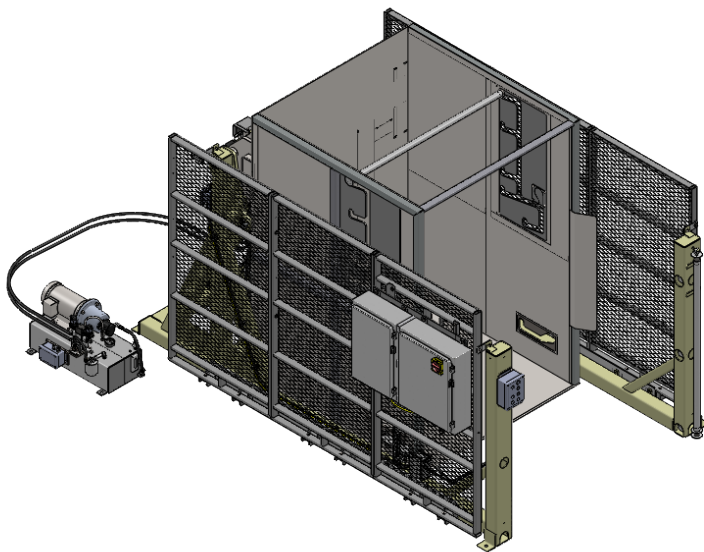


# SOUTHWORTH

## T2-135

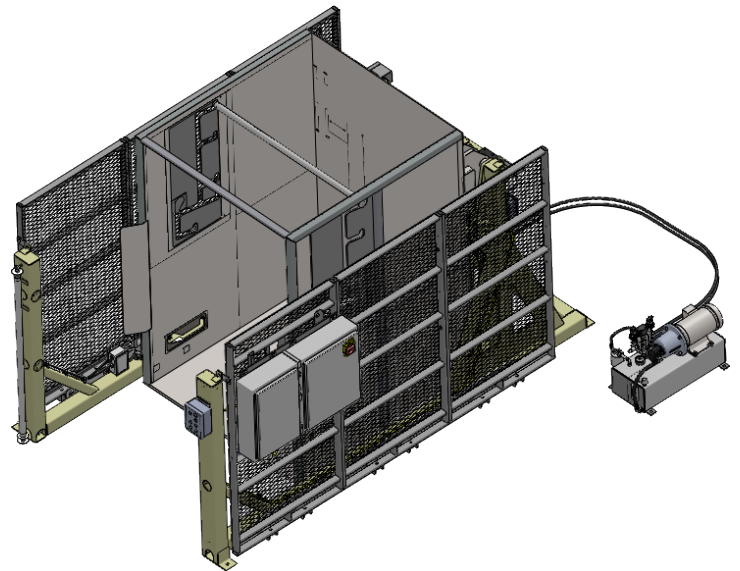
### *Parcel Unloader*

This manual applies to Southworth part numbers represented below.



**45009212**

Control Panel and Controls  
on Left Side of  
Loading Area



**45010573**

Control Panel and Controls  
on Right Side of  
Loading Area

Model: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Date placed in service: \_\_\_\_\_

**SOUTHWORTH PRODUCTS CORP.**

P.O. Box 1380, Portland, ME 04104-1380W

TF +1.800.743.1000 | D +1.207.878.0700 | F +1.207.797.4734

[www.SouthworthProducts.com](http://www.SouthworthProducts.com)

**Owner Manual**

# Contents

If viewing this manual electronically, just left click any section below to immediately view that area.

<b>1</b>	<b>INTRODUCTION.....</b>	<b>5</b>
1.1	Responsibilities of Owner and Users .....	5
1.2	Responsibilities of Operators .....	6
1.3	Machine Specifications .....	8
<b>2</b>	<b>SAFETY .....</b>	<b>9</b>
2.1	Safety Alert Symbols.....	9
2.2	Signal Words.....	9
2.3	Safety Devices .....	10
<b>3</b>	<b>LABELING .....</b>	<b>11</b>
3.1	Label Placement Diagram.....	11
<b>4</b>	<b>INSTALLATION .....</b>	<b>13</b>
4.1	Key Components .....	15
4.2	Machine Dimensions.....	17
4.3	Machine Installation .....	19
4.4	Power Unit Installation & Hydraulic Hose Connections .....	21
4.5	Control Panel Installation & Electrical Connections .....	22
4.6	Testing.....	24
<b>5</b>	<b>OPERATION .....</b>	<b>27</b>
5.1	Approved Containers .....	28
5.2	Start-Up & Loading .....	29
5.3	Manual Operation .....	30
5.4	Automatic Operation .....	31
5.4.1	Automatic Lowering .....	32

<b>6</b>	<b>MAINTENANCE &amp; REPAIR .....</b>	<b>33</b>
6.1	Periodic Maintenance .....	34
6.1.1	Weekly Maintenance .....	34
6.1.2	<b>Monthly Maintenance .....</b>	<b>34</b>
6.2	Relieving Hydraulic System Pressure .....	35
6.3	Adjusting Proximity Switches .....	36
6.3.1	Upper Travel & Deceleration Switches .....	36
6.3.2	Lower Travel & Deceleration Switches .....	36
<b>7</b>	<b>TROUBLESHOOTING.....</b>	<b>37</b>
7.1	Conveyor System Interface.....	39
7.1.1	Signals to Conveyor System .....	39
7.1.2	Signals from Conveyor System .....	39
7.1.3	PLC Fault Messages .....	40
<b>8</b>	<b>ELECTRICAL.....</b>	<b>41</b>
8.1	Fuses .....	41
8.2	Control Panel .....	42
8.2.1	External Connection Schematics .....	43
8.3	Electrical Schematic.....	44
8.4	Proximity Switch Operation Diagram .....	48
<b>9</b>	<b>HYDRAULICS.....</b>	<b>49</b>
9.1	Hydraulic Fluid Information .....	49
9.2	Hydraulic Power Unit .....	49
9.3	Valve Stack .....	50
9.4	Hydraulic Schematic .....	51
<b>10</b>	<b>WARRANTY &amp; CONTACT INFORMATION .....</b>	<b>52</b>

 **WARNING**

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

This label (part # 10095524)  
is required by California Law.  
For more information visit:

[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# 1 INTRODUCTION

## 1.1 Responsibilities of Owner and Users

**Basic Principles** - Owners/users shall apply sound principles of safety, training, inspection, maintenance, and expected operating environment. It shall be the responsibility of the owner/user to advise the manufacturer where deflection may be critical to the application.

**Manuals** - Owners/users shall keep and maintain a copy of the operating and maintenance manual(s) and ensure its availability to operating and maintenance personnel.

**Inspection and Maintenance** - It shall be the responsibility of the users to inspect and maintain the machine as required to ensure proper operation. The frequency of inspection and maintenance shall be based upon the manufacturer's recommendations and be compatible with operating conditions and the severity of the operating environment. Machinery that is not in proper operating condition shall be immediately removed from service until repaired. Maintenance and repairs shall be made by a qualified person and the repairs shall be in conformance with the manufacturer's recommendations.

**Maintenance Safety Precautions** - Before adjustments and repairs are started on the machine, the following precautions shall be taken as applicable:

1. Remove the load from the load enclosure.
2. Lower load enclosure to the full down position.
3. Relieve system pressure from all circuits before loosening or removing any components.
4. All controls in the "off" position and all operating features secured from inadvertent motion by brakes, blocks, or other means.
5. Disconnect power and follow established owner/user lockout/tag out policies.
6. Follow precautions and directions as specified by the manufacturer.

**Replacement Parts** - When parts or components are replaced, they shall be replaced with parts or components approved by the original manufacturer.

**Maintenance Training** - The user shall ensure only qualified personnel inspect and maintain the machine in accordance with the manufacturer's recommendations.

**Operator Training** - An owner/user, who directs or authorizes an individual to operate the machine shall ensure that the individual has been:

1. Trained in accordance with the manufacturer's operating manual.
2. Made aware of the responsibilities of operators as outlined in the **Responsibilities of Operators** section of this manual.
3. Retrained, if necessary, based on the owners/user's observation and evaluation of the operator.

**Modifications** and additions shall not be performed without the manufacturer's prior written approval. Where such authorization is granted, capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

## 1.2 Responsibilities of Operators

**Basic Principles** - Operators shall apply sound principles of safety and good judgment in the application, and operation of the machine with consideration given to its intended use and expected operating environment. Since the operator is in direct control of the machine, conformance with good safety practices is the responsibility of the operator. The operator shall make decisions on the use and operation with due consideration for the fact that his or her own safety as well as the safety of other personnel on or near the machine is dependent on those decisions.

**General Training** - Only personnel who have received general instructions regarding the inspection, application, and operation of machine, including recognition and avoidance of hazards associated with their operation, shall operate the machine. Such topics covered shall include, but not necessarily be limited to, the following issues and requirements:

1. A pre-start inspection
2. Responsibilities associated with problems or malfunctions affecting the operation of the machine
3. Factors affecting stability
4. The purpose of placards and decals
5. Workplace inspection
6. Safety rules and regulations
7. Authorization to operate
8. Operator warnings and instructions
9. Actual operation of the machine. Under the direction of a qualified person, the trainee shall operate the machine for a sufficient period of time to demonstrate proficiency in actual operation of the machine.

**Pre-start Inspection** - Before use each day or at the beginning of each shift, the machine shall be given a visual inspection and functional test including but not limited to the following:

1. Operating and emergency controls
2. Safety devices
3. Hydraulic system leaks
4. Electrical cables and wiring harness
5. Loose or missing parts
6. Nameplates, precautionary and instructional markings and/or labeling
7. Guarding system
8. Items specified by the manufacturer

**Problem or Malfunctions** - Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the machine.

**Before Operations** - The operator shall:

1. Read and understand the manufacturer's operating instruction(s) and user's safety rules or have them explained.
2. Understand all labels, warnings, and instructions displayed on the machine or have them explained.

**Workplace Inspections** - Before the machine is used and during use, the operator shall check the area in which the machine is to be used for possible hazards such as, but not limited to:

1. Bumps, floor obstructions, and uneven surfaces
2. Overhead obstructions and electrical hazards
3. Presence of unauthorized persons
4. Other possible unsafe conditions as noted in the operating manual.

**Operator Warnings and Instructions** - The operator shall ensure the operation of the machine is in compliance with the following:

1. **Guarding system** - Guarding shall be installed and positioned, and access gates or openings shall be secured per the manufacturer's instructions (If applicable).
2. **Distribution of load** - The load and its distribution in the load enclosure shall be in accordance with the manufacturer's rated capacity for that specific configuration.
3. **Maintaining overhead clearance** - The operator shall ensure that adequate clearance is maintained from overhead obstructions and energized electrical conductors and parts.
4. **Point of Operation** - The operator shall not place any part of their body under the load enclosure.
5. **Precaution for moving equipment** - When other moving equipment or vehicles are present, special precautions shall be taken to comply with the safety standards established for the workplace.
6. **Reporting problems or malfunctions** - The operator shall immediately report to a supervisor any problem(s) or malfunction(s) that become evident during operation. The operator shall ensure all problems and malfunctions that affect the safety of operations are repaired prior to continued use.
7. **Capacity limitation** - Rated capacity shall not be exceeded when loads are transferred to the load enclosure.
8. **Work area** - The operator shall ensure the area surrounding the machine is clear of personnel and equipment before lowering the load enclosure.
9. **Securing the machine** - The operator shall comply with the means and procedures provided to protect against use by an unauthorized person(s).
10. **Altering safety devices** - Safety devices shall not be altered or disabled.
11. **Modifications** or alterations of the machine or the fabrication and attaching of frameworks or the mounting of attachments to the machine or the guarding system shall only be accomplished with prior written permission of the manufacturer.
12. **Assistance to the operator** - If an operator encounters any suspected malfunction or any hazard or potentially unsafe condition relating to capacity, intended use, or safe operation the operator shall cease operation of the machine and request further instruction from the owner/user.
13. **Problems or malfunctions** - Any problem(s) or malfunction(s) that affect the safety of operations shall be repaired prior to the use of the machine.

### 1.3 Machine Specifications

This machine is to be used to unload parcels from specific gaylord transport boxes and plastic hopper onto a chute feeding a conveyor system. See containers that will be used in this machine in the specifications below.

Model:	T2-135 (45009212 or 45010573)
Max Capacity:	2,000 lbs
Max Height When Tilted:	161" (approx.)
Degree of Full Tilt:	135"
Tilt Up Time:	29 seconds (approx.)
Tilt Down Time:	23 seconds (approx.)
Total Machine Weight:	3,230 lbs (approx.)
HPU/Control Panel Weight:	Over 300 lbs
Hydraulic Fluid Capacity:	9.75 gallons, usable
Hydraulic Fluid Type:	Conoco AW32, use same as or equivalent
Motor:	3.0 HP TEFC Continuous Duty Motor with Variable Frequency Drive
Motor Full Load Amps:	4.2 amps with 460/3/60v
Primary Voltage:	460 V
Primary Phase:	3
Primary Frequency:	60 Hz
Control Voltage:	24 V DC
Compatible With:	Containers Below
	Blue Hamper: 48" X 31.5" X 38.25" Tall
	Blue Bin: 48" X 40.75" X 45.75" Tall
	Small Gaylord: 40" X 48" X 35" Tall Plus 5" Tall Pallet
	Medium Gaylord: 40" X 48" X 46" Tall Plus 5" Tall Pallet
	Large Gaylord: 40" X 48" X 60" Tall Plus 5" Tall Pallet
	Roller Cage: 47.25" X 39.37" X 74.41" Tall
	Pallet: 40" X 48" X 5" Tall

This tilter operates with power up and power down, motor is running when tilting the load enclosure up or down.



## 2 SAFETY

All personnel installing, operating, and maintaining this machine shall read and understand this manual. For questions or concerns contact the manufacturer.

This machine shall be installed, operated, and maintained by trained and/or qualified personnel only.

### 2.1 Safety Alert Symbols

A symbol that indicates a hazard. It is composed of an equilateral triangle surrounding an exclamation mark. The safety alert symbol is only used on hazard alerting signs. It is not used on safety notice and safety instructions signs.



**A** – For use with **DANGER** signal word; (safety white triangle, safety red exclamation mark, safety red background)

**B** – For use with **WARNING** signal word; (safety black triangle, safety orange exclamation mark)

**C** – For use with **CAUTION** signal word; (safety black triangle, safety yellow exclamation mark)


**D** – For use with **DANGER, WARNING, or CAUTION** signal words; (safety yellow triangle with a safety black border and safety black exclamation mark)

### 2.2 Signal Words

#### **DANGER**

 **DANGER** Indicates a hazardous situation that, if not avoided, will result in death or serious injury.


#### **WARNING**

 **WARNING** Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

#### **CAUTION**

 **CAUTION** Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

#### **NOTICE**

 **NOTICE** Indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

## 2.3 Safety Devices

### **CAUTION**

All maintenance to be performed with the load enclosure in the fully lowered position.

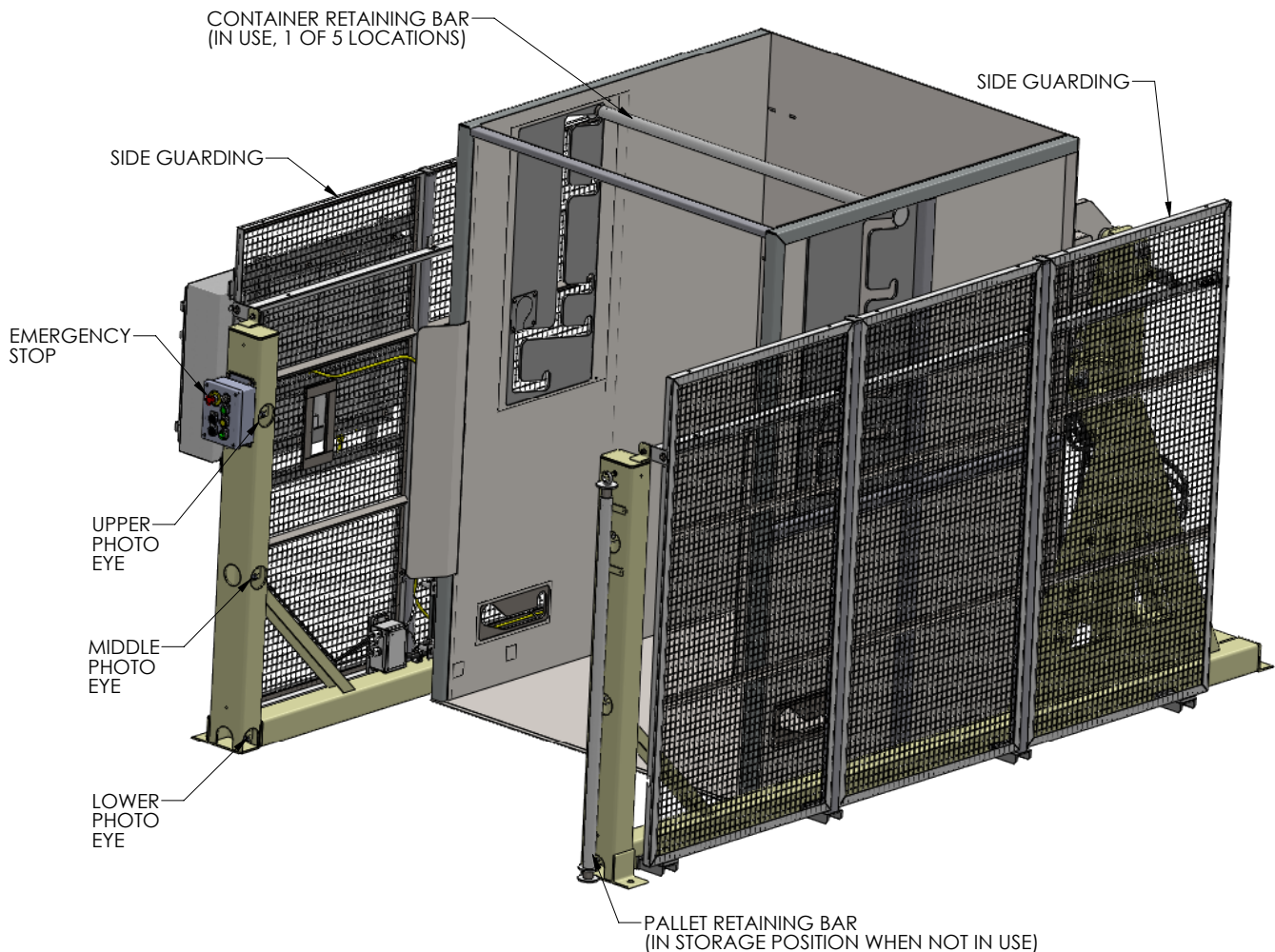
This machine is equipped with devices and features to protect the operator and nearby personnel from severe injury or death. These features and devices shall be installed and functioning correctly during operation.

**Side Guarding** – Protects operator and nearby personnel from moving parts.

**Photo Eyes** – Protects the operator and nearby personnel while machine is operating by preventing the load enclosure from lowering or raising when an obstruction is detected.

**Retention Bar** – Protects the operator and nearby personnel from crush hazards by preventing the load from falling out of the load enclosure.

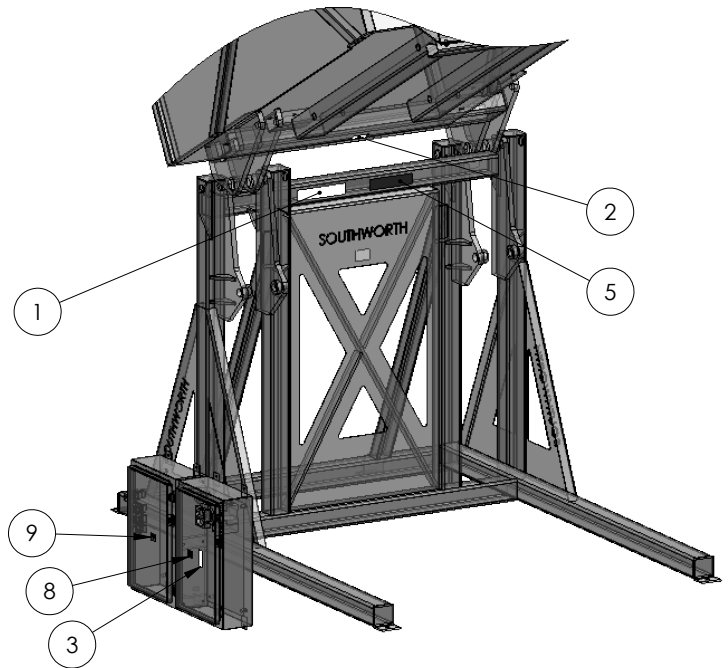
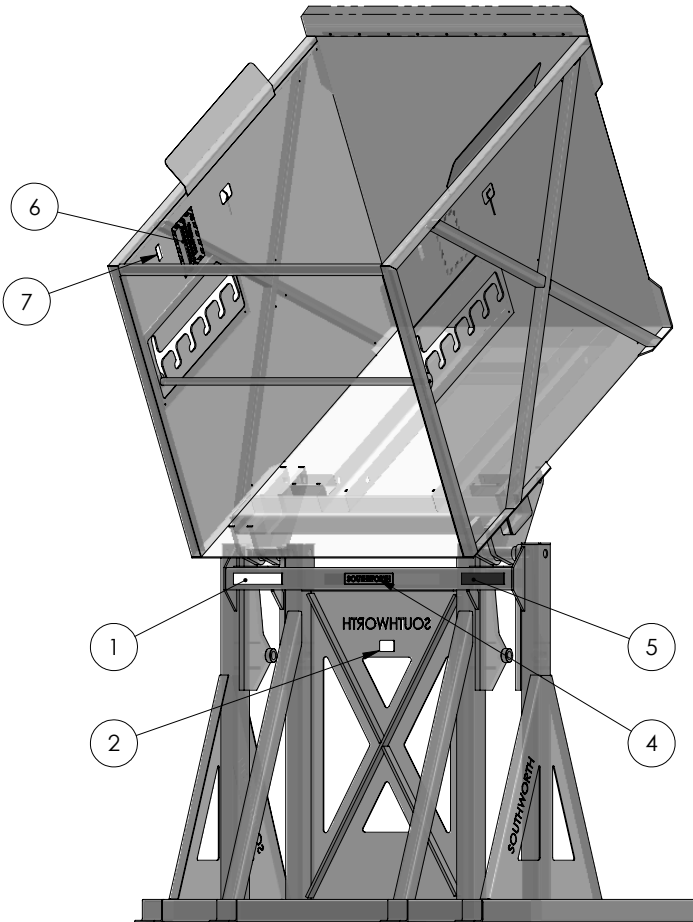
**Emergency Stop** – Pressing the E-STOP at any point during operation will stop the machine and prevent further operation until it is reset.



### 3 LABELING

This machine has labeling to indicate potential hazards this machine may pose when operating and/or maintaining the machine. All labels must be legible. If any label is missing, damaged, or otherwise illegible contact the manufacturer for replacement labels.

#### 3.1 Label Placement Diagram

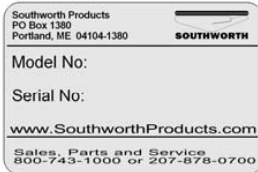


Item No.	Part No.	Qty.
1	10078631	2
2	10079929	2
3	10047672	1
4	5900158	1
5	10017991	2
6	10077573	2
7	2998427	2
8	2987003	1
9	5900166	1
10	2986997	1
APPLY ITEM 10 TO HPU TANK		

1



2



3



4



5



6



7



8



9



10



## 4 INSTALLATION

Installation of this machine shall be performed by trained and/ or qualified personnel only. The owner/ installer is responsible obtaining any necessary permissions and/ or permits. The owner/installer is responsible for compliance with all applicable codes and ordinances. Read and understand all safety and installation information in this manual.

Unless otherwise stated this machine shall only be used indoors in normal industrial conditions. It must not be exposed to the elements.

This machine shall be installed and operated on a solid, level surface capable of supporting the machine and its maximum rated capacity.

**Before installation**, remove all shipping materials and verify all components on the packing list were received. The control panel and power unit are shipped in the load enclosure.

Inspect the machine, all components, wiring, and electrical connections for damage. If components are missing or damage is found contact the manufacturer before continuing installation.

### **DANGER**

**High Voltage: Electrical service and installation must be performed by trained and/ or qualified personnel. Lock-out/ tag-out the power source before installation.**

**Electric motors can create sparks. Do not install in an area where flammable gases may be present.**

**All electrical components must be protected from wet and/ or dirty environments unless specifically configured for such environments.**

**Pinch Points and Crush Hazards exist when moving and transporting the machine. Do not enter under any equipment while moving or transporting. Keep hands, feet, and loose clothing away from moving equipment.**

**Never enter beneath the load enclosure.**

**Do not sit, stand, or ride in the load enclosure.**

**This machine must be installed on a solid, stable, level surface as described in this manual.**

**This machine must be properly secured to the floor before operation. Lag bolts are to be supplied by the installer.**

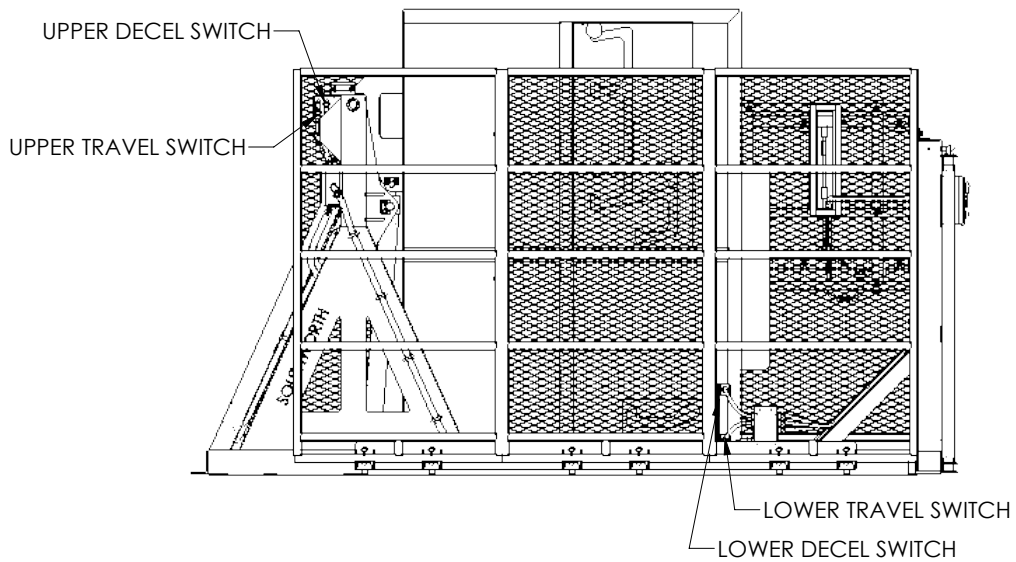
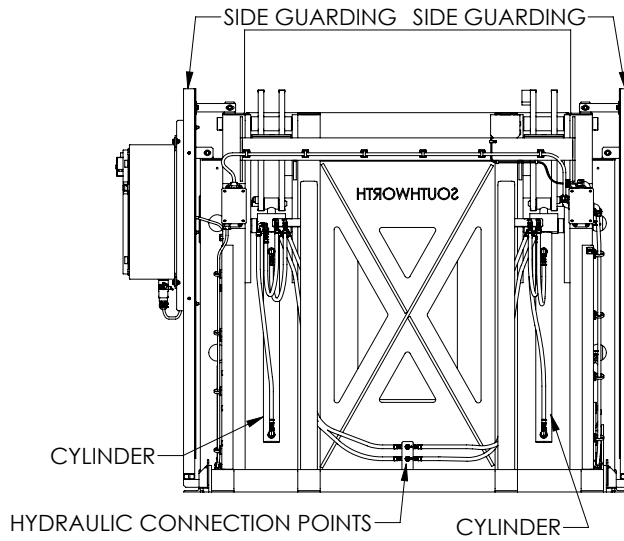
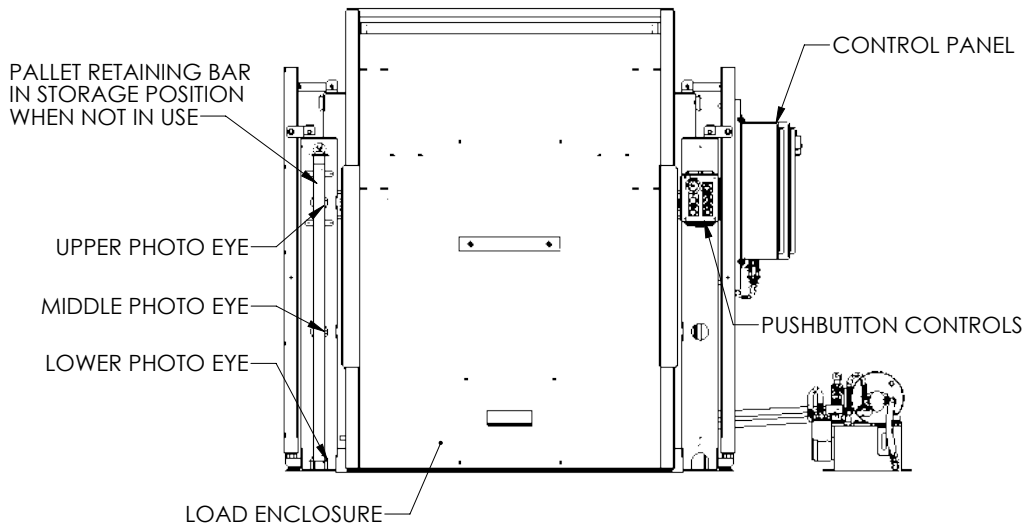
**⚠ CAUTION**

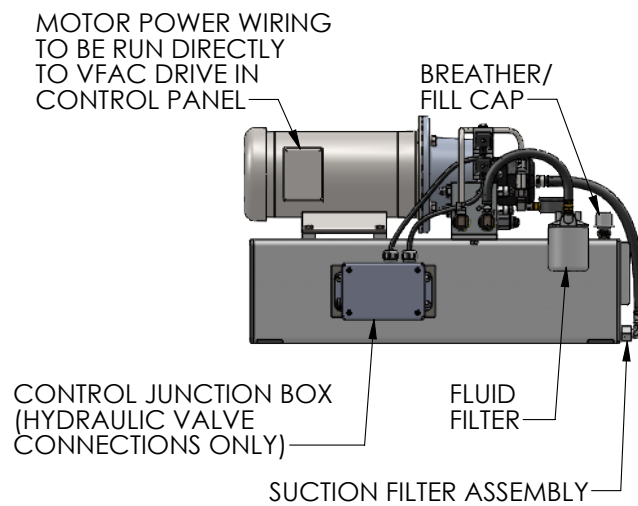
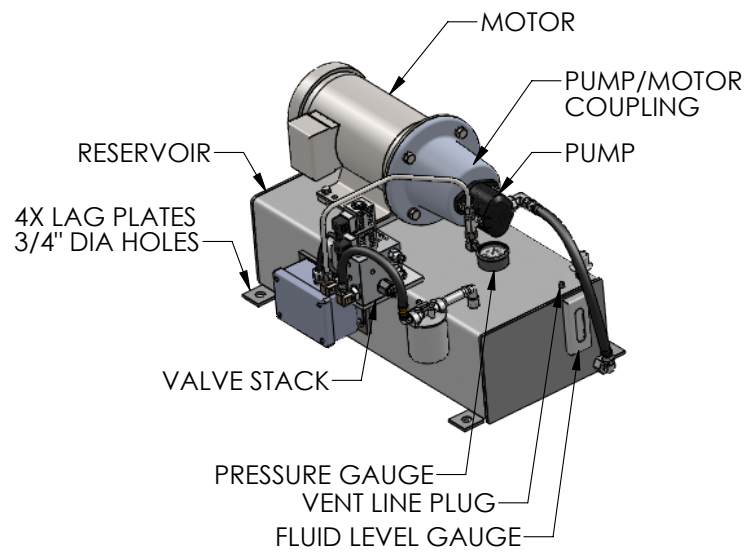
The installer is responsible for providing adequate anchors. Minimum requirements for machine frame anchors: 5/8" x 5" wedge or expansion type anchors with a minimum of 600 lbs. pull-out.

•  
• The installer is responsible for ensuring this machine will properly interface with  
• the chute without interference. See Machine Dimensions section.  
•



## 4.1 Key Components

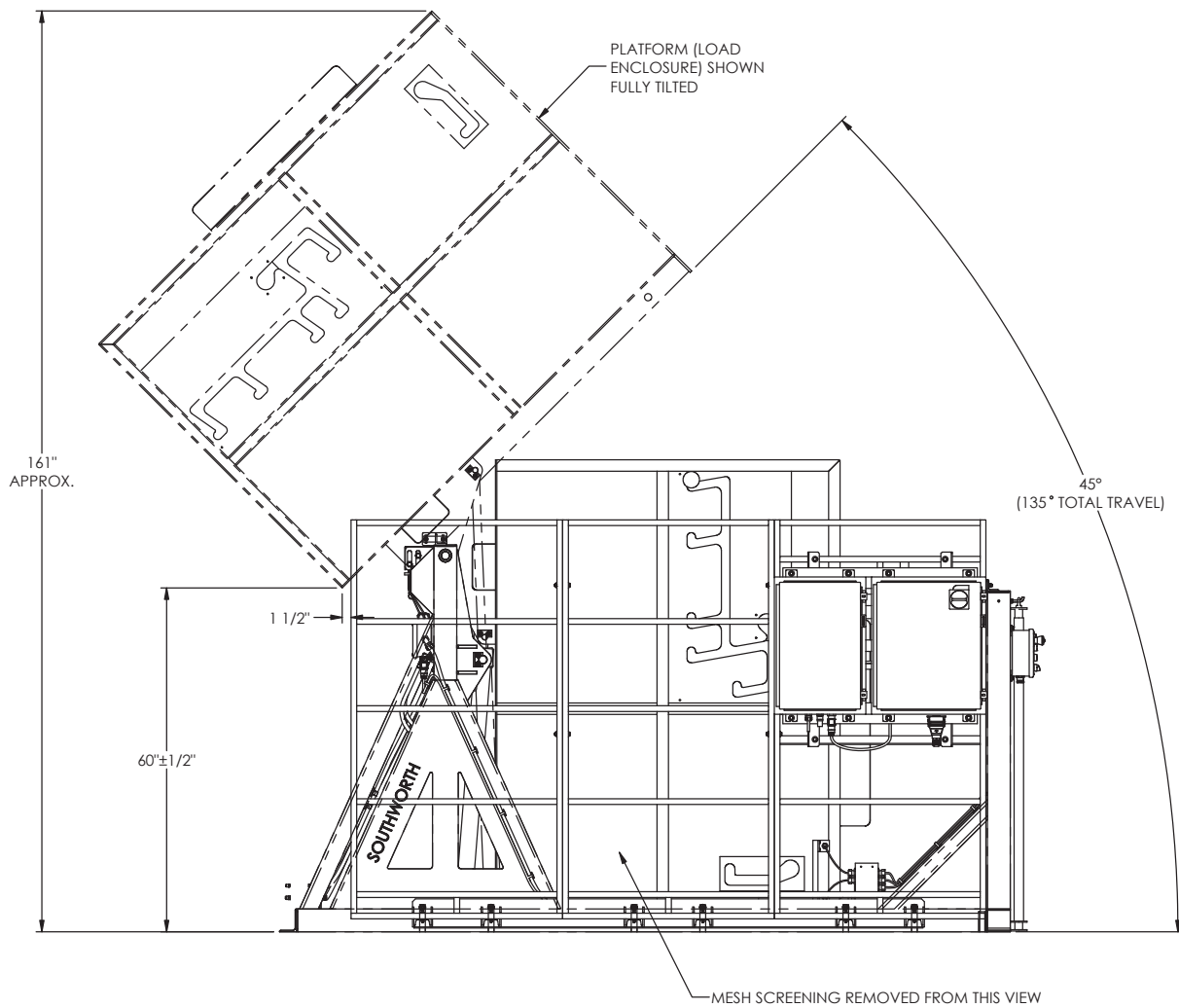
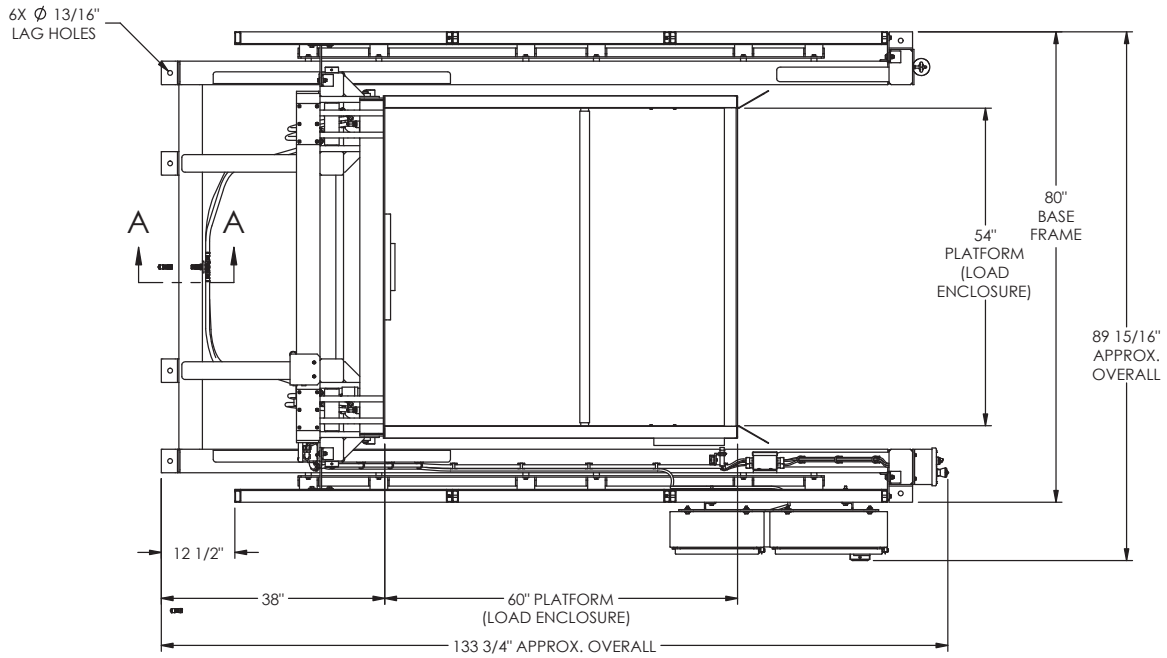


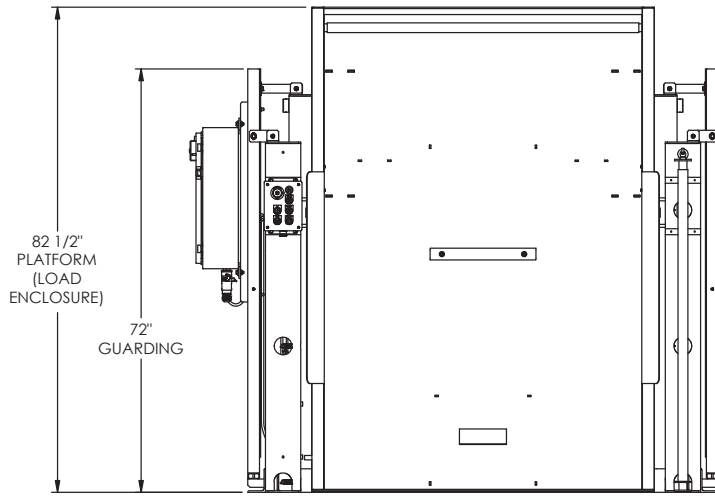


## EXTERNAL HYDRAULIC POWER UNIT



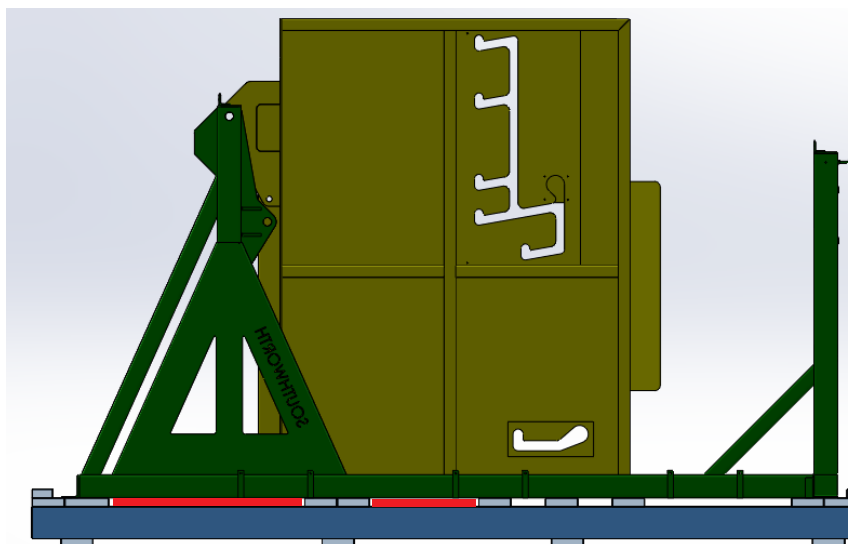
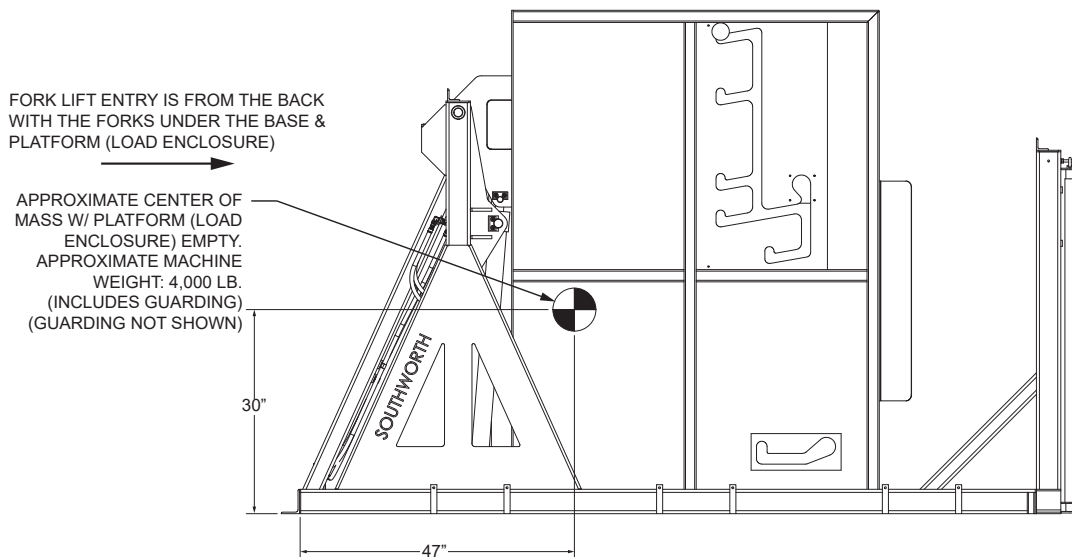
## 4.2 Machine Dimensions





### 4.3 Machine Installation

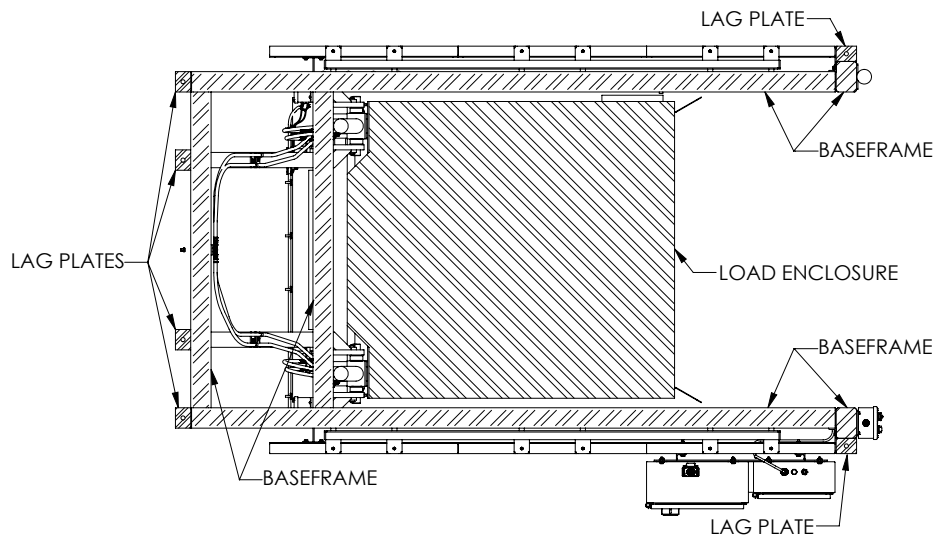
1. Mark the location for the machine. The machine should be positioned such that the machine and conveyor system and chute (supplied by others) interface without interference.
2. Side to side angular slope of the base frame must be less than  $\frac{1}{2}$  degree, or one side higher by no more than  $\frac{3}{8}$ ".
  - Shimming up low side to be less than  $\frac{1}{4}$ " difference is acceptable.
  - Keep as much base frame in contact with the floor as possible.
3. Front to back floor slope should allow the bottom of the load enclosure to rest flat on the floor when lowered.
  - Install so base frame contacts floor as much as possible.
4. If high points occur in the area of floor where the machine is to be installed, they must not create side to side frame deviation greater than indicated in item 2.
5. There must not be high points within the area of the load enclosure. The load enclosure must rest flat on the floor when lowered.



## NOTICE

### Machine Weight: Approximately 4,000 lb.

- Using a forklift, insert forks between pallet stringers and base frame in area depicted in red above and carefully lift the machine off of the pallet high enough to place lumber or other material under the machine's frame. This will make space for the forklift's extended forks to enter beneath the machine from the cylinder end with the forks beneath the base frame and load enclosure.
- Raise the machine off the pallet and move to the desired location.
- Once at the desired location, level the base of the machine. Use shims and/or grout between the floor and the bottom of the base frame as necessary.



### **BOTTOM OF T2-135**

(GROUT AND SHIM TO LEVEL ALL OF THESE AREAS)

- If necessary, use shims beneath the lag plates to fill any gap between the floor and the lag plates.
- Shim beneath base frame as necessary. Fill any gaps with grout to ensure frame is properly supported.

## NOTICE

Shims must completely fill the gap between the floor and lag plate and must fit tightly without causing deflection of the lag plate. The lag bolts are not to be used to deflect the frame in order to compress the lag angle onto the shim.

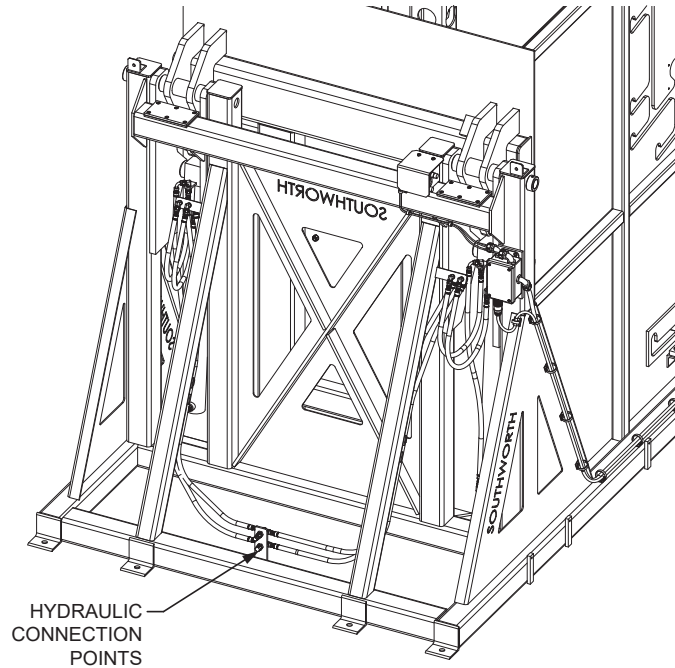
Contact between the floor and the base frame must be continuous with no gaps between the floor and the bottom of the base frame.

Lags must not be located on cracks or seams in the concrete.

- Tighten the lag bolts according to the lag bolt manufacturer's specification.

## 4.4 Power Unit Installation & Hydraulic Hose Connections

1. Locate the power unit in the desired location. Machine is supplied with 15 feet of hose.



2. Anchor the power unit to the floor.
3. Connect supplied hydraulic hoses. Connection points on the machine are located on the rear cross member of the base frame.
  - Connect port "A" of the valve stack to the connection point labeled "A" (cap end of cylinders).
  - Connect port "B" of the valve stack to the connection point labeled "B" (rod end of cylinders).

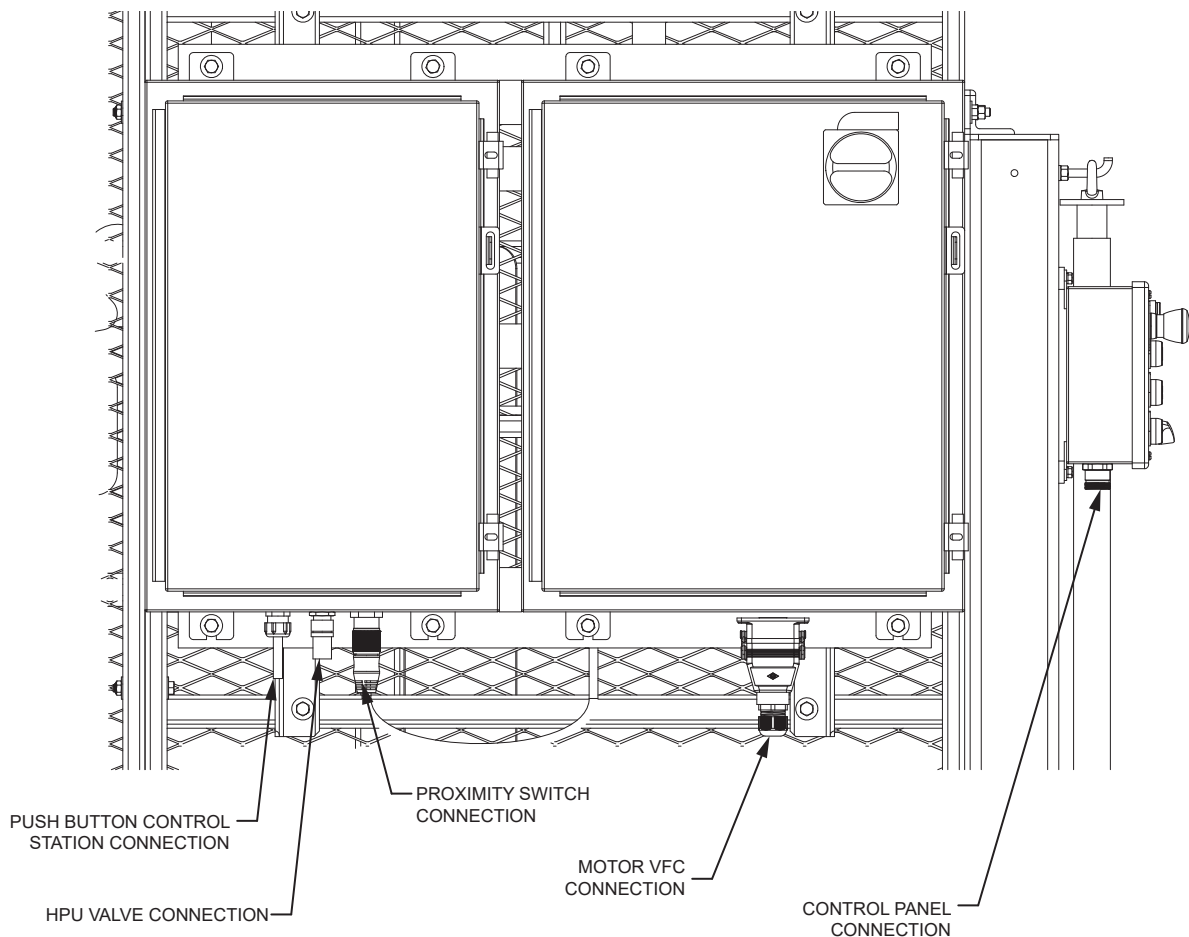
## 4.5 Control Panel Installation & Electrical Connections

1. Mount the control panel to the control panel mounting bracket using the supplied hardware.

### NOTICE

See Electrical section for schematics and specifications.

Ensure all cables are protected from damage.



2. Connect the motor variable frequency drive cable (cable included) to the control panel (female end of connector mounted to control panel by the factory).
3. Connect the hydraulic power unit valve cable (cable included) to the control panel.
4. Connect the push-button control (cable included) to the control panel.
5. Connect the proximity switch cable (cable included) to the control panel.
6. Connect house power and ground (wiring by others) into the control panel.
7. Connect conveyor system interface (wiring by others).
8. Confirm automatic lowering function is enabled or disabled as desired. See **Automatic Operation** section.

9. Connect house power to the input, line, side of the fused disconnect and ground to an available green/yellow ground block in the control panel.

### **NOTICE**

- **Interface signals to and from conveyor system will require an additional panel knock out, wiring and strain relief by others. This machine will be supplying foreign voltage to the conveyor systems control panel. Use orange wire to identify those wires that can remain energized when the conveyor systems control panel disconnect is turned off.**
- 
- 
- 
- 
- 
- 
- 
- 
-

**CAUTION**

In the event of an emergency or failure, immediately press the E-STOP button on the controls.

When raising and lowering the load enclosure, the machine is to decelerate shortly before it reaches the proximity switches. The decel is triggered by the decel proximity switches, one for up and one for down. Proper adjustment of these proximity switches is essential for safe operation of this machine. If the machine does not begin to decelerate as it approaches the fully raised or lowered positions, immediately press the E-STOP button located on the controls and contact maintenance personnel. See Adjusting Proximity Switches section.

The up limit, up decelerate, down limit and down decelerate proximity switches may require adjustment. Do not allow the machine to power into in the up-stops or floor. Powering the machine into the floor or up-stops may damage the machine. See Adjusting Proximity Switches section.

1. Verify all electrical and hydraulic connections have been made according to the schematics.
2. Power the machine by turning the main disconnect switch to the on position. The red E-STOP light will turn on.
3. Pull and twist to release the E-STOP push-button and press the E-STOP RESET button. The E-STOP light will turn off and the E-STOP reset light will turn on.
4. If the MAN/AUTO switch is in the MAN position the green AUTO light will be off and the GUARD RESET light will flash.

**NOTICE**

If the MAN/AUTO switch was in the AUTO position on start-up the green AUTO light will flash quickly. The machine will not operate until the switch is turned to the MAN position. If desired to continue in AUTO mode, just turn the switch back to AUTO. This sequence only occurs when initially turning on or resetting after the E-STOP was engaged.

5. Verify all personnel are clear of the area.
6. Press the GUARD RESET button. If the photo eyes do not detect an obstruction the GUARD RESET light will turn off and the AUTO light will turn on. The machine is now able to operate.

**NOTICE**

If the photo eyes detect an obstruction the GUARD RESET light will continue to flash and the machine will not operate. Clear the obstruction and press the GUARD RESET button again.



7. With the GUARD RESET light off and the AUTO light on, verify the photo eyes operate correctly by placing an object in front of one of the photo eyes. The GUARD RESET light should begin flashing.
8. Press the GUARD RESET button and repeat the previous with the other two photo eyes.
9. Press the GUARD RESET button, the light should turn off.
10. Do steps 7 through 9 for both AUTO mode and MAN mode.
11. While the load enclosure is raising and lowering and while the load enclosure is in its totally tilted position, repeat steps 7 through 9.
12. If the machine is in any other position than fully lowered after an obstruction is detected by the photo eye circuit, press the E-STOP button before attempting to clear the obstruction.

**⚠ DANGER**

**Never enter beneath the raised load enclosure.**

13. Once the obstruction is cleared (use a rake if load enclosure is elevated), perform steps 3 through 6 before continuing.
14. Without loading the machine, follow the instructions for manual operation in the **Manual Operation** section.
15. Without loading the machine, follow the instructions for automatic operation in the **Automatic Operation** section.
16. If configured for automatic lowering, follow the instructions in the **Automatic Lowering** section.



17. Ensure that pressing the E-STOP push-button actually stops the machine throughout the raising and lowering of the load enclosure and that the E-STOP light illuminates while depressed.
18. With the E-STOP push-button depressed, make sure that the E-STOP RESET, UP, DOWN, GUARD RESET, or MAN/AUTO buttons do not respond.

## 5 OPERATION

**This machine may be operated by trained personnel only.**

**Before operating** this machine, read and understand this manual. Inspect the machine for excessive wear and/ or damage. **If excessive wear or damage is found, remove the machine from service and contact maintenance personnel. Do not operate this machine until all necessary repairs are completed.** Inspect all precautionary labeling. If any label is missing or illegible contact the manufacturer for replacement labels. Ensure area is free of debris before operating.

### **DANGER**

**Crush, pinch, and shear points exist; keep hands, feet, and loose clothing away from machine during operation.**

**Only trained and/ or qualified personnel shall operate this machine. Personnel operating this machine must read and understand this manual.**

**Do not enter beneath the load enclosure when raised.**

**Do not sit, stand, or ride in load enclosure during operation.**

**Verify the area around the machine is clear of debris and/ or personnel before operating.**

**All guarding must be in place before operation.**

**All loads must be secured, using the retaining bar, before raising.**

**In the event of an emergency or failure, immediately press the E-STOP button located on the controls.**

**After the E-STOP has been pressed or the power has been turned off and back on, the machine will pause for up to one minute to allow the variable frequency drive (VFD) to completely de-energize. After the pause the VFD contactor will close and re-enable the VFD drive.**

**Loads shall not exceed the rated capacity, 2000 lbs. Only pre-specified containers are to be used.**

**To operate the machine there must be no faults and the photo eyes across the front opening of the machine must be clear.**

## NOTICE

If a fault is detected during operation the Auto Mode and GUARD RESET lights will flash alternately and the fault code will be displayed on the PLC. To clear the fault, correct the fault condition then press the E-STOP and reset after five seconds.

Anytime an obstruction of the photo eye is detected, the GUARD RESET light will begin to flash and the GUARD RESET button will need to be pressed before operation can continue.

Before any motion begins, the audio alarm will begin and there is a two second delay before motion begins. This prevents rapid jogging of the machine in manual mode and alerts the operator and nearby personnel.

When raising and lowering the load enclosure, the machine is to decelerate shortly before it reaches the proximity switches. The decel is triggered by the decel proximity switches, one for up and one for down. Proper adjustment of these proximity switches is essential for safe operation of this machine. If the machine does not begin to decelerate as it approaches the fully raised or lowered positions, immediately press the E-STOP button located on the controls and contact maintenance personnel. See Adjusting Proximity Switches section.

### 5.1 Approved Containers

Container	Dimensions
Blue Hamper	48" x 31.5" x 38.25"
Blue Bin	48" x 40.75" x 45.75"
Small Gaylord	40" x 48" x 35" (Plus 5" tall pallet)
Medium Gaylord	40" x 48" x 46" (Plus 5" tall pallet)
Large Gaylord	40" x 48" x 60" (Plus 5" tall pallet)
Roller Cage	47.25" x 39.75" x 74.41"
Pallet	40" x 48" x 5"

## 5.2 Start-Up & Loading

1. Power the machine by turning the main disconnect switch to the on position. The red E-STOP light will turn on.
2. Release the E-STOP push-button and press the E-STOP RESET button. The E-STOP light will turn off and the E-STOP reset light will turn on.
3. If the MAN/AUTO switch is in the MAN position the green AUTO light will be off and the GUARD RESET light will flash.

### NOTICE

.....  
: **If the MAN/AUTO switch was in the AUTO position on start-up the green AUTO light**  
: **will flash quickly. The machine will not operate until the switch is turned to the MAN**  
: **position. If desired to continue in AUTO mode, just turn the switch back to AUTO.**  
: **This sequence only occurs when initially turning on or resetting after the E-STOP**  
: **was engaged.**  
: .....

4. Verify all personnel are clear of the area.
5. Load the container into the load enclosure and secure it using the retaining bar.

### NOTICE

.....  
: **Only approved containers may be used. See Approved Containers section.**  
: .....

.....  
: **This process will interrupt the photo eye circuit. The green GUARD RESET light will**  
: **flash and the machine will not operate until the GUARD RESET button is pressed.**  
: .....

6. Press and release the GUARD RESET button. If the photo eyes do not detect an obstruction the GUARD RESET light will turn off and the AUTO light will turn on. The machine is now able to operate.

### NOTICE

.....  
: **If the photo eyes detect an obstruction the GUARD RESET light will continue to**  
: **flash and the machine will not operate. Clear the obstruction and press the GUARD**  
: **RESET button again.**  
: .....

### NOTICE

⋮  
⋮ **If the photo eye circuit was disrupted before attempting to operate, the GUARD RESET light will flash. The GUARD RESET button must be pressed before operation may resume.**  
⋮  
⋮

⋮ **To operate the machine manually, the MAN/AUTO switch must be in the MAN position.**  
⋮  
⋮

1. **To raise the load** press and hold the up button. The audio alarm will begin and after two seconds the machine will begin to raise. The machine will continue to raise until the upper travel proximity sensor is reached or the operator releases the button.
2. **To lower the load** press and hold the down button. The audio alarm will begin and after two seconds the machine will begin to lower. The machine will continue to lower until the lower travel proximity sensor is reached or the operator releases the button.
3. Press the E-STOP button any time the situation warrants immediately stopping the machine is necessary.
4. Any obstruction detected by the photo eye circuit will cause the machine to stop whether raising, lowering, or not moving at all. If the load enclosure is at fully lowered position, clear the obstruction, then press the flashing GUARD RESET button and hold for 2 seconds before continuing.
5. If the machine is in any other position than fully lowered after an obstruction is detected by the photo eye circuit, press the E-STOP button before attempting to clear the obstruction.

### DANGER

**Never enter beneath the raised load enclosure.**

6. Once the obstruction is cleared (use a rake if load enclosure is elevated), perform steps 2 through 6 of the **Start-Up & Loading** section before continuing.

### NOTICE

If the photo eye circuit was disrupted before attempting to operate, the **GUARD RESET** light will flash. The **GUARD RESET** button must be pressed before operation may resume.

To operate the machine automatically the **MAN/AUTO** switch must be in the **AUTO** position.

1. Press the up button to start the automatic cycle. The machine will wait until the “conveyor ready” and “enable tipper” signals are seen by the PLC.
2. Once the required signals are present the audio alarm will begin and after two seconds the machine will begin to raise.
3. The machine will continue to raise until the “conveyor ready to receive” signals opens or the upper travel proximity sensor is reached.
4. Once the “reset tipper” signal is present the audio alarm will begin and after two seconds the machine will begin to lower.
  - If the upper travel proximity sensor was not reached during the raising process, the machine will lower until either the “reset tipper” signal opens or the lower travel proximity sensor is reached.
  - If the upper travel proximity sensor was reached during the raising process, the machine will lower until the lower travel proximity sensor is reached.
5. Once the lower travel proximity sensor is reached, the **GUARD RESET** light will flash and the **AUTO** light will turn on.
6. Unload the empty container and load in the next container. Secure the container using the retaining bar. The **GUARD RESET** button must be pressed and held for 2 seconds before continuing.
7. Press the **E-STOP** button any time the situation warrants immediately stopping the machine is necessary.
8. Any obstruction detected by the photo eye circuit will cause the machine to stop whether raising, lowering, or not moving at all. If the load enclosure is at fully lowered position, clear the obstruction, then press the flashing **GUARD RESET** button and hold for 2 seconds before repeating the process beginning with step 1.
9. If the machine is in any other position than fully lowered after an obstruction is detected by the photo eye circuit, press the **E-STOP** button before attempting to clear the obstruction.

### DANGER

**Never enter beneath the raised load enclosure.**

10. Once the obstruction is cleared (use a rake if load enclosure is elevated), perform steps 2 through 6 of the **Start-Up & Loading** section before continuing.

11. Repeat the process beginning with step 1.

#### **5.4.1 Automatic Lowering**

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If a jumper wire is present between terminals 11 and 108 the automatic lowering feature will be enabled.

When automatic lowering is enabled, a thirty second timer will begin once the machine reaches the upper travel proximity sensor. If the “reset tipper” signal is not received before the timer expires the machine will begin lowering, automatically, until the lower travel proximity sensor is reached.



### **DANGER**

High Voltage can cause severe injury or death. Disconnect and lockout electrical power before performing maintenance or repair.

Only trained and/ or qualified personnel shall perform and maintenance or repair.

High pressure fluids can penetrate skin and cause severe injury or death. Always relieve hydraulic system pressure before performing maintenance or repair of the hydraulic system.

Never enter beneath the raised load enclosure.

If a hydraulic fitting becomes loose or if a hydraulic hose breaks, the hydraulic fluid will escape from the system under pressure. If the machine is elevated when this happens, it will drop very quickly. Someone may be hurt or the product or machine may be damaged.

Do not change the setting on the relief valve in the pump. If you do, this may damage the machine and you may be hurt. The relief valve has been included for the protection of all of the workers who use the machine.

As the machine moves, “pinch points” are created. Keep hands, feet and loose clothing away from these pinch points. If your arms, hands or your clothing is caught, you may be hurt.

If damage or excessive wear is found, remove the machine from service until the machine is repaired.

All maintenance to be performed with the load enclosure fully lowered.

The warning labels on the machine are there for the safety of the operator. If the labels are worn or missing, replace them.

Use hydraulic fluid as specified by Southworth with the correct grade and properties for the existing operating conditions.

It is very important to keep the hydraulic oil free from dirt, dust, metal chips, water and other contamination. Most of the problems with hydraulic systems are caused by contamination of the oil.

## 6.1 Periodic Maintenance

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### Before Each shift:

- Inspect the machine for excessive wear or damage.
- Verify all precautionary labeling is in place and legible.
- Verify all three photo-eyes across the load enclosure opening are functioning correctly.
- Verify the machine moves smoothly through the tilt up/down movements.
- Verify E-STOP operates correctly.

### 6.1.1 Weekly Maintenance

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- Inspect all hydraulic fittings and hoses for excessive wear or damage. Ensure fittings are tight.
- Inspect all fasteners, ensure they are tight.
- Verify all proximity switches are properly adjusted.

### 6.1.2 Monthly Maintenance

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- Perform all weekly maintenance and Before Each Shift maintenance.
- Inspect all pivot pins and bushings and cylinder clevis pins and bushings for excessive wear or damage.
- Inspect all wiring, control panel buttons and switches, and push-button controls for damage or loose connections and proper functionality.
- Inspect the hydraulic fluid. If the fluid is dark or cloudy, has a burnt smell, or contains any debris, change the fluid and fluid filter. Verify proper fluid level through sight glass on side of the reservoir. Fluid level should be just below the top of the sight glass when load enclosure is lowered.
- Inspect base frame, tilt frame, and load enclosure for excessive wear, damage, and broken welds.
- If squeaks or groans are heard coming from slowly moving joints, and all moving joints are in servicable condition, consider spraying a penetrating lubricant like (1) PB B'laster (penetrating catalyst), (2) Kano Kroil, or (3) WD-40 lubricant [preference in that order] on them to reduce or eliminate the noise.

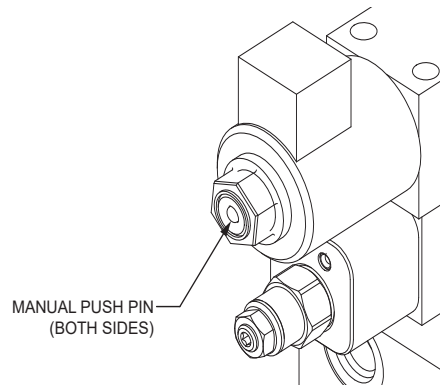
## 6.2 Relieving Hydraulic System Pressure

### **DANGER**

High pressure fluids can penetrate skin and cause severe injury or death. Use proper PPE when working with pressurized systems.

Before performing any maintenance on the hydraulic system, relieve the system pressure by:

1. Lowering the load enclosure into its fully lowered position.
2. With the load enclosure fully lowered, manually shift the 4-way valve on the hydraulic power unit in each direction by pressing on and shifting the valve spool in each direction and holding it for five seconds. This will relieve pressure between the four-way valve and the pump side of the Counterbalance valve.



3. Pressure in the hoses can be relieved by slowly and carefully loosening the fittings for each line at the A and B port fittings on the valve stack. Use a clean container to catch fluid. Clean fluid can be returned to the reservoir.

## 6.3 Adjusting Proximity Switches

### 6.3.1 Upper Travel & Deceleration Switches

The Upper End of Travel switch must be adjusted so that the frame of the load enclosure comes to rest gently on the rubber pads.

The Upper Deceleration switch must be adjusted such that the load enclosure has sufficient time to slow before reaching the Upper End of Travel switch.

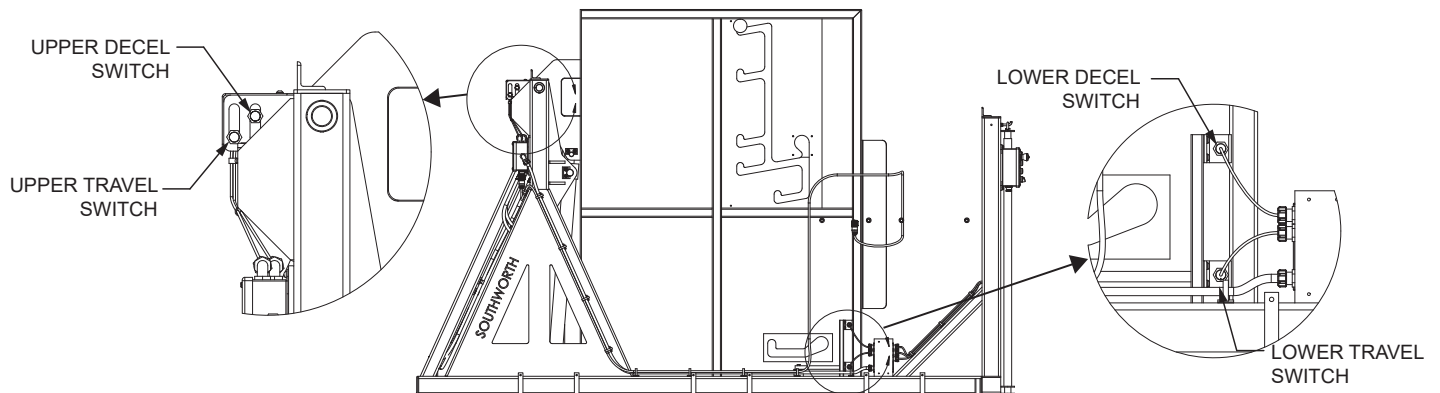
To adjust these switches, loosen the retaining nut and slide the switch body up or down as necessary. Re-tighten retaining nut after adjustment.

### 6.3.2 Lower Travel & Deceleration Switches

The Lower End of Travel switch must be adjusted such that the load edge of the load enclosure comes to rest gently on the floor.

The Lower Deceleration switch must be adjusted such that the load enclosure has sufficient time to slow before reaching the Lower End of Travel switch.

To adjust these switches, loosen the retaining bolts of the bracket that the switch body is mounted to. Slide the bracket up or down as necessary. Re-tighten the retaining bolts after adjustments.



## 7 TROUBLESHOOTING

### NOTICE

After the E-STOP has been pressed or the power has been turned off and back on, the machine will pause for up to one minute to allow the variable frequency drive (VFD) to completely de-energize. After the pause the VFD contactor will close and re-enable the VFD drive.

Symptom	Potential Cause	Potential Solution	
Machine will not raise and/or lower (motor does not run)	E-STOP button may be depressed.	Verify the E-STOP button is not depressed.	
	Photo eyes may detect an obstruction.	Verify that there are no obstructions of the photo eyes.	
	GUARD RESET button has not been pressed after photo eye obstruction.	If the GUARD RESET light is flashing, press and release the button. The machine will not operate until the GUARD RESET button has been pressed.	
	PLC has detected a fault	When a fault is detected the auto mode and GUARD RESET lights will flash. The fault code can be read on the PLC display. Correct the fault condition and press the E-STOP and reset after five seconds then follow the steps in the <b>Start-Up &amp; Loading</b> section. Also see the <b>PLC Fault Messages</b> section.	
	PLC not receiving required signals from conveyor system.	See <b>Signals to Conveyor System</b> section and <b>Signals from Conveyor System</b> section.	
	Machine not receiving power	Verify that the main disconnect switch is in the on position	
		Verify that control panel is receiving the correct supply voltage. One or more fuses may be open.	
	Controls damaged or not receiving power	Inspect the controls and cable for damage. Verify that controls are receiving power.	
Variable Frequency Drive malfunction	Verify VFD is receiving correct supply voltage and does not indicate a fault.  If a fault is indicated see the GS2 Series Drive User Manual.		

Symptom	Potential Cause	Potential Solution
Machine will not raise and/or lower (motor does run)	Hydraulic system leak	Inspect all hoses, cylinders, and fittings for leaks. Repair or replace as necessary
	Hydraulic fluid level is low	Check hydraulic fluid level, add fluid as necessary. Fluid level should be just below the top of the sight glass when load enclosure is lowered.
	Hydraulic valves not working correctly	Verify valve solenoids are receiving power and functioning properly
		Verify valves are not blocked from opening and closing by manually shifting the valve side to side
Motor may be rotating backwards.	Verify motor rotates in the correct direction. If not swap any two phases of power to the motor (T1, T2, T3) at the VFD terminals.	
The load enclosure does not raise and lower smoothly or will not hold position	Counterbalance valving may be out of adjustment	Contact Customer Service for assistance.
The motor continues to run after reaching the full up/full down positions.	Proximity sensors may be out of adjustment.	See <b>Adjusting Proximity Switches</b> section.
Load enclosure does not decelerate when raising or lowering		

## 7.1 Conveyor System Interface

### **NOTICE**

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**Conveyor system signal relays and wiring provided by others. Refer to Electrical Schematic section.**

### 7.1.1 Signals to Conveyor System

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**Tipper E-Stop Signal** - When the E-STOP is pressed this signal will turn off. When the E-STOP has been reset, this signal will turn on.

**Tipper Fault Signal** - If the PLC detects a fault, this signal will turn on. Once the fault is cleared the signal will turn off.

**Tipper Ready Signal** - If the machine is in automatic mode and ready to raise the load, this signal will turn on.

**Tipper Running Signal** - If the machine is in motion this signal will turn on.

### 7.1.2 Signals from Conveyor System

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**Reset Tipper Signal** - When the conveyor system is ready for the machine to lower to the full down position, this signal will turn on.

**Enable Tipper Signal** - This signal must be closed for the machine to operate in automatic mode.

**Conveyor Ready to Receive Signal** - When the conveyor system is ready to receive a load this signal will turn on. If the machine is in automatic mode, it will begin raising after a two second warning delay.

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**If the enable tipper, reset tipper, and conveyor ready to receive signals are all closed, and the tipper is in automatic mode, it will raise first. If it reaches full up, it will stop and then lower to full down, where it will stop and the GUARD RESET light will flash. The machine will be disabled until the GUARD RESET button is pressed.**

### 7.1.3 PLC Fault Messages

If a fault is detected, the GUARD RESET and auto lights will flash and the fault code will be displayed on the PLC display. To clear the fault, the condition must be corrected, and the E-STOP must be pressed for five seconds and reset.



Fault Code	Message
D2	Expansion module disconnected.
D3	Run mode trap. Press and reset e-stop.
D4	Tilt or deceleration switch failure. Either the tilt up/decel down switches or tilt down/decel up switches are triggered at the same time.
D5	HPU ran more than 35 seconds.
D6	Enable Tipper signal is off. (Message only, no fault).
D7	Deceleration proximity switch failure. Both the up and down decel switches are triggered at the same time.
D8	Tilt proximity switch failure. Both the full up and full down proximity switches are triggered at the same time.
D9	GUARD RESET button stuck or tied down.
D10	Waiting for Conveyor Ready signal. (Message only, no fault)



## 8 ELECTRICAL

<b>Primary</b>	460V, 3Ph, 60Hz
<b>Control</b>	24 VDC
<b>Motor</b>	3.0HP, Continuous Duty
	4.2 FLA
<b>Variable Frequency Drive</b>	Automation Direct GS23-43P0

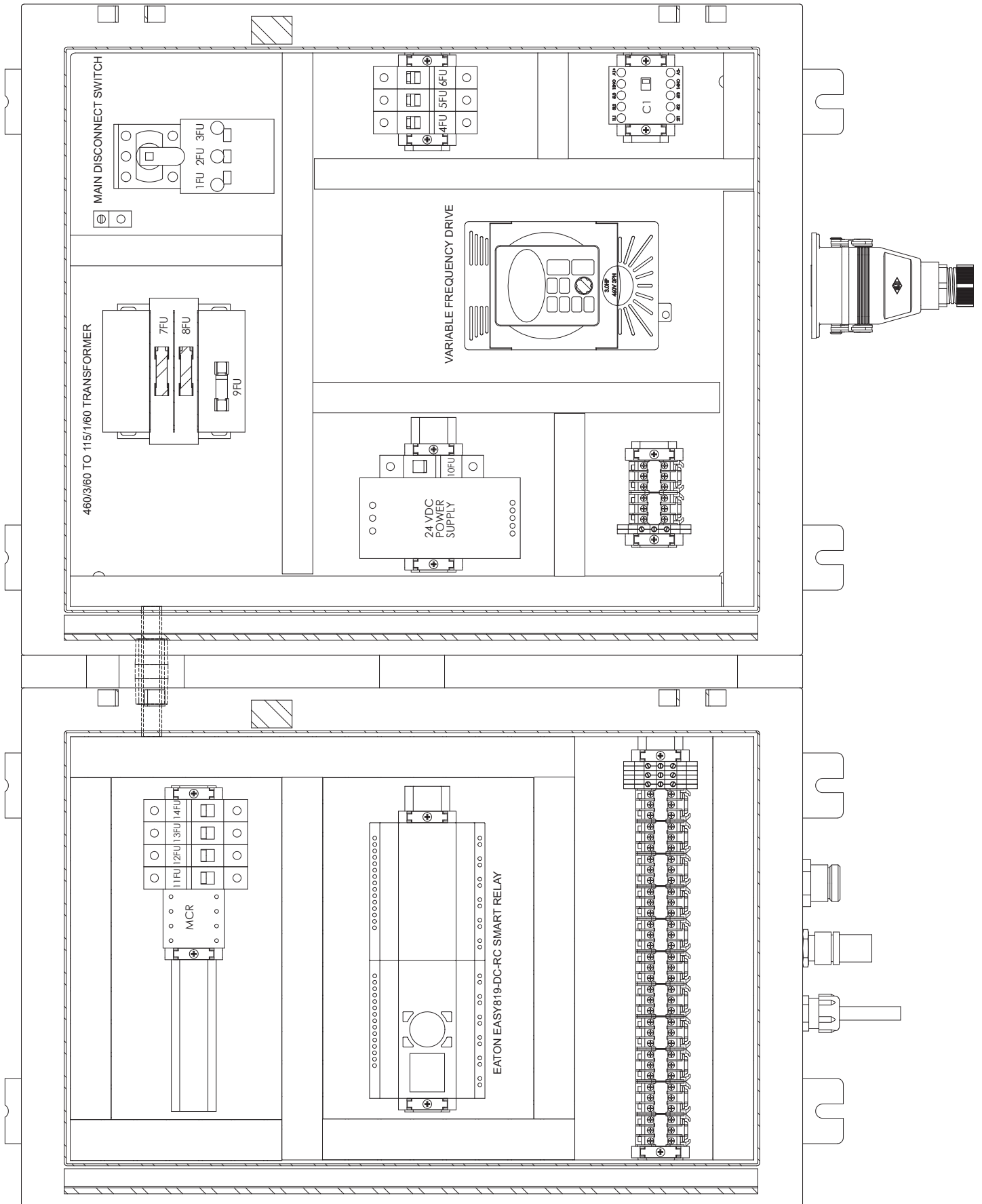


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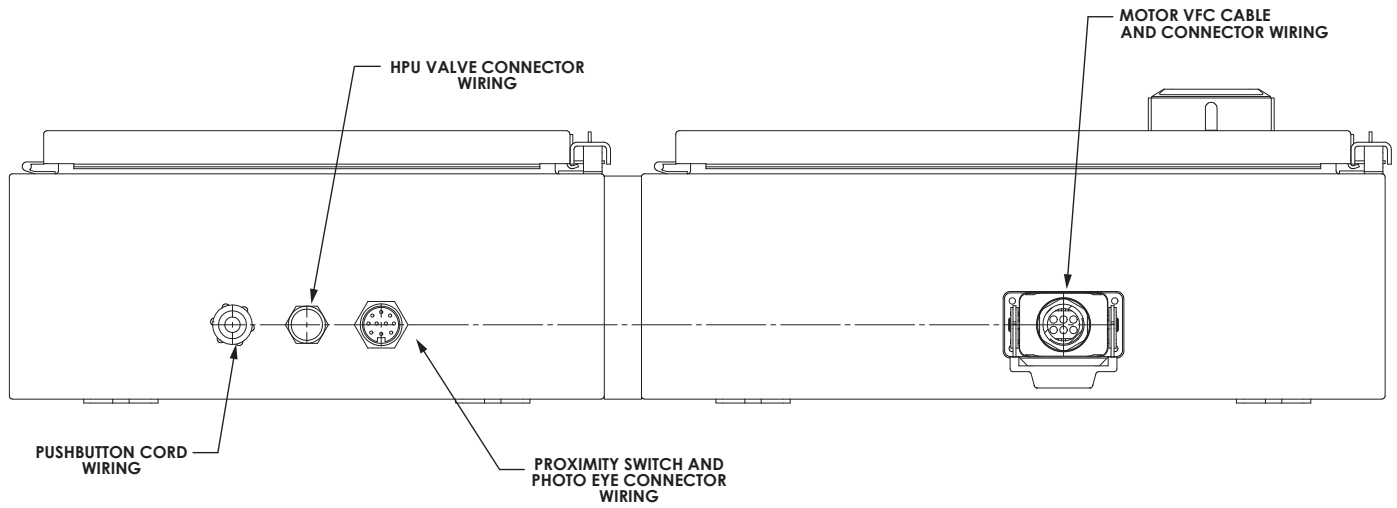
### 8.1 Fuses

<b>Fused main disconnect to be supplied by owner/installer.</b>		
<b>Fuse Number</b>	<b>Fuse</b>	<b>Rating</b>
1	Bussman FNQ-R-8	8A, 600VAC
2	Bussman FNQ-R-8	8A, 600VAC
3	Bussman FNQ-R-8	8A, 600VAC
4	Bussman FNQ-R-7	7A, 600VAC
5	Bussman FNQ-R-7	7A, 600VAC
6	Bussman FNQ-R-7	7A, 600VAC
7	Bussman FNQ-R-8/10	800mA, 600VAC
8	Bussman FNQ-R-8/10	800mA, 600VAC
9	Bussman FNM-3	3A, 250VAC
10	Bussman FNM-8	8A, 250VAC
11	Bussman FNM-1/2	500mA, 250VAC
12	Bussman FNM-5	5A, 250VAC
13	Bussman FNM-3	3A, 250VAC
14	Bussman FNM-1/2	500mA, 250VAC
15	Bussman FNM-1/2	500mA, 250VAC

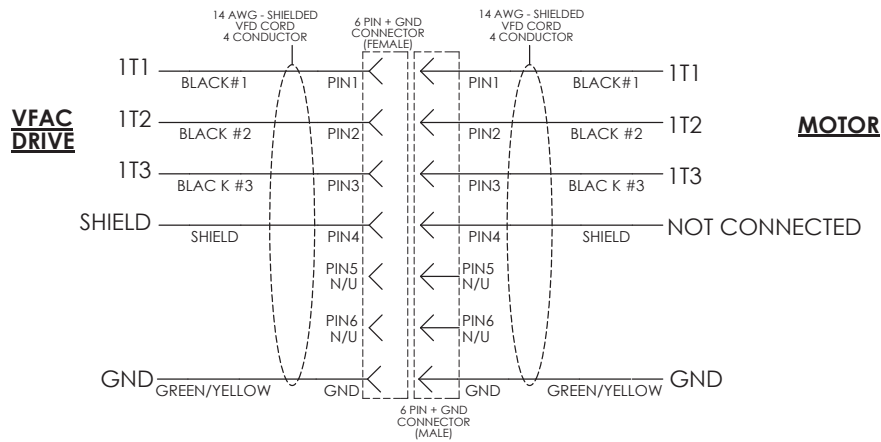
## 8.2 Control Panel



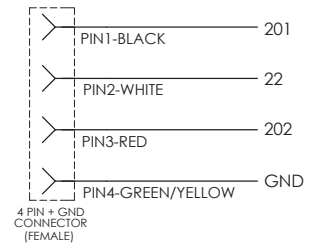
## 8.2.1 External Connection Schematics



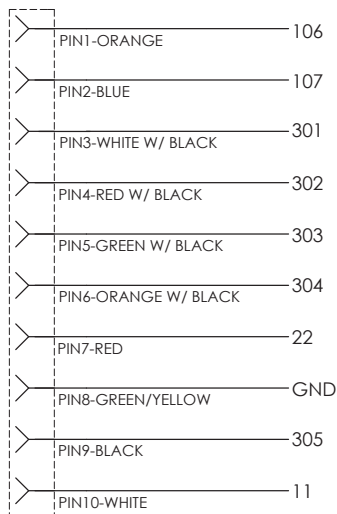
### MOTOR VFC CABLE AND CONNECTOR WIRING



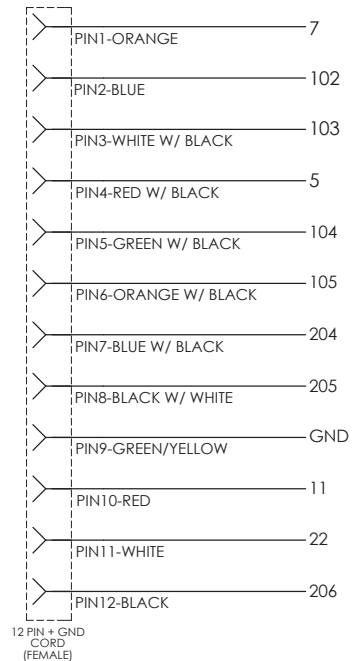
### HPU VALVE CONNECTOR WIRING



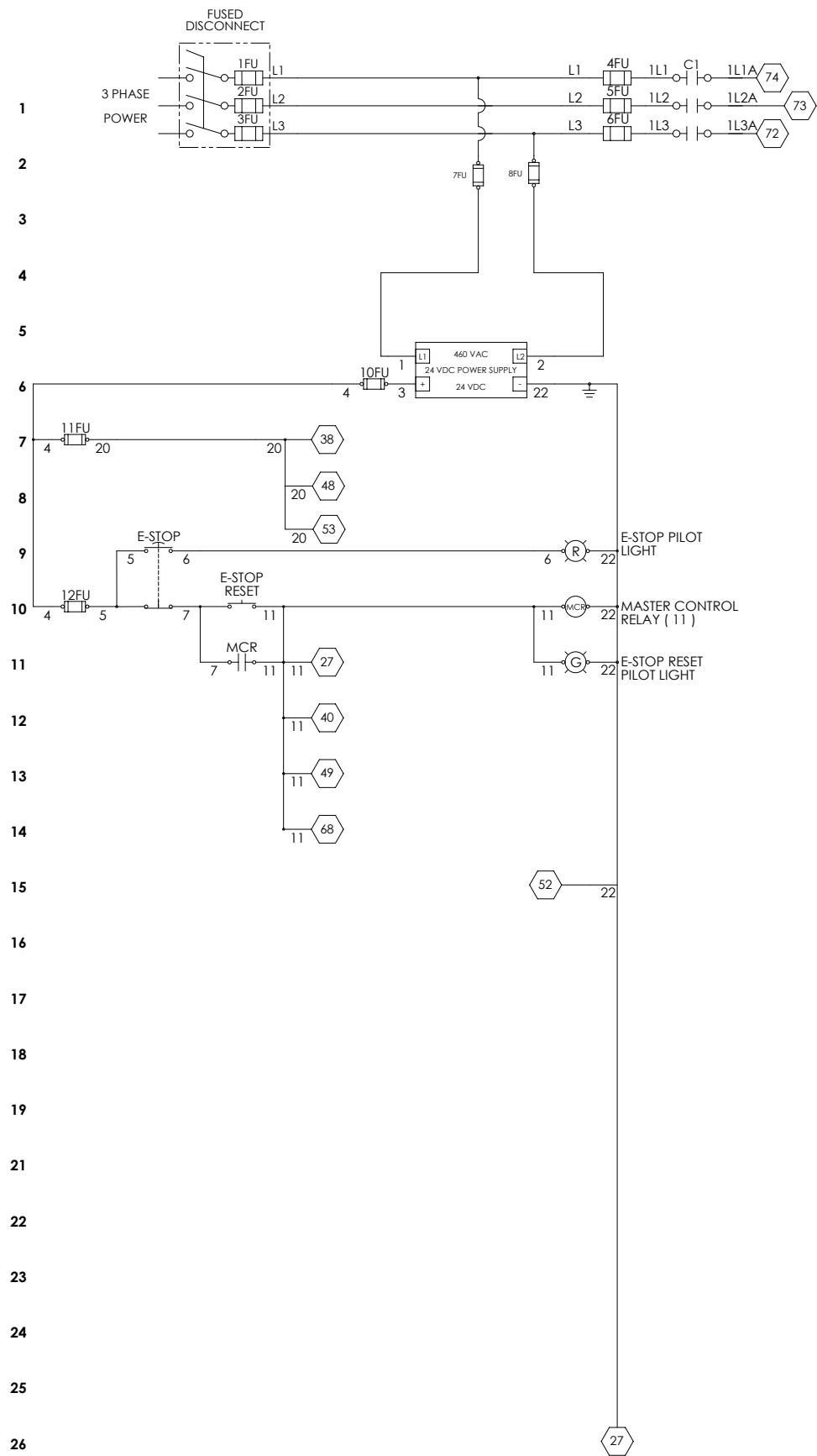
### PROXIMITY SWITCH AND PHOTO EYE CONNECTOR WIRING

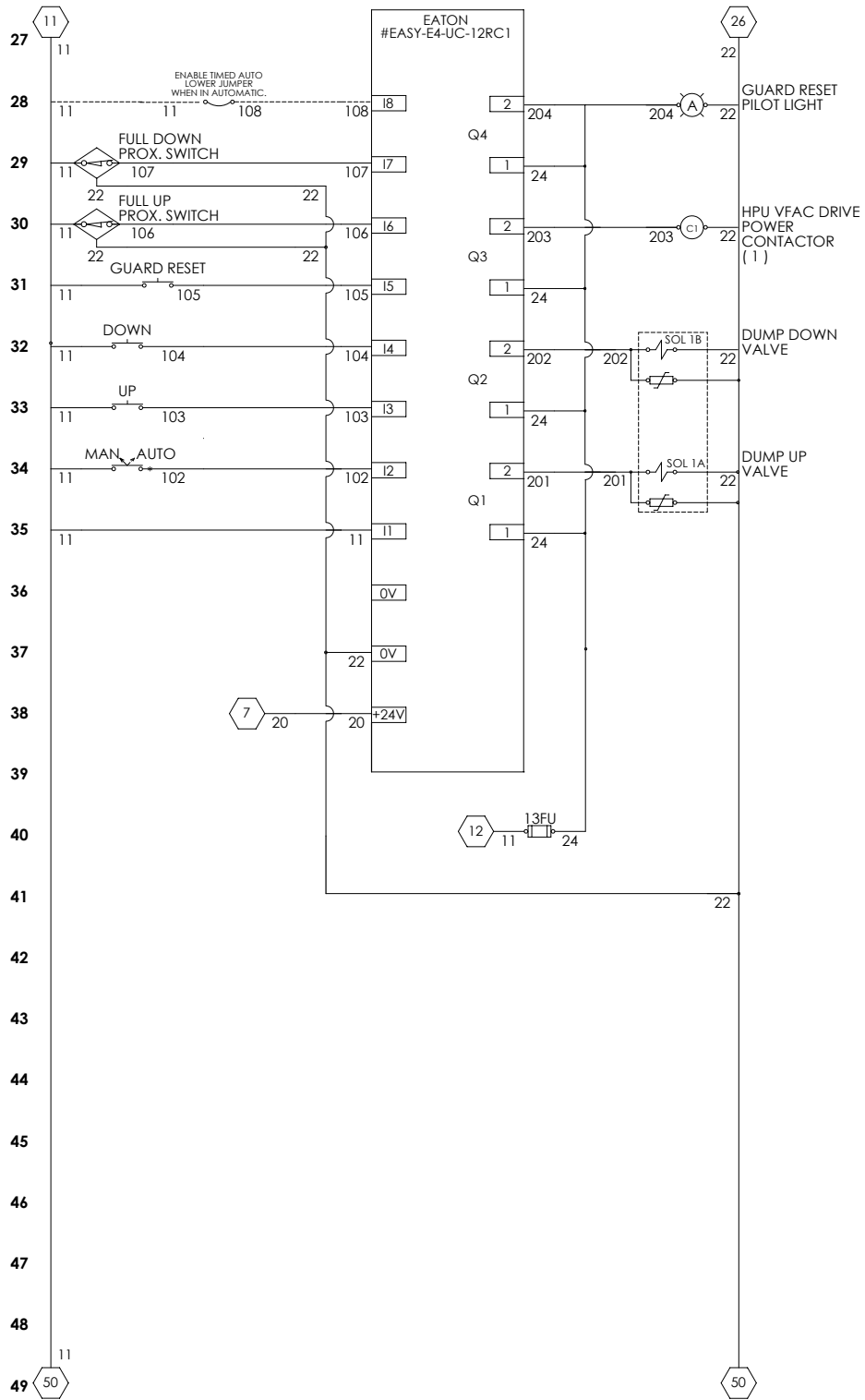


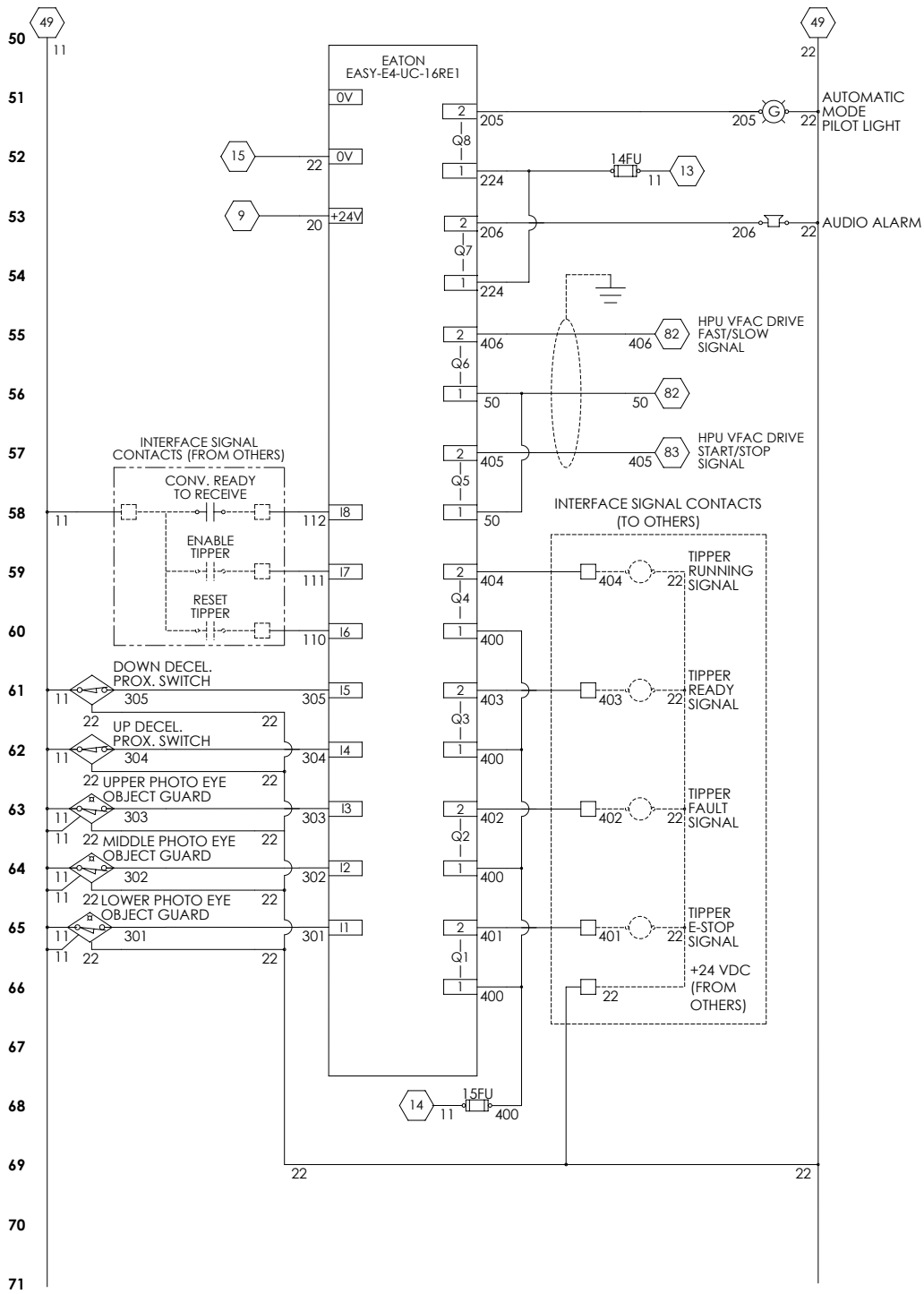
### PUSHBUTTON CORD WIRING

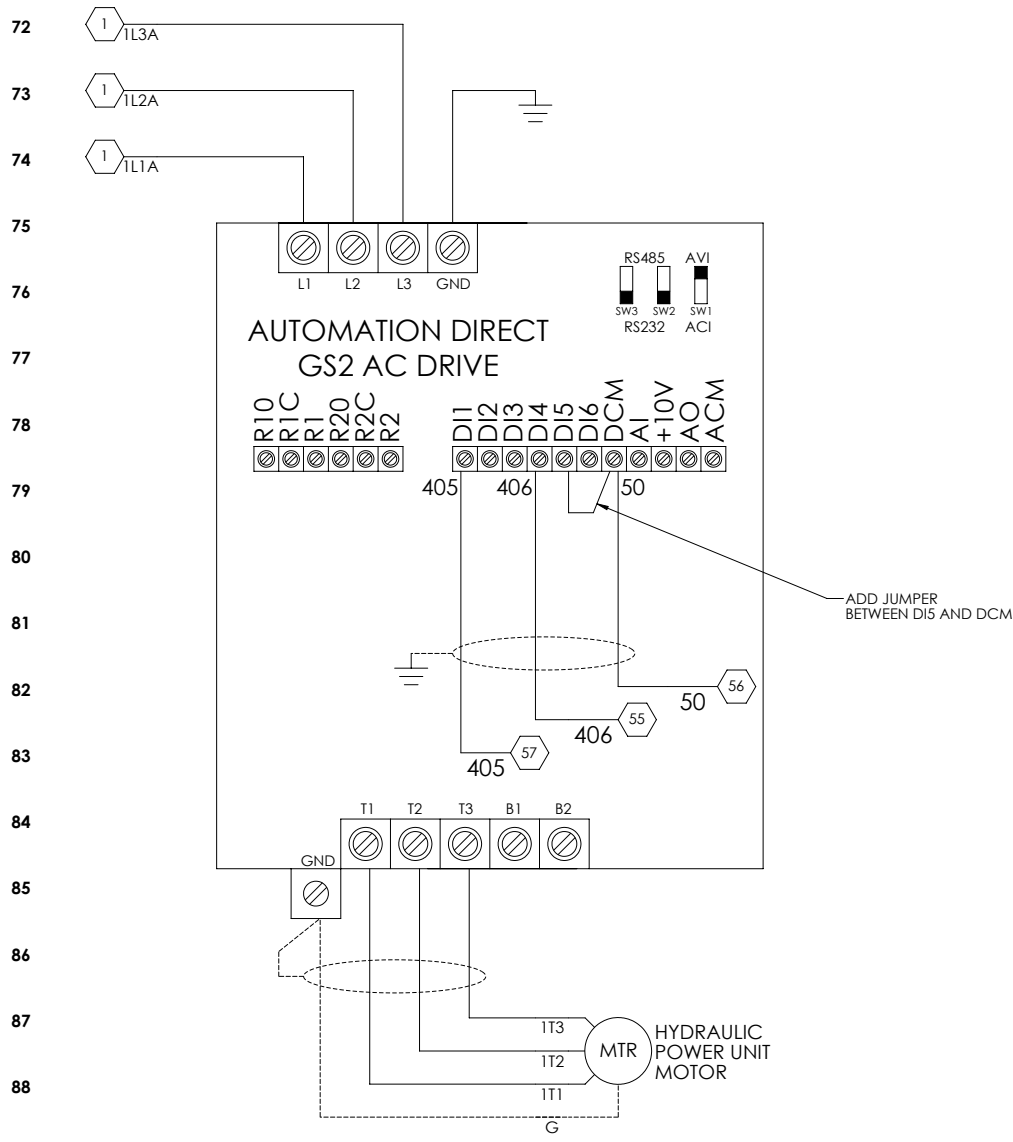


# 8.3 Electrical Schematic



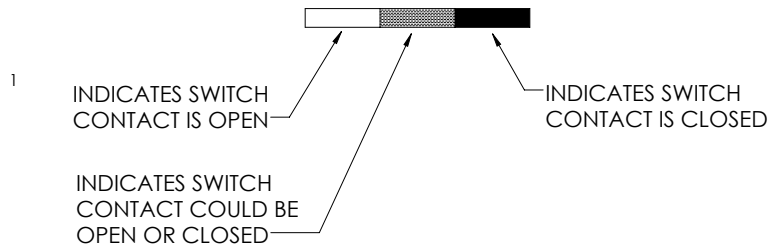
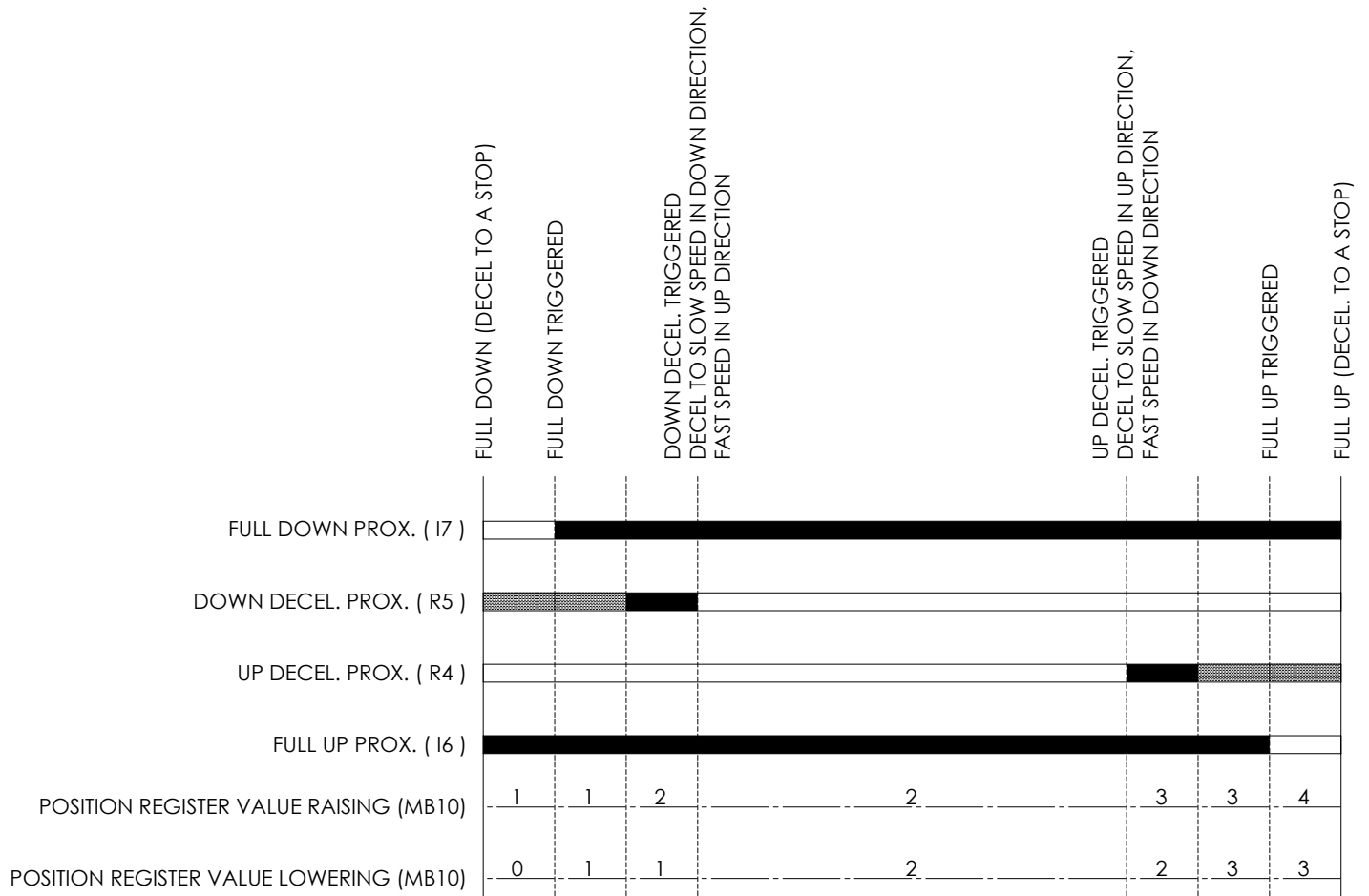






## 8.4 Proximity Switch Operation Diagram

### PROXIMITY SWITCH OPERATION DIAGRAM





## 9 HYDRAULICS

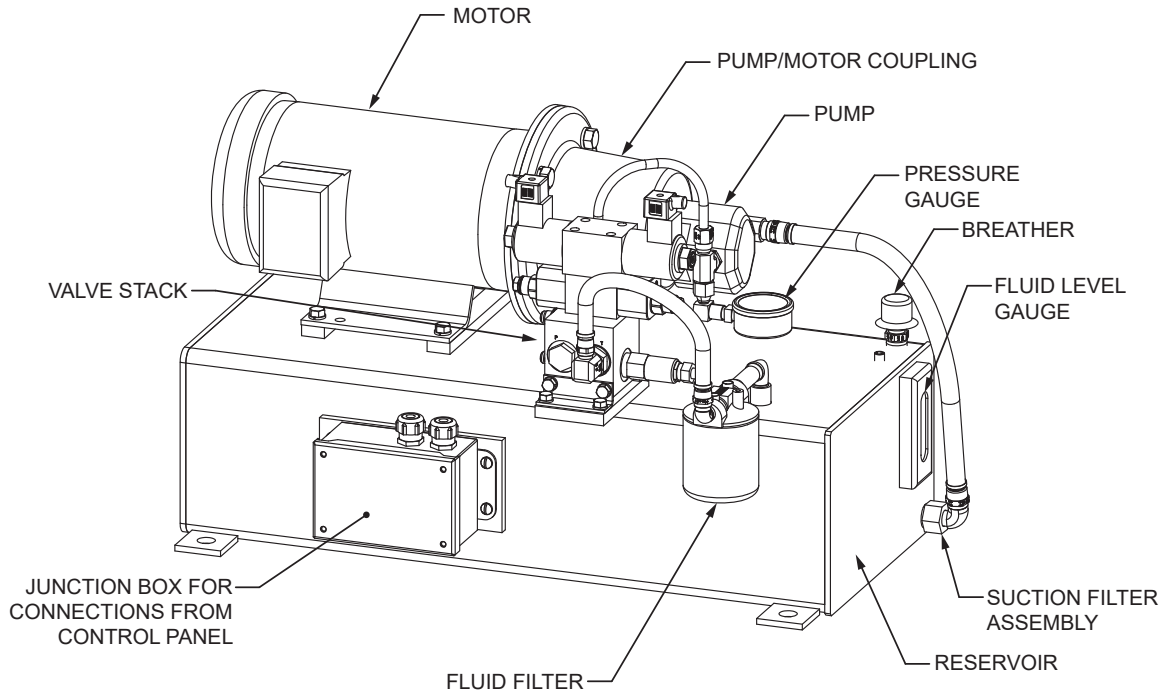
### 9.1 Hydraulic Fluid Information

This machine is supplied with Conoco AW32 hydraulic fluid. Always use the same or equivalent when replacing fluid.

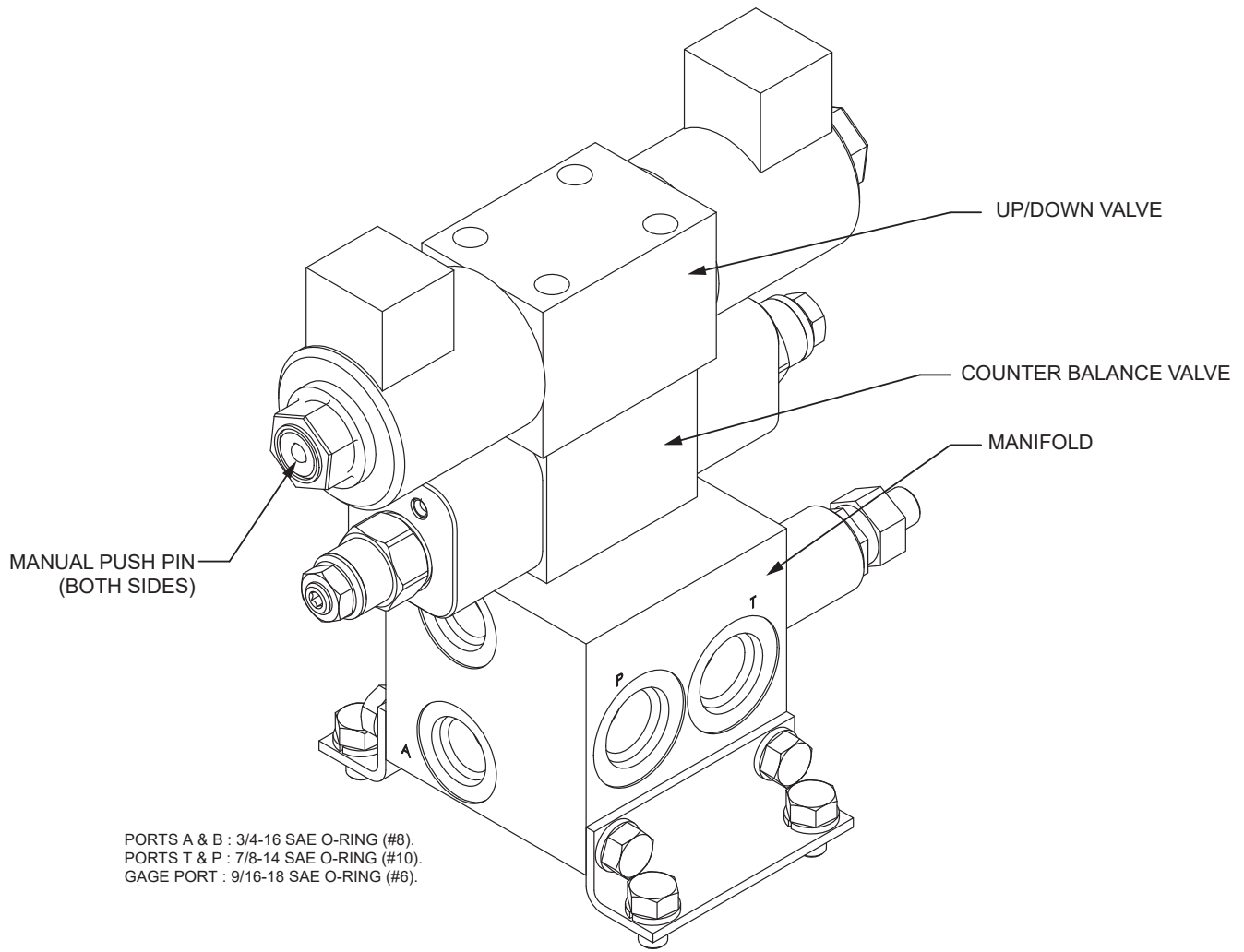
Usable reservoir capacity: 9.75 gallons.

Fluid level should be visible and near the top of the sight glass when load enclosure is lowered.

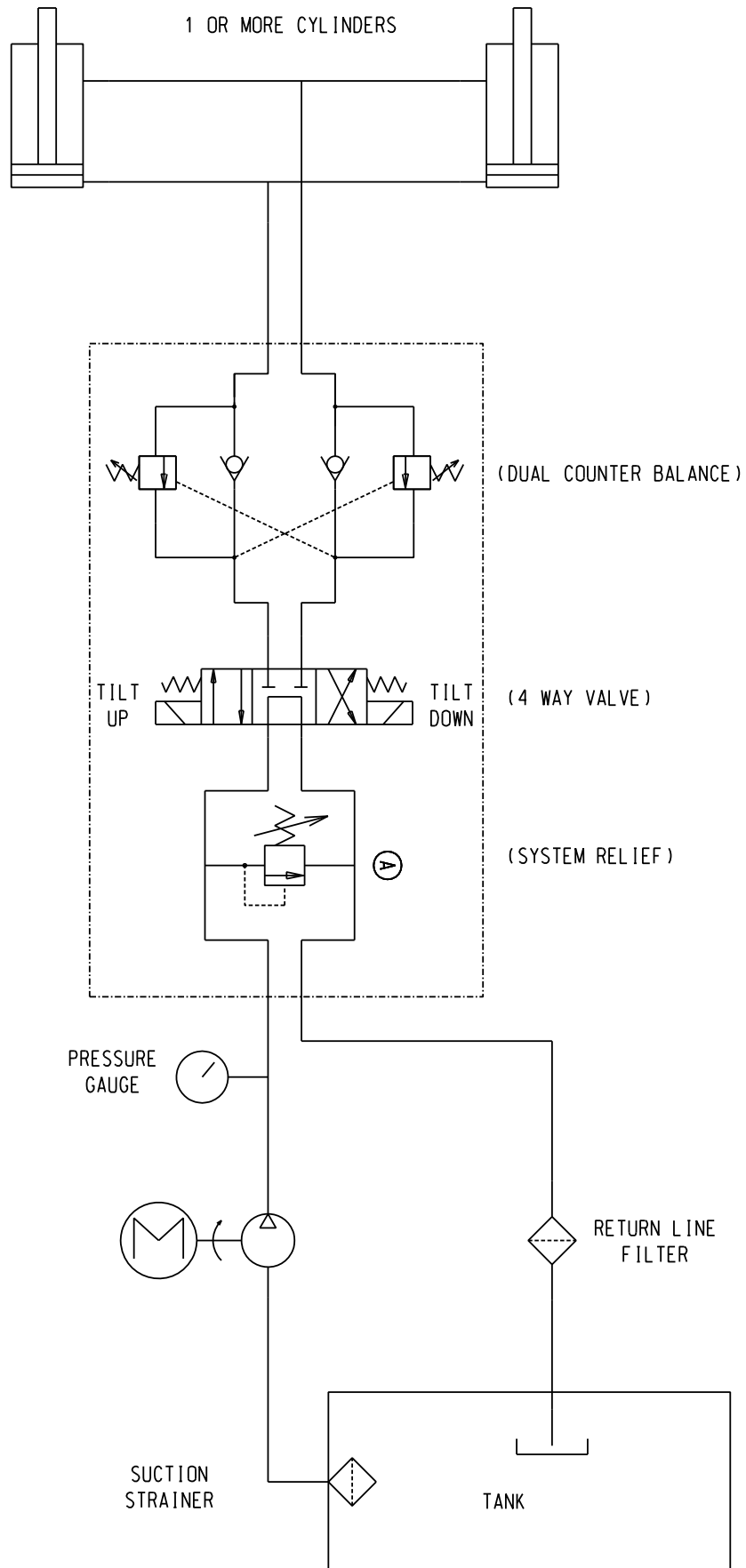
### 9.2 Hydraulic Power Unit



### 9.3 Valve Stack



## 9.4 Hydraulic Schematic



## 10 WARRANTY & CONTACT INFORMATION

Southworth Products Corp. warrants this product to be free from defects in material or workmanship for the duration of the warranty period. Warranty periods vary and begin on the date of shipment. For specific warranty information, contact Southworth Products with the machine's serial number.

Any claim for breach of this warranty must be received in writing by Southworth within the warranty period. Warranties shall not cover failure or defective operation, caused by misuse, misapplication, negligence or accident, exceeding recommended capacities, or any alteration or repair of the item purchased which has not been authorized by Southworth. Except as set forth herein, Southworth makes no other warranties, express or implied, including THE WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE, all of which ARE HEREBY EXCLUDED.

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