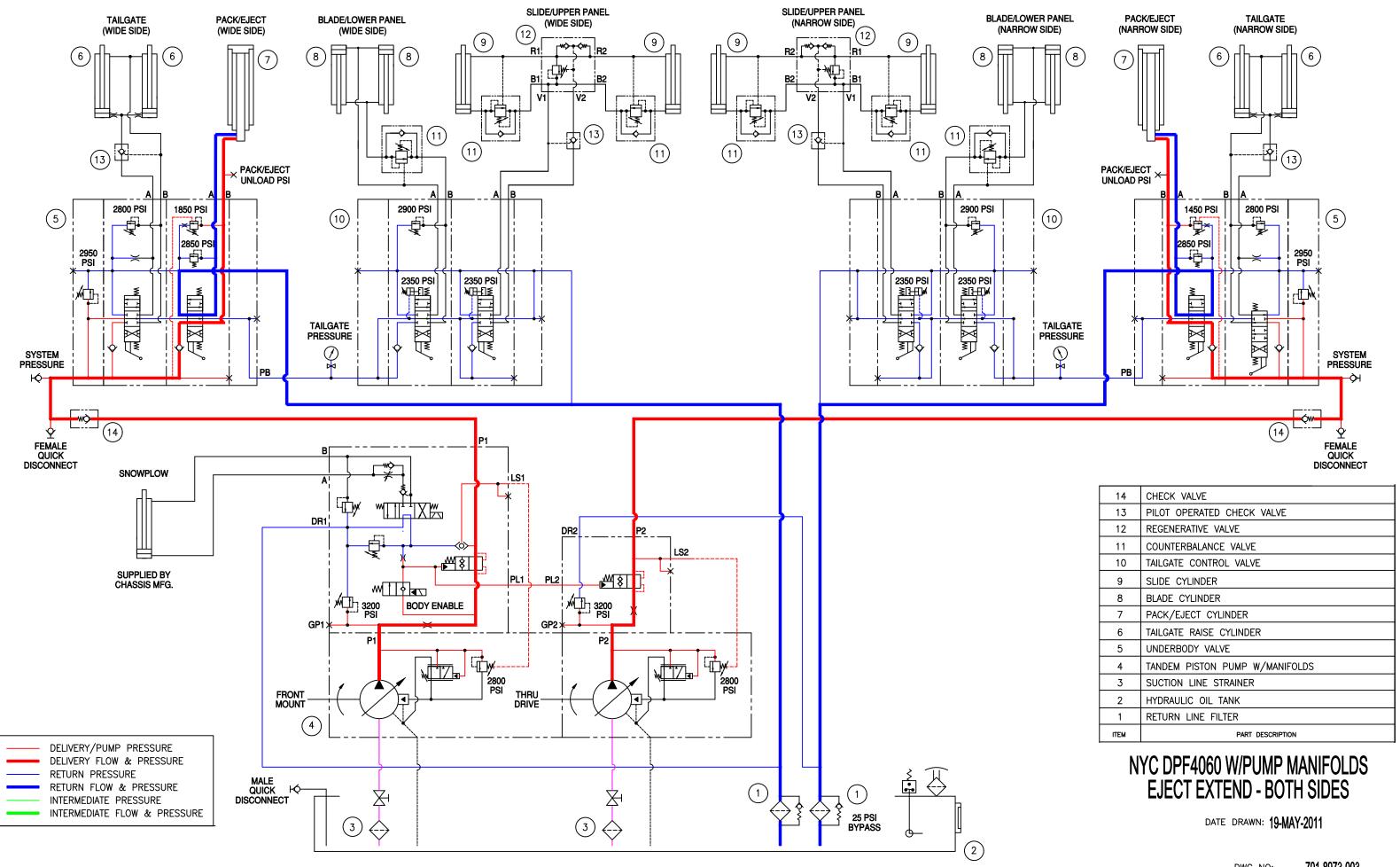


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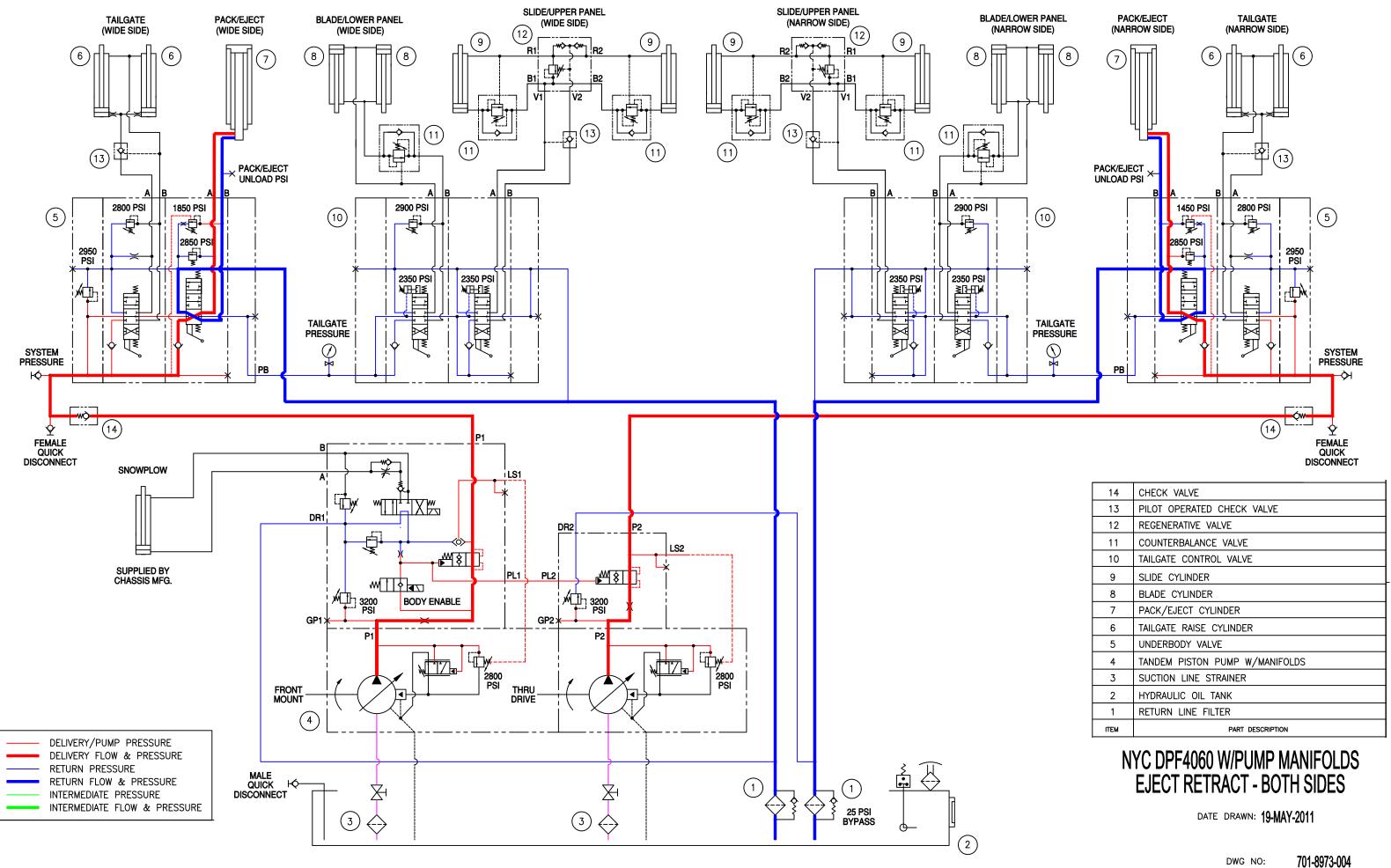


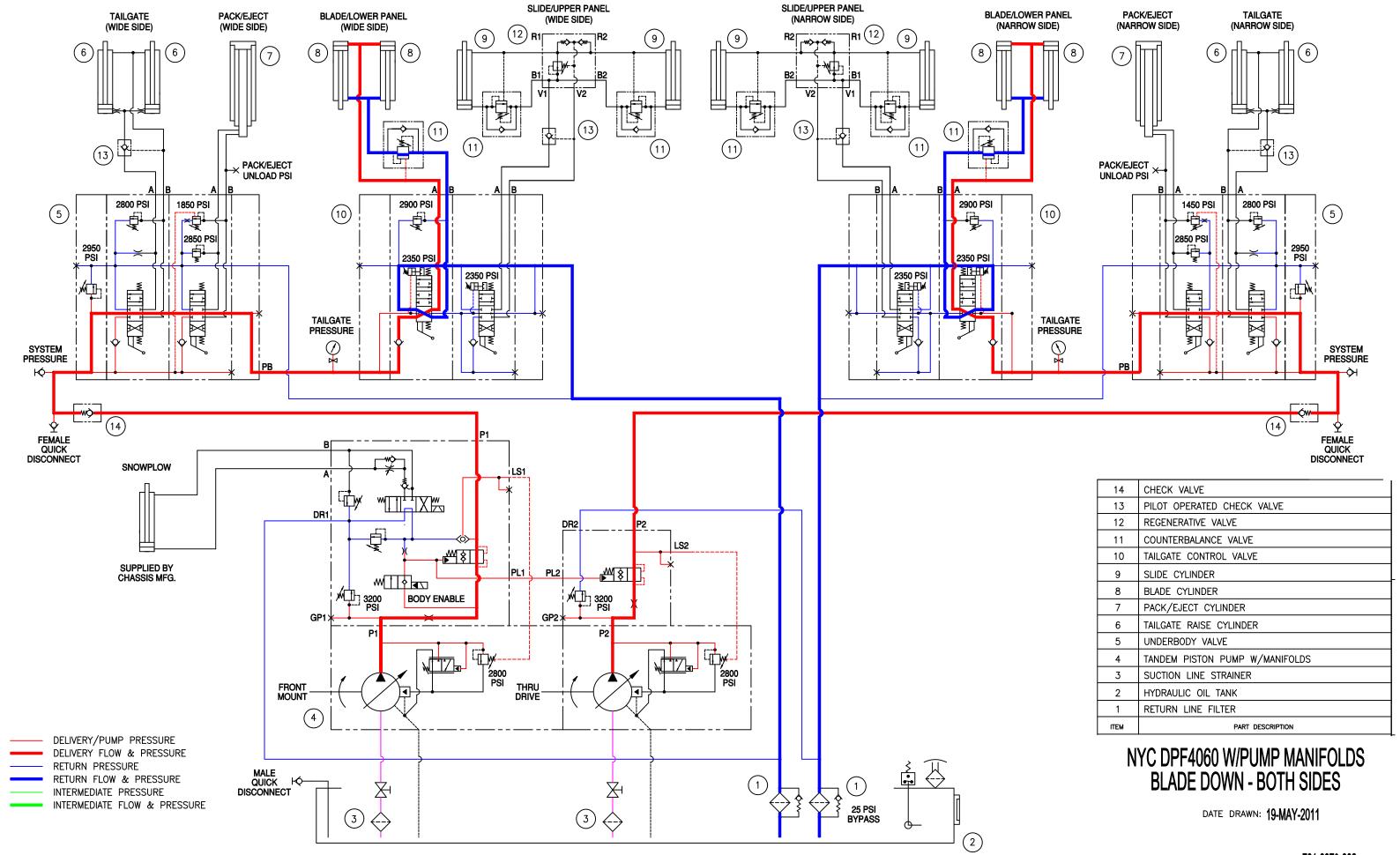
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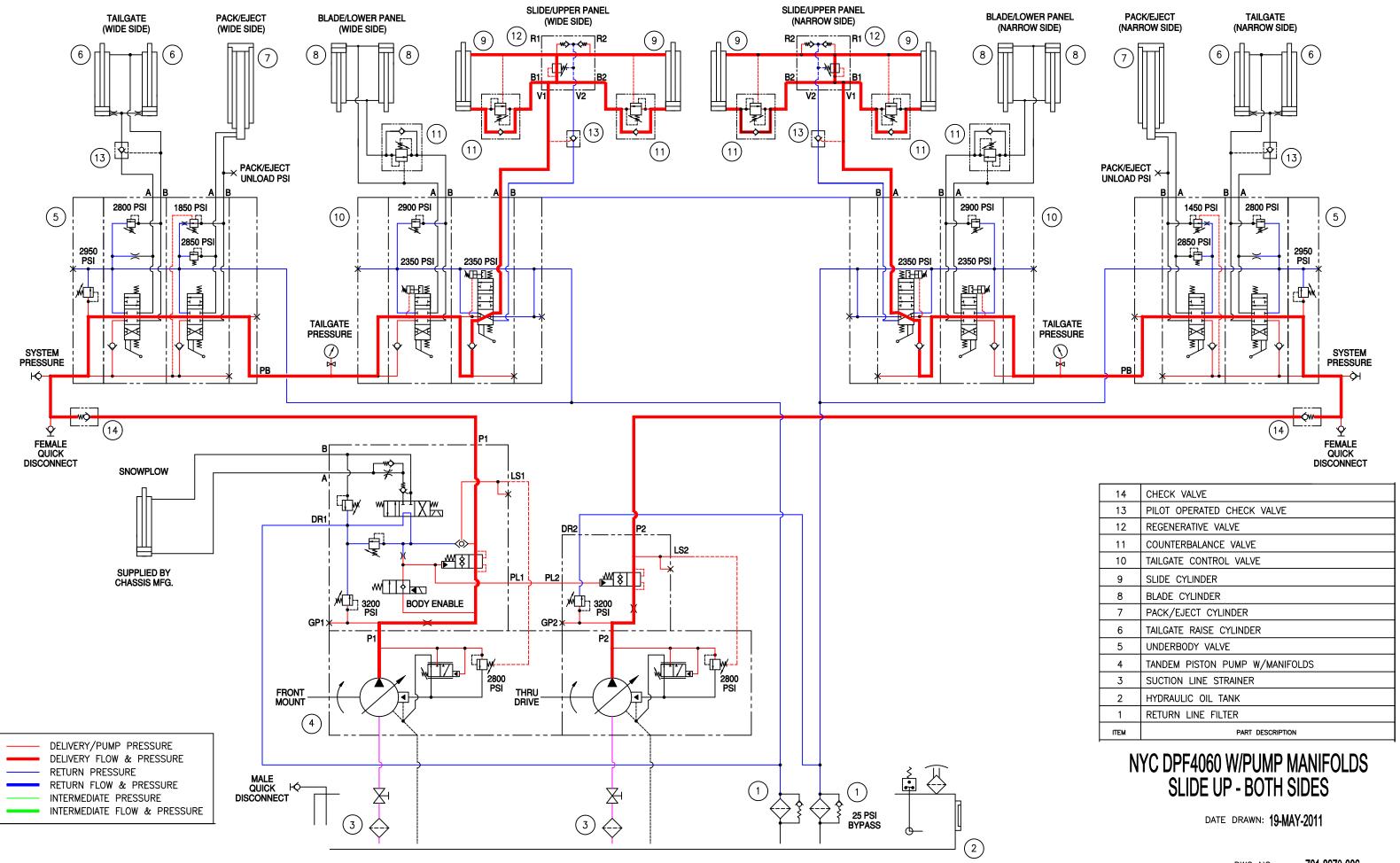


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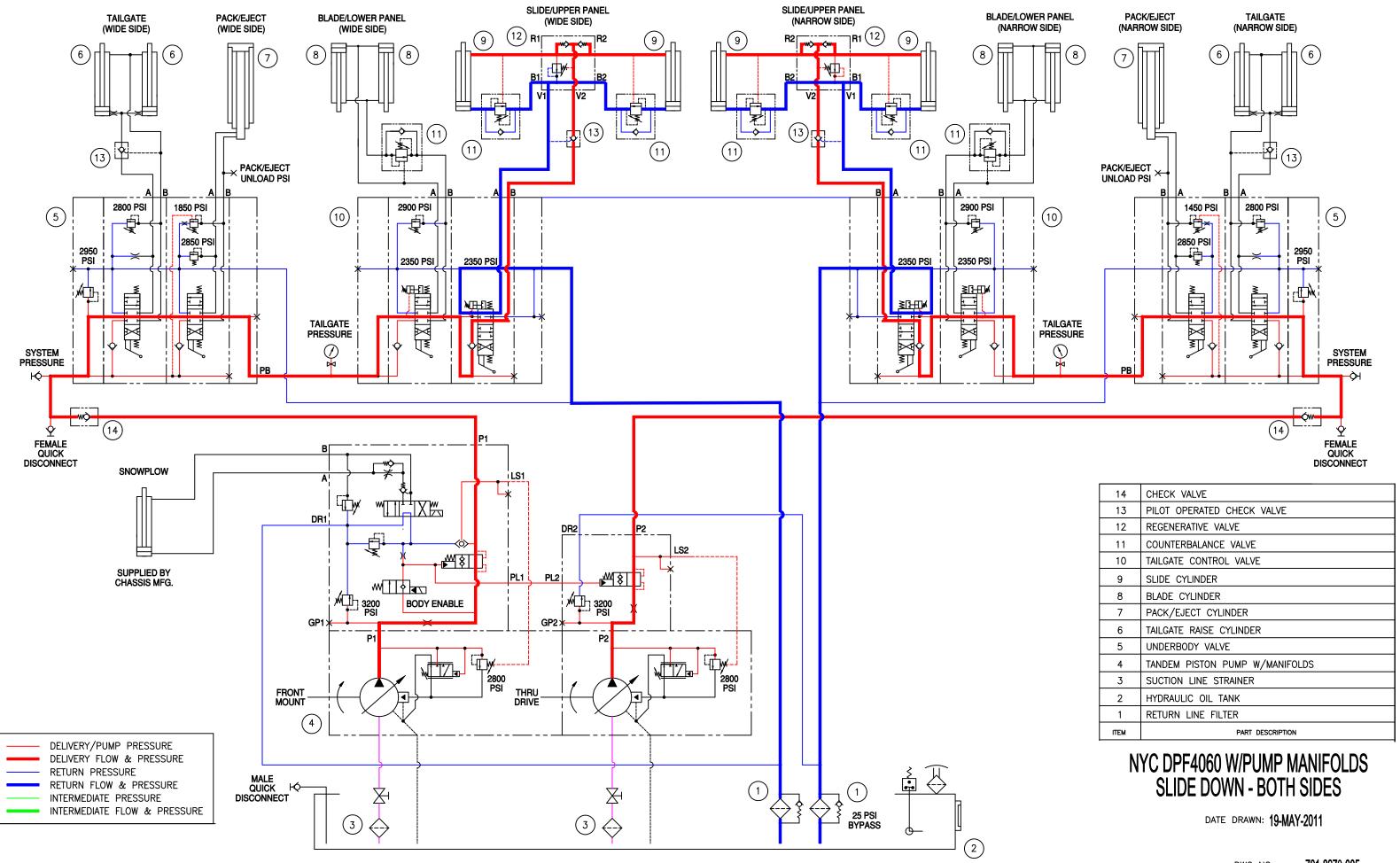
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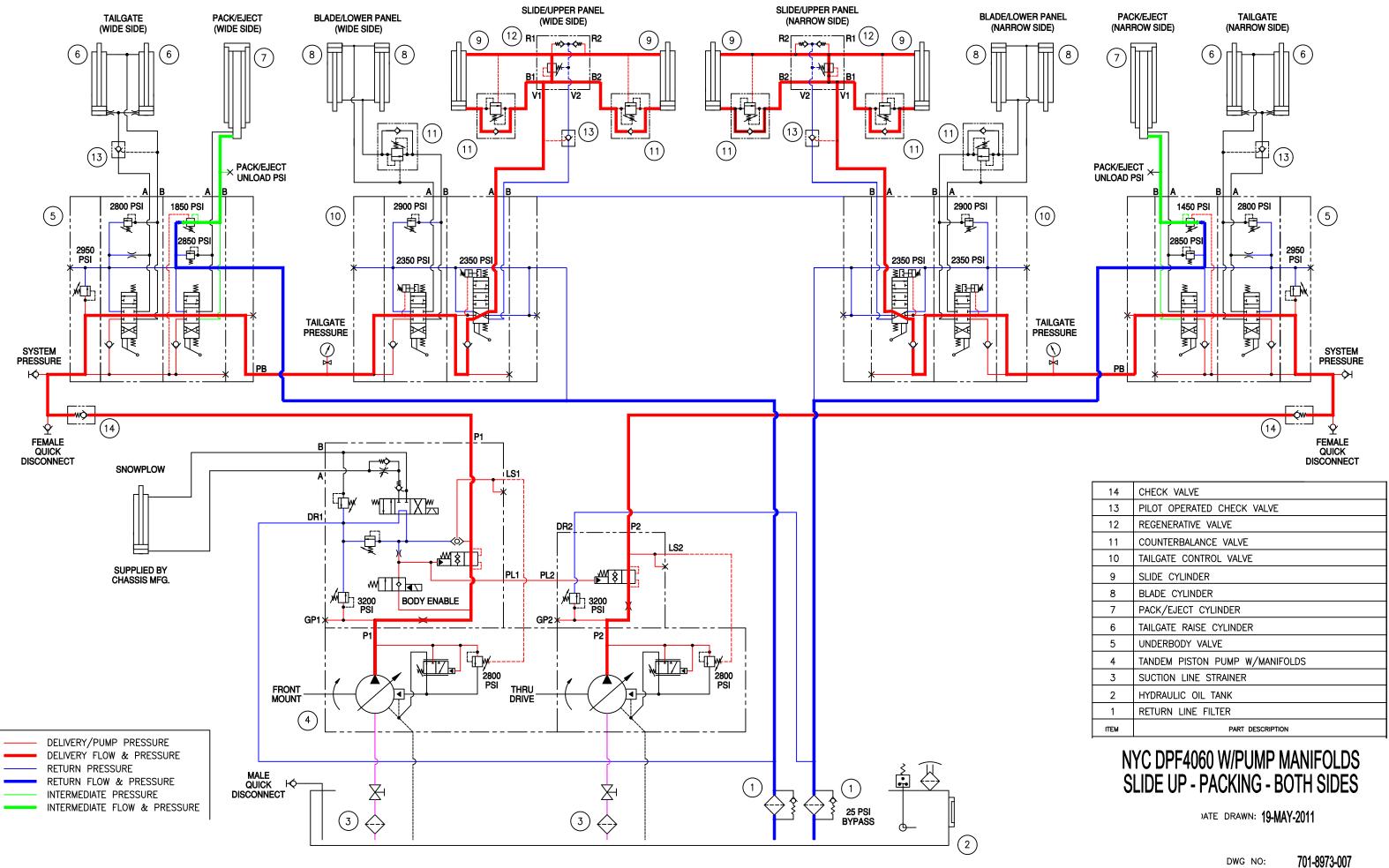


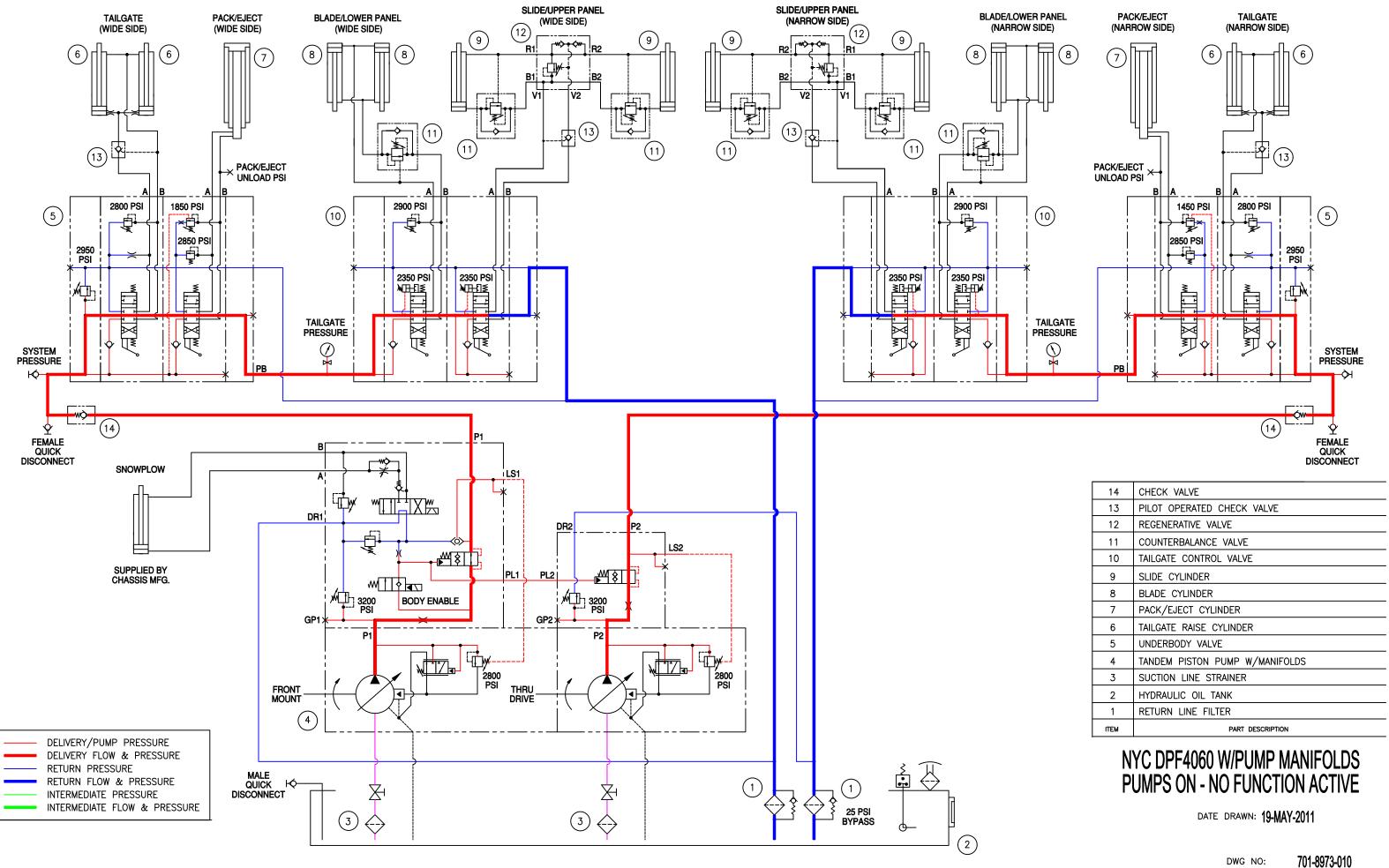


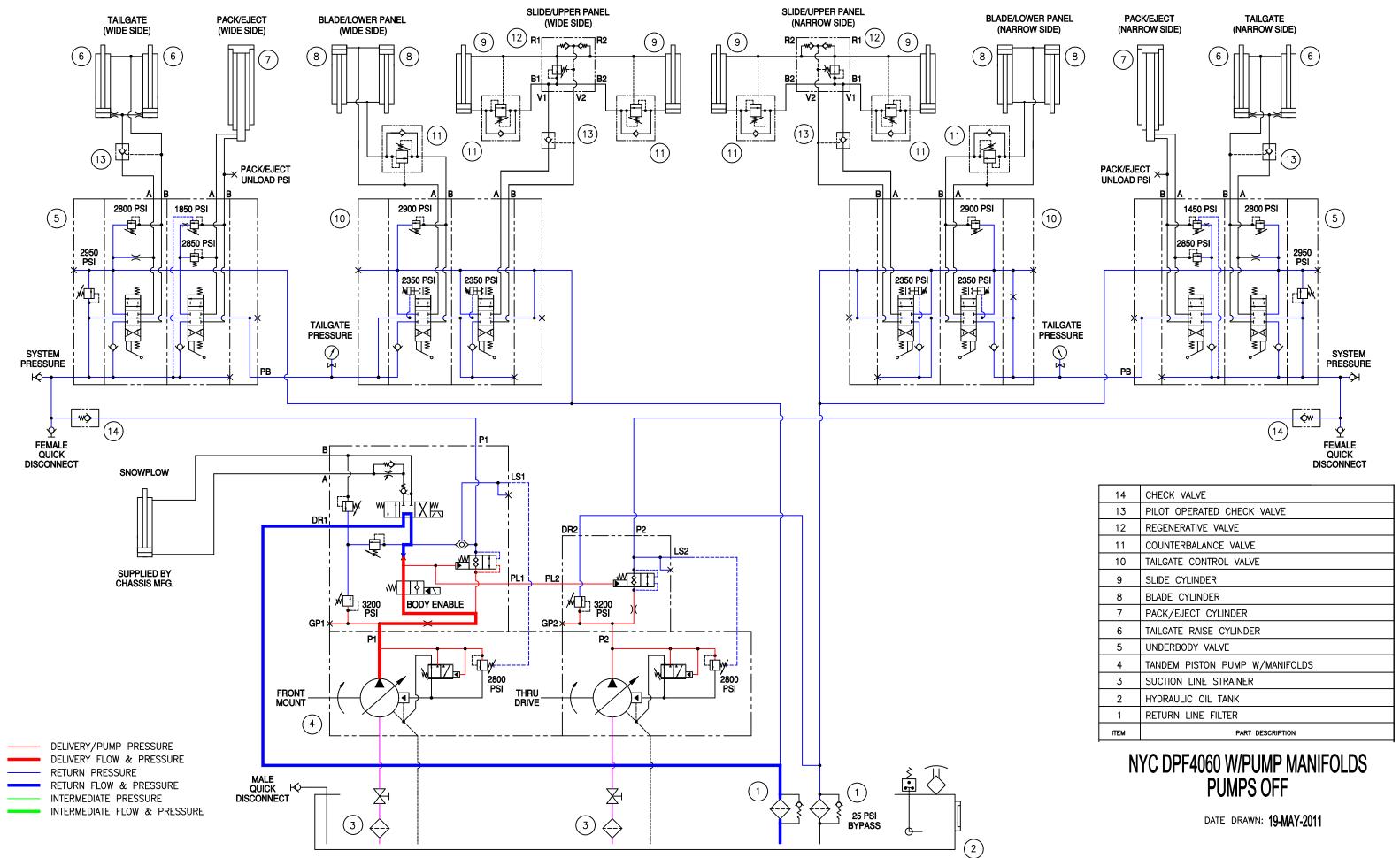


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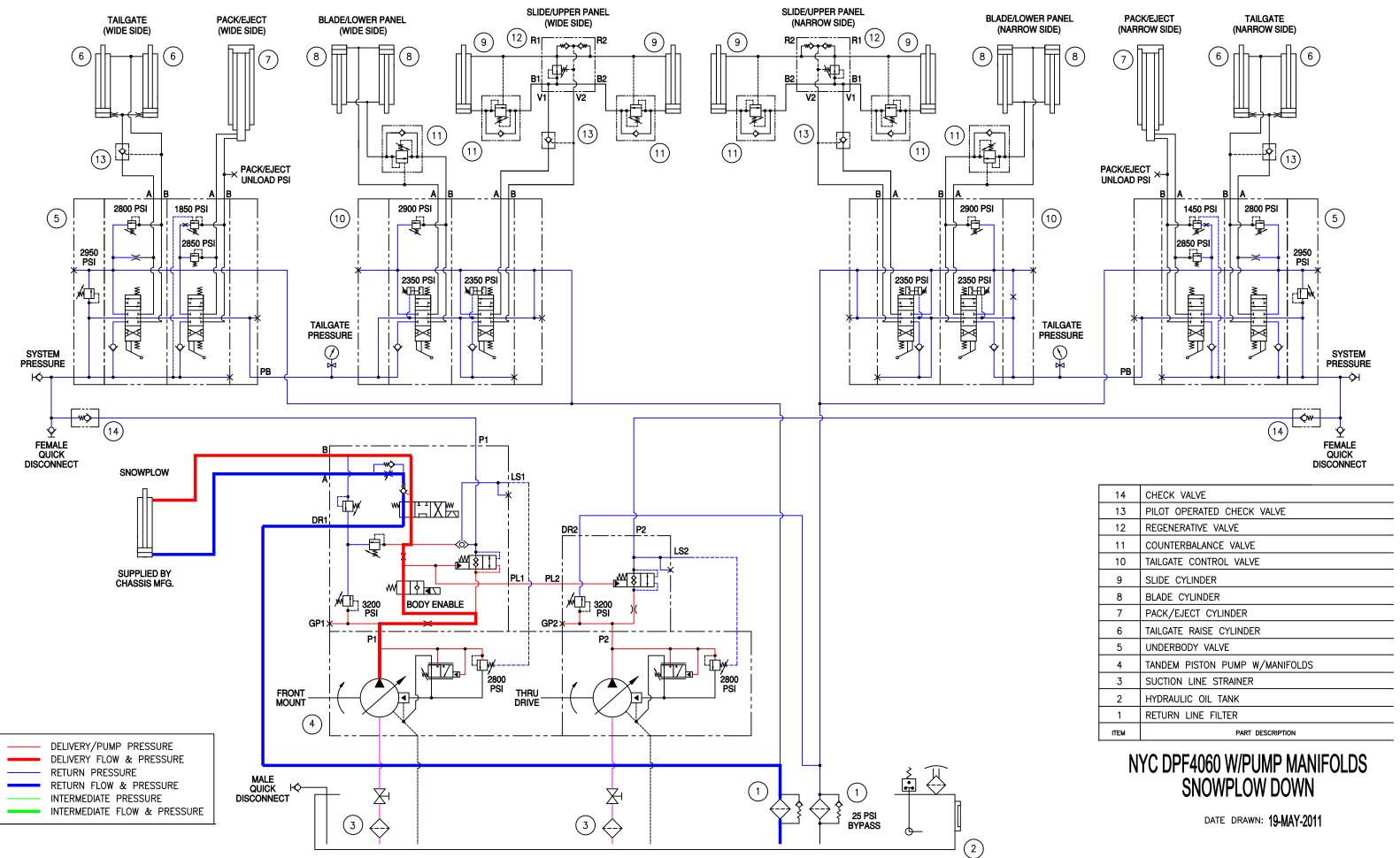


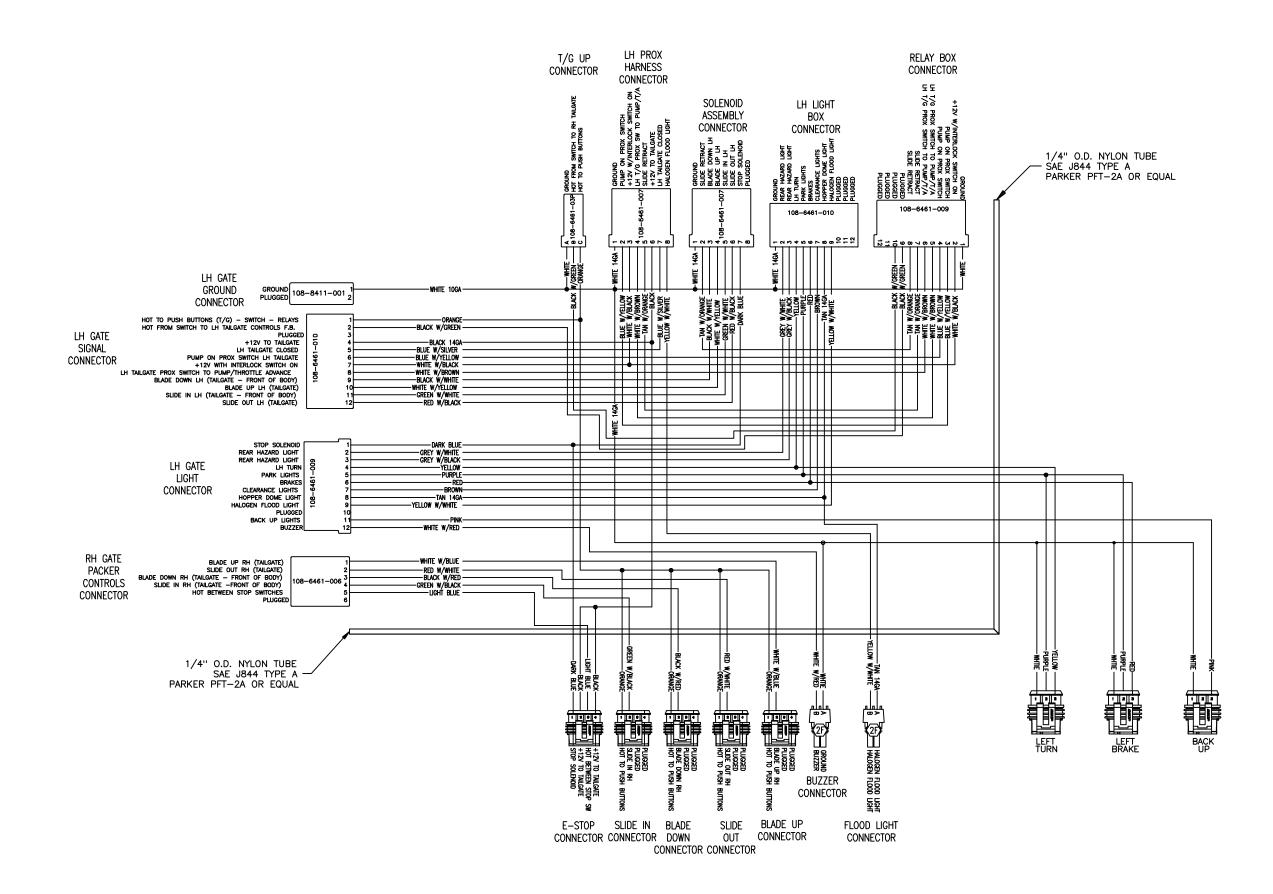


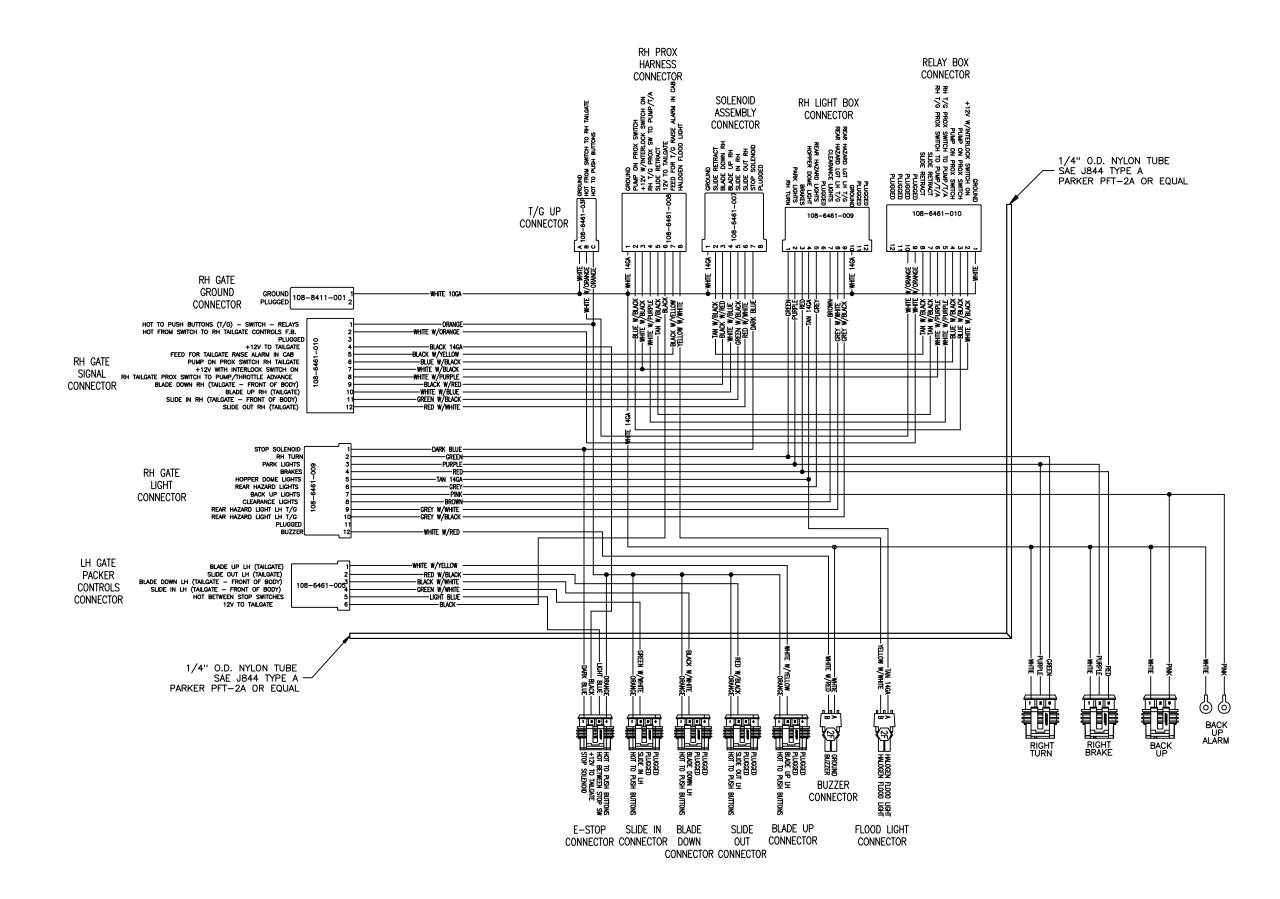


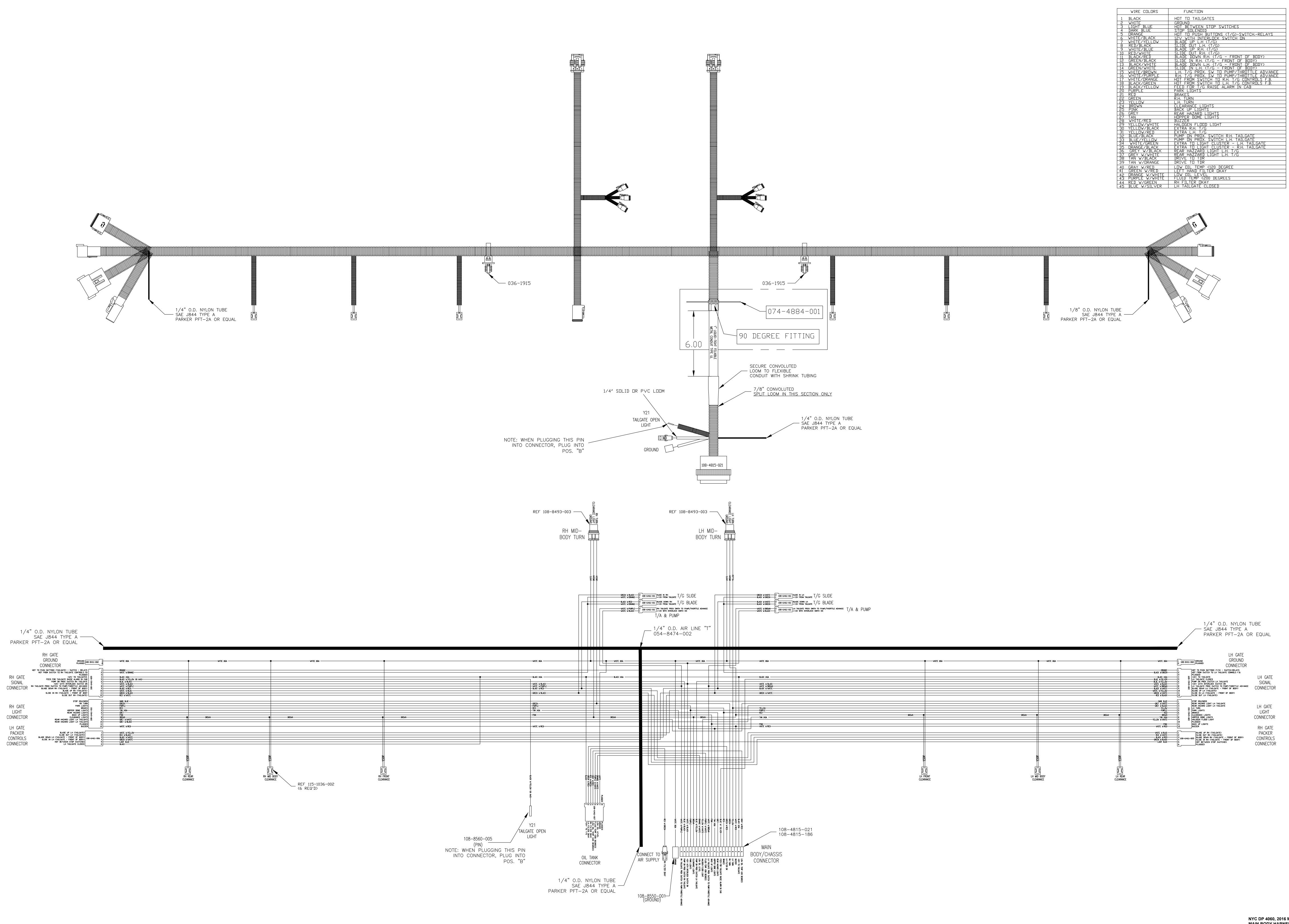
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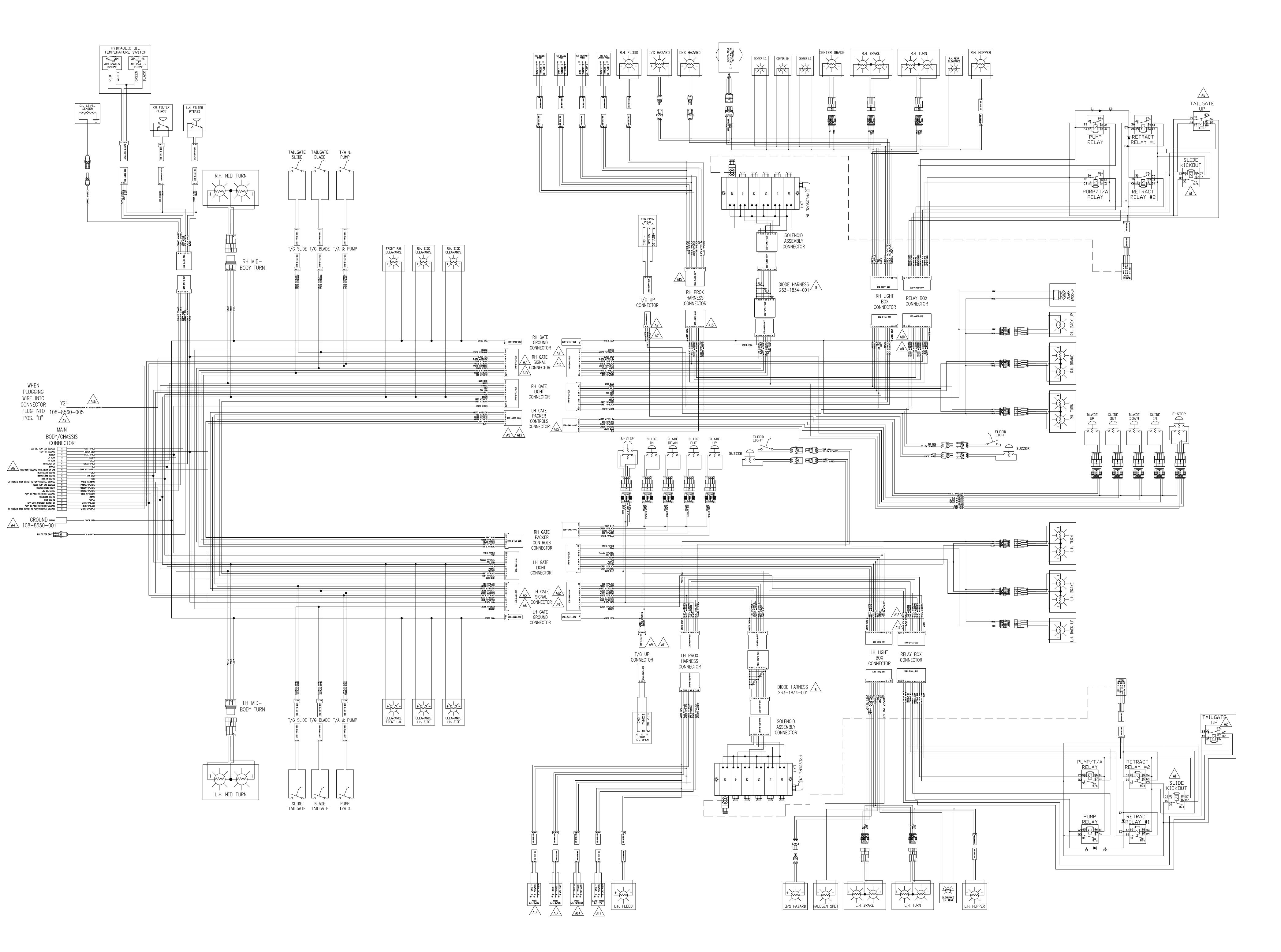
701-8973-001













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#### HEIL ENVIRONMENTAL WARRANTY STATEMENT

The Heil Co. d/b/a Heil Environmental ("Heil") warrants its solid waste collection equipment to be free from defects in material and workmanship under normal use for a period of one (1) year or 2000 hours of operation (whichever comes first) from the date of equipment In-Service or during the period of coverage offered by an extended warranty program, when proper service and maintenance as described in Heil Service Bulletins and Parts & Service Manuals are performed. The standard or extended equipment warranty is not transferable except for sales demonstration units.

This warranty is expressly limited to the repair or replacement of any component or part thereof, of any such refuse or recycling collection body manufactured by Heil that is proven to Heil's satisfaction to have been defective in material or workmanship. Such components or parts shall be repaired or replaced at Heil's option without cost to the standard purchaser for parts and labor provided such unit is returned to an authorized Heil Distributor for replacement or repair. The repair or replacement must be made during the standard or extended warranty coverage period. Before any warranty can be allowed on new equipment, a validated warranty registration form must be on file with Heil's Customer Service Department within sixty (60) days of the equipment's In-Service date. Wear items are excluded from warranty coverage.

All OEM service parts sold by Heil have a six (6) month warranty from the date of purchase. Aftermarket parts purchased from Heil are supported by a 90-day warranty. The parts warranty covers parts only, providing that factory inspection reveals a defect in material or workmanship. Labor, troubleshooting, equipment downtime, etc. is not covered under the parts warranty policy.

HEIL MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE. HEIL DOES NOT ASSUME ANY LIABILITY OR ACCEPT CLAIMS FOR LOSS OF PROFITS, PRODUCT DOWN TIME OR ANY OTHER DIRECT, INCIDENTAL OR INDIRECT CONSEQUENTIAL LOSSES, COSTS, DAMAGES OR DELAYS.

Any improper use, operation beyond rated equipment or component capacity, substitution of parts that are not Heilapproved, or any alteration or repair by others in such a manner as in Heil's sole judgment affect the product operation or integrity shall void the warranty.

Other than the extension of the standard warranty period purchased under a supplemental Heil Extended Warranty Program, no employee or representative is authorized to modify this warranty in any way nor shall any other warranties be granted. No dealer-supplied warranty program is endorsed or supported by Heil.

Heil retains the right to modify its factory warranty program prospectively at any time.



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