

# **PRE-LOAD COMPACTOR**



## **OPERATION AND SERVICE MANUAL**

*Model:* 4500SPH

*Serial Number:* C3001

*Order Number:* 417.2219

*Job Number:* 17.2077

*Customer:* Metro Regional Services

*This manual contains information that is the property of SSI Shredding Systems, Inc. By accepting this information, the borrower agrees that it will not be used for any other purpose than that for which it is loaned.*

**SSI Shredding Systems, Inc.**  
9760 SW Freeman Drive  
Wilsonville, Oregon 97070  
(503) 682-3633 phone  
(503) 682-1704 fax  
[www.ssiworld.com](http://www.ssiworld.com)

**Introduction**

**Receiving, Storage and  
Set-Up**

**Operation**

**Preventive Maintenance**

**Service**

**Troubleshooting**

---

---

---

**Warranty**

**Specifications, Parts Lists,  
Drawings and Program**

**Vendor Literature**



## INTRODUCTION TABLE OF CONTENTS

SECTION	PAGE
1.0	1

<b>CONTENTS</b>	1.0
<b>PURPOSE OF THIS MANUAL</b>	1.1
<b>CUSTOMER ASSISTANCE</b>	1.2
<b>SAFETY PRECAUTIONS</b>	1.3
MACHINE LOCK-OUT	1.3.1
COMPACTOR SAFETY STICKERS & TAGS	1.3.2
POWER UNIT SAFETY STICKERS & TAGS	1.3.3
CONTROL PANEL SAFETY STICKERS & TAGS	1.3.4
<b>DEFINITIONS AND ABBREVIATIONS</b>	1.4
<b>OPERATING PRINCIPAL</b>	1.5



This manual contains guidelines for the set-up, safety, operation, maintenance, and service of equipment provided by SSI.

This manual should be kept clean and near the machine at all times. Please read and understand the applicable section and their safety precautions prior to performing any procedures.



**WARNING**

**Serious injury or death could result from the improper use, repair or service of this machine.**

**Repairs and/or service to this machine must only be done by properly trained personnel.**

**IMPORTANT**

**It is very important that all personnel operating and maintaining this machine, study the sections of this manual that pertain to their particular task before beginning or damage to the equipment may occur.**

This manual contains the following:

- Section 1 Introduction
- Section 2 Receiving, Storage & Setup
- Section 3 Operation
- Section 4 Preventative Maintenance
- Section 5 Service
- Section 6 Troubleshooting
- Section 7 Optional Equipment if Applicable (Section may be left blank)
- Section 8 Optional Equipment if Applicable (Section may be left blank)
- Section 9 Optional Equipment if Applicable (Section may be left blank)
- Section 10 Warranty
- Section 11 Specifications, Illustrations & Parts Lists
- Section 12 Vendor Literature

The information contained in the above sections was known to be accurate at the time of shipment. SSI strives to keep customers informed of machine changes that may effect units already in the field. If you have any questions regarding information in this manual or with your machine, please call SSI Customer Service. This Manual covers models 4500SPH, 4500, 4500EX



SSI provides customer assistance with the operation, maintenance and service of this machine.

**HOURS:**

Office: Monday-Friday, 7:00 am to 5:00 pm PST  
24-hour phone support available.

**PHONE:**

Voice: 503-682-3633  
Fax: 503-682-1704

**EMAIL:**

info@ssiworld.com  
parts-service@ssiworld.com

**WEB SITE:**

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

**ADDRESS:**

Shipping and correspondence should be sent to the following address:

SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286

**RETURNED GOODS:**

Please call for a Returned Goods Authorization (RGA) Number before shipping to SSI.  
C.O.D. freight and packages will not be accepted.

**SSI WARRANTY**

For information regarding SSI's warranty policy, please refer to Section 10 in this manual or contact SSI.

Machine operators and maintenance personnel must always comply with the safety precautions given in this manual and on the stickers and tags attached to the machine.

These safety precautions are given for your safety. Review them carefully before operating the machine and before performing general maintenance or repairs.

Supervising personnel should develop additional precautions relating to the specific work area and local safety regulations.

The *COMPACTION SYSTEM™* will provide safe and dependable service if operated in accordance with the instructions given in this manual. Read and understand this manual and any stickers and tags attached to the machine. Failure to do so could result in personal injury or machine damage.

## SAFETY SYMBOLS

Safety symbols and signal words, as shown below are used to emphasize all operator, maintenance and repair actions which, if not strictly followed, could result in a life-threatening situation, bodily injury or damage to the machine.



This is the safety alert symbol.

It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



This safety alert and signal word indicate an imminently hazardous situation which, if not avoided **WILL** result in **DEATH** or **SERIOUS INJURY**.



This safety alert and signal word indicate a potentially hazardous situation which, if not avoided **COULD** result in **DEATH** or **SERIOUS INJURY**.



This safety alert and signal word indicate a potentially hazardous situation which, if not avoided **MAY** result in **MINOR** or **MODERATE INJURY**.



This signal word indicates a situation which, if not avoided **WILL** result in **PROPERTY/EQUIPMENT DAMAGE**.

**IMPORTANT**

This signal word indicates a situation which, if not avoided MAY result in PROPERTY/EQUIPMENT DAMAGE.

## GENERAL SAFETY PRECAUTIONS

- Establish a training program for all operators to ensure safe operation.
- Do not operate the machine unless thoroughly trained or under the supervision of an instructor.
- Always wear safety equipment such as goggles, ear, head protection and safety shoes at all times when operating the machine.
- Do not inspect or clean the machine while it is running. Accidental engagement of the machine can cause serious injury.
- Do not operate a damaged or improperly adjusted machine.
- Never wear loose clothing that can get entangled in the working parts of the machine.
- Keep all parts of your body away from the working parts of the machine.
- Always keep critical markings, such as warning stickers legible.
- To avoid personal injury or machine damage, all maintenance, repair and service must only be performed by properly trained personnel.
- Always stand clear (at least 30ft/9m) away from the chute loading area while the compactor is loaded.
- NEVER load any flammable or explosive items into the compactor such as fuel tanks or propane bottles.
- Use appropriate fall protection when working on machine platforms.
- Always have all shields and guards in place before operating machine.
- Do not process excessively long material that exceeds the top of the feed hopper.
- Never attempt to process materials for which the compactor was not designed.
- Do not put fingers in bolt holes or between other heavy parts.
- Always use extreme caution around high-voltage electrical components.
- Always allow the hydraulic system to cool before performing service work.
- Always release all pressure in the oil and cooling systems before disconnecting lines and fittings.
- Always replace fasteners with SSI approved parts or equivalent.

## MACHINE LOCK-OUT

- Always lock-out the machine when entering the chamber.
- Always lock out and tag out the machine before opening and entering the cylinder area.
- Always lock-out and tag-out all power to panels and electric components before servicing.

**This is very important!** It is possible to be in the chamber and out of sight of the control panel. Locking the unit out is the only way to prevent someone from starting the machine while you are inside it!

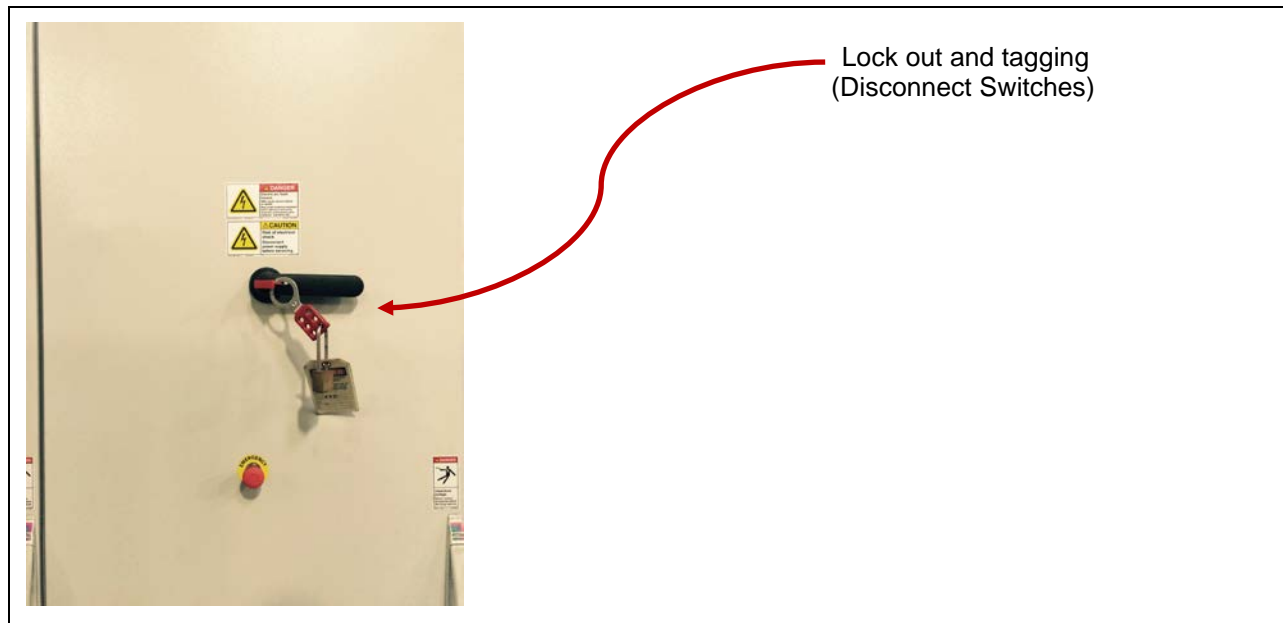


**Unexpected machine startup can result in death or severe personal injury.**

To ensure safety when servicing or inspecting the compactor all sources of energy **must be switched off, locked out and tagged** at the source, before work or inspection is started.

Switch off the main breaker located on the right side of the motor starter panel. (If the unit has more than one breaker, all of them must be switched off, locked out and tagged.) Press the HPU start button prior to working on the machine to ensure that the unit is fully locked out. Anyone who will be involved in the service or maintenance of the compactor must place their own lock on the disconnect switch.

Locking out and tagging should be done in accordance with plant rules or OSHA approved procedures. After the power has been locked out, it is recommended that an attempt be made to start the machine using the diesel start button on the control panel. This step confirms that the unit has been correctly locked out.





## POSSIBLE SOURCES OF ENERGY

All possible sources of energy must be identified and locked out prior to working on the equipment. The following is a list of common sources of energy. It is possible that other sources of energy exist that are not identified here.

### Electrical Energy

#### Control Voltage

The voltage on the control circuit is typically 24 VDC, but could be higher. Normally, locking out the main disconnect switch isolates this voltage from any control wiring. In some situations, the control voltage can be fed from external circuits and will have to be locked out at its source. In some case control power from other equipment will be present in the SSI supplied panel. Lock out all of the sources of electrical energy before working on the electrical system.

#### Main Power

The main incoming power will be significantly higher than the control voltage and present a lethal shock hazard. In most cases, locking out the main breakers on the SSI supplied panels will eliminate this voltage from all of the circuits except the incoming leads to the breakers themselves. In other cases, the power will have to be locked out at facility breakers feeding the equipment. Carefully determine power sources and lock out all of them prior to working on the equipment.

On units equipped with diesel engines there are electrical heaters in the hydraulic tank and engine block that are powered from outside sources. Disconnect (unplug) these to eliminate hazards from this source.

On units equipped with conveyors: lockout any conveyors feeding the conveyor.

### Potential Energy (Gravity)

The discharge gate itself is a source of potential energy. Lower the discharge gate fully or block it up in the raised position prior to working around or under it.

**Falling material is a source of potential energy.** Make sure that material hanging in or around the hopper or conveyors has been secured prior to working under it. Ensure the material on the tipping floor is stabilized prior to working under the chute area.

### Hydraulic Energy

**Stored Hydraulic Pressure** – Residual pump pressure. When the power unit is turned off, for a few seconds after the motors stop turning there can be some pressure remaining in the system. Push pin (manually activate) all solenoid valves to relieve this pressure.

Gate cylinders have counterbalance valves that are designed to hold the pressure in the cylinders which prevents them from drifting down. For the gate cylinders; support the gate to minimize the pressure retained and then carefully crack a hose fitting between the cylinder and the counterbalance valve to bleed off any pressure.

If the platen is pressing against trash at the moment that the machine is turned off, the trash can push the platen and create pressure in the compaction cylinder. When the HPU is turned off, It is possible for the platen to move for many minutes as the trash relaxes and pushes the platen back. This hazard can be eliminated by positioning the platen away from any trash or waiting 30 minutes to allow the platen to stabilize.

### Thermal Energy

In addition to the above forms of energy, there are two sources of potentially dangerous temperatures:

Hot fluids: Hydraulic fluid can reach temperatures capable of burning or scalding flesh.



Hot Surfaces: The surface temperatures of hydraulic components or HPU tank can reach temperatures capable of causing burns.

The only way to eliminate these hazards is to wait until the unit has cooled.

In addition to locking out all energy sources, the following warnings must also be observed.



**Crushing Hazard.**

**When the machine is in motion, moving parts will cause personal injury or death. Do not work on or enter any part of the compactor while it is in operation or has an electrical power supply connected.**

**Lock out and tag out electrical power source and clear stored energy.**



**Moving Parts Hazard.**

**Servicing hydraulic cylinder related components with stored energy present after machine shut-down can result in unexpected machine motion.**

**Manually support loads suspended by cylinders and clear stored energy prior to servicing equipment.**

**Press in Solenoids to bleed off any pressure prior to servicing the cylinder hydraulics. See picture illustration below for location of the solenoids.**



**Moving Machinery Hazard.**

**Servicing hydraulic cylinder related components with hydraulic pressure present in the cylinders after machine shutdown can result in unexpected machine motion.**

**Manually support loads suspended by cylinders prior to servicing the equipment.**

**Crack a hose fitting in addition to manually pressing solenoids to bleed off any pressure prior to servicing the cylinder hydraulics.**

 **WARNING**

**Falling Material Hazard.**

**Un-compacted material in the feed chamber opening can fall through the chamber to the chamber floor below.**

**Remove un-compacted material prior to working below the chamber opening.**

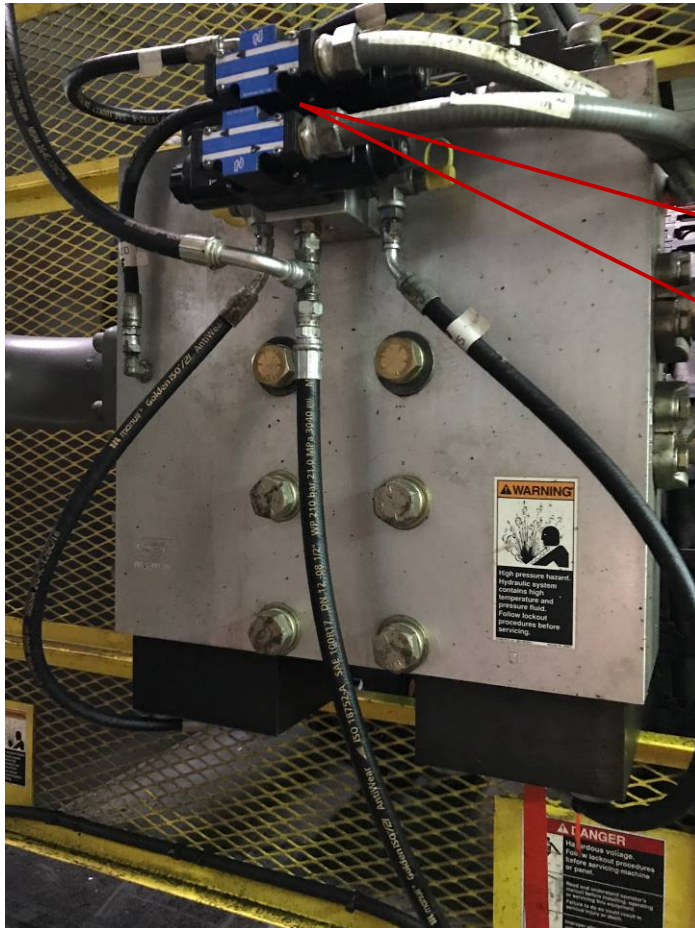
 **CAUTION**

**Burn Hazard.**

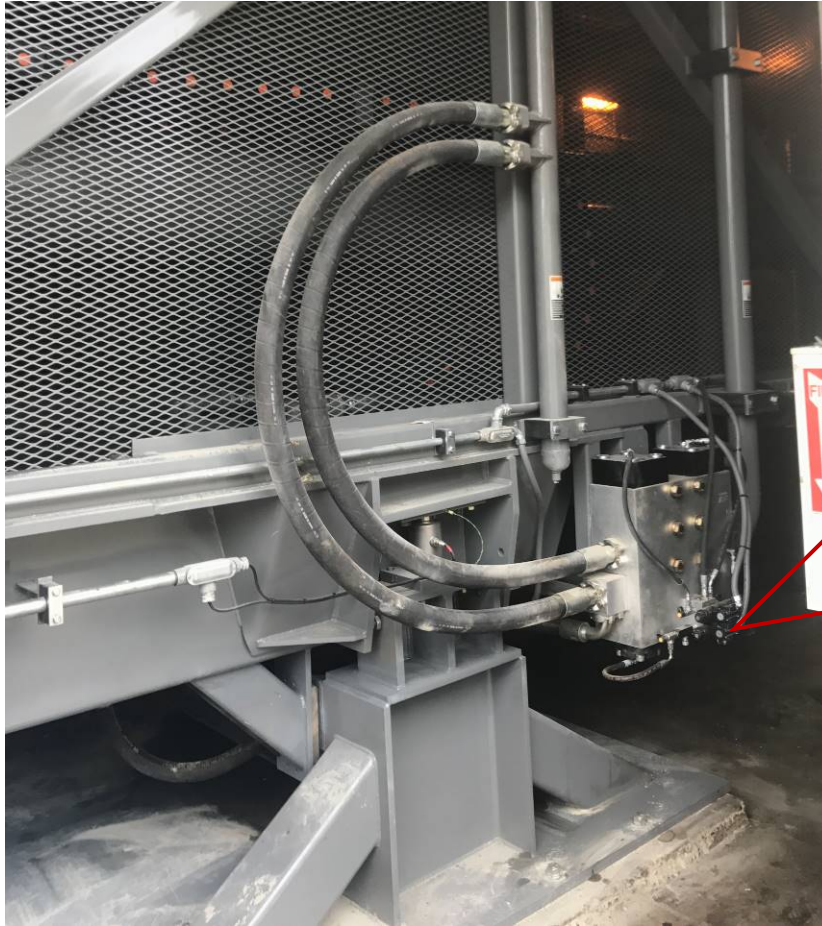
**Hydraulic fluid can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.**

**Allow fluids and lubricants and associated parts to cool before servicing.**

Locations of all the solenoids on the compactor.



This Cram manifold is located on the back of the main compaction cylinder, please manually pushpin all solenoids several times to eliminate stored hydraulic energy.



This Eram manifold is located on the side of the compactor, please manually pushpin all solenoids several times to eliminate stored hydraulic energy.

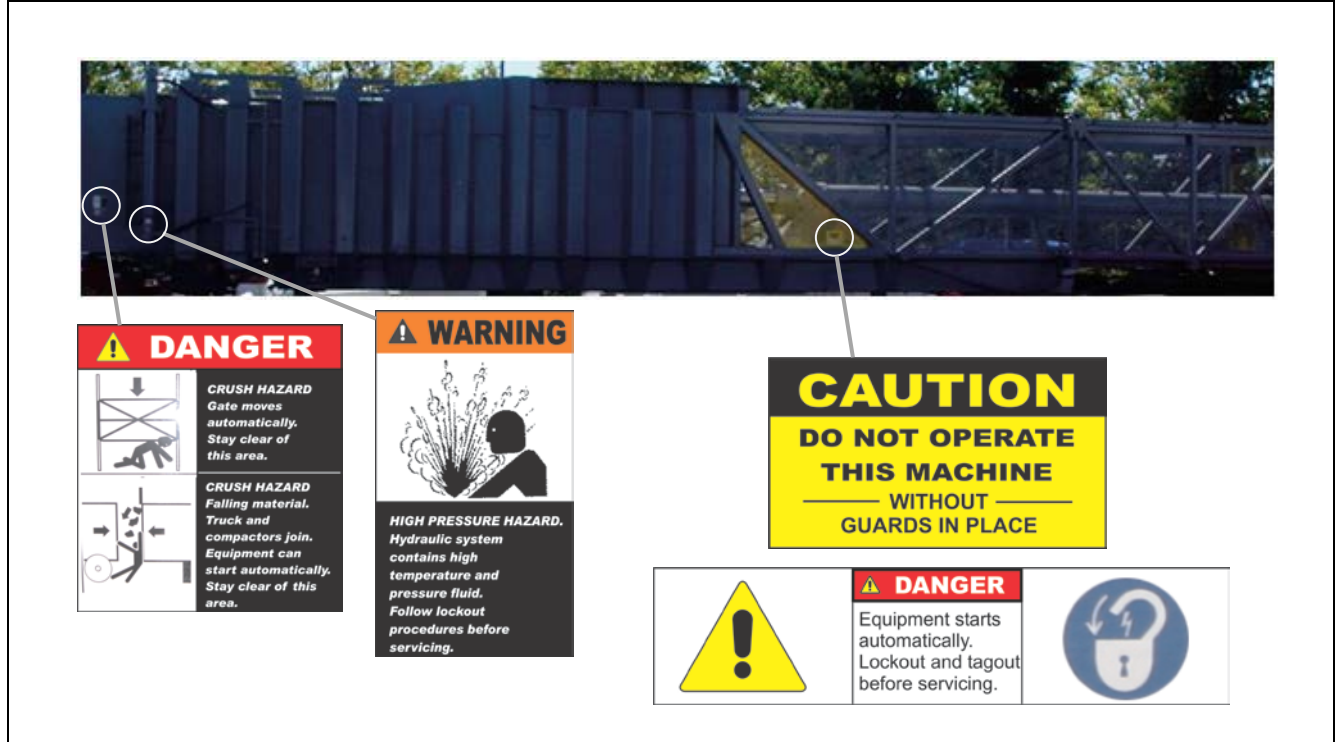


There are also several solenoid valves under the compactor floor closer to discharge gate area, please manually pushpin all solenoids several times to eliminate stored hydraulic energy.

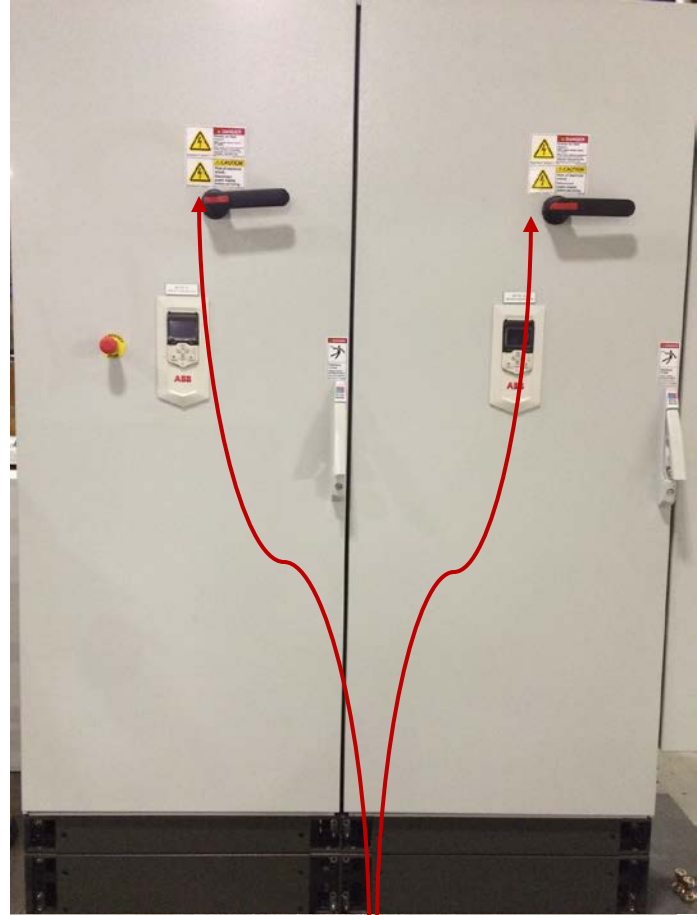
**STICKERS & TAGS**

Always keep stickers on the machine legible and clean at all times.

If stickers become illegible, contact SSI for replacement stickers.







	<p><b>⚠ DANGER</b></p> <p><b>Electric arc flash hazard.</b> Will cause severe injury or death. Wear proper protective equipment before opening or performing diagnostic measurements while energized. (See NFPA 70E)</p> <p><small>©Clarion Safety Systems, LLC clarionsafety.com 14234 Reorder No. 18010-20026P1</small></p>
---	---

	<p><b>⚠ CAUTION</b></p> <p><b>Risk of electrical shock.</b> Disconnect power supply before servicing.</p>
---	---

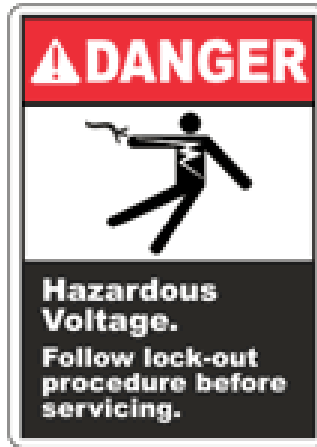


**⚠ DANGER**

**Electric arc flash hazard.**

Will cause severe injury or death.

Wear proper protective equipment before opening or performing diagnostic measurements while energized. (See NFPA 70E)







Your SSI product manual contains the following abbreviations and common terms used throughout the manual. Some of the terms may not apply to your compaction system.

**Bale** - The material that the compactor compacts is a bale. This is ejected into a trailer or a container.

**Bearings** – The wear bearing for the platen and carriage are made of a sacrificial material that wears out instead of wearing out the floor tracks they ride on.

**Carriage** – The frame behind the platen that holds the ERAM's and supports the cover for the hopper when the compactor is ejecting or compacting a bale. The cover keeps material from falling on the cylinders and causing damage.

**Chamber** - This is the main body of the compactor. This is where the compaction takes place.

**Clear Stroke** - This is when the platen goes forward in the chamber and pushes material out of the load chamber area.

**Compact Stroke** - This is when the platen goes forward of the knife and applies pressure to the material to create a bale.

**CRAM** - Compaction ram, the main cylinder in the compactor that pushes the platen and the carriage forward and pulls them back.

**CRAM Manifold** - Is the hydraulic manifold located on the rear end of CRAM cylinder. This controls the movement of the Cram cylinder.

**Density Mode** - When the PLC calculates the density per foot for the bale. This builds a consistent bale with a constant density from front to rear.

**Distance Measuring Electronics (DME)** - This is the laser device used for monitoring the distance of the platen from the home position.

**ERAM** - Ejection ram, the two cylinders supported by the carriage. These are used to push the bale out of the compactor on many series of compactors. These cylinders push the platen forward while the carriage holds position to seal off hopper opening

**ERAM Manifold** - Is the hydraulic manifold located on the side of the carriage section. This controls the movement of the Eram cylinders. (4500 models only)

**Faults** - Any of the conditions that the PLC detects that will not allow the compactor to run properly or causes the compactor to shut down.

**Gate** - This is at the discharge end of the compactor. It is used to keep the bale inside the compactor while it is being built. The gate is raised to discharge the bale.

**Hydraulic Power Unit (HPU)** - Refers to the hydraulic pump, motor, control valves, fluid reservoir, filter, and hoses assembled to power the cylinders.

**Home Position** – Platen is fully retracted, material can be added to load chamber.

**Hopper** - The integral part of the compactor into which waste material is fed or dumped.



**Hopper Extensions** - One or more fabricated components that increase the capacity of the hopper. On mobile systems, the hopper extension is typically removed during transport.

**Knives** - A thick heat-treated metal plate used to shear through material that is put into the hopper. The platen knife is mounted on the platen, and the chamber knife is mounted in the chamber.

**Laser**- Measures distance of the platen

**Load Cell** - Part of the scale system that the compactor is mounted on. This gives an electrical signal to the scale system that is converted to a weight.

**mGuard Router** – The device that allows the technician at SSI to call into the PLC on the compactor and troubleshoot or amend the program. A independent Ethernet connection required (supplied by others).

**HMI** – Operator Interface used to monitor compactor operation. It is also for inputting data for making bales and monitors maintenance operations.

**Pilot Pressure** - Pressure generated by the Pilot pump to operate the many hydraulic valves.

**Platen** - Weldment moved by the hydraulic cylinders, which, compresses the material in the compaction chamber.

**Poppet Valves** - These are located on the CRAM and ERAM manifold and control the flow of hydraulic fluid to the cylinders.

**Programmable Logic Controller (PLC)** – A solid state electronic device that receives information from sensors and push buttons, processes this information using stored, programmed logic and executes commands to control the operation of machines or processes.

**Scale Card** - The portion of the scale system where the load cell signals are converted to a weight signal for display.

**Scraper** – Located at the rear of the hopper, it keeps material from migrating into the rear of the compactor.

**Shear point** - The point where the platen knife overlaps the chamber knife at the forward end of the loading chamber.

**Sign Board** – Displays information from the PLC for the operator. Information such as bale weigh, platen location, and any faults that may occur.

**Unloaders** – These valves are located on the HPU and divert the hydraulic oil flow to the compactor cylinders that perform the hydraulic work.

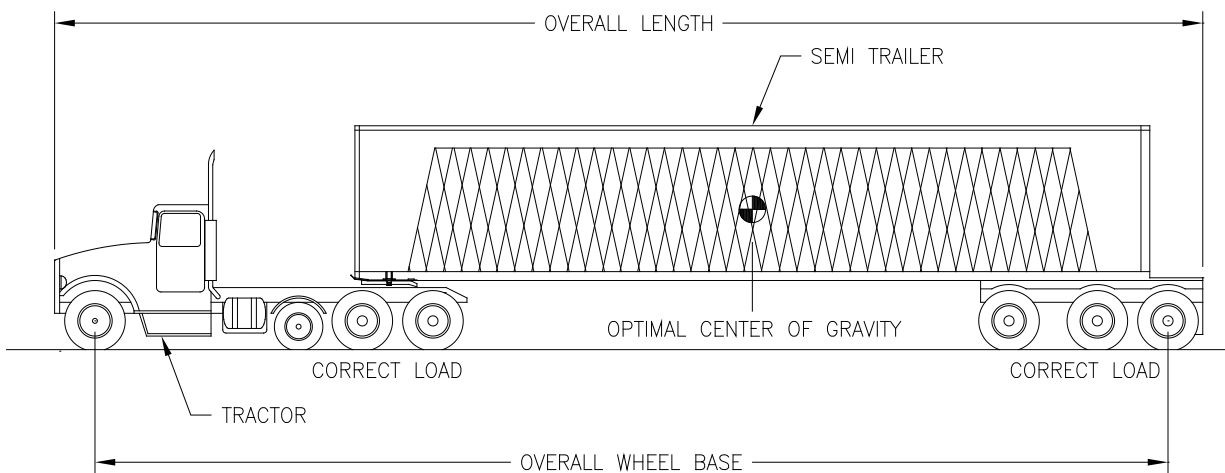
**Variable Frequency Drive (VFD)** – The HPU includes VFD Main Motor Controllers. These controllers only start and run the main pump motors when cylinder movement or work is required. These controllers also start and run the heat exchanger if provided. These units provided to save substantial electrical energy.

## INTRODUCTION

This compactor is designed to load trailers and or containers with compacted Municipal Solid Waste (MSW) in a way that provides the maximum legal highway load while minimizing wear and tear, and damage to the trailer or container. This system has been engineered to maintain the most flexibility to construct bales of MSW for each individual operation and road legal transportation situation. The compactor is manufactured with the highest quality of materials to provide years of dependable operation.

## MAXIMIZING WASTE TRANSFER

The goal of utilizing a compaction system is to maximizing waste transfer and minimize transportation costs. Every State and Province governs its own highway system, therefore requires hauling operations to adhere to existing weight laws. During the process of building bales in the Compaction System, flexibility has been designed into the Control System to allow the operator to adjust many parameters to insure maximum bale weights are achieved for the particular transport equipment and individual weight laws. The following is a general guideline for achieving maximum bale weights, however, experimentation with the Compaction System will untimely provide the best results for each waste transfer station operation.



### OPTIMUM BALE CONFIGURATION

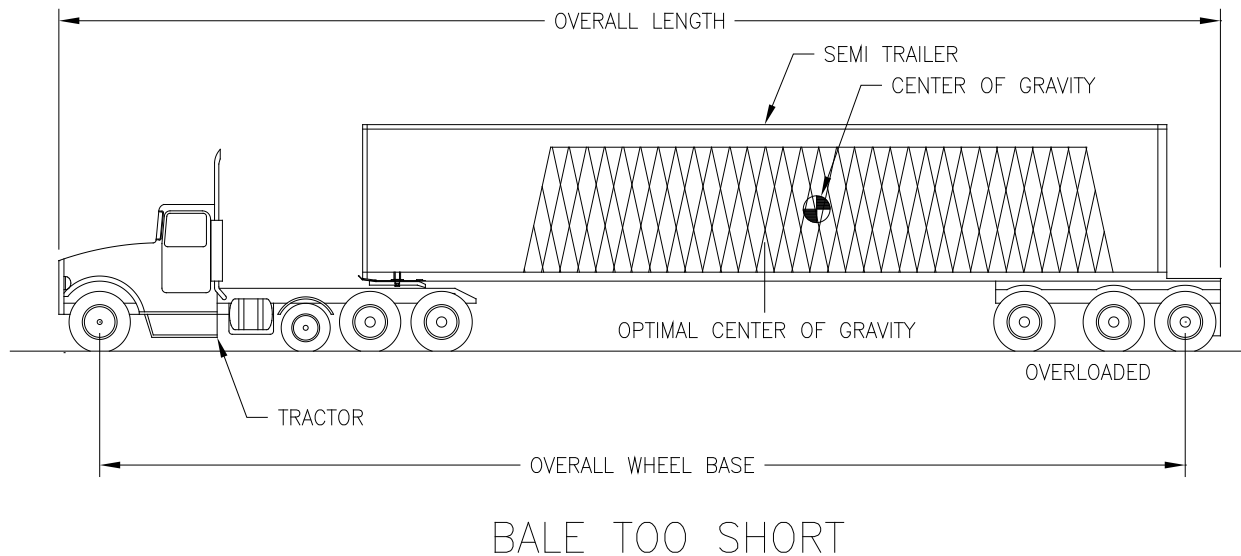
The above diagram shows a typical Tractor-Semi Trailer configuration. The Optimum Bale Configuration is shown above. It is important to insure the bale is placed in the trailer with the proper Center of Gravity to insure the weight is equally distributed on the Tractor and the Semi-trailer.

Municipal Solid Waste (MSW) varies greatly. Its consistency and moisture content can change with the seasons of the year. The Compaction System can allow for this inconsistency by constructing bales in our systems Density Mode. Density Mode constructs a uniform weight and density bale even if the weight consistency varies in the MSW being loaded into the compactor.

The operator of the compactor will need to experiment with the settings on the compactor control system in order to optimize the bale size to be able to eject the bale into the trailer or container to place the Center of Gravity in the right location. MSW will expand a certain amount when ejected from the Compaction System. The expansion rate can be as little as 10% and as much as 30%, with normal expansion rate about 18%.

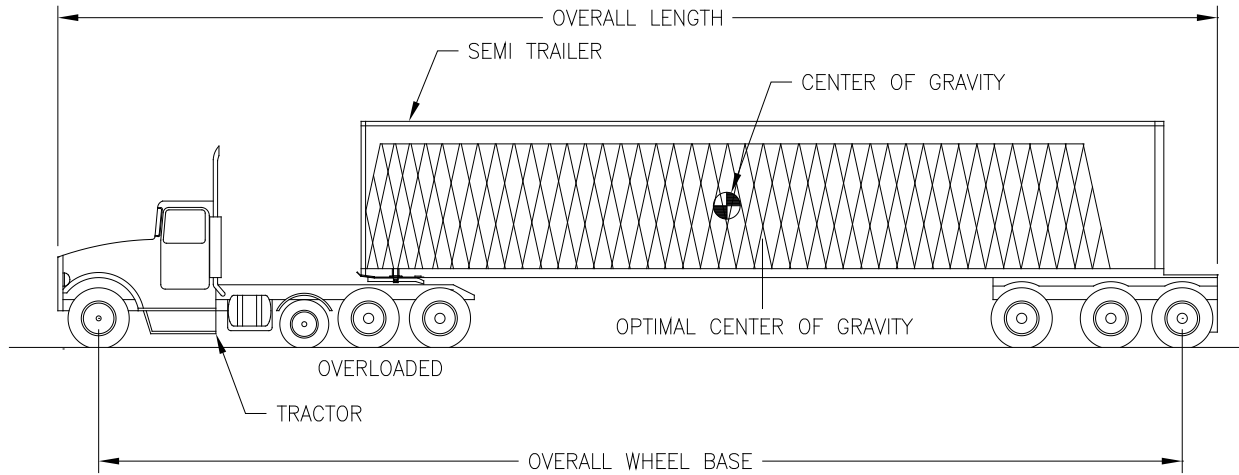
In the case as shown above, an operator would want to build a bale length of about 30' long within the Bale Chamber of the compactor. Upon ejection, the bale would expand to 35 ½' in length. With the Platen able to eject the bale 7' into the rear of the trailer or container box (net about 6' with material fall back off the end of the bale) the end of the front of the bale would be about 6' from the front of a 48' trailer box or container. This bale configuration would be optimum for this tractor-trailer configuration.

As an example of the difference between Density Mode ON (as above) and Density Mode OFF may be as follows:



With the Density Mode OFF, the compactor Control System will compact the MSW to full system pressure. Instead of the platen traveling forward and stopping at a pre-determined distance (to hold a constant bale density) the platen will go as far forward as possible. The Platen will continue to compress the MSW until full system pressure has been reached. Bale densities of 2400 lbs per lineal foot can be achieved in this bale-building mode. This would result in a 65,500 lbs bale with only a bale length of 27 ½'. Therefore when the bale is ejected into the trailer as before, the bale Center of Gravity would not be far enough ahead to maintain the proper weight distribution for the hauling equipment. An overloaded condition would be present on the last group of axles in the combination while the tractor axles would not have enough weight to meet the Gross loading weight.

The opposite situation can also exist with building a bale that is too long. Take for instance, the bale length is set for 34' long and the Compaction System is set with Density Mode ON. The following condition may happen with respect to loading the trailer or container:



BALE TOO LONG

As shown above, if the constructed bale was 34' long in the bale chamber, it would expand to about 41' long when ejected. With the Platen pushing the bale to 7' inside the end of the trailer or container, the front end of the bale would be placed completely at the end of the trailer box. This would place the Center of Gravity of the bale too far ahead in the trailer thus overloading the tractor axles while causing the rear group of axles on the trailer to be under-loaded.

The SSI Compaction System has a Control System that allows the operator to custom set all the parameters for the bale-building mode to adapt their Transfer Station Operation to be as efficient as possible. As distances increase from Transfer Stations to Regional Landfills, this ability to make each and every load at the optimum weight insures the least amount of expense to transport the most amount of MSW in every Transfer Station Operation that includes an adaptable Compaction System.



## RECEIVING & SETUP CONSIDERATIONS

SECTION

2.0

PAGE

1

<b>CONTENTS</b>	2.0
<b>RECEIVING/STORING THE COMPACTOR</b>	2.1
<b>SETUP CONSIDERATIONS &amp; INSTALLATION</b>	2.2
<b>LIFTING THE COMPACTOR</b>	2.3
<b>LIFTING THE HYDRAULIC POWER UNIT (HPU)</b>	2.4
<b>HYDRAULIC POWER UNIT (HPU) TO COMPACTOR CONNECTIONS</b>	2.5
<b>INITIAL START-UP</b>	2.6



## RECEIVING

Although this compactor was thoroughly inspected, tested and prepared for shipment, it is possible for equipment to be damaged during transit.

Please check each item carefully with the shipping manifest. If any damage or shortage is found, call it to the attention of the carrier immediately. Any damage should be noted on the bill of lading or other documents required by the carrier. This will help prevent any controversy and will facilitate prompt and satisfactory adjustments.

## STORING

If the compactor is to be stored outside, it should be covered. The following preventive maintenance procedures are also recommended:

1. Cover all exposed cylinder rod surfaces with a protective grease or oil. Wrap rods in plastic if the unit is to be stored for more than 5 days. **DO NOT USE CARD BOARD** as wet cardboard will have a chemical reaction with the chrome plating and cause damage to the chrome.
2. The oil reservoir should be filled to the top and sealed with tape if storage is to exceed 20 days.
3. Place identification tags on all modified components/oil levels for future reference.
4. Protect electrical cabinets and enclosures from water.



## OVERVIEW

The flow of the material to be processed and machine placement are important considerations for safe, efficient performance and ease of service. SSI can provide system design assistance to assure optimum performance of the total system. The following outlines many important considerations.

### Material Feed Method

- Evaluate type and size of material to be processed prior to specifying components.
- Determine the feed method:
  - Automatic (rubber belt or steel pan conveyor)
  - Direct feeding of material by a front-end loader or crane.
- Evaluate “lift over” height when determining type of feeding.
- Careful selection of the method of loading and the operation of that system is vital to successful compactor operation.

### Material Pre-sorting (*materials that cannot be processed, such as flammable liquids*)

- Select areas for inspection and sorting prior to feeding.
- Determine the method for sorting the material to be processed.
- Determine where materials that cannot be processed will be stored.

### Load Chute Interface

- Contact SSI for proper load chute interface requirements to ensure the scales function properly.

### Perimeter Clearance

- Maintain a perimeter distance of at least 36 inches from machinery for servicing.

## GENERAL INSTALLATION

The compactor is shipped partially assembled in multiple pieces in one or more loads that contain the hydraulic power unit, electrical controls, load cells, pedestals and other smaller parts.

SSI can be contracted to provide technical service representatives to assist in the compactor installation or full installation. If contracted to only assist in the installation it will be necessary to have at least 2 additional persons available. The services of a qualified welder and electrician will also be necessary.

The installation procedure offers an excellent time to acquaint maintenance and operating personnel with the machine. Depending on other agreements further training may be provided by SSI.

A typical installation of assembly, testing, and training requires approximately 14 days. Careful coordination with other contractors at the job site will be necessary to ensure that the installation progresses smoothly.

### Ambient Temperature

- The hydraulic components are designed to operate at an ambient air temperature of 35°F to 100°F.
- Operation at higher temperatures may require supplemental cooling.
- Operation at lower temperatures will require lubricant changes and possibly oil heaters.

### Cleanliness

- Try to keep dust to a minimum.
- High dust levels will necessitate more frequent cleaning of the fan and cooling fins.
- High dust levels will necessitate more frequent cleaning of the oil cooler.
- The installation should allow for easy removal and replacement of seals and covers.



## Foundation Requirements

- Each compactor site is unique in its foundation requirements due to soil loading conditions.
- SSI can only provide typical compactor-loading characteristics.
- The customer or their designated engineering firm needs to determine the type and size of embeds for the support of the compactor based on local conditions.

## Electrical Service

- No mounting of the electrical panels is provided unless specified on the order.
- The control panel should be located within clear view of the compactor.
- Wiring that is not directly mounted to the machine (including required wiring between the operator's control panel and the motor starter panel) is not provided by SSI.
- All conduit that runs between the compactor and any fixed structure must be of the flexible type which will prevent restrictive movement and inaccurate scale weights.
- Conduit must be provided for sensing circuits.
- All wiring must comply with National Electric Code standards.
- State and local codes may apply.

Refer to the *Technical Specifications* section of this manual for electrical requirements. A power supply is used to produce the necessary service voltage for the programmable controller (usually 24vdc).

## Hydraulic System Components

- The hydraulic power unit (HPU) is skid mounted and is connected to the compactor with a number of fluid lines.
- The HPU must be located within 15 feet of the compactor but greater separation is possible with larger pipe diameters.
- All hydraulic components and connections must conform to accepted industry standards.
- Hoses should be used to connect pipe to the HPU and to the machinery to isolate vibration.
- Rated working pressure of hoses, pipes and fittings must be equal to or higher than the relief valve setting on the HPU.
- Proper sizing of hose and pipes and minimum use of elbows and fittings help prevent power loss and heat buildup.
- Hoses should be restrained or confined to minimize hazards resulting from sudden pressure changes.
- Use of hard pipe is recommended whenever the connection between the HPU and machinery is longer than 15 feet.
- Pipe should be pickled, oiled and plugged type. **DO NOT USE GALVANIZED OR STANDARD BLACK STEEL PIPE!**
- Pipe supports should be used on 7-foot centers or less.
- It is recommended to cover the hydraulic power unit to protect it from weather and shield it from the sun.

## HYDRAULIC HOSES

Hydraulic hoses are required on all machines. The HPU is connected to the compactor entirely with hoses if they are located within approximately 15 feet of each other. If the HPU is located more than 15 feet from the machine, pipe should be used for the hydraulic supply lines. When using pipe, hoses must be used to connect the hard piping to the HPU and compactor in order to isolate vibration and prevent connection failures. Hose lengths should be kept to 15 feet or less. Hoses must withstand a minimum of 3,000 psi pressure and be equipped with SAE Code 61 flange ends. Hoses are to be restrained as required to minimize hazards resulting from sudden pressure changes.

## HARD PIPING

Use of hard piping is recommended whenever the connection between the HPU and compactor is longer than 15 feet. Hydraulic pipe should conform to ASTM Standard A-106, Grade B and be pickled, oiled, and plugged. **DO NOT USE GALVANIZED OR STANDARD STEEL PIPE!**

## PIPE CONNECTIONS AND SUPPORTS

All pipefitting should be the socket-weld type for increased strength and prevention of contamination. Pipe supports should be used on 7-foot centers or less due to the bi-directional flow of fluid and sudden pressure changes. Clamps and supports should not be welded directly to the pipe.

## PIPE FLUSHING

Hydraulic lines **must** be thoroughly flushed before connection to the compactor.

Basic guidelines for flushing hydraulic lines assume that oil will be moving at a minimum of 15 feet per second for a minimum time of 3 minutes per foot of pipe. The following minimum flow rates are recommended for standard pipe sizes:

Schedule 80 Pipes	
3/8"	7 gpm
1-1/4"	60 gpm
1-1/2"	82 gpm
2"	138 gpm
Schedule 160 Pipes	
1-1/2"	66 gpm
2"	104 gpm
3"	252 gpm

If the flow requirement cannot be achieved, the time requirement should be increased by the percentage of the reduced flow. It is recommended that the flow rate for flushing not drop below 5-feet per second. The flushing oil should be filtered to 10 Micron. Oil temperature during flushing should be approximately 100°F.

## HYDRAULIC POWER UNIT INSTALLATION

The compactor has been operationally tested and all adjustments properly set from the factory. Follow accepted industry standards when connecting the power unit. Care must be exercised to prevent system contamination.

Follow installation instructions for specific hydraulic motors and pumps located in the vendor section of your service manual.

## Installing External Hydraulic Lines

If the installation of the compactor requires that hydraulic piping and/or hoses be installed any rigid pipe used must be of a pickled and oiled type to prevent the introduction of rust and mill scale into the hydraulic system.

Before the compactor or other hydraulically driven components can be operated, all pipes must be thoroughly flushed. Hoses that have not been capped or may be contaminated should be flushed also. Follow the procedure below.

1. Connect the ends of the hydraulic lines together, bypassing the cylinders.
2. Close the control panel and switch the control power circuit breaker ON. Energize main power supply. Check control panel to confirm that "Power On" light glows.



3. Test motor rotation by starting HPU motor briefly. Observe rotation as motor coasts to a stop. If rotation needs to be changed, turn off and lock out the main power supply and switch any two motor leads at the load side of the motor starter.
4. Start HPU and allow fluid to circulate in the lines for at rated flow. Oil temperature during flushing should be approximately 100°F. Check filter-clogging indicators at least hourly. Change filters if red indicators are visible.
5. Visually inspect for leaks after flushing.
6. Change pressure and return filters.
7. Reconnect hydraulic lines to components as described on the hydraulic schematic.

### **INSTALLATION PROCEDURE**

The following tasks are typical of a compactor installation procedure. Individual items may have to be modified because of details specific to the job site.

1. Move the compactor to its final position but keep it raised about 2 inches above the final mounting height.
2. Bolt upper pedestal assembly to load cell assembly, (refer to the Load Cell Assembly drawing in Section 11). Tighten positioning bolts to outside pocket assembly centering upper pedestal assembly.
3. Lower the compactor onto the pedestals. Take note to confirm compactor and the discharge to trailer height is appropriate. Shim the upper pedestal to the lower pedestal if required.
4. Weld the upper pedestal to the lower pedestal, and the lower pedestal to the embed plate. Take care in placing the welding ground to prevent load cell damage. Loosen positioning bolts to allow 1/8 inch clearance between the bolt heads and the pocket assembly on the compactor. Install ground strap between the upper pedestal and the lower pedestal.
5. Position the hydraulic power unit and bolt it to the floor.
6. Install the compaction cylinder manifold if shipped separately. Remove all shipping braces and stops.
7. Connect the hydraulic lines and fill the reservoir. Note: follow all flushing requirements if hard piping is used. Refer to Pipe Flushing guidelines above.
8. Position and connect operators control panel and main control panel.
9. Attach upper gate track to the top of the chamber.
10. Position and attach the load chute.
11. Position, anchor, and connect the wheel stops and trailer guides. This should be done with a typical trailer in position to be loaded.
12. Confirm all guards are in place and attached securely.

**! WARNING**

**Crushing hazard.**

**Incorrectly suspended loads can cause serious injury.**

**Use appropriately rated rigging and cranes for moving heavy equipment.**

**! WARNING**

**Crushing hazard.**

**Shifting components can cause serious injury.**

**Do not put fingers in bolt holes or between heavy parts.**

**! WARNING**

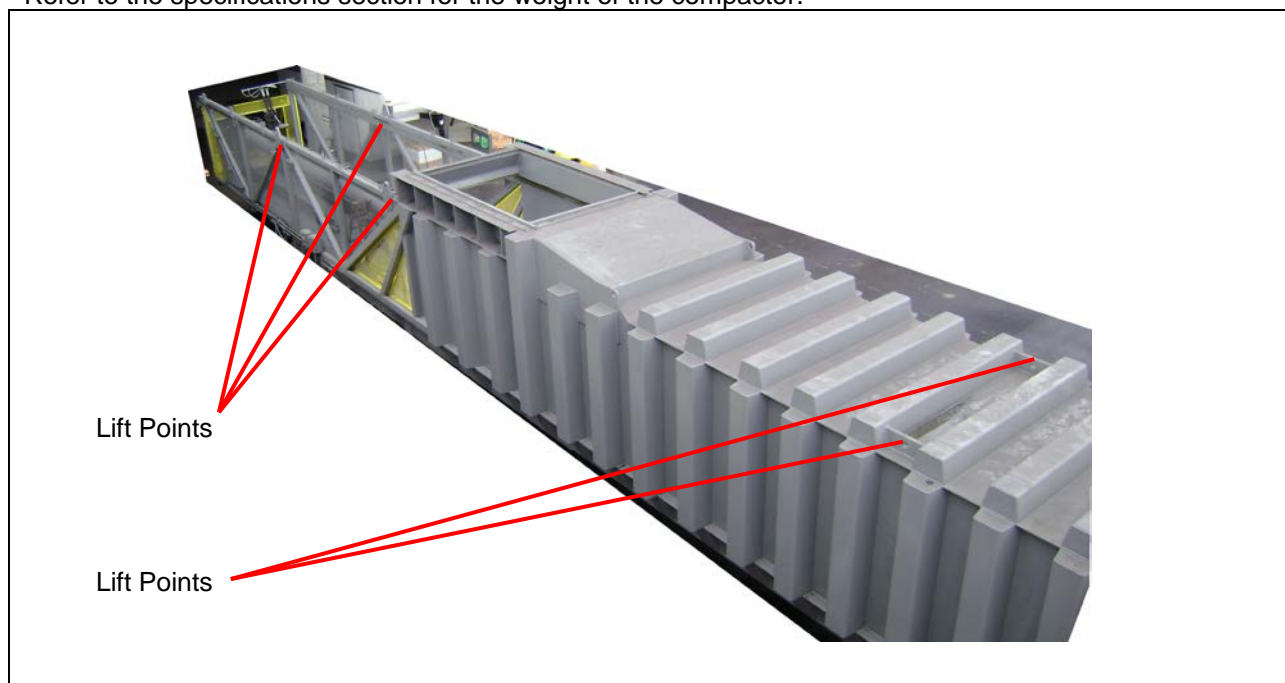
**Lifting hazard.**

**Lifting heavy components can cause serious injury. The machine contains components that are too heavy for one person to lift.**

**Use approved lifting devices and procedures.**

Hire a professional rigging company for lifting or moving the compactor.

Refer to the specifications section for the weight of the compactor.



 **WARNING**

**Crushing hazard.**

**Incorrectly suspended loads can cause serious injury.**

**Use appropriately rated rigging and cranes for moving heavy equipment.**

 **WARNING**

**Crushing hazard.**

**Shifting components can cause serious injury.**

**Do not put fingers in bolt holes or between heavy parts.**

 **WARNING**

**Lifting hazard.**

**Lifting heavy components can cause serious injury. The machine contains components that are too heavy for one person to lift.**

**Use approved lifting devices and procedures.**

The hydraulic power unit can be lifted and positioned in two ways:

1. By forklift
2. By crane, using the lifting eyes provided at 3 points on the unit.

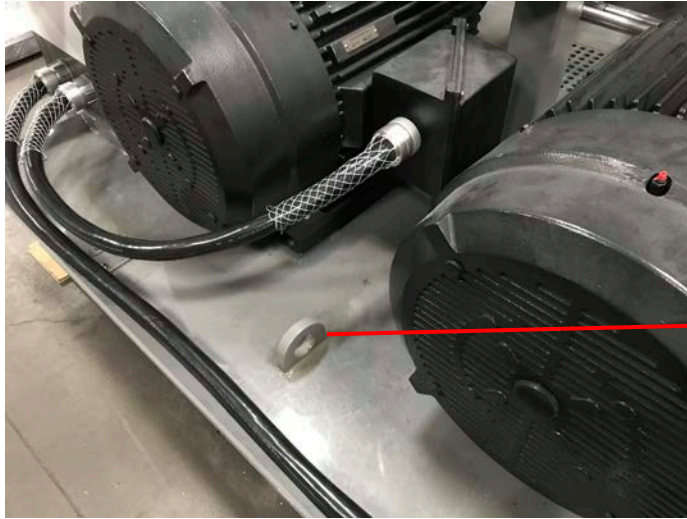
**NOTICE**

**Equipment damage.**

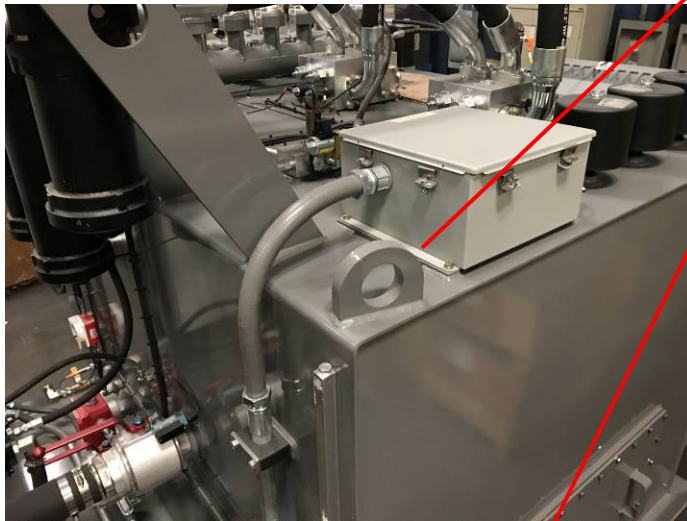
**Lifting components by non-approved lifting points can cause damage to the equipment.**

**Use only lifting eyes welded to the tank or platform. Use a spreader bar to ensure that the chains do not press against other parts of the unit when tensioned.**

Refer to the Specifications section for the weight of the hydraulic power unit.



Safe Lifting Points  
(Lifting eyes on  
both sides of unit)





HPU can also be moved or lifted by placing the forks on the bottom of the HPU from ether sides.

**DANGER**

**High-Pressure Leaks Hazard.**

**Hydraulic fluid can penetrate skin resulting in severe personal injury or death.**

**WARNING**

**Electric Shock Hazard.**

**External wiring, connections and interlock devices must be installed in accordance with the latest national electric codes, local codes, and local electric utility requirements. Improper installation may result in serious injury or death and damage to the equipment.**

**Only competent, authorized electricians should attempt to install, modify, or maintain the electrical system.**

**NOTICE**

**Equipment Damage Hazard.**

**Failure to follow proper initial start-up or re-start after service procedures may result in severe damage to hydraulic components.**

Prior to installing and connecting any hydraulic hoses or sensor cable, carefully read and understand Set-Up Considerations in Section 2.

When installing the hydraulic hoses and control wires connections between the HPU and the compactor, refer to the *Hydraulic Schematic* and *Electrical Schematic* located in Section 11 in this manual.

### Hydraulic Connections

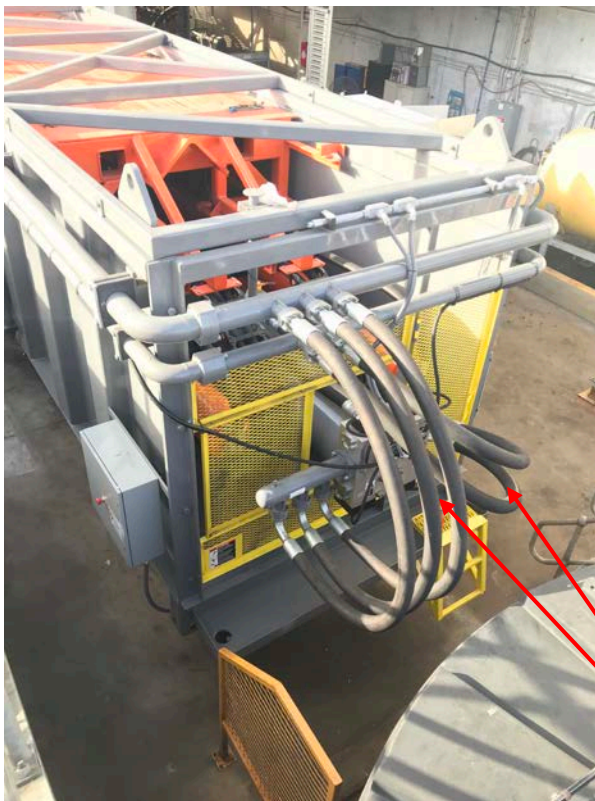
Ensure that hose sizes and working pressure ratings meet the sizes and ratings specified on the Hydraulic Schematic. Thoroughly clean the inside of all hoses prior to installation.

1. Connect the main pressure hoses between the compactor and the HPU, standard connections which consists of two main pressure hoses three main return hoses and several pilot pressure hoses. There may be additional hose connections please refer to system layout for details.  
*See illustrations below*





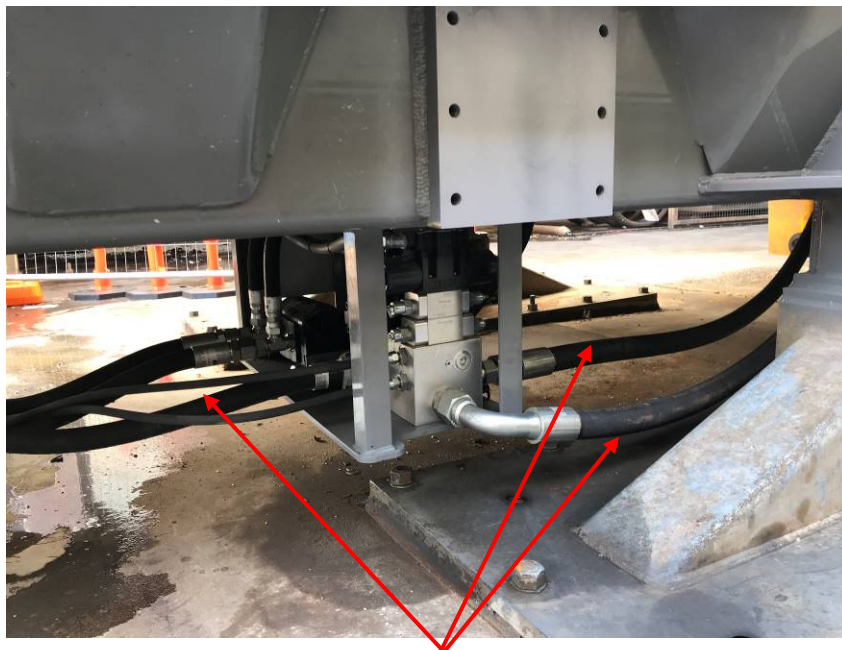
As you can see here that there are three return hoses and two pressure hoses



There are additional hose connections between the cram logic block and pipe manifolds



**As you can see here that there are two pressure hose connections**



**There are additional hose connections at the discharge end for gate and latch, these are pressure and return hoses**

2. Fill the hydraulic oil reservoir making sure the sight glass registers the oil level.  
**PLEASE NOTE: MAKE SURE ALL CONNECTIONS ARE MADE BEFORE STARTING HPU.**



**High-Pressure Leaks Hazard.**

**Hydraulic fluid can penetrate skin resulting in severe personal injury or death.**

3. Make sure to be alert at initial start-up and walk around the HPU to verify that there are no leaks.

### **Electrical Connections**

External wiring, connections and interlock devices must be installed in accordance with the latest national electric codes, local codes, and local electric utility requirements. Improper installation may result in serious injury or death and damage to the equipment.

Connect the prewired wires to the correct location on the terminate strips on the main panel and multiple junction boxes on the Compactor.

Reattach Control Panel to the Compactor and terminate all the pre-wired wires to the Control Panel. Please note that in some cases control panel maybe mounted remotely this will require to run additional conduit and wiring.

Install the Sign Board and junction box with stack light, warring horn and antenna in a visible location where personnel loading the compactor can easily view it.

Check all electrical connections and **VERIFY THAT MOTOR ROTATIONS ARE CORRECT BEFORE STARTING THE HPU.**

SSI offers, at additional cost, complete start-up and operator training services. If these services have not been contracted, a checklist form supplied with the machine outlines the procedure to be performed at initial start-up. This form must be filled out and returned to SSI by the installer.

The following instructions serve as a guide for the safe and correct installation and testing of the compactor.

1. The installer should thoroughly review the operator's manual before operating the HPU and compactor. Read and understand the safety precautions. Locate the *Troubleshooting*, *Preventive Maintenance*, and *Service* sections for future reference.
2. Check fluid level in the hydraulic reservoir. Make sure fluid is visible in the sight glass.
3. Locate and review the electrical schematic in *Section 11*. Make sure that any wiring that has taken place during installation, including any accessory equipment, is in accordance with the schematic.



**Electric Shock Hazard.**

**Improper installation may result in serious injury or death and damage to the equipment.**

**Only competent, authorized electricians should attempt to install, modify, or maintain the electrical system.**

4. Inspect the site layout of the equipment. Make sure that an adequate number of emergency stop stations are installed at appropriate locations around the equipment.



**Electric Shock Hazard.**

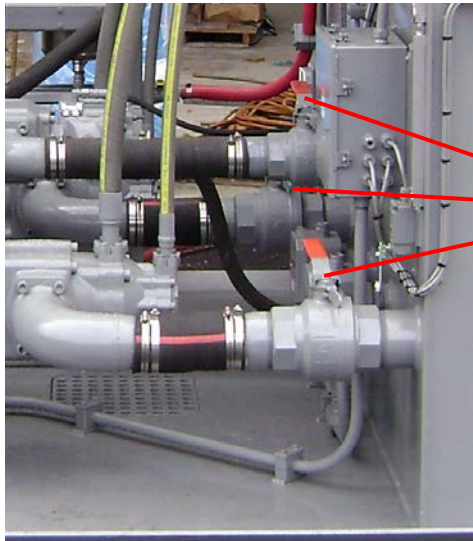
**Servicing electrical components without disconnecting the power supply may result in serious injury or death.**

**Lock out and tag out all power to panels and electric components before servicing.**

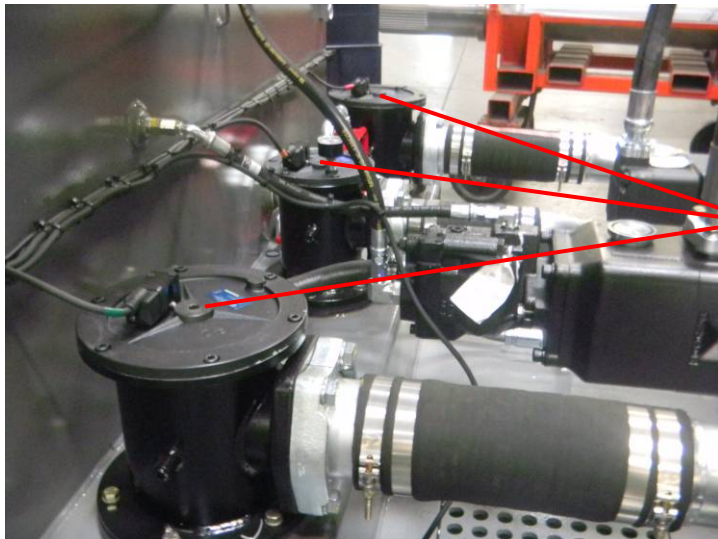
**NOTICE**

Check the compactor and auxiliary equipment to ensure that there are no personnel, tools, or other unsafe materials inside or nearby, then call out a warning before starting the machine.

5. Ensure all hydraulic suction valves or oil strainers (if present) are fully open.



Suction Valves in Closed Position



Oil Strainers (use allen wrench to open or close Oil Strainers)



6. Close the motor starter panel, remove the lockout lock(s) and switch the main circuit breakers ON. At the control panel, insert the key and turn it to the ON position.
7. Start the HPU by pressing and holding the HPU START/RUN button until the horn no longer sounds (about 10 seconds). Over the next few seconds, the system will start the HPU electric motors. After the motors have started, press the HPU STOP button and, from the fan end of the motor, observe the motors winding down. Check that all of the motors rotate in the direction indicated on the ROTATION label on the motors.

If motor rotation is incorrect, a qualified and licensed electrician must perform the following procedure.

Do not proceed with the initial machine start-up until motor rotation has been corrected.

Ensure that the machine is turned off, electrically locked out at the power source, and tagged (Refer to Section 5).

If the motors starter panel was mounted to the HPU and the motors wired by SSI: Swap any two leads on the line side of the control panel's main breaker that corresponds to the motor that is rotating in the wrong direction. If both motors rotate in the wrong direction, swap any two leads on the line side of both main breakers.

If the motors starter panel was located and the motors wired on site: Swap any two leads on the load side of the motor starter that corresponds to the motor(s) that is rotating in the wrong direction.

Repeat steps 12 and 13 for all the motors installed.

14. Press and hold the HPU START/RUN button. The warning horn will sound for about 10 seconds. When the horn stops, release the button. Over the next few seconds, the system will start both HPU electric motors in sequence, and the green HPU START/RUN lamp will remain on.

## INITIAL START UP OF THE COMPACTOR

Before initial start-up, complete the Installation and Safety Checklist provided in this manual.

To start the compactor, perform the following steps:

1. Set the main breaker at the motor control panel located on the HPU to the **ON** position.
2. Turn control power breaker **ON** in the control panel. Caution, only authorized personnel should be allowed to open the main control panel.
3. Turn the **OFF-ON** key switch to **ON**. All of the panel lights that are PLC controlled and meters should glow for two seconds. Scan the lights to see that none of them are burned out. Push the **MCR** button on panel to set all E-Stop functions.
4. Select **OFF** on the **MAINTENANCE OVERRIDE** key switch to control the compactor. (NOTE: The **MAINTENANCE OVERRIDE** key switch uses a special key so that general operators do not have the ability to place the compactor into the **MAINTENANCE OVERRIDE** mode of operation.)
5. Start the pumps by pressing and holding the **SYSTEM AUTO START/RUN** Push Button on the Operator Control Panel. When the motors have started, the **HPU START/RUN** cell glows solid green and lets you know the HPU is operating properly.
6. Test and operate each component in the system to insure proper operation. Listen for unusual noises and check for any oil leaks.
7. **EXTEND** and **RETRACT** the platen using the **GATE/COMPACT** joystick.



**INITIAL START-UP AND SAFETY CHECK LIST**

SSI Shredding Systems offers start-up/operating training services. If this service has not been contracted, the following check list needs to be reviewed, signed, and returned to SSI Shredding Systems by a suitable Purchaser Representative. If there are any questions, please call.

**A. Review Service Manual**

- 1. Operating procedures \_\_\_\_\_
  - Safety precautions \_\_\_\_\_
  - Start-up procedures \_\_\_\_\_
- 2. Maintenance and Service \_\_\_\_\_
- 3. Hydraulic System \_\_\_\_\_
- 4. Electrical System \_\_\_\_\_

**B. Review Installation of Compactor**

- 1. Check oil levels, greased bearings \_\_\_\_\_
- 2. Scales calibrated \_\_\_\_\_
- 3. Inspect Electrical Installation \_\_\_\_\_

**C. Review Safety Requirements**

- 1. Appropriate guards in position \_\_\_\_\_
- 2. Emergency Shut-down switches at required places \_\_\_\_\_
- 3. Warning signs attached \_\_\_\_\_

**D. Start up**

- 1. Check motor shaft rotation (all motors) \_\_\_\_\_
- 2. Check all input connections to programmable controller \_\_\_\_\_
- 3. Check operational modes of all systems, including emergency shut-down \_\_\_\_\_

**COMMENTS** \_\_\_\_\_  
\_\_\_\_\_

SIGNATURES  
DATE: \_\_\_\_\_

\_\_\_\_\_  
SSI Compaction Systems  
Representative

\_\_\_\_\_  
Purchaser's  
Representative

	<b>OPERATION</b>	<b>SECTION</b> 3.0	<b>PAGE</b> 1
---	------------------	-----------------------	------------------

<b>CONTENTS</b>	3.0
<b>RANGE OF APPLICATIONS</b>	3.1
<b>CONTROL PANEL FUNCTIONS</b>	3.2
CONTROL PANEL MESSAGES	3.2.1
STATUS LIGHTS & WARNING HORN	3.2.2
<b>STARTING THE COMPACTOR</b>	3.3
<b>OPERATING THE COMPACTOR</b>	3.4
<b>EXTENDED PERIOD OF NON-OPERATION PROCEDURE</b>	3.5
<b>RADIO REMOTE CONTROL (Optional)</b>	3.6
<b>ENTERING THE HOPPER/CHAMBER</b>	3.7





## GENERAL

SSI Pre-Load Compactors are used to compact, load and transfer from 25 to 125 tons of waste per hour into lightweight transfer trailers to maximize payloads for long haul transfer. See section 3.4 for general guidance on how to load the compactor. Bellow list is the materials that can be loaded and materials that should not be loaded in the compactor at all.

Materials recommended include:

- Municipal Solid Waste
- Green Waste

Following material can be loaded in to compactor, however with caution. This type of material should be placed toward the center of the waste bale and not be placed in the compactor near the shear zone. Any items over 72" see section 3.4 page 7, Loading Compactor.

- Tree Trunks
- Stumps
- Branches
- Construction and Demolition Waste
- Shingles and roofing material
- Mattresses
- Pallets
- Cable Drums (without cables)
- Empty Oil Drums without flammable products
- Plastic Barrels
- White Waste
- Refrigerators
- Ranges
- Dishwashers
- Carpeting
- Household Bulky Waste
- Sofas
- Chairs
- Dressers
- Other Furniture

**DO NOT** attempt to process material such as the following  
(Refer to the Safety Precautions in this manual):

- Flammable material of any type, liquid, gas or solid not mentioned above
- Hazardous material such as Asbestos
- Sealed containers or pressurized objects such as inflated tires on rims or oxygen bottles
- Containers that once held flammable or hazardous materials but are now empty (empty propane bottles)
- Large blocks of Steel Reinforced Concrete
- Bundles or "nests" of re-bar
- Car Engines
- Gearboxes
- Steel Plates
- Large Scrap Metal
- Ships Hawsers
- Steel Cable
- Long wooden objects such as telephone poles and rail road ties

The compactor has two main control points, the control panel and (if provided) a radio remote.

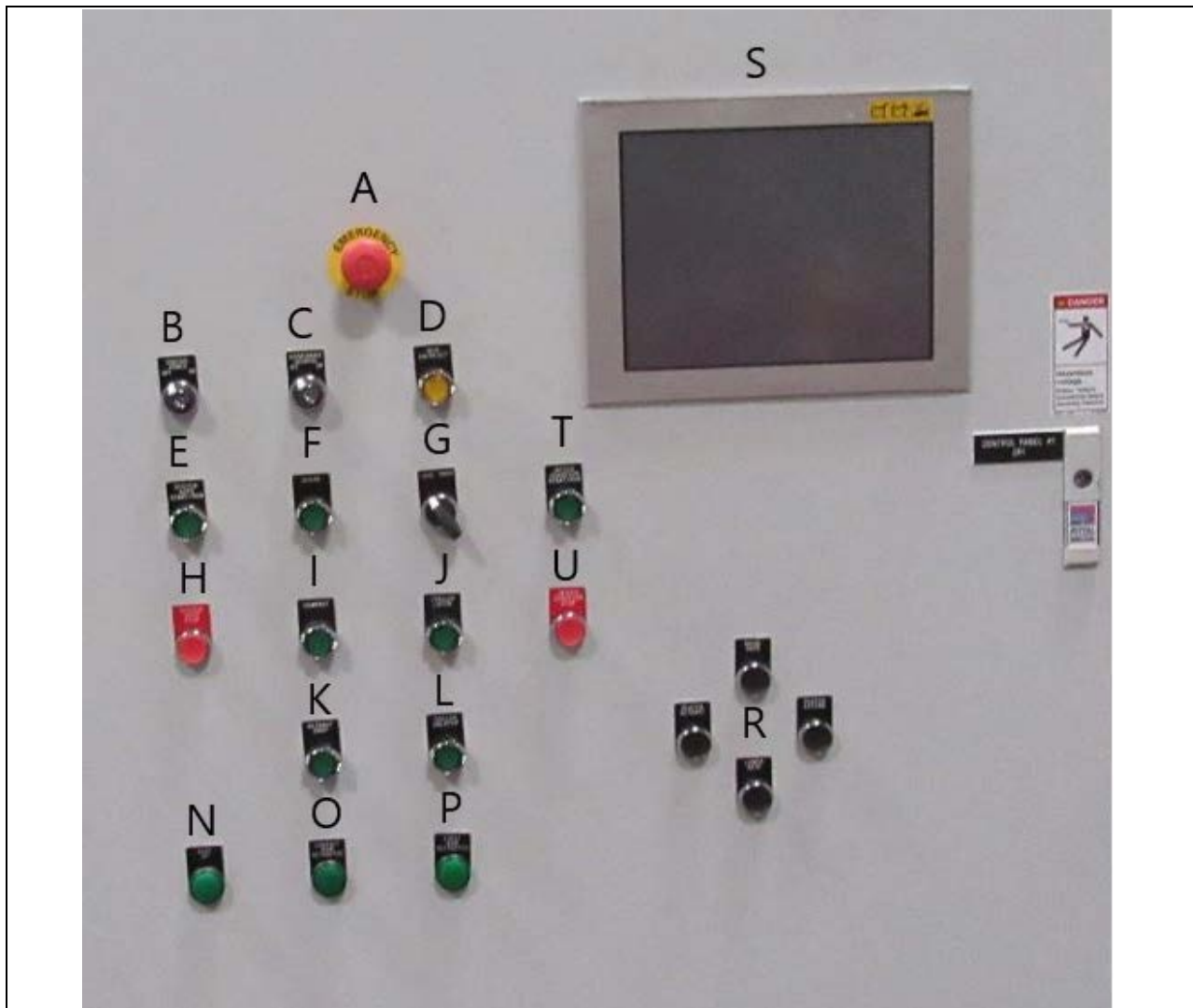
The control panel is used to stop and start the hydraulic power unit (HPU), set operating parameters and perform maintenance tasks. Manual operation can be done from control panel as well as the radio remote. For details on the radio control functions refer to the Radio Remote Control section.

**SCREEN LIST**

**Page**

Main Screen .....	05
HPU Screen .....	06
PLC Inputs.....	06
PLC Outputs.....	07
Last 46 Truck Loads.....	08
Alarm History.....	08
Maintenance Record 1 .....	09
Maintenance Record 2 .....	09
Setup Screen .....	10
Truck Setup.....	11
Estop Screen.....	11
Scales Screen .....	12

## CONTROL PANEL



**(A) EMERGENCY STOP Button**

Immediately disconnects power from all functions.

**(B) OFF/ON Key Switch**

Turns control power on and off.

**(C) MAINTENANCE OFF/ON Key Switch**

Turns Maintenance Functions on and off. "OFF" allows the machine to operate with "Automatic" modes. "ON" allows the Joy Stick to operate the gate and platen functions manually. Maintenance should only be used to place the machine components in specific positions for maintenance personnel.

**(D) MCR ON/RESET Button/Lamp**

Activates the master control relay supplying control power to the PLC. If the light is on, the emergency stop buttons are clear, access doors are closed and the control power is on.

**(E) HPU Systems Auto Start/Run**

Starts the Hydraulic Power Unit (HPU). By pushing Auto Start/Run compactor will build a bale automatically.

**(F) CLEAR**

Causes the platen to push material out of the load chute area without compacting it and then returns to the fully retracted position. This is the fastest way to make more room in the chute area for more material to be added.

**(G) LOCAL/RADIO Switch (units with radio control only)**

Selects between LOCAL (Control Panel) control and REMOTE (radio remote control)

**(H) SYSTEM AUTO STOP Button**

Stops the auto operation and HPU(hold for 3 seconds).

**(I) COMPACT**

Platen pushes material until it compacts against the gate and returns to the fully retracted position.

**(J) TRAILER LATCH**

Latches the trailer in secure position when ejecting bail in to trailer/container (trailer latch needs to be latched before raising the gate).

**(K) RETRACT/SHUT button has two functions.**

1. If the platen is not in the home position, this button will cause the platen to return to the fully retracted position.
2. If the platen is fully retracted, this button will cause the platen to extend until the load chute is closed. The compactor should be left in this position when it is not actively being used to prevent anyone or anything from entering the compaction chamber.

**(L) TRAILER UNLATCH**

Unlatches the trailer after the bale was ejected in to the trailer and gate lowered (latch will automatically be lowered when gate is lowered).

**(M) CONTAINER IN (not available on all systems)**

Moves the dolly in to engage the container for ejecting the bale.

**(N) GATE UP**

Light, indicates that the gate is up.

**(O) COMPACT RAM RETRACTED**

Light, indicates that the C-RAM is retracted (home position).

**(P) EJECT RAM RETRACTED**

Light, indicates that the E-RAM's are retracted (platen and carriage are joined).

**(Q) CONTAINER OUT (not available on all systems)**

Moves the dolly out to disengage the container after ejecting the bale.

**(R) MOMENTARY CONTACT - FOUR POSITION JOY STICK (OR 4 BUTTONS)**

**With Maintenance Key Switch "OFF"** – Move and hold Joy Stick "GATE UP", Gate will raise to the Up position. Gate will stop automatically when the Gate Up Limit Switch is tripped. Release the Joy Stick and Gate will stop in its current position. Move and hold Joy Stick "GATE DOWN", Gate will lower to the Down position. Gate will stop automatically when the Gate Down Limit Switch is tripped. Release the Joy Stick and Gate will stop in its current position. Move and hold Joy Stick "PLATEN EXTEND", Platen will extend in the Normal Compact Mode (see Compact Push Button above). Release the Joy Stick and Platen will stop in its current position. Move and hold Joy Stick "PLATEN RETRACT", Platen will retract in the Normal Retract Mode (see Retract Push Button above). Release the Joy Stick and Platen will stop in its current position.

**With Maintenance Key Switch "ON"** – Move and hold Joy Stick "GATE UP", Gate will raise to the Up position. Gate will stop automatically when the Gate Up Limit Switch is tripped. Release the Joy Stick



and Gate will stop in its current position. Move and hold Joy Stick "GATE DOWN", Gate will lower to the Down position. Gate will stop automatically when the Gate Down Limit Switch is tripped. Release the Joy Stick and Gate will stop in its current position. Move and hold Joy Stick "PLATEN EXTEND", Platen will extend. Release the Joy Stick and Platen will stop in its current position. To move the E-Ram's past the 28'ft it must be activated with the Maintenance Screen on the Panel View (see instructions below). Move and hold Joy Stick "PLATEN RETRACT", Platen will retract. Release the Joy Stick and Platen will stop in its current position. To move the Nose Platen, ERAM Mode must be activated with the Maintenance Screen on the Panel View (see instructions below).

### **(S) TOUCH SCREEN CONTROLS**

Permits the operator to set various system operation parameters using touch screen buttons or indicators. Displays specific system faults when they occur.

### **Using the Screens and Entering Data**

The system uses a touch sensitive computer monitor to permit activating functions or moving to new screens by simply touching the button or indicator shown on the screen. Care should be used to prevent damaging the screen. Dirty gloves or hands can transfer grit to the screen, which will scratch it and eventually ruin it. Gently remove dust from the screen with a clean rag.

### **(T) INFEEED CONVEYOR START/RUN**

Start button, Run Light indicates that the conveyor is running

### **(U) INFEEED CONVEYOR STOP**

Stops infeed conveyor

## **PANEL VIEW SCREEN OPTIONS**

The following are the options for the PANEL VIEW interface to the PLC for the machine. At any time push the **NEXT SCREEN** button and proceed. The SCREENS are:

- 1. MAIN DISPLAY**
- 2. HPU/SET POINTS**
- 3. INPUT STATUS**
- 4. OUTPUT STATUS**
- 5. TRUCK LOAD HISTORY**
- 6. ALARMS HISTORY**
- 7. MAINTENANCE RECORD #1**
- 8. MAINTENANCE RECORD #2**
- 9. AUTO WAIGHT**
- 10. TRUCK SETUP**

To change screens push the appropriate button for the screen of your choice.

### **MAIN DISPLAY SCREEN**

The following information is displayed:

#### **LOAD READY BUTTON**

This allows the operator to make an under sized bale by pushing this button after a compaction stroke but prior to the platen reaching the home position.

#### **HPU**

This display, indicates if the **HPU** is **ON** or **OFF** and **HPU** faults.

#### **LASER STATUS**

This indicates if there is a problem with the **LASER (DME)** Distance measurement system.

#### **BALE INFORMATION**

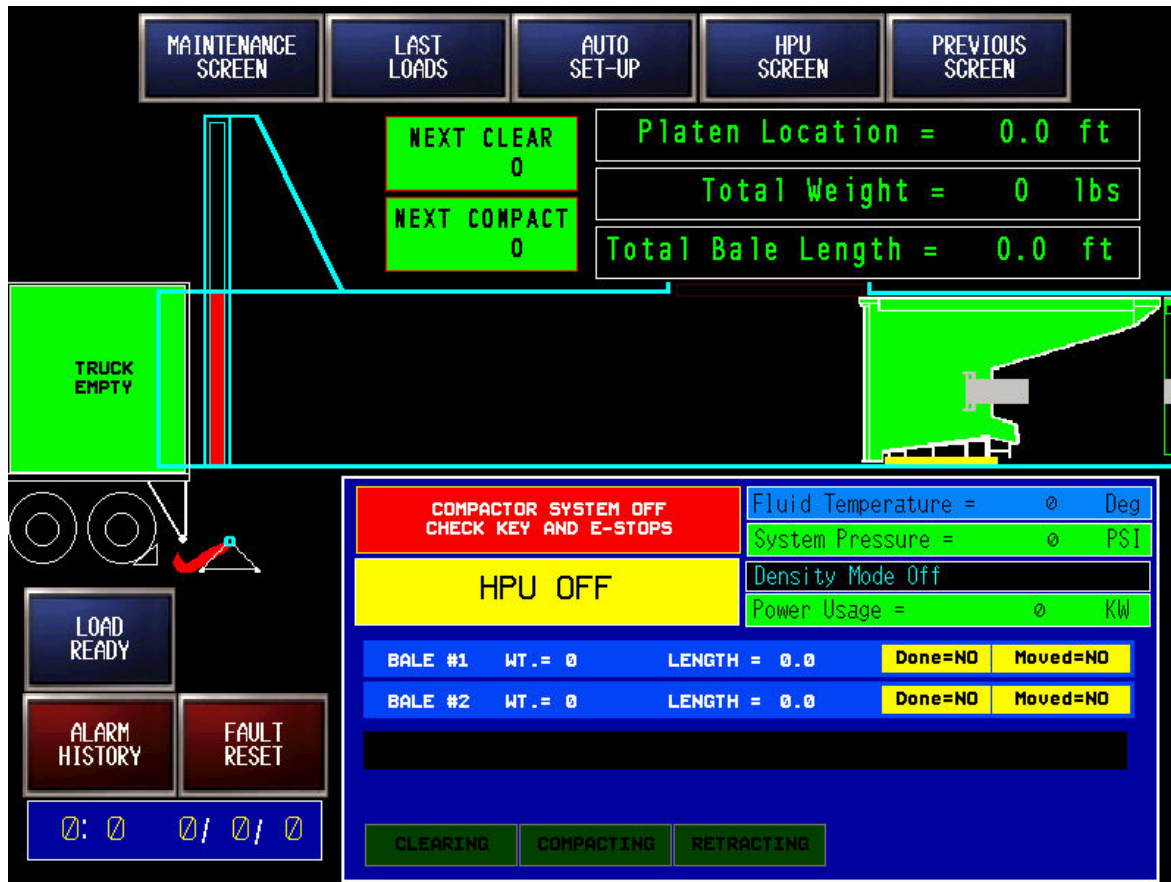
Bale weight and length for the bale is displayed. Also if it is done and has been moved is displayed.

#### **FAULT RESET BUTTON**

This will let you reset the system, if there is fault of any kind.

#### **MAIN DISPLAY**

Will also let you know system pressure, compactor status.



## 2. HPU/SET POINT SCREEN

The following information is displayed:

### START/STOP HPU MOTOR BUTTONS

Press the **HPU START** button to start the HPU. Motor #3 will start first to develop pilot pressure. Then Motor #1 will start, and then #2 motor will start. The HPU START button will turn green when all motors are running.

### CRAM MILEAGE/TRUCK LOADS

This displays the mileage and feet of travel on the CRAM. This information is for maintenance purposes. Total truck loads and tonnage is also displayed

### ERAMS MILEAGE

This displays the mileage and feet of travel on the ERAM. This information is for maintenance purposes.

### TEMP SWITCH INFO

This informs the operator if the low temperature or the high temperature switch is active.

### SYSTEM PRESSURE

This displays the current system pressure while the compactor is operating

### UNLOADER JOG

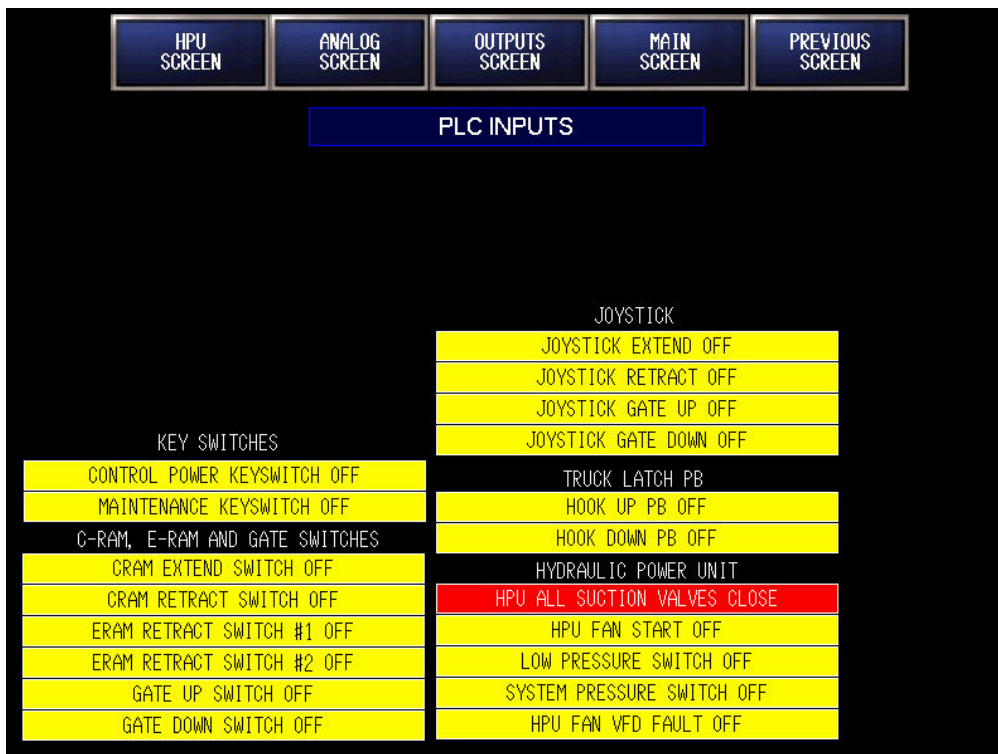
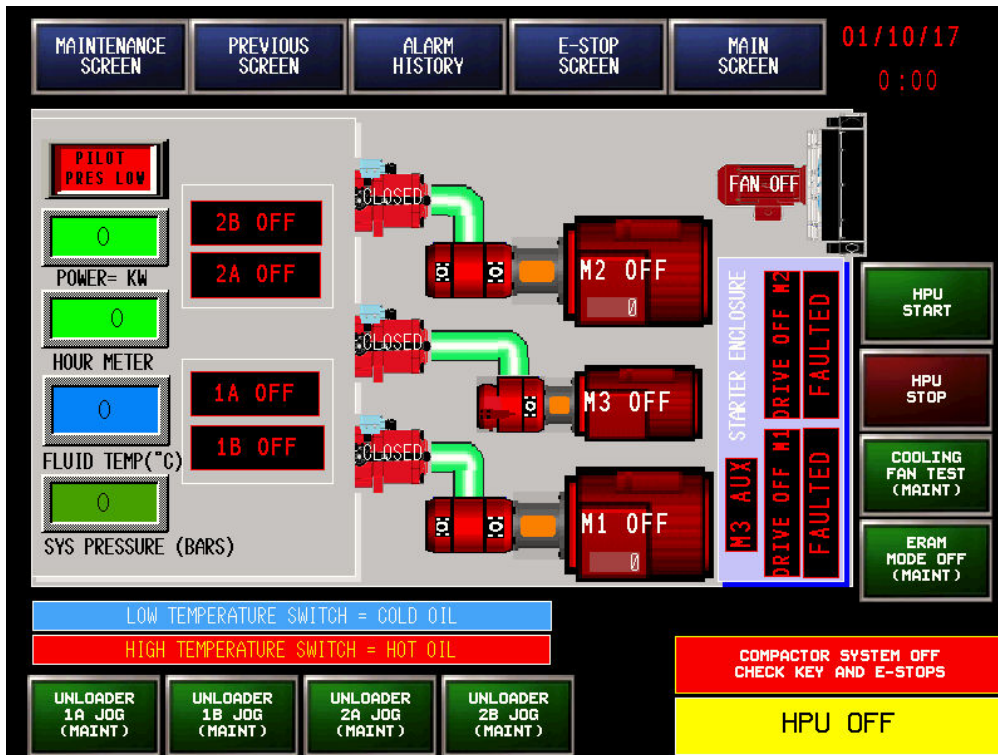
This allows the maintenance people to actuate the unloaders and set relief pressures. It also indicates at what pressure each pump section is operating.

### COOLING FAN TEST BUTTON

This allows the operator to test the cooling fan and ensure it is operating.

### E-RAM MODE

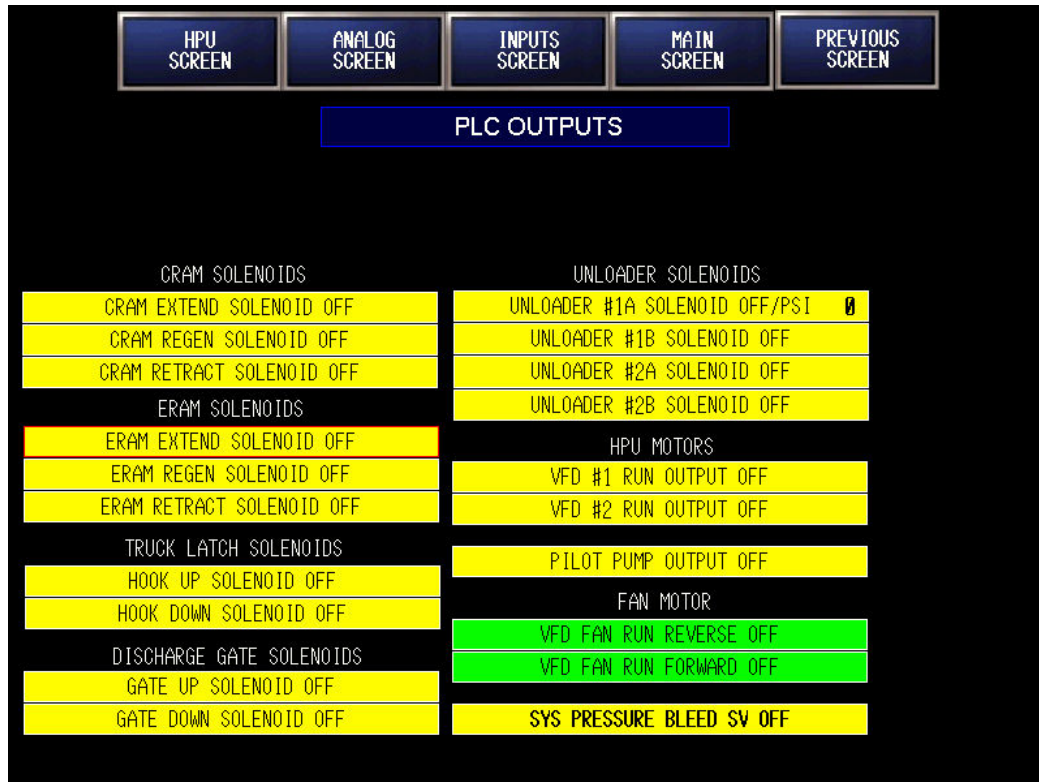
This allows the maintenance people to separate the platen and carriage in maintenance mode.



### 3. INPUT STATUS SCREEN

The following information is displayed:

This screen allows the operator or maintenance personnel to monitor the various inputs to the PLC. This is a very valuable trouble-shooting tool for the compaction system.



### 3. OUTPUT STATUS SCREEN

The following information is displayed:

This screen allows the operator or maintenance personnel to monitor the various inputs to the PLC. This is a very valuable trouble-shooting tool for the compaction system.





This screen displays a maintained history of alarms that occur during the operation of the system and if they were acknowledged or cleared

<p><b>DAILY MAINTENANCE CHECKLIST</b></p> <p>1. Inspect and Clean Power Unit</p> <p><b>CHECK</b> A. Remove trash from motors, valves, and oil cooler.</p> <p><b>CHECK</b> B. Check machine for leaks, loose fittings and bolts, frayed wire, worn hoses, etc.</p> <p><b>CHECK</b> C. Check oil level (with cylinders fully retracted). Add as needed.</p> <p>2. Remove trash behind platen and carriage</p> <p><b>CHECK</b> A. Check for trash on DME LASER reflector. Remove and clean if any is found.</p> <p><b>CHECK</b> B. Inspect hose track for damage. Replace any damaged sections.</p> <p>3. General Inspection</p> <p><b>CHECK</b> A. Observe operation of compactor. Check for unusual noise or vibration.</p>		<p><b>NEXT MAINTENANCE SCREEN</b></p> <p><b>MAIN SCREEN</b></p> <p><b>PREVIOUS SCREEN</b></p> <p><b>WEEKLY MAINTENANCE CHECKLIST</b></p> <p><b>CHECK</b> I. Inspect platen and chamber knife for damage and looseness. Inspect compaction walls.</p> <p><b>CHECK</b> II. Measure knife gap. Inspect platen face face to floor clearance. Inspect carriage height. Inspect carriage side bearings. Inspect gate track wear strip thickness.</p> <p><b>CHECK</b> III. Inspect platen wedge bearing and thickness. Inspect platen for wear and damage. Inspect carriage bearing and thickness. Inspect cylinder rods for damage and seals for leaks. Inspect trunion mount. Inspect torque on trunion eye locking nuts.</p> <p><b>CHECK</b> IV. Hose and pipe inspection.</p>
--	--	--

## 7. MAINTENANCE SCREEN

This screen shows the compactors Daily and Weekly maintenance requirements and this need to be checked off as they are completed.

<b>ALARM HISTORY</b>	<b>INPUTS</b>	<b>OUTPUTS</b>	<b>NEXT MAINTENANCE SCREEN</b>	<b>MAIN SCREEN</b>	<b>PREVIOUS SCREEN</b>
<p><b>150 Hour maintenance due in 0.00 hours</b></p> <p>1. General inspection. 2. Take hydraulic oil sample and replace HPU filters.</p>					
<p><b>750 Hour maintenance due in 0.00 hours</b></p> <p>1. General inspection. 2. Take hydraulic oil sample and replace HPU filter. 3. Check pump couplings. 4. Check for loose wiring. 5. Check platen and carriage for cracks.</p>					
<p><b>3000 Hour maintenance due in 0.00 hours</b></p> <p>1. Replace PLC battery. 2. Replace hydraulic oil, and replace HPU filters.</p>					
<p><b>Compaction cylinder rebuild due in 0.00 miles</b></p> <p>1. Replace seals, wipers, and wear bearings.</p>					
<p><b>Ejection cylinder rebuild due in 0.00 miles</b></p> <p>1. Replace seals, wipers, and wear bearings.</p>					

## 8. MAINTENANCE SCREEN #2

This displays the hourly maintenance requirements and cylinder maintenance requirements

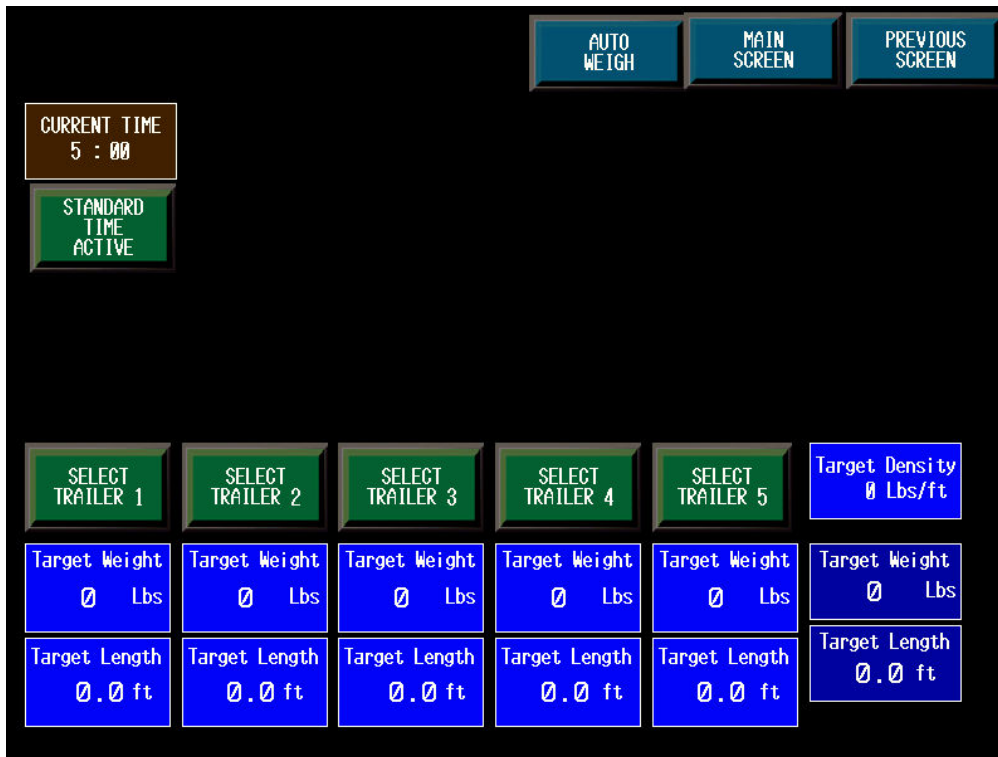


## 10. SET UP SCREEN

This screen allows the operator to set the following operating parameters:

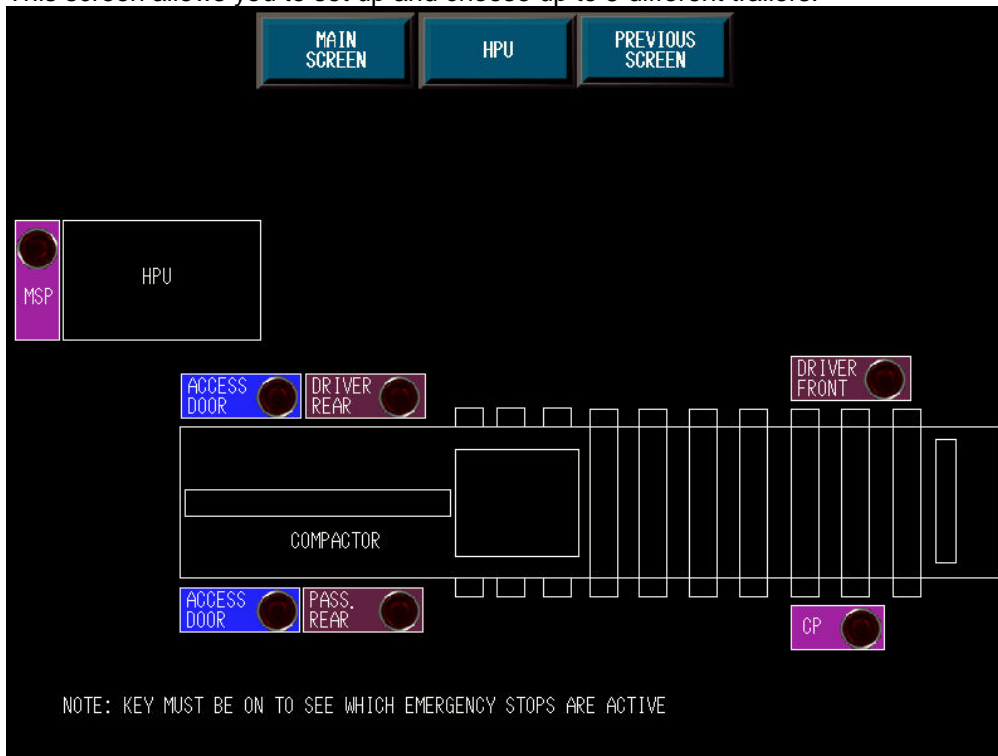
- Density Mode on**
- Shear Enable**
- Bale Weight Target**
- Bale length**
- Hopper target weight**
- Weight accept %**
- Compacts per bale**
- Scale deviation**

- A. Density mode on, allows the compactor calculate bale density and length to get the optimum bale weight for an evenly built bale.
- B. Shear Mode enable allows the platen to extend past the chamber knife to shear material, when disabled the platen stops one foot short of the shear point.
- C. Bale weight target, this allows the operator to select the weight for the bale the compactor makes and will give a load ready light once the bale weight is reached
- D. Bale length, this allows the operator to select the length of bale the compactor makes.
- E. Hopper Target weight determines when the compactor will make a clear in the automatic mode. If the target weight is to low the compactor will do continuous clear strokes.
- F. Weight accept %, is set by the operator and is the percentage of target weight that is allowable.
- G. The operator depending on the type of material being processed sets compacts per bale. Wet MSW will require less compacts then drier C&D material
- H. Scale Deviation, allows the operator to set the compactor scales to match truck scales to ensure proper loads.



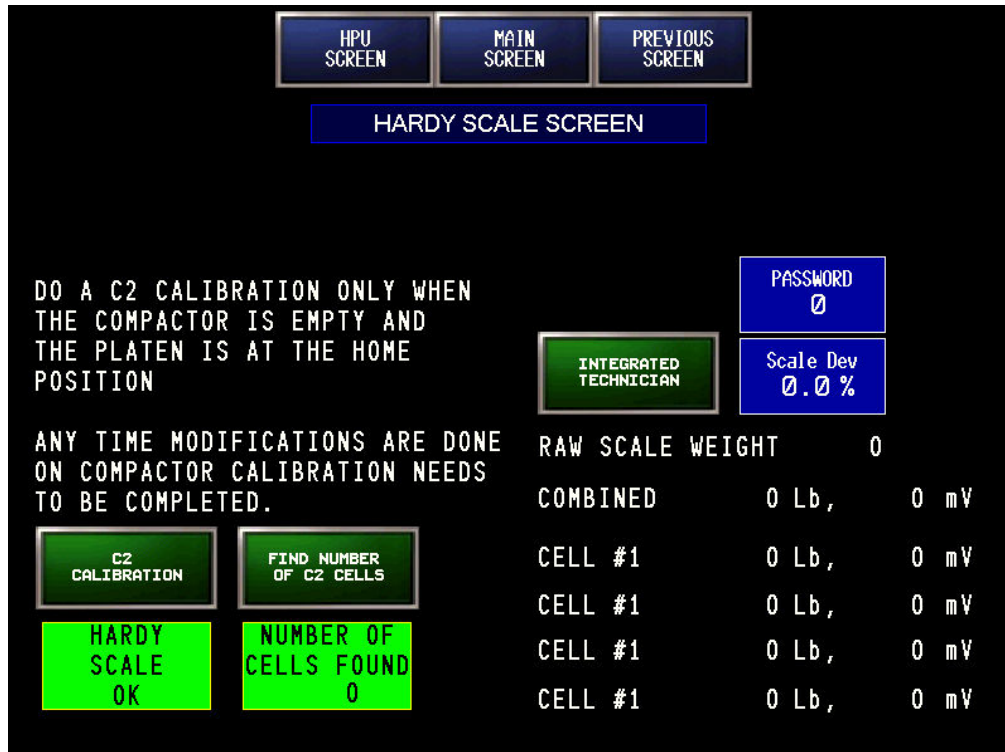
### 10. TRUCK SET UP SCREEN

This screen allows you to set up and choose up to 5 different trailers.



### 10. ESTOP SCREEN

This screen shows active estop and access doors either open or close.



## 12. SCALE SCREEN

This screen shows active load cells and also allows you to calibrate the scales.



During operation, the Programmable Logic Controller (PLC) constantly monitors the condition of the machine to ensure that the system is operating correctly. There are two types of messages that are displayed on the touch screen to help identify what is happening.

**Status Messages** – Displayed on the status bar just under the “MAIN SCREEN” label on the main screen. Status messages do not cause the machine to shut down or prevent the machine from being started. However, depending on the message displayed, the operator may be required to start the system in order to get the machine producing.

**Fault Messages** – Displayed in the fault messages bar on the main screen. All of the faults require the operator to fix the situation prior to restarting the process.

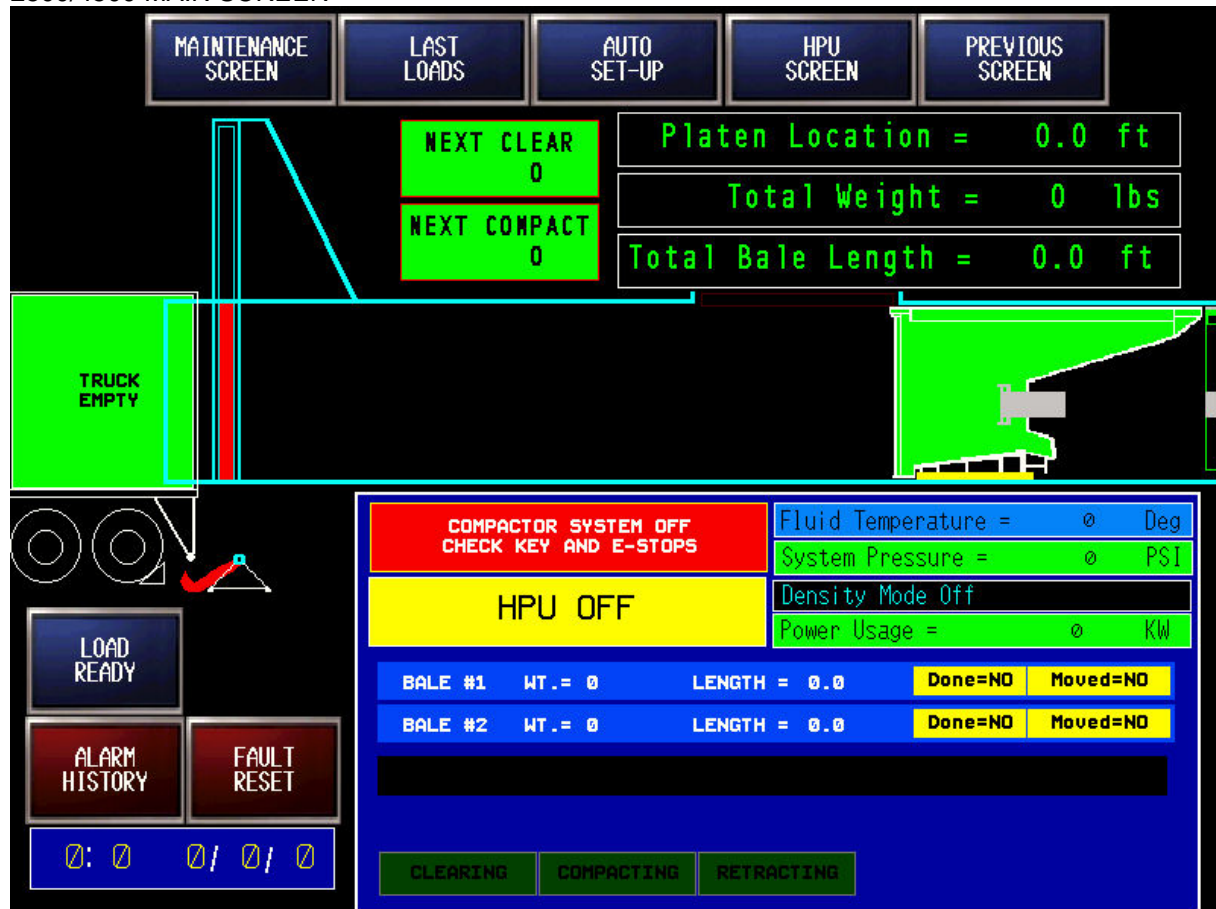
There are two types of faults, those that shut down the Compactor system, but leave the HPU running, known as system faults. The other, known as HPU faults, shut down both the Compactor system and the HPU.

In the event of a Fault, the SYSTEM FAULT/RESET light will come on steady, and the red Status light will stay on continuously.

To silence the fault horn, press the SYSTEM FAULT/RESET button momentarily.

To reset the fault, hold the SYSTEM FAULT/RESET button for 25 seconds.

2500/4500 MAIN SCREEN





## STATUS MESSAGES

### CONTROL POWER OFF

The key switch is off

### ESTOP AT CONTROL PANEL

The emergency stop button on the control panel has been pressed.

### ESTOP AT MOTOR PANEL

The emergency stop button on the motor starter panel has been pressed.

### ESTOP AT RADIO CONTROL

The emergency stop button on the remote control has been pressed. (This is only possible if the unit is supplied with remote controls)

### REMOTE ESTOP ACTIVE

Any emergency stop push button other than those on the control panel, motor starter panel or radio controls been pressed. (This is only possible if the unit is supplied with additional emergency stops)

### FAULT ACTIVE

There is a fault condition, see the fault message detailed below

### HPU OFF

The HPU is off. Press and hold the HPU START/RUN button until the warning horn has finished sounding to start the HPU.

### HPU OIL COLD

The temperature of the hydraulic fluid in the HPU is below the temperature needed to operate. Let the HPU run to heat the oil. When the oil has warmed sufficiently, the system can be started.

### HPU OIL HOT

The temperature of the hydraulic fluid in the HPU is above the allowable operating temperature. Let the HPU run to cool the oil. When the oil has cooled sufficiently, the system can be started.

## SYSTEM FAULTS (HPU continues to run)

### HPU HOT OIL

The temperature of the hydraulic oil is too high. The Compactor will turn off but the HPU will continue to run in an attempt to cool the oil. Allow the HPU to run until the Hot Oil goes out. The cooler fans should be running during this time. Reset the fault .If the problem persists, clean the heat exchanger.

### HPU COLD OIL

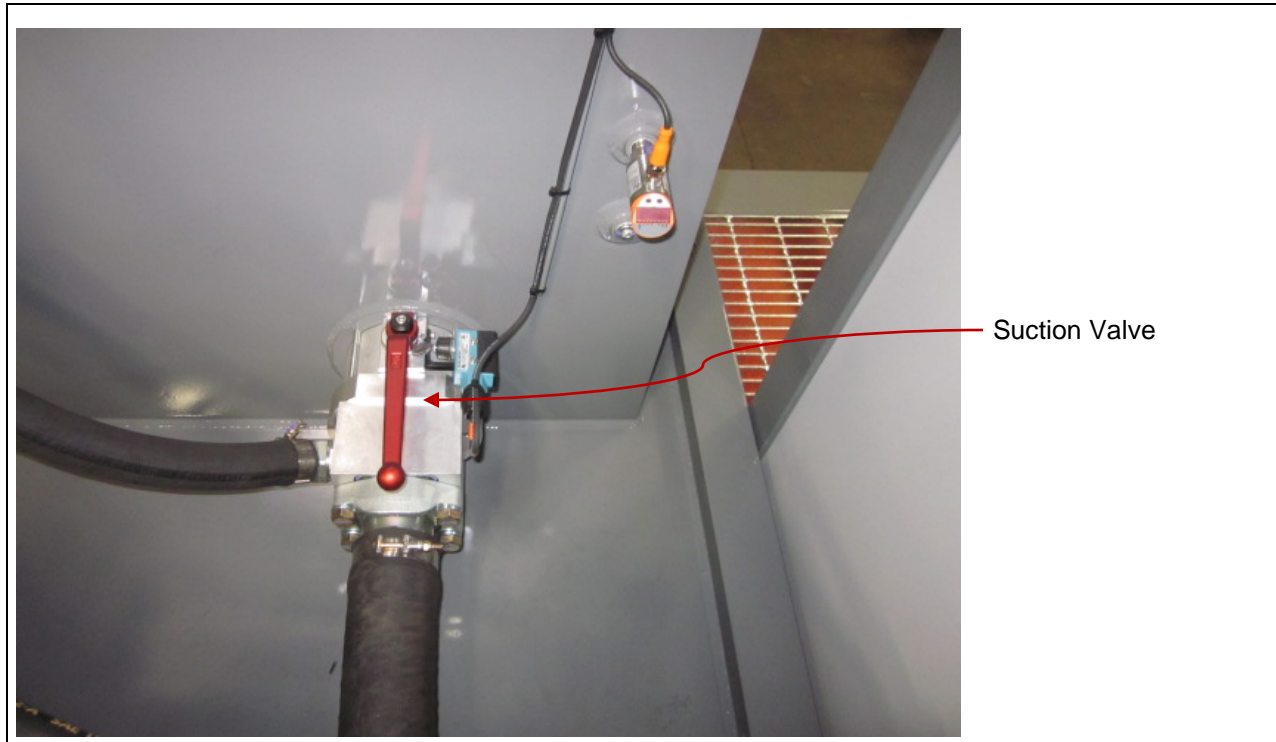
The temperature of the hydraulic oil is too high. The Compactor will turn off but the HPU will continue to run in an attempt to cool the oil. Allow the HPU to run until the Cold Oil goes out. Reset the fault and restart the Compactor.



## HPU FAULTS (HPU shut down)

### HPU SUCTION VALVE CLOSED

The hydraulic suction valve is closed. Ensure that the valve is fully open. Reset the fault and restart the HPU



### HPU OIL LEVEL LOW

The level of the hydraulic oil in the reservoir is too low. Add filtered oil until the level is about three-fourths of the way up the oil level sight glass, located near the top of the reservoir. Use only the hydraulic oil specified in the lubrication specifications. Reset the fault and restart the HPU

### COOLING PUMP OVERLOAD FAULT

If the hydraulic power unit has a pump and motor dedicated to circulating the hydraulic fluid through the heat exchanger and the filters, this message indicates that the motor overloads for this motor have tripped. Determine why this motor is overloaded and correct the problem. Reset the fault and restart the HPU

### HPU OIL HOT LIMIT

The temperature of the hydraulic oil is above 170°. The PLC will turn off the HPU. Need to inspect cooling circuitry for possible problems with heat exchanger fan, pump and motor. Reset the fault. If the same fault reoccurs, shut down the system and have an **authorized electrician** refer to the VFD Manual in *Section 12* for further instructions.

### MOTOR 1 VFD FAULT

If the main motor #1 is started using an VFD drive, this message indicates that the electric motor failed to complete the start-up sequence. Cycle the main breaker on the Motor Starter Panel off and on, and try to restart the hydraulic power unit. If the same fault reoccurs, shut down the system and have an **authorized electrician** refer to the VFD Manual in *Section 12* for further instructions.

**MOTOR 2 VFD FAULT (MOTOR VFD FAULT if second motor is provided)**

If the main motor #2 is started using an VFD drive, this message indicates that the electric motor failed to complete the start-up sequence. Cycle the main breaker on the Motor Starter Panel off and on, and try to restart the hydraulic power unit. If the same fault reoccurs, shut down the system and have an **authorized electrician** refer to the VFD Manual in *Section 12* for further instructions.

**⚠ WARNING**

**Electric Shock Hazard.**

**External wiring, connections and interlock devices must be installed in accordance with the latest national electric codes, local codes, and local electric utility requirements.**

**Only competent, authorized electricians should attempt to install, modify, or maintain the electrical system.**



Compactor™ system is equipped with three status lights mounted on the wall above the loading area and a strobe light mounted on the control panel. The lights, and a warning horn, tell the operator the status of the machine.

The meanings of the color and flash patterns of the status lights and warning horn are:

**RED LIGHT (fault light)**

**Solid** - An HPU fault is active. The fault will have to be fixed and cleared before the HPU can be restarted. The exact fault is shown on the touch screen on the control panel.

**Continuous flash** - A system fault is active. The fault will have to be fixed and cleared before production can continue. The exact fault is shown on the touch screen on the control panel.

**YELLOW LIGHT**

**Solid** - HPU is running, Manual Mode Run

**Single flash** - HPU is running, Load Ready

**GREEN LIGHT**

**Solid** - Unit is running in automatic, OK to load material

**Single flash** – Unit is running in radio mode, Ok to load material

**WARNING HORN**

**Intermittent beeping** – HPU or Trolley system is starting.

**Steady beeping** - warning horn is sounded when platen and carriage is traveling in the chute area in manual mode, this to inform operator that if carriage and platen is to separate by operators choice they need to be aware that there is potential for debris to fall between platen and carriage.

**Intermittent beeping** - In sync with the single flash red light when a warning is active.

**Strobe light**

Will flash when load is ready

## PRIOR TO START-UP

1. Perform a full daily inspection each day before starting the machine, refer to *Section 4.2, Daily Inspection*.
2. Ensure that there are no persons inside the compactor, and that there are no unauthorized persons in the vicinity of the compactor.
3. With the machine turned off, electrically locked out and tagged, refer to *Section 4.1, Locking Out the Compactor*. Check for damage and or material that may have become stuck between the platen and the carriage.



**This equipment must be operated by trained, authorized personnel only.**



**Prevent personal injury. All guards and shields must be in place before starting or operating the unit.**

## STARTING THE HYDRAULIC POWER UNIT

1. If not already on, turn ON all of the main breakers located on the front of the Motor Starter Panel.
2. At the Control Panel, insert the key and turn it to the ON position. The CONTROL PANEL will take several seconds to self-start, then the Compactor screen will appear.
3. If the HPU does not start, check all EMERGENCY STOP buttons and pull out any that are depressed also check that the access doors are closed and latched.



**Prevent injuries. Check the compactor and auxiliary equipment to ensure that there are no personnel, tools, or other unsafe materials inside or nearby, then call out a warning before starting the machine.**

4. Press and hold the HPU START/RUN button. The warning horn will sound for about 5 seconds. When the horn stops, release the button. Over the next few seconds, the system will start all Pilot motor only; the two main motors will remain off until function is requested. See illustration below
5. The HPU status bar on touch screen will indicate that HPU is running, note that the main motors will not run until command is given. The compactor is ready to process material. See illustration below.



# STARTING THE COMPACTOR

**MAINTENANCE SCREEN**   **PREVIOUS SCREEN**   **ALARM HISTORY**   **E-STOP SCREEN**   **MAIN SCREEN**   **08/05/16**  
**0:00**

**PILOT PRES LOW**

**POWER= KW**

**HOUR METER**

**FLUID TEMP(°C)**

**SYS PRESSURE (BARS)**

**2B OFF**  
**2A OFF**

**1A OFF**  
**1B OFF**

**OPEN**   **OPEN**   **OPEN**

**M2 OFF**  
**M3 OFF**  
**M1 OFF**

**FAN COOLING**

**STARTER ENCLOSURE**  
**M3 AUX DRIVE OFF M1 NO FAULT**  
**M2 DRIVE OFF M1 NO FAULT**

**HPU STARTING**  
**HPU STOP**  
**COOLING FAN ON**  
**ERAM MODE OFF (MAINT)**

**LOW TEMPERATURE SWITCH = COLD OIL**  
**HIGH TEMPERATURE SWITCH = HOT OIL**

**COMPACTOR SYSTEM OFF**  
**CHECK KEY AND E-STOPS**

**UNLOADER 1A JOG (MAINT)**   **UNLOADER 1B JOG (MAINT)**   **UNLOADER 2A JOG (MAINT)**   **UNLOADER 2B JOG (MAINT)**

**HPU RUNNING**

## GENERAL

The following is a general guideline to the operation of the SSI compactor. It is not intended to replace a comprehensive operator-training program. The knowledge required to properly operate and maintain a transfer station is much more complex than simply causing the compactor to compress material and load it into containers. Only things directly related to machine control will be covered here. Topics such as load distribution in the container, blending material type prior to compaction and securing truckloads are beyond the scope of this manual. As part of compactor start up training, SSI will have a limited involvement with the larger compactor operation but it is ultimately the owner's responsibility to see that comprehensive operator training is provided.

### Safety Precautions



**Trained, authorized personnel should only operate this equipment.**



**The operator should visually inspect the compacting chamber, drive unit and load chute area to insure that no objects or personnel are in these areas before start-up.**



**Operator should check for loose fittings, bolts, frayed wire, worn hoses and malfunctioning components each day before beginning operation.**



**Guards are provided to prevent personal injury from moving parts. Never operate the compactor with any guard removed or anyone inside the guarded area.**

### Safety Shutdowns

The compactor controls have switches and interlocks for the safety of personnel.

### Emergency Stop Switches

Pressing any of the red **EMERGENCY STOP** buttons on control panels or other remote locations will immediately shut down the HPU motors, stop movement and shut off control power to the compactor. This will result in the fastest possible shutdown of the compactor. Correct the problem and then pull the emergency stop buttons out to their normal operating position can restore the power. The compactor can then be restarted.

The emergency stops are intended for use only in an emergency. Use the motor stop button and the key switch to shut down the compactor under normal situations.



### Access Panel Interlocks

Opening any of the hinged access doors to the cylinder section of the compactor will result in an immediate emergency stop. The power will not reset until all of the doors are closed again. The bolt on panels are not interlocked.

### Initial Start Up of the Compactor

Refer to Initial Start Up Section 2.6 page 3

### Compactor Shut Down

With the platen / carriage in a full retracted position, (Home Position), do a shut operation by pushing the **SHUT/RETRACT** button. This will cause the platen to extend to close to the load chamber opening. You then can turn the compactor off by turning the **CONTROL POWER** key switch to the **OFF** position.

### Normal Starting of The Compactor

Do a walk around inspection of the compactor as per the Daily Preventative Maintenance Check List provided in this manual. Turn the hydraulic power unit on and allow it to run for a few minutes. The compactor will display a **COLD OIL** fault when oil temperature is below 70°F, and not allow for movement of the cylinders until the oil warms up.

Do a **CLEAR STROKE** operation. Next do a walk around inspection to check for any hydraulic leaks. You are now ready for operation of the compactor.

### Remote Control (if provided)

The Compactor can be operated in the Radio mode by using the radio remote control. This is to allow the operator to be in the machine loading the compactor. The remote control allows nearly all the operations of the Compactor to be conducted without using the main control panel after initial startup. Refer to the *Radio Remote Control* section for more details on using the remote control.

In general it is best to operate the Compactor from the cab of whatever equipment is used to load the Compactor. This will allow the operator to respond to situations without having to exit the loading machine and walk to the Compactor. In general, the cab of the loading machine has some visibility of the loading hopper, making it the best place to see the situation in the hopper.

### Local Operator Control Panel

The main control panel has four active buttons, **CLEAR**, **COMPACT**, **LOAD READY**, and **RETRACT**, as well as the **Gate/Compact** joystick.

The **GATE/COMPACT** joystick is used to manually move the platen out and back as needed to move a bale into a container. **Note:** *Any compactor motion, such as a clear stroke, that is in progress will be interrupted by the joystick.* When using the joystick in manual mode, it is not necessary to be concerned about which cylinder is active since the programmable controller controls this.

The **CLEAR** button causes the platen to push material out of the load chute area without compacting it and then returns to the fully retracted position. This is the fastest way to make more room in the chute area for more material to be added.

The **COMPACT** button causes the platen to push material until it compacts it against the gate and then returns to the fully retracted position.

The **RETRACT/SHUT** button has two functions.

1. If the platen is not in the home position, this button will cause the platen to return to the fully retracted position.

- 2., If the platen is fully retracted, this button will cause the platen to extend until the load chute is closed. The compactor should be left in this position when it is not actively being used to prevent anyone or anything from entering the compaction chamber.

The **LOAD READY** light will go on when the bale is complete. This signals that the bale can be ejected into the trailer. If a partial bale needs to be ejected into a trailer, the **LOAD READY** button can be pressed after a manual compaction, allowing the gate to be raised and the bale ejected. Refer to the Ejecting Bale section below for the ejection sequence of operations.

## FEEDING THE COMPACTOR

It is important to understand that the loading of material into the compactor is a very important operational element. In some cases, material is placed into the compactor by automatic methods such as rubber belt or steel pan conveyors. In other cases, direct feeding of material by a front-end loader or crane is used. Conveyance into the compactor is the primary factor in controlling the throughput of the compactor. Careful selection of the method of loading and the operation of that system is vital to successful compactor operation.



**An emergency stop switch should be installed and maintained in close proximity to the compactor-loading chute and at other locations as necessitated by the installation.**



**Loading any type of flammable materials into the Compactor can cause a fire or explosion.**



**Objects thrown from the Compactor can cause severe personal injury or death. While material is being processed, stay in the cab of another machine or stay at least 50 feet (15 meters) away from the loading hopper. Always wear a hard hat.**

The compactor controls has an OK TO LOAD COMPACTOR signal wire that should be used to interlock any feed device (conveyor) to the compactor. The output from the programmable controller will be on any time the compactor can accept material. This output will turn off when the compactor cannot accept material.

Always monitor what is being placed in the hopper of the Compactor. There is always the possibility that there are things in the un-compacted material that should not go into the Compactor. Sorting, or removing those items, is the job of the person loading the Compactor. Refer to *Section 3.1, Application Range* for what is acceptable, and what is not.





### **Non Compactable Material**

Non-compactable materials are any material that the compactor cannot compact to a tighter density, but are such that if positioned improperly can cause catastrophic damage to the compactor. This material has the potential to cause severe damage to the compaction chamber and the moving parts of the compactor: Refer to Section 3.1 Range of Applications

### **Bale Building**

The SSI Pre-Load Compactor is designed to compress Municipal Solid Waste, (MSW) into a bale of material that can be loaded into a container or a trailer to be transferred to a disposal site.

Material is loaded into the load chute of the compactor. The scale system that supports the compactor supplies weight information of the material that has been loaded to the Programmable Logic Controller, (PLC). At a programmed weight, the compactor will clear the material into the compaction chamber by pushing the material with the platen. This sequence can be repeated until enough material has entered the compaction chamber. The compactor will then perform a compaction stroke that compacts the material against the discharge gate. The above operations will be repeated until a bale is complete. At this time the load is ready to discharge into a container or trailer.

### **Manual vs Automatic Mode**

The Compactor is designed to build bales in two modes, a manual mode and an automatic mode. In the manual mode, the operator starts all the functions of machine movement either at the local control panel, a remote control panel, or an optional radio control system. In an automatic mode, the compactor works entirely on programmed weights of the material loaded and builds a bale. In any case, trained operators are to discharge the finished bale into a container, or trailer by manually operating the compactor.

### **Density Mode**

The following information explains the Density Mode Procedure:

The SSI Compactor is equipped with a DENSITY MODE that allows the Compactor to build a bale with a constant density through out the bale length. When you program the Compactor to build a bale to a required weight and length and the DENSITY MODE is on, the program will calculate what the Density should be per foot of material.

In AUTOMATIC MODE the Compactor will try to make the bale to the desired density. While processing very heavy material you may only go to the length and not do a full pressure compaction.

*Example: You have a 10,000 lb. Load of lead next to the gate that takes up 2 feet of chamber length. At 2,000 lbs. Per foot density it would require a 5-foot bale length.*

*The compactor would only go to a bale length of 5 feet and then stop. You would not touch the lead. The compactor will compact to the bale weight or length; which ever comes first. If the compactor can not reach weight or length due to very light material it will go to full pressure and reverse or show bale ready at the programmed bale length.*

With the DENSITY MODE off, the compactor will go to full pressure on each compact stroke until the weight or length of the bale that has been programmed into the PLC has been reached. The compactor will then show a bale ready.



Care should be taken when compacting material such as wood and dry material that can become stuck in the chamber due to over compaction.

## **MATERIAL TYPES**

Different materials act in different ways when being compacted. The compactor will build a denser or heavier bale with one or more compaction strokes. A heavy and wet MSW material would require less compaction strokes. In some cases the bale may not maintain its shape when moving into a container or trailer. If this is the case, the compactor should be programmed to build a shorter bale at the same weight to compress the material to a greater density bale. A light and dry MSW would require more compaction strokes to build the proper weight bale at a given bale length.

## **Building a Bale in Manual Mode**

The manual mode is used to allow control of the compactor from the operator control panel, the remote control panel, or the optional radio remote control unit.

## **Building a Bale in Automatic Mode**

In automatic mode, the compactor will use the scale input to automatically build a bale. When the bale has been completed, the LOAD READY light will turn on. If a trailer has been moved into place and the truck latch applied, the bale will then be ready to be manually ejected into the trailer.

To start the automatic operation of the compactor, simply push the SYSTEM AUTO START/RUN button and the compactor will build a bale automatically until the LOAD READY light is on. At this time the bale will be manually ejected and then the SYSTEM AUTO START/RUN can again be pushed to build another automatic bale.

## **Discharging Material Into A Trailer**

Discharging the compacted material into the trailer or container should be closely monitored. Keep in mind that the compactor controls have no information about whether the load is going into the container correctly or not. The operator must pay close attention to the loading operation at all times. Emergency Stops should be placed in the operator observation points.

Before a load is ejected, a trailer or container that can accept the bale must be at the compactor and in position and the truck latch applied, if so equipped.

To eject the bale into the truck or container the operator must control the compactor with the joystick on the operator control panel.

Hold the joystick in the RAISE GATE position. The platen will back off of the bale 2 feet to relieve pressure from the gate and then the gate will rise. The gate will stop when it has reached the fully raised position.

When the joystick is held in the **EXTEND** position, the bale will be pushed into the container.



**Take caution when loading the bale not to damage the trailer.**

The bale will be pushed into the container to the full extent of the cylinders. At this point most operators back the platen up a few feet and then push forward again to help contain material which might roll off the load and hinder closing of the doors of the container or trailer.

After the load has been satisfactorily ejected into the container, the operator must manually retract the platen only until it is clear of the gate. After the gate has been fully lowered, the platen can be returned to the home position by pressing either the **AUTOMATIC CYCLE START** or the **RETRACT** button. This allows the operator to immediately pull the truck or container forward after lowering the truck latch, and close the doors.

## Maintenance Mode

In maintenance the PLC will allow certain interlocks and permissives to be overridden. The maintenance mode is to be used exclusively for positioning the compactor for maintenance, freeing any jams, and testing. It is **never** to be used for production compacting and is only operated from the local control panel.



**WARNING:** Improper operation in the maintenance mode can cause personal injury or damage to the machine. Only trained personnel should have access to the key to activate maintenance mode.

The **MAINTENANCE OVERRIDE** key switch is located on the operator control panel. To place the unit in maintenance mode, start the unit normally and then select the **ON** position on this switch.

To take the unit out of maintenance mode, set the **MAINTENANCE OVERRIDE** key switch to the **OFF** position.

While in the maintenance mode, all of the cylinders can be extended and retracted without regard to the limit switches at the ends of the strokes. This is useful for setting pressures (see maintenance section) and placing the cylinders at their full extension. The exception to this is the compaction cylinder home limit switch. It is always active since bottoming the compaction cylinder in its fully retracted position could potentially damage the cylinder.

## BASIC COMPACTOR OPERATION PROCEDURES MODEL 4500

**Check and make sure that the Compactor has been turned OFF and in the SHUT POSITION at the end of the previous shift.**

1. Do a walk around inspection of the Compactor and check for any unusual conditions.
2. Turn the Compactor on at the main control panel and check the control lights.
3. Check and see that the "E" Ram Retract light is ON and the **MAINTENANCE OVERRIDE** key is in the **OFF** position.
4. Start the pumps and check for any leaks or unusual sounds.



5. Push the SHUT/RETRACT button to return the Platen to the home position.
6. Check and reset the TARE function on the panel view. The panel view should show the following: Tare Yes, Bale length weight 0.
7. If you are going to position the Compactor for cleaning, move the platen forward by pressing the COMPACT BUTTON while in the NORMAL mode. When the platen has reached full distance and starts to retract, press the LOAD READY BUTTON. The platen will stop and you will have a LOAD READY light. Raise the gate and extend the platen as if you were moving a bale. Check for the GATE UP light when you are extending or retracting the platen in the gate area.
8. ***FOLLOW YOUR COMPANY LOCK OUT TAG OUT PROCEDURE BEFORE ENTERING THE COMPACTOR.***
9. Clean and inspect the Compactor. Note and correct any conditions that need attention. Pay particular attention to the Limit Switches.
10. After cleaning, inspecting, and securing the Compactor, Turn the Compactor on and check for the GATE UP LIGHT. The GATE UP LIGHT must be ON. Retract the platen clear of the gate and lower the gate. Lower the TRUCK LATCH by depressing the down button. In Normal Mode, press the SHUT/RETRACT button. The platen will return to home position. You are now ready to start making a bale. If you place the LOCAL/RADIO switch to radio, you can override the AUTO MODE at any time with the radio and control the compact, clear, shut/retract, load ready and HPU stop functions with the radio.
11. When a bale has been made to the target weight and length the Compactor will show a load ready.
12. When you have a load ready, you are now ready to move the bale. Position an empty truck to receive the bale. When the truck is in position raise the truck latch. Raise the gate; the GATE UP light must be on before you can move the bale. It is the operators' responsibility to visually inspect that the truck has been correctly latched. Extend the platen to full extend. Retract the platen approximately 8 feet and extend 2 more times. The bale has been positioned in the trailer. Retract the platen clear of the gate. Lower the gate and then the truck latch. Check the "E" Ram RETRACT light. The "E" RAM RETRACT light must be OFF. Press the AUTO button and place the control to radio. The platen will return to home position and you are ready to build another bale.
13. When you have made your last bale for the day and the platen is in the compact position, press the shut/retract button and return the platen to the home position. This will allow any material that may be on the platen lid to fall into the Compactor. Press compact and the LOAD READY light will come on again. You are now ready to move the bale.
14. When the bale is moved return the platen to home position, press SHUT/RETRACT and close the load chamber. You are now ready to turn off the Compactor.

NOTE: Do not leave-wet loads in the compactor over night in cold weather, as moving a frozen bale can be extremely difficult.

### **Loading the compactor**

How you load the compactor is very important to how the compactor operates efficiently. The best garbage to compact with the least amount of effort is of course wet garbage. However, there is bulky waste, shingles, roofing material, construction, demolition waste and dry solid waste that must be compacted. Break up bulky material as much as possible. It is best to mix the bulky and dry material with the wet material. Material such as rail road ties, heavy timbers and heavy steel pipe over 72" long should



not be loaded into the compactor. This type of material can get crossways in the chamber, cause severe damage to the compactor and become jammed in the compaction chamber.

Take care when loading the compactor, not to overload the chamber and cause a bridge or jam in the load chamber. Material can be loaded on the PLATEN LID when the platen is at 3' or less and is retracting. Do not load material on the platen or carriage lid while the compactor is in compact mode or clear mode, only after the platen has retracted to 3' or less. Material such as carpet, mattresses in batches, heavy cardboard, heavy newspaper and layered plywood should be loaded in the bottom of the load chamber, as they are nearly impossible to shear. Please see section 3.1 Range of Applications for more list of material that requires caution when loading such material.

These instructions are being provided to assist you in the basic operation of your Compactor. As you know, there are many other factors involved in the operation and function of the Compactor. Please refer to the manual and become familiar with the operations and troubleshooting of the Compactor. Understanding the machine, and good housekeeping and maintenance are very important in the life and operation of the Compactor.

## **OPERATION & TROUBLE-SHOOTING GUIDE FOR SSI COMPACTOR**

The SSI Pre-Load Compactor is designed to compress Municipal Solid Waste into a bale of material that can be loaded into a container or trailer and transported to a disposal site. It is the intention of this document to explain in detail the most efficient operation of an SSI compactor.

SSI compactors are designed for the most efficient operation of a transfer station. This would be defined as an operation that requires the least amount of maintenance with the maximum amount of operational time and maximum throughput. It is our sincere hope that your SSI compactor is operated as described below to ensure the longest equipment life.

### **Preventive Maintenance**

The SSI compactor is designed for the least amount of maintenance required for normal operation.

**A)** The best maintenance program must start with the customer being familiar with the equipment and its operation. A visual inspection of moving parts, possible hose chaffing, bearing thickness, hydraulic leaks, etc. can minimize operational down time by addressing the compactor readiness for normal operation.

**B)** Without a doubt, the best maintenance program must start with the proper operation of the compactor. Any equipment must be operated within the limits of the design of the machine. Operational abuse or misuse can and will be the major contributor to increased maintenance and down time. Please refer to the operational section below to help assist the operators of the machine to comply with certain parameters of compactor operation.

**C)** The platen and carriage bearing systems are designed with the best materials available to ensure long life without the necessity of constant lubrication. The bearing material is designed to be the sacrificial element for the bearing - wear strip combination. These bearings and the adjustment mechanisms are also designed for the easiest adjustability in the field to help user to keep the system in proper adjustment.

**D)** On all hydraulically operated equipment one of the most important fundamentals is to keep the hydraulic oil clean. This insures long life of both the hydraulic pumps and the hydraulic cylinders. SSI has continually upgraded the design of the Hydraulic Power Unit which now includes nine (9) filters--four (4) on the individual pressure sections of the main pumps, four (4) return lines from the compactor, and one (1) kidney filter from the heat exchanger circuit. All of these filters should be kept in the green on their mechanical indicators in order to insure long life of all the hydraulic components in the system.



## Operation

There are two (2) basic bale-building operations used to construct bales in SSI compactors. They are as follows:

**1) Manual Mode** is by far the preferred method in single compactor, top-loaded transfer stations. This method requires the loader operator to be the key component in the entire operation of building bales. Since he/she is in total control of the material to be loaded, his/her responsibility is to ensure the proper mix and the proper quantity of material is charged into the load chamber of the compactor as the bale is constructed.

The machine should be set for the following:

- A) Finished Bale Length
- B) Bale Target Weight
- C) Density Mode On
- D) Three Compacts Per Bale.
- E) Shear Mode OFF

When the machine is ready to begin the bale building operation, the loader operator pushes or dumps a load of material into the load chamber of the compactor. It is important to remember that non-shearable materials such as steel rebar and water heaters be placed at the bottom of the load in the load hopper. As soon as the operator sees that the load hopper is somewhat full, he/she simply depresses the "Clear Stroke" button on the radio control unit he/she is operating. The loader operator simply returns to the pile for more material as the compactor moves the waste from the load chamber to the compaction chamber. The loader operator repeats the "Clear Stroke" function until the compactor has reached about 1/3 of its total bale weight. At this time the operator depresses the "Compact Stroke" button and the compactor moves the material forward and compacts the first 1/3 of the bale.

The operator repeats the above sequence for "Clear Strokes" until the compactor has accumulated 2/3 of the required bale weight and again depresses the "Compact Stroke". At this time the compactor will compact the first 2/3's of the bale to the specifications entered into the computer.

Finally the operator performs the last set of "Clear Stroke" commands until the desired bale weight has been accumulated. The operator then depresses the "Compact Stroke" and the compactor will finish the bale as to its desired length. The compactor will automatically signal a "Load Ready" and the bale is ready to be ejected into the trailer for transport.

**2) Automatic Bale Building.** In many operations the compactor will be used to construct bales totally automatically. Some operations may require an additional operator to be near the Operators Control Panel in order to change "Hopper Target Weight" requirements as the mix of material required to be compacted significantly changes densities. The "Hopper Target Weight" should be set to initiate all "Clear Stokes" and "Compact Strokes" as the material fills the load chamber but doesn't extend above the shear knives on a regular basis. Lighter material requires a "Hopper Target Weight" significantly less than heavy material and will require a higher level of communication between the loader operator and the compactor operator to insure the most efficient operation.

In this mode, the loader operator simply loads material into the load chamber until the compactor initiates the "Clear" and "Compact" stokes always mindful that the most efficient operation is one that keeps all shearing to a minimum.

**NOTE:** Can override auto CLEAR or COMPACT with Radio buttons or Operator control panel buttons.

## Shearing of materials



In either the manual or automatic mode, to allow the compactor to operate in the most efficient manner, the operator should make note to prevent the machine from shearing material continually. Even though the compactor is built to shear a significant amount of material, the Hydraulic Power Unit must provide high-pressure hydraulic fluid to the compaction cylinder during the shearing operation. In order to accomplish this, the large flow pump sections are unloaded back to the reservoir and the entire system slows down during this operation. As the amount of material that is sheared increases, the duller the knives become and the harder the shearing operation becomes, slowing the machine even more.

### Shear gap and clean oil

In both manual or automatic mode, along with all machine functions, the shear gap needs to be maintained at the proper clearance and the hydraulic oil needs to be kept clean. Refer to the service manual for more information. Properly maintained, the compactor will and can serve the needs of your operation for many years.

### Trouble shooting jams

JAM - The point at which the compactor fails to move the platen either forward or backwards.

Compactor "Jams" or shut downs can come in two different configurations.

**1) A Control Shutdown or Fault.** The operator initiates a function and moves the platen. During that function the PLC stops the movement of the platen and does not initiate any other function. The machine simply stops and idles or the Hydraulic Power Unit shuts down.

This type of Shutdown can happen in many different ways and can be investigated and corrected as follows:

#### A) MOTOR #1 VFD FAULT

If the main motor #1 is started using an VFD drive, this message indicates that the electric motor failed to complete the start-up sequence or control is switched to local at the control pad on VFD drive. Cycle the main breaker on the Motor Starter Panel off and on, and try to restart the hydraulic power unit. If the same fault reoccurs, shut down the system and have an **authorized electrician** refer to the VFD Manual in *Section 12* for further instructions.

**B) AUXILIARY CONTACT FAULT.** At any time during the startup or operation of the compactor system, this fault can occur. It signifies that the contactor that latches the electric motors "ON" has failed or a motor overload has tripped. With this fault, the compactor computer signals which motor starter has tripped so maintenance personnel can check the overload switch on the starter or the wiring to and from the computer may be loose.

**C) HYDRAULIC POWER UNIT SHUT DOWNS.** These include: 1) Oil Too Hot.

Simply allow the oil in the Hydraulic Power Unit to cool and restart the compactor. 2) Oil Level Too Low. Maintenance personnel should add oil to an acceptable level and restart the compactor. 3) Suction Valves Closed. Maintenance personnel should check and make sure the main pump suction valves on the Hydraulic Power Unit are open. If open, personnel should check to make sure the wiring to and from the computer and the limit switches are complete. 4) Oil Too Cold. The compactor will allow the Hydraulic pumps to run, but no compactor motions, until the oil has warmed up to acceptable levels. All of these functions are signaled to the operator through the Panel View and the Reader Board.

**D) MULTIPLE LIMIT SWITCH FAULTS.** These include: 1) Truck Gate. Both limit switches are "ON" at the same time. Maintenance personnel will have to check and see if one or the other limit switch ("UP" or "DOWN") is faulty. 2) CRAM (Compaction Cylinder). Both limit switches are "ON" at the same time. Maintenance personnel will have to check and see if one or the other limit switch ("EXTENDED" or "RETRACTED") is faulty.



**E) PILOT PRESSURE TOO LOW.** This fault occurs whenever the pilot pressure is too low to operate the compactor. Maintenance personnel should check the pilot pressure switch for the proper setting, and or the wiring to and from the computer, and or the proper setting for pressure on the pump.

**F) A PREMATURE LOAD READY SIGNAL.** At any time the operator sees that the compactor has given the signal that a bale is ready and a "LOAD READY" signal exists and he/she knows that the bale does not weigh enough, chances are that the platen has moved forward either with a Clear Stroke or a Compact Stroke and cannot shear the material placed in the load chamber. The compactor will always default to a "LOAD READY" if it compacts material to full pressure and cannot move forward to the preset bale length. To clear the Jam of material between the platen and the chamber knife, the operator simply depresses the Shut/Retract button on the radio control. This allows the platen to retract away from the chamber knife and allows the material to fall into the load chamber and clear the knife area. Then the operator simply pushes the Clear Stroke or the Compact Stroke to move the Jam material into the bale chamber of the compactor. If the operator continues to get a premature "LOAD READY" signal, the operator has placed too much non-shareable material into the load chamber. At this time the operators may have to physically remove some of the material from the Jam. This should only be done with the platen at its full retracted or "HOME" position and the compactor locked out and Tagged out in accordance with your company's policy.

**2) A Mechanical Jam.** The operator initiates a function and moves the platen. During the intending function the platen comes to a halt as the hydraulic power unit continues to try to move the platen. The cylinders and the hydraulic power unit are still trying to move the platen either forward or back but some mechanical jam has stopped its movement. At this point the machine does not have the physical power to overcome the resistance of the jam. This causes the hydraulic power unit to over heat the oil very quickly due to the oil being forced over relief valves at a very high pressure.

Mechanical jams can occur in three (3) different areas of the platen movement in and through the compactor. In each of the three (3) different areas of the jams, the operator and maintenance personnel need to approach the situation in various ways. Following, is a systematic approach to mechanical jams in the compactor:

**A) A Mechanical Jam in the load chamber (from 0.0 ft. up to 10.0 ft. from "HOME" position on the tipping floor Reader Board and on the Panel View located on the Operators Control Panel).**

Although this is an extremely rare occurrence (none known to date) the platen may end up getting jammed by not moving past the chamber knife. Even though material may not jam the knife, loose material may end up getting under the platen in the space between the platen and the floor wear liners therefore raising the platen up in the load chamber. The platen would only jam if the replaceable lead plates on the top sides of the platen, were worn to the point to allow the platen to raise up enough to allow the knives to hit each other.

The operator would notice that platen would not be moving and would simply depress the Shut/Retract button on the radio control to retract the platen to the "HOME" position. If the problem persists, maintenance personnel would need to replace the platen lead plates. This would bring the platen back into proper operational condition. The platen lead plates can be replaced with the platen positioned at the end of its full stroke out at the discharge end of the compactor.

**B) A Mechanical Jam in the first 1/2 of the Bale Chamber (from 10.0 ft. up to 25.5 ft. from "HOME" position on the tipping floor Reader Board and on the Panel View located at the Operator Control Panel).**

The compaction cylinder (CRAM) operates in this area of the bale chamber To confirm this, **the green light on the front of the Operators Control Panel for the "ERAM RETRACTED" should be "ON"**. This signifies that the platen and the carriage are together. If a mechanical jam occurs, the operator





would notice that the platen has stopped. The computer will think the bale has been constructed to that point and will simply stop because the Hydraulic Power Unit has gone to a high pressure. When the system begins to retract, the jam may be detected when the platen fails to move.

The machine has the ability to retract the platen with about 115 tons force which is about 1/2 of the 260 tons of force for the extend function. The operator should depress the Shut/Retract button on the radio control unit and first see if shifting the machine has an effect on the jam. If not, maintenance personnel should enter the rear of the machine and visually inspect the platen to determine if material can be removed if accessible. If not, maintenance personnel should exit the machine and attempt to **retract** the platen using the maintenance key at the Operator Control Panel. This is done by turning the maintenance key to the "ON" position and using the manual Joy Stick on the front of the Operators Control Panel.

The maintenance key allows the Hydraulic Power Unit to supply more pressure to the cylinder at the maximum of 3000 psi. This increases the retract force to 132 tons. If the platen does not respond, the maintenance personnel should try to extend the platen. **Caution: The platen will only extend to 25.5 ft. in the maintenance mode without using the Ejection Cylinders (ERAM's).** Once the platen has moved to 25.5 ft. the maintenance personnel must depress the "ERAM MODE OFF" button on the Panel View and the button will turn green from yellow and will state "ERAM MODE ON". At this time the Joy Stick on the Operators Control Panel will operate the ERAM's and not the CRAM.

**Caution:** The maintenance personnel should **NEVER** retract the **CRAM** cylinder without the "**ERAM RETRACT**" light "**ON**". If the platen and the carriage are separated as the joint moves into the load chamber area, (past the Chamber Knife) material can fall between the two assemblies and cause **SEVERE DAMAGE** to the compactor.

The personnel should continue to move the platen forward until the material in the compactor has been ejected into a trailer. When the platen has moved to the fully extended position, maintenance personnel should inspect the platen to see what material was causing the jam and make sure it has been removed. If none was found the maintenance personnel should take the compactor out of maintenance mode by turning the key "OFF". Then the platen can be retracted with normal operation and the inside of the compactor load chamber can be inspected.

If the platen fails to move at all with the use of the maintenance key, the maintenance personnel needs to enter the compactor and use the Jam Relief Feature on the platen. Personnel should place hydraulic jacks under the platen and lift. This basically takes pressure off the platen wedge bearings and allows the adjustment screws to be actuated a bit easier. The wedge bearings can be moved rearward and the jacks released to provide more clearance between the roof of the bale chamber and the top of the platen. Maintenance personnel can then attempt to move the platen using either the normal operation of the compactor or the maintenance key.

Once the platen is free and the material that has caused the Jam has been removed, the maintenance personnel should reset the proper shear gap clearance using the normal procedure found in the Operators Manual. The compactor is ready to operated with normal procedures.

**C) A Mechanical Jam in the second 1/2 of the Bale Chamber (from 25.5 ft. up to 44.0 ft. from "HOME" position on the tipping floor Reader Board and on the Panel View located at the Operator Control Panel).**

This is the area of the bale chamber that the ERAM cylinders, located on the compactor carriage, function. To confirm this, **the green light on the front of the Operators Control Panel for the "ERAM RETRACTED" should be "OFF"**. If a mechanical jam occurs, the operator would notice that the platen has stopped. The computer will think the bale has been constructed to that point and will simply stop



because the Hydraulic Power Unit has gone to a high pressure. When the system begins to retract, the jam may be detected when the platen fails to move.

The machine has the ability to retract the platen with about 163 tons force which is about 1/2 of the 260 tons of force for the extend function. The operator should depress the Shut/Retract button on the radio control unit and first see if shifting the machine has an effect on the jam. If not, maintenance personnel should enter the rear of the machine and visually inspect the platen to determine if material can be removed if accessible. If not, maintenance personnel should exit the machine and attempt to **retract** the platen using the maintenance key at the Operator Control Panel. Turning the maintenance key to the "ON" position and depressing the "ERAM MODE OFF" button on the Panel View does this. The button will turn green from yellow and will state "ERAM MODE ON". At this time the joystick on the Operators Control Panel will operate the ERAM's and not the CRAM.

The maintenance key allows the Hydraulic Power Unit to supply more pressure the compactor at the maximum of 3000 psi. This increases the retract force to 189 tons of force. If the platen does not respond, the maintenance personnel should try to extend the platen. **Caution: The platen will only extend to within 3 ft. of the gate or to 41.0 ft. in the maintenance mode.** Once the platen moves close to the gate, the gate needs to be raised in order to eject the material from the compactor to the trailer.

The personnel should continue to move the platen forward until the material in the compactor has been ejected into a trailer. When the platen has moved to the fully extended position, maintenance personnel should inspect the platen to see what material was causing the jam and make sure it has been removed. If none was found the maintenance personnel should take the compactor out of maintenance mode by turning the key "OFF". Then the platen can be retracted with normal operation and the inside of the compactor load chamber can be inspected.

If the platen fails to move at all with the use of the maintenance key, the maintenance personnel needs to enter the compactor and use the Jam Relief Feature on the platen. Personnel should place hydraulic jacks under the platen and lift. This basically takes pressure off the platen wedge bearings and allows the adjustment screws to be actuated a bit easier. The wedge bearings can be moved rearward and the jacks released to provide more clearance between the roof of the bale chamber and the top of the platen. Maintenance personnel can then move the platen using either the normal operation of the compactor or the maintenance key.

Once the platen is free and the material that has caused the jam has been removed, the maintenance personnel should reset the proper shear gap clearance using the normal procedure found in the Operators Manual. The compactor is ready to operated with normal procedures.

## Summary

The most important feature to remember during the operation of the compactor in the maintenance mode is how the machine and the operator control the platen movement. Following are some basic facts that need to be foremost in any training program and maintenance operation:

- 1) When the maintenance key is "ON", the joystick on the Operator Control Panel controls the extension and retraction of the platen.
- 2) When the maintenance key is "ON", and when the "ERAM MODE" button on the Panel View is "YELLOW" (ERAM MODE OFF) the joy stick controls the CRAM (the single cylinder that moves the platen and the carriage together).
- 3) When the maintenance key is "ON", and when the "ERAM MODE" button on the Panel View is "GREEN" (ERAM MODE ON) the joy stick controls the pair of ERAM cylinders (the twin cylinders that extends and retracts the platen in front of the carriage).



4) In the maintenance mode, the most important light on the Operator Control Panel is the “ERAM RETRACTED” green light. This light is “ON” or “GREEN” when the platen is fully retracted to the carriage.

5) The maintenance personnel should **NEVER** retract the **CRAM** cylinder without the “ERAM RETRACT” light “ON”. If the platen and the carriage are separated as the joint moves into the load chamber area, (past the Chamber Knife) material can fall between the two assemblies and cause **SEVERE DAMAGE** to the compactor.

### Remote Display

The remote control panel display has a row of information. At idle, the board displays the following:

**WT XXXXX PL XX.X**

**WT** = Weight of current bale. **PL** = Platen location in feet from home or fully retracted position. This format is shown whenever one of the other formats listed below is not active.

**WT XXXXX CL XX.X**

**CL** = Clear Stroke, the platen is moving forward to clear material from the load chamber into the compaction chamber, distance is from home position, (0 = home position, platen fully retracted).

**WT XXXXX CP XX.X**

**CP** = Compact stroke, the platen is moving out to apply pressure to the bale and the distance displayed is from home position.

**WT XXXXX LN XX.X**

**LN** = Bale length. This is displayed for 7 seconds after a compaction stroke has finished compressing the waste. After the 7 seconds, the display reverts to the compact stroke format.

**WT XXXXX RT XX.X**

**RT** = retracting. The platen is retracting automatically to the home position to start a new stroke.

**WT XXXXX LR XX.X**

**LR** = Load ready. This is shown until the operator starts to load the finished bale into the truck.

**WT XXXXX FAULT XX**

**Fault** = A System Fault, the 2 digit code makes reference to a system fault, see **PROTECTIVE SHUTDOWNS AND FAULTS**.

### PROTECTIVE SHUTDOWNS AND FAULTS

The compactor control system displays faults as well as warnings. A fault causes the motors to turn off while a warning does not. Faults cause the **FAULT** light to come on steady. For both warnings and faults, a description of the problem is displayed on the Panel View screen, located on the operator control panel, and on the remote panel display. To clear a fault display, press the CLEAR button on the Panel View.



All of the faults and warnings work in any operating mode, even maintenance mode. A listing and description of the faults and warnings appears below and are displayed on both the remote panel display and the Panel View.

Remote display flashes the fault information on and off every 4 sec. until the fault has been corrected.

**FAULT #01**

Remote Display: **(f1) FAULT 01**  
ProFace HMI: **LASER SERVICE DUE**

Check the laser for operation. Maybe a problem with wiring, or reflector may need cleaning off. If none of this solves the problem, call **SSI** for assistance.

**FAULT #02**

Remote Display: **FAULT 02**  
ProFace HMI: **(f2) HPU #1 AUX. FAULT or VFD #1 FAULT (if provided)**  
**CHECK MOTOR STARTERS or VFD drives**

The **MOTOR STARTER #1** has failed to energize properly when the unit was started, or the PLC didn't receive the signal from the starter that it had energized properly. The motor starters overload relay may be tripped or the cabling from the motor starter panel to the main control panel may not be a connected properly.

**MOTOR #1 VFD FAULT**

If the main motor #1 is started using an VFD drive, this message indicates that the electric motor failed to complete the start-up sequence or control is switched to local at the control pad on VFD drive. Cycle the main breaker on the Motor Starter Panel off and on, and try to restart the hydraulic power unit. If the same fault reoccurs, shut down the system and have an **authorized electrician** refer to the VFD Manual in *Section 12* for further instructions.

**FAULT #03**

Remote Display: **FAULT 03**  
ProFace HMI **(f3) HPU #2 AUX FAULT or VFD #1 FAULT (if provided)**  
**CHECK MOTOR STARTERS**

The **MOTOR STARTER #2** has failed to energize properly when the unit was started, or the PLC didn't receive the signal from the starter that it had energized properly. The motor starters overload relays may be tripped or the cabling from the motor starter panel to the main control panel may not be a connected properly.

**MOTOR #2 VFD FAULT**

If the main motor #2 is started using an VFD drive, this message indicates that the electric motor failed to complete the start-up sequence or control is switched to local at the control pad on VFD drive. Cycle the main breaker on the Motor Starter Panel off and on, and try to restart the hydraulic power unit. If the same fault reoccurs, shut down the system and have an **authorized electrician** refer to the VFD Manual in *Section 12* for further instructions

**FAULT #04**

Remote Display **FAULT 04**

**ProFace HMI (f4) HPU #3 AUX FAULT  
CHECK MOTOR STARTERS**

The **MOTOR STARTER #3** has failed to energize properly when the unit was started, or the **PLC** didn't receive the signal from the starter that it had energized properly. The motor starter overload relay may be tripped or the cabling from the motor starter panel to the main control panel may not be connected properly.

**FAULT #05**

Remote Display: **FAULT 05**  
ProFace HMI: **(f5) HPU OIL HOT FAULT**

The hydraulic oil is too hot for proper cylinder operation. Machine will not restart until oil temperature is below hot oil setting.

**FAULT #06**

Remote Display **FAULT 06**  
ProFace HMI: **(f6) HPU OIL LOW FAULT**

The hydraulic power unit is low on oil and needs to be filled.

**FAULT #07**

Remote Display: **FAULT 07**  
ProFace HMI: **(f7) HPU SUCTION FAULT/ISOLATION VALVE**

The suction valves prior to the two main hydraulic pumps are not fully open. Check to be sure the valve handles are in the full open position. Or one of the return line isolation valves is not fully open, check to ensure the valves are open.

**FAULT #08**

Remote Display: **FAULT 08**  
ProFace HMI: **(f8) HPU OIL COLD FAULT**

The hydraulic oil in the HPU is too cold for proper cylinder operation. Start the HPU motors and allow them to run to warm the oil.

**FAULT #09**

Remote Display: **(f09) FAULT 09**  
ProFace HMI: **SYSTEM OVER PRESSURE**

The system has seen a pressure in excess of 3100 PSI. Check reliefs for proper adjustment. Operating the system above 2800psi will cause damage to hydraulic components

**FAULT #10**

Remote Display: **(f10) FAULT 10**  
ProFace HMI: **GATE LIMIT FAULT**

Both the **GATE UP** and **GATE DOWN** limit switches are energized at the same time. Inspect both limit switches and repair if necessary.

**FAULT #11**

Remote Display: **(f11) FAULT 11**  
ProFace HMI: **CRAM LIMIT FAULT**

Both **CRAM** extend and **CRAM** retracted limit switches are energized at the same time. Inspect both limit switches and repair if necessary.

**FAULT #13**

Remote display: **(f13) FAULT 13**  
ProFace HMI: **HPU #3 PRESSURE FAULT**

The pilot pressure is too low for system operation. Check pressure on HPU motor #3. See "Setting Pilot Pressure" on page 31.

**FAULT #14**

Remote display: **(f14) FAULT 14**  
ProFace HMI: **PLATEN SEPARATION**

The platen and carriage have become separated, check for objects in the platen and carriage joint.

**FAULT #15**

Remote display: **(f15) FAULT 15**  
ProFace HMI: **ERAM LIMIT SWITCH STUCK**

One of the ERAM proximity switches is malfunctioning in the on position and needs to be inspected.

**FAULT #16**

Remote Display: **(f16) COMMUNICATION FAULT**

The remote I/O is not communicating with the PLC. Check the communications cable for proper connections.

**FAULT #17**

Remote display: **(f17) FAULT 17**  
ProFace HMI: **HPU SUMP OIL FAULT**

This fault is triggered by sump oil level. Check sump tank, if full then there is oil leak on HPU. Inspect HPU for leaks prior resetting the fault.

**FAULT #18**

Remote display: **(f18) FAULT 18**  
ProFace HMI: **HPU M1 SUCTION VALVE FAULT**

Check suction valve on motor one at HPU to make sure it is in open position and switch is not damaged.

**FAULT #16**

Remote display: **(f16) FAULT 16**  
ProFace HMI: **HPU M2 SUCTION VALVE FAULT**

	<b>OPERATING THE COMPACTOR</b>	SECTION 3.4	PAGE 18
---	--------------------------------	----------------	------------

Check suction valve on motor two at HPU to make sure it is in open position and switch is not damaged.

	<p style="text-align: center;">EXTENDED PERIOD OF NON-OPERATION PROCEDURE</p>	<p style="text-align: center;">SECTION 3.5</p>	<p style="text-align: center;">PAGE 1</p>
---	---	--	---

This manual is provided for the extended non-operation period of the compaction system. Typically, the compaction system should be operated every six (6) months for a short period of time. This short operational period of Start-up, Operation, and Shut Down, is designed to keep the hydraulic and electrical system charged and ready for full time operation.

The following procedure should be planned in advance to insure the efficient short period operation of the compaction system.

 **WARNING**

**This equipment must be operated by trained, authorized personnel only. Ensure that there are no persons inside the compactor, and that there are no unauthorized persons in the vicinity of the compactor.**

 **WARNING**

**Prevent personal injury. All guards and shields must be in place before starting or operating the unit.**

 **WARNING**

**At any time the compactor is to be operated, Operation Staff on the tipping floor must be informed the compactors are functioning.**

## 24 HOURS PRIOR TO COMPACTOR OPERATION

One (1) day prior to operating the compaction system, all supply power (460VAC) must be turned “ON” to the Hydraulic Power Units. This energizes two separate components of the compaction system: 1) The Variable Frequency Drive components include capacitors to be charged prior to the drive operation. The capacitors should remain charged for up to one (1) year, however, we recommend the system be “powered” at the six (6) month period to maintain charged capacitors, 2) the Hydraulic Power Unit tank heaters will warm the hydraulic oil prior to starting the system (only if the oil in the reservoirs is below 65 degree F).

To turn “ON” the power, turn all the main disconnects on the Hydraulic Power Unit Motor Starter Panels (four per compactor). Confirm the power is supplied to the Motor



	<p style="text-align: center;">EXTENDED PERIOD OF NON-OPERATION PROCEDURE</p>	<p style="text-align: center;">SECTION 3.5</p>	<p style="text-align: center;">PAGE 2</p>
---	---	--	---

Starter Panels by seeing the lights illuminated on the Voltage-Vision indicators on the front of the center Motor Starter Panel.

## STARTING THE OPERATION

Clean the removable filter panels on the air conditioning units on the Variable Frequency Drive Panels (two per compactor).

### Starting the Hydraulic Power Unit

1. At the Control Panel, insert the key and turn it to the ON position, depress the MCR push button. The CONTROL PANEL OPERATOR INTERFACE will take several seconds to self-start, the Compactor screen will appear.
2. On Operator Interface, press the HPU screen.


WARNING

**Prevent injuries. Check the compactor and auxiliary equipment to ensure that there are no personnel, tools, or other unsafe materials inside or nearby, then call out a warning before starting the machine.**

3. Press and hold the HPU START/RUN button on the Operator Interface, or the Auto System Start push button on the face of the Operator Control Panel. The warning horn will sound for about 5 seconds. When the horn stops, release the button. Over the next few seconds, the system will start all of the HPU electric motors in sequence.
4. The motor status on the Operator Interface will turn green signaling the Pilot Pressure and Circulation pump motor is “ON” and is running, the compactor is ready to process material. Allow the Hydraulic Power Unit to run for 15 minutes prior to operating the compaction system

### Operating the Compaction System

1. On operator control panel, push “Retract/Shut” button. Monitor platen as it retracts back to its “Home” position opening the charge chamber to accept waste. The “Retract/Shut” push button will flash “green” as the platen returns to the home position.



2. On operator control panel, push “compact” button. Monitor platen as it extends to within 3’ of gate and returns (to 41’ and back). Compact push button will flash “green” while the platen extends and retracts.
3. To simulate a bale, on operator control panel, push “compact” button. Monitor platen as it extends to within 3’ of gate. Compact push button will flash “green” while the platen extends and retracts. Once the platen is within 3’ of gate, press “load ready” button on touch screen this signals that the simulated bale can be ejected. This will also allow the gate to be raised. On operator control panel, push “trailer latched” button. Trailer latched push button will be solid green while the trailer latch is in latched position. To eject simulated bale, hold the joystick in the “Raised Gate” position. The platen will retract 1’ and then the gate will rise. When the gate has been raised, hold the joystick in the “Extend” position the platen will extend and stop at full stroke. To retract the platen to home position. Hold the joystick in the “Retract” position till platen is within 3’ past the gate. Hold the joystick in the “Lower Gate” position till the gate is all the way down. Push “Retract Shut” button. This will place the platen in home position. Repeat above describe actions tree times.
4. After the simulated bale is complete and the platen has returned to the home position, press the “Retract/Shut” push button. This will place the platen in the shut position, 11.0 feet from home position. This will keep the load chute closed.

**To pressurize the system**

5. At the Control Panel, insert the key in to “Maintenance Override” and turn it to the ON position, press HPU button on the touch screen. On the HPU screen, press and hold each unloader jog button for 5 seconds. This will pressurize the whole system and allow oil to flow under pressure.
6. Prior to shutting off the hydraulic power unit, take an oil sample (Refer to section 4.5 for instruction on obtaining an oil sample). Follow instructions in the kit, mail sample to processing lab.
7. Turn main power key “OFF” and the “Maintenance Override” to off position at the operator control panel.
8. Shut “OFF” all power disconnects on the motor starter panels (four per compactor) located on the Hydraulic Power Units.

**NOTE:** Greasing of the compactor components are not required during the “Non-Operation period”. However, all grease points should be greased prior to starting normal compactor operations.

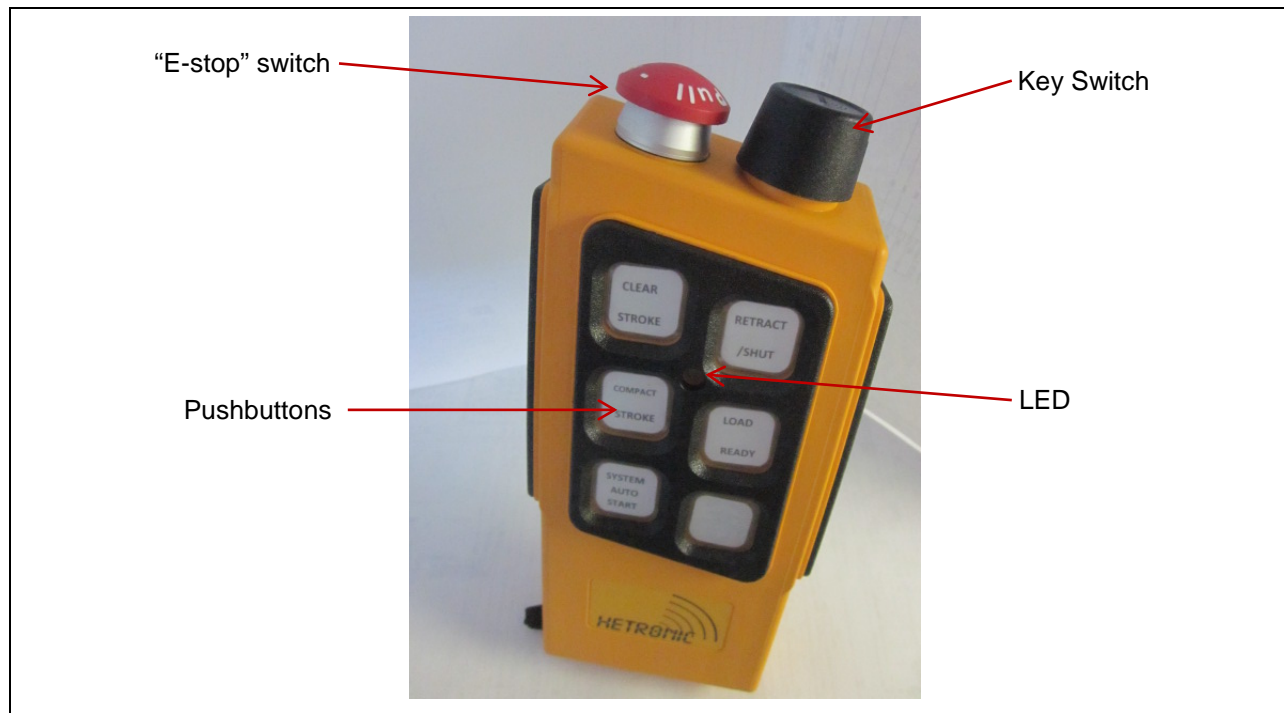
**WAIT SIX MONTHS, START FROM BEGINNING.**

## RADIO CONTROLS ARE OPTIONAL AND MAY NOT PRETEND TO YOUR MACHINE:

The Compactor may be operated from two controls – the control panel and the radio remote control, if provided. In order to control the unit from the remote control, the “Remote / Local” switch on the control panel must be in the “Remote” position. The remote control can be used to clear, compact, retract, shut (when platen is fully retracted, this function will cause the platen to extend until the load chute is closed), load ready button, system auto start and “Emergency Stop” (E-stop) that will shut down the system.

## RADIO REMOTE CONTROL

This remote control is used for automatic operation and has an ON/OFF key, an “Emergency stop” and 12 push buttons on it (see the illustration below).



**Note: The “Emergency stop” is only functional when the remote control is ON and in use.**

To activate the remote control:

1. Turn the ON/OFF key (knob on top of unit) to the ON position.
2. Watch the LED. The LED will begin to flash red. After approx 2 seconds, the LED starts flash green. Now the remote control is communicating with the receiver in the control panel. If the battery is low, the transmitter LED will flash red to indicate a low battery.
3. Any of the push buttons may now be used to control the Compactor.
4. If the “**Emergency stop**” is activated the HPU will stop running.

**The button functions are as follows:**

1. **Clear button.** Button causes the platen to push material out of the load chute area without compacting it and then returns to the fully retracted position. This is the fastest way to make more room in the chute area for more material to be added.
2. **Compact button.** Button causes the platen to push material until it compacts it against the gate and then returns to the fully retracted position
3. **“E-Stop” button.** Pressing this button will shut off automatic operation of the Compactor, shut off the Compactor, and shut off the conveyors if present. Note: This is not a true Emergency Stop since it is not hardwired like all the other E-stop buttons on the machine and power unit. As such, it does not provide the same level of “fail safe” protection the other E-stops provide.
4. **Retract/Shut button** has two functions.
  1. If the platen is not in the home position, this button will cause the platen to return to the fully retracted position.
  2. If the platen is fully retracted, this button will cause the platen to extend until the load chute is closed. The compactor should be left in this position when it is not actively being used to prevent anyone or anything from entering the compaction chamber.
5. **Load Ready button.** Button can be pressed after a manual compaction, allowing the gate to be raised and the bale ejected.
6. **System Auto Start.** This will start the automatic operation, if the auto cycle interrupted by the radio control to add weight, initiate additional compaction or clear stroke. (this button can also start HPU in maintenance mode only).
7. **HPU Stop.** This will stop HPU if you need to stop it for any reason; usually this is useful when doing maintenance on the HPU.

## CHARGING THE RADIO REMOTE CONTROL BATTERIES

The rechargeable batteries are charged on the outside of the starter panel located on the HPU unit. It is also possible to purchase non-rechargeable AA batteries for the remote control. They should not be charged in these chargers.

Yellow CHARGE LED	Lights constantly - Charging Continuous flashing - Damaged battery cell (short)
Red FAST CHARGE LED	On - Fast charge in process
Green READY LED	On - Battery fully charged, trickle mode in process
No LED on after battery inserted	Damaged battery cell (open cell)

There are two possible locations for battery charging station.

Battery charging station



Battery charging station (at control panel)

**⚠ WARNING**

Entering the hopper/chamber without locking out the machine could result in severe personal injury or death.

**ENTERING THE HOPPER/CHAMBER**

There are times when it is necessary to enter the chamber of the Compactor to remove stuck loads or work in the chamber on repairs. If not done correctly, this can be dangerous.

**The following steps must always be followed to prevent injury.**

**⚠ DANGER**

Unexpected machine startup can result in death or severe personal injury.

To ensure safety when servicing or inspecting the compactor all sources of energy **must be switched off, locked out and tagged** at the source, before work or inspection is started.

The compaction system and trolley drive system can be operated independently. To lock-out the compaction system, switch off the main breaker located on the lower left side of the motor starter panel. (the compactor portion of the HPU has two (2) breakers, both must be switched off, locked out and tagged.) Press the HPU start button prior to working on the machine to ensure that the unit is fully locked out. Anyone who will be involved in the service or maintenance of the compactor must place their own lock on the disconnect switch.

Locking out and tagging should be done in accordance with plant rules or OSHA approved procedures. After the power has been locked out, it is recommended that an attempt be made to start the machine using the diesel start button on the control panel. This step confirms that the unit has been correctly locked out.



Container/Trolley Drive Breaker  
(Disconnect Switches)



Compactor Main Power Breakers  
(Disconnect Switches)



**The possible sources of energy are:**

**Electrical energy:** There are several sources of electrical energy to consider.

**Control Voltage** - The maximum voltage on the control circuit of the compactor and container/trolley system is 24 VDC. Customer 220 VAC 50 Hz power is supplied to the motor starter panel to a transformer to obtain 24 VDC control power.

**Component Voltage** – 120 VAC is supplied from a transformer to the operator control panel GFI plug (for remote computer and reader board circuit. Locking out both of the main disconnect switches removes this voltage from circuit.

**Main Power** - The customer supplied main incoming power is 415VAC. Locking all three (3) main breakers will eliminate this voltage from all of the circuits except the incoming leads on the breakers themselves. To isolate this voltage, the facility breakers feeding the motor control panels will have to be turned off, locked out and tagged out.

Some units are equipped with tank heaters on the hydraulic tank. Disconnect these to eliminate hazards from this source.

**Stored Hydraulic Pressure** – Residual pump pressure. When the power unit is turned off, for a few seconds after the motors stop turning there can be some pressure remaining in the system. Push pin (manually activate) an ejection cylinder or gate cylinder solenoid valve to relieve this pressure.

Gate cylinders - These cylinders have counterbalance valves that are designed to hold the pressure in the cylinders which prevents them from drifting down. For the gate cylinders; support the gate to minimize the pressure retained and then carefully crack a hose fitting between the cylinder and the counterbalance valve to bleed off any pressure.

If the platen is pressing against trash at the moment that the machine is turned off, the trash can push the platen and create pressure in either the ejection cylinders or the compaction cylinder. When the HPU is stopped or turned off, the pilot pressure drops to zero immediately and the retained pressure in the cylinder will be relieved. It is possible for the platen to move for many minutes as the trash relaxes and pushes the platen back. This hazard can be eliminated by positioning the platen away from any trash or waiting 30 minutes to allow the platen to stabilize.

**Falling Debris** – When working inside the load chute, ensure the material on the tipping floor is stabilized.

In addition to locking out all energy sources, the following warnings must also be observed.

**⚠ WARNING**

**Falling Material Hazard.**

**Un-Compacted material on the tipping floor can fall through the hopper in to the chamber below.**

**Remove un-Compacted material prior to working in the chamber.**

**⚠ WARNING**

**Moving Machinery Hazard.**

**Un-Compacted material falling on an inclined conveyer belt can cause the conveyor belt to move unexpectedly even though the power is disconnected.**

**Remove un-Compacted material prior to performing maintenance and/or service.**

**⚠ WARNING**

**Moving Machinery Hazard.**

**Servicing hydraulic cylinder related components with hydraulic pressure present in the cylinders after machine shutdown can result in unexpected machine motion.**

**Manually support loads suspended by cylinders prior to servicing the equipment.**

**Crack a hose fitting to bleed off any pressure prior to servicing the cylinder hydraulics.**

**⚠ WARNING**

**Burn Hazard.**

**Hydraulic fluid and gearbox lubricants can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.**

**Allow fluids and lubricants and associated parts to cool before servicing.**

### Returning To Operation

Once everyone is safely out of the machine and has removed their locks, turn on the main disconnect switch(s) and re-start the unit.





**SECTION 4 CONTENTS  
PREVENTATIVE MAINTENANCE**

**SECTION**

4.0

**PAGE**

1

<b>CONTENTS</b>	4.0
<b>MAINTENANCE PROGRAM</b>	4.1
<b>LOCKING OUT THE COMPACTOR</b>	4.2
<b>DAILY INSPECTION</b>	4.3
<b>MAINTENANCE WEEKLY</b>	4.4
<b>MAINTENANCE INITIAL 150 HOURS</b>	4.5
<b>MAINTENANCE EVERY 750 HOURS</b>	4.6
<b>MAINTENANCE EVERY 3000 HOURS</b>	4.7
<b>CYLINDER MAINTENANCE</b>	4.8
<b>PUMP DRIVE COUPLING</b>	<b>4.9</b>
<b>PREVENTATIVE MAINTENANCE RECORD</b>	4.10
<b>MAINTENANCE SCHEDULE WITH SERVICE INTERVALS</b>	4.11



## MAINTENANCE

### GENERAL

The best maintenance program must start with the customer being familiar with the equipment and its operation. A quick walk around; inspecting moving parts, possible hose chaffing, bearing thickness, hydraulic leaks, etc. can minimize operational down time by addressing the compactor readiness for normal operation.

The best maintenance program must start with the proper operation of the compactor. Any equipment must be operated within the limits of the design of the machine. Operational abuse or misuse can and will be the major contributor to increased maintenance and down time. Please refer to the operational section below to help assist the operators of the machine to comply with certain parameters of compactor operation.

The platen and carriage bearing systems are designed with the best materials available to ensure long life without the necessity of constant lubrication. The bearing material is designed to be the sacrificial element for the bearing - wear strip combination. These bearings and the adjustment mechanisms are also designed for the easiest adjustability in the field to ensure the user to keep the system in proper adjustment.

On all hydraulically operated equipment one of the most important fundamentals is to keep the hydraulic oil clean. This insures long life of both the hydraulic pumps and the hydraulic cylinders. The Hydraulic Power Unit includes nine (9) filters--four (4) on the individual pressure sections of the main pumps, four (4) return lines from the compactor, and one (1) kidney filter from the heat exchanger circuit. All of these filters should be kept in the green on their mechanical indicators in order to ensure long life of all the hydraulic components in the system.

***NOTE: Oil samples are required to maintain the cylinder warranty and the warranties of the hydraulic components. SSI requests copies of oil samples for our records.***

Controlling debris both inside and around the compactor is one of the most effective means of improving compactor reliability. Trash can foul limit switches, reduce cooling capacity, clog filters and damage cylinder seals. SSI recommends washing down the compactor quarterly to visually inspect all parts of the machine for damage and cracked welds. Be sure to shut off all power before washing or inspecting the compactor.

A Maintenance Schedule is included in this manual. Also included are daily and weekly check sheets, which can be used as a guide to help perform effective preventive maintenance.

### Tools Required

This list is a partial list of tools that will be required to maintain and service the SSI compactor. These tools should be on hand at the time that the compactor is commissioned.

- 3/4" drive socket set, sockets to 1 1/2" and 2 1/4".
- 1/2" drive hex socket set 5/16" to 1".
- 5/8" and 7/8" Allen wrenches.
- Combination wrench set 5/16" to 1 1/4".
- 18" adjustable wrench.
- 5-ton Porta-power or hydraulic jack.
- Additional small hand tools such as screwdrivers, Allen wrenches, hammers, flashlights and pliers will be required.

Some jobs will require special tools such as a porta-power, come-along or a jack. These can usually be rented locally, but availability should be checked prior to beginning the job.

## LUBRICATION

### Electric motor bearings

The motor is equipped with double-shield ball bearings, having sufficient grease to last indefinitely under normal conditions. Under dirty, wet or corrosive atmospheres, it is advisable to add one-quarter ounce of grease per bearing every 150 hours. Use high quality ball bearing grease with a consistency that is suitable for the class of insulation stamped on the nameplate.

No lubrication is required before start-up, as adequate lubrication has been provided at the factory.

### Hydraulic Oil

Acceptable Hydraulic Oil: ISO 46. The hydraulic reservoir oil capacity is listed with the unit specifications. It is essential that this fluid be kept clean and free of contamination at all times. **SSI requires that samples be taken ever 750 hour of operation during the warranty period to maintain the warranty on the Cylinders and Hydraulic components.** Oil samples can be taken from the oil sample port.



To take a sample you will need a sample kit bottle and something to catch oil in when flushing. Wipe away any dirt or debris that may be on the sample port. Open the port and let the oil flow out into a catch pan, then put the sample bottle in to the flow and fill it up. Immediately close the test port and place top on oil sample bottle. Fill out the label that comes with the sample bottle. Make sure under equipment ID you put the serial number of the compactor that the sample came out of, and that you fill in all the information requested on the label. Affix label and mail to the test lab. You should have results in one to two weeks. **If you are using a testing lab of yours, please fax SSI a copy of the lab results for our records**

The importance of clean oil cannot be stress enough. Dirty oil can lead to early failure of expensive components do to the lapping compound effect that the dirty oil has on moving parts. Proper oil maintenance will prolong the life of your equipment and prevent system downtime and allows you to avoid costly repairs.

**NOTE:** Do not allow the HPU reservoir to become covered with dust or debris, as this acts as insulation and can cause hot oil shut downs by reducing the ability of the reservoir dissipate heat.

## MECHANICAL ADJUSTMENTS

### Cylinder Alignment

#### CRAM Alignment

The alignment of the cylinders can be effected by wear of the brass bearings on both the platen and the carriage. If the platen and the carriage position in the chamber are not properly maintained, the weight of the platen or carriage can bear down on the cylinder rods, accelerating the wear of the internal components and leading to a catastrophic cylinder failure.

The Platen CRAM cylinder alignment should be checked on a weekly basis. Extending the CRAM out to a distance of 2 feet, 6 feet and again at 10 feet, checking the connection point on the platen, does this. The rod should not be tight to the coupling, or more then  $\frac{1}{4}$ " inch off center.



Also make the following measurement checks:

- Measure the height from the floor to the rod at all three distances



- Measure the distance from the wall to the rod, to make sure it is running parallel.





If the bearings on the platen have worn and have not been adjusted the rod will be high in the coupling. If the coupling is in contact with the rod it will put undue pressure on the rod which will over load the head gland seals and wear components. This will accelerate the wear of these components. The platen knife clearance should be checked and adjustments made, then the alignment should be rechecked at the connection point.

- Measure the height from the floor to the rods at all three distances
- Measure the distance from the wall to the rods. (Make sure the carriage is centered in the chamber.)
- Measure the distance between the rods at all three points.
- Measure the collar alignment in four places to ensure it is centered.

Once all the measurements have been made and they are correct, the compactor is ready to operate.

The SSI compactor uses brass alloy slide bearings to position the platen and carriage in the compaction chamber. They are to be adjusted so that the moving parts stay aligned but are free to move with the cylinders. The brass will wear with time, requiring the wedge assemblies that hold the bearings to be adjusted to compensate. The following procedures should be used to adjust all bearings.

### **Adjusting Knives and Platen Bearings**

The following procedure should be used for checking clearance and adjusting knives and platen bearings.

1. Place the controller in maintenance mode.
2. Raise the gate to its open position.
3. Use the Joystick to position the knives together. Extend platen forward until a portion of the leading edge of the platen knife has passed the leading edge of the chamber knife.
4. Turn off and lock out all electrical power to the compactor.
5. Check the clearance between the platen knife and chamber knife. There should be approximately 1/16" clearance to assure good shearing action. If there is more than 3/16" clearance or if the knives are in contact, adjustment is required.

*The platen wedge bearings adjust the platen location up and down in the compaction chamber and hence control the knife clearance. This is also the adjustment for the platen base bearing wear.*

To adjust the platen knife base wedges, follow the procedure below.

1. Place a jack or porta-power under the platen to take the load off of the wedges to make moving them easier.
2. Adjust the wedges using the jackscrews until the proper knife clearance has been reached (1/16" gap).
3. Tighten all of the bolts holding the wedges and remove the jack.

### **Carriage Bearing Adjustment**

The following procedure should be used for checking clearance and adjusting the carriage bearings.

1. Place the controller in maintenance mode.



2. Raise the gate to its full open position
3. Using the Joystick to position the knives together. Extend platen forward until a portion of the leading edge of the platen knife has passed the leading edge of the chamber knife.
4. Turn off and lock out all electrical power to the compactor.
5. Measure the clearance between the top rear of the platen and the top of the chamber.
6. Adjust the bottom carriage bearings.
  - a) Loosen the push bolt jam nuts.
  - b) Adjust the push bolts until the top plate of the carriage is the same distance from the top of the chamber as the platen top plate. Check all four corners.
  - c) Tighten the jam nuts.
7. Adjust the side bearings
  - a. The side bearings should have approximately 1/4-inch clearance to the sides of the chamber. If more than 3/8 inch is observed, loosen the four securing bolts and adjust the pusher bolts until proper clearance is obtained. Re-tighten the securing bolts once you are finished.

**NOTE:** *The carriage and lid scraper should be adjusted whenever platen adjustments are made*

### **Adjusting lid scraper**

The following procedure should be used for checking clearance and adjusting the lid scraper.

1. Place the controller in maintenance mode.
2. Raise the gate to its full open position
3. Using the Joystick to position the knives together. Extend platen forward until a portion of the leading edge of the platen knife has passed the leading edge of the chamber knife.
4. Locate the lid scraper at the rear of the chute, loosened the bracket bolts, and let it drop to lid. Re-tighten the bolts. Test by manually stroking the cylinder full stroke and back via joystick.

## **REPLACING WEAR ITEMS**

### **Replacing the platen bearings**

1. Place the controller in maintenance mode.
2. Raise the gate to the open position.
3. Extend the platen fully out the front of the compactor.
4. Turn off and lock out all electrical power to the compactor.
5. Place a jack under the platen to lift one wedge free of the floor.



6. Working with only one wedge at a time, remove the 8 Bolts that hold the platen-bearing carrier to the base wedges.
7. Slide the carrier and the base bearing out of the compactor.
8. Remove the bolts that hold the bearing and replace the bearing.
9. Installation is the reverse of disassembly. Adjust the base wedges and the knife clearance per instructions given above.

### **Replacing the Carriage Bearings**

- a. Position the compactor as needed for access using maintenance mode on the operator control panel.
- b. Turn off and lock out all electrical power to the compactor.
- c. Replace the bearing as follows:
  - a. Block the carriage to prevent it from dropping.
  - b. Remove the four bolts from the push plate and pull the bearing holder assembly from the side of the carriage tube.
  - c. Remove the four bolts that hold the bearing to the holder and replace the bearings.
  - d. Installation is the reverse of disassembly. Adjust the bearings as described above.

### **Scraper Replacement**

1. Place the controller in maintenance mode.
2. Using the main cylinders, move the platen forward approximately 9 feet.
3. Turn off and lock out all electrical power to the compactor.
4. Using carriage lid as working platform, remove the worn scraper by removing the bolts holding the scraper bracket in place after that remove the nuts that hold the rubber pc to bracket.
5. Installation is the reverse of disassembly.

### **Knife Replacement**

The chamber and platen knives are hardened 4140 steel which should provide years of service. When they become too dull to effectively shear material they can be rotated to use the other side of the knife. Limited repairs of nick and dents can be done with the knives installed but extensive welding could cause the knives to warp, thereby ruining them.

#### **Replacing the chamber knife**

The chamber knife is symmetrical so that it has two cutting edges. In most cases the knife can be turned over to expose the second cutting edge.



**NOTE:** Replacing the chamber knife requires a lifting device capable of supporting 700 pounds at a height of 7 feet or welding temporary supports to the platen face.

1. Place the controller in maintenance mode.
2. Fully retract the platen.
3. Raise the gate to its full open position.
4. Shut off and lock out all electrical power to the compactor.
5. Move the lifting device into place to support the knife.
6. Remove all 13 bolts holding the knife.
7. Lower the knife a minimum of 3 inches with the lifting device and remove it from the machine either through the load chute or the discharge end.
8. Installation is the reverse of disassembly

#### **Replacing the platen knife**

1. Fully extent the platen.
2. Shut off and lock out all electrical power to the compactor.
3. Remove all 16 bolts holding the knife to the platen.
4. Remove the knife with a lift truck or crane.
5. Installation is the reverse of disassembly.

#### **Replacing The Gate Wear Strips**

There are two replaceable items in the gate area. The first is the wear strips on each side of the gate proper. The second is a set of three wear strips built into the chamber sidewalls that the gate rides in.

Unbolting them and installing new or rebuilt plates can easily replace gate wear strips. Ordinarily only the chamber wear strips closest to the truck will require replacement since they receive most of the wear.

Be certain to turn off and lock out all electrical power to the compactor before beginning the job.

## **ELECTRICAL SYSTEM**

### **General**

The electrical drawings provided show the "Power Circuit" and the "Control Circuit". The power circuit drawing shows the 480 Volt wiring that includes the motors and control power transformer. The "Control Circuit" is shown on one or more sheets and covers all of the operator interfaces (push buttons and lights) as well as the programmable controller and the scale circuitry. The control circuit is 120 Volt and is powered from a control transformer located in the motor starter panel.

### **Programmable Controller**

The programmable logic controller (PLC) controls the operation of the compactor.



The program should not be changed for any reason without consulting SSI Shredding Systems.

PLC user manuals are available from the factory. If there are any questions, please contact SSI. The program is contained on RAM chips. If power is lost to the PLC, a battery will maintain the program. PLC Batteries last for approximately one year. **It is recommended that an EEPROM chip be purchased to provide a permanent memory of the system's program.**

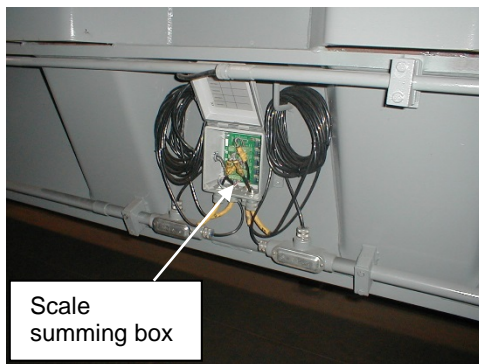
## Scale System

The Compactor uses a Hardy Scale System consisting of quantity four (4) 100,000 pound load cells and a scale module. The scale module is located in the control panel, in the PLC rack. The load cells are all wired to a summing box and from there the signal goes to the scale module which converts, calibrates, and transfers the weight data from the load cells to the programmable controller.

To maintain warranty on the scale system, authorized technicians must perform service. Contact SSI for assistance in locating authorized technicians.

Refer to: Calibrating the Scale System on page 12 of this manual for proper scale calibration.

***Never cut load cell cables as they are calibrated to the load cell.***



## Distance measuring devise (DME)

The compactor uses a laser optic device for the purpose of measuring the movement of the compactor platen during operation of the compactor. The DME operates in a retro reflective mode. Receiving a reflection from a reflective sheet attached to the rear of the platen. This reflective sheet at times becomes covered with dust and will need to be cleaned with a soft damp cloth. A dirty reflective sheet will cause laser faults. The DME provides 1mm resolution from 100mm to 130m (4in. to 426ft.).



**WARNING: LASER LIGHT.** Do not look directly at the light source. Laser light can cause eye injury after prolonged exposure.

**NOTE:** Rodents maybe attracted to the laser light pulses and may cause nuisance faults and have severe vision damage.

## Proximity Switch adjustment

---

There are two proximity switches that indicate that the ERAM's are fully retracted, these may need to be adjusted from time to time. This adjustment needs to take place when the ERAM's are fully retracted. The gap should be 1/8" from the end of the proximity switch to the trigger mechanism. The proximity switches are mounted on a slider plate, simply loosen the bolts and adjust the proximity switches then tighten them back down again.

## HYDRAULIC SYSTEM

### General

An open-loop hydraulic circuit is used. The electric motors drive hydraulic pumps that provide oil to the cylinders. From the cylinders, the oil returns to the hydraulic reservoir. Solenoid valves that are energized by the programmable controller control the oil flow. The hydraulics are designed to allow all of the pump sections to provide oil to the compaction cylinder to minimize machine cycle time. The compaction cylinder also "regenerates" oil to increase ram speed when limited force is required.

As with all hydraulic systems, cleanliness is critical to maximizing the compactor and hydraulic power unit component life. **It is very important to change all filter elements, seals and wipers according to the maintenance schedule.** This is **required** to maintain the warranty of the cylinders. All filters are provided with visual indicators to show when the filter is restricted. The filter elements may require more frequent replacement based on a regular inspection of these indicators.

**NOTE:** *There are high pressure filters and return line filter elements. There are also air filters on the hydraulic tank. Cleanliness is critical to maximize compactor performance and component life. Change filter elements as recommended.*

To provide early warning of component failure a hydraulic oil-sampling program is recommended. At each filter change a sample of the hydraulic fluid should be taken and analyzed for metallic content and contamination. Most oil suppliers have oil analysis programs and should be able to assist you in setting up the hardware required for sampling. SSI provides oil sample kits during the warranty period. An interpretation of the analysis can provide excellent warning of component wear and possible failures. **During the warranty period for the cylinders, this sampling is required to keep the warranty active.** During the warranty period a copy of the oil sample report must be sent to SSI. Please contact SSI Compaction Systems if you need additional information.

The Hydraulic Power Unit (HPU) is equipped with several protective shutdowns that are displayed on the operator control panel. All of these shutdowns are for conditions that will result in immediate machine damage if left uncorrected.

Refer to the hydraulics schematic and the HPU parts list to identify components.

### Bleeding off Hydraulic Pressure



**WARNING Residual** hydraulic pressure can cause serious injury. Remove all hydraulic pressures before making repairs to the hydraulic system or hydraulically actuated machine components.

Even after the motors have been shut down there can be considerable pressure remaining in the pilot circuit and the cylinders. To reduce residual pressure prior to working on hydraulic components, follow this procedure.

1. Lower gate or raise and secure it open.
2. Retract platen to relieve pressure against material.
3. Stop the motor, shut off, and lock out electric power to the compactor.
4. Manually stroke the pilot valves for the gate and for the poppet controls for the main compaction cylinder until all pressure is drained in the pilot circuit.

	<b>MAINTENANCE PROGRAM</b>	SECTION 4.1	PAGE 10
---	----------------------------	----------------	------------

## Hydraulic Adjustments

These adjustments have been set at the factory and should not be changed arbitrarily. Before any readjustments are attempted, please consult SSI Compaction Systems.

## MACHINE LOCK-OUT

- Always lock-out the machine when entering the chamber.
- Always lock out and tag out the machine before opening and entering the cylinder area.
- Always lock-out and tag-out all power to panels and electric components before servicing.

**This is very important!** It is possible to be in the chamber and out of sight of the control panel. Locking the unit out is the only way to prevent someone from starting the machine while you are inside it!

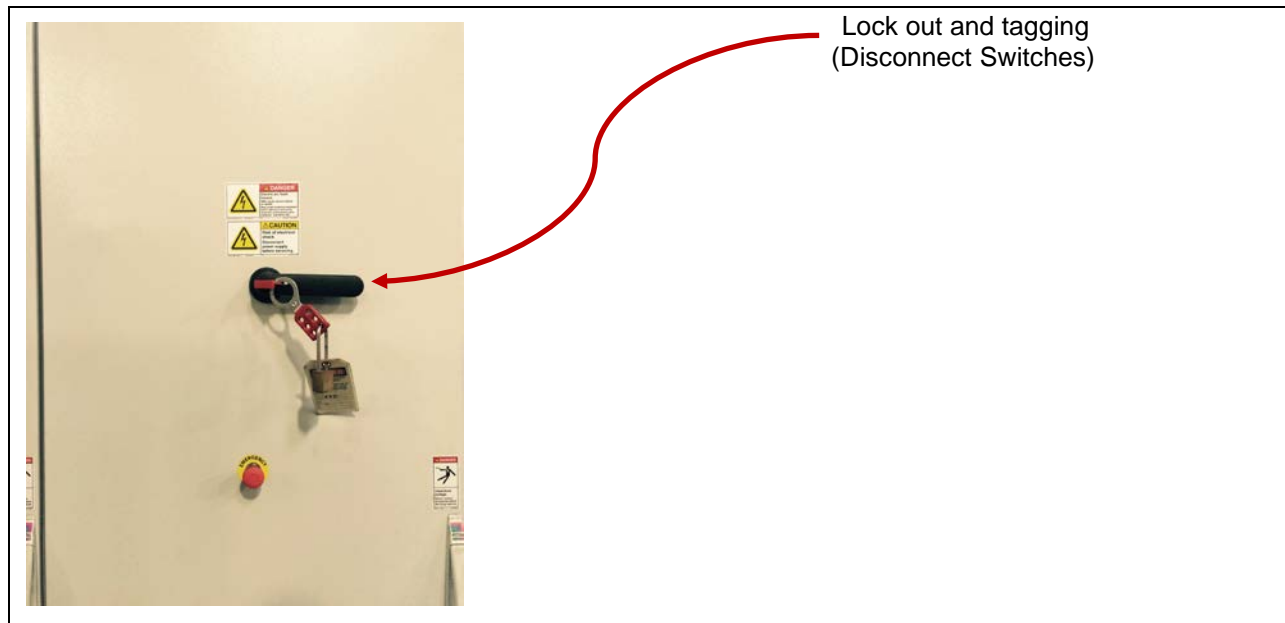


**Unexpected machine startup can result in death or severe personal injury.**

To ensure safety when servicing or inspecting the compactor all sources of energy **must be switched off, locked out and tagged** at the source, before work or inspection is started.

Switch off the main breaker located on the right side of the motor starter panel. (If the unit has more than one breaker, all of them must be switched off, locked out and tagged.) Press the HPU start button prior to working on the machine to ensure that the unit is fully locked out. Anyone who will be involved in the service or maintenance of the compactor must place their own lock on the disconnect switch.

Locking out and tagging should be done in accordance with plant rules or OSHA approved procedures. After the power has been locked out, it is recommended that an attempt be made to start the machine using the diesel start button on the control panel. This step confirms that the unit has been correctly locked out.





## POSSIBLE SOURCES OF ENERGY

All possible sources of energy must be identified and locked out prior to working on the equipment. The following is a list of common sources of energy. It is possible that other sources of energy exist that are not identified here.

### Electrical Energy

#### Control Voltage

The voltage on the control circuit is typically 24 VDC, but could be higher. Normally, locking out the main disconnect switch isolates this voltage from any control wiring. In some situations, the control voltage can be fed from external circuits and will have to be locked out at its source. In some case control power from other equipment will be present in the SSI supplied panel. Lock out all of the sources of electrical energy before working on the electrical system.

#### Main Power

The main incoming power will be significantly higher than the control voltage and present a lethal shock hazard. In most cases, locking out the main breakers on the SSI supplied panels will eliminate this voltage from all of the circuits except the incoming leads to the breakers themselves. In other cases, the power will have to be locked out at facility breakers feeding the equipment. Carefully determine power sources and lock out all of them prior to working on the equipment.

On units equipped with diesel engines there are electrical heaters in the hydraulic tank and engine block that are powered from outside sources. Disconnect (unplug) these to eliminate hazards from this source.

On units equipped with conveyors: lockout any conveyors feeding the conveyor.

### Potential Energy (Gravity)

The discharge gate itself is a source of potential energy. Lower the discharge gate fully or block it up in the raised position prior to working around or under it.

**Falling material is a source of potential energy.** Make sure that material hanging in or around the hopper or conveyors has been secured prior to working under it. Ensure the material on the tipping floor is stabilized prior to working under the chute area.

### Hydraulic Energy

**Stored Hydraulic Pressure** – Residual pump pressure. When the power unit is turned off, for a few seconds after the motors stop turning there can be some pressure remaining in the system. Push pin (manually activate) all solenoid valves to relieve this pressure.

Gate cylinders have counterbalance valves that are designed to hold the pressure in the cylinders which prevents them from drifting down. For the gate cylinders; support the gate to minimize the pressure retained and then carefully crack a hose fitting between the cylinder and the counterbalance valve to bleed off any pressure.

If the platen is pressing against trash at the moment that the machine is turned off, the trash can push the platen and create pressure in the compaction cylinder. When the HPU is turned off, It is possible for the platen to move for many minutes as the trash relaxes and pushes the platen back. This hazard can be eliminated by positioning the platen away from any trash or waiting 30 minutes to allow the platen to stabilize.

### Thermal Energy

In addition to the above forms of energy, there are two sources of potentially dangerous temperatures: Hot fluids: Hydraulic fluid can reach temperatures capable of burning or scalding flesh.

Hot Surfaces: The surface temperatures of hydraulic components or HPU tank can reach temperatures capable of causing burns.

The only way to eliminate these hazards is to wait until the unit has cooled.

In addition to locking out all energy sources, the following warnings must also be observed.



**Crushing Hazard.**

**When the machine is in motion, moving parts will cause personal injury or death. Do not work on or enter any part of the compactor while it is in operation or has an electrical power supply connected.**

**Lock out and tag out electrical power source and clear stored energy.**



**Moving Parts Hazard.**

**Servicing hydraulic cylinder related components with stored energy present after machine shut-down can result in unexpected machine motion.**

**Manually support loads suspended by cylinders and clear stored energy prior to servicing equipment.**

**Press in Solenoids to bleed off any pressure prior to servicing the cylinder hydraulics. See picture illustration below for location of the solenoids.**



**Moving Machinery Hazard.**

**Servicing hydraulic cylinder related components with hydraulic pressure present in the cylinders after machine shutdown can result in unexpected machine motion.**

**Manually support loads suspended by cylinders prior to servicing the equipment.**

**Crack a hose fitting in addition to manually pressing solenoids to bleed off any pressure prior to servicing the cylinder hydraulics.**

 **WARNING**

**Falling Material Hazard.**

**Un-compacted material in the feed chamber opening can fall through the chamber to the chamber floor below.**

**Remove un-compacted material prior to working below the chamber opening.**

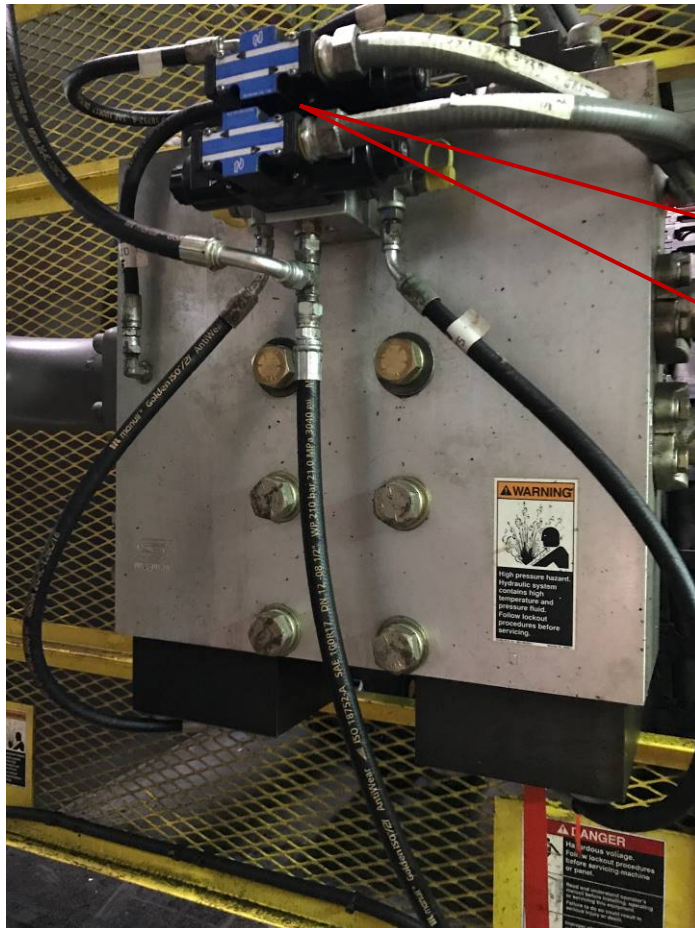
 **CAUTION**

**Burn Hazard.**

**Hydraulic fluid can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.**

**Allow fluids and lubricants and associated parts to cool before servicing.**

Locations of all the solenoids on the compactor.



This Cram manifold is located on the back of the main compaction cylinder, please manually pushpin all solenoids several times to eliminate stored hydraulic energy.





This Eram manifold is located on the side of the compactor, please manually pushpin all solenoids several times to eliminate stored hydraulic energy.



There are also several solenoid valves under the compactor floor closer to discharge gate area, please manually pushpin all solenoids several times to eliminate stored hydraulic energy.

## INSPECTION PRIOR TO START-UP

With the machine turned off, electrically locked out and tagged *Refer to Section 4.1, Locking Out the Compactor.*

### **WARNING**

Entering the hopper/cutting chamber without locking out the machine could result in severe personal injury or death.

1. Check that all safety guards and covers are in place.
2. Check for and remove any material that may have fallen behind the platen in the carriage area.
4. If your system is equipped with a discharge conveyor, check for and remove any material that may have become hung up on or wrapped around the head pulley, tail pulley, belt retention wheels, return rollers, or conveyor side plates.
5. Inspect the Hydraulic Power Unit for exposed hydraulic fluid, grease, or other flammables. Thoroughly remove and/or clean all such material from the HPU and surrounding area.

### **WARNING**

Shifting components can cause personal injury. Do not put fingers in bolt holes or between heavy parts.

## INSPECTION AFTER START-UP

Start the machine per the instructions in *Section 3.*

1. Without loading any material, perform a walk-around to ensure that all components are in the correct position and operating normally.
2. Ensure that the platen and carriage is traveling freely in the chamber.
3. If your system is equipped with a Discharge Conveyor, ensure that the belt appears to be running at normal speed and is tracking correctly.

**Ensure that the machine is not producing any unusual noises.**

Performed every week of operation  
weekly inspection includes the following along with Daily Inspection.  
(Severe applications or environments may require more frequent inspection and service.)

## INSPECTION PRIOR TO START-UP

With the machine turned off, electrically locked out and tagged *Refer to Section 4.2, Locking Out the Compactors.*



Entering the hopper/cutting chamber without locking out the machine, could result in severe personal injury or death.

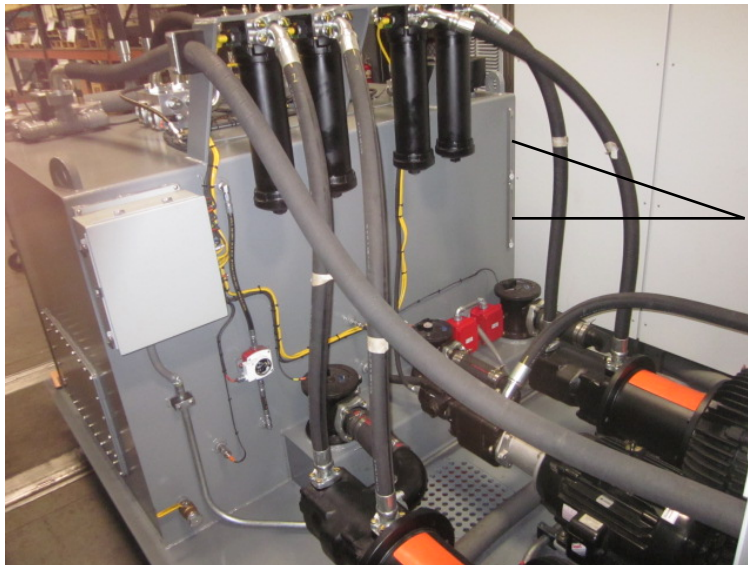


**Burn Hazard.**

Hydraulic fluid and gearbox lubricants can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.

**Allow fluids and lubricants and associated parts to cool before servicing.**

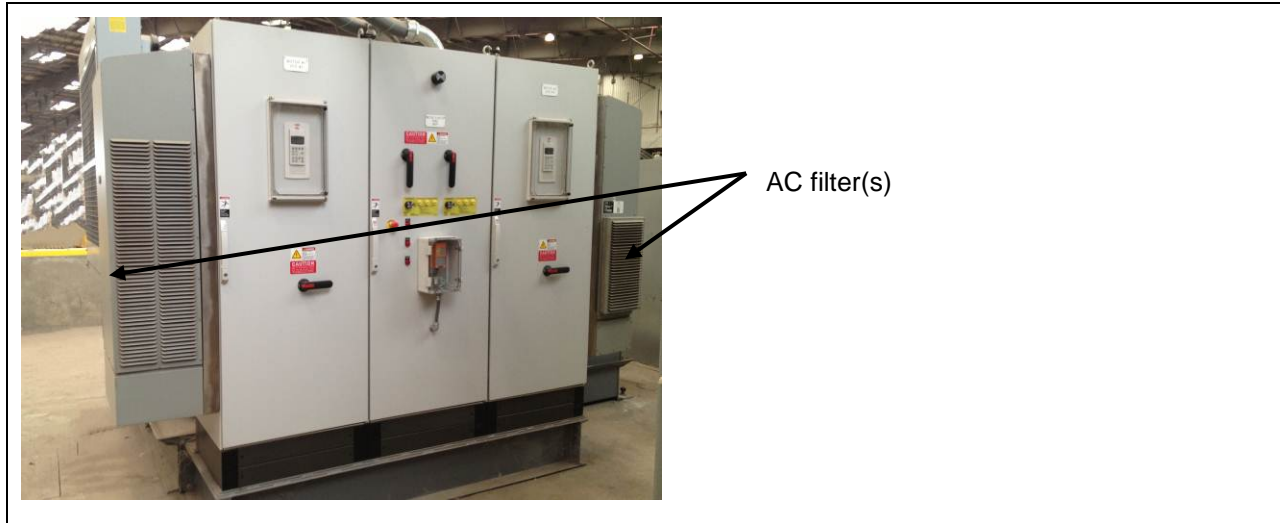
1. Check the hydraulic oil reservoir level. Refill with filtered oil, if required.



Oil Sight Glass

2. Check for loose hydraulic hoses and signs of leakage from all hydraulic components. Tighten as required. Ensure that hoses are not resting against sharp edges.

3. Check all wiring for loose connections or signs of wear
4. Check all bolts securing the hydraulic pumps, motors and manifolds for proper torque.
5. Inspect and clean heat exchanger.
6. Inspect and clean AC filters on the Starter Panels
7. Inspect and check torque setting on Cram and Eram hydraulic cylinders.



**INSPECTION AFTER STARTUP**

1. Start the machine, following the instructions in the Starting the Compactor section.
2. Allow the oil to warm up to normal operating temperature. Visually inspect hydraulic pressure filter and air filter indicators (if provided). Ensure that they are operating with the “green” band visible. If the “green” band is not visible, the filter will need to be replaced immediately

**Torque Spec’s for 16” and 11” cylinders**

Trunnion mounting super nuts ERAM	40/ft-lbs/ and c-ram 75/ft-lbs/
ERAM coupling	410/ft-lbs
ERAM compression ring bolts	108 in-lb
CRAM Coupling	680/ft-lbs
CRAM Head gland bolts	477/ft/lbs
CRAM compression ring bolts	34/ft/lbs

**Torque Spec’s for 14” and 10” cylinders**

Trunnion mounting super nuts ERAM	40/ft-lbs/ and c-ram 75/ft-lbs/
ERAM coupling	410/ft-lbs
ERAM compression ring bolts	108 in-lb
CRAM Coupling	680/ft-lbs
CRAM Head gland bolts	275/ft/lbs
CRAM compression ring bolts	34/ft/lbs

Performed Initial 150 hours of operation

150 hours inspection includes the following along with Daily Inspection and Inspection A.

## PRIOR TO INSPECTION

With the machine turned off, electrically locked out and tagged *Refer to Section 4.1, Locking Out the Compactor.*



**Moving Parts Hazard.**

**Servicing hydraulic cylinder related components with stored energy present after machine shut-down can result in unexpected machine motion.**

**Manually support loads suspended by cylinders and clear stored energy prior to servicing equipment.**

**Press in Solenoids to bleed off any pressure prior to servicing the cylinder hydraulics.**

- Replace all filter elements.
- General inspection of the system.

Performed every 750 hours of operation

750 hour inspection includes the following along with Daily Inspection and Weekly Inspection

## PRIOR TO INSPECTION

With the machine turned off, electrically locked out and tagged *Refer to Section 4.1, Locking Out the Compactor.*



**Entering the hopper/cutting chamber without locking out the machine could result in severe personal injury or death.**

1. With the machine turned off, electrically locked out and tagged (Refer to the Locking Out section):
2. Using a torque wrench, torque the Super Nuts, in an even cross bolt torque pattern, to 40 ft lb. on E-Ram Cylinders and 40 ft lb. on the C-Ram Cylinders.

### Tightening Sequence:

**STEP 1:** Spin the tensioner onto the main thread until it seats against the washer. You may want to back off the tensioner slightly as mentioned in Helpful Tip #3.

**STEP 2:** Tighten (4) jackbolts at 90° apart (12:00, 6:00, 9:00, and 3:00) on all studs with a partial torque (30 - 70%). This serves to seat the flange. If using an impact, use a reduced setting or lightly pulse the trigger at the full setting.

**STEP 3:** At 100% target torque, tighten the same (4) jackbolts on all studs.

**STEP 4:** At 100% target torque, tighten all jackbolts in a circular pattern. Do this for all studs (1 round only). See Helpful Tip #7 about using up to 120% torque.

**STEP 5:** Repeat "STEP 4" until all jackbolts are "stabilized" (less than 10° rotation). This usually requires 2-4 additional passes. If using air tools, switch to a torque wrench when socket rotation is small. Use the torque wrench to stabilize at the target torque

3. Check the tightness of all other threaded fasteners.
4. Unlock and start the machine per the instructions in the *Starting the Compactor* section, and allow it to run until it reaches its normal operating temperature. Turn the machine off and electrically lock out (Refer to the Locking Out section).

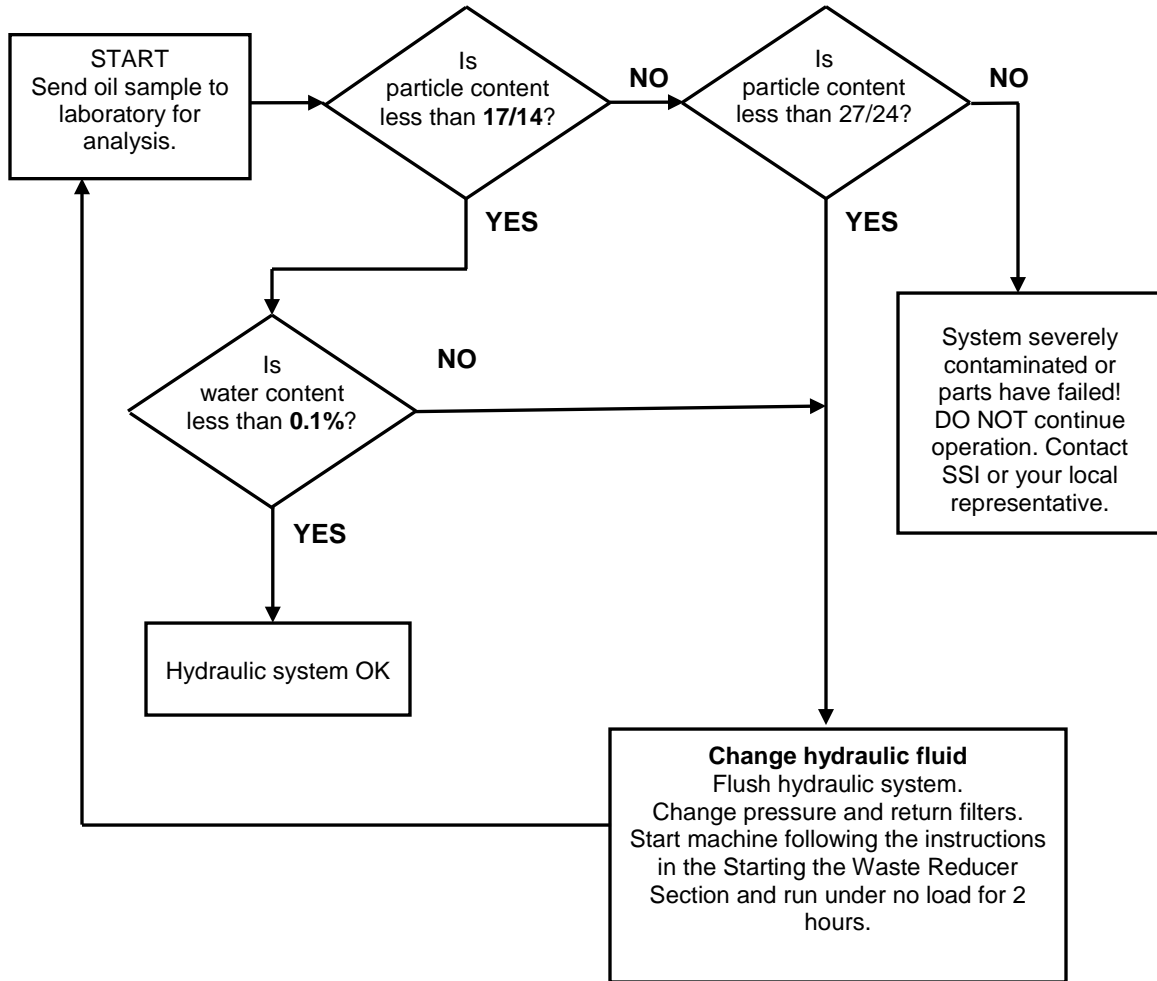


**Burn Hazard.**

**Hydraulic fluid can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.**

**Allow fluids and lubricants and associated parts to cool before servicing.**

5. In a clean oil sample bottle (part# 071028), obtain a sample from the any gauge port (Refer to locations of gauge ports in this section page 3, part number for hose kit is 079381, 003498 and 000590) and forward to a qualified laboratory for particle and water content analysis. Send a copy of the results to SSI Shredding Systems Inc. If particle content exceeds 17/14, in accordance with ISO 11171 (ISO 4406), or water content exceeds 0.1%, use the following chart to determine the appropriate corrective action:



**Replace all filter elements.**

**General inspection of the system.**

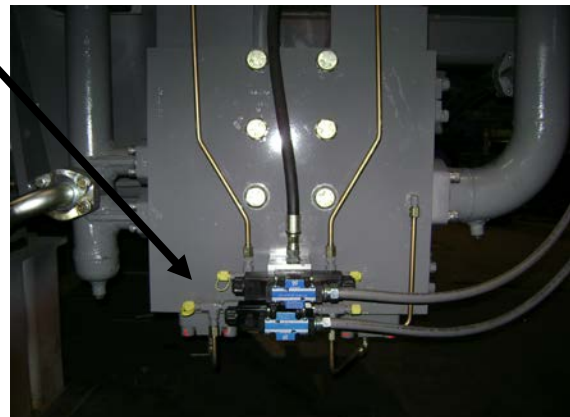
**Lubrication.**

1. Replace the pressure filters located on the HPU. Remove and clean the filter bowl. Replace the filter element and reinstall the bowl. (Refer to the Changing the Pressure Filters section 5.7 and the Parts Lists section 11.2 for the correct part number).
2. Replace the return filters located on the hydraulic reservoir. Remove each filter vertically from the reservoir. Replace the element and re-install the filter. (Refer to the Changing the Return Filters section 5.5 and the Parts Lists section 11.2 for the correct part number).
3. Replace the filter element on the tank filler breather (if provided) (Refer to the Parts Lists section 11.2 for the correct part number).
4. Inspect platen and carriage bearings.
5. Grease platen and carriage allthread adjustment bolts (pump 5 - 15 shots of recommended type grease into each fitting)
6. Grease all trunnion eyes, c-ram trunnion eyes, gate trunnion eyes and e-ram trunnion eyes if present. (pump 5 - 15 shots of recommended type grease into each fitting)

**Locations of gauge ports.**

**Using oil sample hose kit (can be purchased from SSI Shredding System part number is 079381, 003498 and 000590 makes up the hose kit) any gauge port can be used to obtain an oil sample.**

**Here are several locations at which locations the oil can be obtained compactor manifold and logic block.**





Performed every 3000 hours of operation  
3000 hour inspection includes the following along with Daily Inspection and Weekly Inspection.

## INSPECTION PRIOR TO START-UP

With the machine turned off, electrically locked out and tagged *Refer to Section 4.2, Locking Out the Compactor.*



**Moving Parts Hazard.**

**Servicing hydraulic cylinder related components with stored energy present after machine shut-down can result in unexpected machine motion.**

**Manually support loads suspended by cylinders and clear stored energy prior to servicing equipment.**

**Press in Solenoids to bleed off any pressure prior to servicing the cylinder hydraulics.**

1. Replace the pressure filters located on the HPU. Remove and clean the filter bowl. Replace the filter element and reinstall the bowl. (Refer to the *Changing the Pressure Filters* section 5.7 and the *Parts Lists* section 11.2 for the correct part number).
2. Replace the return filters located on the hydraulic reservoir. Remove each filter vertically from the reservoir. Replace the element and re-install the filter. (Refer to the *Changing the Return Filters* section 5.5 and the *Parts Lists* section for the correct part number).
3. Replace the filter element on the tank filler breather (Refer to the *Parts Lists* section 11.2 for the correct part number).
4. Inspect and replace suction strainer filter elements if required. (Refer to the *Changing the Pressure Filters* section 5.6 and the *Parts Lists* section 11.3 for the correct part number).
5. Replace the Hydraulic Oil.

Performed every 378 miles of operation  
378 miles inspection and rebuild includes the following along with Daily Inspection and Weekly Inspection.

## PRIOR TO CYLINDER MAINTENANCE

With the machine turned off, electrically locked out and tagged *Refer to Section 4.2, Locking Out the Compactor.*



**Moving Parts Hazard.**

**Servicing hydraulic cylinder related components with stored energy present after machine shut-down can result in unexpected machine motion.**

**Manually support loads suspended by cylinders and clear stored energy prior to servicing equipment.**

**Press in Solenoids to bleed off any pressure prior to servicing the cylinder hydraulics.**

Your cylinders are a very important as well as expensive part of your SSI compaction system. SSI makes every attempt to maintain a complete cylinder inventory, but in some cases we may not have your cylinder in stock. Cylinders are a long lead-time item, some up to twelve weeks. That is why SSI wants to be sure you do everything in your power to maintain the integrity of your cylinder.

Regular maintenance of your hydraulic system is a key component to long cylinder life. Regular filter changes (every 750 hours) and oil samples will keep your oil clean. Clean oil is one way of the easiest ways to maximize cylinder life. Oil sampling kits are readily available from SSI.

Routine inspections are also important for maintaining your cylinder. Keep an eye out for any nicks or abrasion that can cause premature seal damage. Ensure that debris behind the platen is kept to a minimum, as this can build up and damage the cylinder.

Do not increase pressures beyond manufacture's recommendations. Over pressurization can cause severe damage to the cylinder barrel as well as to the compactor. If you are experiencing loads "sticking" in the compactor, or require higher density loads, please contact SSI for advise before modifying any compactor pressures.

Your hydraulic cylinders are built with many internal seals and wear rings. The key word here is "wear!" After many miles of duty, internal wear rings and seals will need to be replaced under normal circumstances.

Vee Packings (or V-Packings) are multiple-lip (chevron) seals comprised of a group of endless rings and are popular for sealing rods. They can be used for low or high pressure applications and with single or double acting cylinders.

Installation: Properly installed Vee Packings will generally outperform other lip-type seals. They are always installed in sets. Each set contains a number of V-Rings (based upon the pressure) plus male and female adapters.

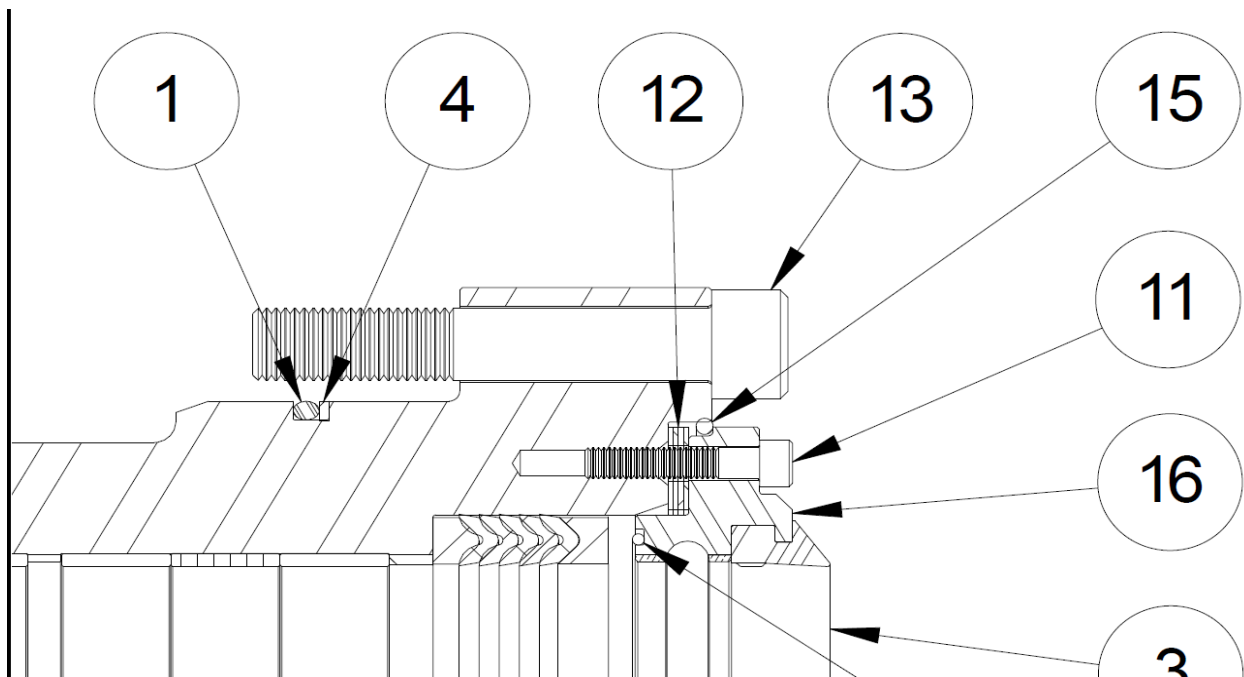
The V-Rings in each set are referred to as pressure rings. Refer to the table below to determine the number of V-Rings per set based on solid rings. This table applies to the majority of installations. There will be exceptions, depending upon special operating conditions, where the table guidelines do not apply.

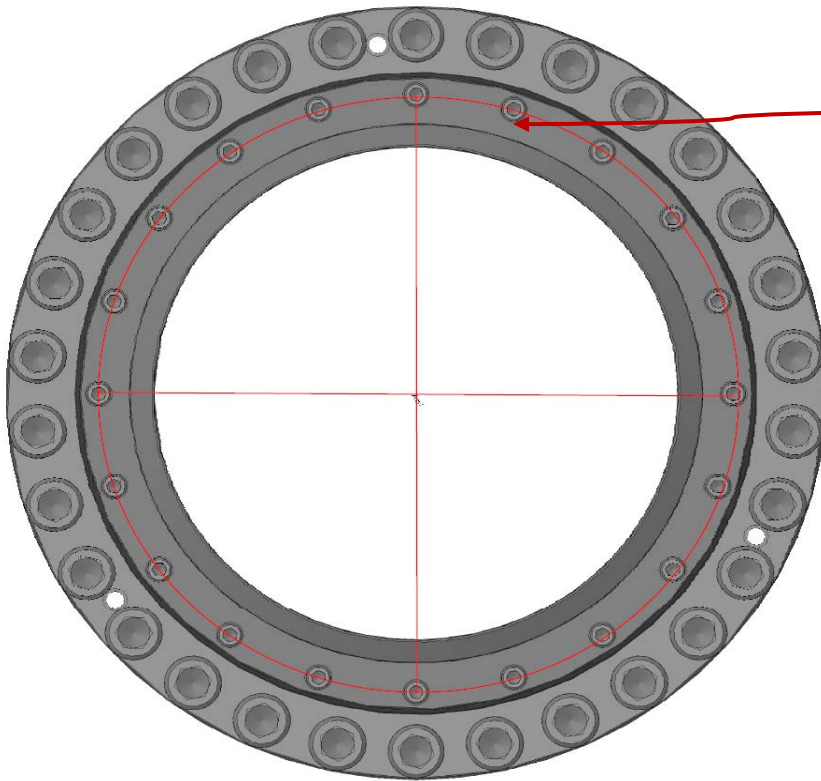
As v-rings wear the compression ring needs to be re-torqued, with each time set of shims (item 12 refer to illustration below) need to be removed to tighten the set. C-ram compression ring bolts (item 11 refer to illustration below) is torqued to 34 ft-lb. Note: after installation of new v-pack, one week's time the v-pack needs to be re-torqued without removing the shims.

SSI recommends replacing the internal components as follows for the warranty period:  
 CRAM components at 378 miles rod travel.  
 ERAM components at 378 miles rod travel.

This may need to be done sooner if the cylinder has not been maintained or operated properly. You may want to check your system and see where you are at in regards to these hours.

Please contact SSI if you wish to have us help to inspect your cylinders or change seals for you.



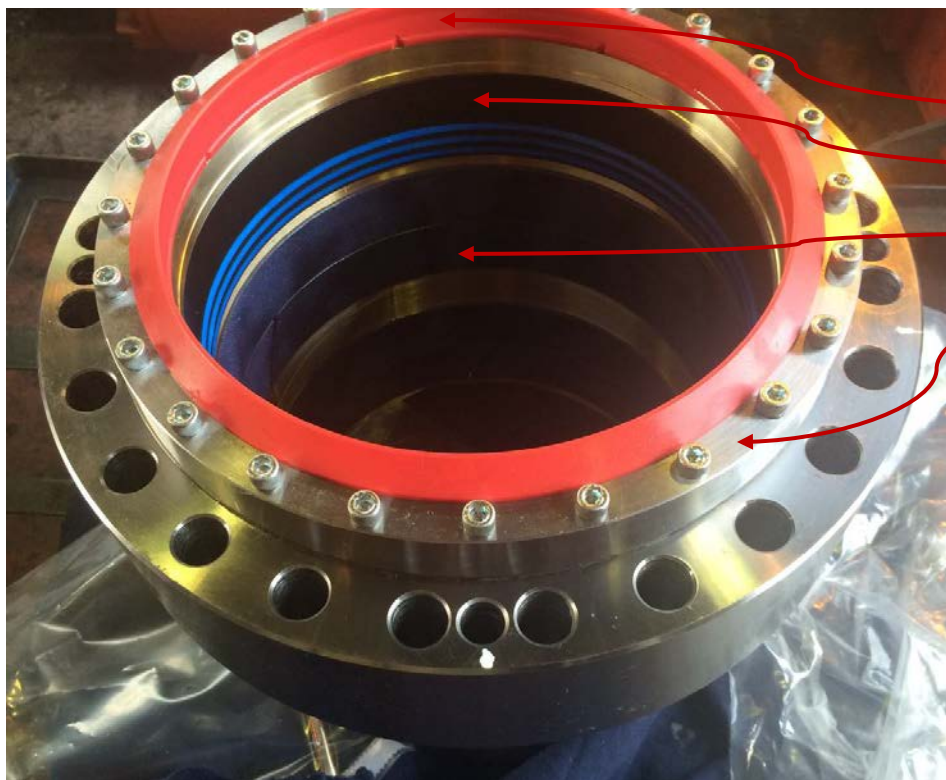


Start here with x pattern torque three bolts to 108 in-lb then follow all the way around three or four time torquing each one to 108 in-lb.

**NOTE:**

For 11" head gland  
Torque these bolts to 108 in-lb

For 16" head gland  
Torque these bolts to 34 ft-lb



Gland Wiper

V-pack set

Bearings (3)

Retainer ring

This is pre-assembled gland



This is pre-assembled gland, then slide the gland on rod and pull in using allthread, do not attempt to pry against rod to time gland for attaching bolts.

**This section covers all compactor models.**

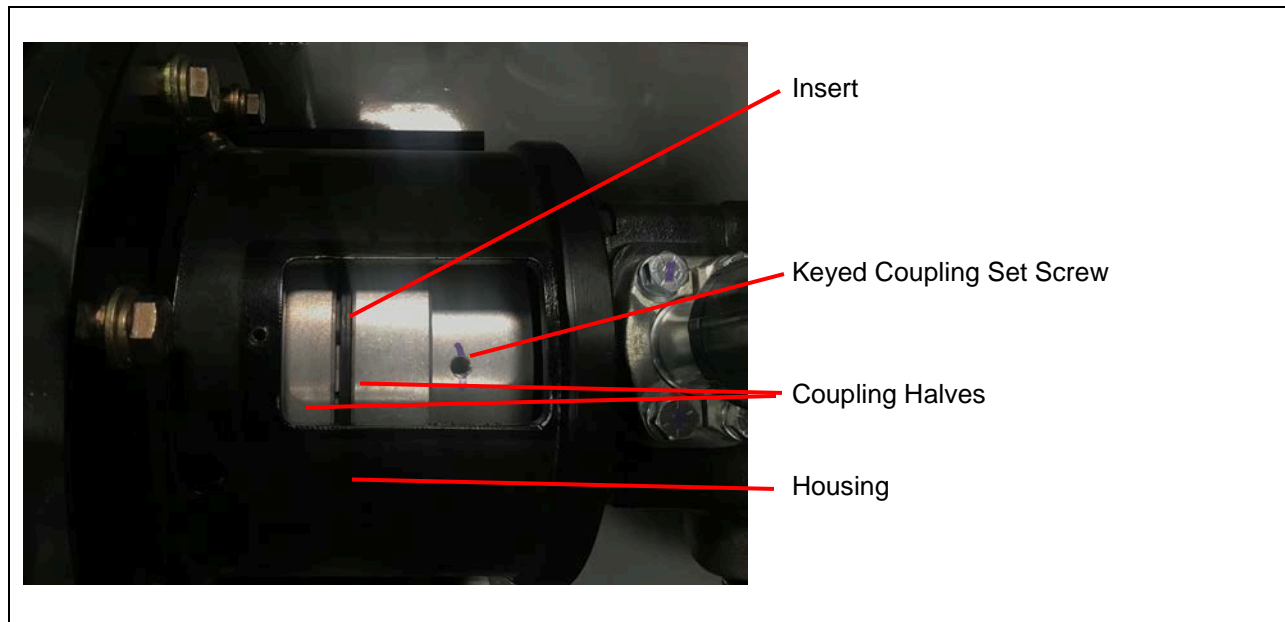
The coupling is located between the electric motor and the hydraulic pump. Coupling components can work loose, causing equipment damage. Refer to the manual section titled "Maintenance Schedule" for inspection intervals. Use the following steps to inspect each pump drive coupling in the system.

**⚠ WARNING**

**Working on the drive components without locking out the machine, could result in severe personal injury or death.**

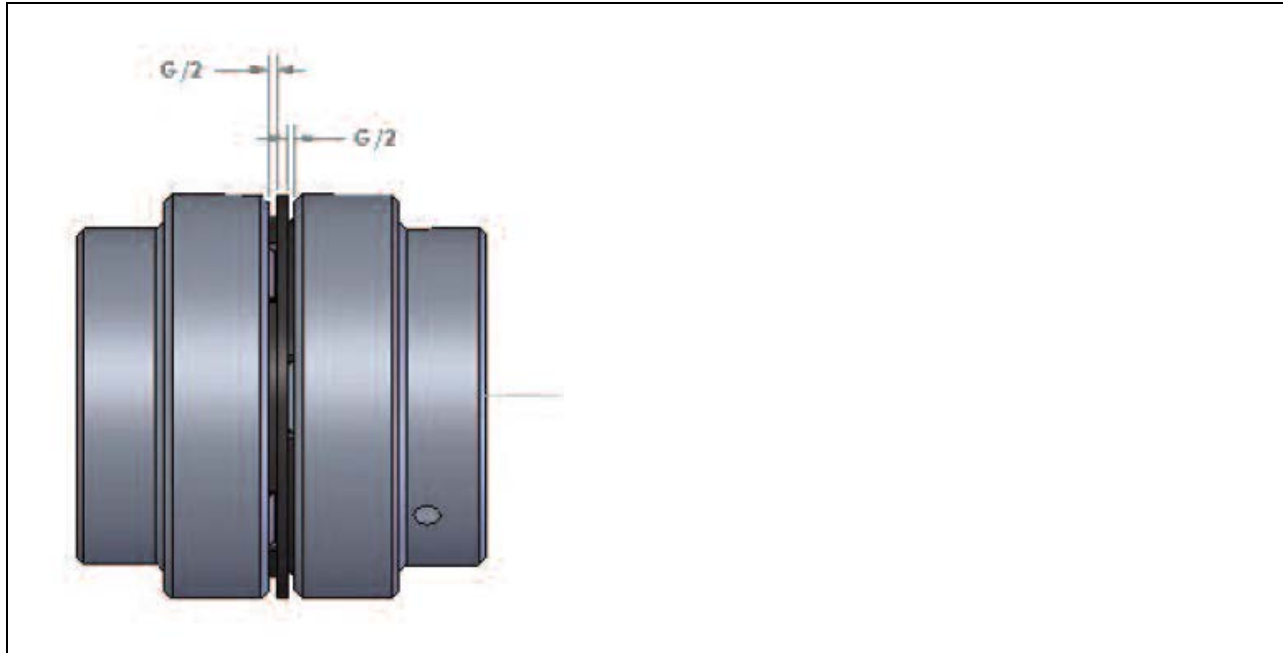
**With the machine turned off and electrically locked and tagged out (Refer Lockout Section 5.1 or 5.2)**

1. Remove the plastic cover on the steel housing between the motor and the pump.



Please note that there are several pump drive coupling assemblies on one HPU.

- Check to make sure that there is clearance (float) between the coupling halves. "G" which is the total clearance should be  $1/8"$  (3mm) and does not have to be uniformly split as shown.



- Find the coupling size engraved on the coupling body. This may require turning the coupling.
- Check the tightness of all set screws and clamp screws based on the following chart.

Coupling Size	Splined Coupling		Keyed Coupling	
	Clamp Bolt Torque	Clamp Bolt Torque	Set Screw Torque	Set Screw Torque
100	130-140 in. lbs.	14-16 Nm	60-70 in. lbs.	7-8 Nm
200	130-140 in. lbs.	14-16 Nm	130-140 in. lbs.	14-16 Nm
300	210-220 in. lbs.	24-26 Nm	130-140 in. lbs.	14-16 Nm
400	210-220 in. lbs.	24-26 Nm	190-200 in. lbs.	21-23 Nm
500	300-310 in. lbs.	34-35 Nm	190-200 in. lbs.	21-23 Nm
600	35-36 ft. lbs.	47-48 Nm	190-200 in. lbs.	21-23 Nm
700	35-36 ft. lbs.	47-48 Nm	300-310 in. lbs.	34-35 Nm
800	49-50 ft. lbs.	66-68 Nm	300-310 in. lbs.	34-35 Nm
900	100-110 ft. lbs.	135-150 Nm	100-110 ft. lbs.	135-150 Nm

- Replace the plastic cover on the steel housing.

**\*This page should be copied and reserved as the master.**

**Daily Preventive Maintenance Check list**

Date: \_\_\_\_\_ Hour meter Reading: \_\_\_\_\_

Performed by: \_\_\_\_\_

**With the machine turned off, electrically locked out and tagged Refer to Section 4.1, Locking out the Pre-Load Compactor.**

 <b>WARNING</b> Unexpected machine startup can result in death or severe personal injury.
---

**PERFORM DAILY**

	Initial
1. Inspect and clean Power unit	
2. Remove trash from motors, valves and oil cooler	
3. Check compactor for leaks, loose fittings and bolts, frayed wires, worn hoses and malfunctioning components	
4. Check oil level with cylinders fully retracted. Add oil if needed	
5. Remove trash from behind platen and carriage	
6. Check for trash on laser reflector, remove and clean with soft damp cloth	
7. Inspect hose track for damage, replace damaged sections	
8. Observe the operation of the compactor for unusual noises or vibrations	
9. Check load cell cables and make sure they are not getting stretched	
10. Check load cell motion retention bolts for 1/8" gap. Adjust if necessary.	
11. Check AC filter(S) on VFD Drives. Clean if necessary, use compressed air to clean.	

Comments:

---



---



---



---



**\*This page should be copied and reserved as the master.**

### Weekly Preventive Maintenance Check List

Date: \_\_\_\_\_ Hour meter Reading: \_\_\_\_\_

Performed by: \_\_\_\_\_

**With the machine turned off, electrically locked out and tagged Refer to Section 4.1, Locking out the Pre-Load Compactor.**

 <b>WARNING</b>
<b>Unexpected machine startup can result in death or severe personal injury.</b>

- A. Place compactor in Maintenance Mode. Start system and move platen to within about Five feet of knife. Raise gate and secure. Shut off and lock out power supply.

	Initial
1. Inspect platen knife and chamber knife for damage.	
2. Inspect knives for looseness, hold down bolts are tight	
3. Inspect side walls for damage	

- B. Start up system and move platen such that the platen knife over laps the chamber knife. Shut off and lock power supply.

1. Measure knife gap, should be 1/16" or less, adjust as required	
2. Inspect the carriage height and adjust if required	
3. Inspect platen bottom face to floor distance, if larger then ¼" weld on a shim	
4. Inspect carriage side bearings, adjust if required	
5. Inspect gate wear bearings, replace if excessive wear is noted	



## PREVENTATIVE MAINTENANCE RECORD

SECTION

PAGE

4.8

3

C. Start up system and extend the platen fully. Shut off and lock out power.

1. Inspect and record platen wear bearing thickness RF      RR      LF      LR	
2. Inspect platen for damage	
3. Inspect and record carriage bearing thickness	
4. Inspect the cylinders for any nicks or abrasions on the surface of the rod a. Compaction cylinder b. Ejection cylinders c. Gate cylinders	
5. Inspect the trunnion for loose fitting trunnion pins and bolts	
6. Inspect the ERAM and CRAM cylinder trunnion super nuts for 40/ft-lbs torque.	
7. Inspect the ERAM rod end coupling for damage and bolts for 410/ft-lbs torque	
8. Inspect the CRAM rod end coupling for damage and bolts for 680/ft-lbs torque	
9. Inspect hose track for wear and for damage	
10. Inspect the platen and the carriage for cracks and cracked welds	

D. Start system, close gate and return platen to home position, with HPU running check the following:

1. Inspect filter condition indicators, replace any in the red	
2. Check oil level	
3. Check and record pilot pressure	
4. Check and clean oil heat exchanger	
5. Inspect all hoses, piping, fittings and valves for leaks and loose bolts	





**MAINTENANCE SCHEDULE**

DESCRIPTION	Manufacturer web site	DAILY Refer to section 4.2	WEEKLY Refer to section 4.3	INITIAL 150 HOURS Refer to section 4.4	EVERY 750 HOURS Refer to section 4.5	EVERY 3000 HOURS Refer to section 4.6
Daily inspection		X				
Weekly inspection see section 4.3			X			
Replace pressure filter elements, four required for each service	<a href="http://www.parker.com">www.parker.com</a> see section 11.2					
Replace return filter elements, four required for each service Replace circulate filter elements, two required for each service	<a href="http://www.mpfitriusa.com">www.mpfitriusa.com</a> see section 11.2			X**	X	X
Replace Hydraulic Oil with ISO grade 46 with antiwear additives <i>Chevron Hydraulic Oil AW 46*</i>	<a href="http://www.carsonoil.com">www.carsonoil.com</a>					X 1,200galons required
Take Hydraulic Oil Sample one oils sample kit is required	<a href="http://www.noria.com">www.noria.com</a> see section 11.2			X***	X***	X***
Inspect Suction Strainers replace filter elements if required Two required for main pumps and one for circulate/pilot pump	<a href="http://www.mpfitriusa.com">www.mpfitriusa.com</a> see section 11.3					X
Hose/Pipe Inspection			X			
Lubricating Electric Motors Bearings	<a href="http://www.globalindustrial.com">www.globalindustrial.com</a>	Refer to Section 12 Vendor Literature for motor manufacturer recommendations				
Lubricating all other parts, where grease zerk(s) is installed Refer to section 4.5 NLGI grade 1 <i>Chevron Ultra-Duty Grease EP 1*</i>	<a href="http://www.globalindustrial.com">www.globalindustrial.com</a>				X	
Check Pump Couplings					X	
Check for Loose Wiring					X*	
Check Platen and Carriage for cracks					X	
Check load cell cabling		X				
General Inspection of System				X**	X	
<p>* This should be done by a qualified electrician</p> <p>** First replacement/inspection recommended after one month of operation or 150 hours whichever first occurs.</p> <p>***Oil samples <b>MUST</b> be taken and results submitted to SSI to maintain warranty on the cylinders and the hydraulic components.</p>						

In addition to the above items, the seals, bearings and wipers must be replaced at or before 4 million linear feet (378 miles) of travel in both the **CRAM** cylinder and the **ERAM** cylinders. **This is required** to maintain the compaction cylinder warranty. The HPU touch screen displays feet and miles of linear travel. Please see section 4.7 for further information.

\*Or equivalent. Recommendations for comparable lubricants can be obtained by calling the SSI Customer Service Department or your local lubricant distributor.



## SECTION 5 CONTENTS SERVICE

SECTION

5.0

PAGE

1

<b>CONTENTS</b>	5.0
<b>LOCKING OUT THE COMPACTOR</b>	5.1
<b>CONTROL SYSTEM THEORY OF OPERATION</b>	5.2
<b>HYDRAULIC THEORY OF OPERATION</b>	5.3
<b>HYDRAULIC PRESSURE CHECK PORTS</b>	5.4
<b>CHANGING THE RETURN FILTERS</b>	5.5
<b>CHANGING THE STRAINER FILTERS</b>	5.6
<b>CHANGING THE PRESSURE FILTERS</b>	5.7
<b>MAIN PUMP PRESSURE SETTINGS</b>	5.8
<b>INSTRUMENTATION CALIBRATION</b>	5.9
<b>HEAT EXCHANGER SERVICE</b>	5.10
<b>PROGRAMMING THE LASER</b>	5.11
<b>PROGRAMMING THE PRESSURE TRANSDUCER AND PILOT SWITCH</b>	5.12
<b>PROGRAMMING THE TEMPERATURE TRANSDUCER/SWITCH</b>	5.13
<b>CALIBRATING THE SCALE SYSTEM</b>	5.14
<b>COMPONENT PHOTOS</b>	5.15

## MACHINE LOCK-OUT

- Always lock-out the machine when entering the chamber.
- Always lock out and tag out the machine before opening and entering the cylinder area.
- Always lock-out and tag-out all power to panels and electric components before servicing.

**This is very important!** It is possible to be in the chamber and out of sight of the control panel. Locking the unit out is the only way to prevent someone from starting the machine while you are inside it!



**Unexpected machine startup can result in death or severe personal injury.**

To ensure safety when servicing or inspecting the compactor all sources of energy **must be switched off, locked out and tagged** at the source, before work or inspection is started.

On compactor, switch off the main 2 breakers located on the right side of the motor starter panel. If the unit has more than one breaker, all of them must be switched off, locked out and tagged. Also make sure that the main power supply from the building is also locked out and tagged.

Anyone who will be involved in the service or maintenance of the compactor must place his or her own lock on the main breaker or disconnect switch.

Locking out and tagging should be done in accordance with plant rules or OSHA approved procedures. After the power has been locked out, it is recommended that an attempt be made to start the machine. This step confirms that the unit has been correctly locked out.



Container/Trolley Drive Breaker  
(Disconnect Switches)



Compactor Main Power Breakers  
(Disconnect Switches)



## POSSIBLE SOURCES OF ENERGY

All possible sources of energy must be identified and locked out prior to working on the equipment. The following is a list of common sources of energy. It is possible that other sources of energy exist that are not identified here.

### Electrical Energy

#### Control Voltage

The voltage on the control circuit is typically 24 VDC, but could be higher. Normally, locking out the main disconnect switch isolates this voltage from any control wiring. In some situations, the control voltage can be fed from external circuits and will have to be locked out at its source. In some case control power from other equipment will be present in the SSI supplied panel. Lock out all of the sources of electrical energy before working on the electrical system.

#### Main Power

The main incoming power will be significantly higher than the control voltage and present a lethal shock hazard. In most cases, locking out the main breakers on the SSI supplied panels will eliminate this voltage from all of the circuits except the incoming leads to the breakers themselves. In other cases, the power will have to be locked out at facility breakers feeding the equipment. Carefully determine power sources and lock out all of them prior to working on the equipment.

On units equipped with diesel engines there are electrical heaters in the hydraulic tank and engine block that are powered from outside sources. Disconnect (unplug) these to eliminate hazards from this source.

On units equipped with conveyors: lockout any conveyors feeding the conveyor.

### Potential Energy (Gravity)

The discharge gate itself is a source of potential energy. Lower the discharge gate fully or block it up in the raised position prior to working around or under it.

**Falling material is a source of potential energy.** Make sure that material hanging in or around the hopper or conveyors has been secured prior to working under it. Ensure the material on the tipping floor is stabilized prior to working under the chute area.

### Hydraulic Energy

**Stored Hydraulic Pressure** – Residual pump pressure. When the power unit is turned off, for a few seconds after the motors stop turning there can be some pressure remaining in the system. Push pin (manually activate) all solenoid valves to relieve this pressure.

Gate cylinders have counterbalance valves that are designed to hold the pressure in the cylinders which prevents them from drifting down. For the gate cylinders; support the gate to minimize the pressure retained and then carefully crack a hose fitting between the cylinder and the counterbalance valve to bleed off any pressure.

If the platen is pressing against trash at the moment that the machine is turned off, the trash can push the platen and create pressure in the compaction cylinder. When the HPU is turned off, it is possible for the platen to move for many minutes as the trash relaxes and pushes the platen back. This hazard can be eliminated by positioning the platen away from any trash or waiting 30 minutes to allow the platen to stabilize.

### Thermal Energy

In addition to the above forms of energy, there are two sources of potentially dangerous temperatures: Hot fluids: Hydraulic fluid can reach temperatures capable of burning or scalding flesh.

Hot Surfaces: The surface temperatures of hydraulic components or HPU tank can reach temperatures capable of causing burns.  
The only way to eliminate these hazards is to wait until the unit has cooled.

In addition to locking out all energy sources, the following warnings must also be observed.

**DANGER****Crushing Hazard.**

**When the machine is in motion, moving parts will cause personal injury or death. Do not work on or enter any part of the compactor while it is in operation or has an electrical power supply connected.**

**Lock out and tag out electrical power source and clear stored energy.**

**WARNING****Moving Parts Hazard.**

**Servicing hydraulic cylinder related components with stored energy present after machine shut-down can result in unexpected machine motion.**

**Manually support loads suspended by cylinders and clear stored energy prior to servicing equipment.**

**Press in Solenoids to bleed off any pressure prior to servicing the cylinder hydraulics. See picture illustration below for location of the solenoids.**

**WARNING****Moving Machinery Hazard.**

**Servicing hydraulic cylinder related components with hydraulic pressure present in the cylinders after machine shutdown can result in unexpected machine motion.**

**Manually support loads suspended by cylinders prior to servicing the equipment.**

**Crack a hose fitting in addition to manually pressing solenoids to bleed off any pressure prior to servicing the cylinder hydraulics.**



 **WARNING**

**Falling Material Hazard.**

**Un-compacted material in the feed chamber opening can fall through the chamber to the chamber floor below.**

**Remove un-compacted material prior to working below the chamber opening.**

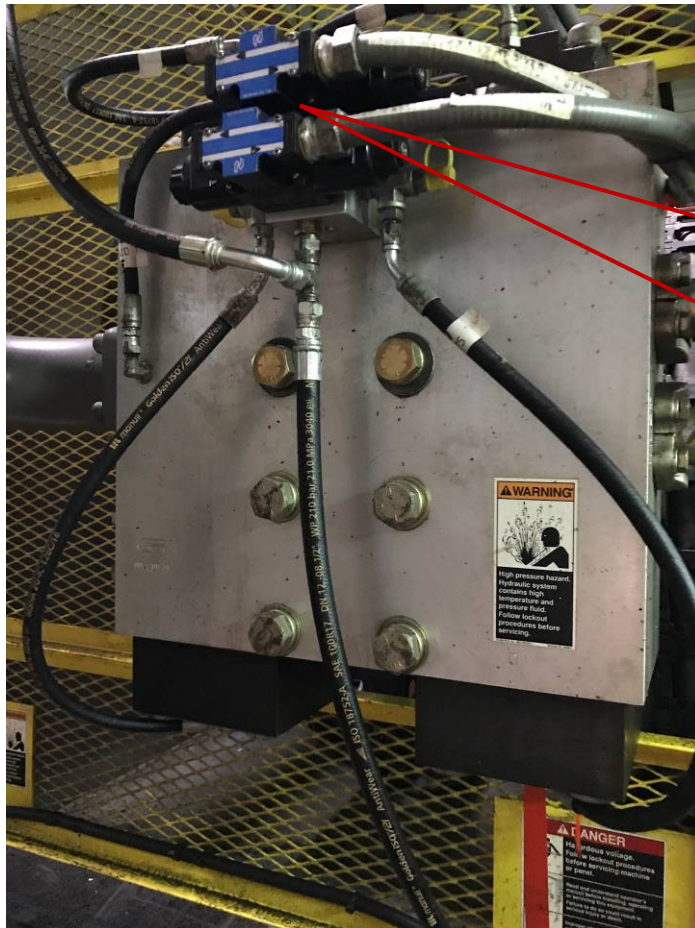
 **CAUTION**

**Burn Hazard.**

**Hydraulic fluid can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.**

**Allow fluids and lubricants and associated parts to cool before servicing.**

Locations of all the solenoids on the compactor.



This Cram manifold is located on the back of the main compaction cylinder, please manually pushpin all solenoids several times to eliminate stored hydraulic energy.



This Eram manifold is located on the side of the compactor, please manually pushpin all solenoids several times to eliminate stored hydraulic energy.



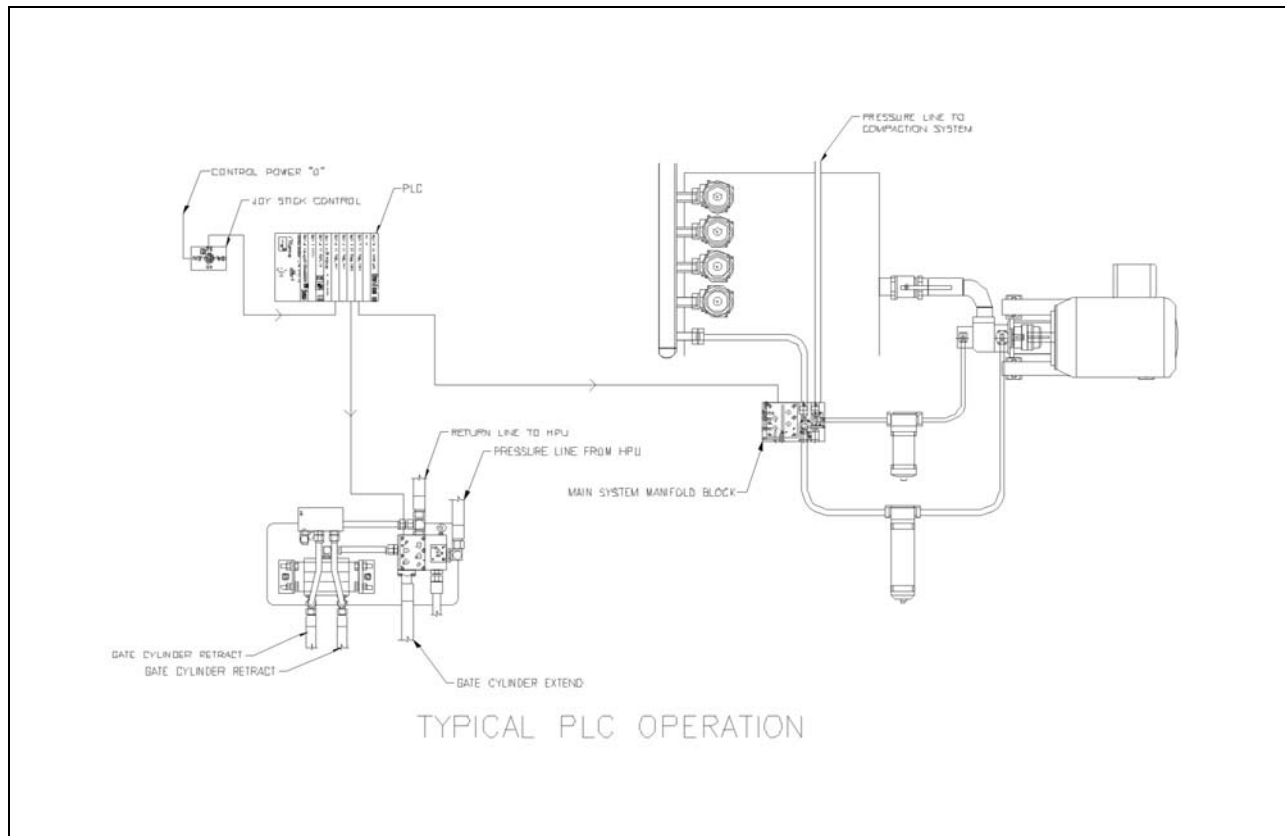
There are also several solenoid valves under the compactor floor closer to discharge gate area, please manually pushpin all solenoids several times to eliminate stored hydraulic energy.

## PROGRAMMABLE LOGIC CONTROLLER OPERATION

The **Programmable Logic Controller (PLC)** is the brain of the Compaction System Operation. The PLC is located in the Operators Control Panel and is the central termination of all the electrical systems and control systems on the Compaction System. The PLC is an Allen-Bradley rack mounted assembly that consists of a Power Supply, a Processor, A Remote Input/Output Communication Module, a Hardy Weigh Scale Module, two Input Modules, Two Output Modules, and a Basic Module.

**Control power** (110 VAC) for the Compaction System is supplied through a transformer mounted in the Compaction System Motor Starter Panel usually located on the HPU. This transformer reduces 460 VAC main power supplied to the Motor Starter Panel to the Control power that is used throughout the Compaction System Control Circuits. The Control Power runs through a fuse located in the Motor Starter Panel and is connected to a 15 Amp circuit breaker in the Operator Control Panel. After the circuit breaker, power is then is supplied to a Surge Suppressor that is wired just ahead of the **PLC Power Supply** module of the PLC Rack. The Surge Suppressor is supplied in the system to protect the PLC from inadvertent power surges to the system.

The PLC Processor contains the **Ladder Logic Program** that operates the Compaction System. The processor constantly scans the program several times a second and operates the system accordingly. For instance, if the operator wants to raise the Gate after a bale has been constructed and after a Load Ready Light has been illuminated, they perform the following task. First, the Trailer Latch must be raised to indicate to the program that a trailer is present at the compactor and ready to receive a bale, the operator raises the Gate Up Joystick on the Operator Control Panel. The following sequence (shown below) is initiated by the operator, through the PLC and the Program to raise the Gate.

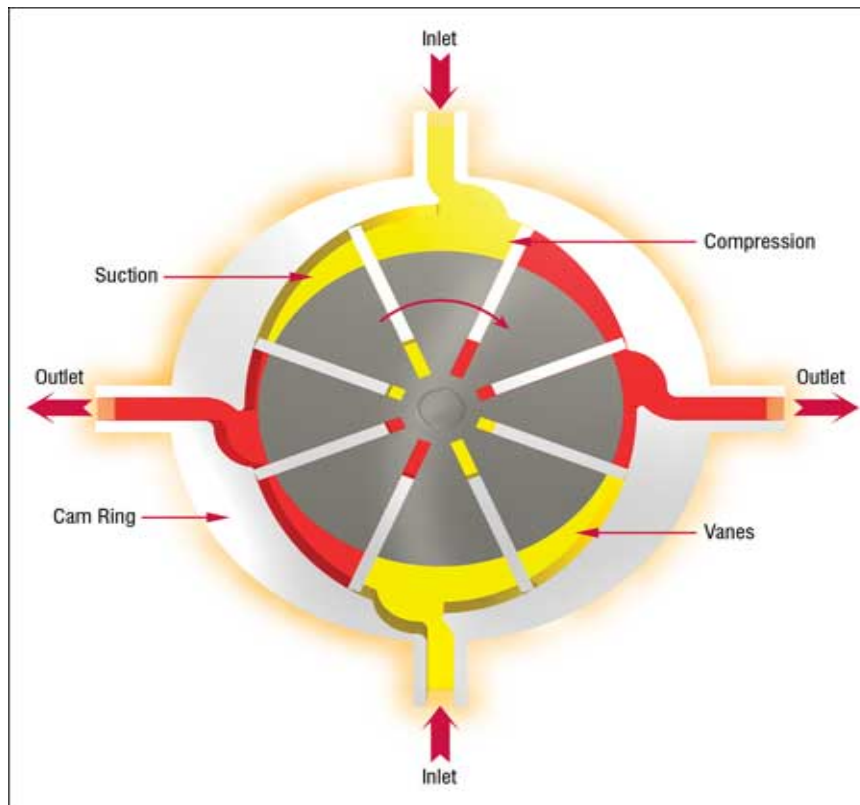


## HYDRAULIC POWER UNIT OPERATION

The Hydraulic Power Unit (HPU) is a stand-alone assembly that provides hydraulic oil pressure and hydraulic oil flow to the Compaction System. Its sole function is to provide the energy to actuate the hydraulic cylinders on the compactor.

There are two types of Hydraulic Pumps utilized on the HPU to supply hydraulic pressure and flow. The fixed displacement valve pump for the compactor cylinders and the heat exchanger circuit. A variable displacement piston pump is used for the pilot pressure circuit. These pumps are driven by three-phase, 460 Volt AC electric motors.

**Fixed Displacement Vane Pump** – This is a fixed displacement pump that utilizes moving vanes within an offset housing that creates hydraulic pressure and hydraulic flow. Vane pumps are of a rugged cast iron construction and are less sensitive to system contamination than most other hydraulic pump designs. These pumps deliver a smooth supply of hydraulic oil flow through the range of hydraulic oil pressures.

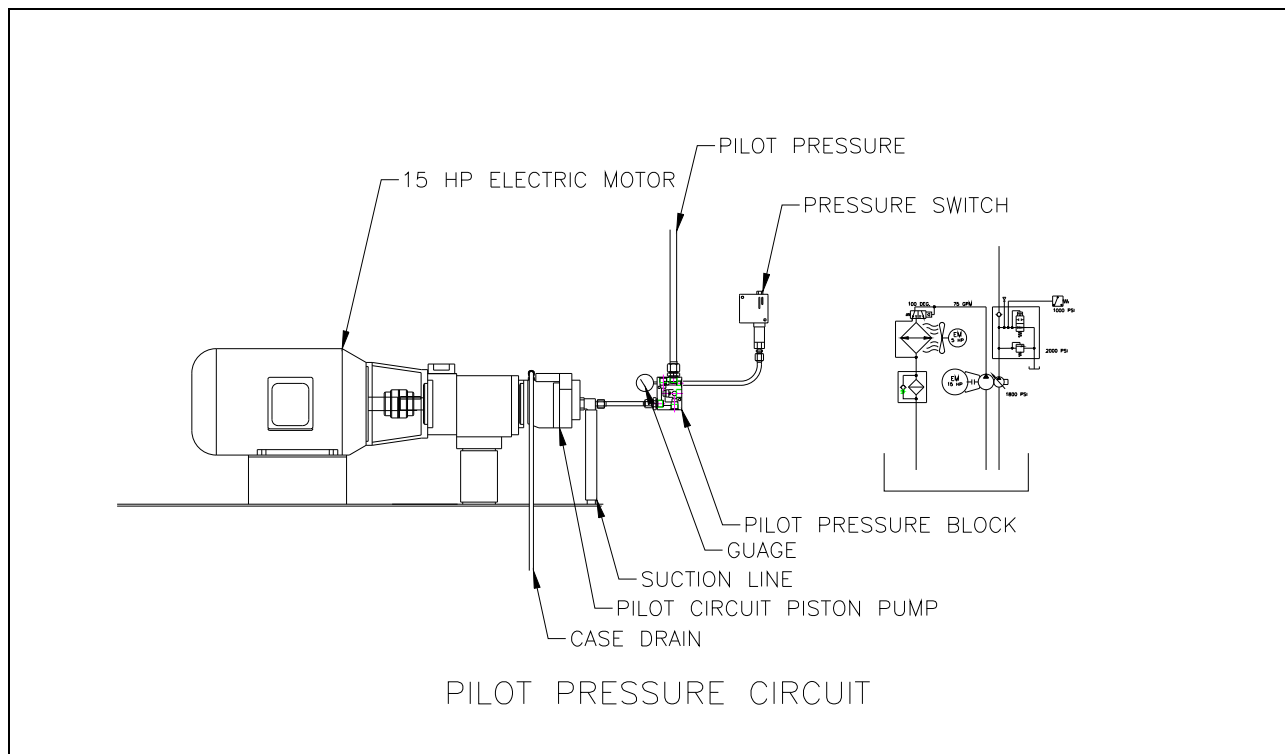


When energy saving VFD motor controllers are used to control the main vane pump motors, these pumps do not operate until cylinder movement or work is to be performed. Once the system requires movement, the motors begin to rotate. As the motors accelerate past 800 RPM, the compactor manifold unloads are shifted to divert the hydraulic oil to the work that is being performed.

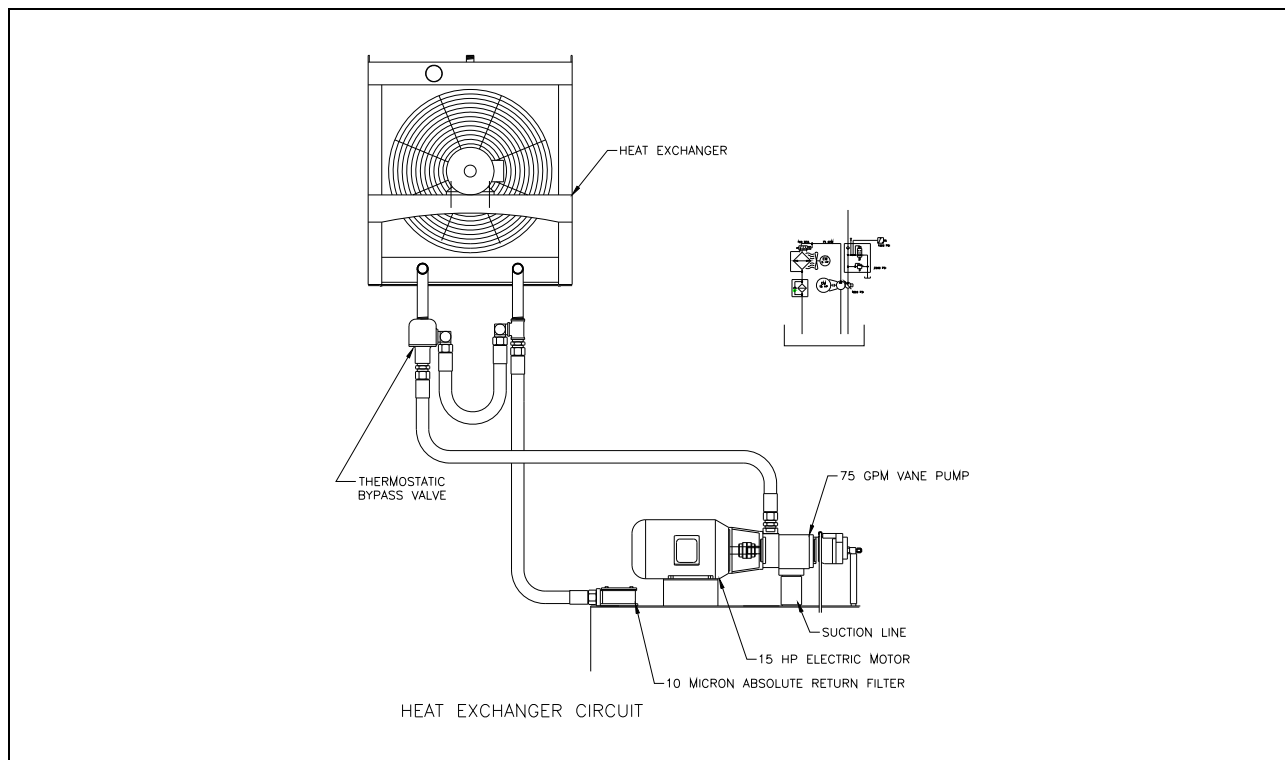


The first circuit that starts up on the HPU when the operator depresses the HPU Start sequence is the Pilot Pressure and Heat Exchanger Circuit. Both of these circuits are powered by the same 15 HP electric motor.

The **Pilot Pressure Circuit** is shown below. The electric motor starts the Piston Pump rotating creating pressure for the pilot circuit. This hydraulic oil pressurizes the Pilot Pressure Block and the system. The Piston Pump Compensator is set at 1800 PSI and the pump charges the pilot system to this pressure. The Pilot Pressure Block contains a Relief Valve that protects the entire Pilot Circuit and the Piston Pump from being over pressurized. This Relief valve is set at 200 PSI above the Compensator on the Piston Pump. Care must be taken to make sure the Piston Pump Compensator has control of the Pilot Pressure Circuit and not the Relief Valve. If the Relief valve is set to low, the pump will continually pump oil “over the relief” causing excessive energy consumption and produce excess heat into the HPU Reservoir. A hydraulic oil Gauge is provided to monitor the Pilot Circuit Pressure. In addition, a Hydraulic\Electric Switch is provided to confirm to the Programmable Logic Controller (PLC) that indeed the Pilot Pressure Circuit is indeed energized. This is very important to prevent inadvertent cylinder movement when the main pumps start. Pilot pressure is required to close the cylinder valves so that the the cylinders hold their position upon start-up. Once the PLC has received an indication that Pilot Pressure is present, the rest of the HPU start-up sequence will commence.



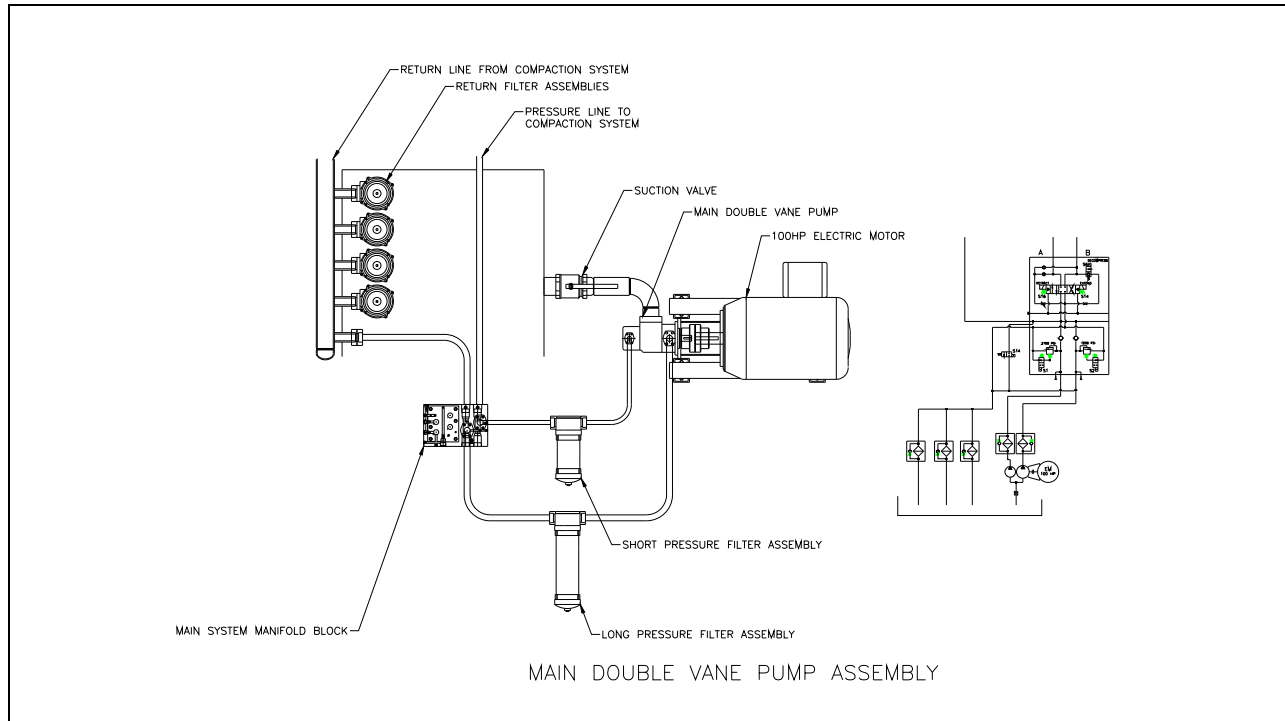
The **Heat Exchanger Circuit** (shown below) starts at the same time as the Pilot Pressure circuit since the two pumps are coupled together and are powered by the same 15 HP electric motor. This circuit is required to keep the hydraulic oil in the reservoir tank within required operating temperatures. This system is entirely hands off and operates automatically whenever the HPU is ON and operating. When ON, the 15 HP electric motor rotates the Fixed Displacement Vane Pump shaft and continually pumps 75 gallons per minute (GPM) through the Heat Exchanger Circuit. There is a thermostat valve that is attached to the Heat Exchanger and automatically bypasses the hydraulic oil if it is under 100°F. This keeps the oil from being cooled when it is already cold. Once the oil is above 100°F, the hydraulic oil is diverted to automatically through the heat exchanger core. There is a three-pole temperature switch mounted on the hydraulic reservoir. This switch monitors the hydraulic oil temperature in the HPU reservoir. This switch is wired into the electrical circuit and is coupled to the PLC. When the temperature of the hydraulic oil is under 65°F, the power unit will start but the system will not operate until the hydraulic oil is above 65°F. This is to insure pump damage does not occur. Once the hydraulic oil is above 65°F, the switch closes and the Compaction System will operate. When the Hydraulic oil reaches 105°F, the second switch will open signaling the PLC to start the 5 HP fan to run. This fan will run continually until the temperature is below 105°F. If the temperature reaches 160°F, the third switch will open signaling the PLC that the hydraulic oil temperature is too high. The PLC will send a warning to the operator and will stop operating the Compaction System. The PLC will keep the 15 HP Heat Exchanger circuit operating to bring the temperature of the hydraulic oil back into its proper operating range.



All the hydraulic oil is filtered when it returns from the Heat Exchanger Circuit. It all flows through the 10 Micron Absolute filter assembly mounted on the top of the hydraulic reservoir. This is the most important filter on the HPU and it should be checked periodically as described in the compactor Operator Manual. Since it filters the entire reservoir oil approximately every 13 minutes, it is important for it to be in good operating condition to maintain clean hydraulic oil.



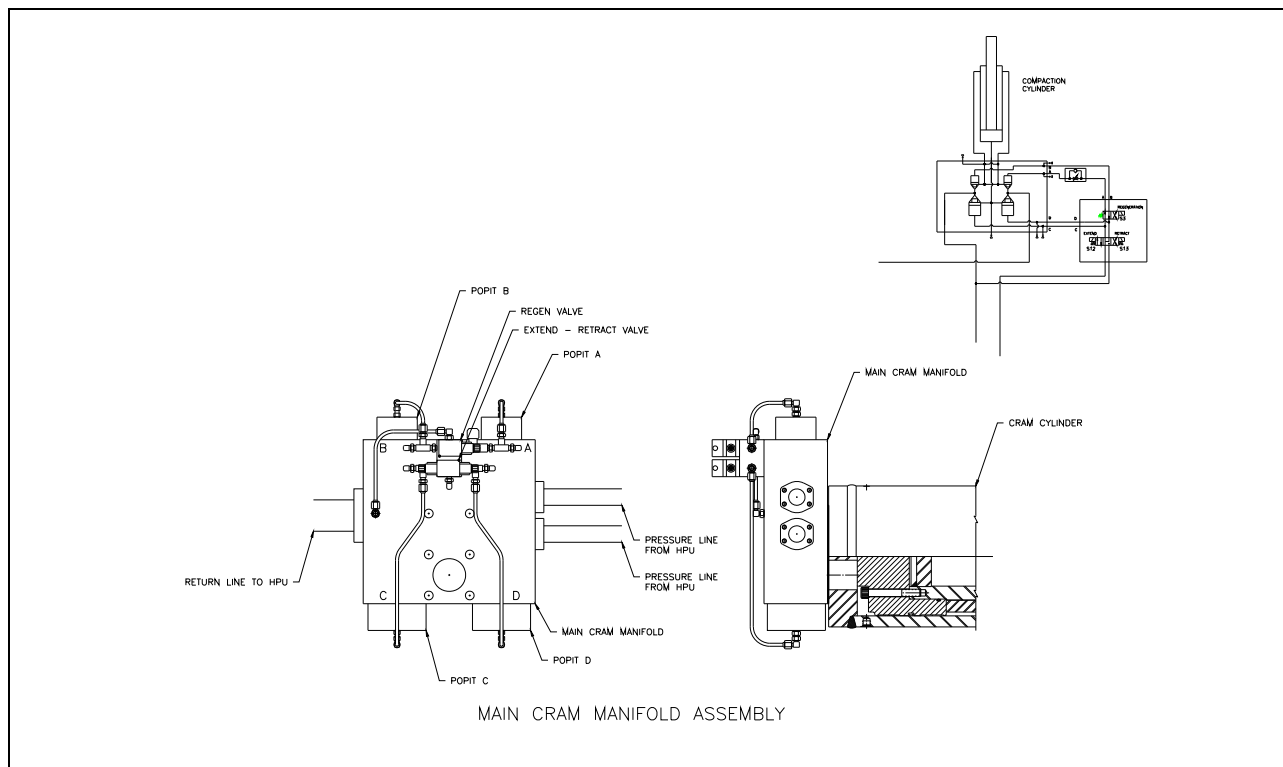
Once the Pilot Circuit has been turned ON, and Pilot Pressure is confirmed, the **Main Vane Pumps** will be brought “on line” to supply hydraulic oil flow to the Compaction System upon demand. When these Main Double Vane Pumps are running, hydraulic oil is pumped first through the long and short pressure filter assemblies. These Pressure Filters are not in the system to filter oil per say, but are in the system to protect the HPU valving and cylinders from contamination in the event of a main pump failure. The flow then continues to the Main System Manifold Block as free flows back to the reservoir through the bank of Return Filter Assemblies. All the hydraulic oil that is returned to the reservoir from any system device is filtered through this bank of return filters, protecting the HPU reservoir from contamination and to keep the hydraulic oil as clean as possible.



The hydraulic system is now ready to operate the Compaction System. The PLC constantly monitors the HPU and its condition during operation. In addition to monitoring its temperature, the reservoir is protected in case the hydraulic oil level becomes too low. A Float Switch is provided to monitor the hydraulic oil level in the tank. If the hydraulic oil level drops below a safe operating level, the switch breaks contact and the PLC performs an emergency stop to the entire HPU. In an emergency shut down, all motors and pumps stop and the entire system stops operation. In addition to the low hydraulic oil level switch, the two Pump Suction Valves are protected against closing by limit switches. If the suction valves are closed, or the handle is moved away from the full open position, the limit switches will break contact and the PLC will do an emergency stop to the whole Compaction System.

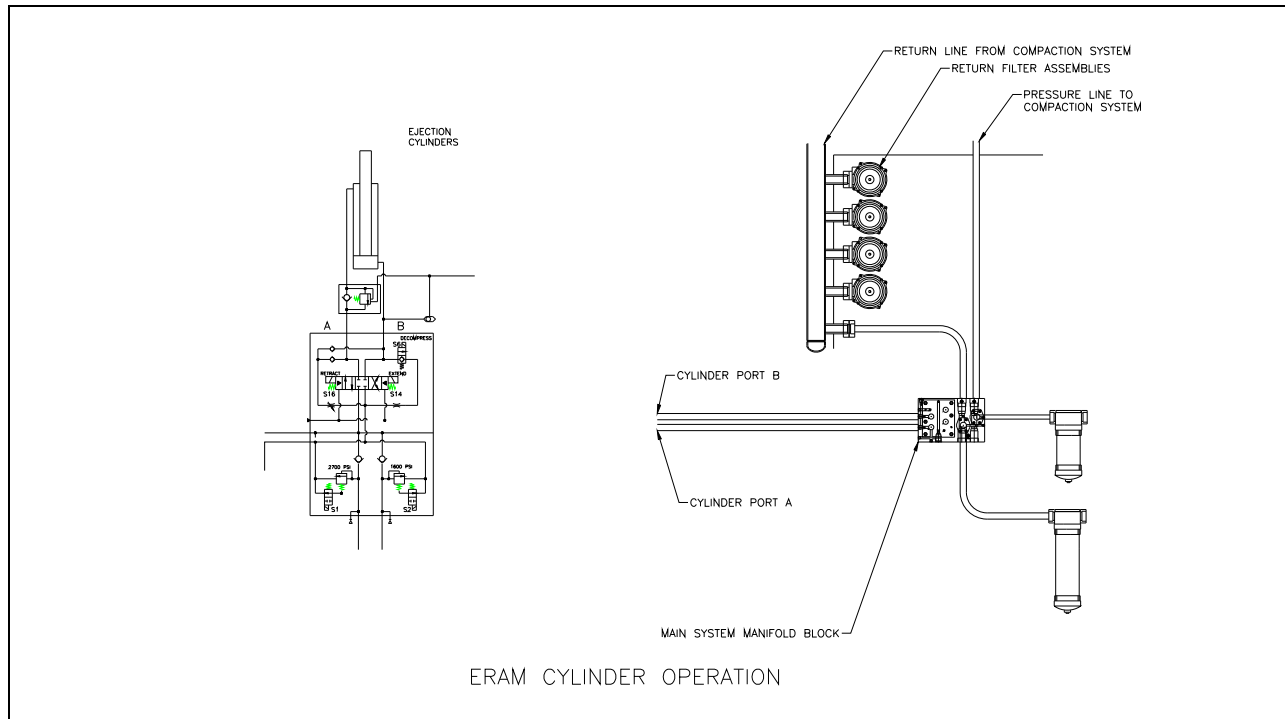
Whenever the Compaction System needs to actuate the **Main Compactor Cylinder (CRAM)**, the PLC sequences the HPU in the following manner. When the Compaction System is at rest, Pilot Pressure is open to all four of the Poppit Assemblies on the CRAM Manifold. This keeps the cylinder rod static and held in position. When rod travel is required, first, the PLC actuates the CRAM Manifold (below) to either extend or retract the CRAM Cylinder.

**To Extend**, the Extend – Retract valve is actuated to the Extend position. In the extend position, the Extend – Retract valve opens and lets the Pilot Pressure on Poppit D and Poppit B go to tank (no pressure). Second, (refer to the Main Double Vain Pump Assembly detail) the Main System Manifold Block Unloader Valves are actuated. These valves close the flow of hydraulic oil back through the return filter assemblies forcing the flow out to the Compactor System. Hydraulic oil then flows to the Extend side, or piston side of the CRAM Cylinder. The rod then extends with the hydraulic oil flowing through Poppit D. The hydraulic oil that is on the rod side of the CRAM cylinder then flows through Poppit B and back to the HPU through the Return Filter Assemblies. **To Retract**, the Extend/Retract valve is actuated to the Retract position. In the retract position, the Extend/Retract valve opens and lets the Pilot Pressure on Poppit C and Poppit A go to tank (no pressure). Second, as above (refer to the Main Double Vain Pump Assembly detail) the Main System Manifold Block Unloader Valves are actuated. These valves close the flow of hydraulic oil back through the return filter assemblies forcing the flow out to the Compactor System. Hydraulic oil then flows to the Retract side, or rod side of the CRAM Cylinder. The rod then retracts with the hydraulic oil flowing through Poppit A. The hydraulic oil that is on the piston side of the CRAM cylinder then flows through Poppit C and back to the HPU through the Return Filter Assemblies.

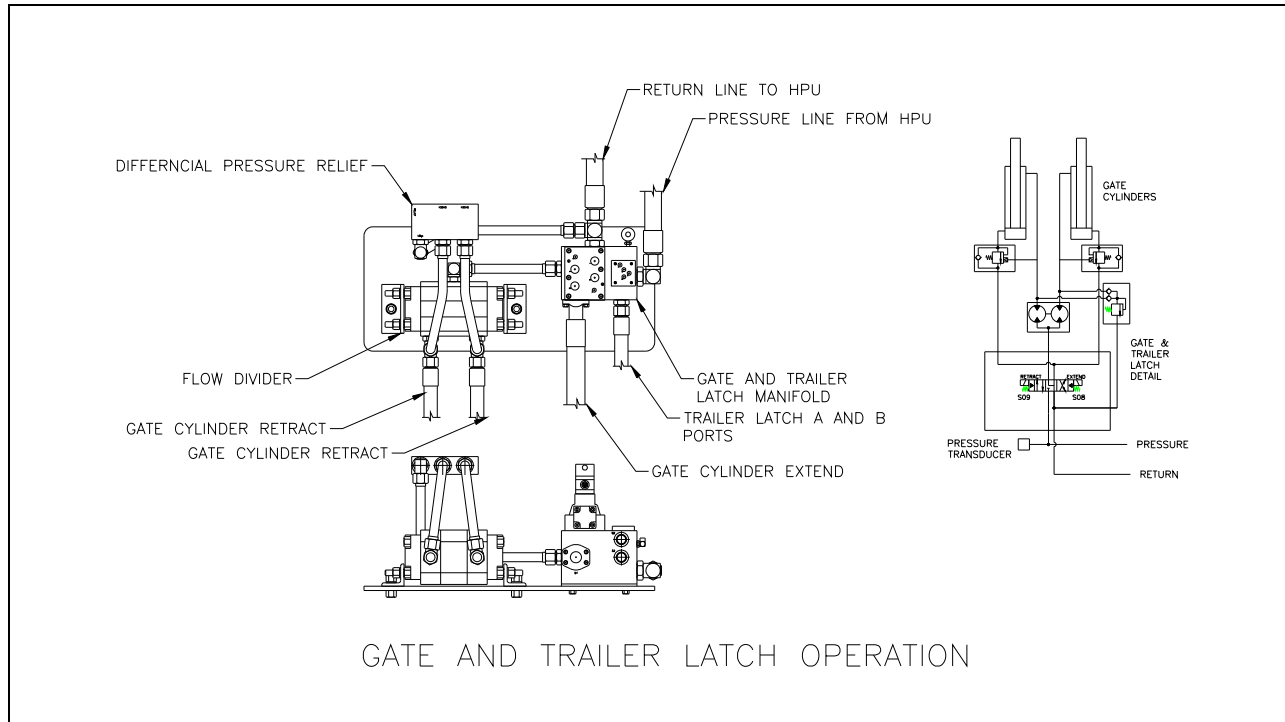


An added feature of this CRAM Cylinder Manifold is its ability to make put the CRAM Cylinder into **Regen Mode**. In Regen, the CRAM cylinder has the ability to extend faster with less hydraulic oil displaced therefore speeding up the cylinder operation greatly. This feature is only actuated in a low-pressure operation such as Clear Strokes and the beginning stages of Compaction Strokes. When the CRAM Cylinder is extending and the system wants to operate in a fast mode, the Regen valve is actuated. While Poppit B and Poppit D are open, the Regen valve allows Pilot Pressure to gain close Poppit B and open Poppit A. All the hydraulic oil returning from the rod side of the cylinder is then reintroduced to the piston side of the cylinder increasing the amount of flow to the cylinder making it extend faster.

In much the same way, the PLC controls the **ERAM Cylinders**. However, the ERAM Cylinders are controlled by the Main System Manifolds and the ERAM Control Valves mounted directly on top. When the ERAM Cylinders need to be extended or retracted, the PLC shifts the ERAM Control Valves to extend or retract. Once shifted, as above, the Main System Manifold Block Unloader Valves are actuated. These valves close the flow of hydraulic oil back through the return filter assemblies forcing the flow out through the already shifted ERAM Valves and to the ERAM Cylinders. Hydraulic oil then flows to either the Extend side, or piston side or the retract side, or rod end of the ERAM Cylinders.



In addition to the above cylinder systems, the **Gate and Trailer Latch System** operates in much the same way as the ERAM Cylinders. First, the PLC shifts the **Gate Cylinder Extend – Retract Valve** to either raise or lower the Gate. To raise or lower the Gate, the Extend – Retract Valve is shifted to the either position. Once shifted, as above, the Main System Manifold Block Unloader Valves are actuated. These valves close the flow of hydraulic oil back through the return filter assemblies forcing the flow out through the already shifted Gate Valve and to the Gate Cylinders. Hydraulic oil then flows to either the Extend side, or piston side or the retract side, or rod end of the Gate Cylinders. The Gate Cylinder circuit has a Flow Divider that is in the retract or rod side of the Gate Circuit. This Flow Divider forces the Gate Cylinders to either extend or retract in unison, thus making the Gate raise and lower evenly. Also on the Gate Cylinders are a pair of Counter Balance Valves provided to hold the Gate in the up position in case of hose failure or to eliminate the Gate from drifting down during the Bale ejection process. The **Trailer Latch** operates in the same way as the Gate. First, the PLC shifts the Trailer Latch Cylinder Extend – Retract Valve to either raise or lower the Trailer Hook. To raise or lower the Hook, the Extend – Retract Valve is shifted to the either position. Once shifted, as above, the Main System Manifold Block Unloader Valves are actuated. These valves close the flow of hydraulic oil back through the return filter assemblies forcing the flow out through the already shifted Trailer Latch Valve and to the Trailer Latch Cylinder. Hydraulic oil then flows to either the Extend side, or piston side or the retract side, or rod end of the Gate Cylinders.



There is also a Pressure Transducer located either on the Gate and Trailer Latch Valve Assembly (as shown) or on the HPU, depending on the lay out of the Compaction System. The Pressure Transducer is used to monitor the pressure the HPU is providing to the Compaction System.

Care must also be taken to change the Return Filter Elements at the prescribed time intervals given the Operation and Maintenance Manual. Since this HPU operates large double acting piston cylinders, large quantities of hydraulic oil is displaced as the Compaction System strokes cylinders back and forth. There are four Reservoir Air Filter canisters that need to be changed as prescribed in the Operation and Maintenance manual. It is very important to keep the air entering the reservoir clean from contaminating the hydraulic oil.

The HPU is designed with two – Double Vane Pump Assemblies. The system is designed to operate the hydraulic cylinders in a fast and efficient method. To accomplish this, the HPU is designed to operate in two distinct operating pressure ranges. Whenever any work is being done by the Compaction System, by either extending or retracting cylinders, the HPU operates at **Full Flow Mode** between 0 and 1500 Pounds per Square Inch (PSI). That is all hydraulic oil flow from all the pump sections is being blocked from returning to the reservoir by the Main System Unloader Valves mounted in the Main System Manifolds. When the hydraulic pressure reaches 1100 PSI, a pressure switch opens and breaks contact signaling the PLC the system has reached that pressure. At 250 HP, the system cannot pump any more hydraulic oil at that pressure. Therefore at this time, the PLC opens two of the four Main Pump Unloading Valves allowing part of the oil flow to return to tank allowing the system to increase the hydraulic oil pressure to complete its task. From 1100 PSI to 2600 PSI the system operates in a **High Pressure Mode** with only two Main Pump Sections. As soon as the hydraulic oil pressure increases to 2600 PSI, another pressure switch opens and breaks contact instructing the PLC that high pressure has been reached. This is normally done when the Platen is compacting waste in a bale. Once the switch has signaled the PLC that the high pressure limit has been reached, the system stops and initiates a retract sequence to begin.



## HYDRAULIC THEORY OF OPERATION

SECTION

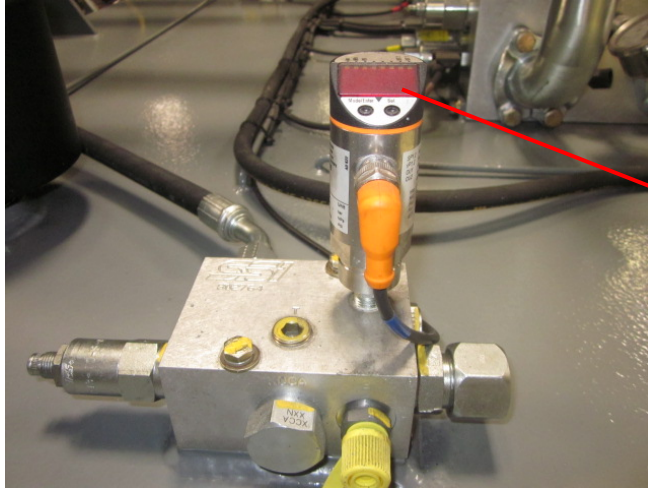
PAGE

5.3

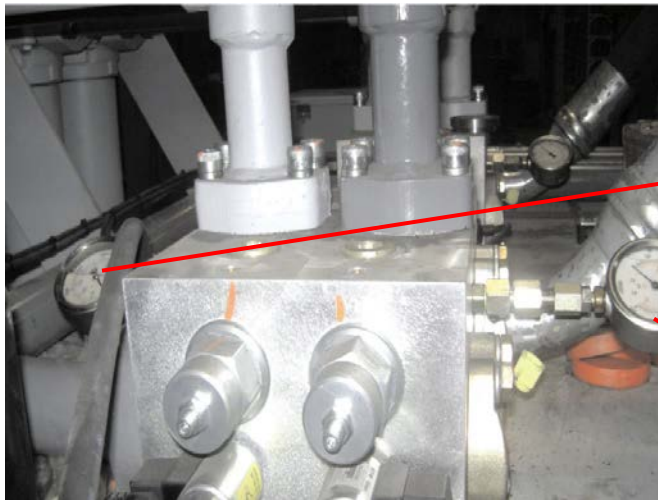
9

To protect the Main Pump System, individual **Relief Valves** are supplied on the Main System Manifold Blocks. If for some reason the pressure increases above the set points of the pressure switches, they will automatically open and allow the over pressure hydraulic oil to bypass back to the reservoir through the Return Filter Assemblies. These Relief Valves are set at 100 PSI over the set point on the fro the pressure switches. Having these Relief Valves set near or under the set points of the pressure switches will stall the Compaction System. If the hydraulic oil pressure never is allowed to build to operate the pressure switches, the compactor HPU will simply run and continually pump hydraulic oil over the Relief Valves. Setting these Relief Valves to high can and will damage the Compaction System. The Compaction System is designed to operate under certain hydraulic oil pressures, hoses, cylinders and even the Compaction System Structure can be damaged.

The following illustration shows the locations of the hydraulic pressure gages and pressure ports. These indicators are used during hydraulic system adjustment and service.



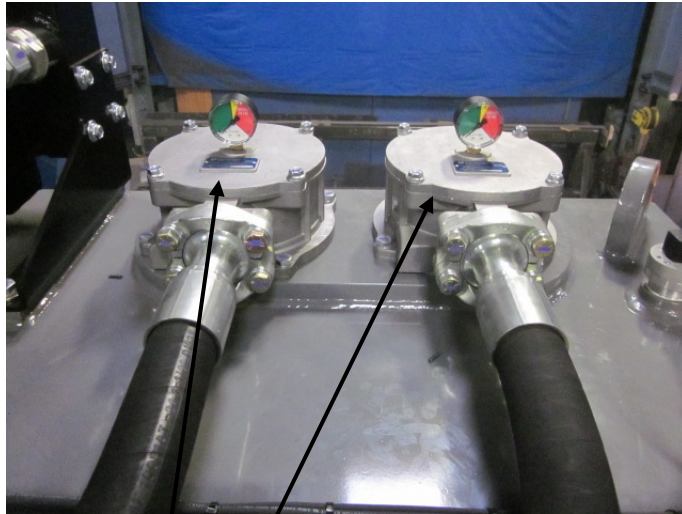
Pilot Pressure Gauge



High Pressure Gauge

Low Pressure Gauge

## COMPONENT IDENTIFICATION



Return Filters – 10 Micron

### What The Return Filters Do

The hydraulic oil return filters clean the hydraulic oil as it returns to the hydraulic reservoir. This is to prevent contamination from a failing part (such as a cylinder) from getting back into the reservoir.

### When To Change The Filters

The filters should be changed every 750 hours or when the filter condition indicators show red after the hydraulic system has warmed up to operating temperature or more. It is common for the indicators to briefly show red after a startup on a cold morning, because the oil is quite thick and there can be a large amount of pressure drop through the filters. After the system has warmed up, stop the pumps for about a minute to allow the indicators to reset, and then restart the power unit. If the indicators are showing red when the oil is hot, the filters must be changed immediately.

Refer to the Parts List in Section 11.2 for the correct replacement filter elements. Some elements on circulation pumps have a finer particle size rating to help condition the oil. Always use exactly the same filter element to prevent damage to the hydraulic components.

**Tools and Items Required**

- Replacement and Circulation filter element(s)
- Ratchet with 1/2 socket
- Bucket to hold dirty filters after removal
- Rags for cleanup
- New hydraulic oil to top off the reservoir



**High Pressure Hazard.**

**Hydraulic system contains high pressure fluid.**

**Follow lock out procedures before servicing.**



**Burn Hazard.**

**Hydraulic fluid and gearbox lubricants can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.**

**Allow fluids and lubricants and associated parts to cool before servicing.**

**With the machine turned off, electrically locked out and tagged *Refer to Section 5.2, Locking Out the Compactor.***

**Changing the filters**

1. Shut down and lock out the machine (refer to the *Locking out the Compactor* section).
2. Remove any equipment above the filter housing which will prevent a 12" long filter element from being removed.
3. Thoroughly clean the outside of the entire area around and above the filter housing to prevent contamination from dropping into the filter housing while it is open.
4. Loosen the 4 bolts around the top of the filter housings. The top of the housing will rise as the bolts are loosened. This is because the filters are spring-loaded and will push up on the top of the housing. A small amount of hydraulic fluid will drain over the edge of the housing.
5. Remove the filter housing cover
6. Remove the filter element by pulling upward on the handle provided. Place the filter in the bucket. Inspect the filter for metal flakes. If any are found, it may be an indication of a hydraulic motor (or other component) failing.
7. Install the new filter element into the filter housing.
8. Inspect the o-ring gasket for nicks and replace if necessary.





## CHANGING THE RETURN FILTERS

SECTION

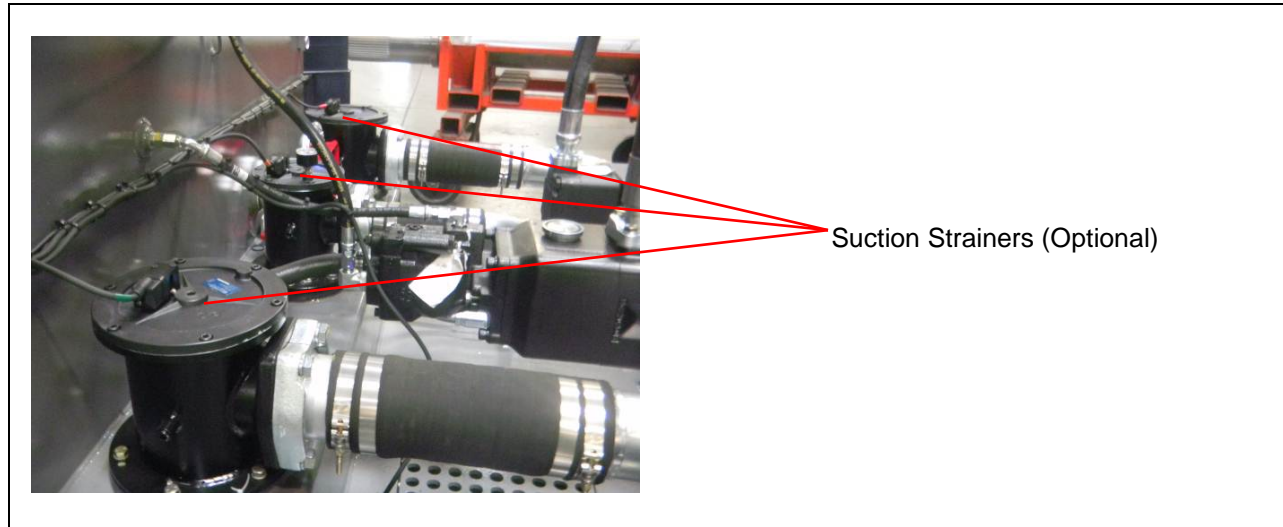
PAGE

5.5

3

9. Install the filter housing cover by pressing down against the spring to start the bolts. Be very careful not to cross thread the bolts. The filter housing is aluminum and can be damaged easily.
10. Clean up any spilled hydraulic fluid
11. Top off the fluid in the tank as needed.
12. Unlock the machine

## STRAINER FILTERS ARE NOT APPLICABLE TO 2000 MODEL COMPACTOR: Suction Strainer Locations



### What the Suction Strainers Due (When Available)

Suction Strainer Elements are manufactured using stainless steel wire screen media. Suction Strainer Elements are only intended to protect hydraulic pumps against catastrophic failure caused by coarse contaminants.

### When to Change the Filters

The filter elements should only be change out if required upon the inspection at 3000hours or when the filter condition indicators show red (after the hydraulic system has warmed up to a minimum of 80 degrees Fahrenheit). If the indicators are showing red when the oil is hot, the filter elements must be changed immediately.

### Tools and Items Required

- Replacement filter elements.
- Allen set (metric)
- Bucket to hold dirty filter elements after removal
- Rags for cleanup



**Burn Hazard.**

**Hydraulic fluid and gearbox lubricants can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.**

**Allow fluids and lubricants and associated parts to cool before servicing.**

**With the machine turned off, electrically locked out and tagged *Refer to Section 5.2, Locking Out the Compaction.***



## CHANGING THE SUCTION STRAINER FILTER ELEMENTS

SECTION

5.6

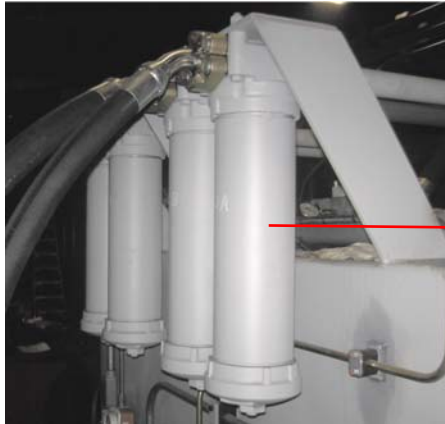
PAGE

2

### CHANGING THE FILTERS

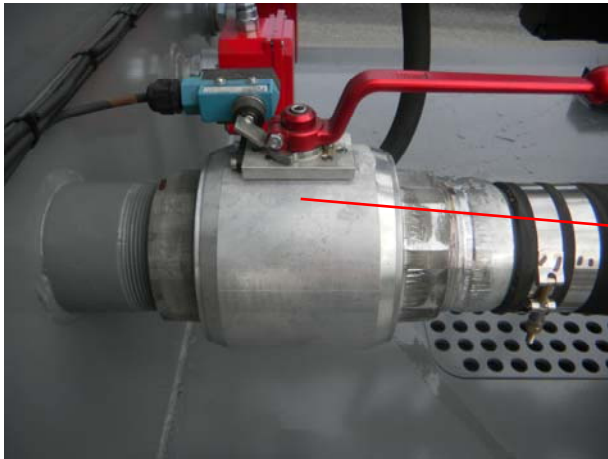
1. Shut down and lock out the machine (refer to Section 5.2).
2. Close the suction strainers (counter clockwise) to keep the reservoir from draining when the filter housings are opened.
3. Thoroughly clean the outside of the entire area around and above the filter housing to prevent contamination from dropping into the filter housing while it is open.
4. Loosen the 6 allen head bolts around the top of the strainer housing using the allen head wrench
5. Remove the filter housing cover
6. Remove the filter element by pulling upward. Place the filter in the bucket. Inspect the filter for metal flakes, plastic material. If any are found, it may be an indication that HPU components like return filter assembly's or internal HPU components failing.
7. Drain any remaining oil from the filter canister and wipe it out to remove any contamination sitting in the bottom of the bowl.
8. Install the new filter element into the filter canister.
9. Install the filter canister back over the filter element.
10. Clean up any spilled hydraulic fluid.
11. Open the suction valve using the allen head wrench (clockwise)
12. Unlock the machine.

## Pressure Filters Location

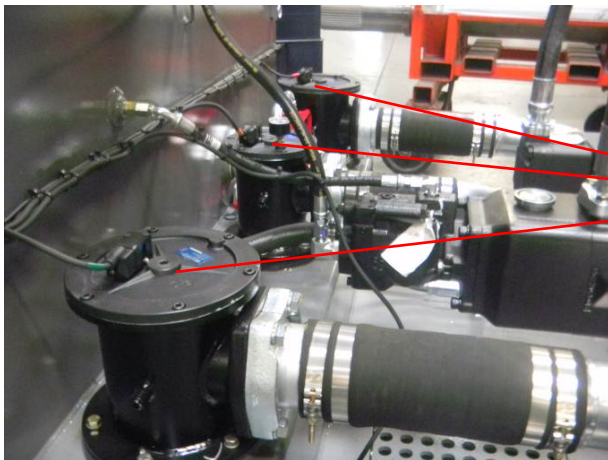


Pressure Filters (4)

## Suction Valve /Strainer Locations



Suction Valves (3)



Suction Strainers (Optional)

### What the Pressure Filters Do

The pressure filters help clean the hydraulic oil after it has passed through the pumps. The filters help prevent contamination from getting into the valves and cylinders.

### When to Change the Filters

The hydraulic oil pressure filters should be changed every 750 hours or when the filter condition indicators show red (after the hydraulic system has warmed up to a minimum of 80 degrees Fahrenheit). If the indicators are showing red when the oil is hot, the filters must be changed immediately.

### Tools and Items Required

- Replacement filter elements. Check that there are replacement o-rings with the new filters, if not, do not attempt to change the filters, the old o-rings will be destroyed when they are removed.
- Strap wrench
- 1 5/8 box-end wrench
- Bucket to hold dirty filters after removal
- Rags for cleanup
- New hydraulic oil to top off the reservoir



**High Pressure Hazard.**

**Hydraulic system contains high pressure fluid.**

**Follow lock out procedures before servicing.**



**Burn Hazard.**

**Hydraulic fluid and gearbox lubricants can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.**

**Allow fluids and lubricants and associated parts to cool before servicing.**

**With the machine turned off, electrically locked out and tagged Refer to Section 5.2, Locking Out the Compaction.**

## CHANGING THE FILTERS

1. Shut down and lock out the machine (refer to Section 5.2).
2. Close the suction valves to keep the reservoir from draining when the filter housings are opened. To close the suction strainers turn counter clockwise and opposite to open suction strainers
3. Thoroughly clean the outside of the entire area around and above the filter housing to prevent contamination from dropping into the filter housing while it is open.
4. Loosen the pressure filter canisters using the strap wrench and/or box end wrench. Approximately 1 gallon of hydraulic fluid will be lost for each filter canister removed.



## CHANGING THE PRESSURE FILTERS

SECTION

PAGE

5.7

3

5. Lower the filter housing to clear the filter element.
6. Remove the filter element by pulling upward on the handle provided. Place the filter in the bucket. Inspect the filter for metal flakes. If any are found, it may be an indication that a hydraulic pump is failing.
7. Drain any remaining oil from the filter canister and wipe it out to remove any contamination sitting in the bottom of the bowl.
8. Install the new filter element into the filter canister.
9. Install the new o-ring on the filter canister.
10. Install the filter canister back over the filter element. Be very careful not to cross thread the canister.
11. Clean up any spilled hydraulic fluid.
12. Open the suction valve.
13. Top off the fluid in the tank as needed.
14. Unlock the machine.

**⚠ DANGER**

High-pressure leaks of hydraulic fluid can penetrate skin resulting in severe personal injury or death.

**⚠ WARNING**

Check the COMPACTOR to ensure that there are no personnel, tools, or other unsafe materials inside or nearby, then call out a warning before starting the machine.

**⚠ CAUTION**

Wear protective clothing, safety glasses, hearing protection, a hardhat, gloves, and protective footwear when operating or servicing the unit.

**OVERVIEW**

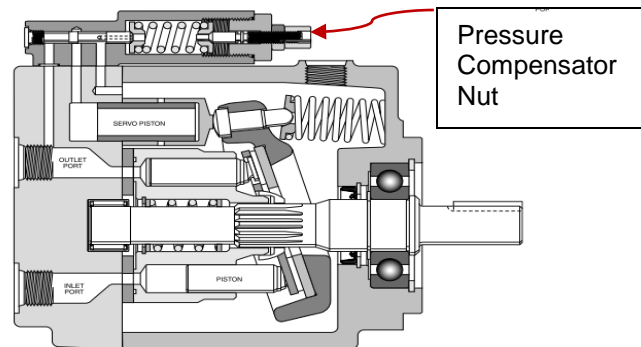
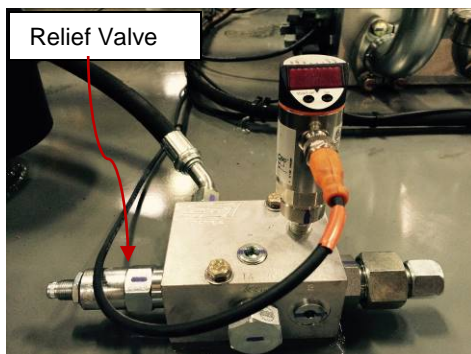
The main pumps that drive the COMPACTOR require three pressure adjustments, low-pressure setting, high-pressure setting, pilot pressure setting.

**HYDRAULIC ADJUSTMENTS**

These adjustments have been set at the factory and should not be changed arbitrarily. Before any readjustments are attempted, please consult SSI Compaction Systems.

To set the pilot pressure:

1. Install a 3,000-psi gauge on the startup valve manifold block.

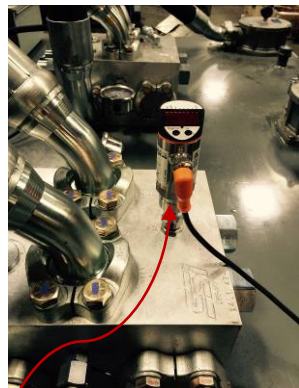
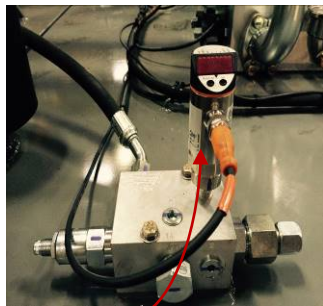
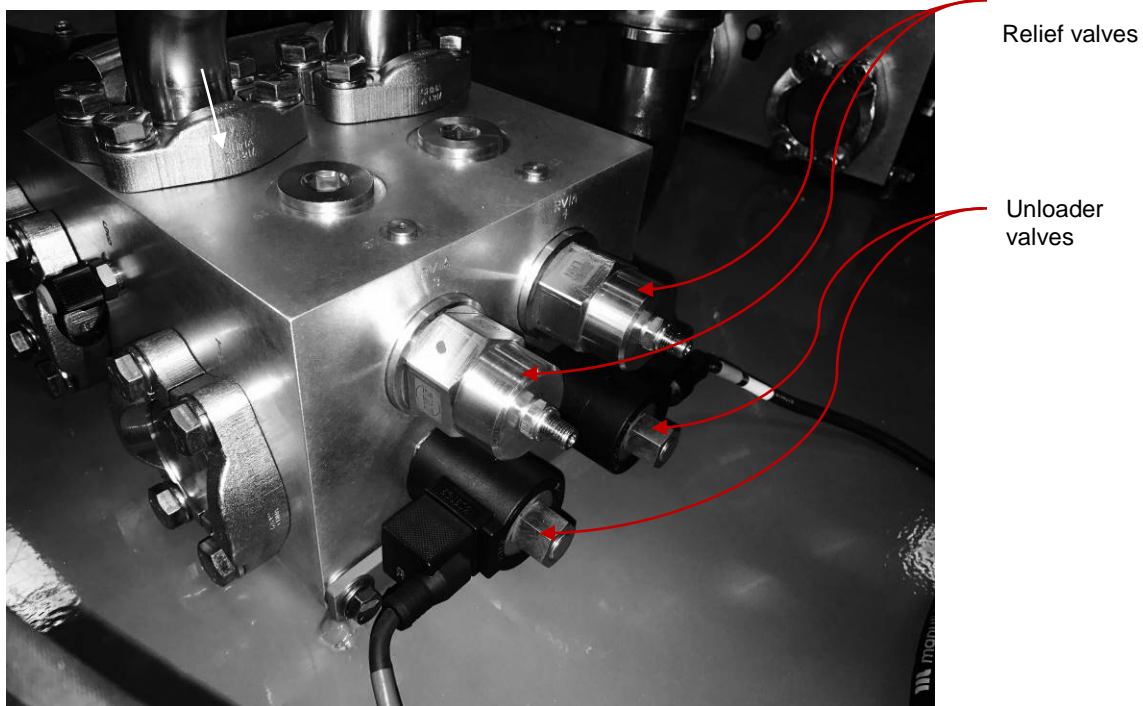


2. Adjust the pressure compensator nut inward and set the relief valve on the startup manifold to 2100 psi and lock the adjustment. The pressure compensator nut on the pump will need to be turned to increase the pressure to 2200 psi to adjust the relief valve.

3. Adjust the pressure compensator nut outward until the pressure reads 1800 psi.

## Setting Relief Pressures and Pressure Switches

There are pressure relief valves for each of the main pump sections. The main relief valves have Allen socket adjustable cartridge valves located on top of the hydraulic tank. To locate the relief's; follow the pressure line from the pressure filters to the next manifold. The relief valves are located on the far side of this manifold. It takes two people to make these adjustments, one to operate the unloader buttons and one to make the adjustments.





 **WARNING**

Setting any relief pressures above 2,800 psi could result in personal injury or machine damage. SSI does not rate the components of the hydraulic system for operation above 2,800 psi.

 **WARNING**

**Burn Hazard.**

Hydraulic fluid and gearbox lubricants can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.

**Allow fluids and lubricants and associated parts to cool before servicing.**

**NOTE:** The system relief pressure is the maximum pressure the hydraulic system can develop before it goes over relief. The operating pressure is the pressure the system develops in normal operation. The pressures are set at the factory and should not need to be adjusted.

1. If there are no gauges on the relief valves already, install a 3,000-psi gauge so that each of the relief valves (un-loaders) has a gauge connected in its circuit.
2. On the HMI, there is SSI only screen that will allow you to set pressure for high and unloader pressure. (see spec's sheet) for unloader pressure and high operating pressure settings and set them according to spec's. SSI screen is password protected and can only be accessed by contacting customer service department at SSI.
3. Start the hydraulic unit. Have an assistant stand by the Panel view.
4. Press unloader 1B button and set the relief to (see spec's sheet), then press unloader button 1A and set the relief to (see spec's sheet).
5. Press unloader 2B button and set the relief to (see spec's sheet), then press unloader button 2A and set the relief to (see spec's sheet).

The system is now set to operate at appropriate settings according to spec's in the operating mode.

**Be sure that all adjustment lock nuts are tight.**

## OVERVIEW

The PLC that controls the Compactor gets data from a number of transducers on the hydraulic system. These electronic transducers and temperature switches must be set correctly any time they are replaced. Refer to the *SSI Customer Service* for assistance on how to set these switches.

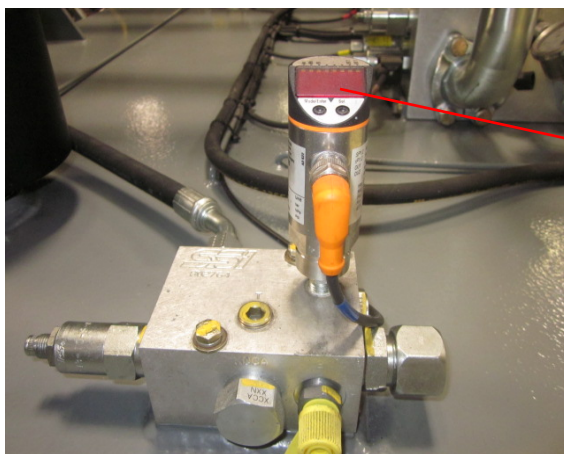
The following illustrations show the locations of all of the cartridges pressure switches and temperature switches on the Compactor.



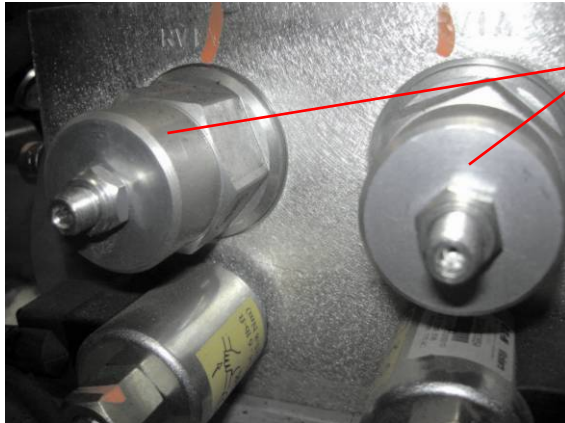
Transducer Switch



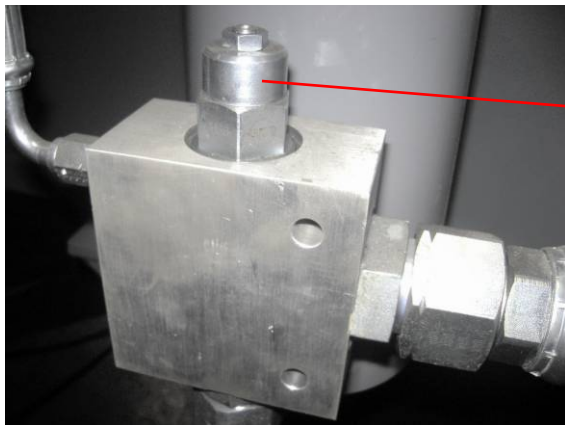
Temp Switch



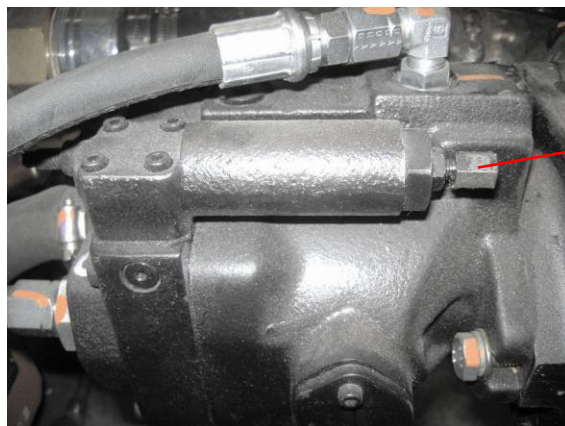
Pilot digital Pressure Gauge



Pressure Relief Cartridges



Gate Holding Cartridge



Pressure Compensator Nut

 **WARNING**

**Burn Hazard.**

**Hydraulic fluid and gearbox lubricants can reach high temperatures during operation. In addition, mechanical components that are in contact with hot fluids and lubricants will also reach high temperatures.**

**Allow fluids and lubricants and associated parts to cool before servicing.**

 **WARNING**

**High Pressure Hazard.**

**Hydraulic system contains high pressure fluid.**

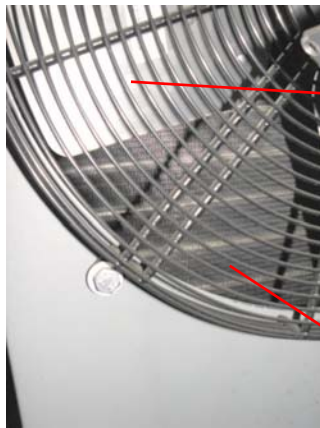
**Follow lock out procedures before servicing.**

## GENERAL

The heat exchanger removes excess heat from the hydraulic fluid by moving air from a fan across the cooling fins of the exchanger. The fan is reversed every 30 minutes of fan operation for 15 seconds. This has the effect of temporarily clearing dust and debris away from the heat exchanger. The openings in all the cores must be kept clean in order for the heat exchanger to work effectively.



Heat Exchanger



Fan Blade

Heat Exchange Cooling Fins

## CLEANING PROCEDURE

1. Shut down and lock out the waste reducer per the Locking Out section of this manual.
2. Using compressed air, clean the heat exchanger cooling fins and pre-filter (if provided) by blowing from the inside of the heat exchanger (fan side) to the outside of the pre-filter.
3. It may be necessary to remove the pre-filter (if provided) and clean both sides of it from time to time. At that time, visually inspect all of the cooling fins for plugging and damage.

Never use a steam cleaner or other wet method unless the unit can be left to dry. Dust sticking and drying onto to any wet areas can degrade the performance of the heat exchanger dramatically.

## LASER PROGRAMING

The IFM laser needs to be programmed to correctly measure the distance to the platen. The following procedure should be followed when installing a new laser.

1. The control power key switch must be 'ON' for the laser to have power. Stop all devices from operation prior to setting the laser.
2. Refer to the chart below for general programming instructions.

1		<p>Press [<b>Mode/Enter</b>] until the <b>requested parameter</b> is displayed.</p>
2		<p>Press [<b>Set</b>] and keep it pressed. The current <b>parameter value flashes</b> for 5 s, then it is <b>increased*</b> (incremental by pressing briefly or scrolling by holding pressed).</p>
3		<p><b>Briefly</b> press [<b>Mode/Enter</b>] (= acknowledgement). The parameter is displayed again, the new <b>parameter value becomes effective</b>.</p>
4	<p><b>Change more parameters:</b> Start again with step 1.</p>	<p><b>Finish programming:</b> Wait for 15 s or press [<b>Mode/Enter</b>] until the current measured value is displayed again.</p>

**Locking / unlocking:**  
The unit can be electronically locked to prevent unwanted adjustment of the set parameters: Press both push buttons for 10s. Indication goes out (= acknowledgement of locking / unlocking).  
Units are delivered from the factory in the unlocked state.

3. Press the MENU / ENTER button until the display reads 'Uni'. If the unit is not set to read in meters "m" showing, press the SET button. Press the MENU / ENTER button until the display reads "m". Press MENU / ENTER to accept the setting.

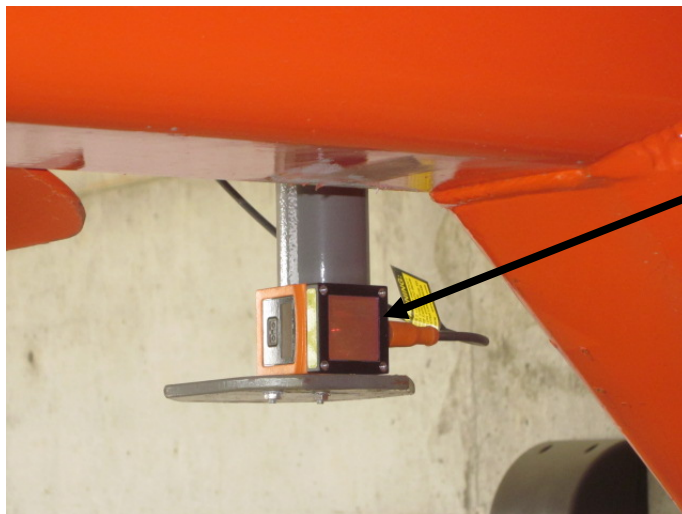
4. Use the process listed in step 3 set the following groups. Press MENU / ENTER to accept each value.

OUI		not used (leave at default setting)
SP1		not used (leave at default setting)
NSP1		not used (leave at default setting)
OU2	I	current output 4-20 mA
ASP	0.61	Analog set point
AEP	32.41	Analog end point
TERC		not used (leave at default setting)
EF		none of the extended functions are used – leave at default value

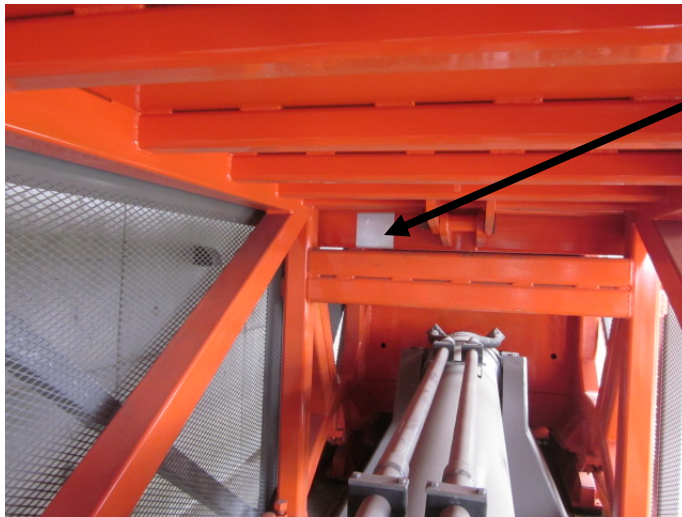
5. After 15 seconds, the laser will return to operational mode. The display will read the current distance to the target in meters.

6. The possible faults displayed during operation are

++	too much light, e.g. reflective surfaces
—	not enough light
far	measured object outside the measuring range > 75 m
near	measured object outside the measuring range < 1 m
SC1	short circuit in switching output 1
SC2	short circuit in switching output 2
SC	short circuit in both switching outputs



Laser measures distance of the platen



Laser target



The platen location is also shown on the touch screen using the laser.





## **PRESSURE SWITCH ADJUSTMENT-PILOT CIRCUIT AND MAIN CIRCUIT**

A programmable pilot pressure switch monitors pilot pressure. The pressure switch senses hydraulic pressure on C-RAM manifold block and E-RAM manifold block, this pilot pressure controls the poppets on both blocks. When the pressure drops below set value, the relay trips, opening (turning off) a circuit on the input side of the PLC.

1. The control power key switch must be 'ON' for the pressure switch to have power. Stop all devices from operation prior to setting the pressure switch.
2. Refer to the chart below for general programming instructions on the pressure switch.
3. Press the MENU / ENTER button until the display reads 'EF'. Press the SET button. Press the MENU / ENTER button until the display reads 'Uni'. Hold the SET button until the display begins scrolling and stop at 'Psi'. Press MENU / ENTER to accept the setting.
4. Using the process listed in step 3 continue to set the rest of the groups under the EF heading: Press MENU / ENTER to accept each value.

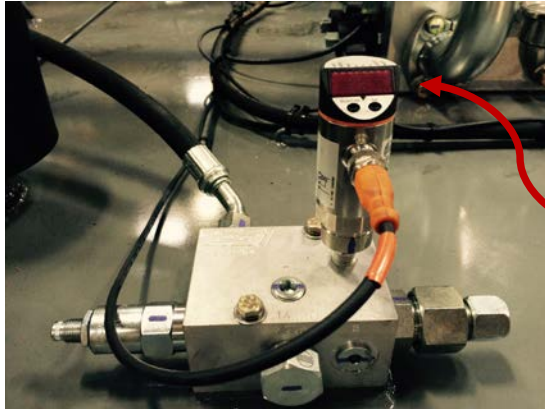
Uni	Psi	Display Units
Hi		Displays maximum recorded pressure (not adjustable)
dS1	0.0	Switch On Delay
dr1	0.0	Switch Off Delay
dS2	0.0	Switch On Delay
dr2	0.0	Switch Off Delay
P—n	PnP	Output Polarity
dAP	60	Display Dampening
diS	d3 or rd3	Display Settings (inverts display)

5. Setting the Pressure set point. Refer to the Unit Specifications page of the service manual for the Overload Pressure Switch setting. Press the MENU / ENTER button until SP1 is displayed. Press and hold the SET button to scroll the to the desired set point. Press MENU / ENTER to accept the value.

6. Using the process listed in step 5, program in the following settings:

SP1	990	Overload Pressure Switch Setting (psi) where XXXX is the Overload Pressure Switch setting shown on the specifications sheet in section 11
rP1	870	Reset setting ( where YYY is 120 psi below Overload Pressure Switch setting)
OU1	Hno	Switch 1 Configuration
SP2	---	Not used – leave default value
rP2	---	Not used – leave default value
OU2	---	Switch 2 Configuration

7. After 15 seconds, the pressure switch will return to operational mode. The display will read the current pressure at the port.
8. For additional information, refer to the vendor literature section of the service manual.

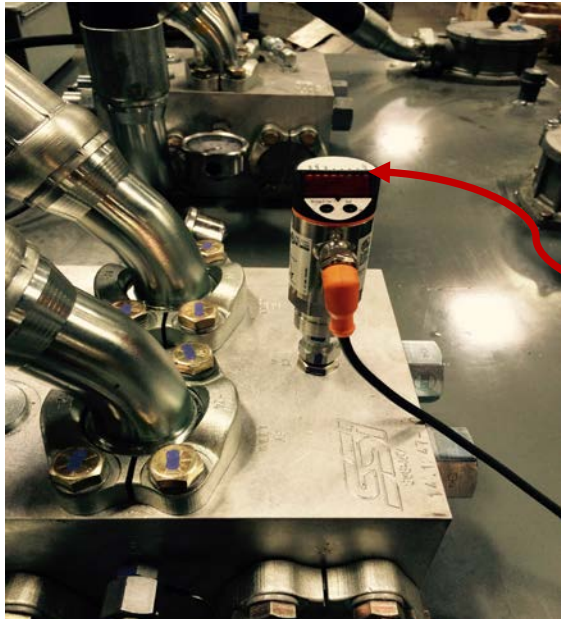


Pilot Pressure Switch

## **PRESSURE SWITCH ADJUSTMENT- MAIN SYSTEM PRESSURE CIRCUIT**

A programmable main pressure switch monitors high pressure, unloader pressure and over pressure. Pressure set points are set on SSI screen on the HMI. No further adjustments need to be set.

The pressure switch located on the compaction manifold at hydraulic power unit. The pressure switch must be set using the procedure outlined in the figure below



Main Pressure Switch  
(high pressure, unloader pressure, over pressure)  
Pressure can be adjusted from SSI Screen on HMI

The pressure switch must be set using the procedure outlined in the figure below, to the values given on the Unit Specifications found in this manual.

1. The control power key switch must be 'ON' for the pressure switch to have power. Stop all devices from operation prior to setting the pressure switch.

2. Refer to the following chart for general programming instructions on the pressure switch.

Programming	
1	<p>Press the <b>Mode/Enter</b> button several times until the <b>respective parameter</b> is displayed.</p>
2	<p>Press the <b>Set</b> button and keep it pressed. The current <b>parameter value flashes</b> for 5s, <b>then the value is increased*</b> (incremental by pressing briefly or scrolling by holding pressed).</p>
3	<p>Press the <b>Mode/Enter</b> button <b>briefly</b> (= acknowledgement). The parameter is displayed again, the set <b>parameter value becomes effective</b>.</p>
4	<p><b>Change more parameters:</b> Start again with step 1.</p> <p><b>Finish programming:</b> Wait for 15s or press the Mode/Enter button until the current measured value is indicated again.</p>

\*Decrease the value: Let the display of the parameter value move to the maximum setting value. Then the cycle starts again at the minimum setting value.

Select the display unit (**Uni**) **before** setting values for the parameters **SPx** and **rPx**. This avoids rounding errors generated internally during the conversion of the units and enables exact setting of the values.  
Setting at the factory: **bAr**.

If no button is pressed for 15s during the setting procedure, the unit returns to the Run mode with unchanged values.

The unit can be electronically locked to prevent unwanted adjustment of the set parameters: Press both pushbuttons until **Loc** is displayed. To unlock: Press both pushbuttons until **uLo** is displayed. Units are delivered from the factory in the unlocked state.  
With the unit in the locked state **Loc** is indicated briefly when you try to change parameter values.



## PROGRAMMING THE PRESSURE TRANSDUCER and PILOT SWITCH

SECTION

5.12

PAGE

4

3. Press the MENU / ENTER button until the display reads 'EF'. Press the SET button. Press the MENU / ENTER button until the display reads 'Uni'. Hold the SET button until the display begins scrolling and stop at 'PSI'. Press MENU / ENTER to accept the setting.
4. Using the process listed in step 3 continue to set the rest of the groups under the EF heading: Press MENU / ENTER to accept each value.

Parameter	Setting	Description
Uni	PSI	Display Units
dS1	0.0	Switch 1 On Delay
dr1	0.0	Switch 1 Off Delay
dAP	60	Display Dampening
diS	d3	Display Setting

5. Setting the Overload Pressure set point. Refer to the Unit Specifications page of the service manual for the Overload Pressure Switch setting. Press the MENU / ENTER button until SP1 is displayed. Press and hold the SET button to scroll to the desired set point. Press MENU / ENTER to accept the value.
6. Using the process listed in step 5, program in the following settings:

Parameter	Setting	Description
SP1	Default	Switch 1 On Point
dS1	Default	Switch 1 Off Point – 120 PSI less than On point
OU1	Default	Output 1 Configuration
OU2	I	Output 2 Configuration

7. After 15 seconds, the pressure switch/transducer will return to operational mode. The display will read the current pressure at the port.
8. For additional information, refer to the vendor literature section of the service manual.

## SCALE SYSTEM IS NOT APPLICABLE TO 2000 MODEL COMPACTOR: Scale System (when available)

The Compactor uses a Hardy Scale System consisting of quantity four (4) 100,000 pound load cells and a scale module. The scale module is located in the control panel, in the PLC rack. The load cells are all wired to a summing box and from there the signal goes to the scale module which converts, calibrates, and transfers the weight data from the load cells to the programmable controller.

To maintain warranty on the scale system, authorized technicians must perform service. Contact SSI for assistance in locating authorized technicians.

**Never cut load cell cables as they are calibrated to the load cell.**

## CALIBRATING THE HARDY SCALE SYSTEM

The entire compactor is supported by four canister type load cells, two mounted in the front and two mounted in the rear. They are placed on the compactors pedestals and are held in place by the load cell pockets on the compactor floor assembly. They are designed to input a weight signal into the compactor's Programmable Logic Controller (PLC) for the function of building a bale of Municipal Solid Waste at a predetermined weight.

The scale system is calibrated at the factory to give the actual weight of the material being feed into the compactor chamber. However, on site scale calibration will be necessary in two of the following circumstances:

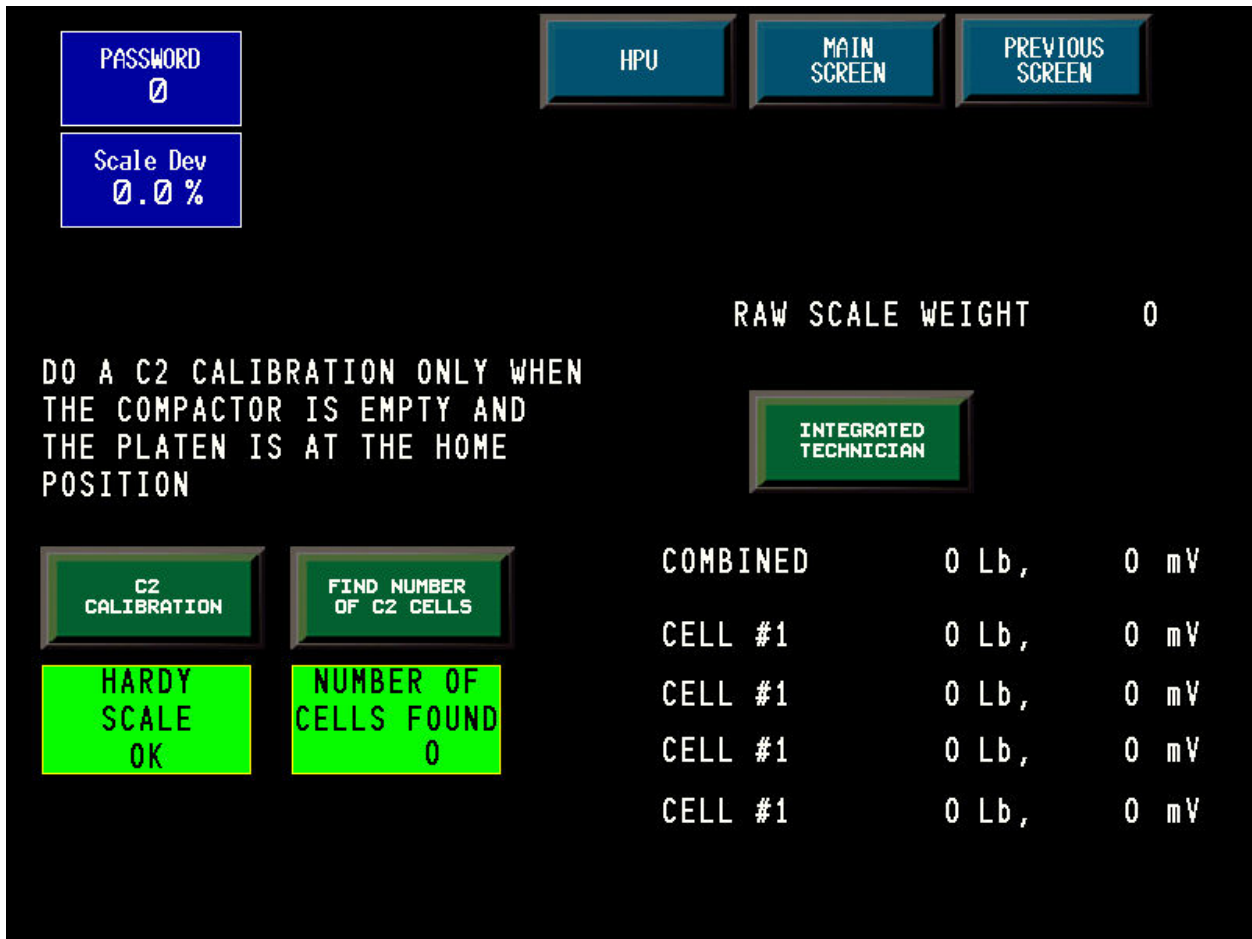
- 1. After Compactor Installation.** Once the compactor has been placed in its position of operation, and all the electrical and hydraulic hose assemblies have been installed, and after the system has been started up and tested, the scales are ready to be "Zeroed" out. The compactor should be free of any material and should not have any extra components of forces applying any weight to the chamber assembly. See the Scale Zero Calibration section below.
- 2. After Any Compactor Modification.** If during any operation or maintenance procedures that have been performed to either add or reduce weight to the compactor chamber, for instance, adding ladder assemblies, etc., the scale system should be "Zeroed" out. Again, care should be taken to insure the compactor is free of any material and should not have any extra components of forces applying any weight to the chamber assembly. See the Scale Zero Calibration section below.

**Scale "Zero" Calibration.** When the scales are ready to be "Zeroed" out, the operator should inspect the compactor chamber assembly to insure that the compactor is free of any material and should not have any extra components of forces applying any weight to the chamber assembly. The platen must be placed in its home position, at 0.0 feet and the operator must also be sure that the load chamber is free on any material and the gate must be down before following this procedure. **A)** Go to Hardy scale screen from NEXT MAINTENANCE SCREEN. **B)** Depress the Find Number of C2 load cell button and make sure that count is 4, next depress integrated technician button and wait for 3-4 seconds after this process depress c2 calibration button once, after few seconds raw scale weight should read 0. The scale system is now at "Zero" for the entire compaction system.

**Bale Weight Calibration.** After the "Zero" calibration is complete for the compaction system, the finished bale weight should be checked to insure the bale weight produced matches the on site truck scales used for trade. Weigh a truck and trailer empty, produce a bale from the compactor and record its weight. Re-weigh the loaded truck and trailer on the scale system used for trade. If the weight of the bale produced equals the weight calculated on the scales for trade, no further calibration is necessary. If the scales vary between the compactor scales and the scales for trade, the following procedure should be followed.

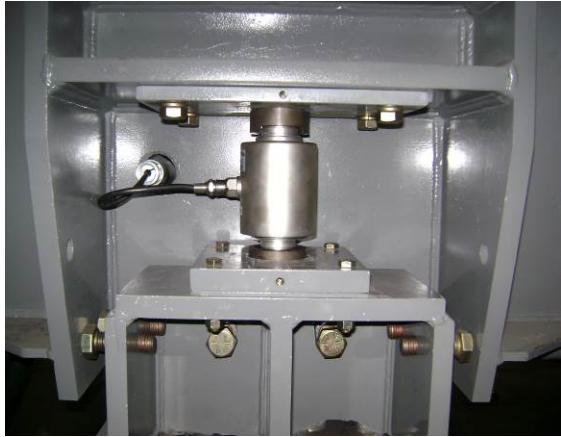


Go to the HMI on the front of the operator control panel. From the main operating screen, touch the maintenance screen then to NEXT MAINTENANCE SCREEN button then select HARDY SCALE. On the upper left hand corner of the screen you will see "Scale Deviation" input. This will allow you to "Adjust" the scale reading to the PLC for the calculation of the bale weight produced. Touch the button labeled "Password", and then enter the four digit numerical password. Once accepted, the password button will be active for several seconds as the "Scale Deviation" factor is entered. The "Scale deviation" factor will change the scale input to the PLC by the percentage entered. For example: If the desired bale weight is 60,000 lbs. and the compactor builds a 60,000 lbs. bale but when it is weighed on the scale for trade at 59,400 lbs. a deviation factor should be entered. In this case a positive 1% deviation factor should be entered as 1.0 for the "Scale Deviation" number. The scale input to the PLC will now be matched to the on site "Legal for Trade" scale system.





Summing box where all load cells are connected.



Load cell, there are two on each end of the compactor



Hardy module for the scale system

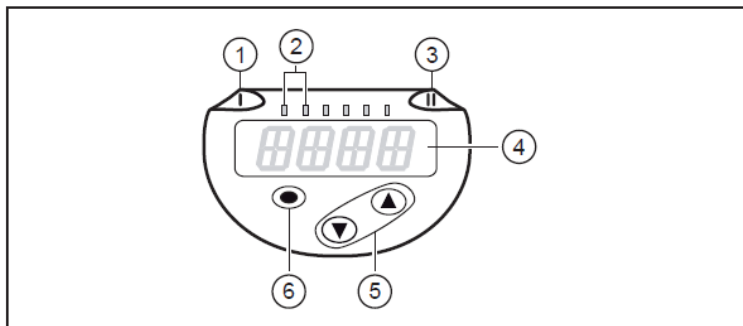
## TEMPERATURE SWITCH / TRANSDUCER ADJUSTMENT

The hydraulic oil temperature is monitored by a combined temperature switch / transducer. The transducer sends an analog signal indicating tank temperature to the PLC. The PLC uses this to determine when to allow operation and control the fan speed. When the temperature exceeds the shutdown value, the switch contacts open (changing the state of a PLC input). On this signal, the controller turns off the processing of material due to hot oil temperature.

The temperature switch / transducer is located on the side of the reservoir on the Hydraulic Power Unit.

1. The control power key switch must be 'ON' for the temperature switch / transducer to have power. Turn off the motors prior to setting the device.
2. Refer to the chart below for general programming instructions.

### 6 Operating and display elements



#### 1, 2, 3: Indicator LEDs

- LED 1 = switching status OUT1 (lights if output 1 is switched)
- LED 2 = temperature in the indicated unit of measurement
- LED 3 = no function

#### 4: Alphanumeric display, 4 digits

- Display of current temperature in red or green colour.
- Display of the parameters and parameter values.

#### 5: Buttons up [▲] and down [▼]

- Select parameters
- Change parameter values (hold button pressed)
- Change of the display unit in the normal operating mode (RUN mode)
- Locking / Unlocking (press buttons simultaneously > 10 seconds)

#### 6: Button [●] = Enter

- Change from the RUN mode to the main menu
- Change to the setting mode
- Acknowledge the set parameter value

#### Locking / unlocking:

The unit can be electronically locked to prevent unwanted adjustment of the set parameters: Press both push buttons for 10s. Indication goes out (= acknowledgement of locking / unlocking).

Units are delivered from the factory in the unlocked state.





# TEMPERATURE AND PRESSURE TRANSDUCERS

SECTION

5. 13

PAGE

2

3. Change the units to degrees Fahrenheit to complete the following procedure. If Celsius is the preferred units, change back to Celsius after configuring the unit.

To adjust the units to °F:

- 1) Press the ENTER to get to the Menu
- 2) Press the DOWN ARROW / UP ARROW button until the display reads 'EF'.
- 3) Press the ENTER button.
- 4) Press the DOWN ARROW / UP ARROW button until the display reads 'Uni'.
- 5) Press Enter to select the parameter.
- 6) Hold the DOWN ARROW or UP ARROW button until the display stops flashing.
- 7) Press the DOWN ARROW / UP ARROW button until the display shows '°F'.
- 8) Press ENTER to accept the setting.
- 9) After 15 seconds, the Temperature Switch will return to operational mode. The display will read the current temperature at the port.

4. Use the ENTER and DOWN ARROW / UP ARROW buttons (similar to the adjustment of the units) to adjust the parameters to the settings listed below.

SP1	170 °F	Hot oil set point
rP1	140 °F	Hot oil reset point
ASP2	0	zero point of analog signal Deg F - (I.e. 4mA=0 deg F)
AEP2	200	full scale of analog signal Deg F - (I.e. 20mA=200 deg F)
EF		Extended functions (press ENTER to enter this menu to access the rest of the parameters)
rES	---	Restore to factory settings – do not use!
OU1	Hnc	Switch 1 Configuration
OU2	I	4-20mA current output
dS1	0.0	Switching delay (default value)
dr1	0.0	Switching delay (default value)
FOU1	default*	not used
FOU2	default*	not used
Uni	°F	Temperature units
P-n	PnP	PnP for sinking inputs on PLC
Lo		Displays minimum recorded temperature hold ENTER to clear
Hi		Displays maximum recorded temperature hold ENTER to clear
dAP	default*	not used
dAA	default*	not used
CoF	default*	not used
coLr	default*	not used
diS	d3 or rd3	Display normal or rotated 180 degrees

5. After 15 seconds, the Temperature Switch will return to operational mode. The display will read the current temperature at the port.

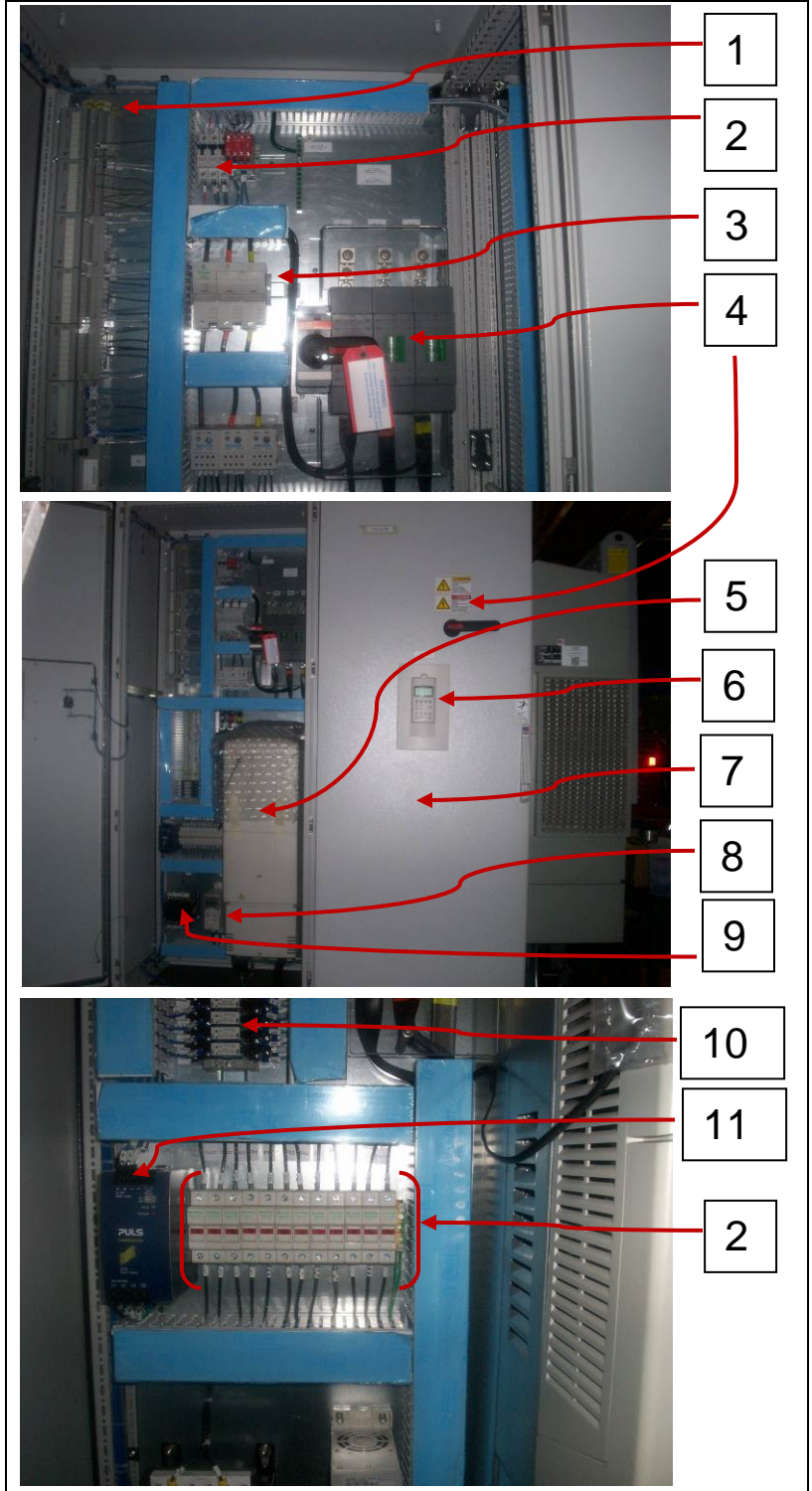
For additional information, refer to the vendor literature section of the service manual.

Your SSI product manual contains the following abbreviations and common terms used through out the manual. Some of the terms may not apply to your compaction system.

**TERMS YOU WILL NEED TO KNOW**

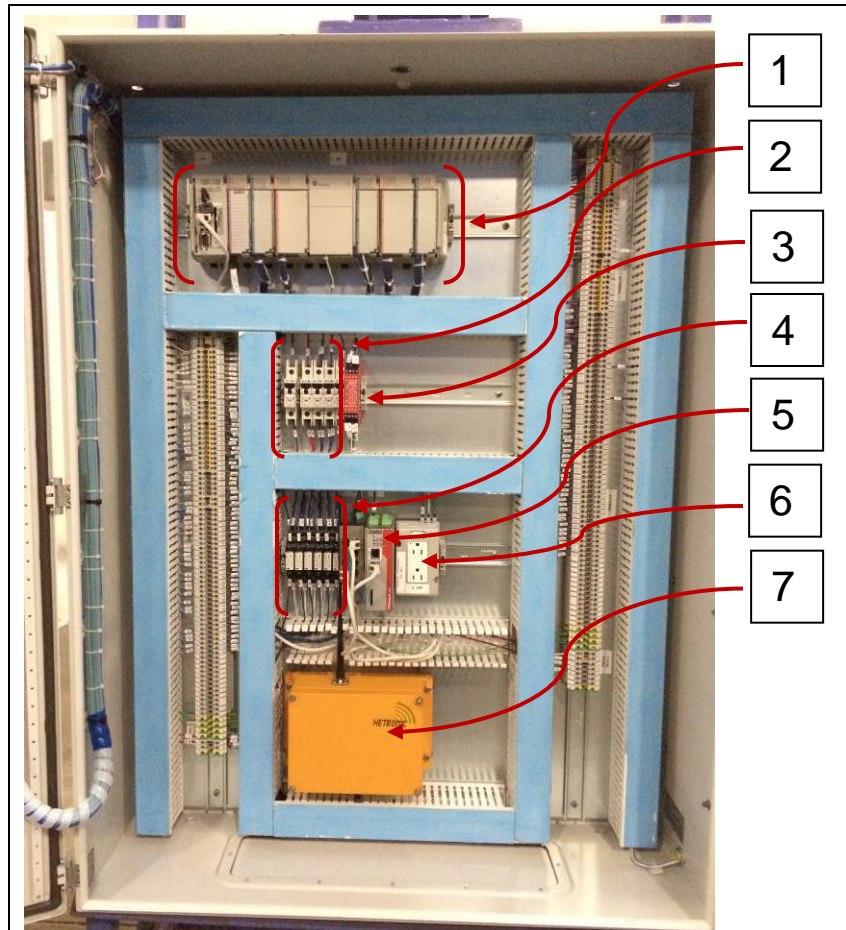
**MAIN PANEL COMPONENTS**

1. I/O Base
2. Breakers
3. Fuse Holders
4. Main Panel Disconnect Switch/s
5. #1 Motor VFD DRIVE
6. VFD DRIVE KEY PAD
7. #2 Motor VFD DRIVE
8. Oil Cooler Motor VFFD DIRVE
9. Relay Coils
10. Transformer
11. Power Supply

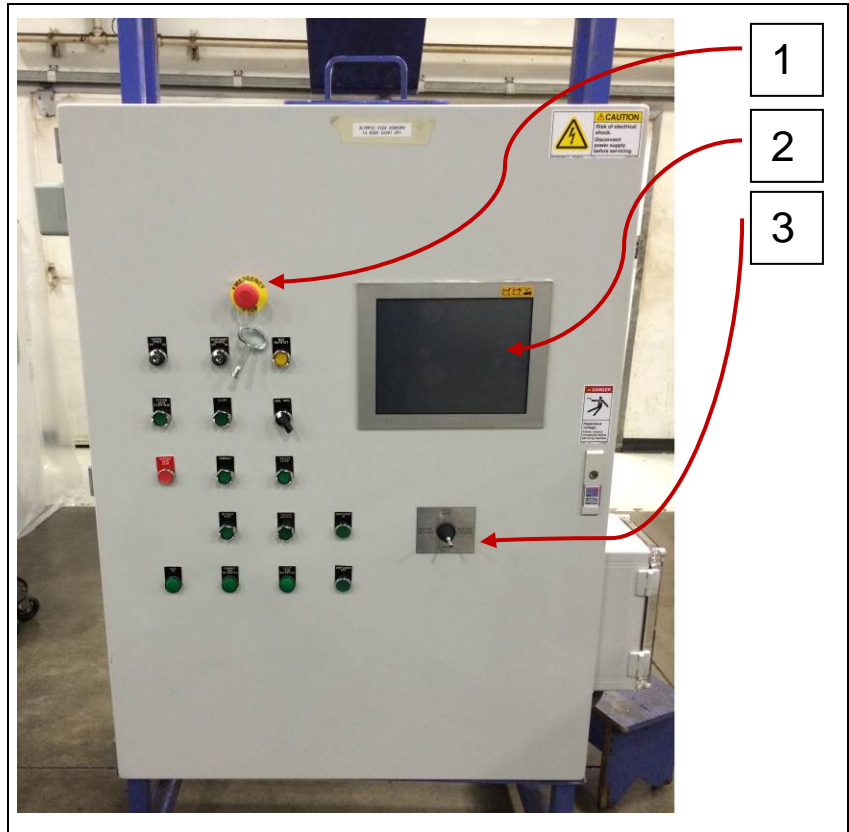


## CONTROL PANEL COMPONENTS

1. PLC programmable logic control
  - a. POWER SUPPLY
  - b. PROCESSOR - SLC 5/03 W/12K
  - c. MODULE - REMOTE I/O SCANNER
  - d. MODULE - WEIGHT SCALE
  - e. MODULE - 16x110VAC INPUT
  - f. MODULE - 16xRELAY OUTPUT
  - g. MODULE - 4XANALOG INPUT
2. CIRCUIT BREAKERS - 15 AMP
3. SAFETY RELAY
4. RELAY COILS
5. MGuard RS2000TX MODEM
6. MODEM - KIT, ETHERNET
7. RADIO CONTROL SYSTEM - 12 CHANNEL
8. CHARGING STATION FOR TRANSMITTER BATTERY  
(Located just outside the CP panel)



1. E-STOP (emergency stop)
2. HMI touch screen
3. JOY STICK OPERATOR - 4 POS

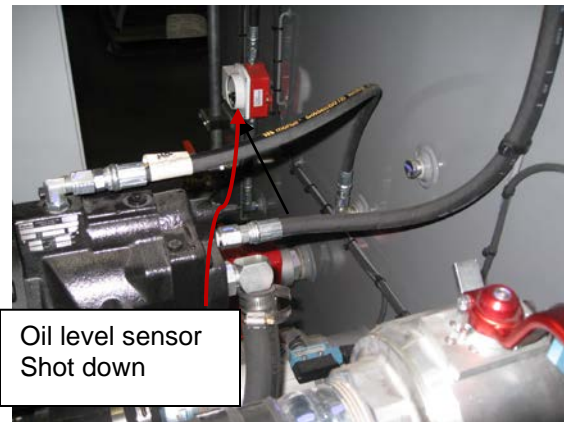
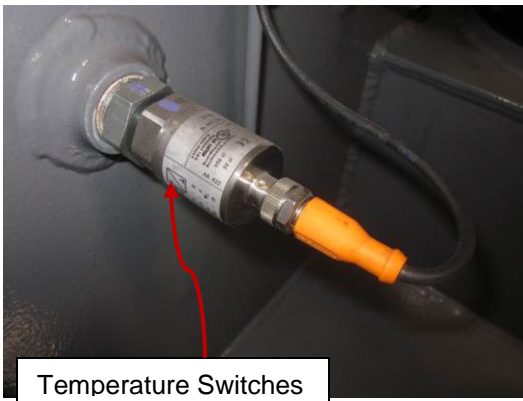
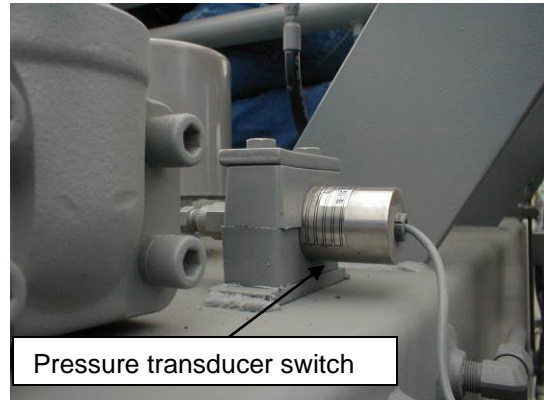
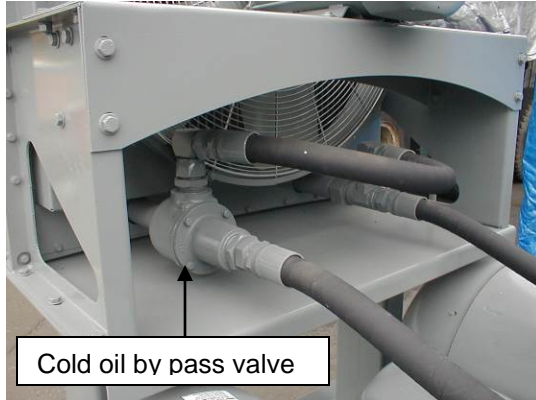
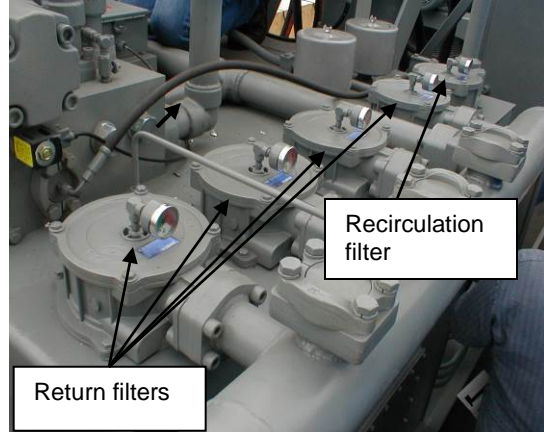
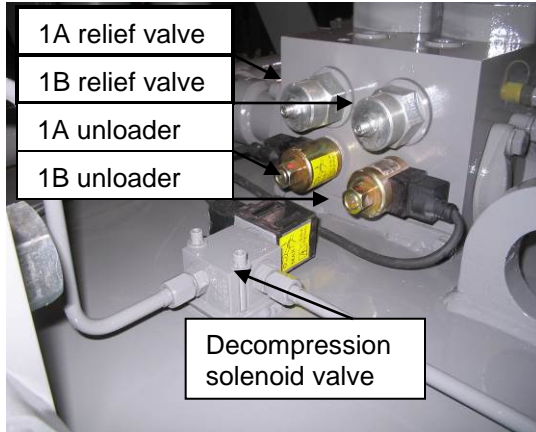


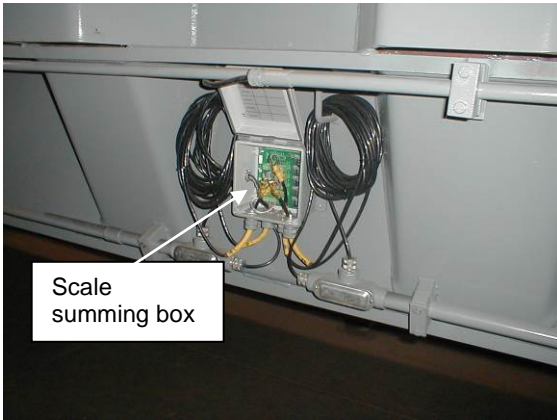
## LASER COMPONENTS

1. LASER - DISTANCE MEASURING
2. LASER - TARGET

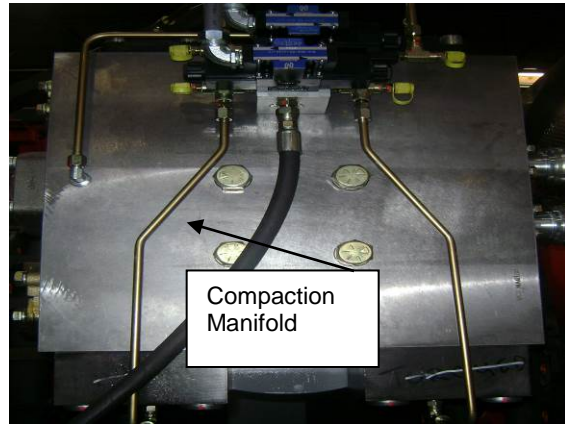


HPU COMPONENTS

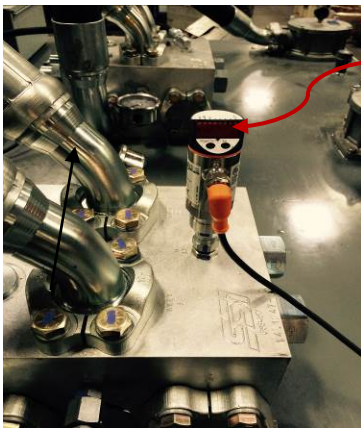




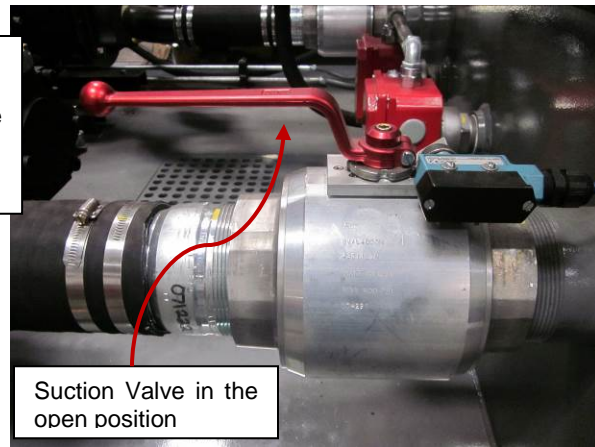
Scale summing box



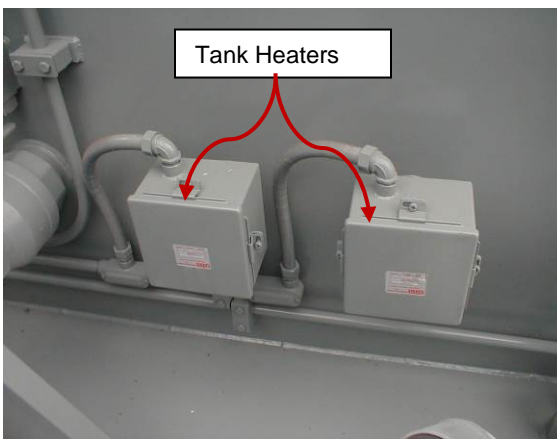
Compaction Manifold



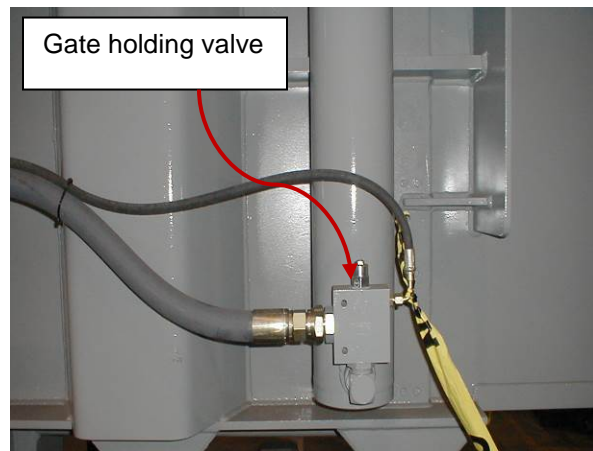
System transducer, Pressures are set on HMI touch screen



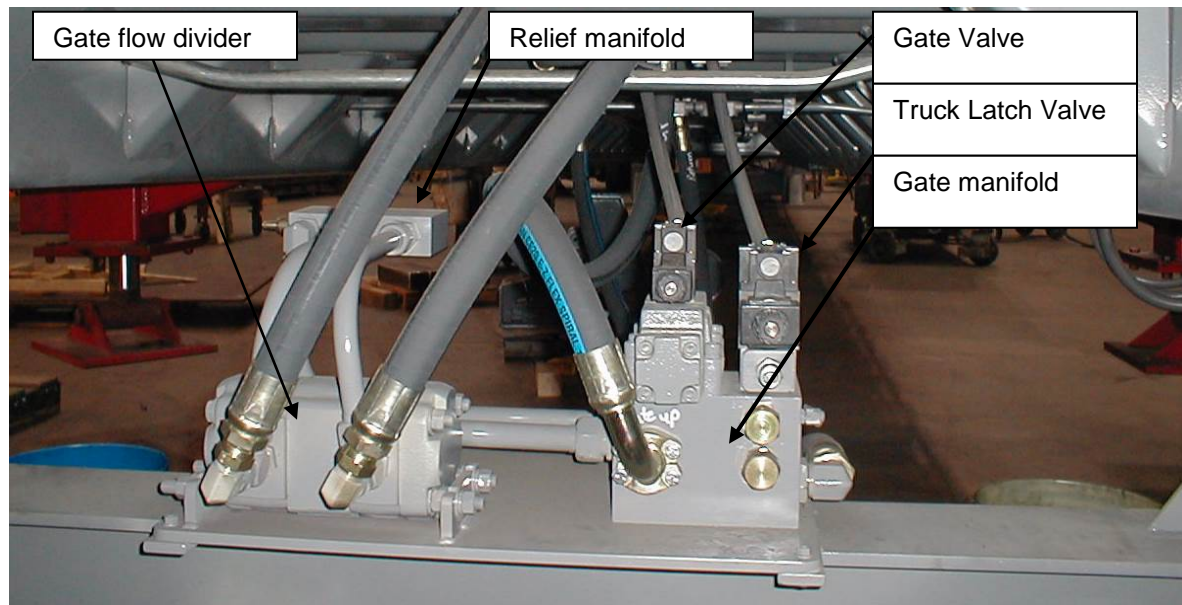
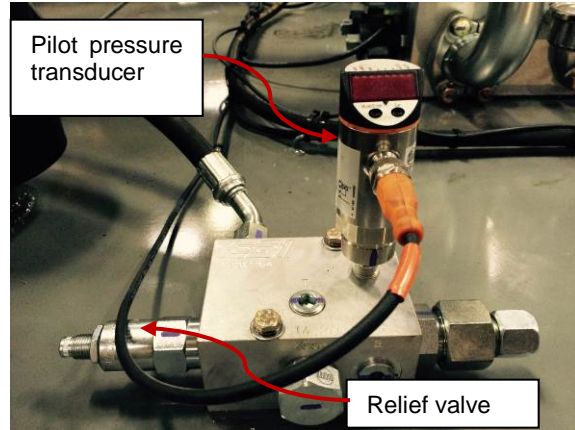
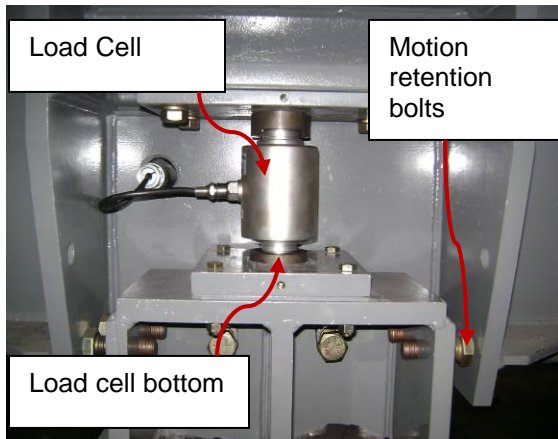
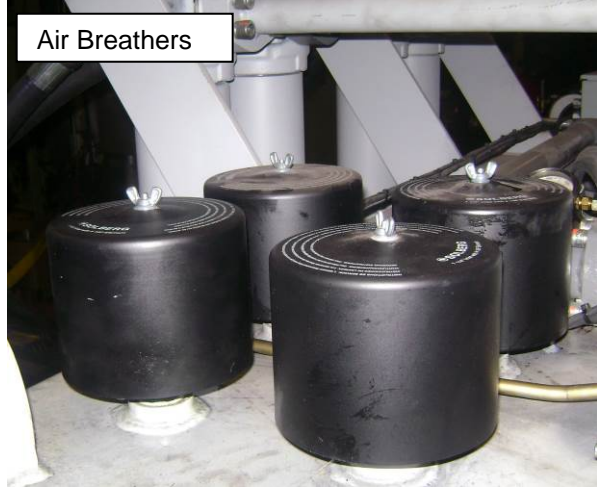
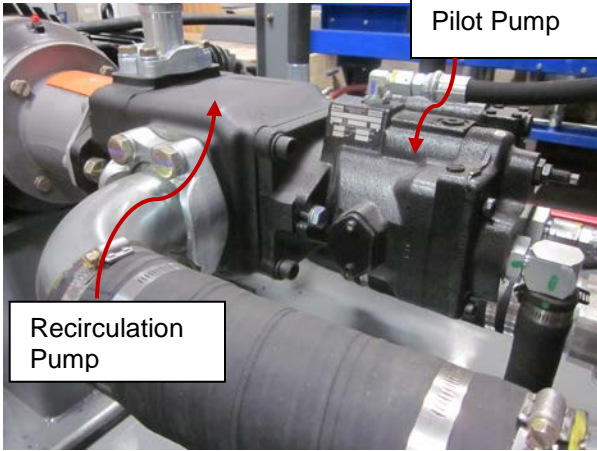
Suction Valve in the open position



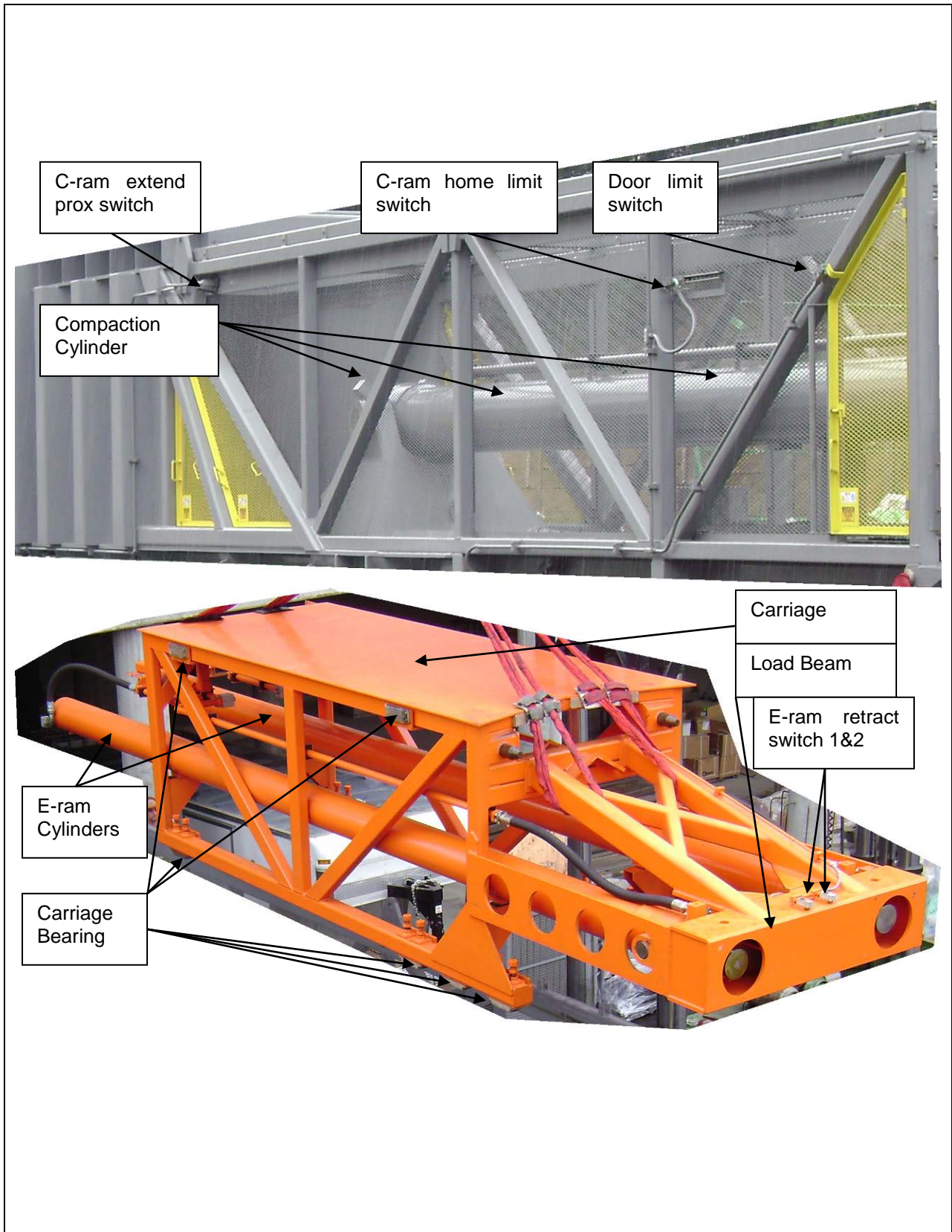
Tank Heaters

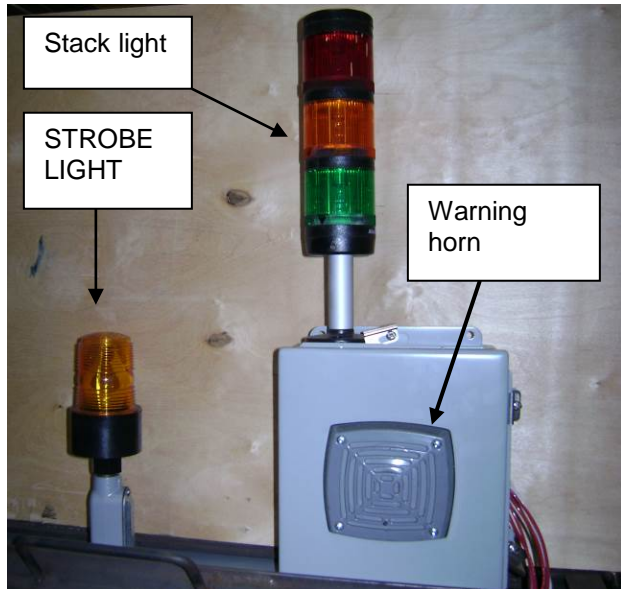
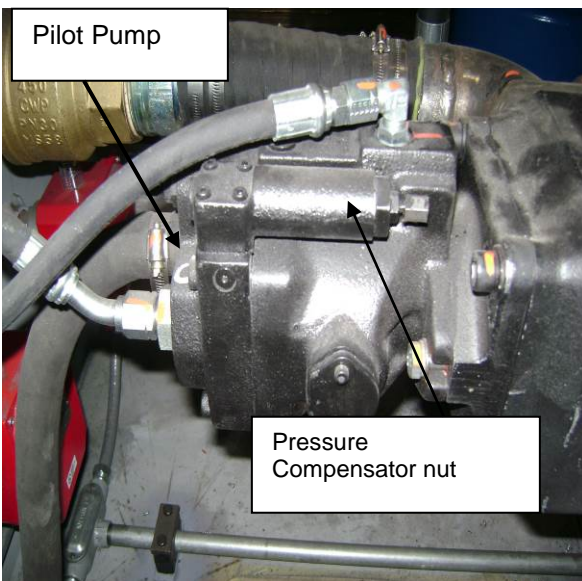
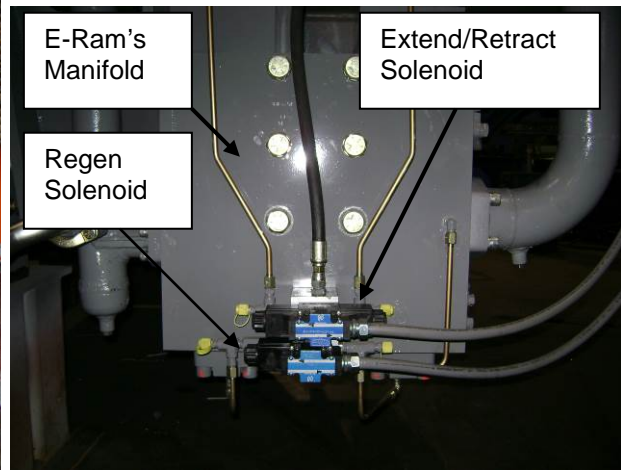
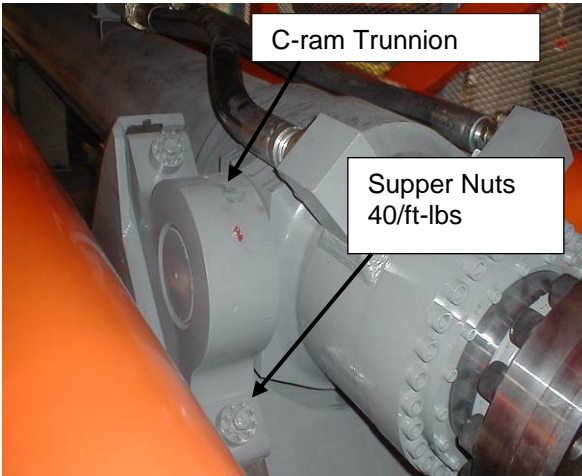


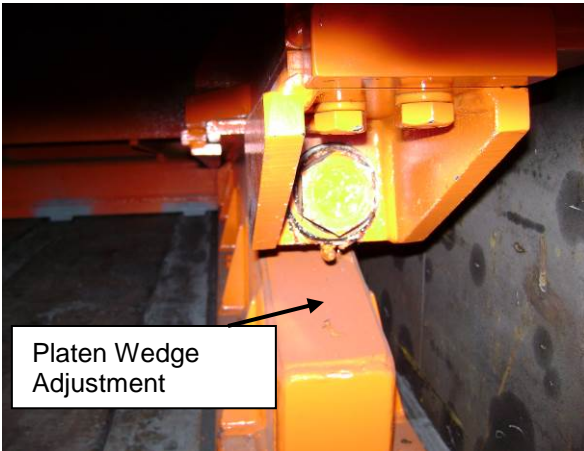
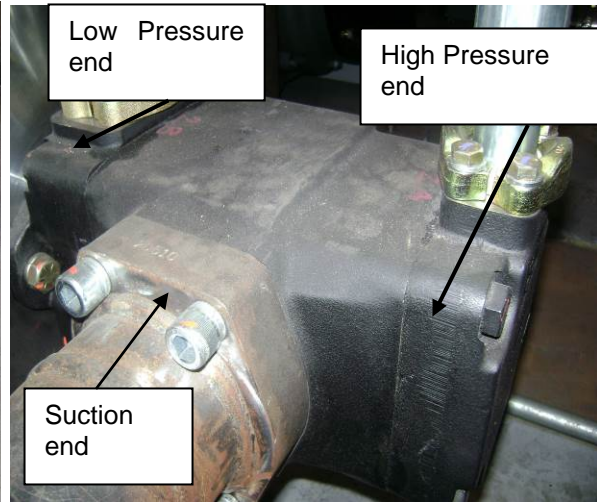
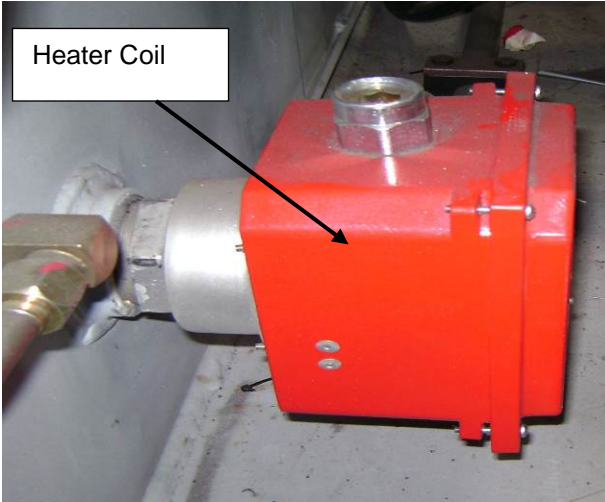
Gate holding valve













**SECTION 6 CONTENTS  
TROUBLESHOOTING**

SECTION	PAGE
6.0	1

CONTENTS	6.0
TROUBLESHOOTING TABLE	6.1



This Troubleshooting table is intended to provide assistance in solving common machine problems. If additional assistance is needed, contact SSI Customer Service.

<b>Hydraulic Power Unit Fails to Start After Pushing START/RUN Button</b>	
<b>Cause</b>	<b>Correction</b>
Emergency Stop Button Pushed	Check all emergency stop buttons to make sure they are pulled out.
Key Switch	Check key switch to make sure it is turned ON.
Radio Emergency Stop	Reset Radio Emergency Stop
Access Doors	Make sure all access doors are closed.
VFD NOT IN REMOTE MODE SEE PICTURE FOR REFERENCE SECTION 5.11	The local/remote button on the VFD keypad has been pressed, placing the VFD in Local mode. (An "L" appears in the upper left corner of the keypad display. Press the local/remote button to return to remote mode. For future assistance see section 12 for additional information.
Fuses / Circuit Breakers	Check for blown fuses, check overload relays, tripped circuit breakers. Replace / reset as necessary.
HPU Oil Level	Check for HYDRAULIC OIL LOW indication on the Operator Interface Panel. Add oil if necessary.  Check oil level sensor for proper operation.
HPU Suction Valves	Make sure large valve between oil reservoir and pump is fully open (handle in-line with hose).  Check valve handle limit switch for proper operation.
Oil Too Hot	Simply allow the oil in the HPU unit to cool down
Programmable Controller	Check wire connections on the programmable controller. Tighten / replace as necessary. Check LED indicators to determine if a signal is being received from the necessary inputs. Refer to the <i>Electrical Schematic</i> .

<b>Truck Latch Malfunction (if present)</b>	
<b>Cause</b>	<b>Correction</b>
Truck mis-aligned with compactor (manual or hyd type)	Make sure truck is aligned.
Bumper Bar on truck damage or wrong type (manual or hyd type)	Consult SSI for proper truck latch construction.
Latch selector pushbuttons defective (hyd type)	1. Check latch unlatch pushbuttons at operator's control panel. 2. Check related wiring. ( <i>See electrical schematic</i> ).
Latch Up/Down solenoid defective (hyd type)	Check electrical circuit and solenoid, repair and/or replace as needed.
Unloader 1A or related circuitry malfunctioning (hyd type)	1. Check electrical circuit and solenoid on the unloader 1A. 2. Check unloader valve, replace if defective. 3. Check the relive valve, replace if defective.

**High Fluid Temperatures (above 150°F)**

<b>Cause</b>	<b>Correction</b>
Oil cooler fan not operating	<ol style="list-style-type: none"><li>1. Check thermostat input light (check on PLC input screen). If light is not on, have a qualified electrician check thermostat and wiring. If light is on, go to next step.</li><li>2. Check cooler fan output light (check on PLC output screen).<ol style="list-style-type: none"><li>a. If the light is not on, have a qualified electrician check the circuit breaker, motor-starter overloads, and output module fuse.</li></ol></li><li>3. Check the cooler fan motor for damage or overheating.</li></ol>
Oil cooler airflow restricted	<ol style="list-style-type: none"><li>1. Louvers must be fully open.</li><li>2. Clean or blow off heat exchanger coils. Refer to Section 5.7.</li><li>3. Remove any object stored in immediate path of fan airflow.</li></ol>
Air temperature in the HPU room is above 100°F	Provide adequate ventilation.
Circulating Pump	Check and make sure circulating pump is functioning properly.

**Discharge Gate will not go up**

<b>Cause</b>	<b>Correction</b>
Load READY not ON	Make sure that the load is complete and load ready light is on
Truck latch is not latched	Make sure truck hook is leached and light is solid green
Local/Radio switch	Make sure Local/Radio switch is in Local.
Gate up proximity switch is active or damaged.	Check Gate Up proximity switch. Input must be OFF, check Input Screen. Replace if necessary.
Gate Up solenoid defective.	Check electrical circuit and solenoid, repair and/or replace as needed.
Unloader 1A or related circuitry malfunctioning.	<ol style="list-style-type: none"><li>1. Check electrical circuit and solenoid on the unloader 1A.</li><li>2. Check unloader valve, replace if defective.</li><li>3. Check the relive valve, replace if defective.</li></ol>

**Discharge Gate will not go down**

<b>Cause</b>	<b>Correction</b>
Local/Radio switch	Make sure Local/Radio switch is in Local.
Gate down proximity switch is active or damaged.	Check Gate down proximity switch. Input must be OFF, check Input Screen. Replace if necessary.
Gate Down solenoid defective.	Check electrical circuit and solenoid, repair and/or replace as needed.
Platen is fully extended	Make sure that the platen is past the gate at least four feet.
Unloader 1A or related circuitry malfunctioning.	<ol style="list-style-type: none"><li>1. Check electrical circuit and solenoid on the unloader 1A.</li><li>2. Check unloader valve, replace if defective.</li><li>3. Check the relive valve, replace if defective.</li></ol>



## TROUBLESHOOTING

SECTION

6.1

PAGE

3

### Platen Will Not Retract In Manual Mode

<b>Cause</b>	<b>Correction</b>
Local/Radio switch	Make sure Local/Radio switch is in Local.
Platen separation, limit switch not closed	1. Check proximity switches 2. Check for objects on the platen and carriage joint should be closed on panel and PLC Input Screen.
Home limit switch actuated or damaged	Check Home Limit switch. Home Limit must be OFF, check the Input Screen.
Valves not functioning	Ensure solenoids and directional valves are working.
Cold Oil	Ensure that oil temp is 67° or above.

### Platen Will Not Extend in Manual Mode

<b>Cause</b>	<b>Correction</b>
Cold Oil	Ensure that oil temp is 67° or above.
C-ram extend switch is actuated or damaged	Check C-ram extend switch.
Gate is not up all the way	1. Ensure gate up light is on, on the control panel. 2. Ensure gate up prox switch is functional.
Valves not functioning	1. Check for defective solenoids. To check the unloader solenoids switch to MAINTENANCE mode and jog the unloaders. To check the solenoids on the extend/retract, manually extend the joy stick that will energize the solenoid, hold a screwdriver or other ferrous metal near the end of the solenoid it will magnetized. If not replace solenoid. 2. If all solenoids are good, Need to check the valves on the related circuitry.
Local/Radio switch	Make sure Local/Radio switch is in Local.

### Platen Will Not Eject Load

<b>Cause</b>	<b>Correction</b>
Stuck Load	Ensure wet and dry garbage are being mixed to allow lubrication to chamber. Carpet, roofing and metal should be pushed in low on the charge.
Gate up prox switch	1. Ensure gate up light is on, on the control panel. 2. Ensure gate up prox switch is functional.
Load READY not ON	Make sure the load is complete.

### Laser Faults

<b>Cause</b>	<b>Correction</b>
Laser will not read distance	1. Check laser alignment. 2. Check laser target that there is no obstruction. 3. Check laser lens, wipe with damp towel. 4. Check laser make sure it's functional. a. Check fuse on power supply.

**Platen Will Not Extend in Auto Mode**

<b>Cause</b>	<b>Correction</b>
Maintenance override selector-switch is in on position.	Make sure that the maintenance override selector-switch is in off position.
System auto start/run push button is not engage.	Make sure system auto start/run is engaged.
Hopper target weight is not met	Make sure that the target weight is met
Gate is not down all the way or damaged proximity switch	1. Make sure gate is all the way close. 2. Check down proximity switch.
C-ram extend switch is actuated or damaged	Check C-ram extend switch.
Valves not functioning	1. Check for defective solenoids. To check the unloader solenoids switch to manual mode and jog the unloaders. To check the solenoids on the extend/retract, manually extend the joy stick that will energize the solenoid, hold a screwdriver or other ferrous metal near the end of the solenoid it will magnetize. If not replace solenoid. 2. If all solenoids are good, Need to check the valves on the related circuitry.
Bad communication	Ensure inputs are being made.

**Platen Will Not Retract In Auto Mode**

<b>Cause</b>	<b>Correction</b>
Maintenance override selector-switch is in on position.	Make sure that the maintenance override selector-switch is in off position.
System auto start/run push button is not engage.	Make sure system auto start/run is engaged.
Platen separation, if not retracting past 28' feet.	1. Check proximity switches 2. Check for objects on the platen and carriage joint.
Platen separation, limit switch not closed	1. Check proximity switches 2. Check for objects on the platen and carriage joint should be closed on panel and PLC Input Screen.
Home limit switch actuated or damaged	Check Home Limit switch. Home Limit must be OFF, check the Input Screen.
Valves not functioning	Ensure solenoids and directional valves are working.
Bad communication	Ensure inputs are being made.

**Hydraulic Power Unit Shut Downs**

<b>Cause</b>	<b>Correction</b>
Oil too hot	Refer to Heat Exchanger Maintenance.
Radio Emergency Stop	Reset Radio Emergency Stop.
HPU low oil shut down	Check oil level, have maintenance personnel add oil to an acceptable level. NOTE: Check oil at home position.
Circulating Pump – pilot pressure low	Check and make sure circulating pump is functioning properly and pressure switch is functional.



**Main Motors Will Not Start**

<b>Cause</b>	<b>Correction</b>
Pilot Pressure not up to pilot pressure switch	Ensure pilot pressure gauge is reading 1800psi, as this needs to be met to allow start up.
Pilot Pump	Ensure that pilot pump is functioning properly.
Radio Emergency Stop	Reset Radio Emergency Stop.
VFD NOT IN REMOTE MODE SEE PICTURE FOR REFERENCE SECTION 5.11	The local/remote button on the VFD keypad has been pressed, placing the VFD in Local mode. (An "L" appears in the upper left corner of the keypad display. Press the local/remote button to return to remote mode. For future assistance see section 12 for additional information.
Blown Fuses - tripped motor overload relay	Inspect related fuses, check overload relay.
Suction Fault	Ensure suction valves are open and making limit switches.
Breaker tripping	Motor failure, have a qualified electrician inspect the motor for faults.

**Pump Noise/Motor Noise**

<b>Cause</b>	<b>Correction</b>
Bad pump section	Replace pump or cartridge.
Love-Joy Coupling Problem	Pull orange inspection cover and rotate and inspect.
HPU low oil	Check oil level, have maintenance personnel add oil to an acceptable level. Troubleshoot low oil switch.
Low Volume flow	Inspect pressure filters for obstruction or collapse.
Case Drain	On pilot pump ensure oil level is high or full enough that pump case cannot syphen off overnight.
Motor Bearings bad	Replace Bearings.

**Desired Hydraulic Pressure Not Obtained**

<b>Cause</b>	<b>Correction</b>
Relief Cartridge	Make sure relief valves have correct pressure settings.
Sticking Poppit	Apply gauges to puppets gauge ports and monitor pressure.
Extend/Retract valve	Make sure that the valve is not sticking.
Worn packing on the cylinders Head Gland or Piston seals	Check mileage or check for leaks around head gland. Rebuild Cylinders as need. Call SSI Customer Service for assistance
Pump Failure	Inspect and Replace pump or cartridge sections.

**Radio Will Not Work (if present)**

<b><i>Cause</i></b>	<b><i>Correction</i></b>
Local/Radio switch	Make sure Local/Radio switch is in Radio.
Battery	Make sure battery is fully charged, if not, charge or replace.
Radio Emergency Stop activated	Pull up to reset.
Antenna damaged or not installed properly.	Inspect antenna for any damage, including shorts, opens, and improper grounds.
Radio Remote Control Unit	Ensure Radio Control Unit has power, check fuses and be sure buttons are working properly.
Receiver Control Unit	Replace Receiver/Decoder board. Ensure Radio Control Unit has power, check fuses and be sure buttons are working properly. Call SSI Customer Service for assistance.

**Control Power Fuses Blowing**

<b><i>Cause</i></b>	<b><i>Correction</i></b>
Damaged cable in hose track	Replace cable in hose track.
Water in J-Boxes / panel	Remove water and dry components.

**Scales not Reading Correctly (if present)**

<b><i>Cause</i></b>	<b><i>Correction</i></b>
Load chute jammed material	Remove material.
Load cell cable damaged.	Replace load cell.
Scale not calibrated	Contact SSI Customer Service.
Water/moisture in summing box	Dry with hair dryer
Bad load cell	Contact SSI Customer Service.

	<b>SECTION 10 WARRANTY</b>	<b>SECTION</b> 10.0	<b>PAGE</b> 1
---	--------------------------------	------------------------	------------------

**LIMITED WARRANTY** 10.1

**WARRANTY SIGN-OFF REQUIREMENTS** 10.2

**WHO IS COVERED.**

This Limited Warranty applies only to the entity who first bought the Equipment from SSI Compaction Systems, a division of SSI Shredding Systems, Inc. (SSI) or its authorized agents.

**WHAT IS COVERED.**

This Limited Warranty covers only Equipment both manufactured and supplied by SSI or its authorized agents. It does not cover consumable items such as fluids, filters, seals, wear strips, bearings, knives, cutters, cleaning fingers, belts or wiper blades.

SSI warrants that at the time of shipment, the Equipment is free from all defects in design, materials, and workmanship and that it will perform in accordance with the specifications or performance standards, if any, agreed to in writing between SSI and the original purchaser.

SSI does not warrant that the operation of any Equipment will be uninterrupted or maintenance free, or that repairs will not be required in the ordinary course of the Equipment's use during the warranty period.

Unless specifically agreed to in writing, SSI does not warrant particle size, throughput rates or capacities of Equipment.

ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXCLUDED. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

IN ALL CASES SSI SHALL HAVE NO LIABILITY FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, WHETHER ARISING IN TORT, CONTRACT, STRICT LIABILITY OR PURSUANT TO ANY STATUTE, EVEN IF SSI OR ITS AGENT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SSI'S LIABILITY UNDER THIS LIMITED WARRANTY IS LIMITED TO A REFUND OF THE PURCHASE PRICE OF THE EQUIPMENT ACTUALLY RECEIVED BY SSI, IN ACCORDANCE WITH "REMEDIES" HEREAFTER. ANY CLAIM AGAINST US, WHETHER UNDER THIS LIMITED WARRANTY, IN TORT, CONTRACT, STRICT LIABILITY OR PURSUANT TO ANY STATUTE OR OTHERWISE, SHALL BE BROUGHT WITHIN ONE (1) YEAR FROM THE DATE WHEN THE CLAIM ARISES OR ONE YEAR AFTER THE EXPIRATION OF THIS LIMITED WARRANTY, WHICHEVER FIRST OCCURS, OR SHALL BE FOREVER BARRED.

**WHAT WILL VOID THE WARRANTY.**

At the option of SSI this Limited Warranty will be void if any of the following occur:

1. Failure to follow installation, storage, maintenance or operating instructions, accepted industry practices, or safety precautions.
2. Repairs, alterations or modifications to the Equipment by anyone other than an authorized factory representative of SSI, unless SSI's prior written approval is obtained.
3. Installing replacement components not manufactured or authorized by SSI without SSI's prior written authorization.
4. With regard to the main compaction cylinder and any ejection cylinders, failing to follow the 1, 2, 3 and 5 of this section and failing to follow the three requirements applicable solely to the those cylinders as set forth in the following paragraph.
5. Failure to timely complete and return to SSI the required warranty maintenance forms as specified in SSI's maintenance and operating instructions.
6. Failure to install components or to otherwise modify the Equipment as may be recommended or required by SSI from time to time.

	<b>LIMITED WARRANTY</b>	SECTION 10.1	PAGE 2
---	-------------------------	-----------------	-----------

## HOW LONG IS THE WARRANTY PERIOD.

Except for the main compaction cylinder and any ejection cylinders, this Limited Warranty is for a period of twelve (12) months from the date of installation of the Equipment and commencement of initial testing or 4,000 hours of use or fourteen (14) months from the date SSI notifies you that the equipment is ready to ship, whichever first occurs. Repairs to or replacement of the Equipment under this Limited Warranty will not extend the warranty period.

*Only so long as all other conditions of this Limited Warranty and the following three additional requirements are strictly followed at all times, the main compaction cylinder and any ejection cylinders shall be covered by this Limited Warranty for a total of two (2) years or 4,000 hours or eight (8) million linear feet of rod travel, whichever occurs first:*

1. Hydraulic oil must be analyzed for any foreign materials and any chemical break down every 750 hours of operation. Copies of the inspection results and analysis must be sent to SSI within 7 days of the completion of the inspection and analysis.
2. Filters must be changed every 750 hours of operation, and their replacement documented contemporaneously in your maintenance records, which shall be provided to SSI upon request.
3. Cylinder seals and wipers shall be replaced solely with SSI authorized parts within two (2) million linear feet of rod travel.

## HOW TO MAKE A CLAIM UNDER THIS LIMITED WARRANTY.

You must contact our customer service department during the warranty period and clearly describe and fully document the problem. You may also be required to return components of the Equipment, or the entire Equipment, to us at your expense.

## REMEDIES UNDER THIS WARRANTY.

If any Equipment does not perform in accordance with the terms of this Limited Warranty, SSI will have the option, based on its own sole discretion and judgment, of selecting one or more of the following remedies:

1. Repair any Equipment that was defective at the time of shipment or that does not perform substantially in accordance with any specifications or performance standards. For a period of ninety (90) days from shipment of the Equipment, SSI will provide any repairs at your place of business at its expense, provided the Equipment is clean, free of excess debris, and readily accessible. Thereafter, you must return the Equipment, or any components designated by SSI to SSI at your expense. If you wish repairs to be performed at your place of business more than ninety (90) days after shipping, you must pay SSI for its labor charges in accordance with its normal rates for such work and the cost of transportation, lodging, and related expenses for its employees.
2. Replace the Equipment with new, updated or factory rebuilt equipment; or
3. Accept the return of the Equipment and refund the purchase price actually received by SSI less the fair and reasonable value of your use of the Equipment. If the Equipment is returned, the freight shall be paid by you.

## OTHER CONDITIONS.

This Limited Warranty may not be amended or altered except by a writing signed by an authorized representative of SSI. By accepting this Limited Warranty you agree that there have been no prior oral or written warranties or representations, and you agree to rely solely on the terms of this Limited Warranty. SSI's pricing of the Equipment reflects the allocation of risk and limitations of liability set forth in this Limited Warranty. This Limited Warranty shall inure to the benefit of SSI, its successors and assigns, and any manufacturer of components contained in the Equipment.



## ACTIONS REQUIRED TO MAINTAIN SSI'S WARRANTY

### Operation of the Unit:

To retain the SSI and other manufacturers warranties the Compactor must be operated in a way that does not abuse the unit. At a minimum the material introduced into the unit should meet the guidelines in the section, *Range of Application*. Other procedures listed in the operating section of this manual must also be adhered to. In all situations, there is no substitute for good judgment.

### Preventive Maintenance:

To retain the SSI and other manufacturers warranties the preventive maintenance inspections and procedures must be completed in a timely manner, refer to *Section 4, Preventative Maintenance*. Documentation proving their completion must be submitted to SSI Shredding Systems on a monthly basis, until the warranty period has ended. Procedures are shown in *Section 4, Preventative Maintenance* of this manual and inspection reports are included for each inspection. Failure to submit this documentation will result in the denial of any warranty claims made to SSI or other equipment suppliers.

Inspection & Maintenance Milestones: (*Refer to Section 4, Preventative Maintenance* for detailed instruction.)

- Daily Inspections
- Maintenance Weekly
- Maintenance Initial 150 hours
- Maintenance every 750 hours
- Maintenance every 3000 hours
- Cylinder Maintenance

**Severe applications or environments may require more frequent inspection and service.**

## CONDITIONS THAT WILL VOID SSI'S WARRANTY

Although not all situations or circumstances can be accounted for, the following are examples that will void the users warranty.

- Operating the machine without the proper fluids.
- Operating the machine with visibly damaged or known damaged items.
- Damage to the machine caused by incorrectly loaded material.
- Failure to perform and document required maintenance and/or adjustments to ensure all components are operating within the manufactures specifications.
- Failure to submit maintenance documentation to SSI Shredding Systems Inc, on a monthly basis.
- Operating the unit in a way or under conditions that constitute abuse.

## GENERAL

Any item for which the component manufacturer denies warranty, SSI Shredding Systems Inc, will also deny warranty.



**SSI REPRESENTATIVE SIGNOFF**

I have reviewed the above document with the customer's representative(s) taking delivery of the following equipment.

Model Number \_\_\_\_\_

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

Signed \_\_\_\_\_

Date \_\_\_\_\_

**CUSTOMER REPRESENTATIVE SIGNOFF**

I have reviewed the above document with the SSI representative(s). I fully understand this document and its implications

Signed \_\_\_\_\_

Date \_\_\_\_\_



**SECTION 11  
SPECIFICATIONS & PARTS LISTS**

SECTION

11.0

PAGE

1

<b>SERVICE SPECIFICATIONS</b>	11.1.1
<b>HYDRAULIC POWER UNIT (HPU) SPECIFICATIONS</b>	11.1.2
<b>ELECTRICAL &amp; CONTROL SPECIFICATIONS</b>	11.1.3
<b>RECOMMENDED SPARE PARTS LIST</b>	11.2
<b>PARTS LISTS &amp; DRAWINGS</b>	11.3



**4500SPH****PERFORMANCE DATA**

Maximum Cram Speed	60 ft/min
Maximum Eram Speed	60 ft/min
Horsepower (Nominal)	250 HP
Peak Compaction Force	260 tons

**PRESSURE SETTINGS**

High Pressure Relief Setting	2,700 psi
Low Pressure Relief Setting	1,200 psi
Pilot Pump Pressure Switch Setting	1,000 psi
Pilot Pump Relief Setting	2,100 psi
High Pressure Switch	2,500 psi
Low Pressure Switch	1,000 psi

**FLUID CAPACITY**

Main Hydraulic Reservoir	1000 gal
In the System	250 gal

**WEIGHTS**

Hydraulic Pump	250 lbs
Pilot/Circulating Pumps	436 lbs
Electric Motor 15HP(Frame Size)	955 lbs
Electric Motor 125HP (Frame Size)	1,600 lbs
ERAM	9,781 lbs
CRAM	21,857 lbs

**DIMENSIONAL DATA**

Refer to Layout Drawing

**Model 4500SPH****COMPONENT DATA**

Electric Motors	2
Manufacturer	Baldor
Power	125 hp (150 kW)
Speed (synchronous)	1,800 rpm
Main Hydraulic Pumps	2
Manufacturer	DENISON
Description	Vane pump mobile application
Heat Exchanger	1
Manufacturer	AMERICAN INDUSTRIAL
Circulating/Pilot Motor	1
Manufacturer	Baldor
Power	15 hp (150 kW)
Speed (synchronous)	1,800 rpm
Pilot Pump	1
Manufacturer	PARKER
Description	Axial Piston Pump
Circulating Pump	1
Manufacturer	DENISON
Description	Vane pump mobile application
Reservoir Capacity	1000 gal (3784.3 liters)



## ELECTRICAL & CONTROLS SPECIFICATIONS

SECTION

11.1.3

PAGE

1

### 4500SPH

#### COMPONENT DATA

Service Required	
Main Voltage	460 VAC / 3-Phase
Frequency	60 Hz
Number of Feed Circuits	2
Minimum Amp Rating per Feed Circuit	225 Amp
Motor Starter Panel	
Enclosure Rating	Nema 4
Breakers	2
Rating	225 Amp (each)
Disconnect	Lockable Handle
Manufacturer	RITTAL
Main Motor Starter	
Style	VFD
Manufacturer	ABB
Heat Exchanger Motor Starter	
Style	VFD

#### CONTROL PANEL

Enclosure Rating	Nema 4
Control Power Voltage	24 VDC
Programmable Logic Controller Mfg	Allen-Bradley
Touch Screen/Alarm Panel Mfg	Pro-Face



## RECOMMENDED SPARE PARTS LIST

SECTION

PAGE

11.2

1

## RECOMMENDED SPARE PARTS LIST

SSI part #	Description	Manufactured	Manufactured part number	Web Site	Price for each item (2013 prices)	Note: quantity needed to preform services
802976	KIT - GLAND/16" SSI DESIGN*	SSI		www.ssiworld.com	\$ 2,750.00	1
802068-01	WEAR STRIP - GATE TRACK CENTER	SSI		www.ssiworld.com	\$ 279.15	4
802125	BEARING - PLATEN BASE**	SSI		www.ssiworld.com	\$ 1,460.00	6
802045	BEARING - WEDGE W/TABS	SSI			\$ 368.83	12
802517	ELEMENT - PRESSURE FILTER/LONG	Parker Hannifin		www.parker.com	\$ 159.25	4
002184	FILTER - ELEMENT - AIR FILTER	Solberg		www.solbergmfg.com	\$ 26.95	4
071028	KIT - OIL SAMPLING	CTC		www.noria.com	\$ 48.62	1
002810	O-RING KIT (COMPACTOR)	SSI		www.ssiworld.com	\$ 95.38	Only as required
078536	SENSOR - INDUCTIVE	IFM		www.ifm.com	\$ 50.00	Only as required
000641	LIMIT SWITCH	Allen-Bradley		www.ab.com	\$ 175.41	Only as required
001896	LIMIT SWITCH - ARM 3" adj metal wheel	Allen-Bradley		www.ab.com	\$ 34.11	Only as required
802987	LOAD CELL	Hardy		www.hardysolutions.com	\$ 2,528.00	Only as required
803112	KNIFE - LEAD PLATE**	SSI		www.ssiworld.com	\$ 609.00	2
802217	KNIFE - PLATEN**	SSI		www.ssiworld.com	\$ 3,158.08	1
802556	KNIFE ASSEMBLY - CHAMBER*	SSI		www.ssiworld.com	\$ 5,293.11	1 set (3pc)
802968	CYLINDER - 2" BORE x 4" STROKE	Sheffer		www.sheffercorp.com	\$ 600.00	Only as required
002707	FILTER - ELEMENT - RETURN	MP Filtri		www.mpfiltriusa.com	\$ 227.23	4
070081	FILTER - ELEMENT - RETURN 10M	MP Filtri		www.mpfiltriusa.com	\$ 297.70	1
019297	KIT - PISTON/16" SSI DESIGN*	SSI		www.ssiworld.com	\$ 2,250.00	1
802068-02	WEAR STRIPS - GATE TRACK MS OUTER	SSI		www.ssiworld.com	\$ 302.86	8
080351	VALVE - 2-WAY W/COIL, 24VDC (VENT)	Modular Controls		www.eaton.com	\$ 99.25	Only as required
999 ELEC	BULB AND FUSE KIT	SSI		www.ssiworld.com	\$ 766.35	Only as required

**BILL OF MATERIAL**

Customer: <b>Metro South</b>		Order No. <b>417.2219</b>	Released: <b>June 2018</b>	
Model: <b>4500SPH</b>		Serial No: <b>C3001</b>	Revised:	
SEQ	Dwg Ref Qty	U/M Description	Material Text	Part No.
1				
2		1 EA <b>CHAMBER - WELDMENT/4500SPH*</b>		<b>804725</b>
3	16	EA CLAMP - BEHRINGER (P-1-1/2" HEAVY DUTY)		000391
4	7	EA CLAMP - BEHRINGER (P-1-1/4" HEAVY DUTY)		010046
5	4	EA CLAMP - BEHRINGER (P-2"-HEAVY DUTY)		010045
6	2	EA CLAMP - BEHRINGER (P-4" HEAVY DUTY)		003990
7	1	EA <b>WEAR STRIP KIT - A514 (T1)/4500SP*</b>		<b>803882</b>
8				
9		1 EA <b>PLATEN ASSEMBLY*</b>		<b>801196</b>
10	1	2 EA CARRIAGE RECEIVER BRACKET**		803227
11	2	0 EA		PLACEHOLDER
12	3	1 EA PLATEN - WELDMENT**		801197
13	4	2 EA WEDGE - LONG/WELDMENT, PLATEN*		802380
14	5	1 EA KNIFE - PLATEN**		802217
15	6	6 EA BEARING - PLATEN BASE**		802125
16	7	1 EA <b>BRACKET - WEDGE ADJUSTMENT ASSY</b>		<b>801900</b>
17	1	1 EA BRACKET - PLATEN WEDGE/ADJ.**		802226
18	2	1 EA ROD - THREADED, 1-1/2"-6UNC:B-7) x 16"		801901
19	3	1 EA NUT - JAM(1-1/2 - 6UNC)GRD 8- ZINC		003308
20	4	2 EA WASHER - FLAT - 1-1/2"/M36-YZ		000362
21	5	2 EA NUT - HEX(1-1/2-6:GR 8)YZ		000361
22	8	1 EA <b>BRACKET - WEDGE ADJUSTMENT ASSY. /LH**</b>		<b>801900-01</b>
23	1	1 EA BRACKET - PLATEN WEDGE/LH/ADJ.**		802226-01
24	2	1 EA ROD - THREADED, 1-1/2"-6UNC:B-7) x 16"		801901
25	3	1 EA NUT - JAM(1-1/2 - 6UNC)GRD 8- ZINC		003308
26	4	2 EA WASHER - FLAT - 1-1/2"/M36-YZ		000362
27	5	2 EA NUT - HEX(1-1/2-6:GR 8)YZ		000361
28	9	2 EA KNIFE - LEAD PLATE**		803112
29	10	0 EA		PLACEHOLDER
30	11	6 EA NUT - HEX(3/4-10:GR 8)YZ		000930
31	12	6 EA SCREW-HHCS(3/4-10 x 3-1/2:GR 8)YZ		002686
32	13	6 EA LOCKWASHER(3/4:HI ALLOY)YZ		000920
33	14	0 EA		PLACEHOLDER
34	15	0 EA		PLACEHOLDER
35	16	4 EA SCREW-SHCS(1-8 x 2-1/2:GR 8)3Z-ROHS		003321
36	17	4 EA GREASE ZERK 1/8" 90 deg.*		003186
37	18	60 EA SCREW-HHCS(1/2-13 X 1-3/4:GR 8)YZ		001496
38	19	60 EA LOCKWASHER(1/2:MED)YZ		000918
39	20	0 EA NUT - JAM(1-1/2 - 6UNC)GRD 8- ZINC	REF ONLYQTY2 REQ	003308
40	21	16 EA SCREW-FHCS(1-8 x 3 1/2:GR 8)3Z-ROHS		071534
41				
42		1 EA <b>CARRIAGE - ASSEMBLY/4500**</b>		<b>802389</b>
43	1	0 EA		PLACEHOLDER
44	2	0 EA		PLACEHOLDER
45	3	24 EA BEARING BOLT PLATE - WALL**		801998
46	4	2 EA WASHER - FLAT - 1/2-YZ		003214
47	5	0 EA PROX SWITCH IFM 24V-FLUSH MOUNT	REF ONLYQTY2 REQ	REF 078847
48	6	4 EA SCREW-PHMS/SS(10-32 X 1-3/4)		002651
49	7	8 EA WASHER - STAR/SS-1/4		002670
50	8	8 EA SCREW-HHMS/SS(1/4-28 X 3/4)		002653
51	9	1 EA ASSEMBLY - CALIBRATOR BOX/ADJUST. BRKT**		802694
52		2 EA LOCKWASHER(1/2:MED)YZ		000918
53		2 EA SCREW-HHCS(1/2-13 X 1-1/2:GR 8)YZ		000852
54		1 EA SPRING - MAGNETIC SWITCH 2"ODx .135"W		001717
55		1 EA GREASE ZERK 1/8" STRAIGHT*		001223
56	10	1 EA CARRIAGE - WELDMENT/4500SPH**		802399
57		5 EA CLAMP - BEHRINGER (P-1/2" HEAVY DUTY)		000459
58	11	4 EA MOUNT - EJECTION CYLINDER TRUNNION*		802374
59	12	12 EA BEARING PLATE BRACKET *		805076
60	13	12 EA BEARING - WEDGE W/TABS		802045
61	14	8 EA SUPERBOLT - MT-150-6/W		000279
62	15	2 EA CLAMP - HOSE/REAR EJECTION/WELDMENT*		802519
63	16	0 EA		PLACEHOLDER
64	17	0 EA		PLACEHOLDER
65	18	0 EA		PLACEHOLDER
66	19	0 EA		PLACEHOLDER

67	20	8 EA	BOLT - ADJUSTMENT, CARRIAGE WALL BRG**		801903
68	21	48 EA	SCREW-SHCS(1/2-13 x 1)Z		002675
69	22	48 EA	SCREW-HHCS(1/2-13 x 2-1/2:GR 8)YZ		000856
70	23	16 EA	BOLT - ADJUSTMENT, CARRIAGE FLOOR BRG**		801902
71	24	8 EA	BOLT - ERAM CYLINDER TRUNNION		804572
72	25	58 EA	LOCKWASHER(1/2:MED)YZ		000918
73	26	8 EA	NUT - JAM (1-8)Z		003118
74	27	16 EA	NUT - JAM(1-3/4-5UNC)Z		000367
75	28	8 EA	SCREW-HHCS(1/2-13 x 4-1/2:GR 8)		000860
76	29	8 EA	NUT - HEX(1/2-13:GR 8)YZ		000934
77	30	1 EA	GUARD-CARRIAGE PROX SWITCH		803947
78	31	2 EA	SCREW-HHCS(1/2-13 X 1-1/4:GR 8)YZ		000853
79	32	16 EA	GREASE ZERK 1/8" STRAIGHT*		001223
80					
81		1 EA	<b>ASSEMBLY - COUPLING/16" - CRAM**</b>		<b>805074</b>
82	1	1 EA	BASE - COMPACTION CYLINDER/16" **		805085
83	2	1 EA	FLANGE - COMPACTION CYLINDER/16"		805086
84	3	14 EA	SCREW-SHCS(1-1/4-7 x 4:GR 8)3Z-ROHS		003760
85					
86		2 EA	<b>ASSEMBLY - COUPLING/10"-11"/ERAM*</b>		<b>802228</b>
87	1	1 EA	BASE - COMPACTION CYLINDER/10"		802250
88	2	1 EA	FLANGE - COMPACTION CYLINDER/10***		802251
89	3	16 EA	SCREW-SHCS(3/4-10 x 5 1/2)3Z(ROHS)		002703
90					
91		1 EA	<b>VERTICAL GATE - ASSEMBLY, w/WALL LINERS*</b>		<b>801979</b>
92	1	2 EA	MOUNTING BRACKET - GATE CYLINDER*		801991
93	2	2 EA	MOUNTING BRACKET - GATE CYLINDER*		801992
94	3	2 EA	BRACKET - ASSEMBLY/PROX SWITCH 24V*		803532
95	1	1 EA	ADJUSTMENT PLATE - PROX SWITCH**		802993
96	2	1 EA	BASE PLATE - PROX SWITCH**		802994
97	3	0 EA	PROX SWITCH		REF
98	4	2 EA	SCREW-PHMS/SS(10-32 X 1-3/4)		002651
99	5	4 EA	WASHER - STAR/SS-1/4		002670
100	6	4 EA	SCREW-HHMS/SS(1/4-28 X 3/4)		002653
101	9	8 EA	WEAR STRIPS - GATE TRACK MS OUTER**		802068-02
102	10	4 EA	WEAR STRIP - GATE TRACK, INNER** txt		801981
103	11	1 EA	GATE - DISCHARGE/WELDMENT**		801980
104	12	4 EA	TRUNNION EYE MOUNT - VERTICAL GATE**		802212
105	13	1 EA	TRACK - UPPER GATE/WELDMENT**		800051
106	14	2 EA	BRACE - GATE TRACK/WELDMENT**		802218
107	15	2 EA	WELDMENT - GATE PIN**		805067
108	17	2 EA	GATE GUIDE (REMOVABLE)**		802161
109	18	76 EA	SCREW-HHCS(3/8-16 x 1-1/4:GR 8)YZ		000874
110	23	6 EA	SCREW-HHCS(1/2-13 x 4:GR 8)YZ		001498
111	79	76 EA	LOCKWASHER(3/8:HI ALLOY)YZ		000922
112	20	8 EA	SCREW-HHCS(1/2-13 X 1-3/4:GR 8)YZ		001496
113	21	38 EA	LOCKWASHER(1/2:MED)YZ		000918
114	22	26 EA	SCREW-HHCS(1/2-13 X 1-1/4:GR 8)YZ		000853
115	24	76 EA	WASHER - FLAT - 3/8-3Z-ROHS		002559
116	25	10 EA	SCREW-HHCS(3/4-10 x 2-1/2:GR 8)YZ		000864
117	26	10 EA	LOCKWASHER(3/4:HI ALLOY)YZ		000920
118	27	12 EA	WASHER - FLAT - PLA325 - 1/2"/M12-YZ		002694
119					
120		1 EA	<b>PEDESTAL/WELDMENT W/O STOP PAD, 1.6 DEG</b>		<b>804750</b>
121		1 EA	<b>PEDESTAL/WELDMENT W/ STOP PAD, 1.6 DEG</b>		<b>804750-01</b>
122					
123		1 EA	<b>CHAMBER KNIFE ASSEMBLY**</b>		<b>802577</b>
124	1	0 EA	KNIFE ASSEMBLY - CHAMBER*	REF ONLY	802556
125	2	13 EA	SCREW-SHCS(1-8 x 2-1/2:GR 8)3Z-ROHS		003321
126	3	1 EA	KNIFE - CHAMBER/MIDDLE SECTION**		802558
127	4	1 EA	KNIFE - CHAMBER/END SECTION, LEFT SIDE**		802557
128	5	1 EA	KNIFE - CHAMBER/END SECTION, RIGHT SIDE*		802623
129					
130		1 EA	<b>ASSEMBLY - LOAD CELL/PEDESTAL(set of 4)*</b>		<b>801133</b>
131	1	4 EA	LOAD CELL		802987
132	2	4 EA	PEDESTAL - LOAD CELL/WELDMENT**		802261
133	3	4 EA	TOP BEARING PLATE - C2 LOAD CELL **		803338
134	4	4 EA	BOTTOM BEARING PLATE - C2 LOAD CELL **		804643
135	5	0 EA	PLACEHOLDER		PLACEHOLDER
136	6	4 SET	BUTTONS - LOAD CELL(1-UPPER, 1-LOWER)**		801405
137	7	0 EA	PLACEHOLDER		PLACEHOLDER
138	8	16 EA	LOCKWASHER(3/4:HI ALLOY)YZ		000920
139	9	16 EA	SCREW-HHCS(1/2-13 x 3:GR 8)YZ		000859
140	10	16 EA	LOCKWASHER(1/2:MED)YZ		000918
141	11	16 EA	WASHER - FLAT - 1/2-YZ		003214
142	12	0 EA	SIDE BAR - TRANSPORT**	REUSABLE PART	803351
143	13	24 EA	SCREW-HHCS(3/8-16 x 1:GR 8)YZ		000871
144	14	12 EA	WASHER - FLAT - 3/8-3Z-ROHS		002559
145	15	12 EA	LOCKWASHER(3/8:HI ALLOY)YZ		000922

146	16	24	EA	SCREW-HHCS(1-8 X 2-1/2:GR 8)YZ		000843
147	17	24	EA	NUT - JAM (1-8)Z		003118
148	18	0	EA	CENTER BAR - TRANSPORT**	REUSABLE PART	803352
149	19	16	EA	NUT - HEX(1/2-13:GR 8)YZ		000934
150	20	16	EA	SCREW-HHCS(3/4-10 x 2:GR 8)YZ		000863
151	21	4	EA	GROUNDING STRAP - 10ga x 13***		803341
152						
153		1	EA	BRACKET - LASER MOUNTING** TXT		802771
154		2	EA	CLAMP - BEHRINGER (P-1-1/2" HEAVY DUTY)		000391
155						
156		1	EA	RAM SUPPORT - REMOVABLE/WELDMENT**		802590-02
157		4	EA	SCREW-HHCS(3/4-10 x 2:GR 8)YZ		000863
158		4	EA	LOCKWASHER(3/4:HI ALLOY)YZ		000920
159		4	EA	NUT - HEX(3/4-10:GR 8)YZ		000930
160		1	EA	REAR COMPACTION RAM SUPPORT *		802027-02
161						
162		1	EA	SAFETY SCREEN WELDMENT OCP**		803875
163	5	16	EA	NUT - HEX(3/8-16:GR 8)-YZ		001445
164	6	32	EA	LOCKWASHER(3/8:HI ALLOY)YZ		000922
165	4	32	EA	SCREW-HHCS(3/8-16 x 1:GR 8)YZ		000871
166		16	EA	SCREW-HHCS(3/8-16 x 3/4:GR 8)YZ		000879
167		4	IN	HINGE - 4" OPEN 1/2" PINx7GAGE THICK		003295
168		2	EA	LATCH - DOOR		851156
169		8	EA	HANDLE 1/2" DIA HR 4 X 7*		803531
170						
171		1	EA	HPU-OL 2X125/066-B45(460/60)24/AIR		C3001-HPU
172	1	1	EA	RESERVOIR - 1000-GAL		804751
173	2	2	EA	MOTOR/PUMP SUB-ASSY - 125-HP-F1/TTEDS*		803267
174	1	1	EA	MOTOR-125HP/444TSC/TEFC/SG/4-blk		077491
175	2	1	EA	PUMP/MOTOR ADAPTER w/ACCESS HOLE		075481
176	3	1	EA	COUPLING - HALF/M800		074984
177	4	1	EA	COUPLING - HALF/M800		070560
178	5	1	EA	COUPLING - INSERT/M800		071033
179	6	8	EA	SCREW-HHCS(5/8-11 x 1-3/4:GR 8)YZ		071519
180	7	8	EA	LOCKWASHER(5/8:MED)YZ		000925
181	8	1	EA	PUMP - VANE (085-B50)-blk		076760
182	9	0	EA			PLACEHOLDER
183	10	4	EA	LOCKWASHER(3/4:HI ALLOY)YZ		000920
184	11	1	EA	NIPPLE - KING/90/4"BARB - 4"C61		080692
185	12	1	EA	FLANGE KIT - SPLIT(64 PA CODE 61)		072621
186	13	4	EA	WASHER - FLAT - PLF436 - 5/8"/M16/M18-YZ		002696
187	14	4	EA	WASHER - FLAT - PLF436 - 3/4"/M20-YZ		002697
188	15	2	EA	RAIL - MOTOR MOUNT, W/SLOTS,125-HP		804694
189	16	4	EA	WASHER - FLAT - PLA325 - 1/2"/M12-YZ		002694
190	17	4	EA	SCREW-HHCS(3/4-10 x 3:GR 8)YZ		000865
191	18	4	EA	BOLT PLATE - MOTOR MOUNT, 3/4-10 **		803468
192	19	4	EA	SCREW-HHCS(1/2-13 X 1-1/2:GR 8)YZ		000852
193	20	4	EA	VIBRATION ISOLATOR - 600-LB/WHITE		072120
194	21	8	EA	SCREW-HHCS(1/2-13 x 3/4:GR 8)YZ		001495
195	22	12	EA	LOCKWASHER(1/2:MED)YZ		000918
196	2	1	EA	SUB-ASSEMBLY - MOTOR/PUMP/15HP**		803547
197	1	1	EA	MOTOR-15HP/254TC-F2/TEFC/4-blk		078199
198	2	1	EA	PUMP/MOTOR ADAPTER		072630
199	3	1	EA	COUPLING - HALF/M400		074948
200	4	1	EA	COUPLING - HALF/M400		074982
201	5	1	EA	COUPLING - INSERT/M400		070355
202	6	4	EA	SCREW-HHCS(1/2-13 X 1-3/4:GR 8)YZ		001496
203	7	8	EA	LOCKWASHER(1/2:MED)YZ		000918
204	8	1	EA	PUMP - VANE (050)-blk*TEXT		076765
205	9	2	EA	SCREW-HHCS(5/8-11 x 1-1/2:GR 8)YZ		000886
206	10	2	EA	LOCKWASHER(5/8:MED)YZ		000925
207	11	1	EA	NIPPLE - KING/90/3" BARB TO 3" C61		073818
208	12	4	EA	WASHER - FLAT - PLA325 - 1/2"/M12-YZ		002694
209	13	0	EA			PLACEHOLDER
210	14	2	EA	MOTOR BOLT BACKUP BAR 254TC		804681
211	17	4	EA	SCREW-HHCS(1/2-13 x 2-1/2:GR 8)YZ		000856
212	18	4	EA	NUT - HEX(1/2-13:GR 8)YZ		000934
213	19	1	EA	PUMP - 6GPM at 1500RPM(blk)*TEXT		074973-01
214	20	2	EA	SCREW-HHCS(M10-1.5 x 35MM:GR 10.9)YZ		002006
215	21	2	EA	LOCKWASHER(M10:MED) GRD 10.9/3Z-ROHS		002004
216	22	1	EA	FLANGE KIT - SPLIT(48 PA CODE 61)		071288
217		1	EA	VALVE - CHECK, 1-1/2", CD61, 5-PSI	MOUNTS ON COOLING PUMP OUTLET TO I	082718
218		0	EA	VALVE - THERMOSTATIC, 2" NPT, 105 DEG	FOR COOLING LOOP BYPASS	072875
219		4	EA	LOCKWASHER(1/2,M12:H. COLLAR)3Z-ROHS	FOR COOLING LOOP BYPASS	000917
220		1	EA	FLANGE - 1-1/2" NPTF THREAD(W43) W/ BOLT	FOR COOLING LOOP BYPASS	071767
221		4	EA	SCREW-HHCS(1/2-13 x 5-1/2:GR 8)Z	FOR COOLING LOOP BYPASS	002683
222		2	EA	FLANGE - 1 1/2" 4 BOLT, 1 1/2" NPTF	FOR COOLING LOOP BYPASS	082191
223		3	EA	NIPPLE - M PIPE(24-32)	FOR COOLING LOOP BYPASS	079949
224	4	2	EA	MANIFOLD ASSY - COMPACTOR - 24VDC*		803520
225	1	1	EA	MANIFOLD - COMPACTOR CYL (WITH PLUGS)**		802839
226	2	2	EA	VALVE - CHECK		070564
227	3	2	EA	VALVE - RELIEF CARTRIDGE		071034
228	4	2	EA	VALVE - 2-WAY W/COIL, 24DC (VENT)		080351
229	5	2	EA	GAUGE TAP - #4 SAE-VITON		002189
230	9	4	EA	SCREW-HHCS(3/8-16 x 3/4:GR 8)YZ		000879

231	10	4 EA	LOCKWASHER(3/8:HI ALLOY)YZ		000922
232	11	2 EA	GAUGE - 0-3000 PSI/KPA/BAR SCALE		073513
233	12	2 EA	ADAPTER - GAUGE - 1/4" NPT		002215
234	8	4 EA	WASHER - FLAT - PLF436 - 3/8"/M10-YZ		002692
235	5	1 EA	<b>4" RETURN MANIFOLD</b>		<b>804601</b>
236	7	1 EA	FILTER - RETURN ASSEMBLY (SEE NOTES)		071067
237		1 EA	MANIFOLD-TEE, 32X32X32 C61 X 16SAE	BOLTS TO RETURN FITLER HOUSING FOR	804745
238	8	4 EA	O-RING -228 BUNA 90A		003902
239	9	16 EA	SCREW-SHCS(1/2-13 x 2-1/4)3Z(ROHS)		071508
240	10	16 EA	LOCKWASHER(1/2,M12:H. COLLAR)3Z-ROHS		000917
241	11	0 EA	HOSE ASSY		PLACE HOLDER
242	12	0 EA	HOSE ASSY		PLACE HOLDER
243	13	0 EA	HOSE ASSY		PLACE HOLDER
244	14	0 EA	HOSE ASSY		PLACE HOLDER
245	15	0 EA	HOSE ASSY		PLACE HOLDER
246	16	0 EA	HOSE ASSY		PLACE HOLDER
247	17	2 EA	PLUG - M PIPE(08)		004499
248	18	3 EA	ELBOW - 90 - M TUBE/M O-RING(06-06)		004572
249	19	8 EA	SCREW-FHCS(3/8-16 x 1/2:GR 8)		002526
250	20	68 EA	SCREW-HHCS(3/8-16 x 3/4:GR 8)YZ		000879
251	21	1 PK	WASHER - NYLON PLASTIC, 3/8" (100/PK)	COMES IN 100PK	082833
252	22	4 EA	BREATHER - AIR FILTER ASSY 1.25 NPT		002183
253	23	2 EA	CLAMP - BEHRINGER (P-4" HEAVY DUTY)		003990
254	24	1 EA	ELBOW - 90 - M TUBE/M O-RING(06-04)		004571
255	25	1 EA	ENCLOSURE - 12 X 12 X 6		002887
256	26	1 EA	ENCLOSURE - BACK PANEL - 12 X 12		002888
257	27	10 FT	HOSE - HYDRAULIC, 2-1/2" (40),100R4		082681
258	28	5 EA	CLAMP - HOSE/2-1/2"/SS,WORM(2-9/16-3-1/2		072738
259	29	20 EA	SCREW-HHCS(5/16-18 x 1:GR 8)YZ		001478
260	30	20 EA	LOCKWASHER(5/16,M8:MED)-YZ-HT HI ALLOY		000923
261	31	2 EA	FILTER - SHORT		071229
262	32	2 EA	VALVE - PRESSURE DUMP (24 VDC)		081264
263		2 EA	ADPTR - ST - M TUBE/O-RING(06-06)	FOR PRESSURE DUMP	004541
264		1 EA	ELBOW - 90 - M O-RING/FSWIVEL (06-06)	FOR PRESSURE DUMP	076184
265		1 EA	TEE - M TUBE/M O-RING/M TUBE(06-06-06)	FOR PRESSURE DUMP	071528
266	33	3 EA	ADPTR - ST - M TUBE/O-RING(06-06)		004541
267	34	0 FT	HOSE - HYDRAULIC, 3/8" (06),100R17		004635
268	35	0 FT	HOSE - HYDRAULIC, 3/8" (06),100R17		004635
269	36	2 EA	FILTER ASSEMBLY - LONG		071228
270	37	16 EA	SCREW-HHCS(1/2-13 x 4 1/4:GR 8)		002704
271	38	16 EA	NUT - HEX(1/2-13:GR 8)YZ		000934
272	39	16 EA	LOCKWASHER(1/2:MED)YZ		000918
273	40	8 EA	WASHER - FLAT - 3/8-3Z-ROHS		002559
274	41	0 EA	MOTOR STARTER PANEL ASSIM		REF
275	42	2 EA	VALVE - BALL/4"(w/LIMIT)SAE		073743
276	43	1 EA	VALVE - BALL/3"(w/LIMIT)SAE		082969
277	44	1 EA	VALVE - BALL/BRASS - 1" NPT		072150
278		1 EA	ELBOW - 90 - M/F PIPE(16-16)		004516
279		1 EA	ADPTR - ST - M PIPE/F PIPE SWIVEL(16-16)		080644
280		1 EA	CAP - 1"NPT SCH40 PIPE CAP, PLTD		076287
281	45	2 EA	NIPPLE - KING/ST/4" x 4" SAE PLTD		080568
282	46	1 EA	NIPPLE - KING/ST/3" x 3" SAE PLTD		082968
283	47	36 IN	HOSE - SUCTION - 4"		071223
284	48	8 EA	CLAMP - HOSE/4"/STAINLESS, T-BOLT		077849
285	49	2 FT	HOSE - SUCTION - 3"		072566
286	50	4 EA	CLAMP - HOSE/3"/STAINLESS, T-BOLT		073617
287	51	1 EA	PLUG - M PIPE(16)* SAE STDS		004501
288	52	8 EA	FLANGE KIT - SPLIT(24 PH CODE 62)		003664
289	53	8 EA	FLANGE KIT - SPLIT(24 PA CODE 61)		004590
290	54	4 EA	FLANGE KIT - SPLIT(32 PA CODE 61)		004591
291	55	1 EA	BUSHING - M/F PIPE (12-04)		004491
292	56	1 EA	TEMPERATURE SENSOR - w/ANALOG		077543
293	57	1 EA	PRESSURE SWTCH-DUAL, w/ DISPLAY,18-36VDC		081863
294	58	2 EA	CABLE - 90 - PLUG CONNECTOR, 4-PIN, 10M		075383
295	59	1 EA	ADPTR - ST - M O-RING/M PIPE(04-04)		004550
296	60	2 EA	GASKET - HPU CLEANOUT COVER - .125" THICK		071357
297	61	1 EA	ADPTR - ST - M TUBE/O-RING(08-10)		071235
298	62	1 EA	ADPTR - ST - M TUBE/O-RING(12-10)		072142
299	63	1 EA	MANIFOLD - START-UP(BARE)		802764
300	64	1 EA	CAVITY PLUG		070991
301	65	1 EA	VALVE - RELIEF - VENT		001819
302	66	1 EA	VALVE - DRAIN CHECK		002192
303	67	1 EA	3/8" PIPE TANK RETURN MANIFOLD		803533
304	68	1 EA	PLUG-PIPE(ALLENHEAD/HOLLOWHEX)3/8 NPT CS		071285
305	69	2 EA	SCREW-HHCS(1/4-20 x 2-1/2:GR 8)YZ		002534
306	70	2 EA	LOCKWASHER(1/4:MED)-YZ		000919
307	71	2 EA	WASHER - FLAT - PLF436 - 1/4"/M6-YZ		002690
308	72	0 EA	HOSE ASSY		PLACE HOLDER
309	73	1 EA	ADPTR - ST - M TUBE/O-RING(08-12)		004544
310	74	1 EA	ADPTR - ST - M TUBE/O-RING(08-10)		071235
311	75	1 EA	ELBOW - 90 - HOSE STEM/M O-RING(16-12)		072996
312	76	34 IN	HOSE - HYDRAULIC, 1" (16),100R4		071244
313	77	4 EA	CLAMP - HOSE/1"/SS, WORM(13/16-1-3/4)		000622
314	78	1 EA	ADPTR - ST - HOSE STEM/M NPT(16-20)		075401
315	79	0 FT	HOSE - HYDRAULIC, 3/8" (06),100R17		004635
316	80	1 EA	ELBOW - 90 - M TUBE/M PIPE(06-08)		004447
317	81	2 EA	GAUGE - SIGHT - 12"\$		000624



318	82	1 EA	FLOAT SWITCH		000574
319	83	3 EA	ELBOW - 90 - M TUBE/M PIPE(08-08)		004449
320	84	1 EA	ADPTR - ST - M TUBE/M PIPE(08-06)		004422
321	85	0 FT	HOSE - HYDRAULIC, 3/8" (06),100R17		004635
322	86	0 FT	HOSE - HYDRAULIC, 3/8" (06),100R17		004635
323	87	2 EA	SCREW-HHCS(1/4-20 x 1-1/2:GR 8)YZ		001477
324	88	6 EA	SCREW-HHCS(1/4-20 x 1/2:GR 8)YZ		001475
325	89	8 EA	LOCKWASHER(1/4:MED)-YZ		000919
326	90	1 EA	ADPTR - ST - M TUBE/M PIPE(08-08)		004423
327	91	2 EA	HEATER - TANK/1500 WATT/460V w/EPOXY CON		070797
328	92	1 EA	PRESSURE TRANSDUCER - 0-5800 PSI		081864
329	93	3 EA	PLUG-1.25"NPT SCH40 BLK PIPE PLUG, M-PLT		072619
330	94	1 EA	PLUG - M O-RING (06) - CS		071989
331		1 EA	NAME PLATE-S/N-SHR/ENGRAVED (SEE TEXT)	PRODUCT: HYDRAULIC POWER UNITMOD. 070708	
332		4 EA	SCREW - RND.HD.DRIVE(#8 x 1/2:18-8SS)	FOR NAME PLATE	076384
333	95	1 EA	ADPTR - ST - M TUBE/M BSPP (06-04)		073004
334	96	1 EA	ADPTR - ST-M O-RING/FJIC SWIVEL(04-06)		073789
335	97	1 EA	ELBOW - 90 - M TUBE/M O-RING(06-04)		004571
336		1 EA	HEAT EXCHANGER - AOC51005-3		071060
337		2 EA	FLANGE - THREADED/2" (W104-32-32)	CONNECTION TO COOLER PIPE STUB	071800
338		1 EA	CHECK - ST - M TUBE/M O-RING(16)/5 PSI	FOR HEAT EXCHANGER PLUMBING	077291
339		1 EA	CAP NUT - 16, JIC	FOR HEAT EXCHANGER PLUMBING	004404
340		1 EA	O-RING -228 BUNA 90A	FOR HEAT EXCHANGER PLUMBING	003902
341		4 EA	SCREW-HHCS(1/2-13 x 5-1/2:GR 8)Z	FOR HEAT EXCHANGER PLUMBING	002683
342		4 EA	LOCKWASHER(1/2,M12:H. COLLAR)3Z-ROHS	FOR HEAT EXCHANGER PLUMBING	000917
343		0 EA	1 1/2" M7 HOSE 24PA ST TO 24PA ST	FOR HEAT EXCHANGER PLUMBING	HOSE ASSY
344		0 EA	2" M7 HOSE 32PA TO 32PA ST	FOR HEAT EXCHANGER PLUMBING	HOSE ASSY
345		0 EA	1 1/2" M7 HOSE 24PA ST TO 32PA 90	FOR HEAT EXCHANGER PLUMBING	HOSE ASSY
346		2 EA	FLANGE KIT - SPLIT(24 PA CODE 61)	FOR HEAT EXCHANGER PLUMBING	004590
347		2 EA	FLANGE KIT - SPLIT(32 PA CODE 61)	FOR HEAT EXCHANGER PLUMBING	004591
348					
349	13	2 EA	HOSE-GOLDEN/35-20-20PAST - 24PH45 X59"	LABEL HOSE ASSEMBLY: 083309-Pump to 083309	
350	14	2 EA	HOSE-GOLDEN/35-24-24PAST - 24PH45 X68"	LABEL HOSE ASSEMBLY: 083310-Pump to 083310	
351	12	1 EA	HOSE-TRACTOR/2SN-24-32PA45 - 24PAST X48"	LABEL HOSE ASSEMBLY: 083311-Cooler B 083311	
352	79	1 EA	HOSE-GOLDEN21-06-06FJIC45-06FJICSTX21.75	LABEL HOSE ASSEMBLY: 083312-Pilot Pur. 083312	
353	72	1 EA	HOSE-ROCK/2SN-08-08FJICST - 08FJIC45X52"	LABEL HOSE ASSEMBLY: 083313-Pilot Pur. 083313	
354	86	1 EA	HOSE-GOLDEN/21-06-06FJICST-06FJICST X23"	LABEL HOSE ASSEMBLY: 083314-Float Sw 083314	
355	85	1 EA	HOSE-GOLDEN/21-06-06FJICST-06FJICST X 8"	LABEL HOSE ASSEMBLY: 083315-Float Sw 083315	
356	35	1 EA	HOSE-GOLDEN/21-06-06FJICST-06FJIC90X32.5	LABEL HOSE ASSEMBLY: 083316-Dump V <sub>e</sub> 083316	
357		4 EA	HOSE-GOLD/35-24-24PA 45 - 24PH STx42.5"	LABEL HOSE ASSEMBLY: 082201-MANIFO 082201	
358		1 EA	HOSE-TRACTOR/1SN-32-32PA90 - 32PAST X91"	LABEL HOSE ASSEMBLY: 083282-MANIFO 083282	
359		1 EA	HOSE-TRACTOR/1SN-32-32PA90 - 32PASTX101"	LABEL HOSE ASSEMBLY: 082203-MANIFO 082203	
360		1 EA	ADPTR - ST - O-RING/O-RING(06-04)		082555
361		1 EA	CAP-3"NPT SCH40 BLK PIPE CAP,FM-PLTD	For heat exchanger	072456
362		1 EA	CAP - 1-1/4" NPT SCH40 BLK-PLTD PIPE CAP	For heat exchanger	071994
363		1 EA	INDICATOR - MP RETURN FILTER(BOTTOM)		074335
364					
365		1 EA	<b>CYL - COMPACTION 16" BORE x 306" CR</b>		<b>804721</b>
366		1 EA	KIT - GLAND/16" SSI DESIGN*		802976
367		1 EA	KIT - PISTON/16" SSI DESIGN*		019297
368		1 EA	NAME PLATE - COMPACTOR CYL. (SEE TEXT)\$	PART NUMBER: 804721CYLINDER DIA.: 16	801871
369					
370		2 EA	<b>CYLINDER - GATE (6" BORE x 84" STROKE)</b>		<b>803210</b>
371					
372		2 EA	<b>CYLINDER - EJECTION (11" BORE x 330") CR</b>		<b>804720</b>
373		1 EA	KIT - PISTON/11" SSI DESIGN*		801476
374		1 EA	KIT - 11" GLAND- V STYLE*\$	KIT DOES NOT INCLUDE V-PACK	804329-01
375		1 EA	V-PACKING KIT FOR 11" CYLINDER		804328
376		1 EA	NAME PLATE - COMPACTOR CYL. (SEE TEXT)\$	PART NUMBER: 804720CYLINDER DIA.: 11	801871
377					
378		2 EA	<b>BEARING STOP - BRASS**</b>		<b>801453</b>
379		1 EA	BEARING - WEDGE W/TABS		802045
380		4 EA	SCREW-HHCS(1/2-13 X 1-1/4:GR 8)YZ		000853
381		4 EA	LOCKWASHER(1/2:MED)YZ		000918
382					
383		1 EA	<b>LADDER - REAR SIDE ACCESS/WELDMENT **</b>		<b>801373</b>
384					
385		1 EA	<b>ASSEMBLY - TRUCK LATCH W/O BASE</b>		<b>803220</b>
386	1	2 EA	COVER HALF - COMPACTOR TRUCK LATCH		804458
387	2	2 EA	SHORT LINK - COMPACTOR TRUCK LATCH		804459
388	3	2 EA	LONG LINK - COMPACTOR TRUCK LATCH		804460
389	4	1 EA	WELDMENT - TRUCK LATCH BASE**		803221
390	5	1 EA	WELDMENT - TRUCK LATCH ARM**		803222
391	6	1 EA	ROCKER ARM**		803223
392	7	2 EA	TRUNNION EYE MOUNT**		802067
393	8	1 EA	CLEVIS - CYLINDER		802837
394	9	1 EA	CYLINDER - 2" BORE x 4" STROKE/Y=#8 SAE		802968
395	10	6 EA	SCREW-HHCS(1/2-13 X 1-1/2:GR 8)YZ		000852
396	11	10 EA	LOCKWASHER(1/2:MED)YZ		000918
397	12	4 EA	SCREW-HHCS(1/2-13 x 2:GR 8)YZ		000855
398	13	10 EA	NUT - HEX(1/2-13:GR 8)YZ		000934
399	14	3 EA	SCREW-HHCS(1-8 x 4-1/2:GR 8)YZ		000847
400	15	3 EA	NUT - FIBER LOCK(1-8:GR 8)YZ		070055
401	16	6 EA	WASHER - FLAT - 1"-YZ		001547

402	19	2 EA	ADPTR - ST - M TUBE/O-RING(08-08)		004543
403					
404		2 EA	RETAINER - LARGE SEAL*		802266
405		2 EA	RETAINER - SEAL - SMALL *		802252
406	432	IN	FOAM SEAL 1 1/2 X 2 1/2 (6'FT PCS ONLY)	FOR SEAL RETAINERS	802420
407	26	EA	SCREW-HHCS(1/2-13 X 1-1/2:GR 8)YZ	FOR SEAL RETAINERS	000852
408	26	EA	LOCKWASHER(1/2:MED)YZ	FOR SEAL RETAINERS	000918
409	26	EA	WASHER - FLAT - 1-1/2"/M36-YZ	FOR SEAL RETAINERS	000362
410					
411		1 EA	HANDRAIL ASSEMBLY - ROOF/4500SPH		804755
412	43	10 EA	SCREW-HHCS(M6-1.0 x 50MM:GR 10.9)Z		078757
413	44	10 EA	NUT - HEX(M6:MED)Z- ROHS		072389
414	45	10 EA	LOCKWASHER(M6:MED)3Z-ROHS		072128
415	46	20 EA	WASHER - FLAT - PLF436 - 1/4"/M6-YZ		002690
416					
417		1 EA	PLATFORM ASSEMBLY, 38-3/4"		804756
418	1	1 EA	PLATFORM WELDMENT, 38-3/4"		804757
419	2	1 EA	2 STEP WELDMENT - PLATFORM		804758
420	3	1 LOT	CUT W-19-4, 1-1/4"x3/16" - PER DWG.		804756/GRATE
421	4	4 EA	SADDLE CLIP FOR 19W4 GRATING		075734
422	10	4 EA	SCREW-HHCS(M6-1.0 x 40MM:GR 10.9)Z		073967
423	11	4 EA	SCREW-HHCS(M6-1.0 x 60MM:GR 10.9)Z		083284
424	12	8 EA	NUT - HEX(M6:MED)Z- ROHS		072389
425	13	8 EA	LOCKWASHER(M6:MED)3Z-ROHS		072128
426	14	16 EA	WASHER - FLAT - PLF436 - 1/4"/M6-YZ		002690
427	15	8 EA	SCREW-HHCS(M10-1.5x25MM:GR 10.9)3Z-ROHS		002623
428	16	8 EA	NUT - HEX(M10:MED)3Z-ROHS		002031
429	17	8 EA	LOCKWASHER(M10:MED) GRD 10.9/3Z-ROHS		002004
430	18	16 EA	WASHER - FLAT - PLF436 - 3/8"/M10-YZ		002692
431	19	2 EA	SCREW-HHCS(M12-1.75x50MM:GR 10.9)3Z-ROHS		002625
432	20	2 EA	NUT - FIBER LOCK(M12x1.75:GR 8)3Z		073681
433	21	4 EA	WASHER - FLAT - 1/2-YZ		003214
434					
435		1 EA	FLOOR PLUMBING		804611
436		2 EA	O-RING -225 BUNA 90A		003901
437		8 EA	SCREW-SHCS(1/2-13 x 2-1/4)3Z(ROHS)		071508
438	32	EA	LOCKWASHER(1/2,M12:H. COLLAR)3Z-ROHS		000917
439	0	EA	CLAMP - BEHRINGER (P-2"-HEAVY DUTY)	Clamps ordered under Chamber Weldment.	010045
440	0	EA	CLAMP - BEHRINGER (P-1-1/2" HEAVY DUTY)	Clamps ordered under Chamber Weldment.	000391
441	3	EA	PLUG - M O-RING (06)		070762
442	4	EA	O-RING -228 BUNA 90A		003902
443	0	EA	CLAMP - BEHRINGER (P-4" HEAVY DUTY)	Clamps ordered under Chamber Weldment.	003990
444					
445		1 EA	MANIFOLD - ERAM - ALUMINUM 24V*		804610-01
446		1 EA	MANIFOLD - ALUMINUM, CRAM/ERAM 24V**		803521-01
447	1	1 EA	MANIFOLD - POPPET(BARE)/ALUMINUM**		002200-01
448	2	1 EA	O-RING -245 BUNA 90A		330505
449	3	6 EA	SCREW-HHCS(1-8 x 9-1/2:GR 8)YZ		071517
450	4	6 EA	LOCKWASHER(1:MED)-YZ		000915
451	5	2 EA	POPPET - BASE END		071049
452	6	2 EA	POPPET - CAP		071050
453	7	8 EA	SCREW-SHCS(1-1/4-7 x 4:GR 8)3Z-ROHS		003760
454	8	8 EA	LOCKWASHER(1 1/4:HIGH COLLAR)Z		071518
455	9	2 EA	POPPET - ROD END		071051
456	10	2 EA	POPPET - CAP		071052
457	11	1 EA	FLANGE KIT - SPLIT(48 PA CODE 61)		071288
458	12	0 EA			PLACE HOLDER
459	13	0 EA			PLACE HOLDER
460	14	1 EA	PLUG - 48-FOP FLANGE		071287
461	15	1 EA	FLANGE KIT - SPLIT(32 PA CODE 61)		004591
462	16	1 EA	PLUG - 32-FOP FLANGE(STEEL)		004599
463		1 EA	MANIFOLD - CYLINDER CONTROL (BARE)**		077937
464		3 EA	PLUG - M O-RING (02) - CS	PLUG PORTS: 1, 2 & 3	071220
465	18	1 EA	VALVE - 4-WAY/3-POS, 24VDC		076685
466	19	1 EA	VALVE - 4-WAY/2-POS, 24VDC		076684
467	20	2 EA	SCREW-SHCS(1/4-20 x 3:GR 8)3Z(ROHS)		001471
468	21	2 EA	ELBOW - 90 - M TUBE/M O-RING(06-06)		004572
469	22	6 EA	WASHER - FLAT - PLF436 - 1"-YZ		002699
470	23	0 EA			PLACE HOLDER
471	24	4 EA	ELBOW - 90 - M TUBE/M BSPP(06-04)		071927
472	25	4 EA	ADPTR - ST - M TUBE/O-RING(06-06)		004541
473	26	4 EA	TEE - STREET O-RING(06)		078608
474	27	1 EA	ADPTR - ST - M TUBE/O-RING(08-06)		003946
475	28	0 EA			PLACE HOLDER
476	29	1 EA	VALVE - FLOW CONTROL(06) w/BYPASS CHECK		077664
477	30	4 EA	GAUGE TAP - #6 SAE		071728
478	31	1 EA	HOSE-06/R2SN-06FJIC ST-06FJIC STx16"OAL		078273
479	32	2 EA	HOSE-06/R2SN-06FJIC 90-06FJIC STx20"OAL		078274
480	33	0 EA			PLACE HOLDER
481	34	2 EA	HOSE-06/R2SN-06FJIC 45-06FJIC STx29"OAL		078275
482	35	8 EA	SCREW-SHCS(3/4-10 x 3:GR 8)3Z(ROHS)		071522
483	36	8 EA	LOCKWASHER(3/4:H. COLLAR)Z		001541
484	37	2 EA	LOCKWASHER(1/4:H. COLLAR)Z		001528
485	38	0 EA			PLACE HOLDER
486	39	1 EA	ADPTR - ST - O-RING/O-RING(06-06)		077665
487		2 EA	NUT - HEX(1-8:GR 8)-YZ		002570
488					

489	1	EA	MANIFOLD - ALUMINUM, CRAM/ERAM 24V**	803521-01
490	1	EA	MANIFOLD - POPPET(BARE)/ALUMINUM**	002200-01
491	2	EA	O-RING -245 BUNA 90A	330505
492	3	EA	SCREW-HHCS(1-8 x 9-1/2:GR 8)YZ	071517
493	4	EA	LOCKWASHER(1:MED)-YZ	000915
494	5	EA	POPPET - BASE END	071049
495	6	EA	POPPET - CAP	071050
496	7	EA	SCREW-SHCS(1-1/4-7 x 4:GR 8)3Z-ROHS	003760
497	8	EA	LOCKWASHER(1 1/4:HIGH COLLAR)Z	071518
498	9	EA	POPPET - ROD END	071051
499	10	EA	POPPET - CAP	071052
500	11	EA	FLANGE KIT - SPLIT(48 PA CODE 61)	071288
501	12	EA		PLACE HOLDER
502	13	EA		PLACE HOLDER
503	14	EA	PLUG - 48-FOP FLANGE	071287
504	15	EA	FLANGE KIT - SPLIT(32 PA CODE 61)	004591
505	16	EA	PLUG - 32-FOP FLANGE(STEEL)	004599
506	1	EA	MANIFOLD - CYLINDER CONTROL (BARE)**	077937
507	3	EA	PLUG - M O-RING (02) - CS	071220
508	18	EA	VALVE - 4-WAY/3-POS, 24VDC	076685
509	19	EA	VALVE - 4-WAY/2-POS, 24VDC	076684
510	20	EA	SCREW-SHCS(1/4-20 x 3:GR 8)3Z(ROHS)	001471
511	21	EA	ELBOW - 90 - M TUBE/M O-RING(06-06)	004572
512	22	EA	WASHER - FLAT - PLF436 - 1"-YZ	002699
513	23	EA		PLACE HOLDER
514	24	EA	ELBOW - 90 - M TUBE/M BSPP(06-04)	071927
515	25	EA	ADPTR - ST - M TUBE/O-RING(06-06)	004541
516	26	EA	TEE - STREET O-RING(06)	078608
517	27	EA	ADPTR - ST - M TUBE/O-RING(08-06)	003946
518	28	EA		PLACE HOLDER
519	29	EA	VALVE - FLOW CONTROL(06) w/BYPASS CHECK	077664
520	30	EA	GAUGE TAP - #6 SAE	071728
521	31	EA	HOSE-06/R2SN-06FJIC ST-06FJIC STx16"OAL	078273
522	32	EA	HOSE-06/R2SN-06FJIC 90-06FJIC STx20"OAL	078274
523	33	EA		PLACE HOLDER
524	34	EA	HOSE-06/R2SN-06FJIC 45-06FJIC STx29"OAL	078275
525	35	EA	SCREW-SHCS(3/4-10 x 3:GR 8)3Z(ROHS)	071522
526	36	EA	LOCKWASHER(3/4:H. COLLAR)Z	001541
527	37	EA	LOCKWASHER(1/4:H. COLLAR)Z	001528
528	38	EA		PLACE HOLDER
529	39	EA	ADPTR - ST - O-RING/O-RING(06-06)	077665
530				
531	1	EA	PIPING ASSEMBLY	804774
532	1	EA	MANIFOLD - ERAM - ALUMINUM 24V*	804610-01
533	2	EA	MANIFOLD - ALUMINUM, CRAM/ERAM 24V**	803521-01
534	3	EA	MANIFOLD - CRAM RETURN PIPE	804762
535	4	EA	MANIFOLD - ERAM RETURN PIPE	804763
536	5	EA	MANIFOLD - ERAM PRESSURE PIPE	804764
537	6	EA	MANIFOLD - ERAM-CRAM PRESSURE PIPE	804765
538	7	EA	MANIFOLD - ERAM PRESSURE PIPE	804766
539	8	EA	MANIFOLD - CRAM PRESSURE PIPE	804767
540	9	EA	MANIFOLD - 1-1/2 SPOOL PIPE	804770
541	10	EA	MANIFOLD - 2" SPOOL PIPE	804773
542	11	EA	MANIFOLD - 2" SPOOL PIPE	804771
543	12	EA	MANIFOLD - 1-1/2" SPOOL PIPE	804772
544	15	EA	CLAMP - BEHRINGER (P-1-1/2" HEAVY DUTY)	000391
545	16	EA	CLAMP - BEHRINGER (P-2"-HEAVY DUTY)	010045
546	5	EA	CLAMP - BEHRINGER (P-4" HEAVY DUTY)	003990
547	6	EA	CLAMP - BEHRINGER (P-3" HEAVY DUTY)	003991
548	18	EA	SCREW-SHCS(5/8-11 x 2-3/4) G8-3Z(ROHS)	071153
549	19	EA	LOCKWASHER(5/8 & M16:H. COLLAR)Z	000924
550	21	EA	SCREW-HHCS(1/2-13 x 5-1/2:GR 8)Z	002683
551	22	EA	WASHER - FLAT - PLA325 - 1/2"/M12-YZ	002694
552	23	EA	SCREW-SHCS(5/8-11 x 3-1/2)Z	002677
553	24	EA	O-RING -245 BUNA 90A	330505
554	25	EA	O-RING -237 BUNA 90A	002232
555	26	EA	O-RING -228 BUNA 90A	003902
556	27	EA	PLUG - M TUBE(06)	004437
557				
558	1	EA	GATE PLUMBING - HYDRAULIC	803863
559	4	EA	O-RING -222 BUNA 90A	003900
560	15	EA	CLAMP - BEHRINGER (P-1-1/4" HEAVY DUTY)	010046
561	16	EA	SCREW-SHCS(7/16-14 x 3:GR 8)	071775
562				
563	1	EA	GATE CYL PLUMBING ASSEMBLY	803545
564	0	EA	CYLINDER - VERTICAL GATE	ONLY AS REF - QTY 2 USED ON EACH MAC GATE CYLINDER
565	2	EA	HYDRAULIC PLUMBING - GATE & TRAILER	ONLY AS REF - QTY 1 USED ON EACH MAC GATE & TRAILER HYD
566	3	EA	FLANGE KIT - SPLIT(20 PA CODE 61)	004589
567	4	EA	ELBOW - 90 - O-RING/O-RING (20-20)	010716
568	5	EA	ELBOW - 90 - M TUBE/M O-RING(20-20)	071280
569	6	EA	ADPTR - ST - M TUBE/O-RING(20-20)	071619
570	7	EA	ADPTR - ST - M TUBE/O-RING(06-06)	004541
571	8	EA	VALVE - COUNTER BALANCE/GATE	071047
572	9	EA	VALVE - BODY	071048
573	10	EA	1 1/4" M7HOSE 20PA ST X 20JIC ST	HOSE ASSY
574	11	EA	1 1/4" M7HOSE 20PA ST X 20JIC ST	HOSE ASSY
575	12	EA	3/8" M7HOSE 06JIC ST X 06JIC 90	HOSE ASSY

576					
577	1	EA	<b>GATE &amp; TRAILER 24V HYDRAULIC ASSEMBLY</b>	<b>803539</b>	
578	1	EA		PLACE HOLDER	
579	2	EA	MANIFOLD - GATE / LATCH(BARE)**	077927	
580	3	EA	LOCKNUT - ALL METAL-5/8-11 GR C-YZ\$	002578	
581	4	EA	PLUG - M O-RING (12)	071271	
582	5	EA	WASHER - FLAT - 5/8-3Z-ROHS	002561	
583	7	EA	VALVE - DIRECTIONAL/D08/C4/24VDC	075853	
584	7	EA	SCREW-SHCS(1/2-13 x 2-1/2)Z	003824	
585	8	EA	LOCKWASHER(1/2,M12:H. COLLAR)3Z-ROHS	000917	
586	9	EA	VALVE - FLOW CONTROL	071040	
587	10	EA	VALVE - BODY/FLOW CONTROL SANDWICH	071041	
588	11	EA	VALVE - COUNTER BALANCE\$	073001	
589	12	EA	VALVE - BODY	071043	
590	13	EA	VALVE - 4-WAY/C4/24VDC	075485	
591	14	EA	SCREW-SHCS(1/4-20 x 5-1/2:GR 8)	071272	
592	15	EA	LOCKWASHER(1/4:H. COLLAR)Z	001528	
593	16	EA	SCREW-HHCS(3/8-16 x 1-1/4:GR 8)YZ	000874	
594	17	EA	LOCKWASHER(3/8:HI ALLOY)YZ	000922	
595	18	EA	ADPTR - ST - M TUBE/O-RING(08-12)	004544	
596	19	EA	ADPTR - ST - M TUBE/O-RING(16-20)\$	071273	
597	20	EA	TEE - M TUBE/M O-RING/M TUBE(20-20-20)	071275	
598	21	EA	ADPTR - ST - REDUCER F/M TUBE(20-16)	071274	
599	22	EA	PLUG - M O-RING (04) - CS	071878	
600	23	EA		PLACE HOLDER	
601	24	EA	DIVIDER - FLOW	071277	
602	25	EA	NUT - HEX(5/8-11:GR 8)YZ	000931	
603	26	EA	LOCKWASHER(5/8:MED)YZ	000925	
604	27	EA	BRACKET - FLOW DIVIDER MOUNTING**	801829	
605	28	EA	SCREW-HHCS(5/8-11 x 3:GR 8)YZ	000888	
606	29	EA	SNUBBER - POROUS TYPE	070480	
607	30	EA	WELDMNT-GATE VALVE SUPPORT 24V*	803540	
608	31	EA	ADPTR - ST - REDUCER F/M TUBE(16-20)	076659	
609	32	EA	ELBOW - 90 - M TUBE/M O-RING(16-16)	004578	
610	33	EA	TEE - M TUBE/M O-RING/M TUBE(16-16-16)	071278	
611	34	EA	MANIFOLD - RELIEF(BARE)**	002226	
612	35	EA	VALVE - CHECK	002227	
613	36	EA	VALVE - RELIEF	002228	
614	37	EA	ADPTR - ST - M TUBE/O-RING(16-16)	004549	
615	38	EA	SCREW-HHCS(3/8-16 x 3-1/2:GR 8)	072012	
616	39	EA	NUT - HEX(3/8-16:GR 8)-YZ	001445	
617	40	EA	HOSE-16/R17-16FJIC 45-16FJIC STx31"OAL	079198	
618	41	EA	HOSE-16/R17-16FJIC ST-16FJICSTx10.25"OAL	079199	
619	42	EA	HOSE-16/R17-16FJIC 90-16FJIC STx39"OAL	079200	
620	43	EA	1 1/4" M7HOSE 20PA ST X 20PA ST	HOSE ASSY	
621	44	EA	1 1/4" M7HOSE 20PA ST X 20JIC ST	HOSE ASSY	
622	45	EA	1/2" M7 HOSE 8JIC ST X 8JIC ST	HOSE ASSY	
623	46	EA	FLANGE KIT - SPLIT(20 PA CODE 61)	004589	
624	47	EA	ADPTR - ST - M TUBE/M PIPE(08-08)	004423	
625	48	EA	ADPTR - ST - REDUCER F/M TUBE(20-24)	074370	
626	49	EA	ADPTR - ST - M TUBE/O-RING(24-20)	078330	
627	50	EA	1 1/2" M7HOSE 24PA ST X 24JIC 90	HOSE ASSY	
628	51	EA	1 1/2" M7HOSE 24PA ST X 24JIC ST	HOSE ASSY	
629	52	EA	ADPTR - ST - M O-RING/M PIPE(04-04)	004550	
630	53	EA	ADPTR - TEE - F/F/M PIPE(04)	004530	
631	54	EA	PRESSURE TRANSDUCER - 0-10000 PSI	070058	ORDERED IN ELECTRICAL ASSY - VERIFY
632	55	EA	GAUGE TAP - 1/4" NPT	000590	
633	56	EA	FLANGE KIT - SPLIT(24 PA CODE 61)	004590	
634	57	EA	RUBBER VIBE ISOLATOR FLOW DIVIDER	803581	
635	58	EA	RUBBER VIBE ISOLATOR FLOW DIVIDER	803582	
636	59	EA	VIBE ISOLATOR WASHER-FLOW DIVIDER	803583	
637					
638	1	EA	<b>CUSTOMER NAME, SCH. #XXXXXX (INITIAL)</b>	<b>995PANEL</b>	
639	1	EA	ENCLOSURE - 47 X 36 X 12-HD HINGE	073418	
640	1	EA	STROBE LIGHT-24VDC/AMBER COLOR	077504	
641	1	EA	PUSHBUTTON - PUSH-PULL, F SER.	073923	
642	1	EA	MOUNTING LATCH W/1N.C.L.B. CONTACT	073935	
643	1	EA	CONTACT BLOCK - SELF-MONITORING, 22mm	076700	
644	1	EA	CONTACT BLOCK - 1 N.O.	073943	
645	1	EA	LEGEND - E-STOP - ROUND - YELLOW, 22mm	073941	
646	1	EA	DECAL - "CAUTION RISK OF ELECTRICAL..."	078987	
647	1	EA	NAME PLATE - LABEL	MODEL: 4500SPHHORSEPOWER: SERIAL 072458	
648	1	EA	SELECTOR - 2 POS, KEY, F SER.	073926	
649	7	EA	MOUNTING LATCH W/1N.O. CONTACT	073936	
650	1	EA	LEGEND - IEC - "CONTROL POWER OFF ON"	073621	
651	1	EA	SELECTOR - 2 POS - KEY (NON-STD) F SER.	074527	
652	1	EA	LEGEND - IEC - "MAINTENANCE OVERRIDE"	005975	
653	1	EA	PUSHBUTTON - ILLUM., YELLOW, F SER.	073931	
654	1	EA	POWER MOD. W/LATCH&1 N.O.-PB/LIGH,LED,WH	077528	
655	1	EA	LEGEND - IEC - "MCR ON/RESET"	073543	
656	6	EA	PUSHBUTTON - ILLUM.,GREEN, F SER.	073932	
657	6	EA	POWER MOD.W/LATCH&1 N.O.-PB/LIGH,LED,GN	075640	
658	1	EA	LEGEND - IEC - "SYSTEM AUTO START/RUN"	005977	
659	1	EA	LEGEND - IEC - "CLEAR"	005982	
660	1	EA	LEGEND - IEC - "RETRACT SHUT"	005984	

661	1 EA	LEGEND - IEC - "TRAILER LATCH"		005988
662	1 EA	LEGEND - IEC - "TRAILER UNLATCH"		005989
663	1 EA	LEGEND - IEC - "COMPACT"		005983
664	3 EA	PILOT LIGHT - GREEN, F SER.		073929
665	3 EA	POWER MOD. W/LATCH-PILOT LIGHT, LED, GRN		079376
666	1 EA	LEGEND - IEC - "GATE UP"		005987
667	1 EA	LEGEND - IEC - "COMPACT RAM RETRACTED"		005985
668	1 EA	LEGEND - IEC - "EJECT RAM RETRACTED"		005986
669	1 EA	PUSHBUTTON - RED, EXTENDED HEAD, F SER.		073922
670	1 EA	MOUNTING LATCH W/1N.C. CONTACT		073934
671	1 EA	LEGEND - IEC - "SYSTEM AUTO STOP"		005978
672	2 EA	MOUNTING LATCH W/1N.C. CONTACT		073934
673	1 EA	SELECTOR - 2 POS, KNOB, F SER.		073925
674	1 EA	LEGEND - IEC - "LOCAL RADIO"		005979
675	1 EA	RELAY - SAFETY MONITORING-24VDC		075959
676	6 EA	RELAY - CONTROL - 24VDC, 10A		071690
677	7 EA	RELAY - SCREW TERMINAL SOCKET		071692
678	1 EA	PLC - CONTROLLER, (COMPACTLOGIX) 2 MB		081669
679	1 EA	MODULE - WEIGH SCALE (A-B COMPACT SER.)		078682
680	3 EA	MODULE - INPUT/16 DC, MICRO 1500		071694
681	2 EA	MODULE - OUTPUT/16 x RELAY		071252
682	1 EA	POWER SUPPLY-COMPACT I/O EXPANS., 24DC\$		077721
683	1 EA	END CAP TERMINATOR - RIGHT END		070389
684	1 EA	HMI - 12" - COLOR, 24VDC, ETHERNET*TXT		074999
685	2 EA	CIRCUIT BREAKER - 6 AMP - 1 POLE		070973
686	1 EA	CIRCUIT BREAKER - 15 AMP - 1 POLE		076575
687	1 EA	ROUTER - FL MGuard RS2000 TX/TX VPN		079902
688	2 EA	CABLE - ETHERNET, CAT5e, 3'		080499
689	1 EA	CABLE - ETHERNET, CAT5e, 7'		080500
690	1 EA	CIRCUIT BREAKER - 10 AMP - 1 POLE		003982
691	1 EA	CIRCUIT BREAKER - 4 AMP - 1-POLE		076000
692	1 EA	RECEPTACLE - 20A, GFCI, DIN MOUNT		078685
693	2 EA	BATTERY CASE - 3 x "AA"		073413
694	1 EA	BATTERY CHARGER - 3.6V, 125VAC POWER	SHIPS LOOSE	073404
695	2 EA	BATTERY - RECHARGABLE, 3.6V		073403
696	2 EA	TRANSMITTER ONLY - ERGO (USA) COMPACTOR		082209
697	1 EA	RECEIVER - ERGO RX-14B RX, 110VAC/24VDC		078347
698	1 EA	SEE TEXT FOR DETAILS	FOR THE FOLOWING USEBLANK-BLACK-IE CUSTOM LEGEND	
699	1 EA	LEGEND - IEC - "INFEED CONV. START/RUN"		005966
700	1 EA	LEGEND - IEC - "INFEED CONVEYOR STOP"		005967
701	4 EA	PUSHBUTTON - BLACK, FLUSH HEAD, F SER.		081907
702	1 EA	CABLE - MICROWAVE 320		080021
703	1 EA	LEVEL SENSOR-MICROWAVE 320		077343
704	1 EA	CABLE - 100' MICROWAVE 320		082615
705	1 EA	HUB - ETHERNET, 8 PORT		081687
706	1 EA	SEE TEXT FOR DETAILS	FOR THE FOLLOWING USE:1" X 3" 3/16" W/ CUSTOM PHENOLIC	
707	2 EA	ENCLOSURE - 2000Hx800Wx500Dmm		078951
708	1 EA	ENCLOSURE - SIDEWALLS, 2000mmX500mm		078984
709	2 EA	ENCLOSURE - PLINTH,8", 200x800mm		073609
710	1 EA	ENCLOSURE - SIDE PANEL PLINTH,8", 500mm		074258
711	2 EA	ENCLOSURE - HANDLE, TS8 SERIES		073685
712	2 EA	ENCLOSURE - LOCK INSERT		073611
713	0.5 EA	ENCLOSURE - EYEBOLT BRACKET, TS8		073689
714	1 EA	ENCLOSURE - PRINT POCKET, 17mmD, TS8		078557
715	4 EA	ENCLOSURE - PANEL SUPPORT		073614
716	1 EA	ENCLOSURE - CORNER BAYING BRACKET, TS8		073686
717	1 EA	ENCLOSURE - BAYING CLAMPS, 1 PCS., TS8		073687
718	1 EA	ENCLOSURE-BASE/PLINTH SIDE, 100MMx500MM		080615
719	1 EA	ENCLOSURE - BAYING COVER, TOP, 500mm		076148
720	1 EA	PUSHBUTTON - PUSH-PULL, F SER.		073923
721	1 EA	MOUNTING LATCH W/1N.C.L.B. CONTACT		073935
722	1 EA	CONTACT BLOCK - SELF-MONITORING, 22mm		076700
723	1 EA	LEGEND - E-STOP - ROUND - YELLOW, 22mm		073941
724	1 EA	CONTACT BLOCK - 1 N.O.		073943
725	1 EA	NAME PLATE - LABEL	MODEL: 4500SPHHORSEPOWER: 2x125SE	072458
726	2 EA	DECAL - "CAUTION RISK OF ELECTRICAL..."		078987
727	1 EA	PHENOLIC - "MOTOR #1 DRIVE CONTROLLER"		076190
728	1 EA	PHENOLIC - "MOTOR #2 DRIVE CONTROLLER"		076191
729	1 EA	RELAY - 24VDC - SAFETY RELAY		078662
730	1 EA	POWER SUPPLY-380-480VAC-24VDC,480W,20A,Q		075912
731	2 EA	DISCONNECT - FUSIBLE, 400 AMP		420649
732	2 EA	DISCONNECT - SHAFT, 21.1" LG, 12mm		420650
733	2 EA	ROTARY DISCONNECT HANDLE-INTERNAL,400A		078997

734	2 EA	HANDLE - PISTOL, 274mm, NEMA 4	421208
735	1 EA	TERMINAL LUG KIT, (2) #4-300MCM (6 PCS.)	421025
736	4 EA	TERMINAL SHROUD - 400A	420655
737	6 EA	FUSE - 225 SP - CLASS J	002151
738	6 EA	DISTRIBUTION BLOCK - FINGER SAFE, 310A	075954
739	8 EA	DISTRIBUTION BLOCK - ASSY. PIN	075943
740	1 EA	VFD - 5HP, 460V, 8.8A, (355)	079914
741	3 EA	FUSE - 25A - CLASS CC, KLKR TYPE	080417
742	1 EA	ALARM HORN - WARNING - 24VDC, 104dB	080318
743	3 EA	FUSE - 40A - CLASS J	078725
744	1 EA	TRANSFORMER - 500VA - 240X480-120VAC	005846
745	1 EA	FINGER SAFE COVER - TRANSFORMER	072993
746	1 EA	FUSEBLOCK - 1-POLE - CLASS CC	078563
747	1 EA	FUSE - 8A - CLASS CC, CCMR TYPE	078559
748	4 EA	FUSEBLOCK - 2-POLE - CLASS CC	078564
749	2 EA	FUSE - 4A - CLASS CC, CCMR TYPE	078875
750	1 EA	ADAPTER - REMOTE I/O, ETHERNET	075117
751	1 EA	MODULE - INPUT 24VDC /REMOTE I/O	074183
752	2 EA	BASE - TERMINAL(3 WIRE)	074185
753	3 EA	MODULE - 8PT OUTPUT	070844
754	3 EA	BASE - FUSED NEMA TERMINAL	070843
755	1 EA	MODULE - ANALOG - 4IN/2OUT	074186
756	1 EA	INPUT - 4PT ANALOG	070845
757	1 EA	BASE - TERMINAL(2 WIRE)	070841
758	5 EA	RELAY - CONTROL - 24VDC, 10A	071690
759	5 EA	RELAY - SCREW TERMINAL SOCKET	071692
760	2 EA	FUSEBLOCK - 3-POLE - CLASS CC	078565
761	3 EA	FUSE - 10A - CLASS CC, CCMR TYPE	078198
762	3 EA	FUSEBLOCK - 3-POLE - 60A CLASS J	078571
763	9 EA	FUSE - 60A - CLASS J	002142
764	4 EA	FUSE - 5A - CLASS CC, CCMR TYPE	077212
765	2 EA	FUSE - 12A CLASS CC, CCMR TYPE	000322
766	3 EA	CIRCUIT BREAKER - 6 AMP - 1 POLE	070973
767	1 EA	CMC-FWD,20-25A, 15HP	070247
768	1 EA	AIR COND. - 15,000btu, NEMA 12, 480VAC	077475
769	1 EA	KEYPAD - NEMA 4 MFG. KIT, ACS355	421343
770	2 EA	DRIVE - CONSTANT TORQUE/ACS 580 (180)	421497
771	1 EA	LABEL/ISO - LOCK OUT/ELECTRICAL POWER	082316-ISO
772	2 EA	KEYPAD - NEMA 4 MFG. KIT, ACS880	421371
773	40 FT	CABLE - 12/4 AWG, SHIEDLED, VFD	082553
774	50 FT	CABLE - 4/0 AWG, SHIEDLED, VFD	082551
775	1 EA	SEE TEXT FOR DETAILS	FOR THE FOLLOWING USE:1" X 3" 3/16" W/ CUSTOM PHENOLIC
776	1 EA	ENCLOSURE - PARTIAL PANEL, 700mmx700mm	079934
777	1 EA	ENCLOSURE-CHASSIS W/FLANG,17x73x500mm	079936
778	2 EA	PANEL BUS ADAPTER - ACS580	421521
779	2 EA	ENCLOSURE - PLINTH,8", 200x800mm	073609
780	1 EA	ENCLOSURE - SIDE PANEL PLINTH,8", 500mm	074258
781	1 EA	ENCLOSURE - 24 X 24 X 8	010608
782	1 EA	ENCLOSURE - BACK PANEL - 24 X 24	002414
783	1 EA	DECAL - "CAUTION RISK OF ELECTRICAL..."	078987
784	1 EA	PUSHBUTTON - PUSH-PULL, F SER.	073923
785	1 EA	MOUNTING LATCH W/1N.C.L.B. CONTACT	073935
786	1 EA	CONTACT BLOCK - SELF-MONITORING, 22mm	076700
787	1 EA	CONTACT BLOCK - 1 N.O.	073943
788	1 EA	LEGEND - E-STOP - ROUND - YELLOW, 22mm	073941
789	1 EA	ADAPTER - REMOTE I/O, ETHERNET	075117
790	1 EA	MODULE - INPUT 24VDC /REMOTE I/O	074183
791	1 EA	BASE - TERMINAL(3 WIRE)	074185
792	1 EA	MODULE - 8PT OUTPUT	070844
793	1 EA	BASE - FUSED NEMA TERMINAL	070843
794	1 EA	INPUT - 4PT ANALOG	070845
795	1 EA	BASE - TERMINAL(2 WIRE)	070841
796	6 EA	RELAY - CONTROL - 24VDC, 10A	071690
797	6 EA	RELAY - SCREW TERMINAL SOCKET	071692
798	1 EA	CIRCUIT BREAKER - 6 AMP - 1 POLE	070973
799	2 EA	SWITCH - MAG-SAFETY INTERLOCK-24VDC,10m	075793
800	3 EA	PUSHBUTTON - PUSH-PULL, F SER.	073923
801	3 EA	MOUNTING LATCH W/1N.C.L.B. CONTACT	073935
802	3 EA	CONTACT BLOCK - SELF-MONITORING, 22mm	076700
803	3 EA	CONTACT BLOCK - 1 N.O.	073943
804	3 EA	LEGEND - E-STOP - ROUND - YELLOW, 22mm	073941
805	1 EA	JUNCTION BOX(INTGRTD TECH/N4X FRP	802659
806	2 EA	ENCLOSURE - 6 X 6	000647

807	2 EA	ENCLOSURE - BACK PANEL - 6 X 6	000648
808	6 EA	SENSOR - INDUCTIVE - FLUSH MOUNT	078847
809	1 EA	SENSOR - OPTICAL DISTANCE LASER, 1-75m	075957
810	9 EA	CABLE - ST - PLUG CONNECTOR, 4-PIN, 10M	075382
811	60 FT	CABLE - 8 CONDUCT (REQUIRED C-2 CALIBRA)	802661
812	4 EA	LOAD CELL	802987
813	3 EA	ENCLOSURE - 24 X 24 X 8	010608
814	3 EA	ENCLOSURE - BACK PANEL - 24 X 24	002414
815	1 EA	STACK LIGHT, LED/24VDC, GREEN, AMBER, RED	079757
816	3 EA	ENCLOSURE - 10 X 8 X 4	001897
817	3 EA	ENCLOSURE - BACK PANEL - 10 X 8	001704
818	1 EA	ALARM HORN - WARNING - 24VDC, 104dB	080318
819	1 EA	BULKHEAD FITTING - TNC TO TNC	073293
820	15 EA	CONNECTOR - DIN W/15' PIG TAIL *spcl	073711
821	2 EA	CABLE - 90 - PLUG CONNECTOR, 4-PIN, 10M	075383
822	1 EA	DISPLAY-REMOTE/HALF BRIGHT(RS-485)	803459
823	10 EA	CONDUIT - RIGID STL(1 1/2")x10' FT	080251
824	1 EA	CONDUIT - BODY TYPE T 1 1/2"	080253
825	1 EA	CONDUIT - BODY TYPE LB 1 1/2"	080512
826	1 EA	CONDUIT - RIGID STL(1")(10'FT STICKS)	070827
827	2 EA	CONDUIT - BODY TYPE T, 1"	080160
828	8 EA	CORD CONNECTOR - 3/4"(250-.375 CORD OD	070847
829	2 EA	BUSHING REDUCER - 3" TO 2"	000495
830	4 EA	STRAIN RELIEF - 2", 1.400" - 1.750"	081789
831	12 EA	CONDUIT - RIGID STL(1 1/2")x10' FT	080251
832	10 EA	CONDUIT - RIGID STL(1")(10'FT STICKS)	070827
833	2 EA	CONDUIT - BODY TYPE T, 1"	080160
834	4 EA	STRAIN RELIEF - 2", 1.400" - 1.750"	081789
835	1 EA	CONDUIT - BODY COVERS 1 1/2"	080254
836	1 EA	CONDUIT - BODY COVER GASKETS 1 1/2"	080255
837	10 EA	CONDUIT - COUPLING - RIGID - 1-1/2"	004857
838	12 EA	CONDUIT - ST. LQ-TIGHT CONN 1-1/2in	004791
839	2 EA	CONDUIT - 45 DEG. LQ TIGHT CONN 1 1/2"	079354
840	3 EA	CONDUIT - 90 DEG- LQ-TIGHT CONN(1-1/2")	004797
841	20 FT	CONDUIT - 1 1/2" LIQUID TIGHT FLEX	077243
842	2 EA	CONDUIT - BODY COVERS 1"	071249
843	2 EA	CONDUIT - BODY COVER GASKETS 1"	071250
844	4000 FT	WIRE - BLUE (#14 AWG THHN) 500'&2500'	004686
845	2 EA	CONDUIT - BODY COVERS 1"	071249
846	2 EA	CONDUIT - BODY COVER GASKETS 1"	071250
847	1 EA	CONDUIT - NIPPLE - CLOSE (1")	080167
848	1 EA	CONDUIT - REDUCER BUSHING (1 1/2"-1")	080158
849	10 FT	CONDUIT - 1" LIQUID TIGHT FLEX	070855
850	4 EA	MYERS HUB - 1 1/2"	077244
851	1 EA	CONDUIT - BODY TYPE T 1 1/2"	080253
852	1 EA	CONDUIT - BODY TYPE LL, 1 1/2"	081996
853	2 EA	CONDUIT - REDUCER BUSHING (1 1/2"-1/2")	080252
854	2 EA	CONDUIT - BODY COVER GASKETS 1 1/2"	080255
855	2 EA	CONDUIT - BODY COVERS 1 1/2"	080254
856	1 EA	DISPLAY CPU FOR (RS-485)	804667
857			
858	1 GAL	FINISH-STANDARD SSI 4500 COMPACTOR GRAY*	079022
859			
860	1 EA	TRUNNION ASSEMBLY - COMPACTOR*	802206
861	2	1 EA TRUNNION - WELDMENT/2500 SP**	802207
862	6	2 EA WELD BAR - TRUNNION**	801361
863	3	2 EA MOUNT - TRUNNION EYE*	802208
864	7	4 EA SCREW-HHCS(1/2-13 x 3-1/2:GR 8)YZ	001497
865	8	4 EA WASHER - FLAT - PLA325 - 1/2"/M12-YZ	002694
866	10	2 EA SCREW-SQHSS(3/4-10 x 3)3Z-ROHS	002766
867	11	2 EA NUT - HEX(3/4-10:GR 8)YZ	000930
868	5	4 EA SUPERBOLT - MT-175-5/W	003877
869	4	4 EA BOLT - CRAM CYLINDER TRUNNION**	801906
870			
871	1 EA	ASSEMBLY - C-RAM EXTEND SW/4500-2500/DS*	801422
872	0 EA	ASSEMBLY - CALIBRATOR BOX/ADJUST. BRKT** REFERENCE ONLY	802694
873	1 EA	PROTECTOR - PROX. SWITCH**	802695
874	1 EA	BRACKET - ASSEMBLY/PROX SWITCH*	802665
875	1 EA	ADJUSTMENT PLATE - PROX SWITCH**	802993
876	1 EA	BASE PLATE - PROX SWITCH**	802994
877	2 EA	SCREW-PHMS/SS(10-32 X 1-3/4)	002651
878	4 EA	WASHER - STAR/SS-1/4	002670
879	4 EA	SCREW-HHMS/SS(1/4-28 X 3/4)	002653
880	1 EA	PROXIMITY SWITCH	070871
881	2 EA	SCREW-HHCS(3/8-16 x 1-1/4:GR 8)YZ	000874

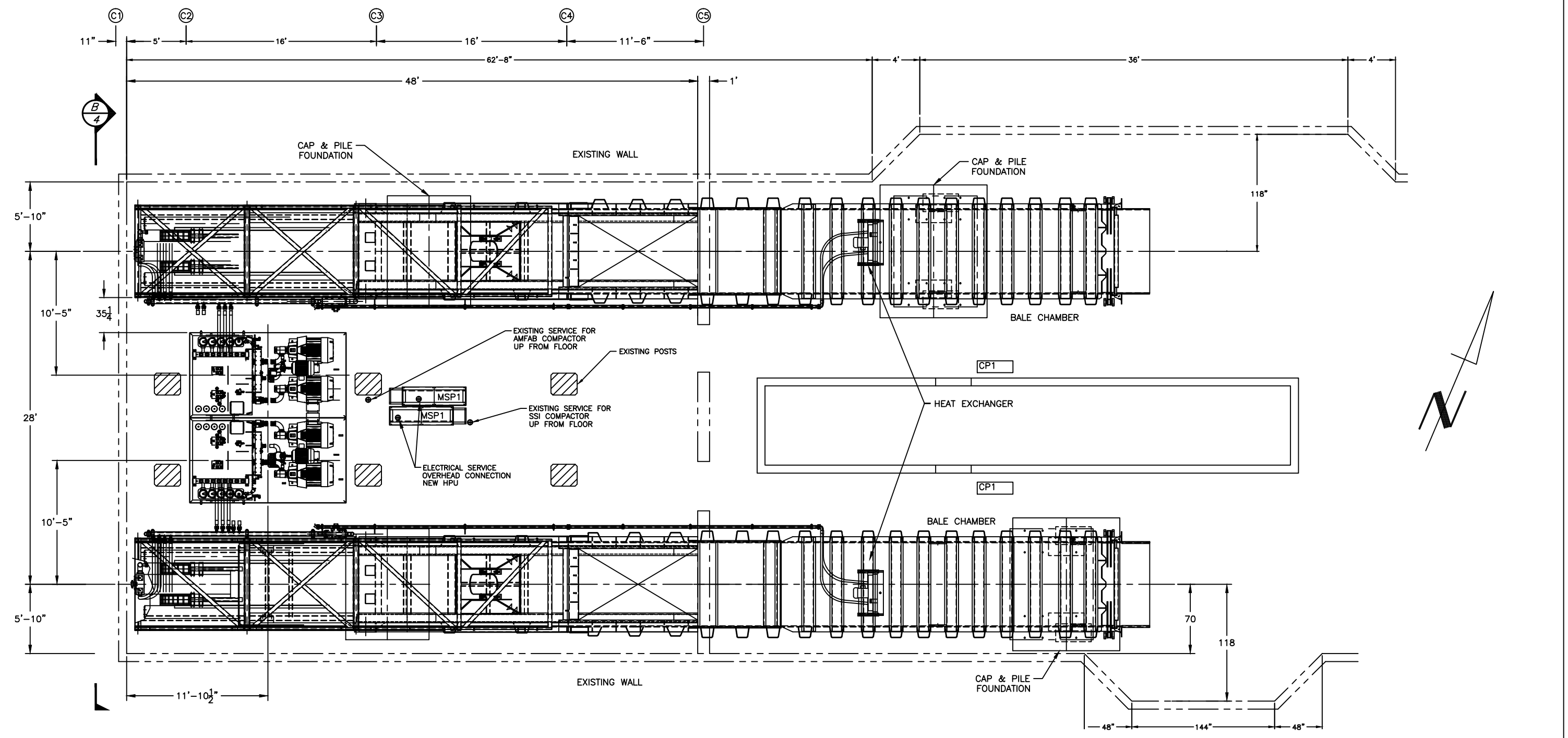
882	1 EA	LOCKWASHER(3/8:HI ALLOY)YZ		000922
883	2 EA	WASHER - FLAT - 3/8-3Z-ROHS		002559
884				
885	1 EA	PLUMBING - HYDRAULIC/CARRIAGE/4500SPH*		801406
886	16 EA	CLAMP - BEHRINGER (P-2"-HEAVY DUTY)		010045
887				
888	1 EA	SCRAPER RUBBER HD ASSEMBLY**		803639
889	1 0 EA	WELDMENT - LOAD CHUTE REF ONLY		REF
890	2 1 EA	SCRAPER MOUNT BAR RUBBER HD - WELDMENT**		803638
891	3 1 EA	SCRAPER - RUBBER HD - 72" - TXT		803640
892	4 14 EA	WASHER - FLAT - PLF436 - 3/4"/M20-YZ		002697
893	5 14 EA	LOCKWASHER(3/4:HI ALLOY)YZ		000920
894	6 7 EA	SCREW-HHCS(3/4-10 x 3-1/2:GR 8)YZ		002686
895	7 7 EA	NUT - HEX(3/4-10:GR 8)YZ		000930
896	8 7 EA	T-BOLT ASSY FOR RUBBER SCRAPER - TXT		803943
897				
898	2 EA	HOLDER - HOSE/EJECTION CYL./WELDMENT*		802521
899				
900	1 EA	PLUMBING ASSEMBLY-ERAM/CARRIAGE-4500SPH		803874
901	1 9 EA	CARRIER - CABLE & HOSE (4')(FIXED)		802489
902	2 2 PR	BRACKET - CABLE & HOSE CARRIER(MOVING)		802490
903	3 100 EA	TIE WRAP - BLACK 20"/NYLON 6/6		070652
904	4 4 EA	HOSE ASSY-32-OP32-G32xB.E. X288"OAL		801385
905	5 8 EA	FLANGE KIT - SPLIT(32 PA CODE 61)		004591
906	6 0 EA	CLAMP - HOSE/REAR EJECTION/WELDMENT*	FOR REFERENCE ONLY	802519
907	7 2 EA	BRACKET - FLOOR, HOSE TRACK**		803280
908	8 8 EA	SCREW-HHCS(1/2-13 x 5:GR 8)Y		000861
909	9 8 EA	NUT - HEX(1/2-13:GR 8)YZ		000934
910	10 8 EA	LOCKWASHER(1/2:MED)YZ		000918
911	11 60 EA	SEPARATOR - CABLE & HOSE CARRIER\$		802491
912				
913	1 EA	PLUMBING - C-RAM**		801443
914	10 EA	CLAMP - BEHRINGER (P-2"-HEAVY DUTY)		010045
915	8 EA	FLANGE KIT - SPLIT(32 PA CODE 61)		004591
916				
917	1 EA	SSI SIGN AND NAME PLATE - COMPACTOR		804566
918	2 EA	SIGN-4500SPH, 38"WIDE X 20"TALL - TXT		804199/SIGN
919	8 EA	SCREW-HHCS(3/8-16 x 1:GR 8)YZ		000871
920	8 EA	LOCKWASHER(3/8:HI ALLOY)YZ		000922
921	8 EA	WASHER - FLAT - PLF436 - 3/8"/M10-YZ		002692
922	1 EA	NAME PLATE - S/N-COM/ENGRAVED (SEE TEXT)	PRODUCT: (5)MODEL: 4500SPH SERIAL NO	070708-01
923	4 EA	SCREW - RND.HD.DRIVE(#8 x 1/2:18-8SS)		076384
924	0 EA	SAFETY LABEL LAYOUT DRAWING	PRINT AND INCLUDE CURRENT REV	PRINT 050155
925				
926	1 EA	ASSEMBLY - CRAM HOME LIMIT SWITCH**		801265
927	1 EA	LIMIT SWITCH		000641
928	1 EA	LIMIT SWITCH - ARM 11.5" SS ROD		070846
929	2 EA	SCREW-PHMS/SS(10-32 X 1-3/4)		002651
930	2 EA	SCREW-HHCS(3/8-16 x 1:GR 8)YZ		000871
931	2 EA	LOCKWASHER(3/8:HI ALLOY)YZ		000922
932				
933	1 EA	ROOF HEAT EXCHANGER MOUNT		804768
934				
935	4 EA	GOLDENISO/35-32-32PA ST - 32PA STx53"		HOSE - CRUSH CYL (A)
936	2 EA	GOLDENISO/35-32-32PA ST - 32PA STx78"		HOSE - CARRIAGE (A)
937	2 EA	GOLDENISO/35-32-32PA 90 - 32PA STx95"		HOSE - CARRIAGE (B)
938	1 EA	GOLDENISO/35-32-32PA ST - 32PA STx123"		HOSE - ERAM PRESS (E11)
939	1 EA	GOLDENISO/35-32-32PA ST - 32PA STx107"		HOSE - ERAM PRESS (E12)
940	2 EA	ROCK2SN-06-06FJIC 90 - 06FJIC STx132"		HOSE - GATE CYL PILOT
941	2 EA	GOLDENISO/35-20-20PA ST - 20FJIC STx65"		HOSE - GATE CYL (A)
942	2 EA	GOLDENISO/35-20-20PA ST - 20FJIC STx36"		HOSE - GATE CYL (B)
943	1 EA	GOLDENISO/35-24-32PA 90 - 24PA STx86"	Time @90	HOSE - ERAM - FLOOR (P)
944	1 EA	GOLDENISO/35-24-24PA ST - 24PA 90x132"	Time @0	HOSE - ERAM - FLOOR (T)
945	1 EA	GOLDENISO/35-24-24PA ST - 24FJIC 90x65"	Time @90	HOSE - FLOOR TO FLOW DIV (P)
946	1 EA	GOLDENISO/35-24-24PA ST - 24FJIC STx60"		HOSE - FLOOR TO FLOW DIV (T)
947	2 EA	GOLDENISO/35-20-20PA 45 - 20FJIC STx58"		HOSE - GATE PIPE (A) TO FLOW D
948	1 EA	GOLDENISO/35-20-20PA 45 - 20PA STx66"		HOSE - GATE PIPE (B) TO FLOW D
949	3 EA	GOLDENISO/35-32-32PA ST - 32PA STx87"		HOSE - RETURN HPU X 3
950	1 EA	GOLDENISO/35-32-32PA 90 - 32PA STx95"		HOSE - CRAM PRESSURE UPPER
951	1 EA	GOLDENISO/35-32-32PA 90 - 32PA STx100"		HOSE - CRAM PRESSURE LOWER
952	1 EA	GOLDENISO/35-32-32PA 90 - 32PA STx111"		HOSE - HPU MAN 1 PRESSURE M1
953	1 EA	GOLDENISO/35-32-32PA 90 - 32PA STx138"		HOSE - HPU MAN2 TO PRESSURE M2
954	1 EA	GOLDENISO/35-32-32PA 90 - 32PA STx110"	CLOCK @ 90	HOSE - CRAM RETURN CR1
955	1 EA	GOLDENISO/35-32-32PA 90 - 32PA STx92"	CLOCK @ 90	HOSE - CRAM RETURN CR2
956	1 EA	GOLDENISO/35-32-32PA 90 - 32PA STx78"	CLOCK @ 90	HOSE - CRAM RETURN CR3
957	27 FT	HOSE - HYDRAULIC,1-1/2" (24),100R2AT		074841
958	2 EA	FITTING - CRIMP,ST,HOSE,C61 FLNGE(24-24)		083408
959	1 EA	FITTING - CRIMP,ST,HOSE/C61 FLNGE(24-32)		074891
960	1 EA	FITTING - CRIMP,90,HOSE/C61 FLNGE(24-24)		074022
961	26 FT	HOSE - HYDRAULIC,2" (32),100R2AT		074843
962	1 EA	FITTING - CRIMP,45,HOSE/C61 FLNGE(32-32)		075538
963	3 EA	FITTING - CRIMP,ST,HOSE/C61 FLNGE(32-32)		074840



**DRAWINGS**

General Arrangement Drawing	80-4660	Sheet 2/4 Only
Chamber Assembly	80-4806	
Trunnion Assembly	80-2206	
Platen Assembly	80-1196	
Carriage Assembly	80-2389	
CRAM Extend Switch	80-1422	
ERAM Plumbing Assembly	80-3874	
Chamber Knife Installation	80-2577	
Load Cell Assembly	80-1133	
Load Chute and Seal Assembly	80-1391	
Hydraulic Schematic	80-4780	
Hydraulic Power Unit	80-4779	Sheet 1 Only
Vertical Gate Assembly	80-1979 (2)	
Compactor Plumbing Detail	80-4774	Sheet 1 Only
Building Plumbing Detail	80-4629	
Electrical Schematic	80-4733	
Gate Plumbing Detail	80-3545	
Gate and trailer Hydraulic	80-3539	
Trailer Latch Assembly	80-2475	

ITEM NO.	QTY.	FAB CODE	MFG CODE	MATERIAL
----------	------	----------	----------	----------



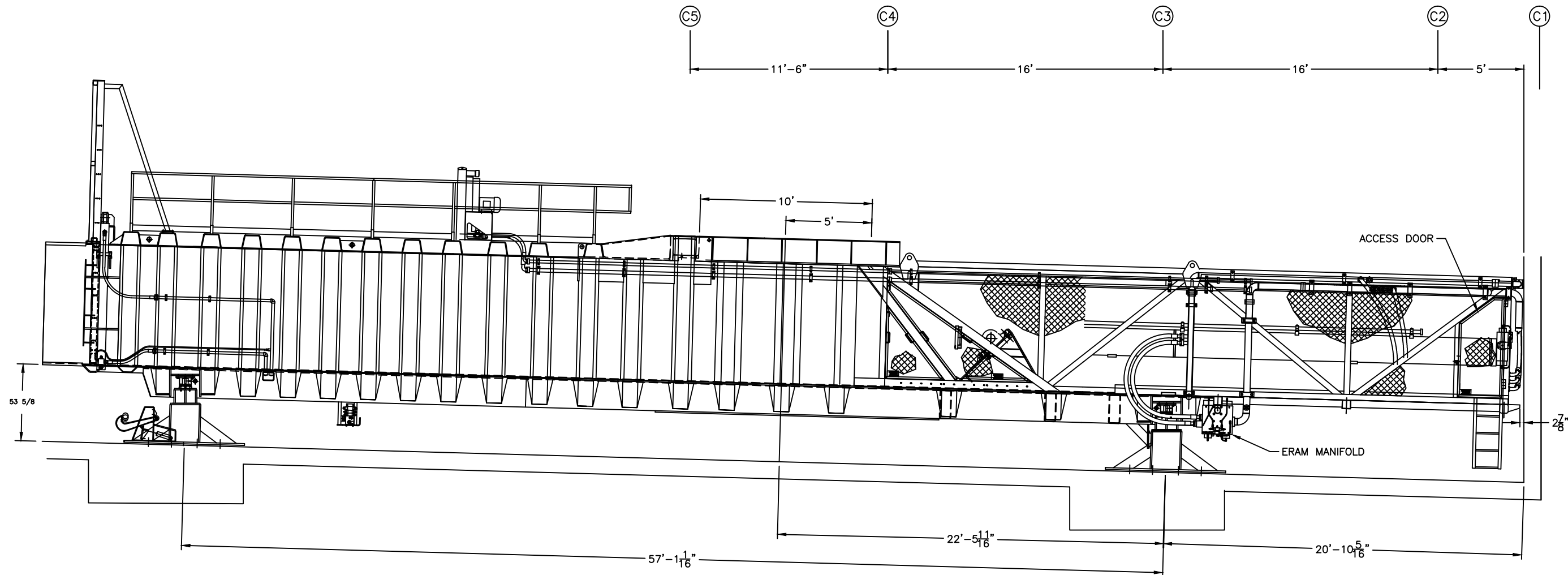
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
1	AS BUILT UPDATE DR12953	6/11/18	JBB	RC
0	RELEASED DR 11926	5/1/17	DM	DM

UNLESS OTHERWISE SPECIFIED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

**SSI** SSI Shredding Systems, Inc.  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704  
 WEB SITE: <http://www.ssiworld.com>

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:  
 ANGLES ± 1'  
 FRACTIONS ± 1/16  
 2 PL DEC. ± 0.03  
 3 PL DEC. ± 0.005

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.				
<b>PLAN VIEW SSI COMPACTORS</b>				
METRO SOUTH				
WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
	5/1/17	D Miller	1/4" = 1'-0"	1-48
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET REV.
		4500 SPH	80-4660-D	1of4 1



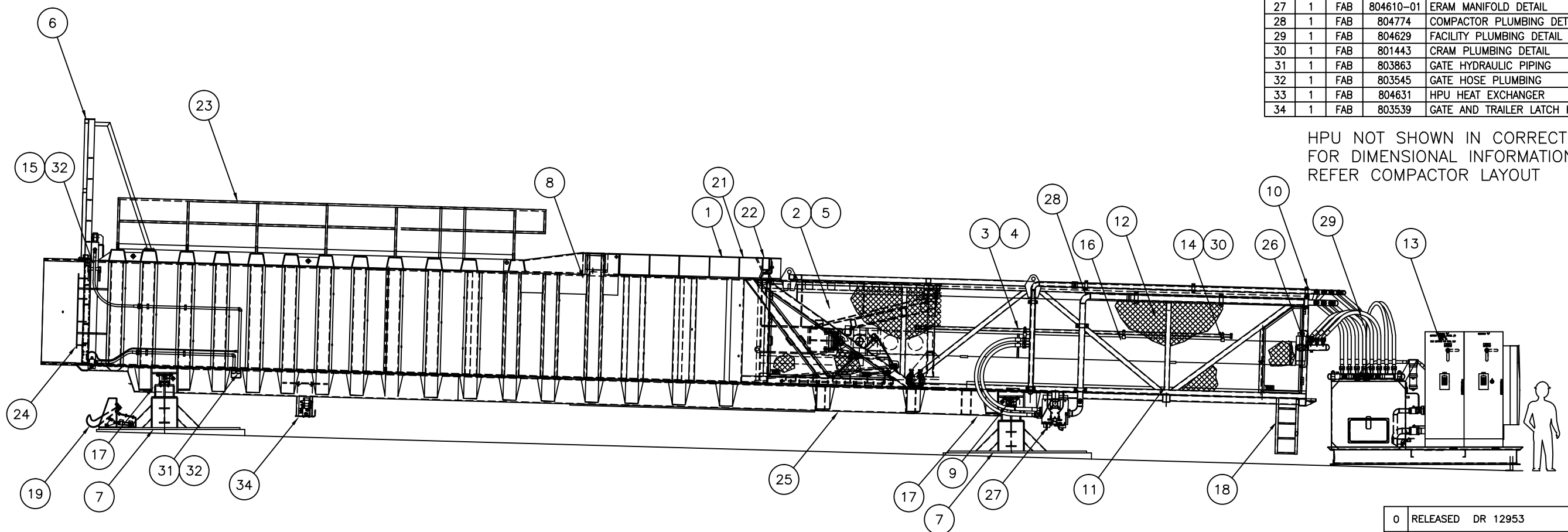
1	AS BUILT UPDATE DR12953	6/11/18	JBB	RC
0	RELEASED DR 11926	5/1/17	DM	DM
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.

**SSI** *SSI Shredding Systems, Inc.*  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704  
 WEB SITE: <http://www.ssiworld.com>

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:				
ANGLES ± 1°				
FRACTIONS ± 1/16				
2 PL DEC. ± 0.03				
3 PL DEC. ± 0.005				
THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.				
<b>SOUTH COMPACTOR #1</b>				
METRO SOUTH				
WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
	5/1/17	D Miller	1/4" = 1'-0"	1-48
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
		4500 SPH	80-4660-D	2of4
				SHEET REV.
				1

ITEM NO.	QTY.	FAB CODE	MFG CODE	MATERIAL
1	1	FAB	804724	CHAMBER WELDMENT
2	1	FAB	801196	PLATEN ASSEMBLY
3	1	FAB	802389	CARRIAGE ASSEMBLY
4	1	FAB	805074	16" CYLINDER COUPLING
5	2	FAB	802228	11" EJECTION CYLINDER COUPLING
6	1	FAB	801979	VERTICAL GATE ASSEMBLY
7	2	FAB	804750	FRONT AND REAR PEDESTALS
8	1	FAB	802577	CHAMBER KNIFE INSTALLATION
9	1	FAB	801133	LOAD CELL ASSEMBLY
10	1	FAB	802771	LASER MOUNTING BRACKET
11	1	FAB	802590	REAR RAM SUPPORT
12	1	FAB	803875	SAFETY SCREENS
13	1	FAB	804779	HYDRAULIC POWER UNIT
14	1	BUY	804721	COMPACTION CYLINDER 16" BORE x 306" STK
15	2	BUY	803210	GATE CYLINDER 6" BORE x 84" STK
16	2	BUY	804720	EJECTION CYLINDER 11" BORE x 330" STK
17	2	FAB	801453	BRASS BEARING STOP
18	2	FAB	801373	REAR ACCESS LADDER
19	1	FAB	803220	TRAILER LATCH ASSEMBLY
20	1	FAB	802070	TIRE GUIDE (NOT SHOWN)
21	2	FAB	802266	LARGE SEAL RETAINER
22	2	FAB	802252	SMALL SEAL RETAINER
23	1	FAB	804775	ROOF HANDRAIL ASSEMBLY
24	1	FAB	802427	DISCHARGE BUMPER KIT
25	1	FAB	804611	FLOOR PLUMBING DETAIL
26	1	FAB	803521-01	CRAM MANIFOLD DETAIL
27	1	FAB	804610-01	ERAM MANIFOLD DETAIL
28	1	FAB	804774	COMPACTOR PLUMBING DETAIL
29	1	FAB	804629	FACILITY PLUMBING DETAIL
30	1	FAB	801443	CRAM PLUMBING DETAIL
31	1	FAB	803863	GATE HYDRAULIC PIPING
32	1	FAB	803545	GATE HOSE PLUMBING
33	1	FAB	804631	HPU HEAT EXCHANGER (NOT SHOWN)
34	1	FAB	803539	GATE AND TRAILER LATCH HYDRAULICS

HPU NOT SHOWN IN CORRECT POSITION.  
FOR DIMENSIONAL INFORMATION PLEASE  
REFER COMPACTOR LAYOUT

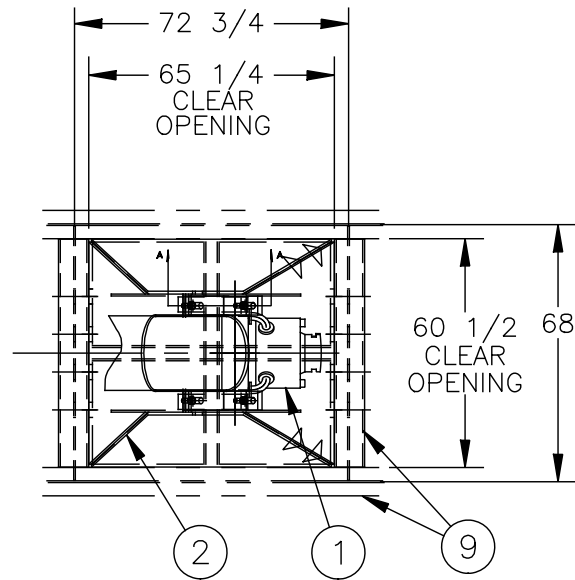


0	RELEASED	DR 12953	6/29/18	JBB	RC
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.	

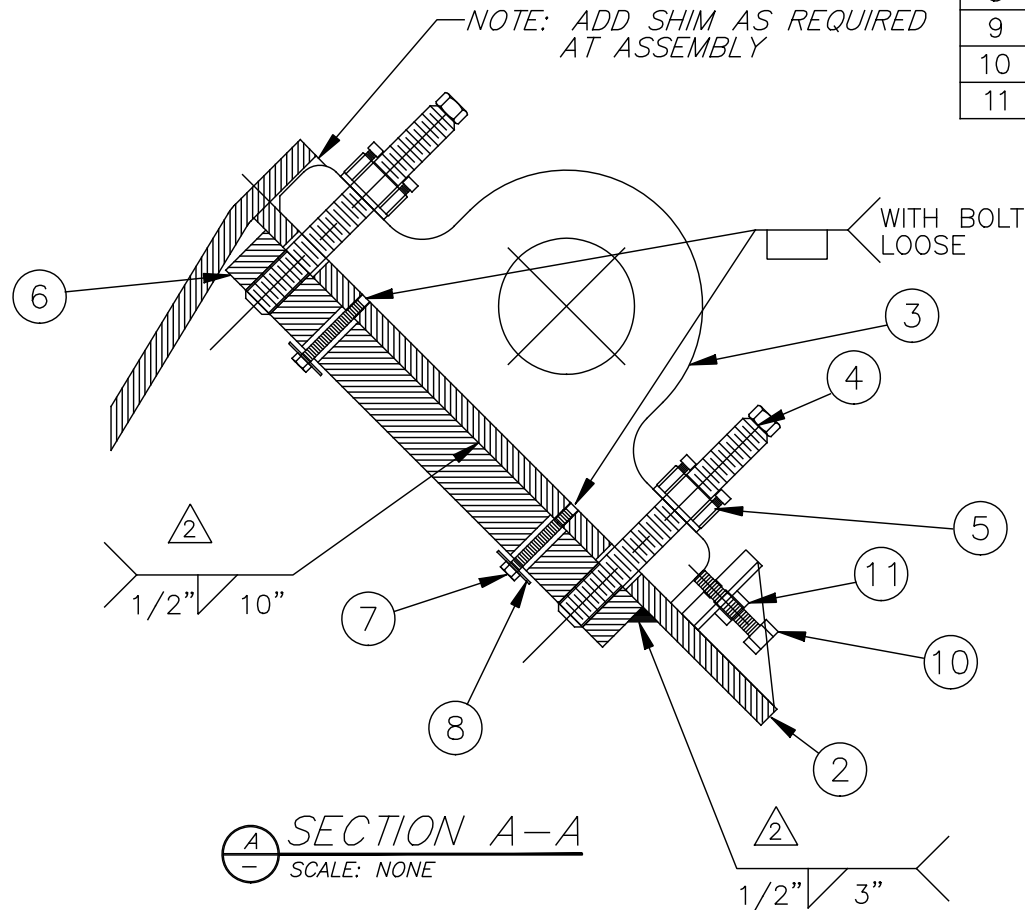
**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704  
WEB SITE: <http://www.ssiworld.com>

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:						THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.					
ANGLES ± 1°						ASSEMBLY - CHAMBER					
FRACTIONS ± 1/16						METRO - C3001					
2 PL DEC. ± 0.03		DATE		DRAWN BY		SCALE		PLT SCALE			
3 PL DEC. ± 0.005		6/29/18		JASON B		1/4"=1'-0"		1-48			
REF. DWG.		ASSY. DWG.		MODEL		DRAWING NUMBER		SHEET		REV.	
804778				4500 SPH		80-4806-D		1of1		0	

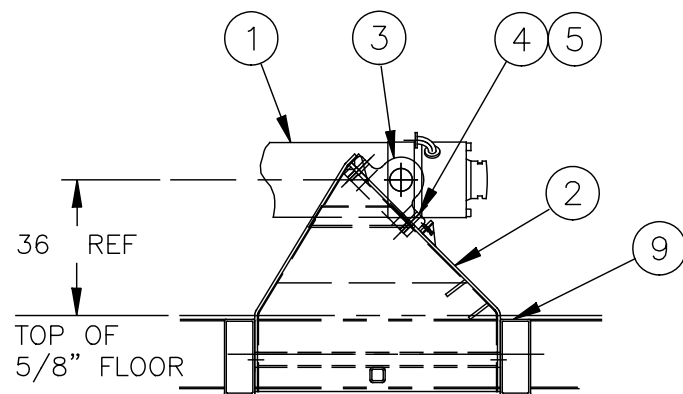
ITEM NO.	QTY.	FAB CODE	MFG CODE	MATERIAL
1	REF	BUY		COMPACTION CYLINDER 16" BORE
2	1	FAB	802207	TRUNNION WELDMENT
3	2	FAB	802208	TRUNNION EYE
4	4	FAB	801906	1 3/4"-5UNC ALL-THREAD 12" LONG
5	4	BUY	003877	1 3/4" LOCKING RING SUPER BOLT #MT-175-5/W
6	2	FAB	801361	TRUNNION WELD BAR
7	4	BUY	001497	1/2-13UNC HHCS 3 1/2" LONG
8	4	BUY	002694	1/2"x 2" FENDER WASHER
9	REF	FAB	803168	FLOOR ASSEMBLY
10	2	BUY	002766	3/4-10UNC SQ HHCS 3"LONG
11	2	BUY	000930	3/4-10UNC NUT



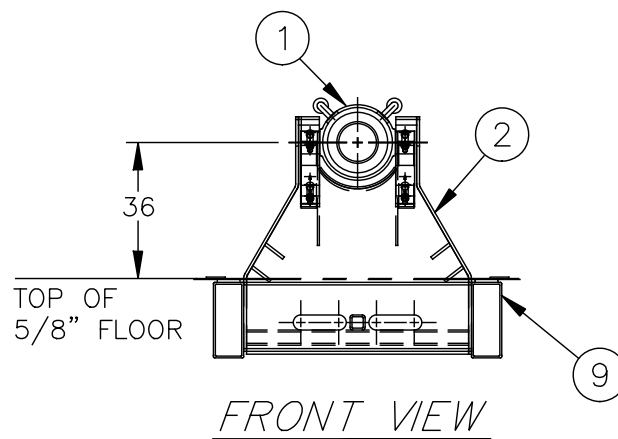
TOP VIEW



SECTION A-A  
SCALE: NONE



SIDE VIEW



FRONT VIEW

REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
9	ITEM 7 QTY 4 WAS 8 DR12317	10/4/17	JBB	RC
8	MFG CODE CHANGES TO BOM	10/24/11	RC	
7	ADDED ALL THREAD PART WITH NUT ITEM 4 DR 05666	7/30/10	DM	
6	DRO3112; ITEM 6 MADE INTO NEW DRAWING	12/29/06	DG	DM
5	MODIFIED FAB CODES ITEM 4 & 6 DR 00316	8/21/02	DM	SR
4	DELETED ITEM 12; ADDED MFG CODE TO ITEMS 4 & 5; ITEM 12, WAS A HEX NUT.	07/01/99	KMR	DM
3	ADDED DETAIL OF ITEM 6 FROM WELDMENT DRAWING.	06/17/99	KMR	DM
2	WELD, IN POSITION, REINFORCEMENT BARS AFTER C-RAM IS ALIGNED.	11/16/98	KMR	DM
1	ADDED ITRM #12; SLOTS TO FRONT VIEW	10/15/98	DLC	KMR
0	RELEASED	5/28/97	CS	DM

UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:

ANGLES ± 1'  
FRACTIONS ± 1/16

2 PL DEC. ± .03  
3 PL DEC. ± .005

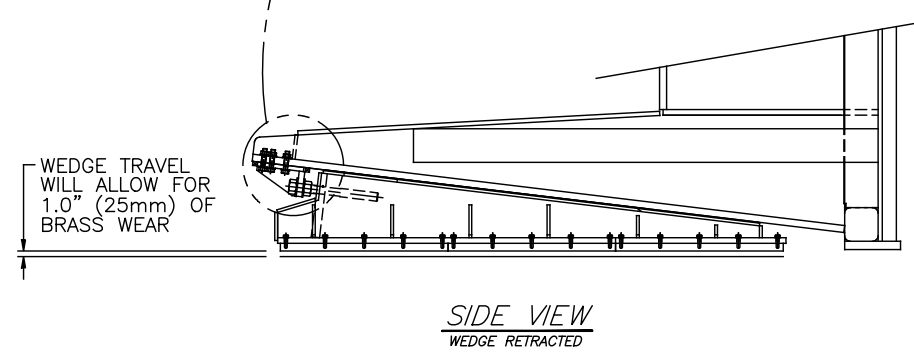
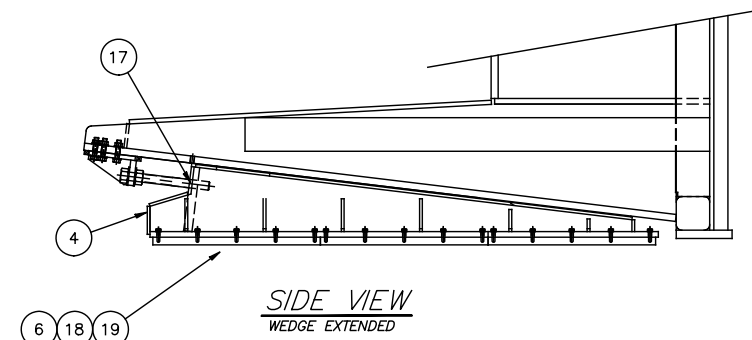
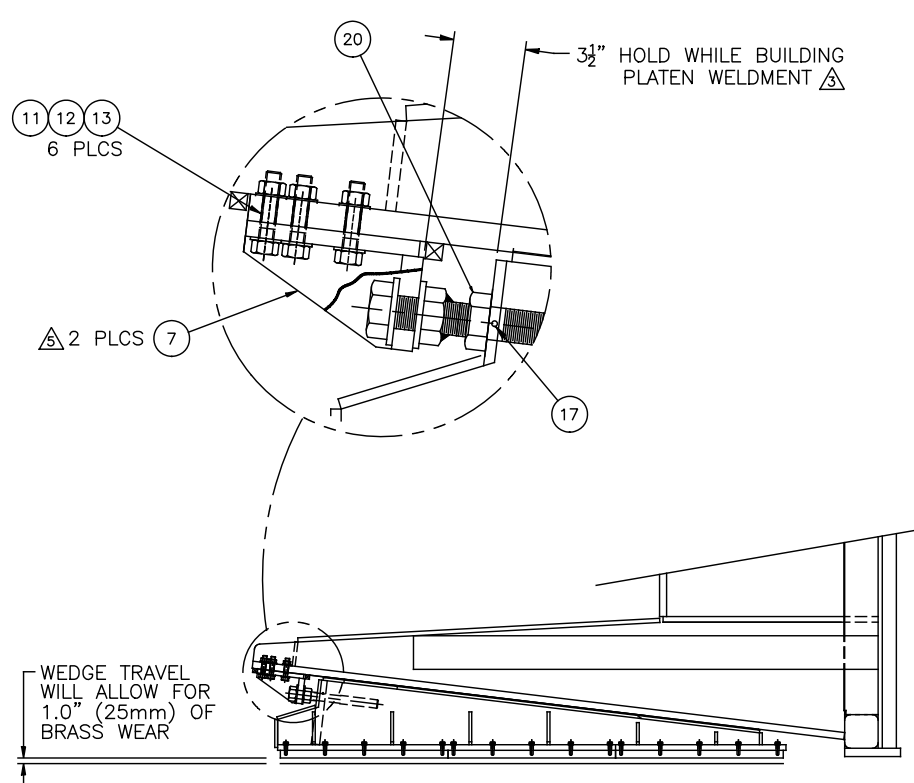
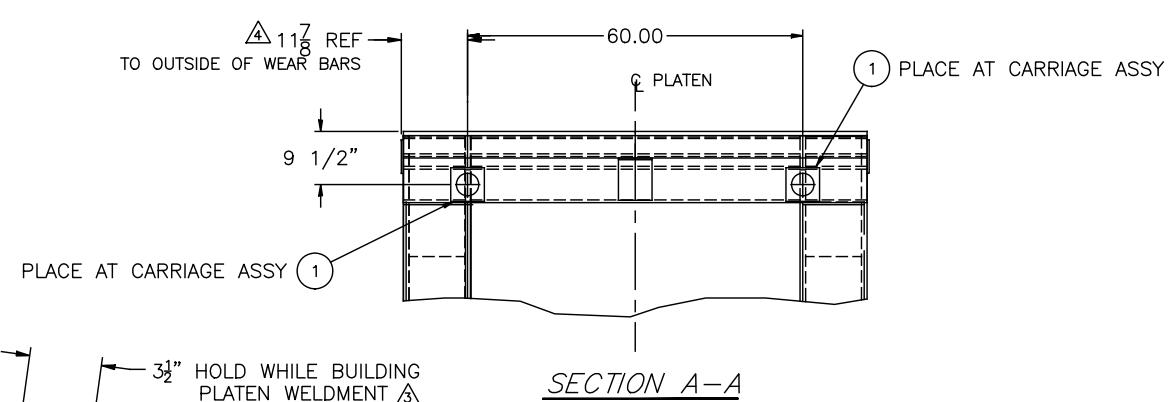
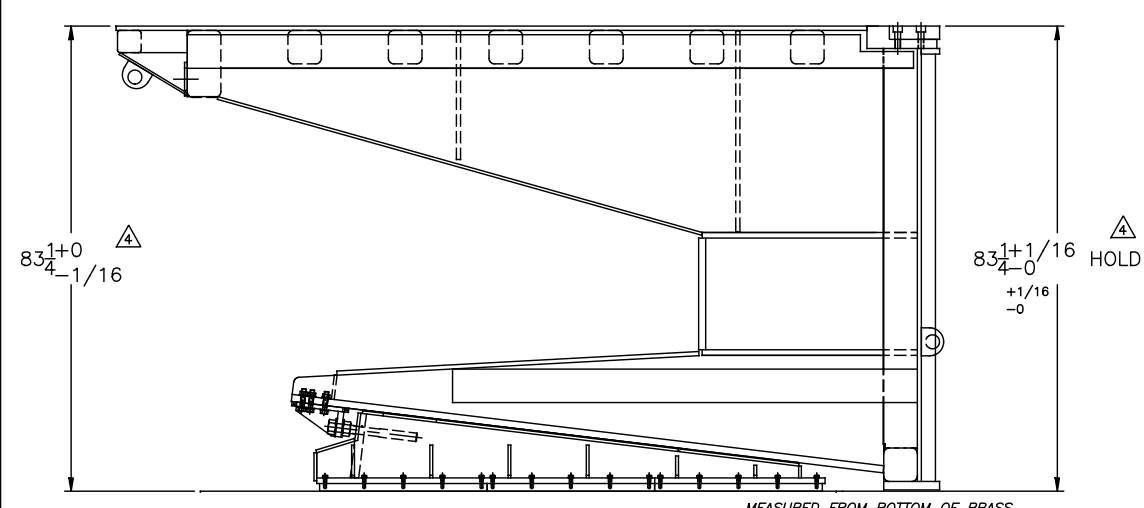
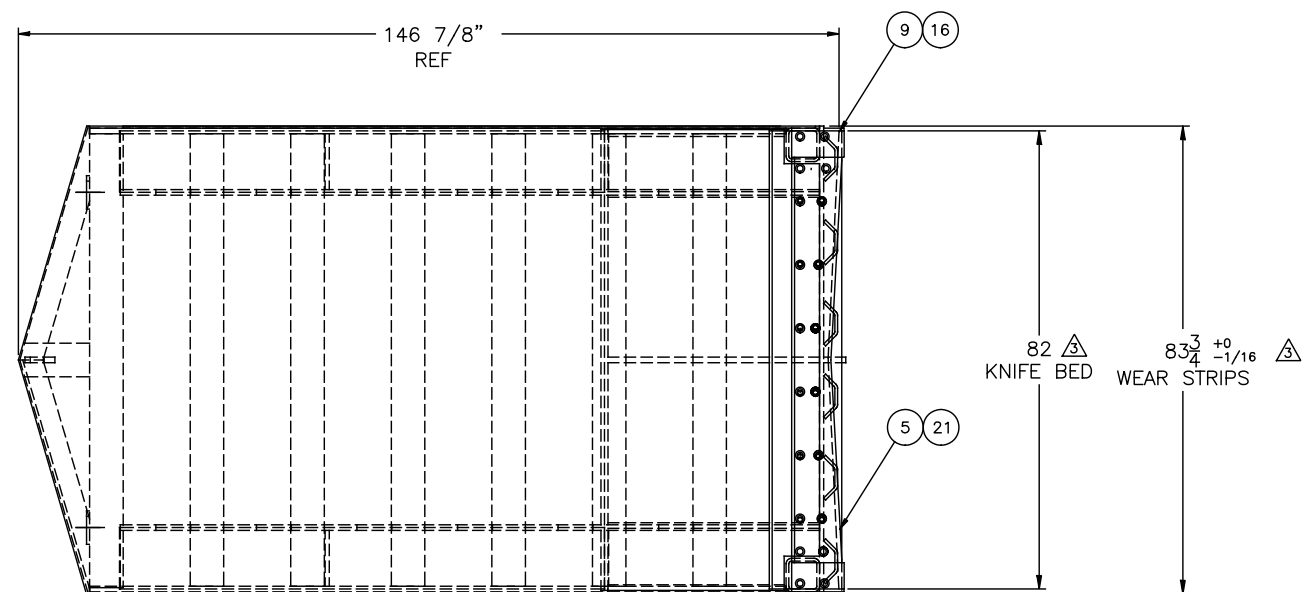
REF. DWG. ASSY. DWG.

**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704  
WEB SITE: <http://www.ssiworld.com>

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

ASSEMBLY - TRUNNION  
(16" CYLINDER)

WEIGHT	DATE	DRAWN BY	SCALE	PLOT SCALE
3,842#	5/28/97	C.SNYDER	1/48	1=48
MODEL	DRAWING NUMBER	SHEET	REV.	
COMPACTOR	80-2206-B	1 of 1	9	



REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
5	DR# 12743 ITEM#7 NOW SYMMETRICAL BRACKET	2/28/18	RC	JB
4	PDR# 12384 ADDED TOLERANCE TO HEIGHT, WIDTH, ITEM#1 LOCATION, AND WEDGE ADJUSTMENT DIMENSIONS	10/30/17	RC	JB
3	PDR#11322 ITEM#18 WAS 002705	9/26/16	RC	SR
2	MOVED CARRIAGE RECEIVER PLATE PART 803227, WAS BURNED DR 10964	4/13/16	DM	SR
1	ADJUSTMENT WAS 5" DR04339	8/27/08	DM	SR
0	RELEASED DR01800	12/1/04	DM	KBW

UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:

ANGLES ± 1°  
FRACTIONS ± 1/16

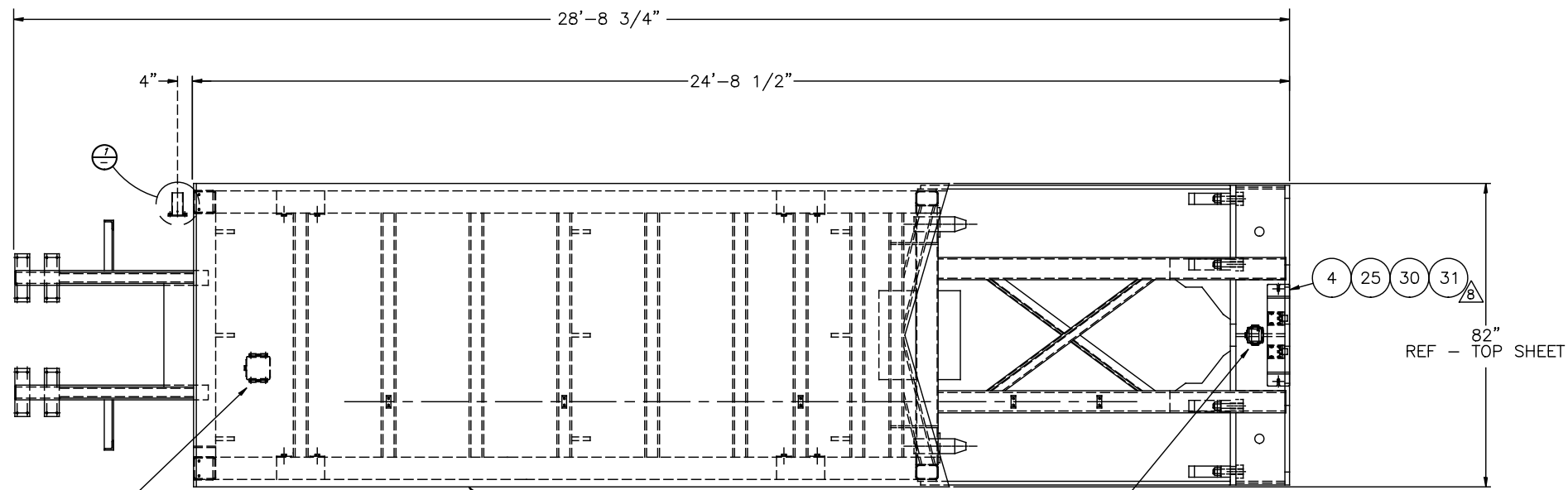
2 PL DEC. ± 0.03  
3 PL DEC. ± 0.005

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**SSI Shredding Systems, Inc.**  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704  
WEB SITE: <http://www.ssiworld.com>

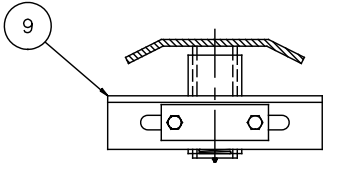
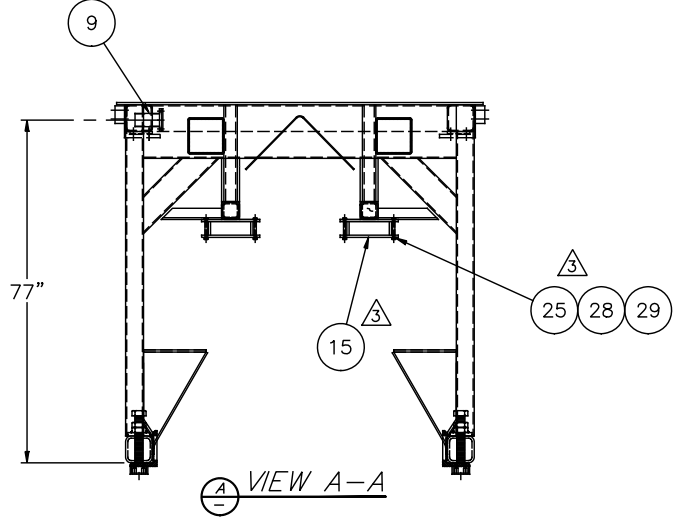
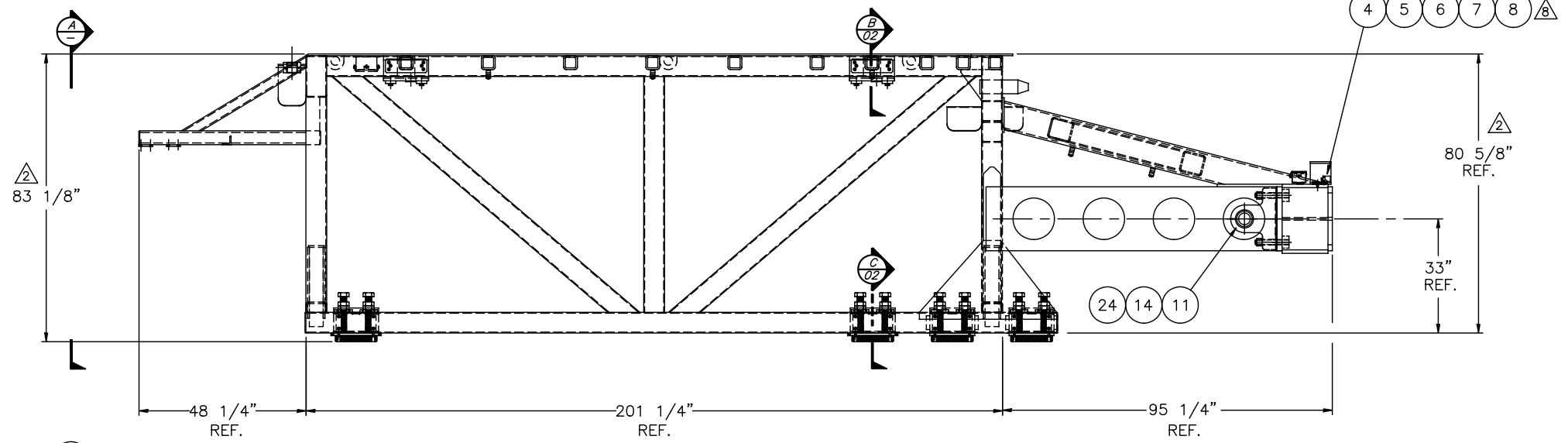
**ASSEMBLY - PLATEN**

WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
22,800#	12/1/04	D Miller	3/4"=1'-0"	1=16
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
80-1195-D		4500SPH	80-1196-D	1of1
				REV.
				5



REF - 6" JBOX MOUNT  
USES M6 HARDWARE

REF - 4" JBOX MOUNT  
USES 10-32 HARDWARE



DETAIL 1  
SCALE: 5/1

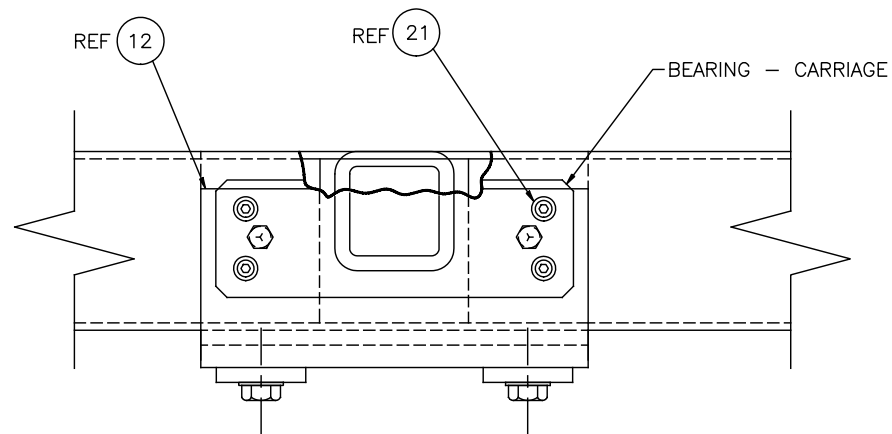
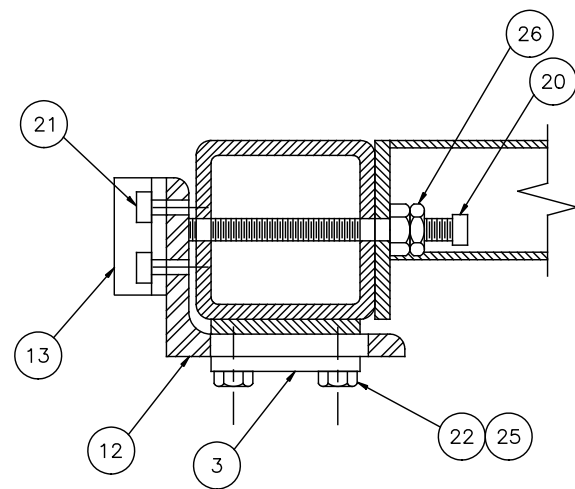
NOTE:  
ITEM 9  
LOCATE @ ASSEMBLY  
ON CONTROL PANEL SIDE

REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
8	PDR#12384 COPY REVISED WELDMENT, ADD JBOXES & SENSORS	11/1/17	RC	JB
7	PDR#11462 ITEM#24 WAS 003782 ITEM#30 & 31 ADDED ITEM#25 WAS QTY56	11/17/16	RC	SR
6	ADJUSTMENT BOLTS ON OWN DRAWINGS DR 05763	9/20/10	DM	
5	ADDED EXTRA BEARING DR01037	9/30/03	DM	SR
4	DELETED ITEM 1 MOVED TO WELDMENT ADDED ITEM 30-31	09/12/00	GAL	DM
3	DELETED ITEM 15, SHIM KIT REFERENCE 80-3198-B; ITEM 10 WAS 80-2377-D	11/01/99	KMR	DM
2	TOOK 1/8" OFF THE DESIGNATED DIMENSIONS; ITEM 20 & 26 WAS 3/4"; ITEM 12 QTY WAS 10.	06/22/99	KMR	DM
1	CHG: #20 WAS 12 Lg; #24 WAS 7 Lg	11/30/98	DLC	BP
0	RELEASED	9/30/98	DLC	DM

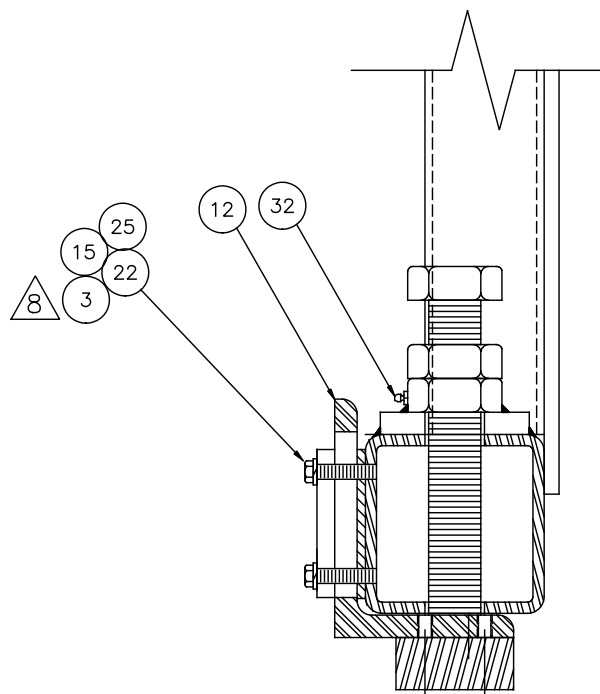
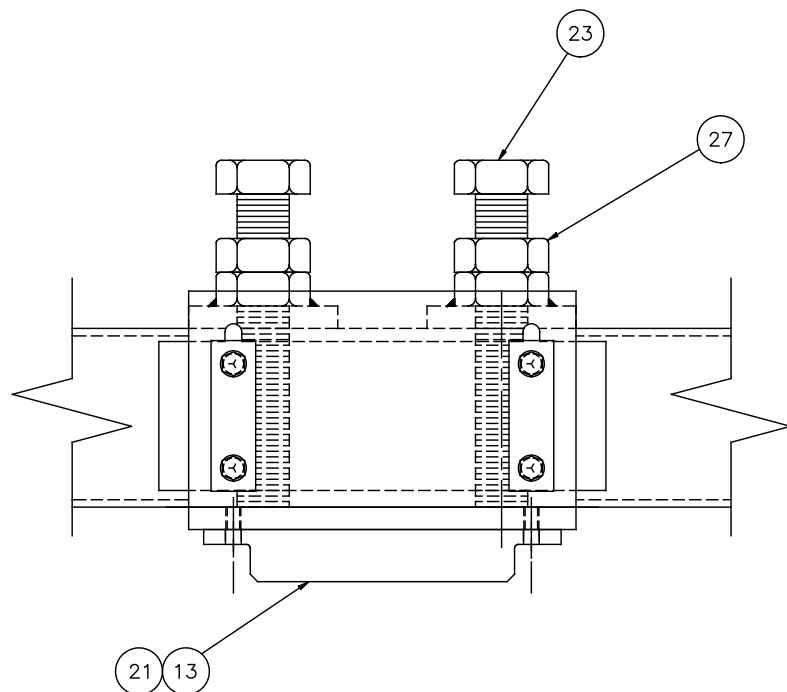
**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704  
WEB SITE: <http://www.ssiworld.com>

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:				
ANGLES ± 1°				
FRACTIONS ± 1/16				
2 PL DEC. ± 0.03				
3 PL DEC. ± 0.005				
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
80-2384-D		4500SPH	80-2389-D	1 of 2
WEIGHT		DATE	DRAWN BY	SCALE
		9/30/98	D. COOK	1/20
PLT SCALE		REV.		
1=20		8		

ASSEMBLY - CARRIAGE



**B** SECTION B-B  
01 SCALE: NONE



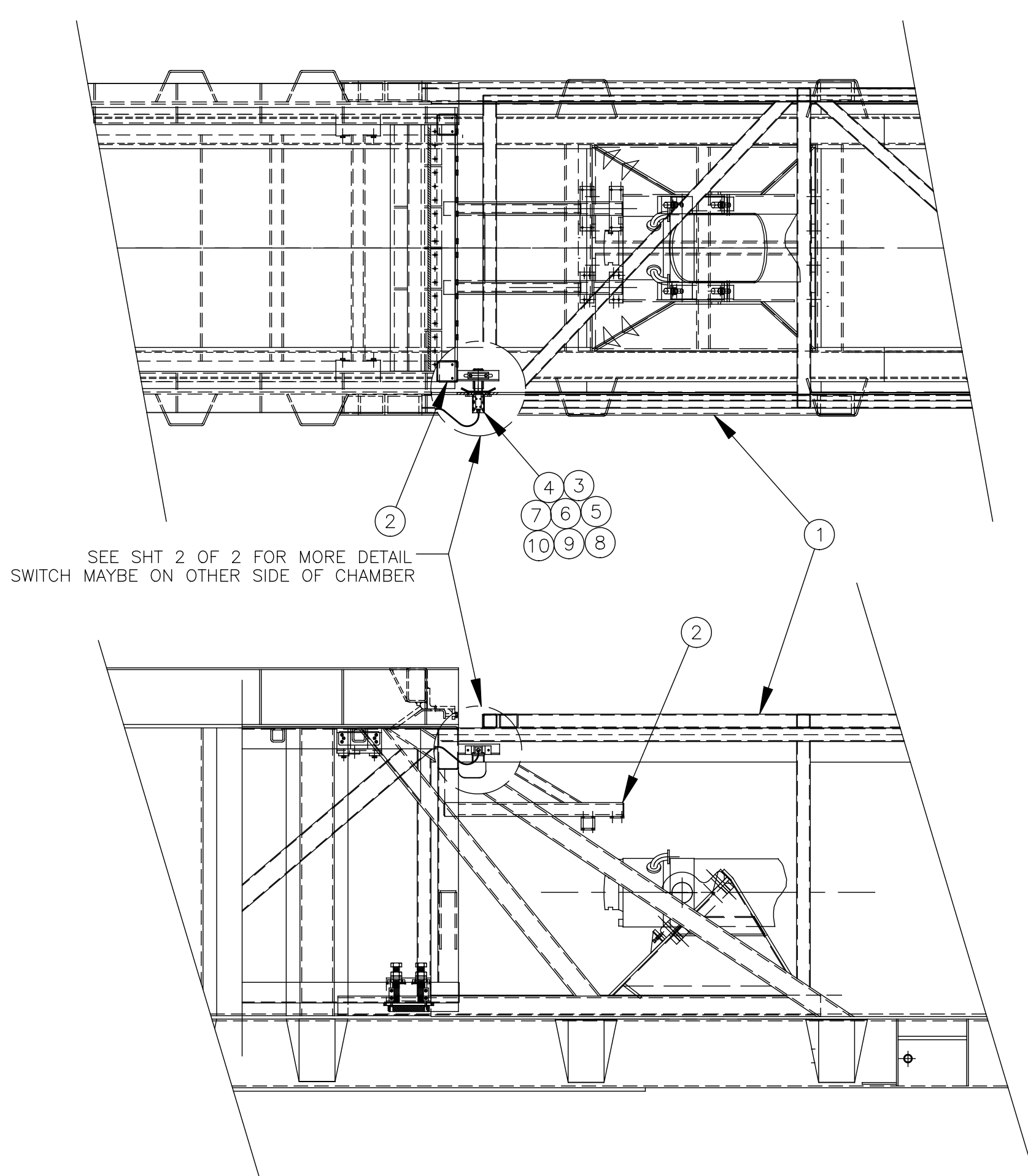
**C** SECTION C-C  
01 SCALE: NONE

REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
8	PDR#12384 ITEM#3 WAS #2	11/1/17	RC	JB
7	PDR#11462 ITEM#24 WAS 003782 ITEM#30 & 31 ADDED ITEM#25 WAS QTY56	11/17/16	RC	SR
6	SEE SHEET 1. DR05763	9/2010	DM	
5	SEE SHEET 1. DR01037	9/30/03	DM	SR
4	SEE SHEET 1.	09/12/00	GAL	DM
3	SEE SHEET 1.	11/01/99	KMR	DM
2	SEE SHEET 1.	06/22/99	KMR	DM
1	SEE SHEET 1.	11/30/98	DLC	BP
0	RELEASED	9/30/98	DLC	DM

**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704  
WEB SITE: <http://www.ssiworld.com>

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:					THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.				
ANGLES ± 1° FRACTIONS ± 1/16					ASSEMBLY - CARRIAGE				
2 PL DEC. ± 0.03 3 PL DEC. ± 0.005		WEIGHT SHT1	DATE 9/30/98	DRAWN BY D. COOK	SCALE 1"=1'	PLT SCALE 1=12			
REF. DWG. 80-2384-D	ASSY. DWG.	MODEL 4500SPH	DRAWING NUMBER 80-2389-D		SHEET 2of2	REV. 8			





SEE SHT 2 OF 2 FOR MORE DETAIL  
SWITCH MAYBE ON OTHER SIDE OF CHAMBER

ITEM NO.	QTY.	FAB CODE	MFG CODE	MATERIAL
1	REF	-	-	CHAMBER
2	REF	-	-	CARRIAGE
3	REF	-	-	ASSEMBLY-CALIBRATOR BOX 80-2694
4	1	MACH	802695	PROX-SWITCH-PROTECTOR 80-2695
5	1	FAB	802665	PROX-SWITCH MOUNT ASS'Y 80-2665
6	2	CUT	001399	F.B. 1/4" X 1-1/2" 5 1/4" LG
7	1	BUY	070871	PROX SWITCH A/B #802PR-LBAH1
8	2	BUY	000874	SCREW-HHCS-3/8" 1-1/4" LONG
9	2	BUY	000922	3/8" LOCKWASHER-MED
10	2	BUY	002559	3/8" FLATWASHER

NOTE:  
ITEM 3,4,5,6,AND 7 WILL  
NEED TO BE LOCATED WITH THE  
C-RAM AND CARRIAGE FULLY  
EXTENDED

SLOTTED ANGLE MOUNT (ITEM #1 FROM 802694) IS  
WELDED TO THE TOP REAR OF  
THE CARRIAGE.  
WHEN WELDING THIS ITEM TO THE CARRIAGE  
MAKE SURE THE WHOLE ASSEMBLY (802694)  
IS USED!(ITEM #6 T.S. FROM 802694) SHOULD BE  
ABOUT 1-1/8" AWAY FROM THE  
5/8" X 8" F.B. TO ALLOW MOVEMENT  
AS THE CARRIAGE TRAVELS

SLIDER BRACKET (ITEMS # 4,5,& 8 FROM 802694)  
SHOULD BE IN THE CENTER OF THE PROX.  
SWITCH. ITEM # 7

DRIVERS SIDE SHOWN - SEE DRAWING  
80-2705 FOR PASSENGER SIDE ASSY

2	ADDED DETAIL FOR ITEM 6 ATTACHMENT (SHEET 2) DR 06305	4/15/11	DM	
1	ITEM 3 WAS "FAB" DR03738	11/1/07	DM	SR
0	RELEASED DR03388	5/24/07	DM	SR
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.

UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:  
 ANGLES ± 1'  
 FRACTIONS ± 1/16  
 2 PL DEC. ± 0.03  
 3 PL DEC. ± 0.005

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

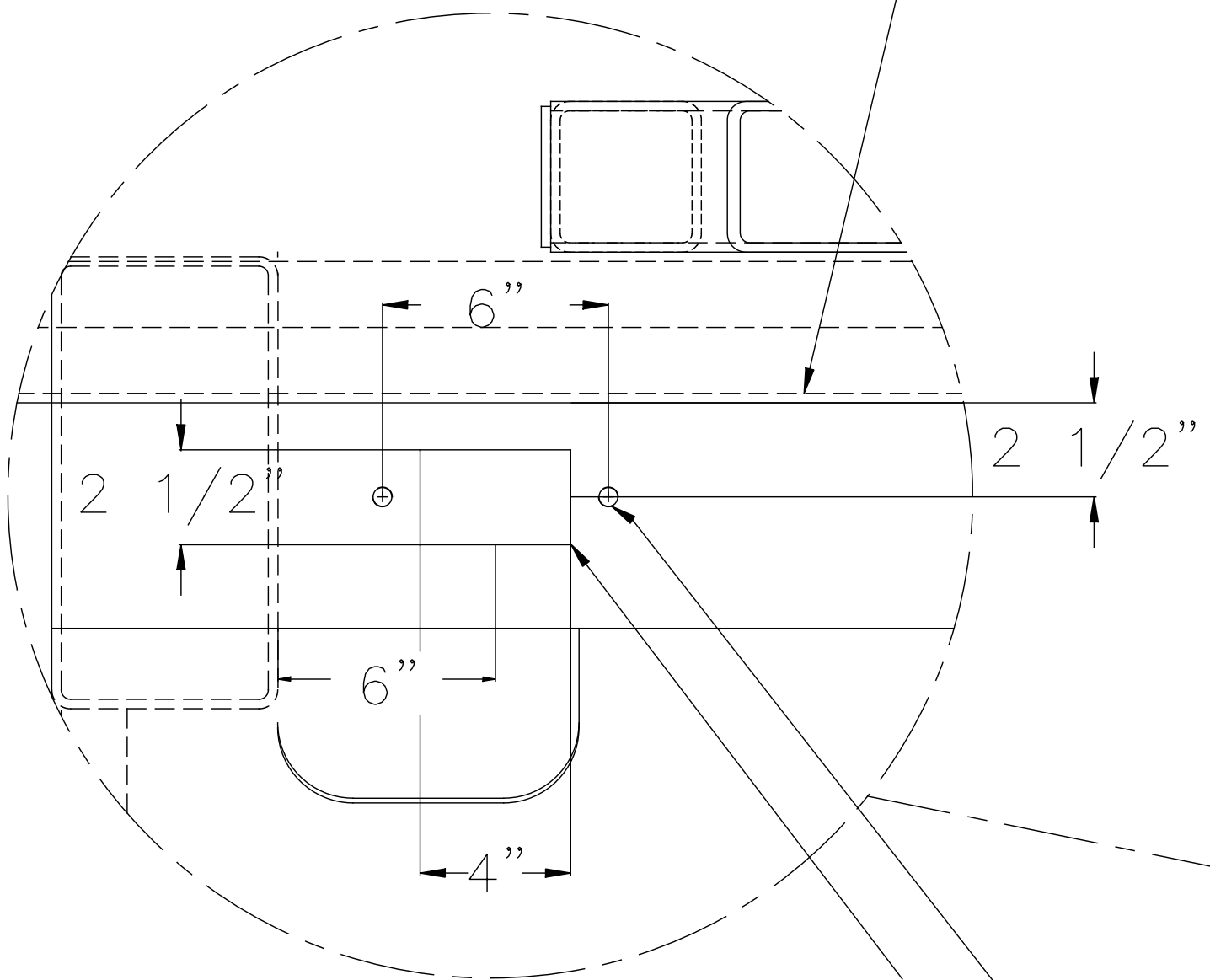
**SSI Shredding Systems, Inc.**  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704  
 WEB SITE: <http://www.ssiworld.com>

**C-Ram Extend Switch**  
4500

WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
	5/24/07	D Miller	1/16	1=16

REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET	REV.
80-2705		4500-2500	80-1422-D	1of2	2

Ref Bottom of T.S. 4"x4"  
Outside Cylinder Section

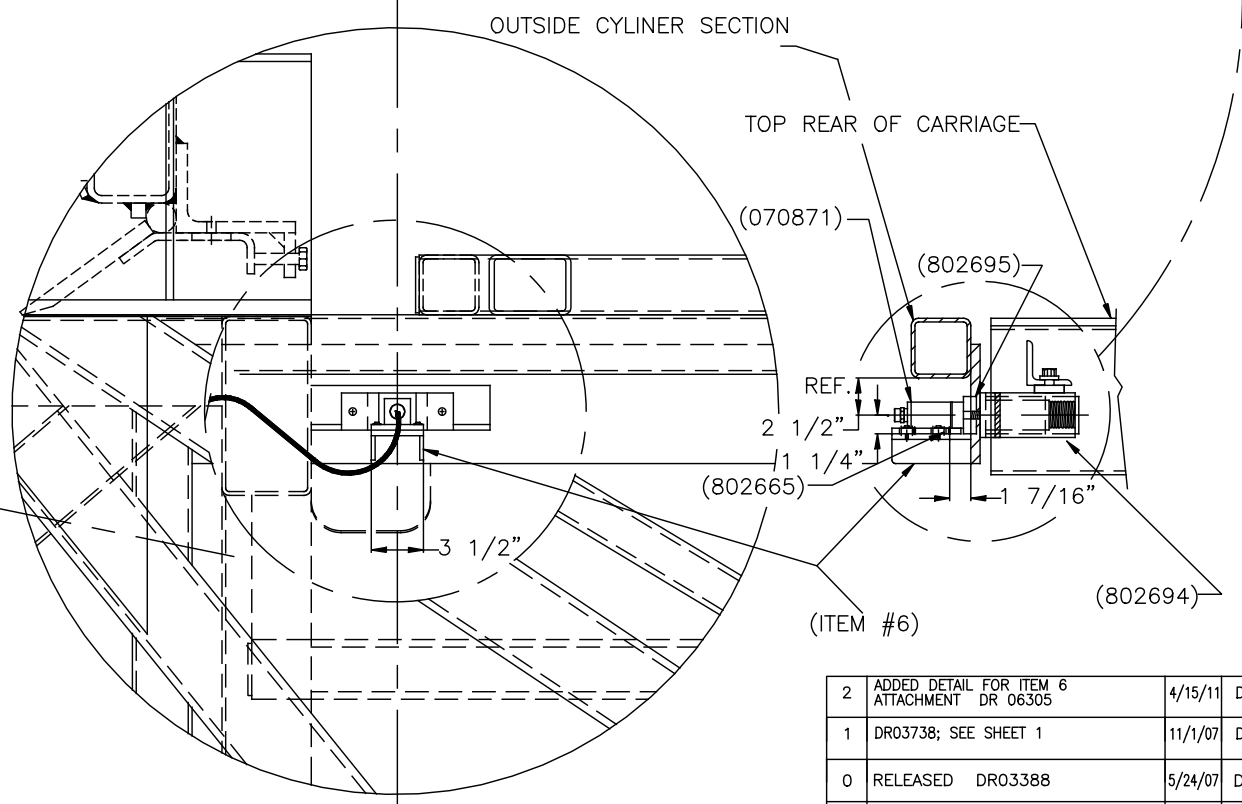
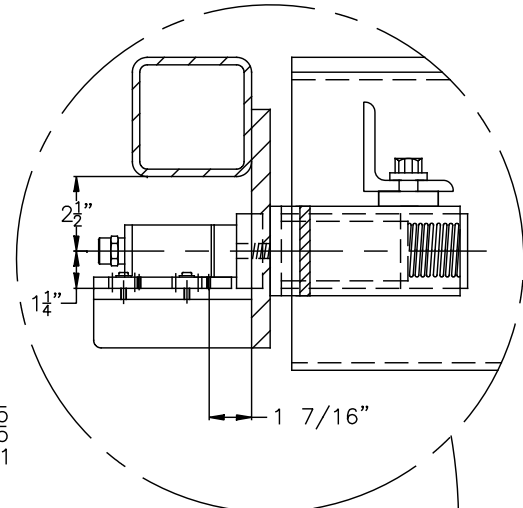
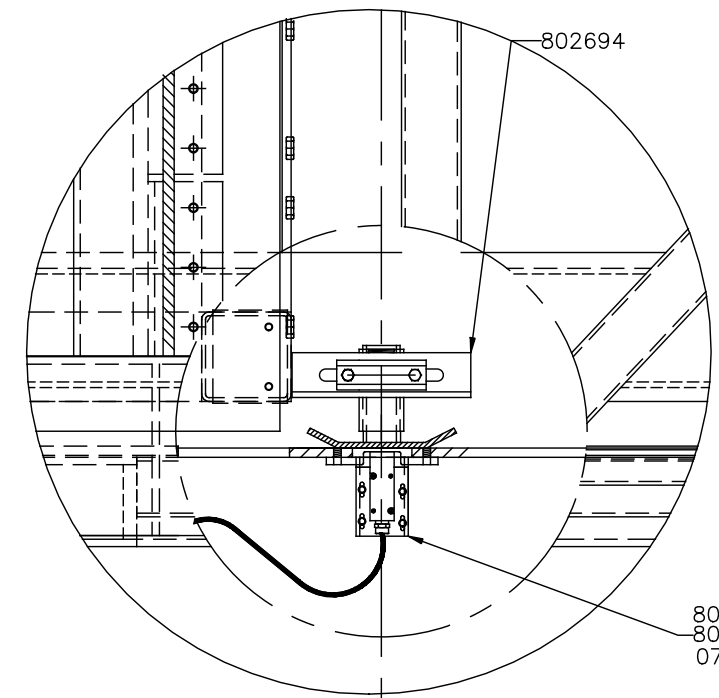


SLOT BURN DETAIL

Burn 2 1/2" x 4" Hole  
Thru 5/8" x 8" F.B.

Use 802695 to ensure it  
Clears any cross braces

Drill&Tap 3/8"-16unc thru.



REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
2	ADDED DETAIL FOR ITEM 6 ATTACHMENT DR 06305	4/15/11	DM	
1	DR03738; SEE SHEET 1	11/1/07	DM	SR
0	RELEASED DR03388	5/24/07	DM	SR

UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

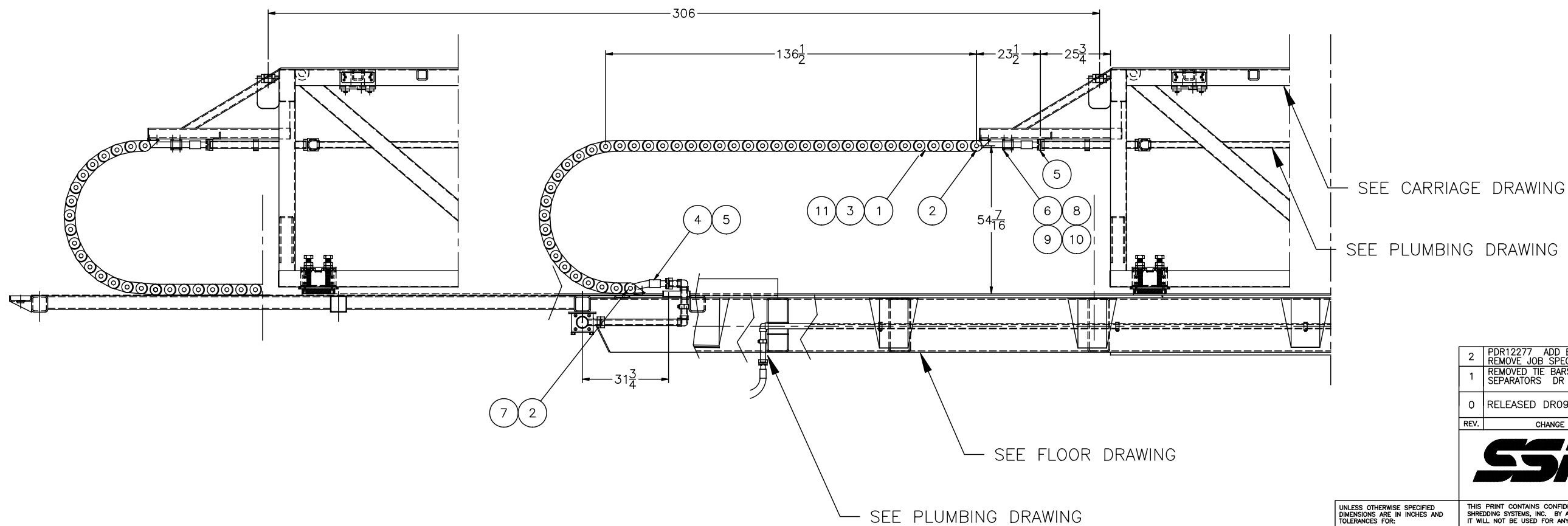
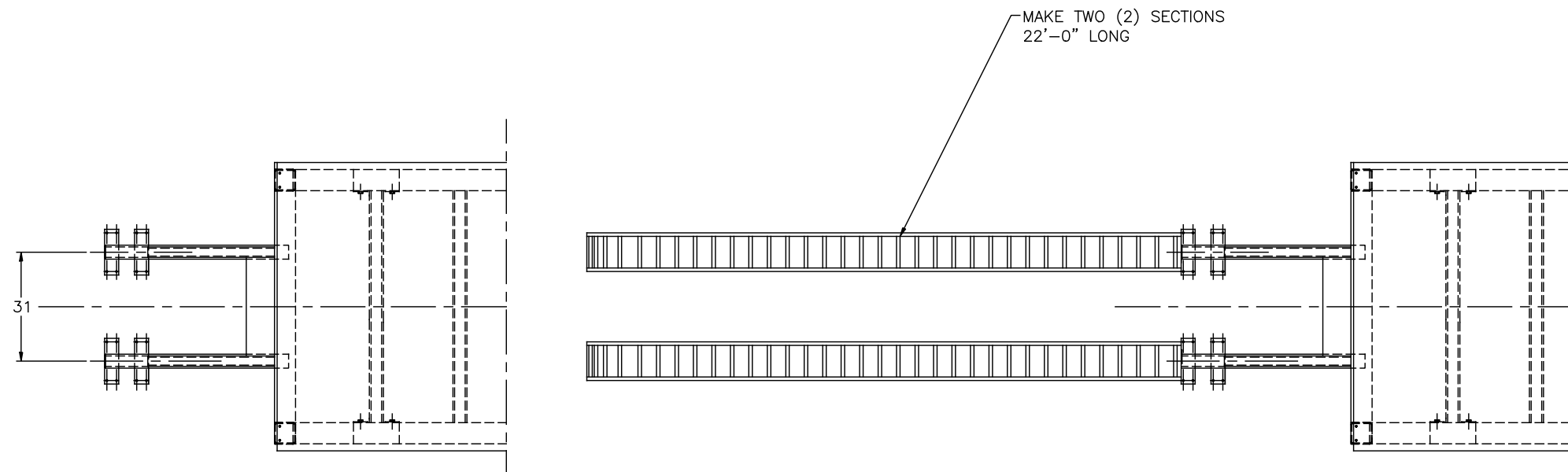
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:  
 ANGLES ± 1°  
 FRACTIONS ± 1/16  
 2 PL DEC. ± 0.03  
 3 PL DEC. ± 0.005

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**SSI** SSI Shredding Systems, Inc.  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704  
 WEB SITE: <http://www.ssiworld.com>

**C-RAM-EXTEND SWITCH**  
4500

WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
	5/24/07	D Miller	1/6	1=6
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
80-2705		4500&2500	80-1422-D	2of2
				REV. 2

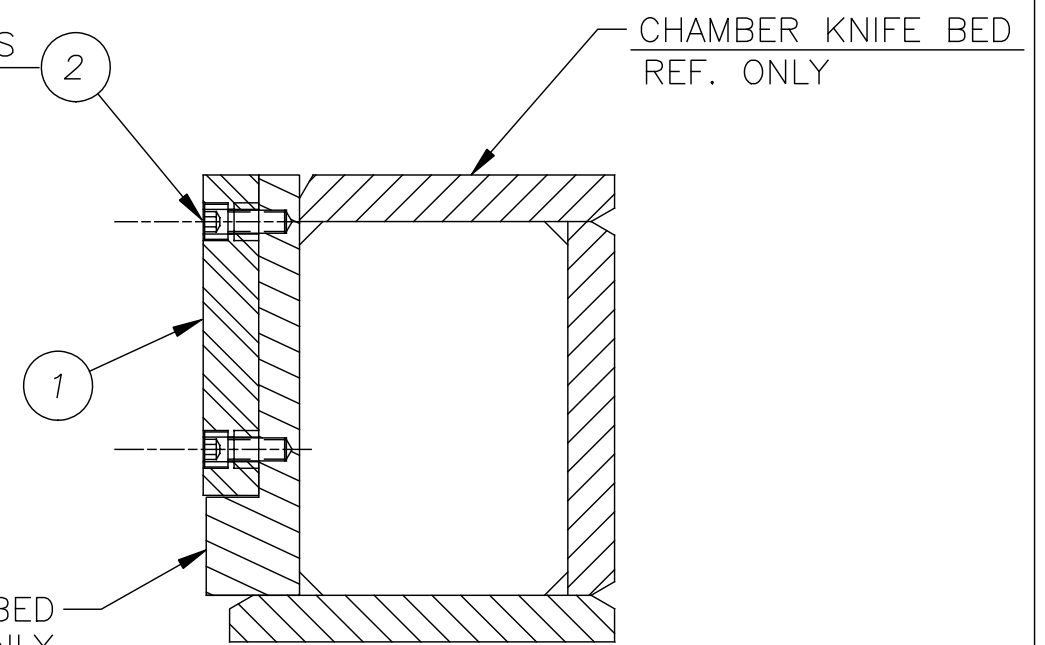
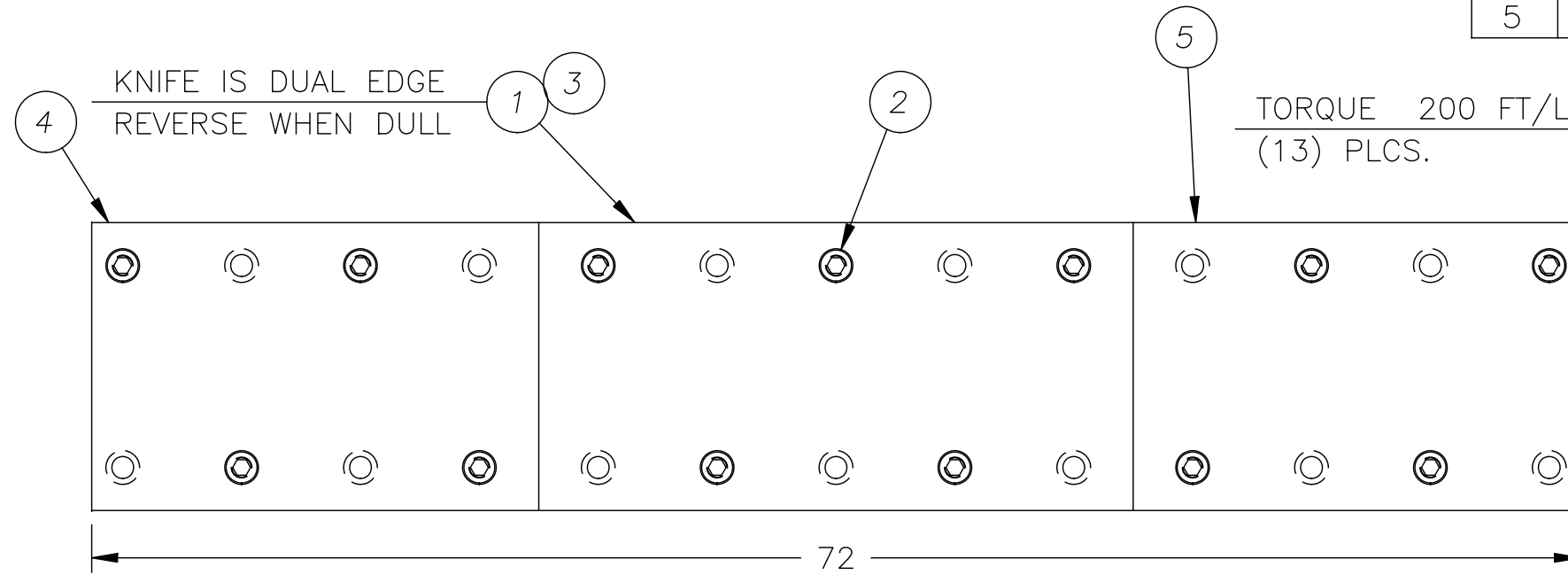


REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
2	PDR12277 ADD BACK IN SEPARATORS REMOVE JOB SPECIFIC REFERENCES	9/19/17	RC	JB
1	REMOVED TIE BARS & SEPARATORS DR 11868	4/6/17	DM	CS
0	RELEASED DR09329	6/3/14	DM	SR

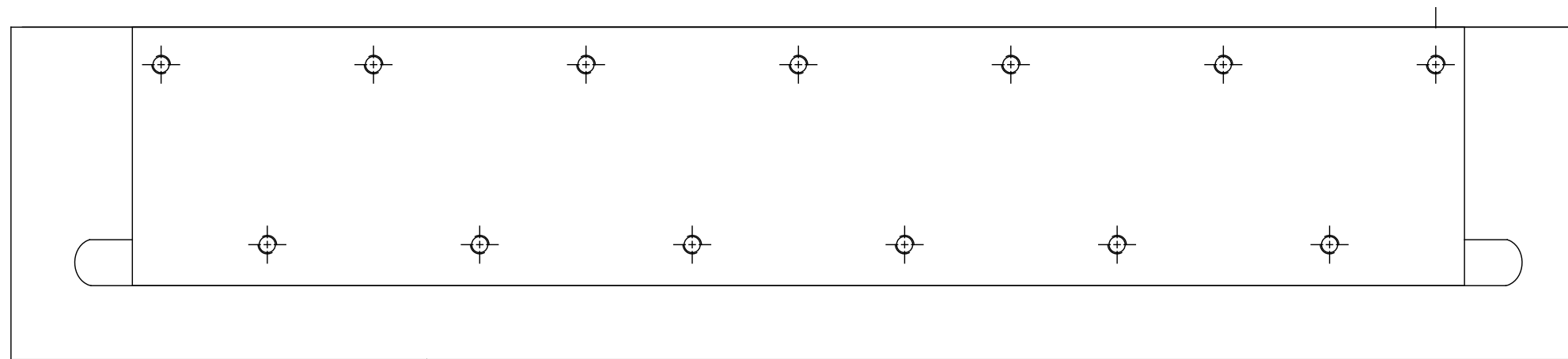
**SSI** SSI Shredding Systems, Inc.  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704  
 WEB SITE: <http://www.ssiworld.com>

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:					THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.				
ANGLES ± 1° FRACTIONS ± 1/16					ERAM PLUMBING ASSEMBLY 4500SPH				
2 PL DEC. ± 0.03 3 PL DEC. ± 0.005		WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE			
		222#	6/3/14	D Miller	1/20	1=20			
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER		SHEET	REV.			
		4500SPH	80-3874-D		1of1	2			

ITEM NO.	QTY.	FAB CODE	MFG CODE	MATERIAL
1	1	REF	-	CHAMBER KNIFE (3) PC 80-2556-D
2	13	BUY	003321	1"-8UNC S.H.C.S., GRD. 8 2 1/2" LG.
3	1	MFG	802558	CHAMBER KNIFE 80-2558
4	1	MFG	802557	CHAMBER KNIFE 80-2557
5	1	MFG	802623	CHAMBER KNIFE 80-2623



*KNIFE ASSEMBLY*  
CROSS-SECTIONAL VIEW



*CHAMBER KNIFE INSTALLATION*  
VIEW FROM INSIDE COMPACTOR

REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
3	DEL WRONG/EXTRA PT NUMBERS	10/21/11	RC	
2	Added Item 5	06/14/01	GAL	DG
1	ADD ITEMS 3 & 4	04/02/01	GAL	DG
0	RELEASED	3/22/01	GAL	DM

**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

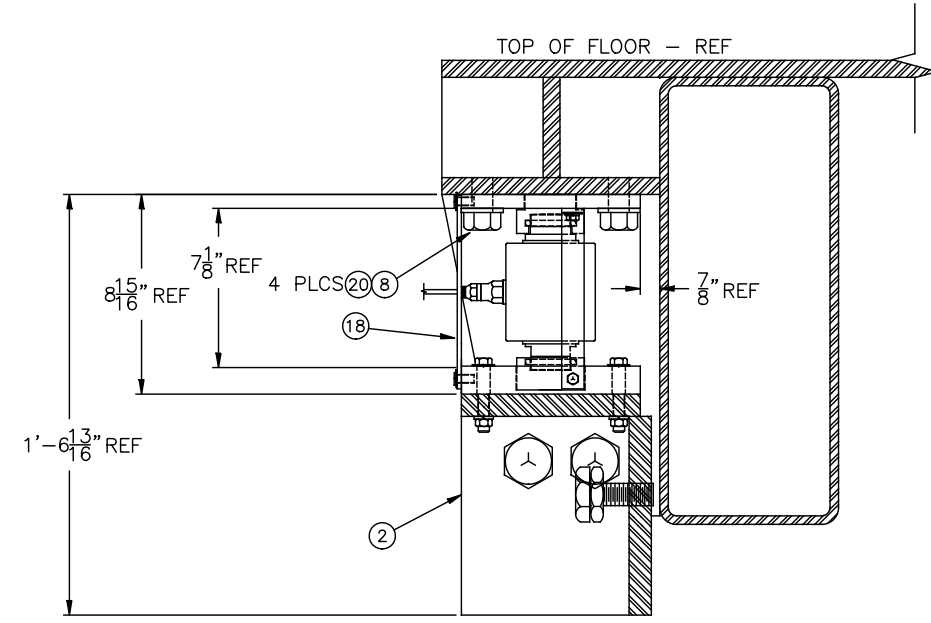
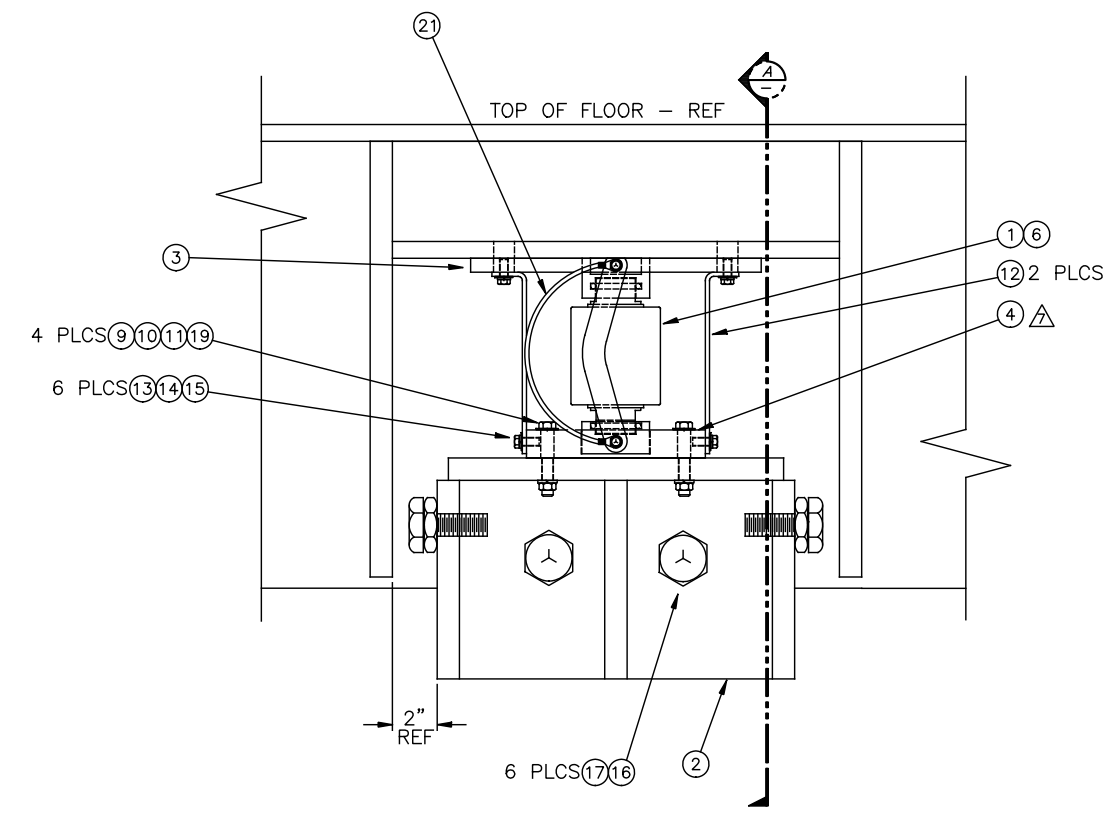
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:  
 ANGLES ± 1°  
 FRACTIONS ± 1/16  
 2 PL DEC. ± .03  
 3 PL DEC. ± .005

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

KNIFE INSTALLATION THREE PIECE				
WEIGHT	DATE	DRAWN BY	SCALE	PLOT SCALE
	10/21/11	LOVELL	1/8	1=8
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
		COMPACTORS	80-2577-B	1 of 1
				REV. 3

ITEM NO.	QTY.	FAB CODE	MFG CODE	MATERIAL
1	4	REF	802987	HARDY C2 LOAD CELL (REFERENCE ONLY)
2	4	FAB	80-2261-B	PEDESTAL - LOAD CELL
3	4	FAB	803338	5/8" T-1 TOP PLATE
4	4	FAB	804643	BOTTOM BEARING PLATE
5				
6	4	FAB	801405	LOAD CELL BUTTONS (UPPER AND LOWER)
7				
8	16	BUY	000920	LOCKWASHER 3/4"
9	16	BUY	000859	HHCS 1/2" NC GR 8 3" LONG
10	16	BUY	000918	LOCKWASHER 1/2"
11	16	BUY	003214	WASHER, FLAT 1/2"
12	8	REF	803351	TRANSPORT SIDE BAR
13	24	BUY	000871	HHCS 3/8" NC GR 8 1" LONG
14	12	BUY	002559	WASHER, FLAT 3/8"
15	12	BUY	000922	LOCKWASHER 3/8"
16	24	BUY	000843	HHCS 1"- 8UNC GR 8 2 1/2" LONG
17	24	BUY	003118	NUT, JAM 1"- 8UNC
18	4	REF	803352	TRANSPORT CENTER BAR
19	16	BUY	000934	NUT, HEX 1/2"
20	16	BUY	000863	HHCS 3/4"-10UNC GR 8 2" LONG
21	4	FAB	803341	WIRE 10ga GROUNDING STRAP 12"

**NOTE:**  
 QTY = 1 COMPACTOR  
 OR = 4 LOAD CELLS



**SECTION A-A**  
 SCALE: 1/1

REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
7	PDR#11773 ITEM#4 & 5 NOW ITEM#4 NO LONGER NEED SHEET#2	3/7/17	RC	SR
6	ROTATE LOAD CELL 90 DEGREES FOR PROPER ORIENTATION DR 06854	10/25/11	DM	
5	ITEM 12 & 18 WAS "FAB" DR 06741	9/16/11	DM	
4	ITEM 3, 4, 5, 12, 18, & 21 MOVED TO OWN DRAWINGS DR 06213	3/15/11	DM	
3	SEE SHEET 3; DR03530	8/3/07	DM	SR
2	UPDATED ITEM 6 FOR LOAD CELL BUTTONS; DR03301	4/6/07	DM	SR
1	ADDED PART NUMBERS FOR LOAD CELL AND LOAD CELL BUTTONS DR03288	4/4/07	DM	SR
0	RELEASED DR 01264	1/21/04	DM	SR

UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

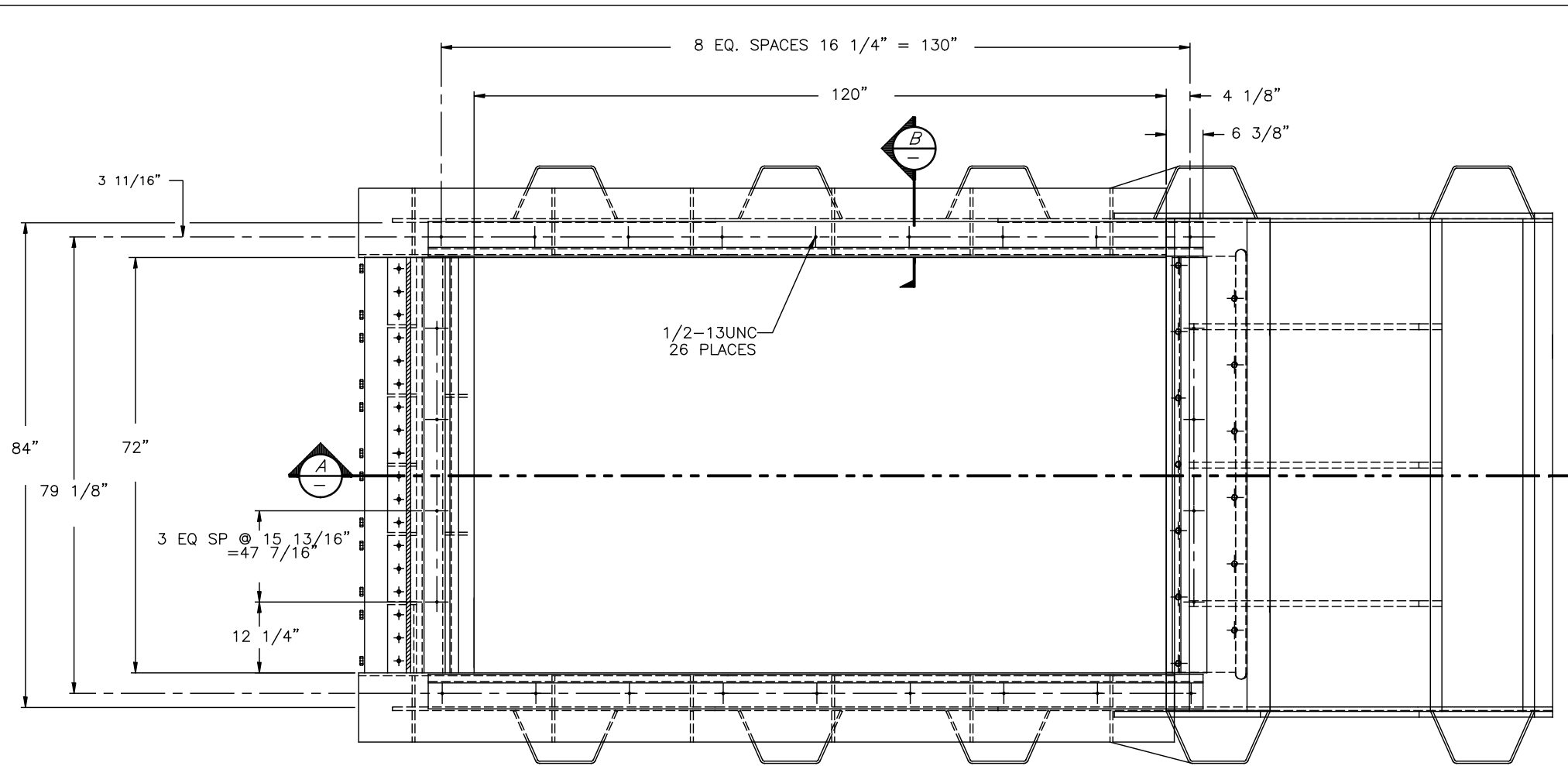
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:  
 ANGLES ± 1°  
 FRACTIONS ± 1/16  
 2 PL DEC. ± 0.03  
 3 PL DEC. ± 0.005

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

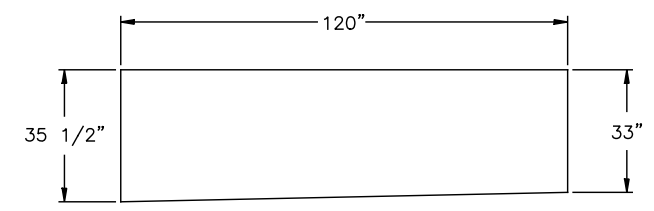
**SSI Shredding Systems, Inc.**  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704  
 WEB SITE: <http://www.ssiworld.com>

**ASSEMBLY - LOAD CELL**  
 HARDY C2 TYPE

WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
	1/21/04	D Miller	1/4"=1"	1=4
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
		COMPACTOR	80-1133-D	1of1
				REV. 7

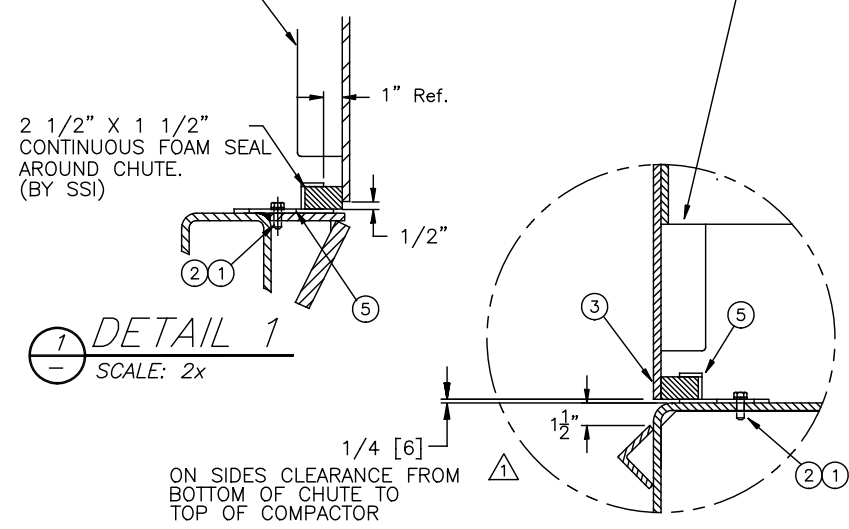


TOP VIEW - LOAD CHUTE AREA



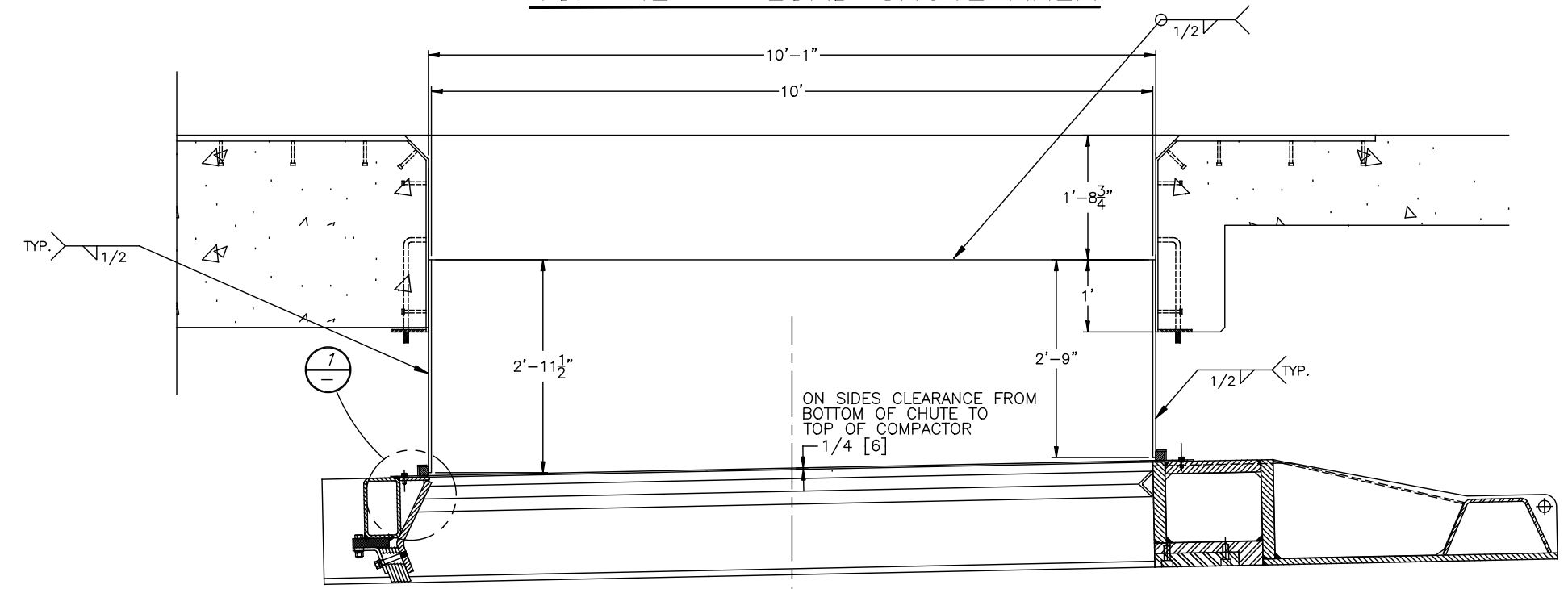
DETAIL ITEM 3  
SCALE: 1/2x

IF DROP FROM FACILITY ROOF TO COMPACTOR IS MORE THAN 24" ADD STIFFENER RIBS - QTY5 ON SIDES, QTY3 ON FRONT/REAR.



DETAIL 1  
SCALE: 2x

SECTION B-B  
SCALE: 2x (ROTATED 90°)



SECTION A-A

1	PDR#12346	10/14/17	RC	JB
0	RELEASED DRO3212	2/14/07	DM	SR
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.

UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

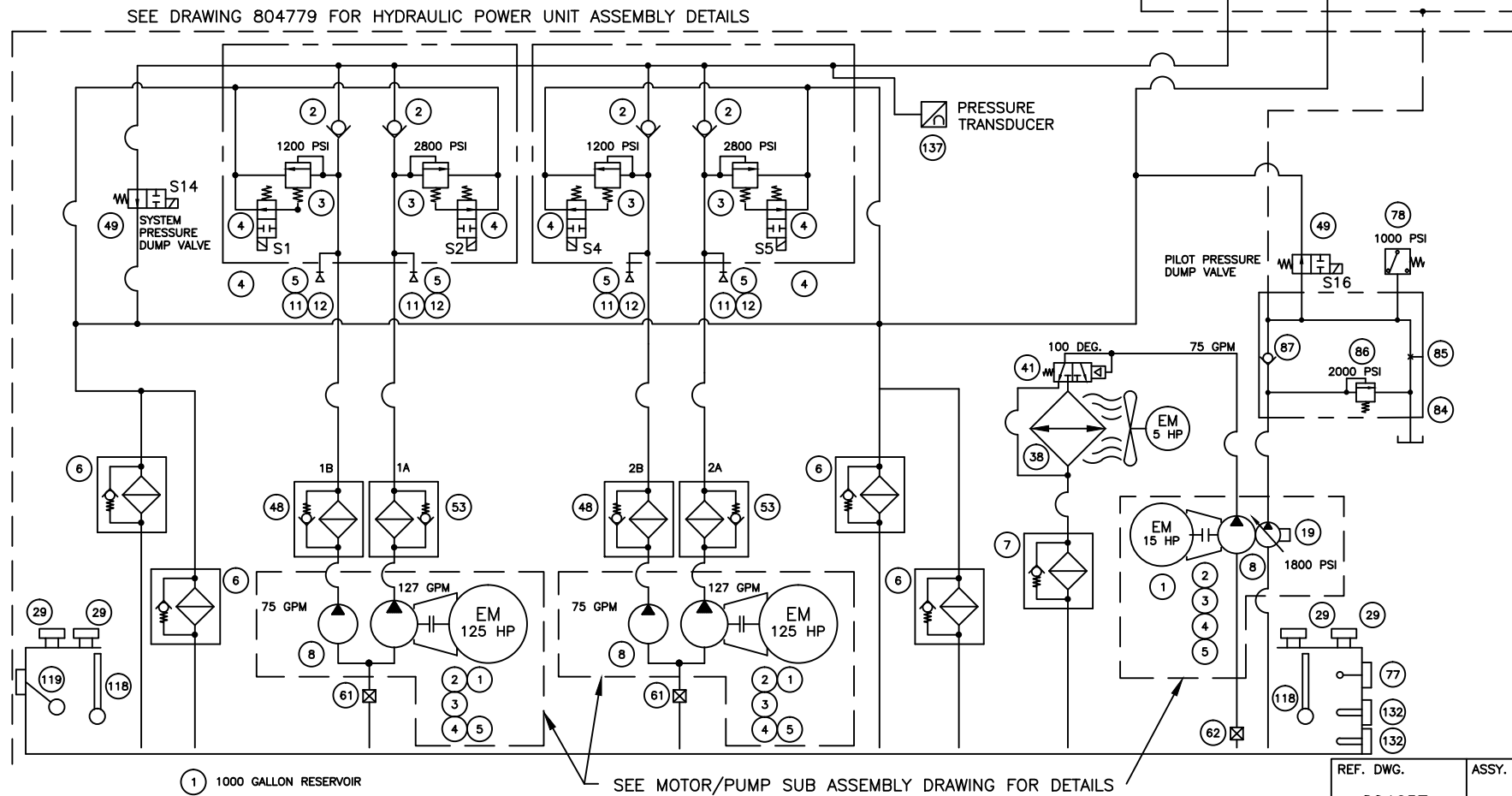
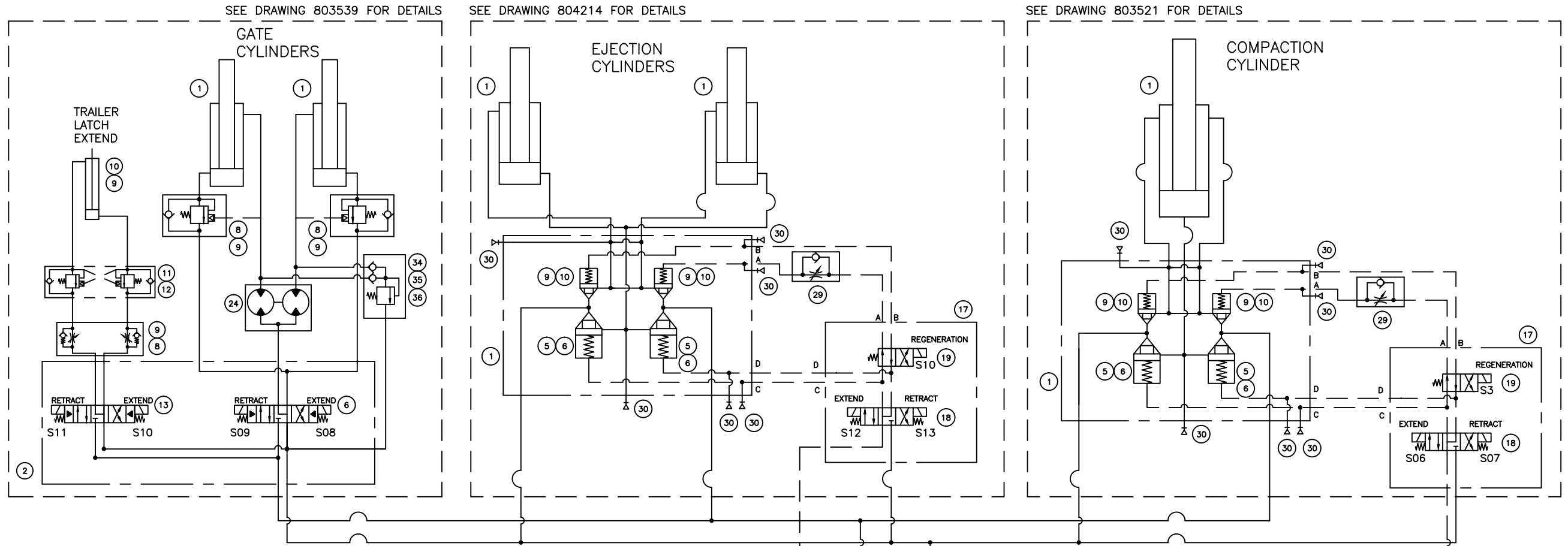
**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704  
WEB SITE: <http://www.ssiworld.com>

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

LOAD CHUTE AND SEAL DETAIL  
KING COUNTY FIRST NE #1

WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
	2/14/07	D Miller	1"=1'-0"	1=12
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
		4500SPH	80-1391-D	1of1

REV.	1
------	---



0	RELEASED DR 12953	5/25/18	JBB	RC
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.

**SSI** SSI Shredding Systems, Inc.  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

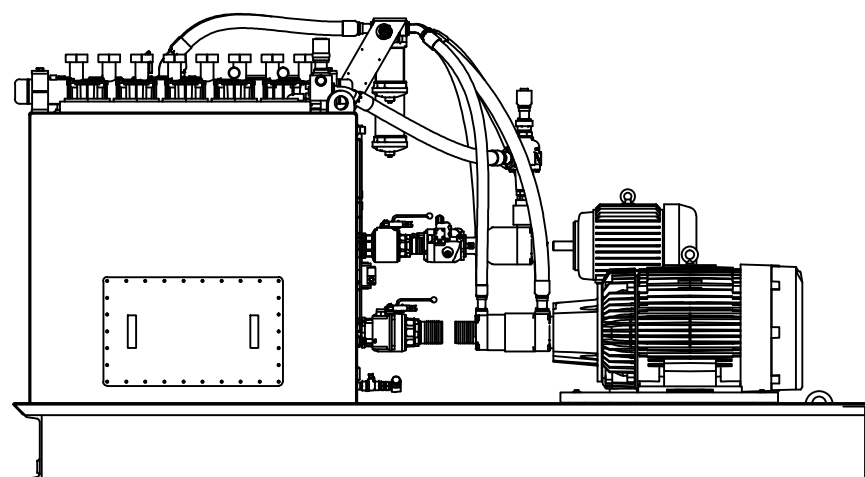
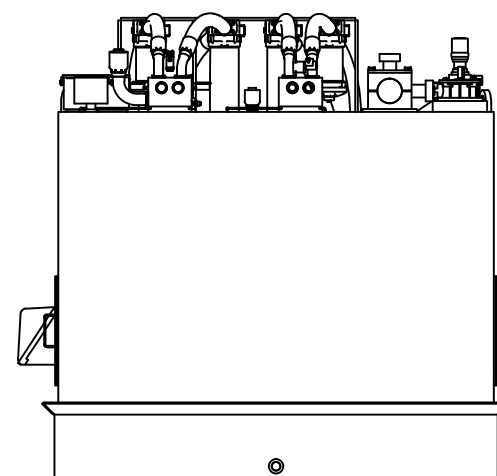
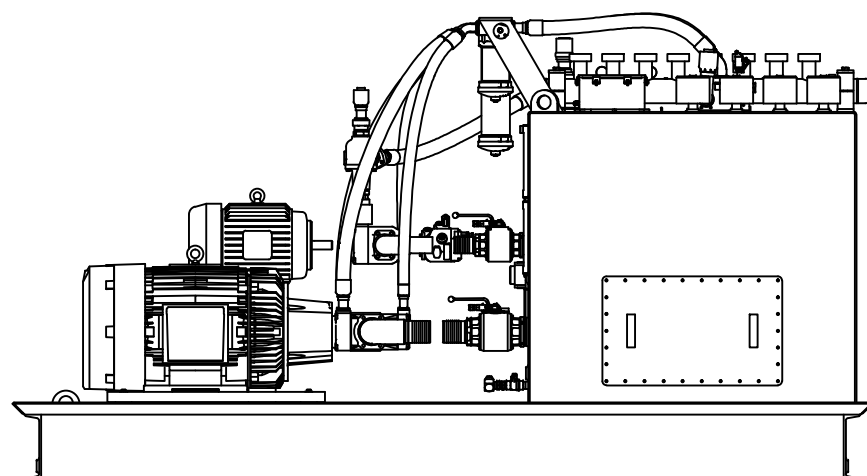
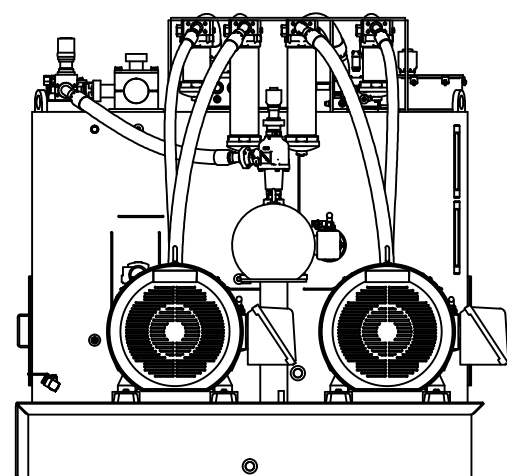
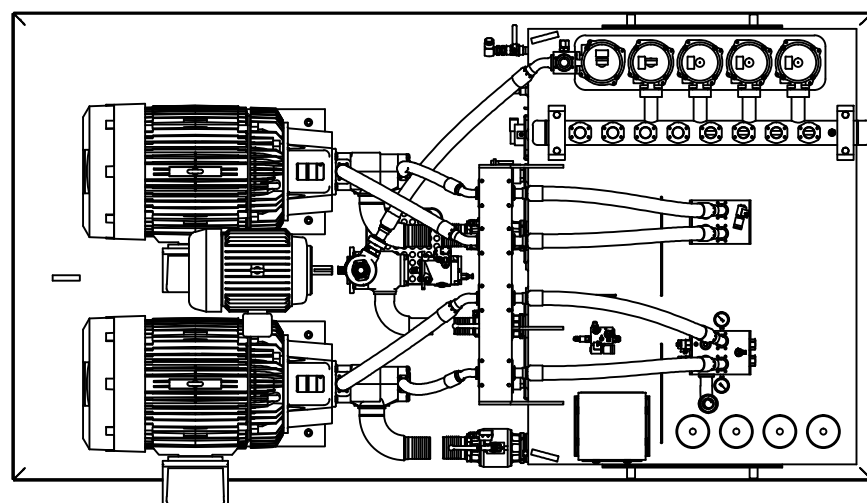
THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**SCHEMATIC-HYDRAULIC**  
**250 HP WITH ERAM REGEN**

WEIGHT	DATE	DRAWN BY	SCALE	PLOT SCALE
	5/25/18	JASON B	NONE	1:10
MODEL	DRAWING NUMBER	SHEET	REV.	
4500SPH	80-4780-B	1 of 1	0	

REF. DWG. 804657  
 ASSY. DWG.

SEE MOTOR/PUMP SUB ASSEMBLY DRAWING FOR DETAILS



0	RELEASED DR12978	6/8/18	JBB	RC
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.

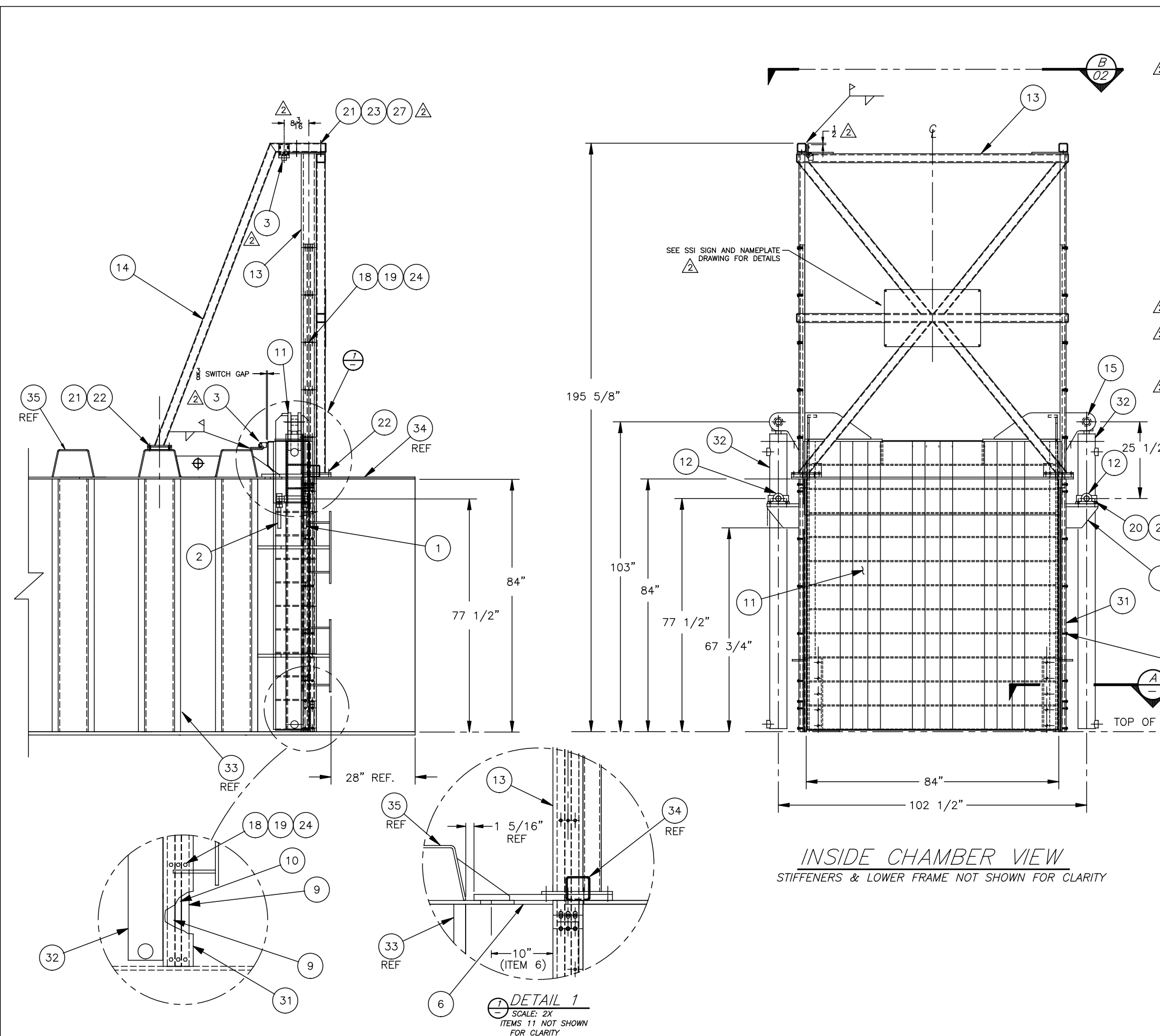
**SSI** SSI Shredding Systems, Inc.  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

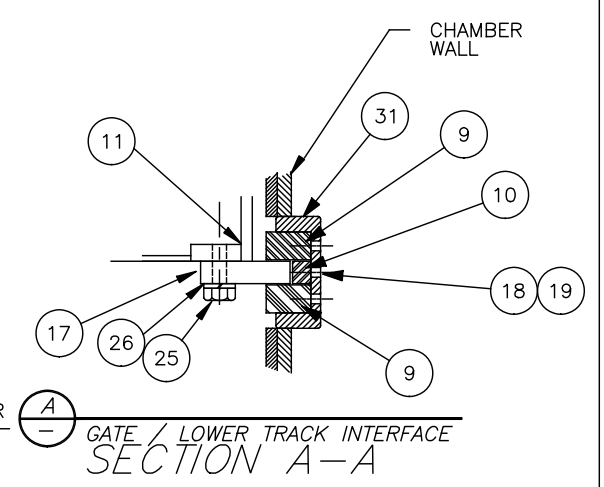
HYDRAULIC POWER UNIT  
 1000 GAL

WEIGHT	DATE	DRAWN BY	SCALE	PLOT SCALE
	6/8/18	JASON B	1:35	1:17
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
804657		4500SPH	80-4779-B	1 of 1
				REV.
				0

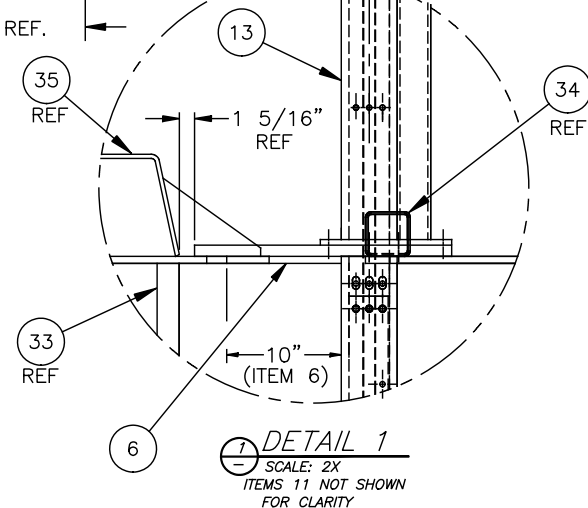




ITEM NO.	QTY.	FAB CODE	MFG CODE	MATERIAL
1	2	FAB	801991	CHANNEL SIDE GATE CYLINDER MOUNTING BRACKET
2	2	FAB	801992	NON-CHANNEL SIDE GATE CYLINDER MOUNTING BRACKET
3	2	FAB	803532	BRACKET-ASSY/PROX SWITCH 24V
4				
5				
6	2	CUT	000965	F.B. 1/2" x 2" 10" LG
7				
8				
9	8	FAB	802068-02	WEAR STRIP 1.125 x 2.00 CRS F.B.
10	4	FAB	801981	WEAR STRIP 0.75 x 1.00 CRS F.B.
11	1	FAB	801980	WELDMENT - DISCHARGE GATE
12	4	FAB	802212	TRUNNION EYE MOUNT (GATE CYL.)
13	1	FAB	800051	WELDMENT-UPPER GATE TRACK
14	2	FAB	802218	WELDMENT-UPPER GATE TRACK BRACE
15	2	FAB	805067	WELDMENT-GATE PIN
16				
17	2	FAB	802161	GATE GUIDE
18	76	BUY	000874	3/8-16UNC HHCS 1 1/4" LG
19	76	BUY	000922	3/8" LOCKWASHER
20	8	BUY	001496	SCREW-HHCS(1/2-13 GR 8)YZ 1 3/4" LG
21	38	BUY	000918	1/2" LOCKWASHER
22	26	BUY	000853	SCREW-HHCS(1/2-13 GR 8)YZ 1 1/4" LG
23	6	BUY	001498	SCREW-HHCS(1/2-13 GR 8)YZ 4" LG
24	76	BUY	002559	3/8" FLAT WASHER
25	10	BUY	000864	3/4"-10UNC HHCS 2 1/2" LG
26	10	BUY	000920	3/4" LOCKWASHER
27	12	BUY	002694	WASHER - FLAT - PLA325 - 1/2"/M12-YZ
28				
29				
30				
31	2	REF		LOWER GATE TRACK
32	2	REF		GATE CYLINDER
33	1	REF		WELDMENT-SIDEWALL
34	1	REF		END ROOF
35	1	REF		WELDMENT-ROOF



INSIDE CHAMBER VIEW  
STIFFENERS & LOWER FRAME NOT SHOWN FOR CLARITY



REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.
2	PDR#12451 ADDED ITEM#3 ITEM#21 WAS QTY32, ADDED #23&27	11/20/17	RC	JB
1	DELETING REF PT#'S-PDR#7334	4/10/12	RC	-
0	RELEASED DR05677	8/5/10	DM	

UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE:

ANGLES ± 1'  
FRACTIONS ± 1/16

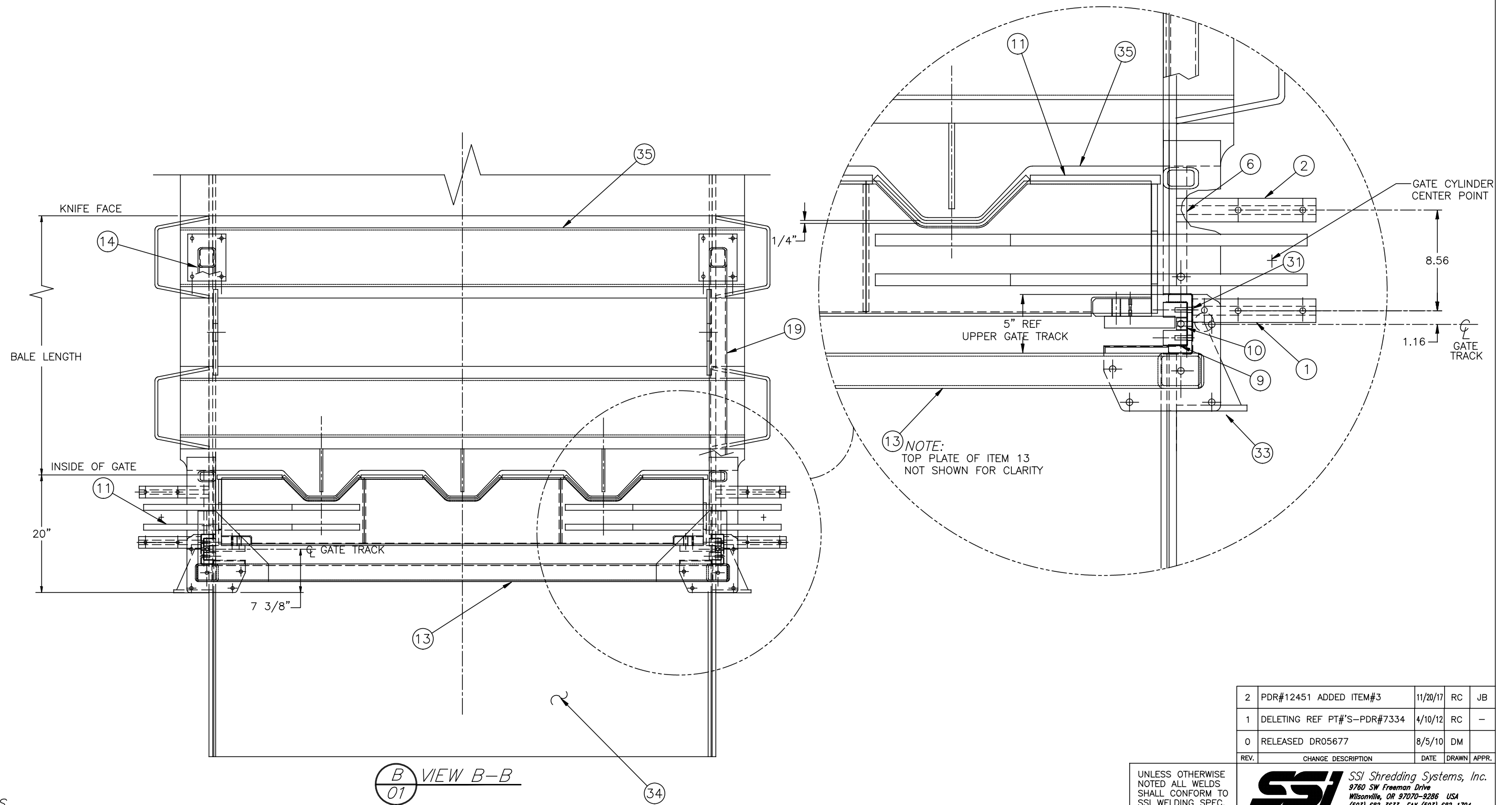
2 PL DEC. ± 0.03  
3 PL DEC. ± 0.005

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**SSI Shredding Systems, Inc.**  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704  
WEB SITE: <http://www.ssiworld.com>

**ASSEMBLY-VERTICAL GATE SPECIAL - WALL LINERS**

WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
	8/5/10	D Miller	3/4"=1'	1=16
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
			80-1979-D	1 of 2
				REV. 2




**NOTES**

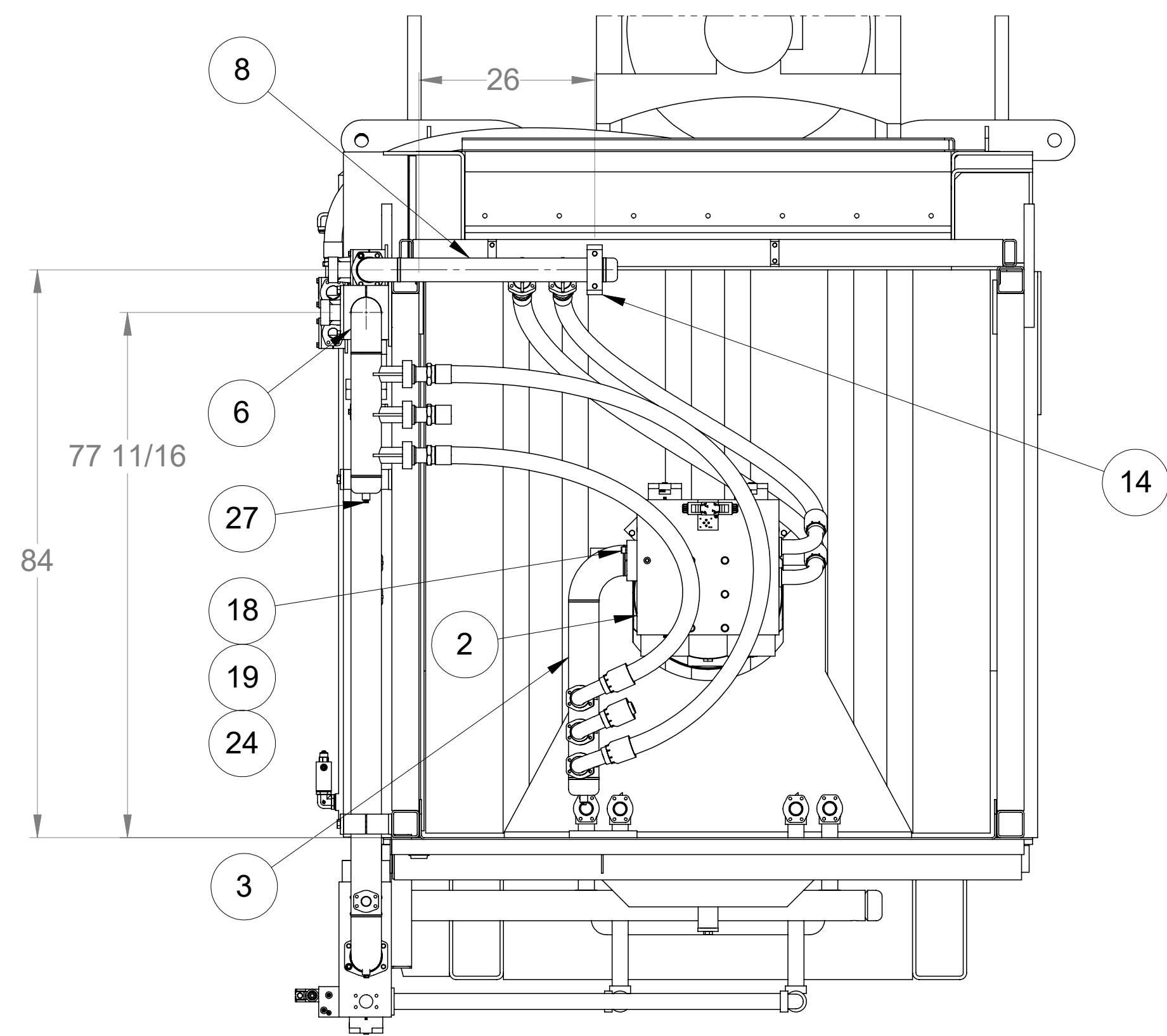
- 1.) UNLESS OTHERWISE NOTED BURN PROFILES ON LAYER "BURN" TO BE WITHIN .06 TOTAL (KERF INCLUSIVE)
- 2.) BURNED PART TO BE FLAT WITHIN .06 TOTAL
- 3.) ALL MACH. SURFACES  $125^\circ$  UNLESS OTHERWISE NOTED
- 4.) DEBURR SHARP EDGES EXCEPT AS NOTED
- 5.) ALL DIMENSIONS, ON BURNS, ARE FOR REFERENCE ONLY.

**B**  
01 VIEW B-B

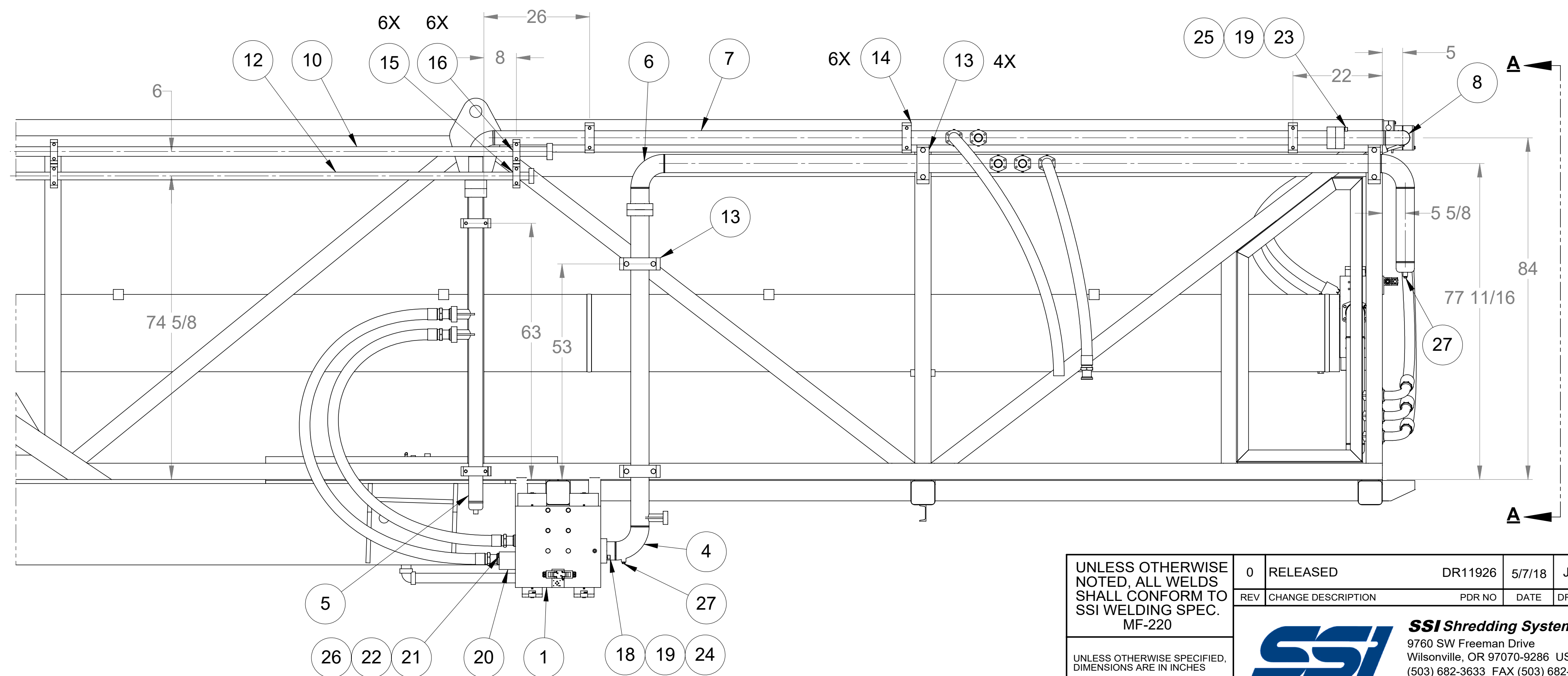
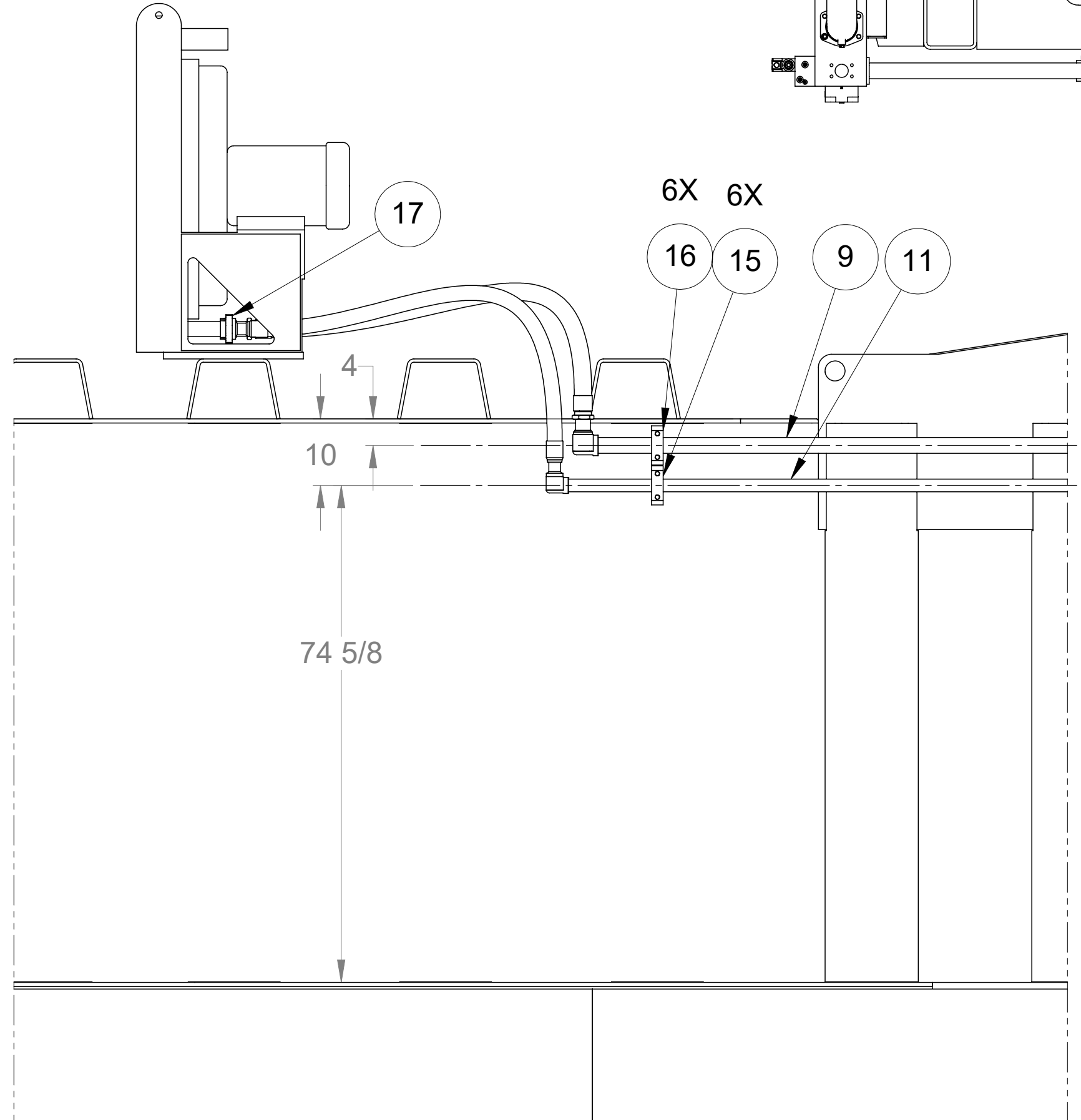
13 NOTE:  
TOP PLATE OF ITEM 13  
NOT SHOWN FOR CLARITY

2	PDR#12451 ADDED ITEM#3	11/20/17	RC	JB
1	DELETING REF PT#'S--PDR#7334	4/10/12	RC	-
0	RELEASED DR05677	8/5/10	DM	
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.

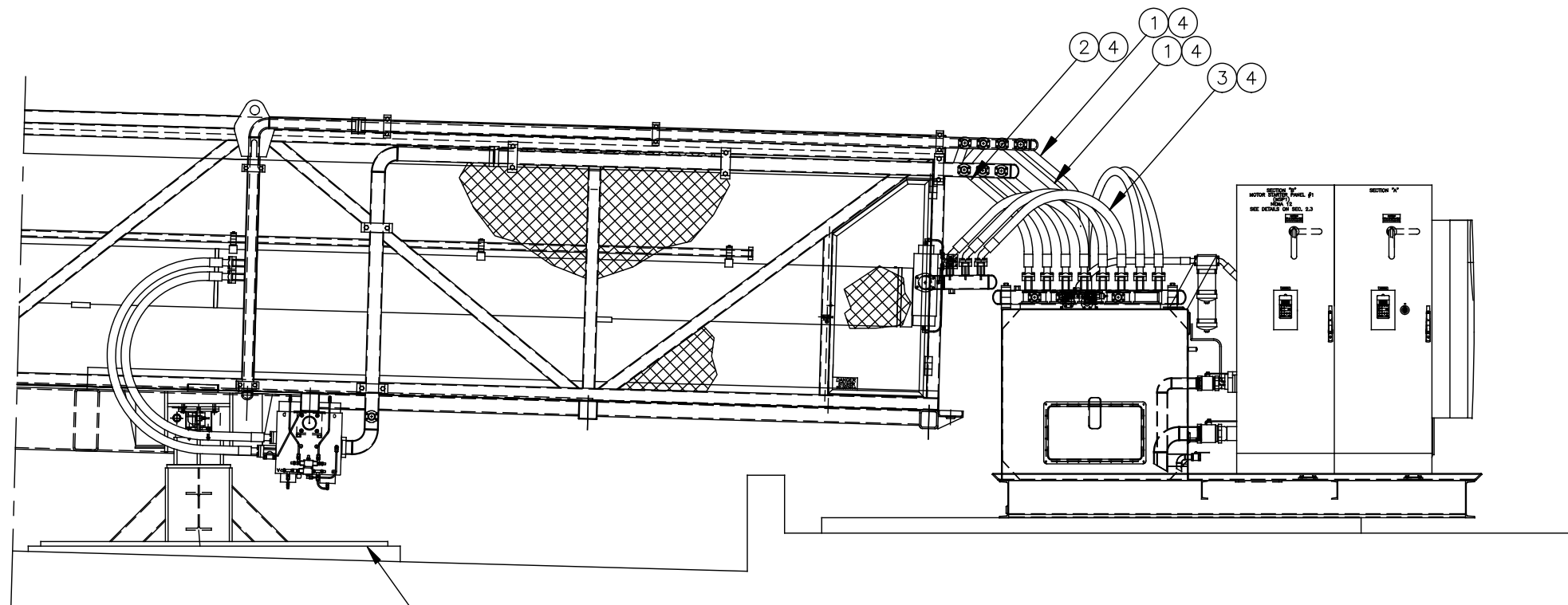
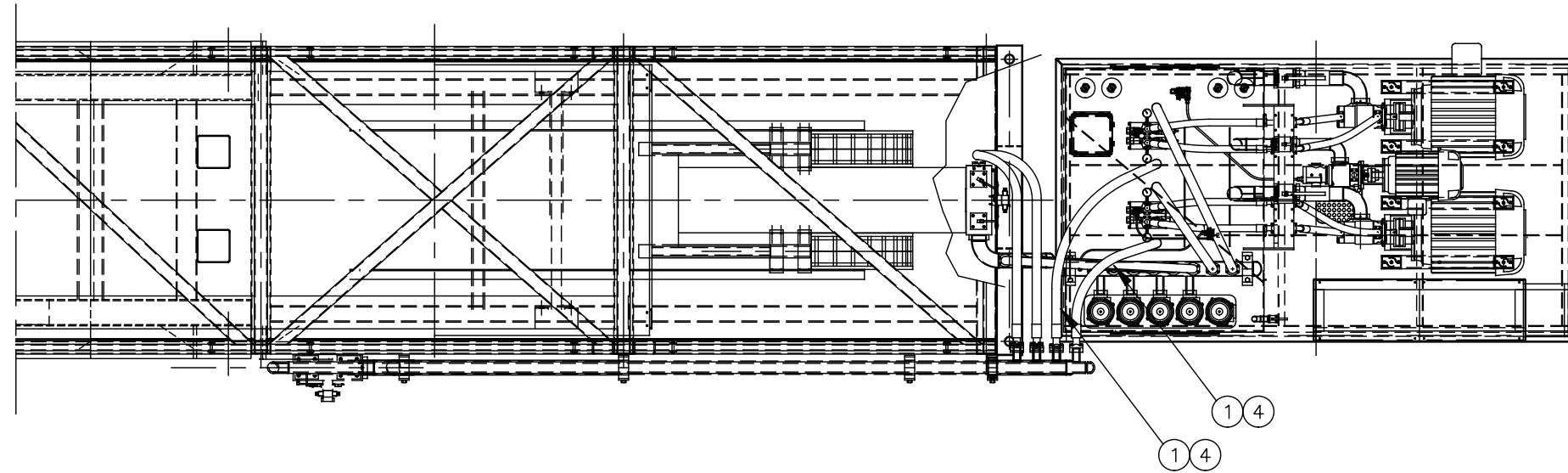
UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001		 <b>SSI Shredding Systems, Inc.</b> 9760 SW Freeman Drive Wilsonville, OR 97070-9286 USA (503) 682-3633 FAX (503) 682-1704 WEB SITE: <a href="http://www.ssiworld.com">http://www.ssiworld.com</a>	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:		THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.	
ANGLES $\pm 1^\circ$ FRACTIONS $\pm 1/16$		<b>ASSEMBLY-VERTICAL GATE</b> <b>SPECIAL - WALL LINERS</b>	
2 PL DEC. $\pm 0.03$	DATE 8/5/10	DRAWN BY D Miller	SCALE 1 1/2"=1'
3 PL DEC. $\pm 0.005$			PLT SCALE 1=8
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER SHEET REV.
			80-1979-D 2of2 2



ITEM	QTY.	FAB CODE	MFG CODE	DESCRIPTION	REF
1	1	REF	804610	ERAM MANIFOLD ASSEMBLY	
2	1	REF	803521	CRAM MANIFOLD ASSEMBLY	
3	1	FAB	804762	CRAM PIPE MANIFOLD	
4	1	FAB	804763	RETURN PIPE MANIFOLD	
5	1	FAB	804764	PRESSURE PIPE	
6	1	FAB	804765	PIPE RETURN	
7	1	FAB	804766	PRESSURE PIPE	
8	1	FAB	804767	PRESSURE PIPE	
9	1	FAB	804770	2" PIPE	
10	1	FAB	804773	2" PIPE	
11	1	FAB	804771	1-1/2 PIPE	
12	1	FAB	804772	1-1/2 PIPE	
13	4	BUY	003990	CLAMP - 4" PIPE (HEAVY SERIES)	SH84500-PP
14	6	BUY	003991	CLAMP - 3" PIPE (HEAVY SERIES)	SH73500-PP
15	6	BUY	000391	CLAMP - 1-1/2" PIPE (HEAVY)	SH61900-PP
16	6	BUY	010045	CLAMP - 2" PIPE (HEAVY SERIES)	SH62375-PP
17	2	BUY	010736	FLANGE - 2" 4 BOLT, 2" NPTF	-
18	12	BUY	071153	SCREW-SHCS(5/8-11 X 2-3/4)	--
19	20	BUY	000924	LOCKWASHER - 5/8 - HI-COLLAR	
20	1	BUY	801887-01	2" MANIFOLD TEE	
21	4	BUY	002683	SCREW-HHCS(1/2-13 x 5:GR 8)YZ	
22	4	BUY	002694	FLAT WASHER PLA325 - 1/2"/M12-YZ	-
23	8	BUY	002677	SCREW-SHCS(5/8-11 X 3-1/2)	--
24	3	BUY	330505	-245 4in ORING	
25	2	BUY	002232	-237 3in ORING	
26	1	BUY	003902	-228 2in ORING	
27	3	BUY	004437	PLUG - M TUBE(06)	



UNLESS OTHERWISE NOTED, ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. MF-220	0	RELEASED	DR11926	5/7/18	JBB	RC
	REV	CHANGE DESCRIPTION	PDR NO	DATE	DRAWN	APPR
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES TOLERANCES ARE:  ANGLES ± 1° FRACTIONS ± 1/16 2 PL DEC ± .03 3 PL DEC ± .005	<b>SSI Shredding Systems Inc.</b> 9760 SW Freeman Drive Wilsonville, OR 97070-9286 USA (503) 682-3633 FAX (503) 682-1704 www.ssiworld.com					
	THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED. <b>PIPING ASSEMBLY</b>					
	CAD SYSTEM	WEIGHT	DATE	DRAWN BY	SCALE	
	SOLIDWORKS		5/7/18	JASON B	1:18	
REF DWG	ASSY DWG	MODEL	DRAWING NUMBER		SHEET	REV
-	-	4500SPH	80-4774-D		1/1	0



SEE DRAWING 80-4584-D  
GENERAL ARRANGEMENT

ITEM NO.	QTY.	FAB CODE	MFG CODE	MATERIAL
1	2	BUY		2" M7HOSE 32PA ST X 32PA 90 X TO FIT
2	3	BUY		2" LOW PRESSURE HOSE 32PA ST X 32PA 45
3	3	BUY		2" LOW PRESSURE HOSE 32PA ST X 32PA 45
4	16	BUY	004591	32PA HOSE END FLANGE KIT

0	RELEASED	DR 11704	2/14/17	DM	SR
REV.	CHANGE DESCRIPTION		DATE	DRAWN	APPR.

UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:  
 ANGLES ± 1°  
 FRACTIONS ± 1/16  
 2 PL DEC. ± 0.03  
 3 PL DEC. ± 0.005

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**SSI Shredding Systems, Inc.**  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704  
 WEB SITE: <http://www.ssiworld.com>

**COMPACTOR FACILITY DETAIL**  
 COUNTY OF SACRAMENTO

WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
	2/14/17	D Miller	1/23	1=23
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
		4500SPH	80-4629-D	1of1
				REV. 0

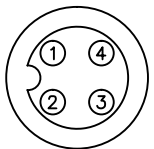
1.1-00  
1.1-01  
1.1-02  
1.1-03  
1.1-04  
1.1-05  
1.1-06  
1.1-07  
1.1-08  
1.1-09  
1.1-10  
1.1-11  
1.1-12  
1.1-13  
1.1-14  
1.1-15  
1.1-16  
1.1-17  
1.1-18  
1.1-19  
1.1-20  
1.1-21  
1.1-22  
1.1-23  
1.1-24  
1.1-25

SYMBOL COMPARISON			
	IEC	JIC (US)	
LIMIT SWITCH, NO			
LIMIT SWITCH, NC			
PUSH/PULL E-STOP BUTTON			
PUSHBUTTON			
SELECTOR, 2 POS			
SELECTOR, 3 POS			
PILOT LIGHT			
RELAY COIL			
SOLENOID COIL			
FLOAT SWITCH			
PRESSURE SWITCH			
THERMO SWITCH			
WARNING HORN			
RELAY CONTACTS			
PROX SWITCH, NO			
PROX SWITCH, NC			
FUSE			
OVERLOAD			
PRESSURE TRANSDUCER			

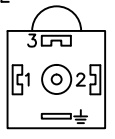
# SCHEMATIC INDEX

TITLE	SECTION	SHEETS
SCHEMATIC INDEX	1	1
BLOCK DIAGRAM & PANEL LAYOUT	2	6
MOTOR POWER SCHEMATIC	3	4
SAFETY CIRCUIT SCHEMATIC	4	2
24VDC CONTROL DEVICE SCHEMATIC	5	3
PLC INPUT/OUTPUT SCHEMATIC	6	4
MSP1 FLEX I/O INPUT/OUTPUT SCHEMATIC	7	5
JB1 FLEX I/O INPUT/OUTPUT SCHEMATIC	8	2

IFM EVC SERIES WIRE COLOR CODE	
1	BRN
2	WHT
3	BLU
4	BLK



CANFIELD CONNECTOR 5F6F1-000-EU0A WIRE COLOR CODE	
1	BRN
2	BLU
3	BLK
⊕	GND



SYMBOLS LEGEND	
	EXTERNAL CONNECTION
	EARTH GROUND
	CHASSIS GROUND
	POWER WIRING 3 PHASE
	POWER WIRING 2 LEGS, 1 PHASE
	CONTROL WIRING

- CP1 = CONTROL PANEL #1
- MSP1 = MOTOR STARTER PANEL #1
- JB1 = JUNCTION BOX #1
- JB4 = JUNCTION BOX #4
- JB6 = JUNCTION BOX #6
- JB7 = JUNCTION BOX #7
- JB8 = JUNCTION BOX #8
- SLJB = STACK LIGHT JUNCTION BOX
- LCSB = LOAD CELL SUM BOX
- ERJB = EJECT RAM JUNCTION BOX
- HPU = HYDRAULIC POWER UNIT
- REM = REMOTE DEVICES
- CUST = CUSTOMER CONNECTION

REV	DESCRIPTION	SHT	DATE	INIT
1	AS BUILT - DR13005	-	06/11/18	RJW
0	FOR RELEASE - DR12729	-	02/26/18	RJW

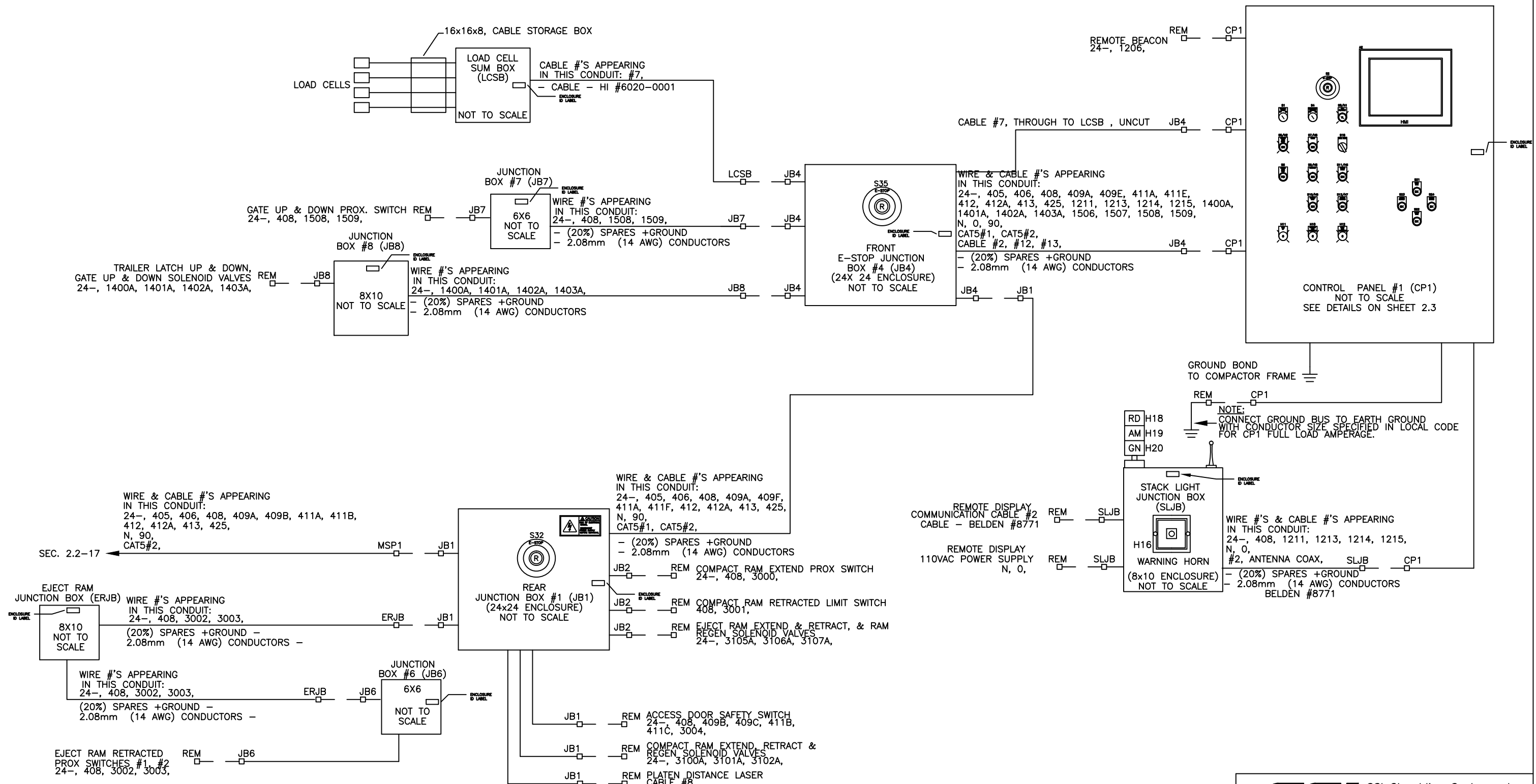
**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

## COMPACTOR ELECTRICAL SYSTEM SCHEMATIC INDEX

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER	SHEET	REV.	
METRO REGIONAL SERVICES	80-4733-B	1.1	1	
HMI PROGRAM #804735				
PROGRAM #804734				

2.1-00  
2.1-01  
2.1-02  
2.1-03  
2.1-04  
2.1-05  
2.1-06  
2.1-07  
2.1-08  
2.1-09  
2.1-10  
2.1-11  
2.1-12  
2.1-13  
2.1-14  
2.1-15  
2.1-16  
2.1-17  
2.1-18  
2.1-19  
2.1-20  
2.1-21  
2.1-22  
2.1-23  
2.1-24  
2.1-25



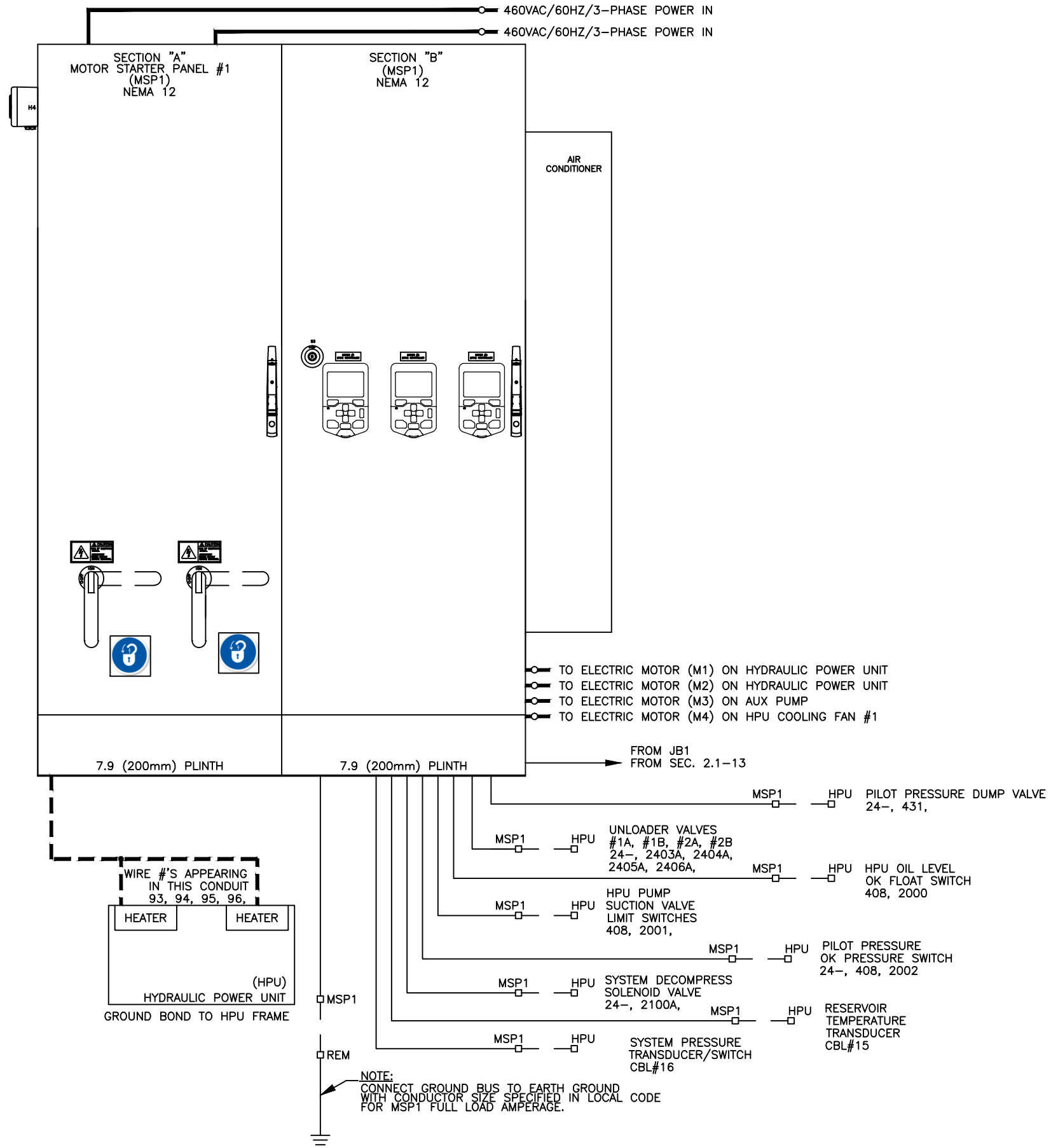
**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

COMPACTOR ELECTRICAL SYSTEM  
BLOCK DIAGRAM AND PANEL LAYOUT

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		2.1	1

2.2-00  
2.2-01  
2.2-02  
2.2-03  
2.2-04  
2.2-05  
2.2-06  
2.2-07  
2.2-08  
2.2-09  
2.2-10  
2.2-11  
2.2-12  
2.2-13  
2.2-14  
2.2-15  
2.2-16  
2.2-17  
2.2-18  
2.2-19  
2.2-20  
2.2-21  
2.2-22  
2.2-23  
2.2-24  
2.2-25



**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

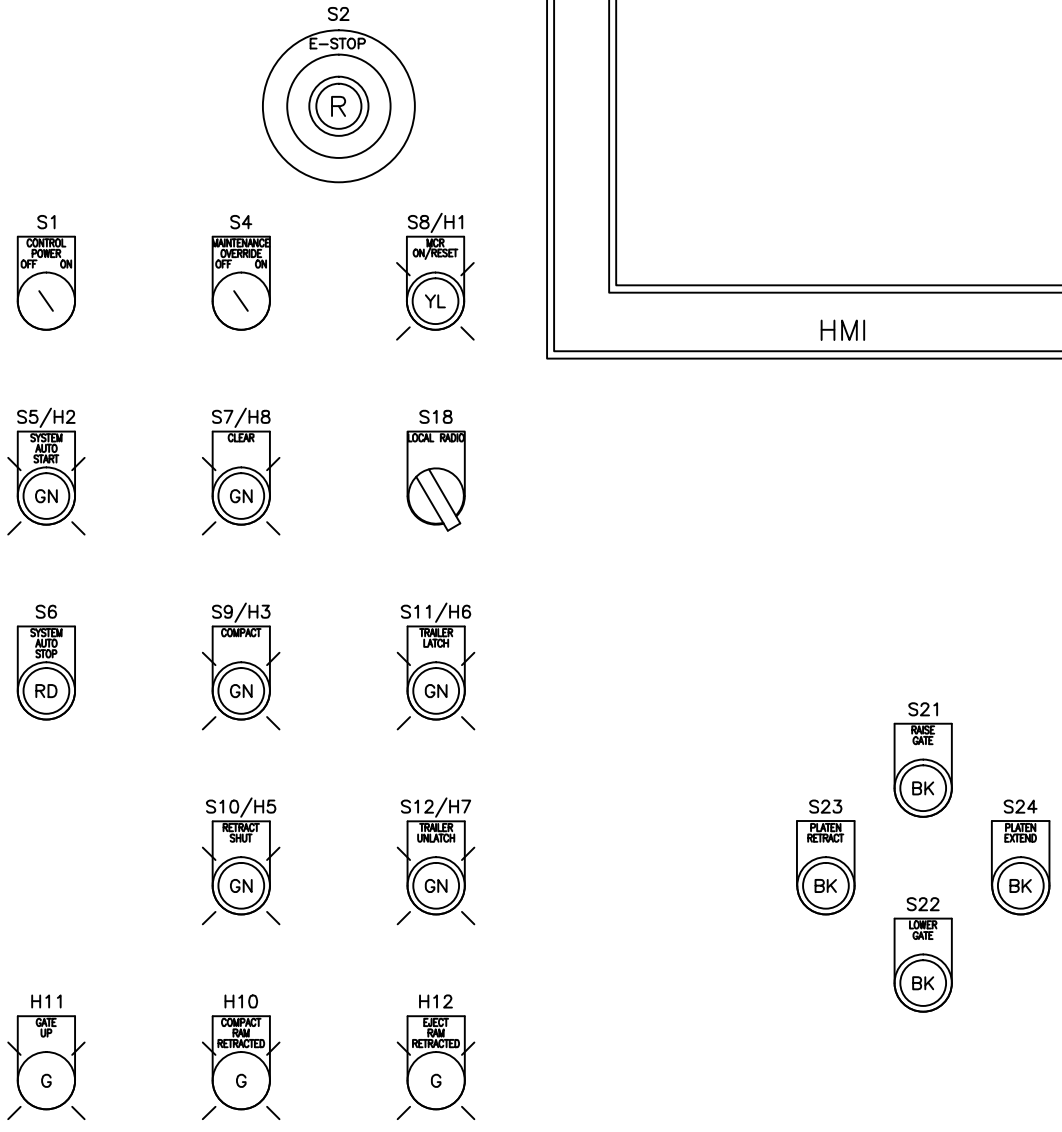
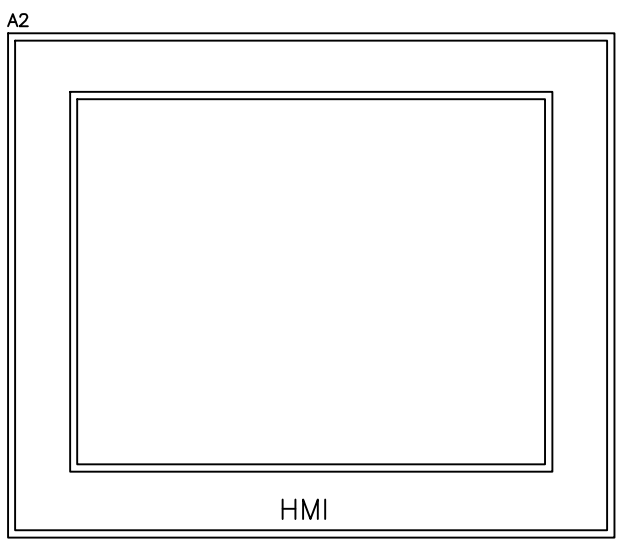
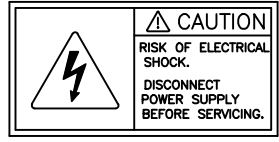
THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

COMPACTOR ELECTRICAL SYSTEM  
BLOCK DIAGRAM AND PANEL LAYOUT (SHT 2)

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER	SHEET	REV.	
C3001-4500SPH	80-4733-B	2.2	1	

2.3-00  
2.3-01  
2.3-02  
2.3-03  
2.3-04  
2.3-05  
2.3-06  
2.3-07  
2.3-08  
2.3-09  
2.3-10  
2.3-11  
2.3-12  
2.3-13  
2.3-14  
2.3-15  
2.3-16  
2.3-17  
2.3-18  
2.3-19  
2.3-20  
2.3-21  
2.3-22  
2.3-23  
2.3-24  
2.3-25

AM  
H9



CONSTRUCTION NOTES:  
1) PANEL TO BE UL LISTED.

CONTROL PANEL (CP1)  
(47"H x 36"W x 12"D)



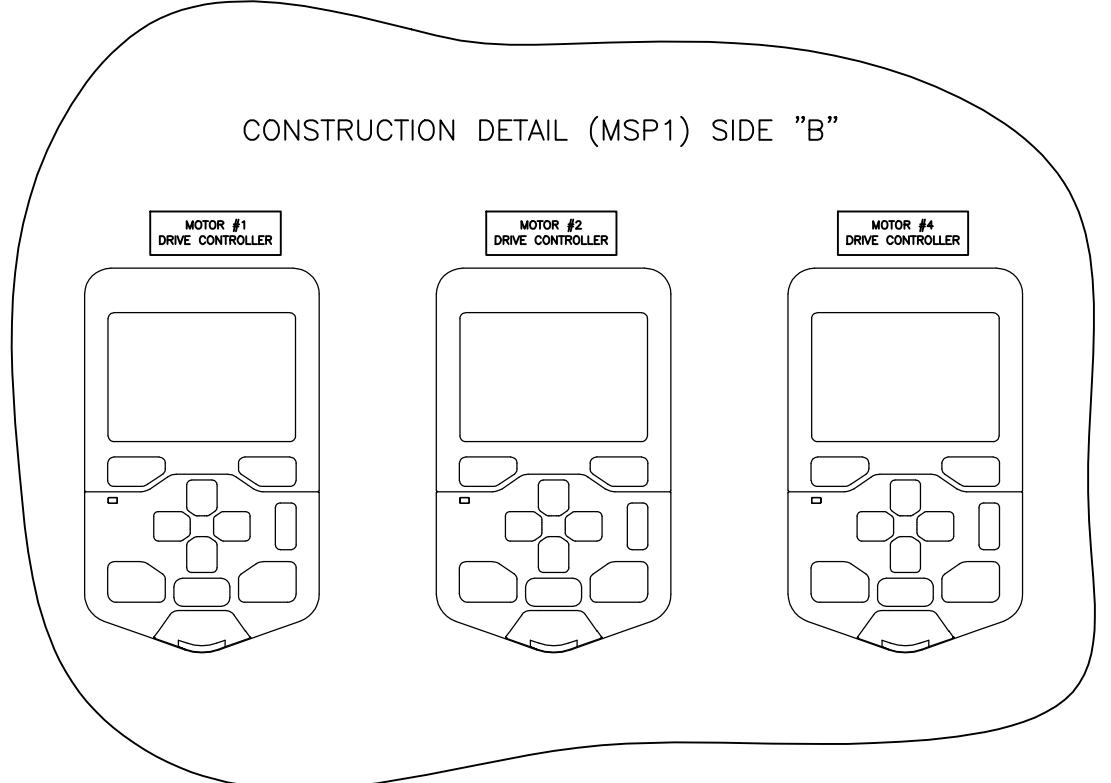
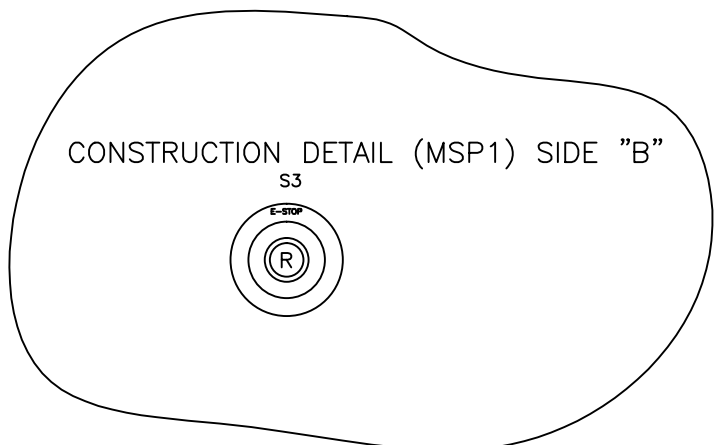
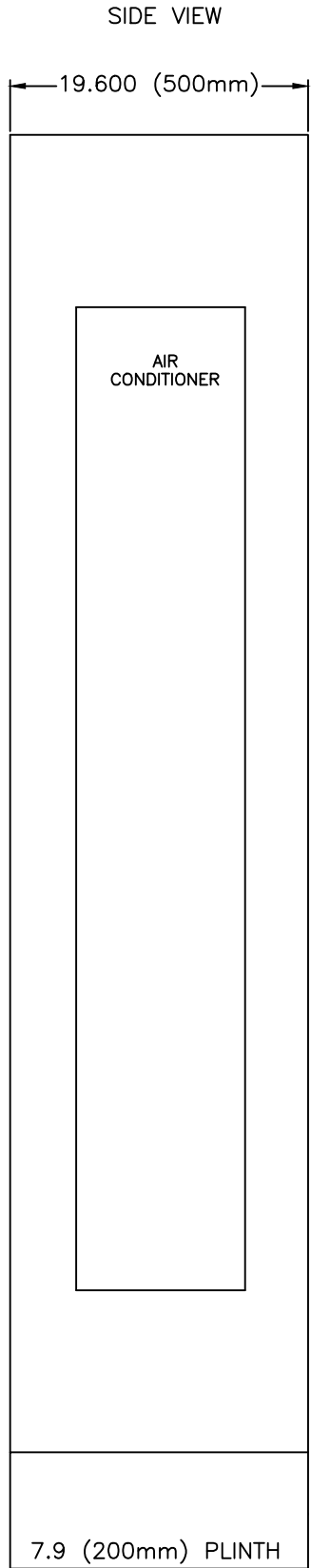
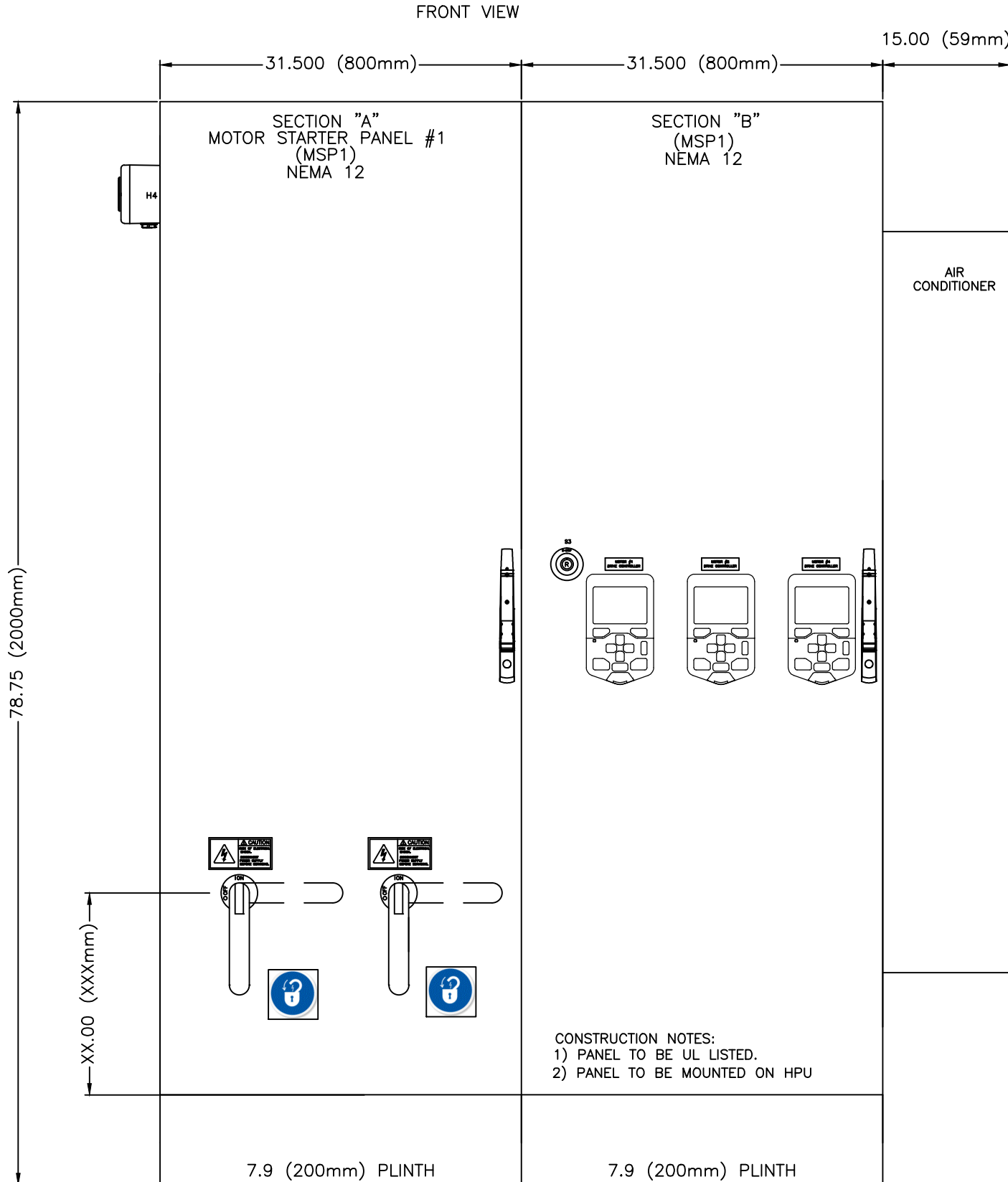
THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

COMPACTOR ELECTRICAL SYSTEM  
CONTROL PANEL PAYOUT

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		2.3	1



2.4-00  
2.4-01  
2.4-02  
2.4-03  
2.4-04  
2.4-05  
2.4-06  
2.4-07  
2.4-08  
2.4-09  
2.4-10  
2.4-11  
2.4-12  
2.4-13  
2.4-14  
2.4-15  
2.4-16  
2.4-17  
2.4-18  
2.4-19  
2.4-20  
2.4-21  
2.4-22  
2.4-23  
2.4-24  
2.4-25



CONSTRUCTION NOTES:  
1) PANEL TO BE UL LISTED.  
2) PANEL TO BE MOUNTED ON HPU

**SSI** SSI Shredding Systems, Inc.  
9760 SW Freeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

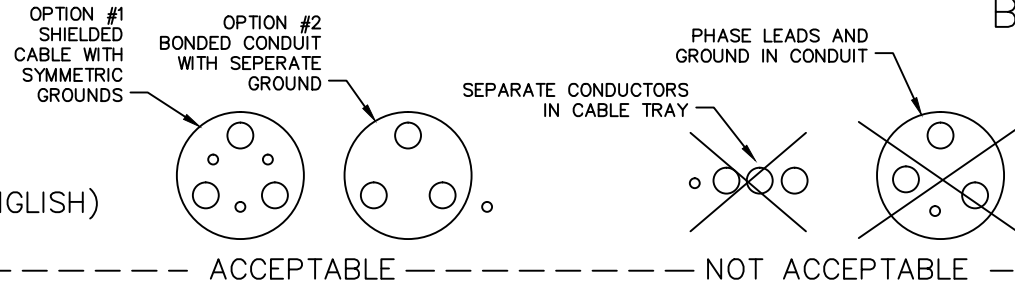
THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

COMPACTOR ELECTRICAL SYSTEM  
MOTOR PANEL LAYOUT

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER	SHEET	REV.	
C3001-4500SPH	80-4733-B	2.4	1	

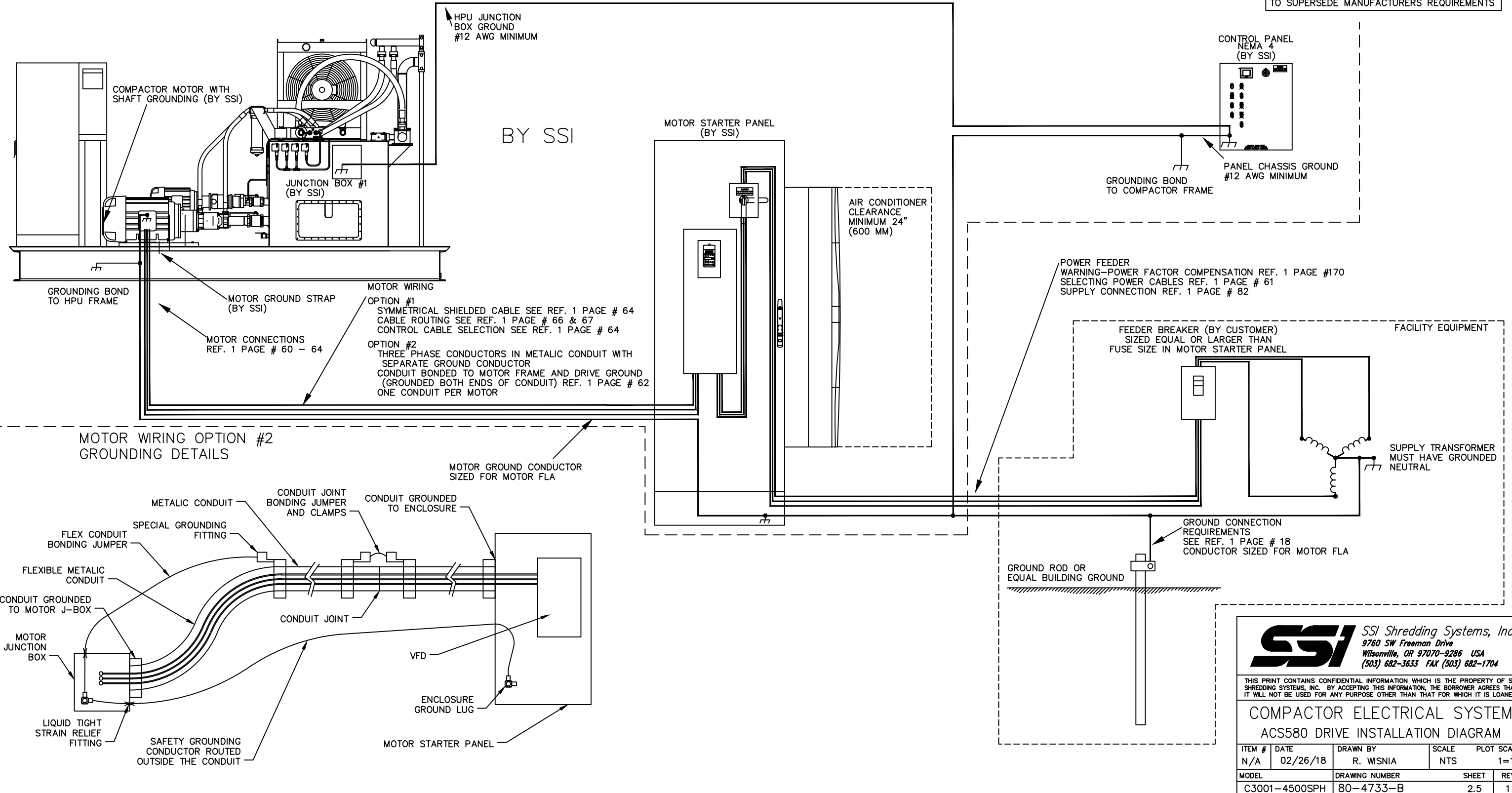
NOTES: 1) ALL WIRING OUTSIDE MOTOR STARTER PANEL AND CONTROL PANEL BY CUSTOMER.  
 2) SINGLE MOTOR INSTALLATION SHOWN, DUPLICATE ALL MOTOR CONNECTIONS AND POWER FEEDER LEADS FOR SECOND MOTOR.

REFERENCES:  
 1) ABB ACS580 HARDWARE MANUAL 3AXD50000018826 REV E (ENGLISH)



BY OTHERS

**CAUTION**  
 INSTALLATION MUST COMPLY WITH LOCAL ELECTRICAL CODES  
 REVIEW ALL EQUIPMENT INSTALLATION AND OPERATIONAL MANUALS BEFORE INSTALLATION  
 THIS SUMMARY IS INTENDED TO PROVIDE AMPLIFICATION OF INSTALLATION REFERENCES AND DOES IS NOT INTENDED TO SUPERSEDE MANUFACTURERS REQUIREMENTS



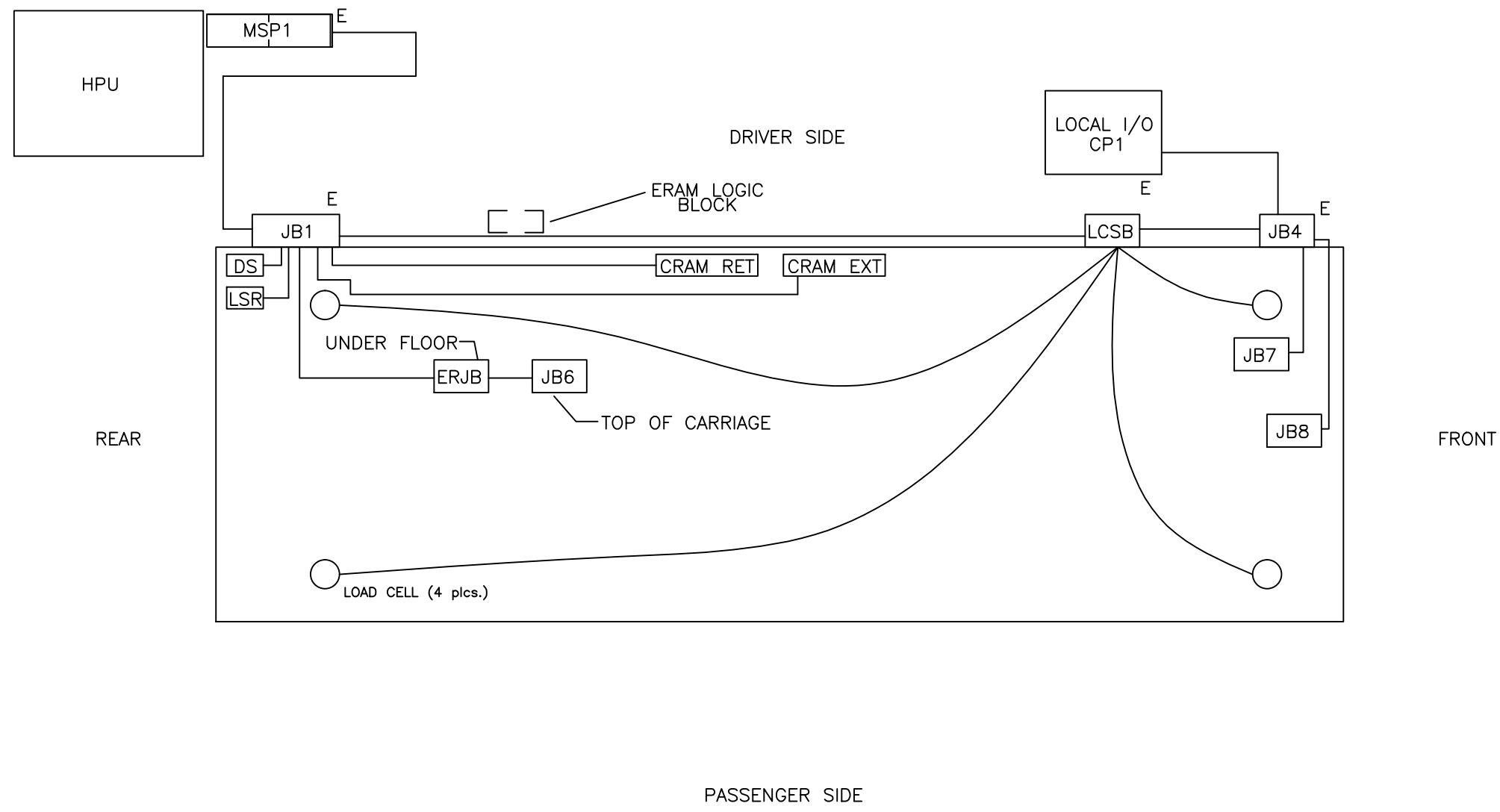
**SSI** SSI Shredding Systems, Inc.  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM  
 ACS580 DRIVE INSTALLATION DIAGRAM**

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER	SHEET	REV.	
C3001-4500SPH	80-4733-B	2.5	1	

2.6-00  
2.6-01  
2.6-02  
2.6-03  
2.6-04  
2.6-05  
2.6-06  
2.6-07  
2.6-08  
2.6-09  
2.6-10  
2.6-11  
2.6-12  
2.6-13  
2.6-14  
2.6-15  
2.6-16  
2.6-17  
2.6-18  
2.6-19  
2.6-20  
2.6-21  
2.6-22  
2.6-23  
2.6-24  
2.6-25



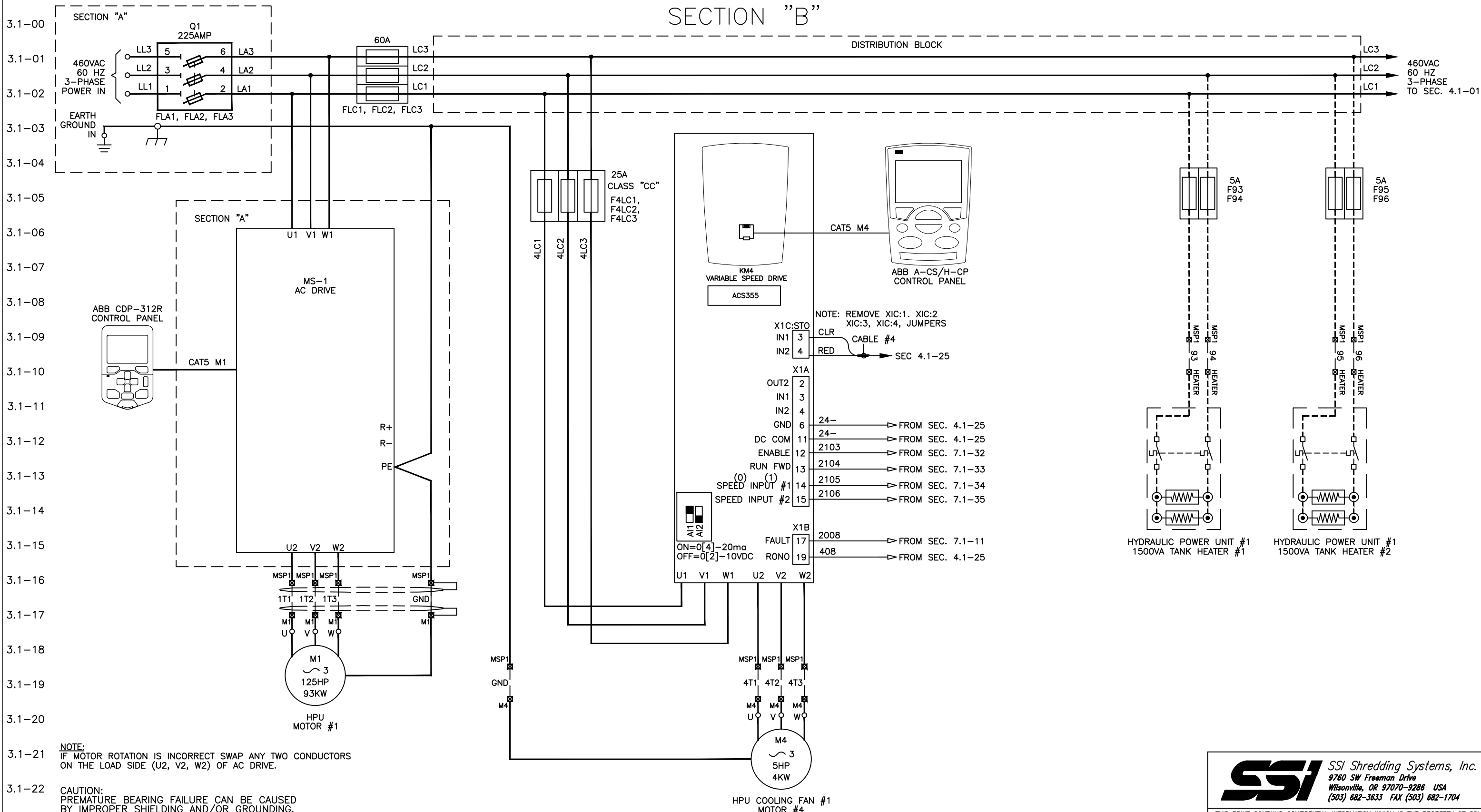
**SSI** SSI Shredding Systems, Inc.  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

COMPACTOR ELECTRICAL SYSTEM  
ELECTRICAL ENCLOSURE LOCATIONS

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		2.6	1

# SECTION "B"



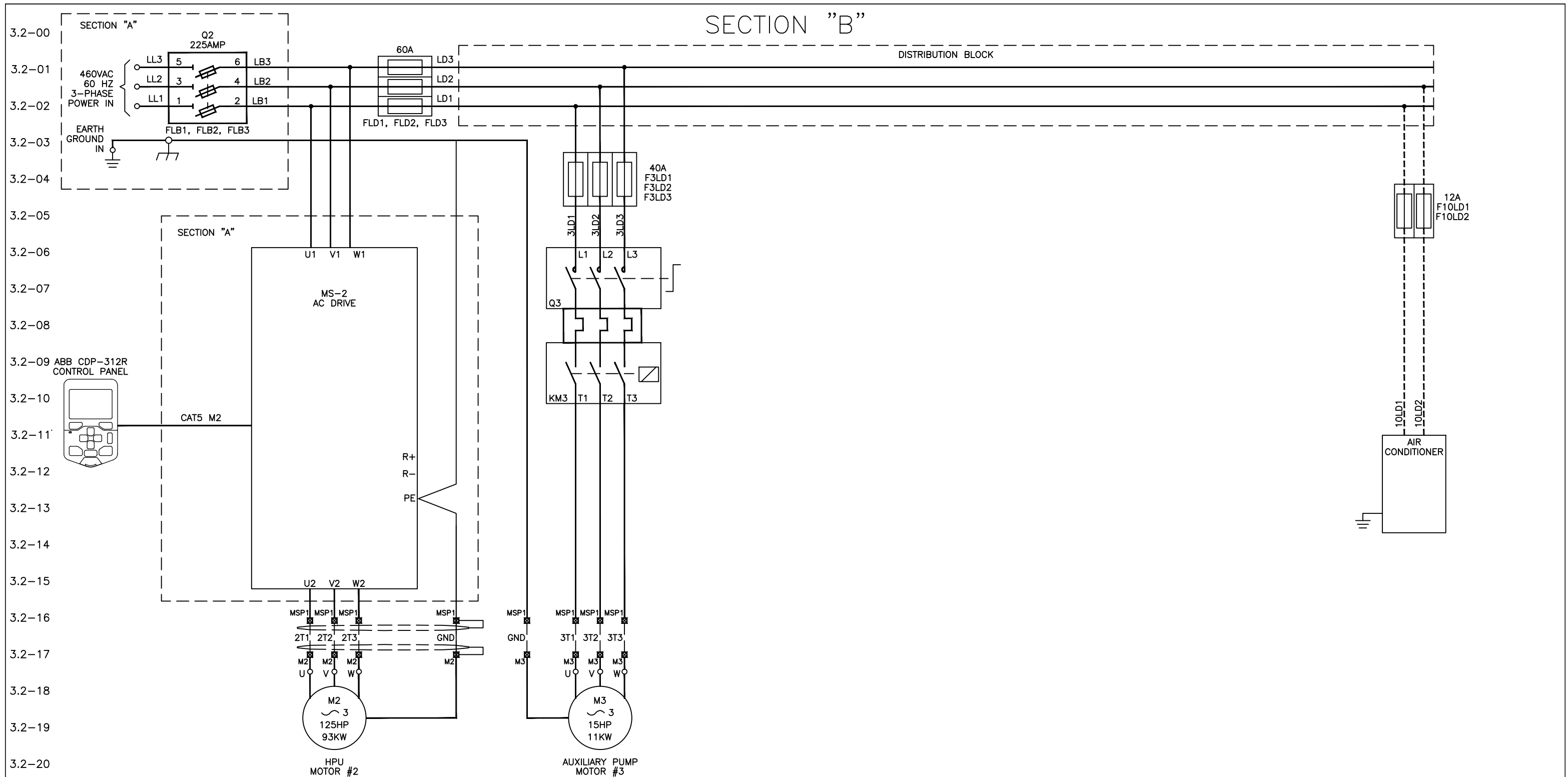
- 3.1-00
- 3.1-01
- 3.1-02
- 3.1-03
- 3.1-04
- 3.1-05
- 3.1-06
- 3.1-07
- 3.1-08
- 3.1-09
- 3.1-10
- 3.1-11
- 3.1-12
- 3.1-13
- 3.1-14
- 3.1-15
- 3.1-16
- 3.1-17
- 3.1-18
- 3.1-19
- 3.1-20
- 3.1-21 **NOTE:** IF MOTOR ROTATION IS INCORRECT SWAP ANY TWO CONDUCTORS ON THE LOAD SIDE (U2, V2, W2) OF AC DRIVE.
- 3.1-22 **CAUTION:** PREMATURE BEARING FAILURE CAN BE CAUSED BY IMPROPER SHIELDING AND/OR GROUNDING. SEE INSTALLATION GUIDELINES ON SHEET 2.4
- 3.1-23
- 3.1-24 USE SHIELDED, SYMMETRICALLY GROUNDED CABLE (AS SHOWN) CONNECTED PER ABB HARDWARE MANUAL.  
OR  
USE THREE PHASE CONDUCTORS IN METALIC CONDUIT WITH SEPARATE GROUND CONDUCTOR BOUNDED TO MOTOR FRAME.
- 3.1-25

**SSI Shredding Systems, Inc.**  
 9760 SW Fraeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

### COMPACTOR ELECTRICAL SYSTEM (MSP1) MOTOR POWER SCHEMATIC

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		3.1	1



- 3.2-21 **NOTE:**  
IF MOTOR ROTATION IS INCORRECT SWAP ANY TWO CONDUCTORS ON THE LOAD SIDE (U2, V2, W2) OF AC DRIVE.
- 3.2-22 **CAUTION:**  
PREMATURE BEARING FAILURE CAN BE CAUSED BY IMPROPER SHIELDING AND/OR GROUNDING. SEE INSTALLATION GUIDELINES ON SHEET 2.4
- 3.2-23
- 3.2-24 USE SHIELDED, SYMMETRICALLY GROUNDED CABLE (AS SHOWN) CONNECTED PER ABB HARDWARE MANUAL.  
OR  
USE THREE PHASE CONDUCTORS IN METALIC CONDUIT WITH SEPARATE GROUND CONDUCTOR BOUNDED TO MOTOR FRAME.
- 3.2-25

**SSI Shredding Systems, Inc.**  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM  
(MSP1) MOTOR POWER SCHEMATIC**

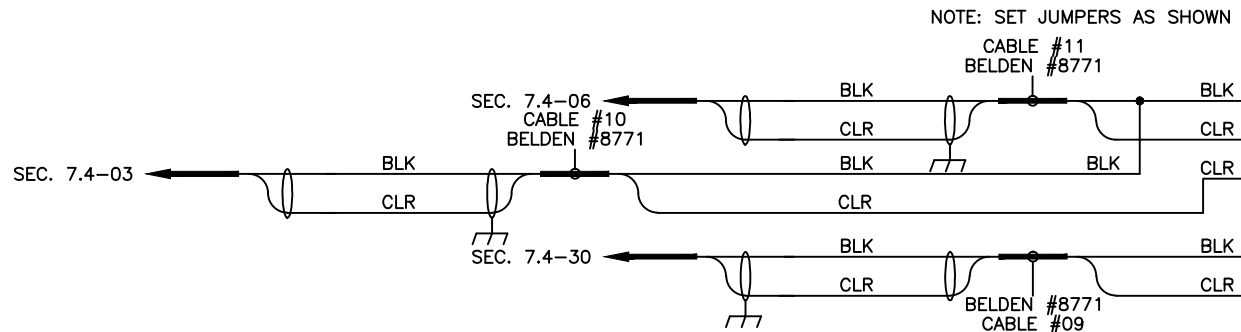
ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		3.2	1

3.3-00  
3.3-01  
3.3-02  
3.3-03  
3.3-04  
3.3-05  
3.3-06  
3.3-07  
3.3-08  
3.3-09  
3.3-10  
3.3-11  
3.3-12  
3.3-13  
3.3-14  
3.3-15  
3.3-16  
3.3-17  
3.3-18  
3.3-19  
3.3-20  
3.3-21  
3.3-22  
3.3-23  
3.3-24  
3.3-25

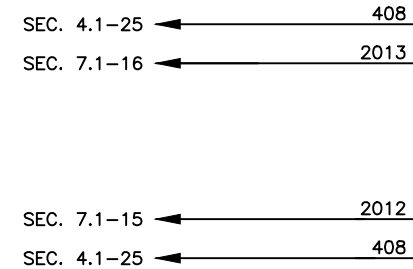
# SECTION "A"

DRIVE CONTROL UNIT #1

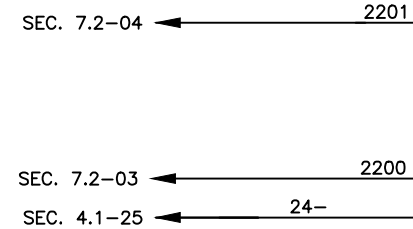
NOTE: SET JUMPERS AS SHOWN



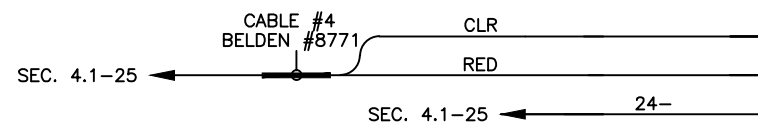
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	J1	AI1 CURRENT/VOLTAGE JUMPER
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	J2	AI2 CURRENT/VOLTAGE JUMPER
9	AGND	ANALOG OUTPUT CIRCUIT COMMON			
8	A02	OUTPUT CURRENT (0-20mA) ACTUAL POWER			
7	A01	OUTPUT FREQUENCY (0-20mA) ACTUAL SPEED			
4	+10V	REFERENCE VOLTAGE 10VDC			
3	AGND	ANALOG INPUT CIRCUIT COMMON			
2	AI1	OUTPUT FREQUENCY/SPEED REFERENCE (0-10VDC)			
1	SCR	SIGNAL CABLE SHIELD (SCREEN)			



27	NO	FAULTED 250VAC/30VDC 2A
25	COM	
26	NC	RUNNING 250VAC/30VDC 2A
24	NO	
22	COM	DRIVE IN REMOTE MODE 250VAC/30VDC 2A
23	NC	
21	NO	
19	COM	
20	NC	



18	DI6	NOT CONFIGURED
17	DI5	(SPARE)
16	DI4	(SPARE)
15	DI3	CONSTANT SPEED (1 = ON)
14	DI2	FORWARD (0)/REVERSE(1)
13	DI1	STOP (0)/START (1)
12	DCOM	DIGITAL INPUT COMMON



38	IN2	SAFE TORQUE OFF. BOTH IN1 AND IN2 MUST BE ON IN ORDER FOR DRIVE TO START.
37	IN1	
36	SGND	
35	OUT 1	

**SSI** SSI Shredding Systems, Inc.  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

## COMPACTOR ELECTRICAL SYSTEM (M1) VFD WIRING DIAGRAM

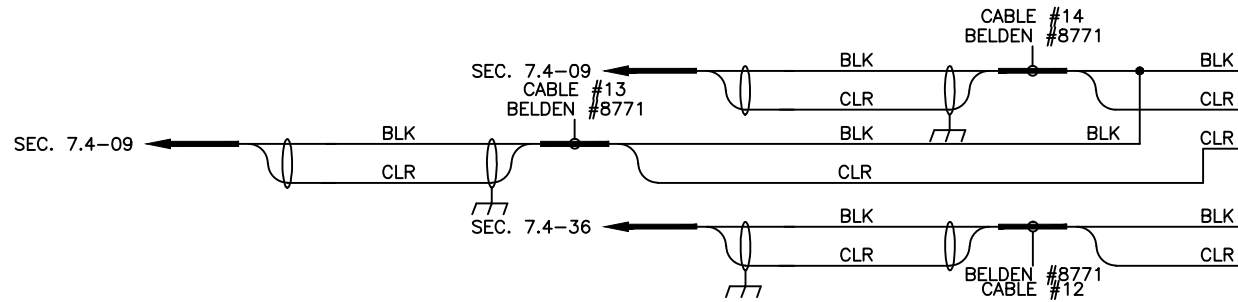
ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		3.3	1

3.4-00  
3.4-01  
3.4-02  
3.4-03  
3.4-04  
3.4-05  
3.4-06  
3.4-07  
3.4-08  
3.4-09  
3.4-10  
3.4-11  
3.4-12  
3.4-13  
3.4-14  
3.4-15  
3.4-16  
3.4-17  
3.4-18  
3.4-19  
3.4-20  
3.4-21  
3.4-22  
3.4-23  
3.4-24  
3.4-25

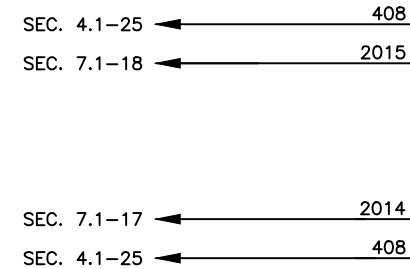
# SECTION "A"

DRIVE CONTROL UNIT #2

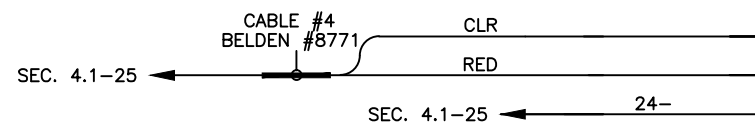
NOTE: SET JUMPERS AS SHOWN



○ ○ ○ ○ J1	AI1 CURRENT/VOLTAGE JUMPER	
○ ○ ○ ○ J2	AI2 CURRENT/VOLTAGE JUMPER	
9	AGND	ANALOG OUTPUT CIRCUIT COMMON
8	A02	OUTPUT CURRENT (0-20mA) ACTUAL POWER
7	A01	OUTPUT FREQUENCY (0-20mA) ACTUAL SPEED
4	+10V	REFERENCE VOLTAGE 10VDC
3	AGND	ANALOG INPUT CIRCUIT COMMON
2	AI1	OUTPUT FREQUENCY/SPEED REFERENCE (0-10VDC)
1	SCR	SIGNAL CABLE SHIELD (SCREEN)



27	NO	FAULTED 250VAC/30VDC 2A
25	COM	
26	NC	RUNNING 250VAC/30VDC 2A
24	NO	
22	COM	DRIVE IN REMOTE MODE 250VAC/30VDC 2A
23	NC	
21	NO	
19	COM	
20	NC	



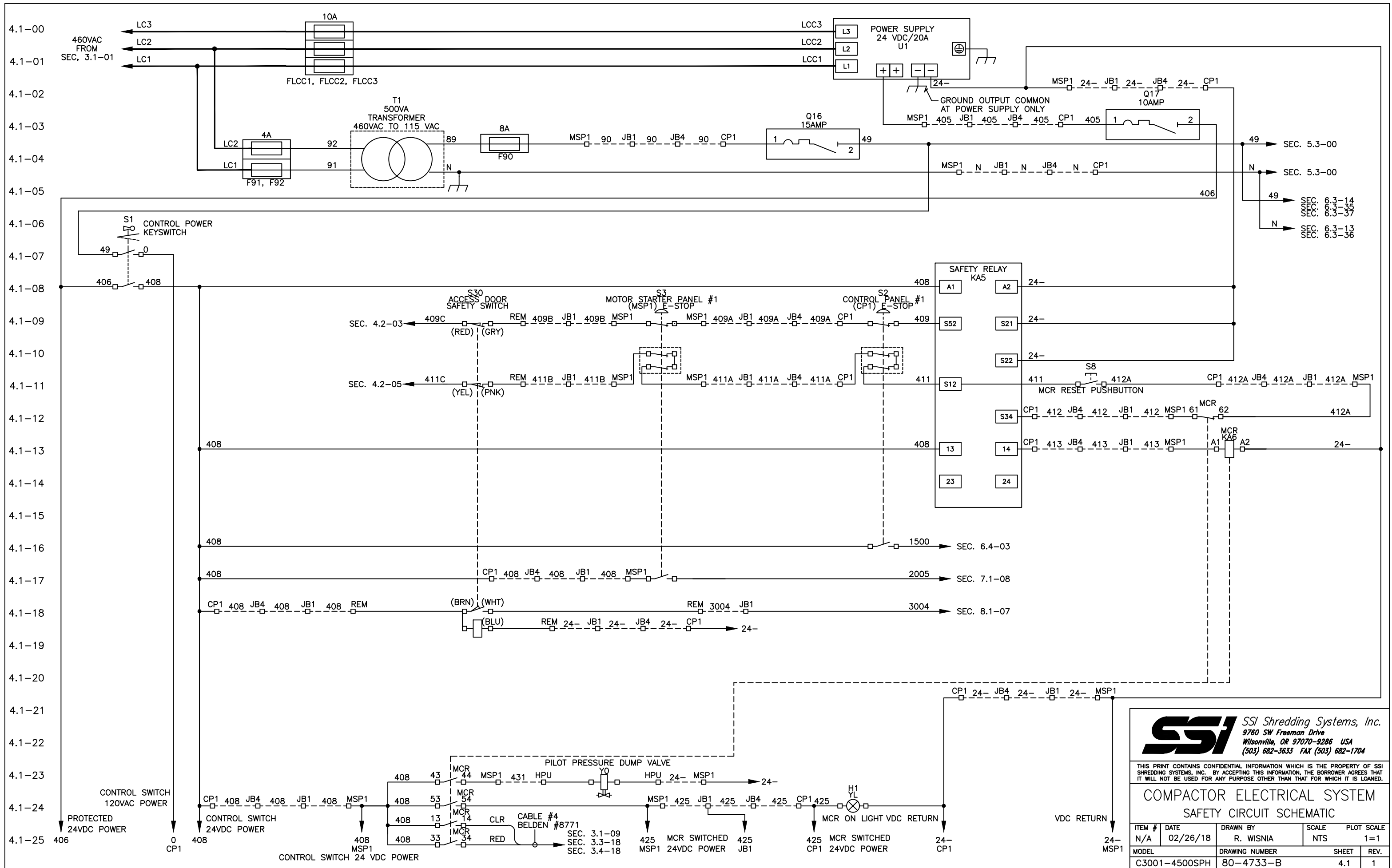
18	DI6	NOT CONFIGURED
17	DI5	(SPARE)
16	DI4	(SPARE)
15	DI3	CONSTANT SPEED (1 = ON)
14	DI2	FORWARD (0)/REVERSE(1)
13	DI1	STOP (0)/START (1)
12	DCOM	DIGITAL INPUT COMMON
38	IN2	SAFE TORQUE OFF. BOTH IN1 AND IN2 MUST BE ON IN ORDER FOR DRIVE TO START.
37	IN1	
36	SGND	
35	OUT 1	

**SSI** SSI Shredding Systems, Inc.  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

## COMPACTOR ELECTRICAL SYSTEM (M2) VFD WIRING DIAGRAM

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		3.4	1



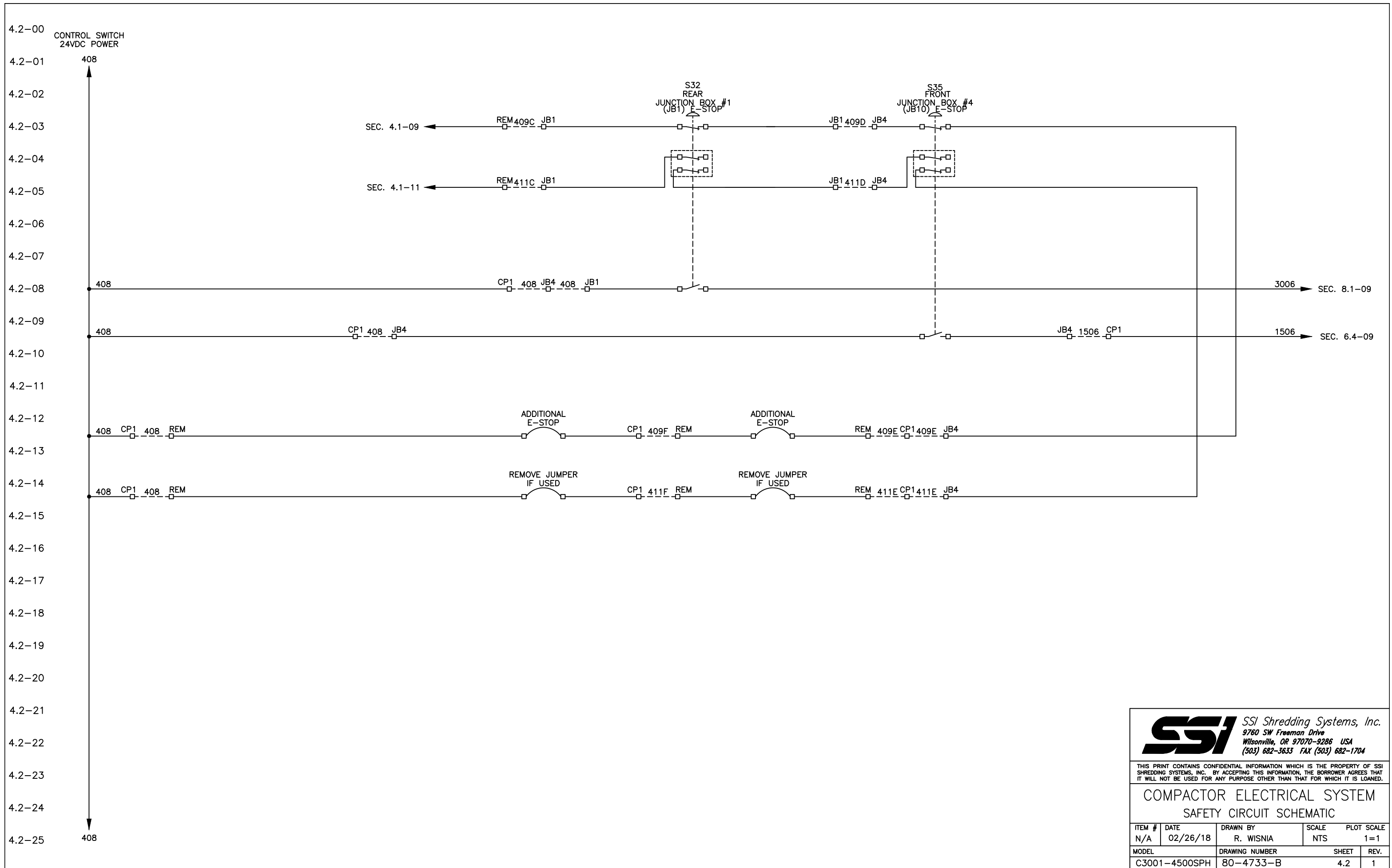
**SSI** SSI Shredding Systems, Inc.  
 9760 SW Fraeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM  
 SAFETY CIRCUIT SCHEMATIC**

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER	SHEET	REV.	
C3001-4500SPH	80-4733-B	4.1	1	



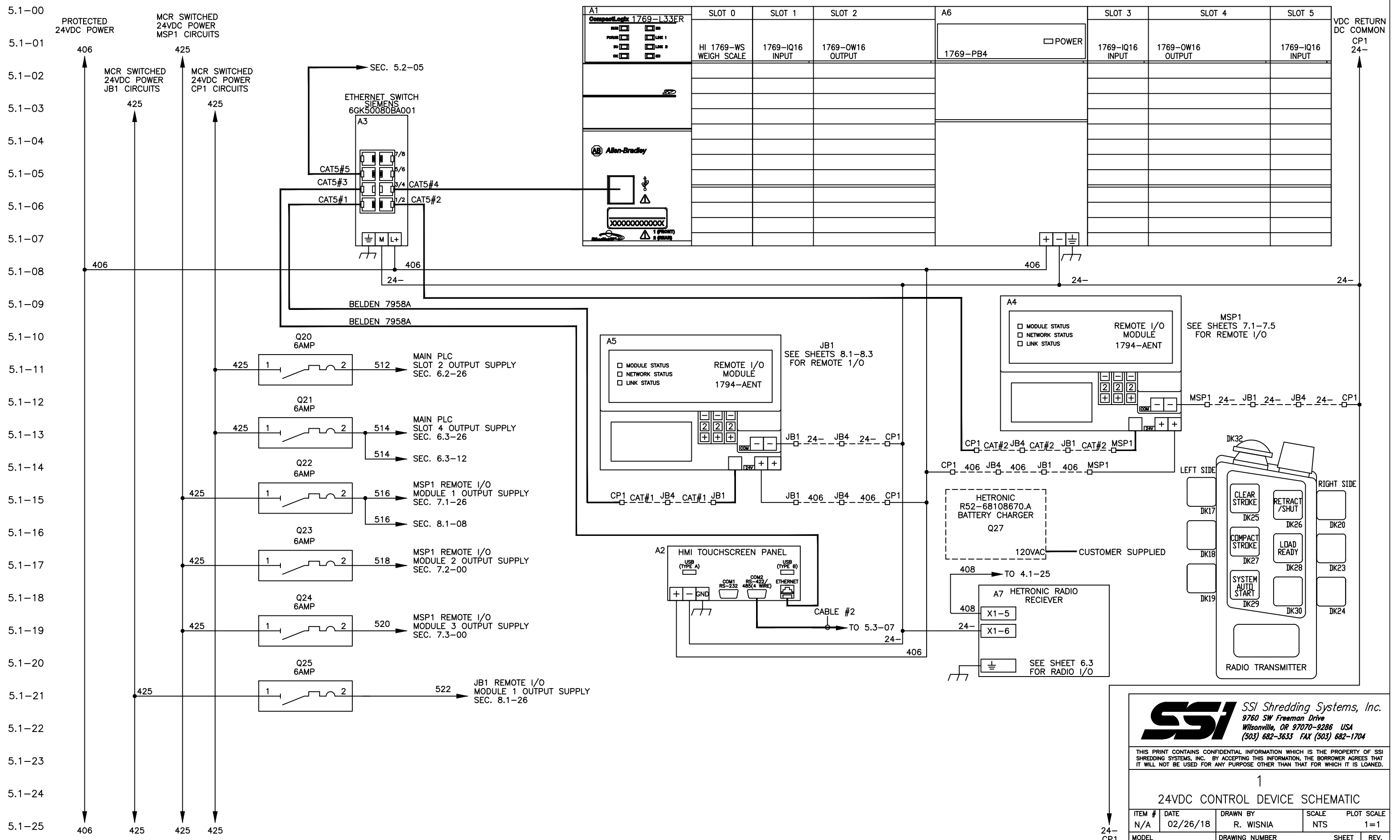


**SSI** SSI Shredding Systems, Inc.  
 9760 SW Fraeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

COMPACTOR ELECTRICAL SYSTEM  
 SAFETY CIRCUIT SCHEMATIC

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		4.2	1

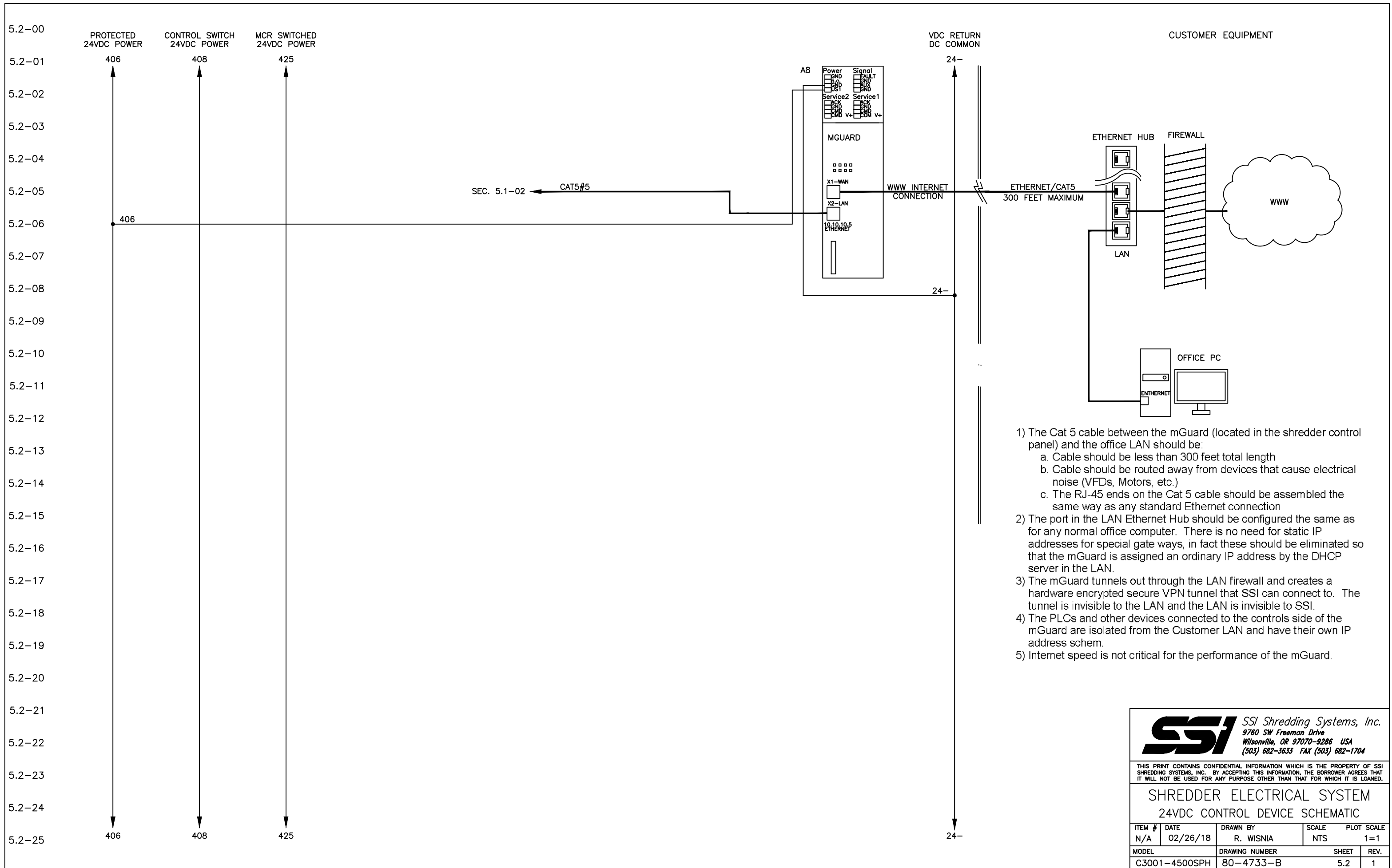


**SSI** SSI Shredding Systems, Inc.  
 9760 SW Fraeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

1  
 24VDC CONTROL DEVICE SCHEMATIC

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		5.1	0



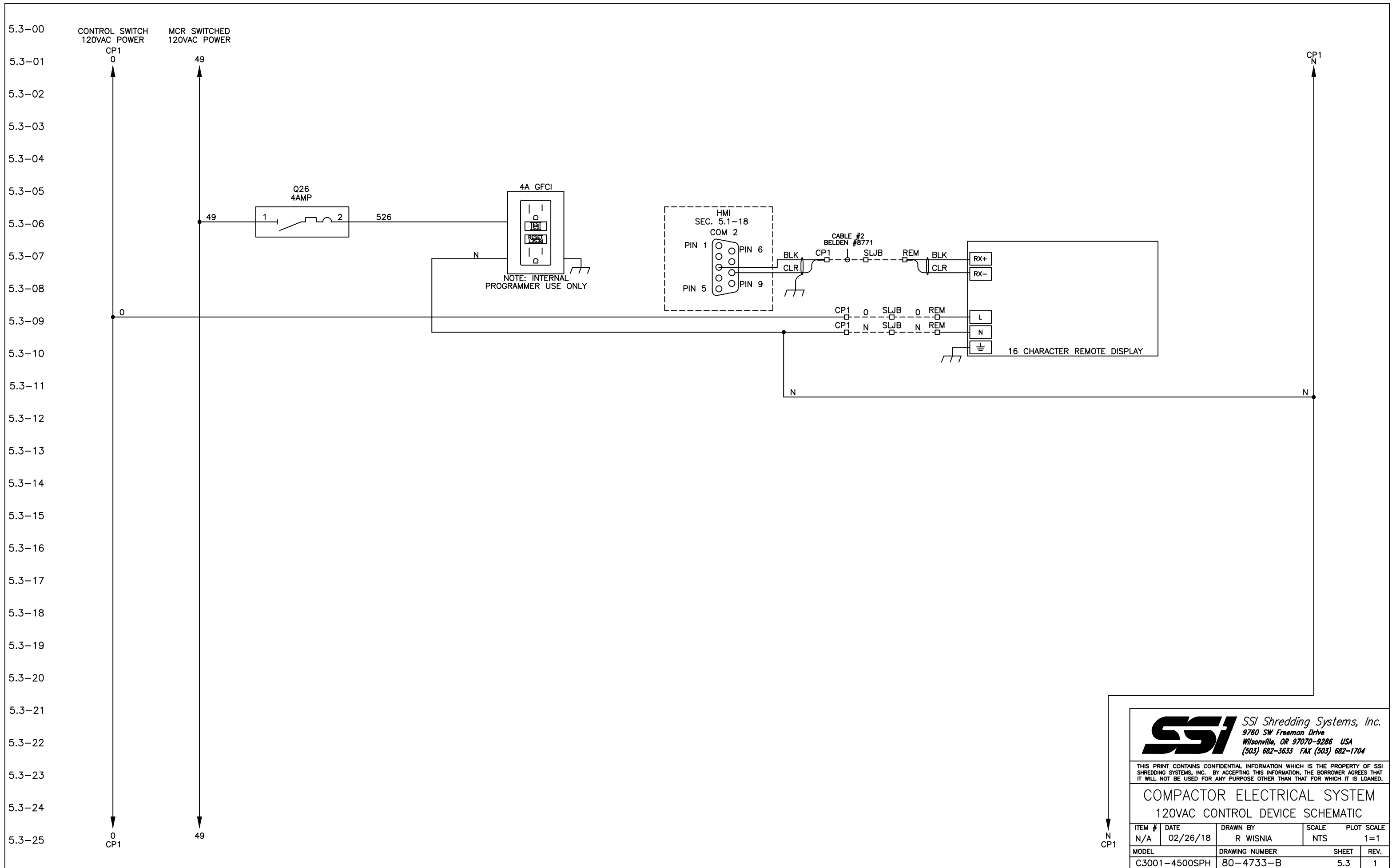
- 1) The Cat 5 cable between the mGuard (located in the shredder control panel) and the office LAN should be:
  - a. Cable should be less than 300 feet total length
  - b. Cable should be routed away from devices that cause electrical noise (VFDs, Motors, etc.)
  - c. The RJ-45 ends on the Cat 5 cable should be assembled the same way as any standard Ethernet connection
- 2) The port in the LAN Ethernet Hub should be configured the same as for any normal office computer. There is no need for static IP addresses for special gate ways, in fact these should be eliminated so that the mGuard is assigned an ordinary IP address by the DHCP server in the LAN.
- 3) The mGuard tunnels out through the LAN firewall and creates a hardware encrypted secure VPN tunnel that SSI can connect to. The tunnel is invisible to the LAN and the LAN is invisible to SSI.
- 4) The PLCs and other devices connected to the controls side of the mGuard are isolated from the Customer LAN and have their own IP address schem.
- 5) Internet speed is not critical for the performance of the mGuard.

**SSI** SSI Shredding Systems, Inc.  
 9760 SW Fraeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**SHREDDER ELECTRICAL SYSTEM**  
 24VDC CONTROL DEVICE SCHEMATIC

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		5.2	1



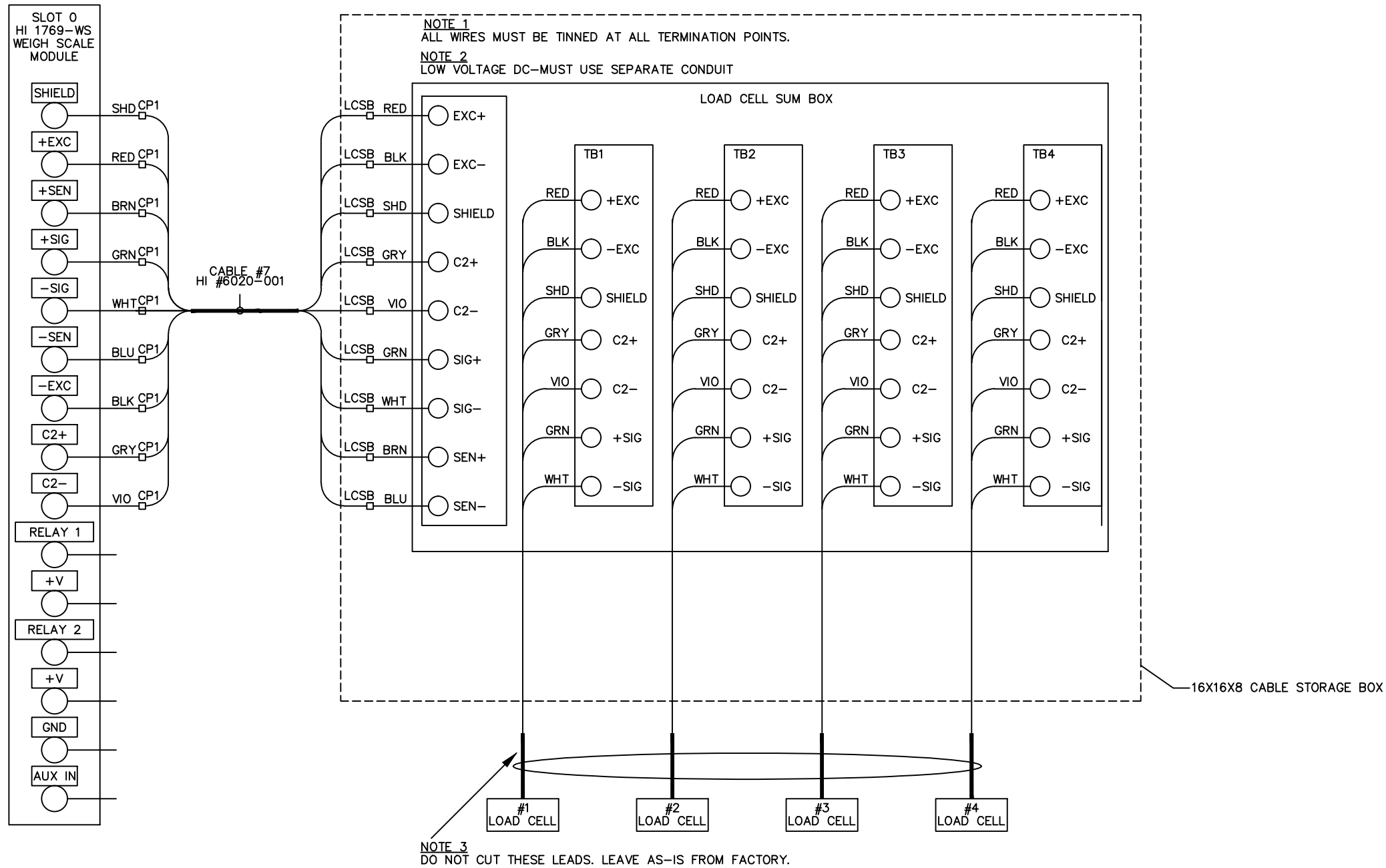
**SSI** SSI Shredding Systems, Inc.  
 9760 SW Fraeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM  
 120VAC CONTROL DEVICE SCHEMATIC**

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		5.3	1

6.1-00  
6.1-01  
6.1-02  
6.1-03  
6.1-04  
6.1-05  
6.1-06  
6.1-07  
6.1-08  
6.1-09  
6.1-10  
6.1-11  
6.1-12  
6.1-13  
6.1-14  
6.1-15  
6.1-16  
6.1-17  
6.1-18  
6.1-19  
6.1-20  
6.1-21  
6.1-22  
6.1-23  
6.1-24  
6.1-25

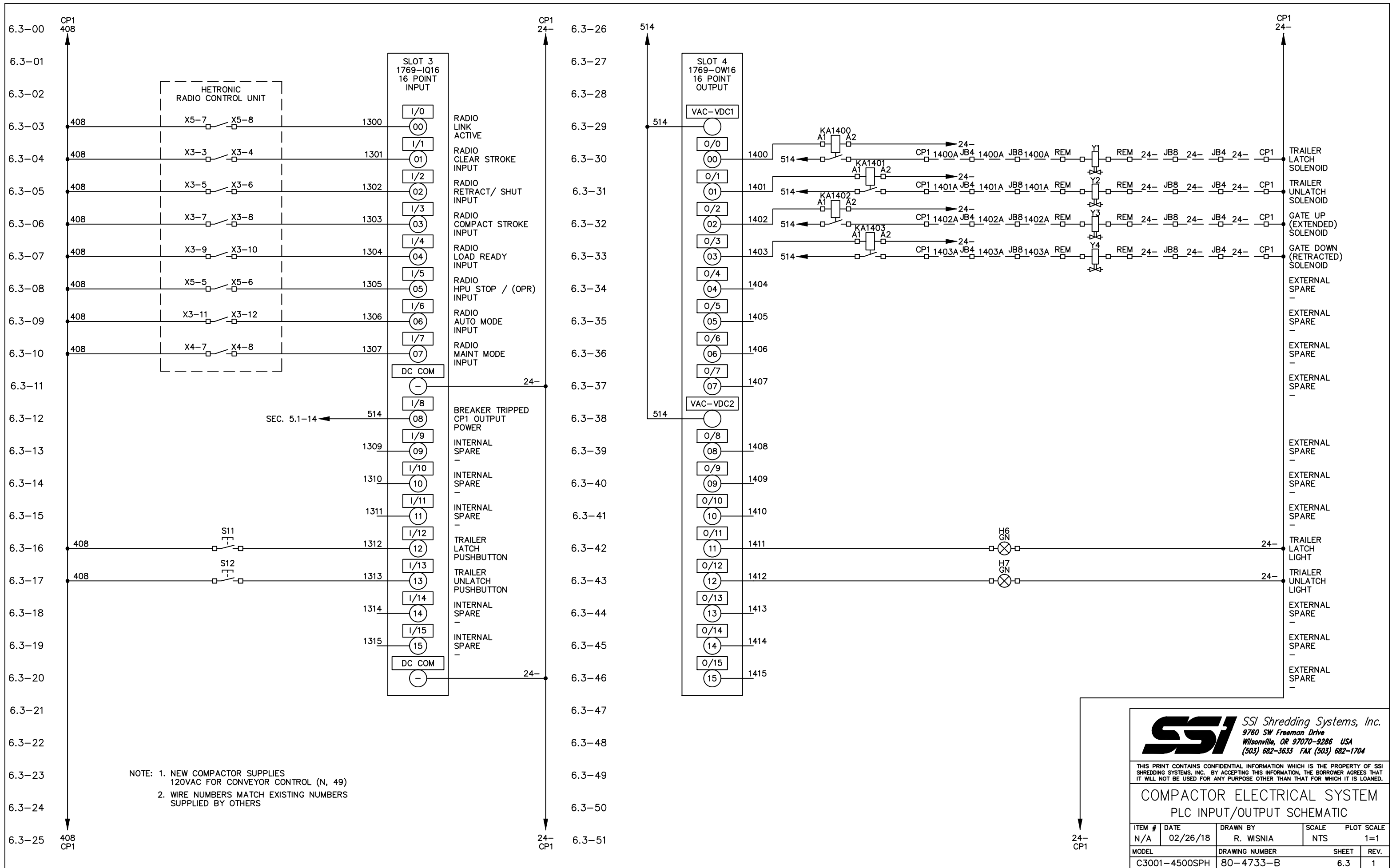


**SSI** SSI Shredding Systems, Inc.  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

COMPACTOR ELECTRICAL SYSTEM  
PLC BASE INPUT/OUTPUT SCHEMATIC

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		6.1	1



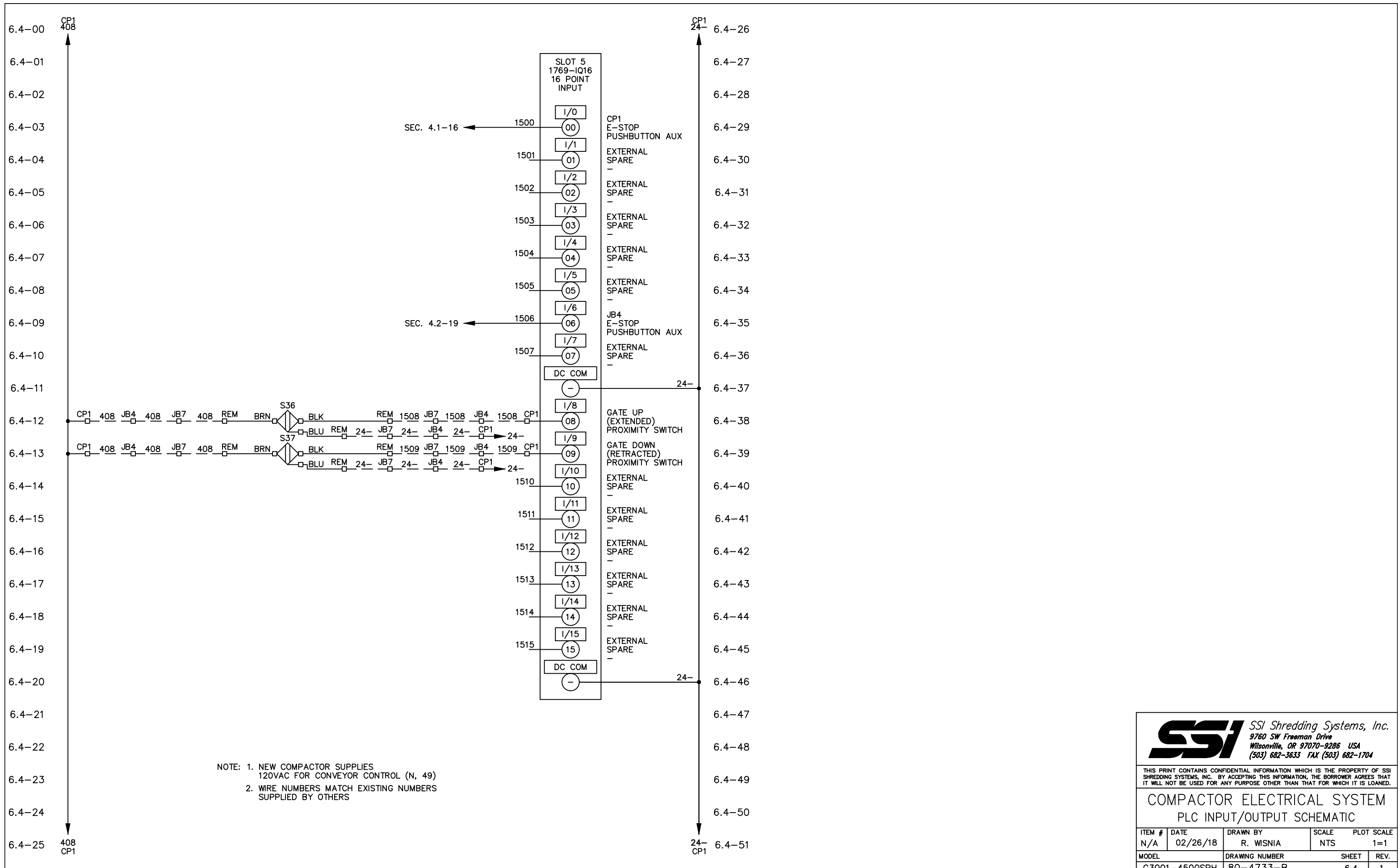
NOTE: 1. NEW COMPACTOR SUPPLIES  
120VAC FOR CONVEYOR CONTROL (N, 49)  
2. WIRE NUMBERS MATCH EXISTING NUMBERS  
SUPPLIED BY OTHERS

**SSI** SSI Shredding Systems, Inc.  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM  
PLC INPUT/OUTPUT SCHEMATIC**

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER	SHEET	REV.	
C3001-4500SPH	80-4733-B	6.3	1	



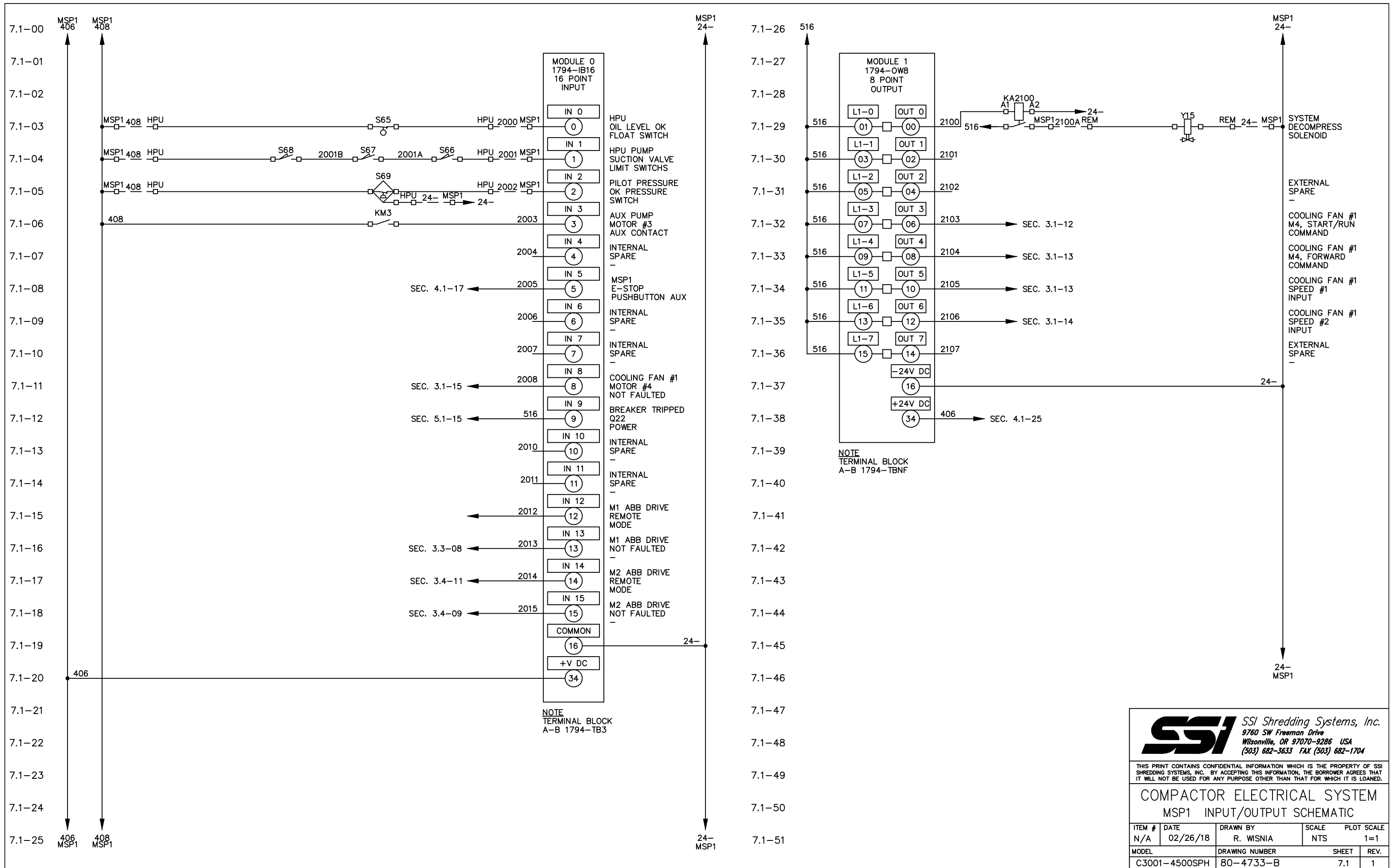
NOTE: 1. NEW COMPACTOR SUPPLIES  
120VAC FOR CONVEYOR CONTROL (N, 49)  
2. WIRE NUMBERS MATCH EXISTING NUMBERS  
SUPPLIED BY OTHERS

**SSI** SSI Shredding Systems, Inc.  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM  
PLC INPUT/OUTPUT SCHEMATIC**

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		6.4	1



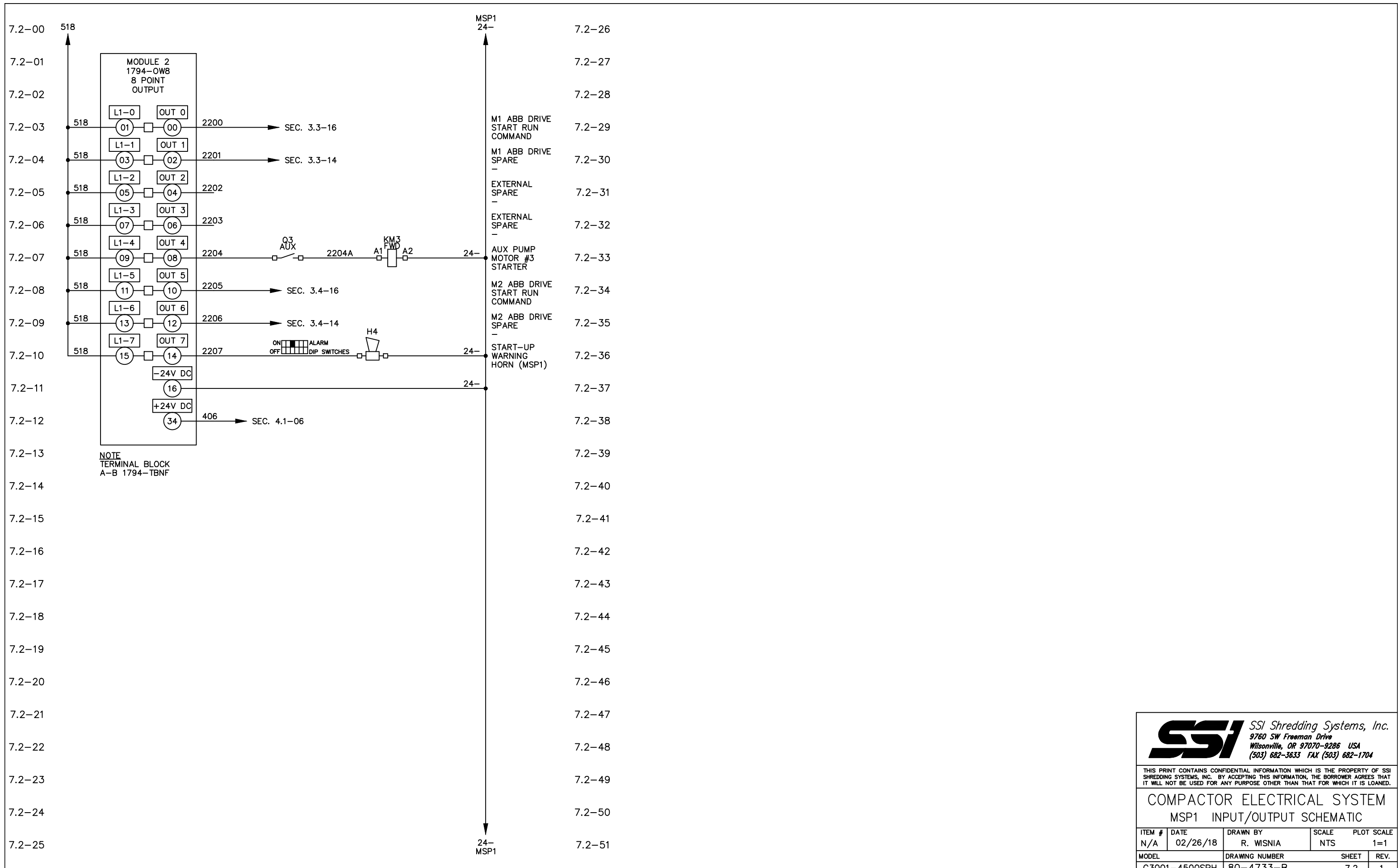
**SSI** SSI Shredding Systems, Inc.  
 9760 SW Fraeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM**  
 MSP1 INPUT/OUTPUT SCHEMATIC

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		7.1	1



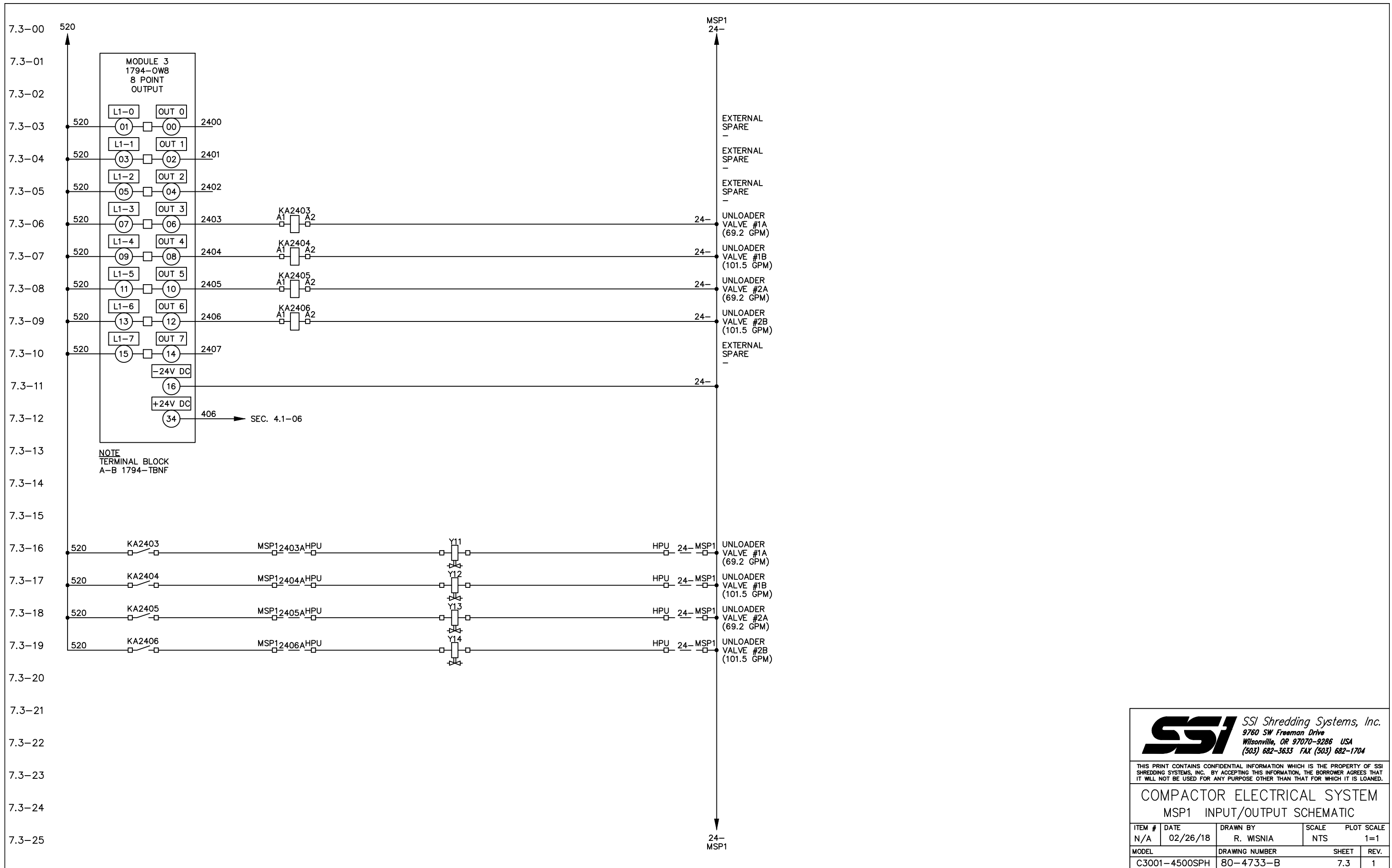


**SSI** SSI Shredding Systems, Inc.  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM  
MSP1 INPUT/OUTPUT SCHEMATIC**

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		7.2	1

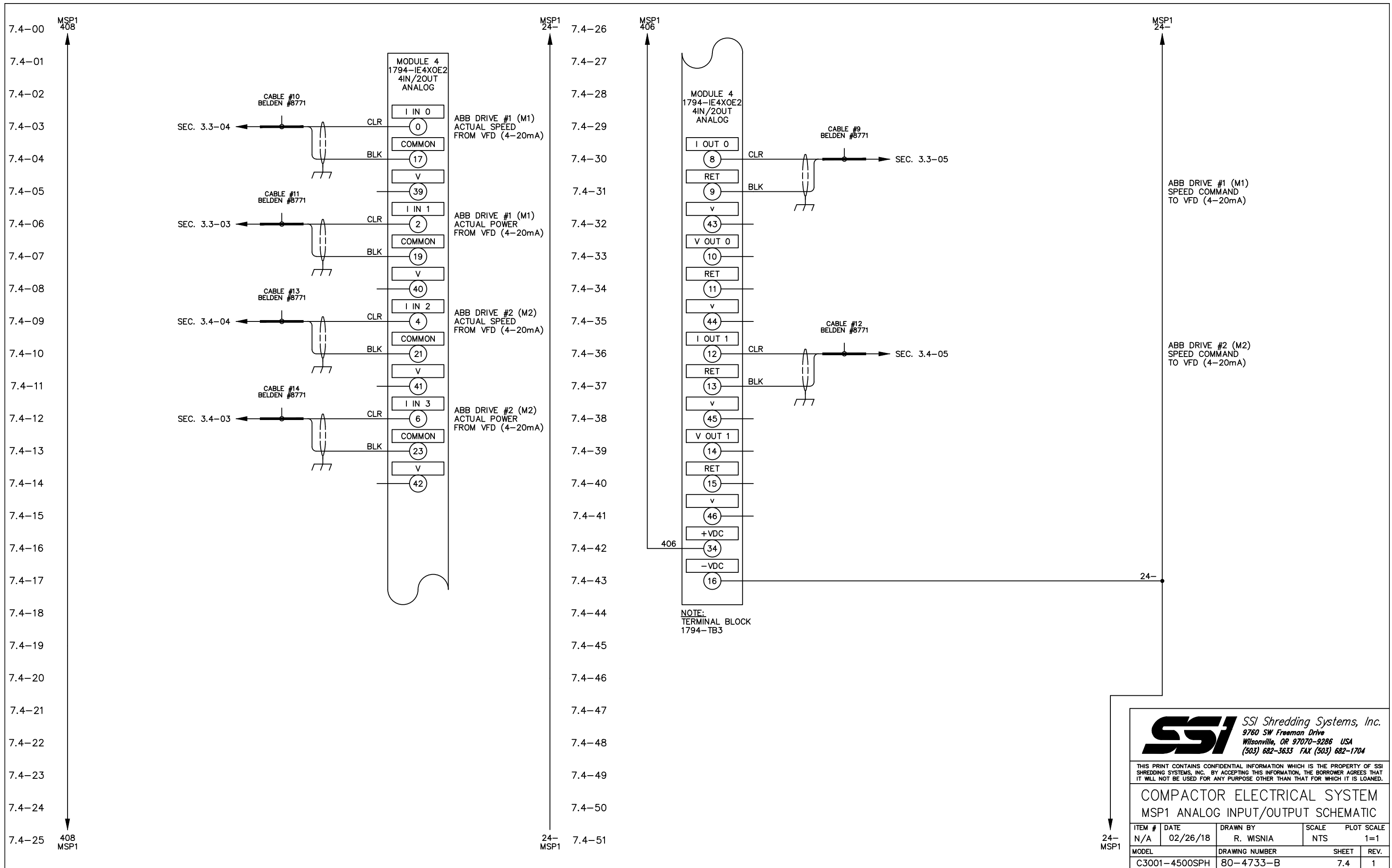


**SSI** SSI Shredding Systems, Inc.  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM**  
MSP1 INPUT/OUTPUT SCHEMATIC

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		7.3	1



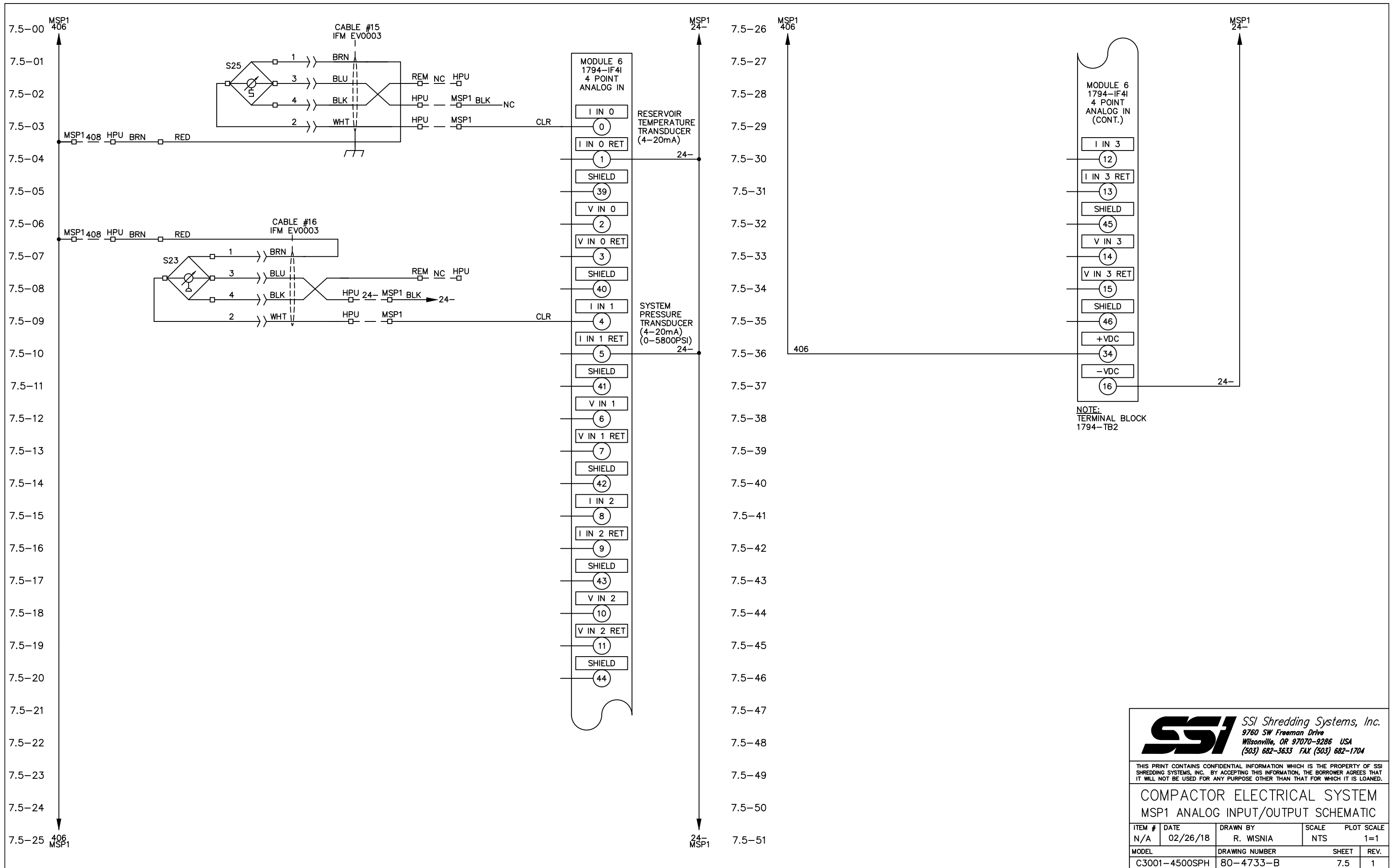
NOTE:  
TERMINAL BLOCK  
1794-TB3

**SSI** SSI Shredding Systems, Inc.  
9760 SW Fraeman Drive  
Wilsonville, OR 97070-9286 USA  
(503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM  
MSP1 ANALOG INPUT/OUTPUT SCHEMATIC**

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		7.4	1



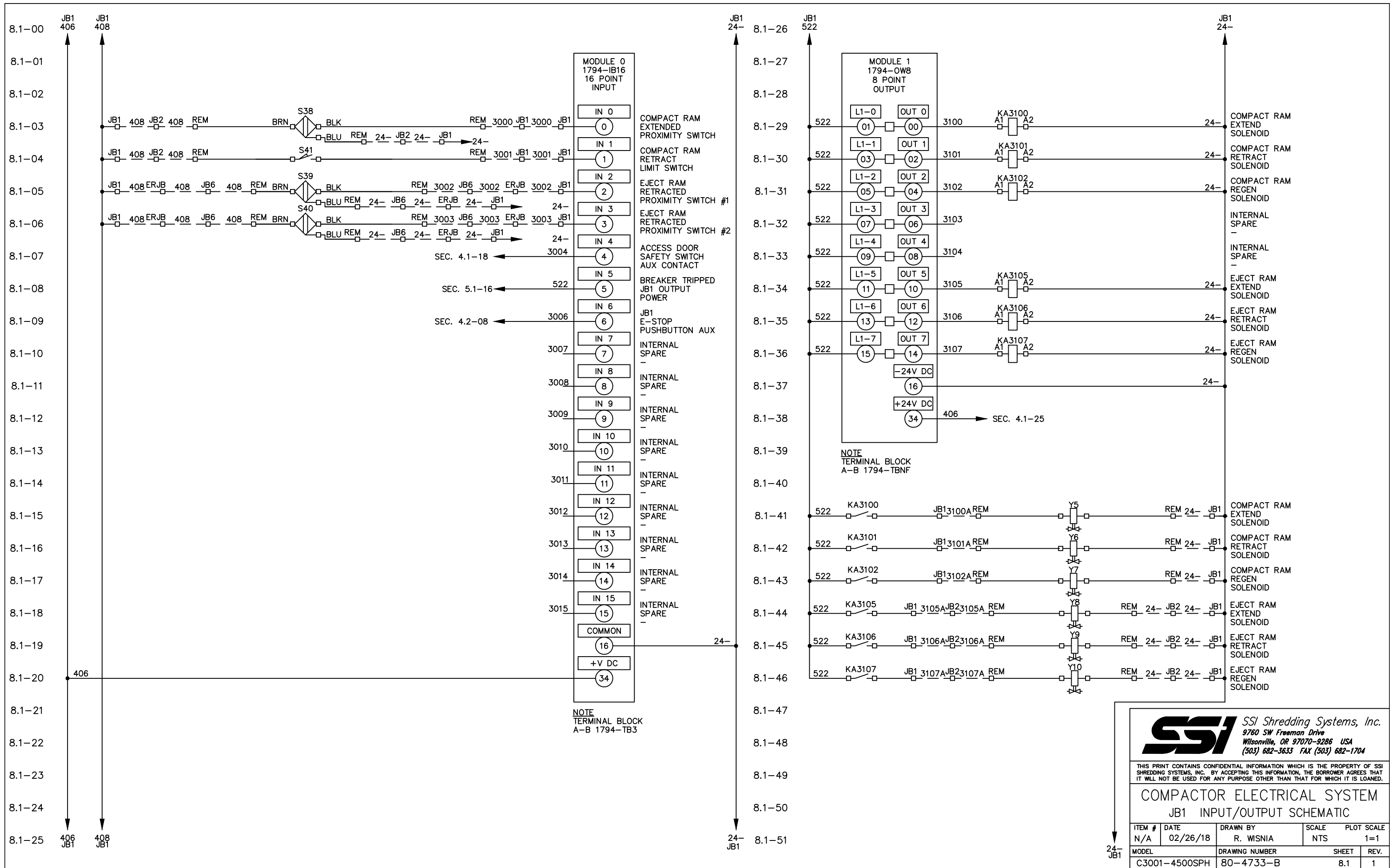
NOTE:  
TERMINAL BLOCK  
1794-TB2

**SSI** SSI Shredding Systems, Inc.  
 9760 SW Fraeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM  
MSP1 ANALOG INPUT/OUTPUT SCHEMATIC**

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		7.5	1

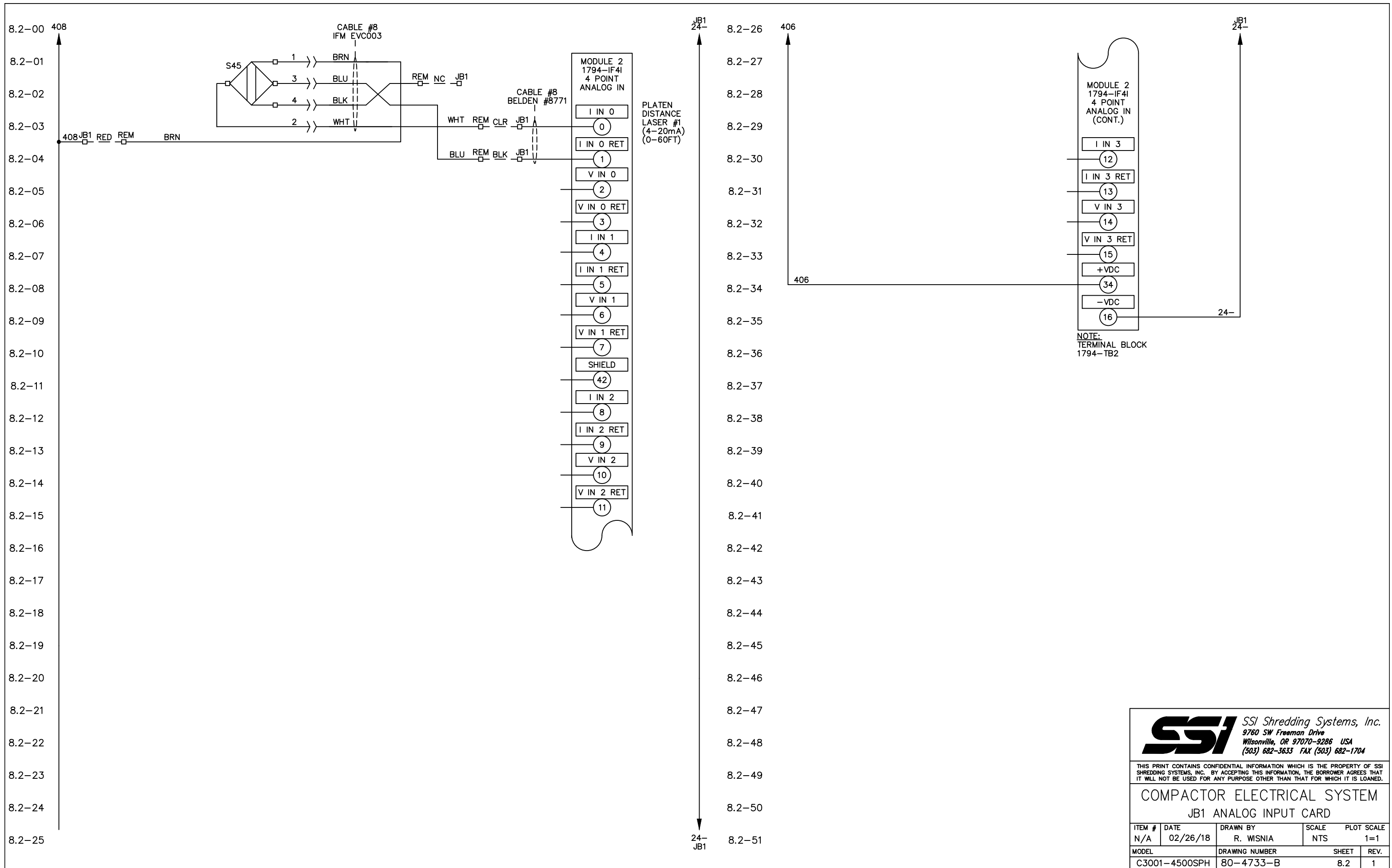


**SSI** SSI Shredding Systems, Inc.  
 9760 SW Fraeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**COMPACTOR ELECTRICAL SYSTEM**  
**JB1 INPUT/OUTPUT SCHEMATIC**

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		8.1	1



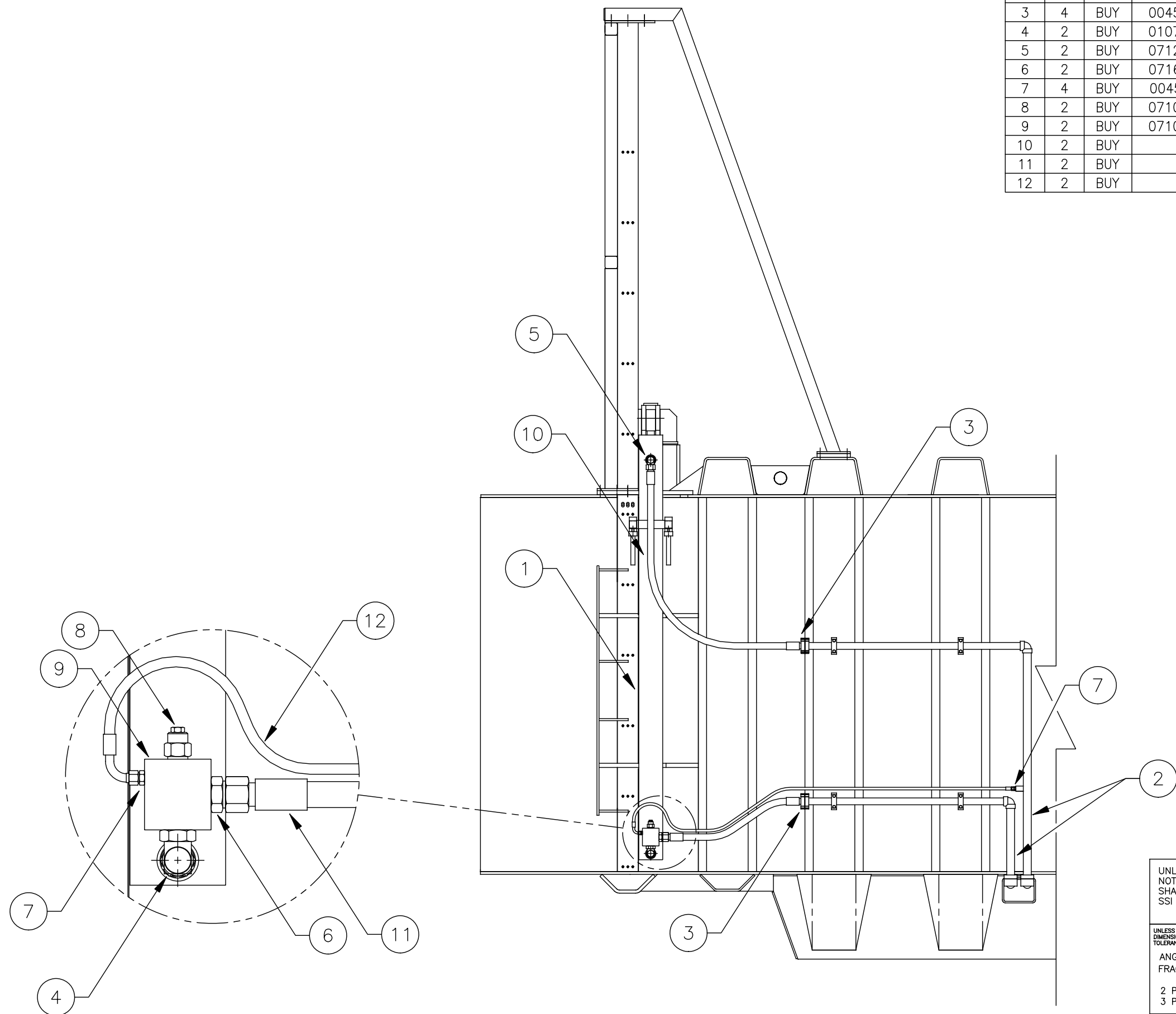
**SSI** SSI Shredding Systems, Inc.  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

COMPACTOR ELECTRICAL SYSTEM  
 JB1 ANALOG INPUT CARD

ITEM #	DATE	DRAWN BY	SCALE	PLOT SCALE
N/A	02/26/18	R. WISNIA	NTS	1=1
MODEL	DRAWING NUMBER		SHEET	REV.
C3001-4500SPH	80-4733-B		8.2	1

1	2	REF		VERTICAL GATE CYLINDER
2	1	REF		GATE HYDRAULIC PLUMBING
3	4	BUY	004589	20PA HOSE END FLANGE KIT
4	2	BUY	010716	#20 O-RING MALE 90 6807-20-20
5	2	BUY	071280	#20 O-RING TO #20 JIC 90 6801-20-20
6	2	BUY	071619	#20 O-RING TO #20 JIC STR 6400-20-20
7	4	BUY	004541	#06 O-RING TO #06 JIC STR 6400-06-06
8	2	BUY	071047	SUN COUNTERBALANCE/GATE CBGA-LIN
9	2	BUY	071048	SUN COUNTERBALANCE VALVE BODY HCN
10	2	BUY		1 1/4" M7HOSE 20PA ST X 20JIC ST TO FIT
11	2	BUY		1 1/4" M7HOSE 20PA ST X 20JIC ST TO FIT
12	2	BUY		3/8" M7HOSE 06JIC ST X 06JIC 90 TO FIT



1	CHANGED TO GENERIC PDR#7461	6/1/12	RC	
0	RELEASED PDR# 7235	3/5/12	RC	
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.

UNLESS OTHERWISE NOTED ALL WELDS SHALL CONFORM TO SSI WELDING SPEC. ST-F001

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:  
 ANGLES ± 1°  
 FRACTIONS ± 1/16  
 2 PL DEC. ± 0.03  
 3 PL DEC. ± 0.005

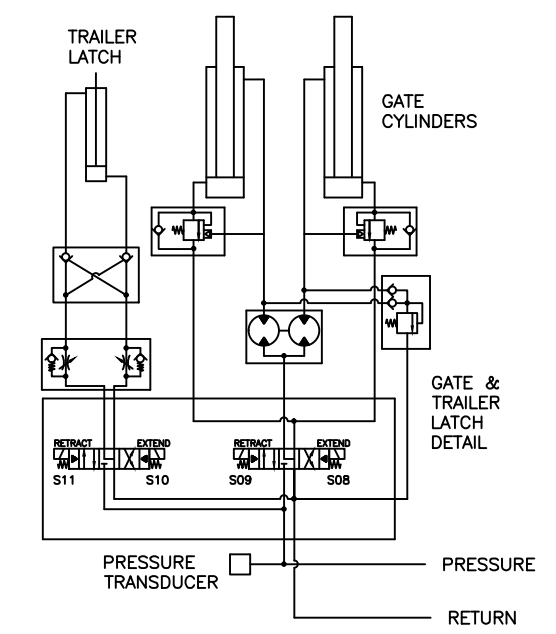
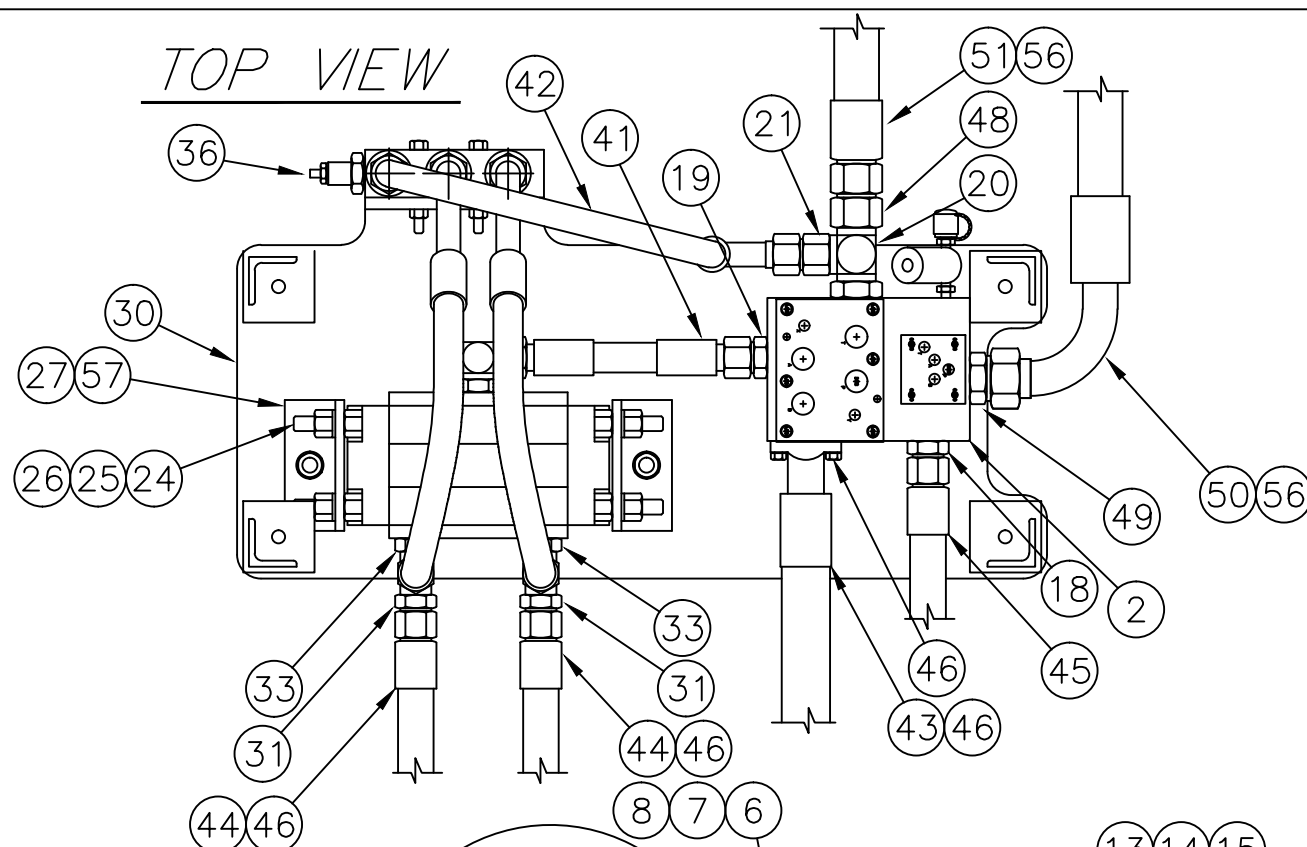
THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**SSI Shredding Systems, Inc.**  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704  
 WEB SITE: <http://www.ssiworld.com>

**GATE CYL PLUMBING DETAIL**

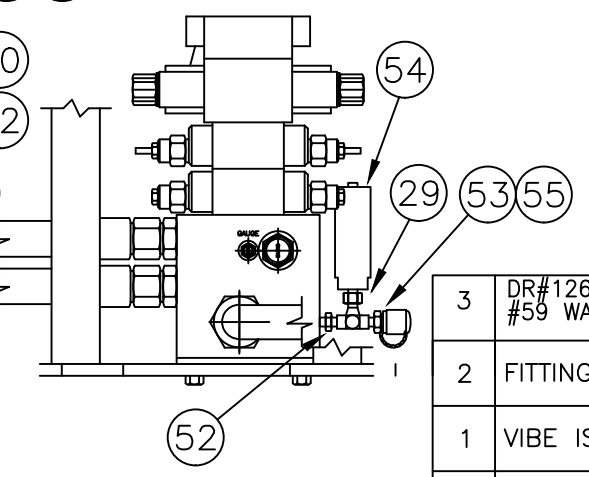
WEIGHT	DATE	DRAWN BY	SCALE	PLT SCALE
	3/5/12	RCURRIER	1"=1'-0"	1=12
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
80-1869-D		4500 SPH	80-3545-D	1of1
				REV.
				1

TOP VIEW

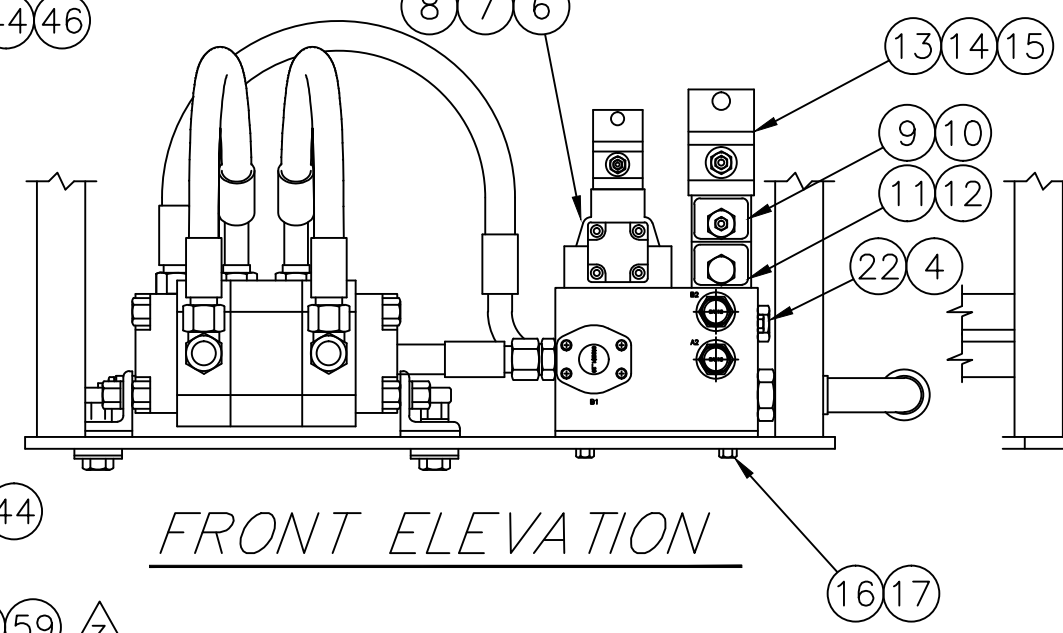


TYPICAL SCHEMATIC

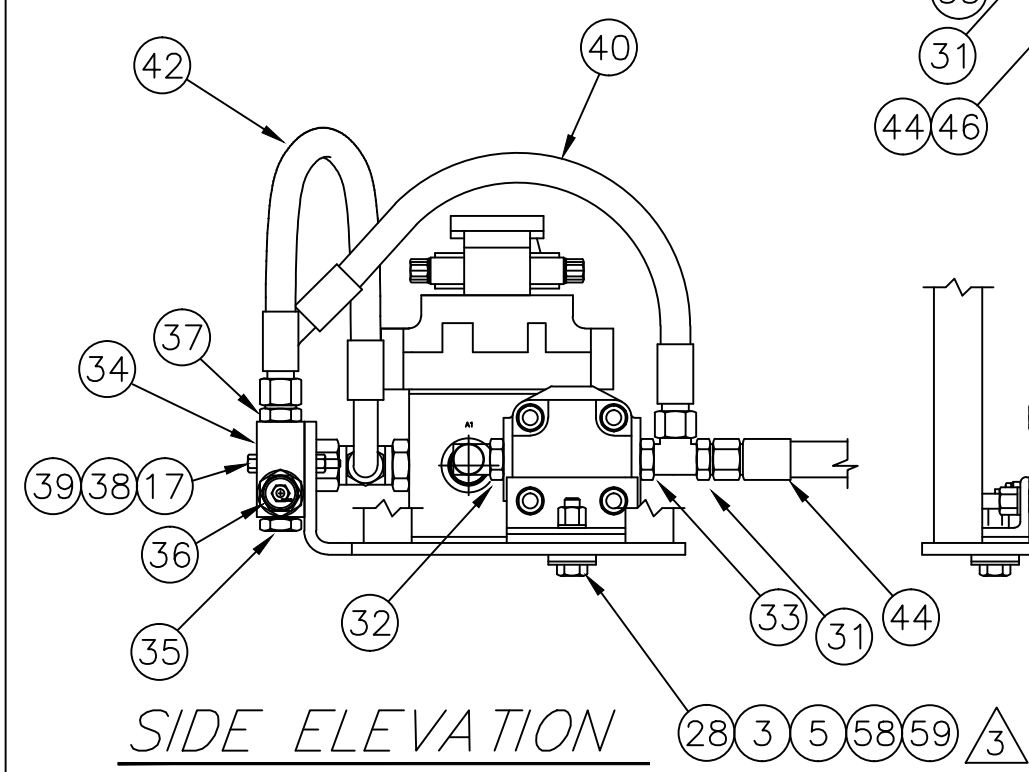
SIDE ELEVATION



FRONT ELEVATION



SIDE ELEVATION



3	DR#12610 VIBE ISOLATOR UPDATE #59 WAS 803563, #58 WAS 803562	1/22/18	RC	JB
2	FITTING UPDATE PDR#7712	10/2/12	RC	-
1	VIBE ISOLATORS PDR#7536	6/22/12	RC	-
0	RELEASED PDR#7223	2/29/12	RC	
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.

**SSI** SSI Shredding Systems, Inc.  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:

ANGLES ± 1°  
 FRACTIONS ± 1/16  
 2 PL DEC. ± .03  
 3 PL DEC. ± .005

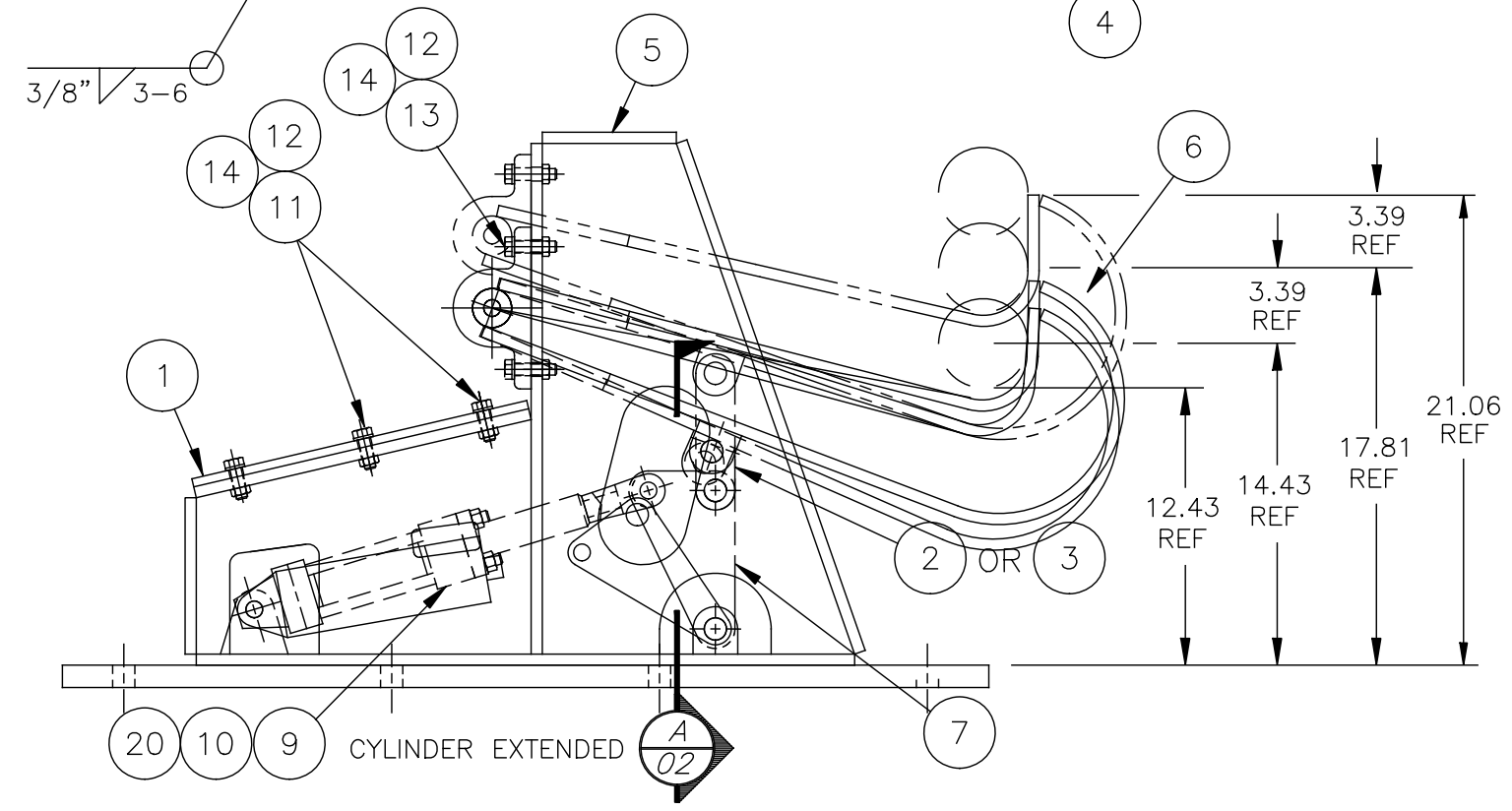
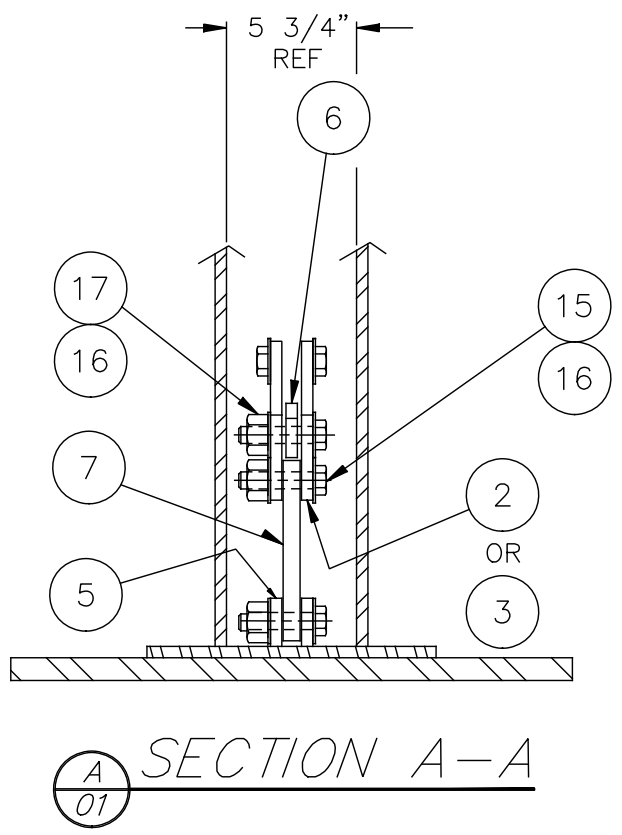
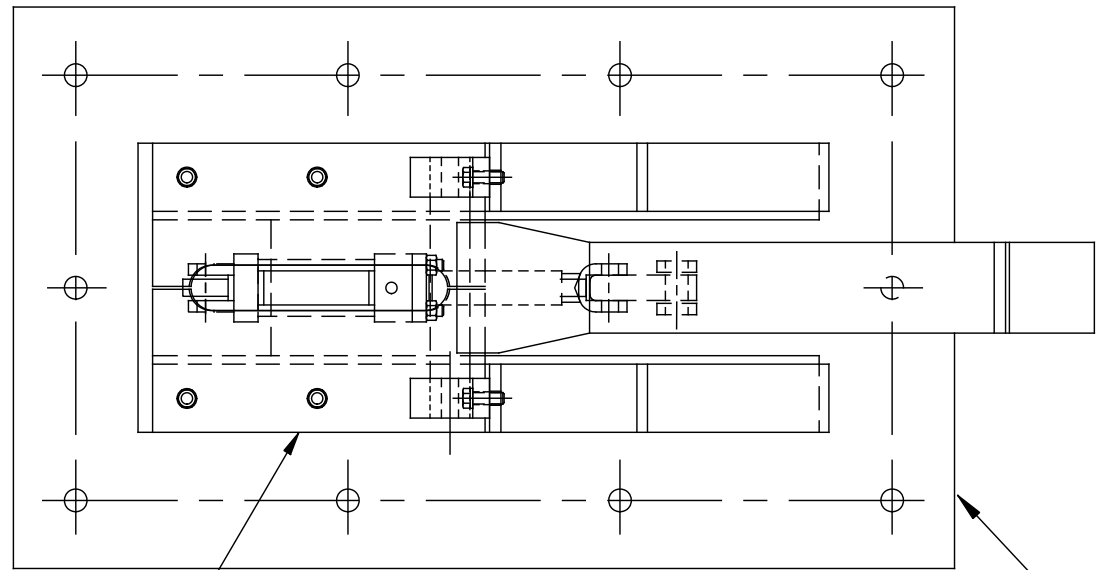
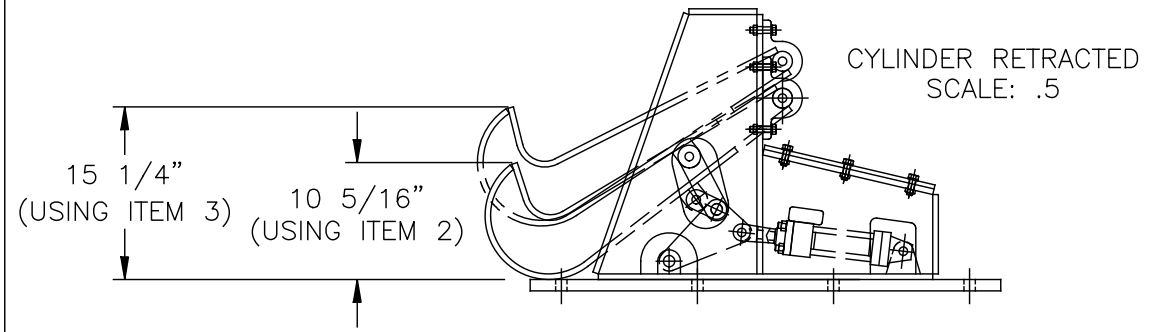
THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

GATE & TRAILER LATCH  
 HYDRAULIC DETAIL - 24V HANGING

WEIGHT	DATE	DRAWN BY	SCALE	PLOT SCALE
	2/29/12	R CURRIER	3/4"=1'-0"	1=8
REF. DWG.	ASSY. DWG.	MODEL	DRAWING NUMBER	SHEET
		COMPACTOR	80-3539-B	2of2
				REV. 3

1  
01 GATE & TRAILER LATCH DETAIL





5	PDR#12384 ITEM#14 WAS CUT @ 3"	10/26/17	RC	JB
4	DR11002 NOW SINGLE SHEET ITEM#1, 2, 3 & 4 UPDATE	04/29/16	RC	DM
3	DR01123;CHANGED CYLDER. MANF. ADDED FITTINGS	11/5/03	CM	DM
2	DR00419; SEE SHT 2	10/17/02	DG	DM
1	REMOVED ITEM 18 & 19. IIMIT SWITCH AND ARM.	09/22/99	KMR	DM
0	RELEASED	08/26/99	KMR	DM
REV.	CHANGE DESCRIPTION	DATE	DRAWN	APPR.

**SSI** SSI Shredding Systems, Inc.  
 9760 SW Freeman Drive  
 Wilsonville, OR 97070-9286 USA  
 (503) 682-3633 FAX (503) 682-1704  
 WEB SITE: <http://www.ssiworld.com>

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES FOR:

ANGLES ± 1°  
 FRACTIONS ± 1/16

2 PL DEC. ± .03  
 3 PL DEC. ± .005

THIS PRINT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF SSI SHREDDING SYSTEMS, INC. BY ACCEPTING THIS INFORMATION, THE BORROWER AGREES THAT IT WILL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS LOANED.

**TRUCK LATCH ASSEMBLY  
 W/PLATE**

REF. DWG. 80-3220-B ASSY. DWG.

WEIGHT 669#	DATE 08/26/99	DRAWN BY RICHERT	SCALE 1/8	PLOT SCALE 1=8
MODEL COMPACTOR	DRAWING NUMBER 80-2475-B	SHEET 1 of 1	REV. 5	



**SECTION 12  
VENDOR LITERATURE**

SECTION

12.0

PAGE

1

<b>ABB</b>	<b>ACS355 USERS MANUAL</b>
<b>ABB</b>	<b>CFD ACS580 OPERATING MANUAL</b>
<b>BALDOR</b>	<b>ELECTRIC MOTOR MANUAL- LUBRICATION ONLY</b>
<b>IFM</b>	<b>PN7370 OPERATING INSTRUCTIONS</b>
<b>IFM</b>	<b>PNTA3313 OPERATING INSTRUCTIONS</b>
<b>IFM</b>	<b>O1D106 OPERATING INSTRUCTIONS</b>
<b>THERMAL EDGE</b>	<b>AC UNIT LITERATURE</b>

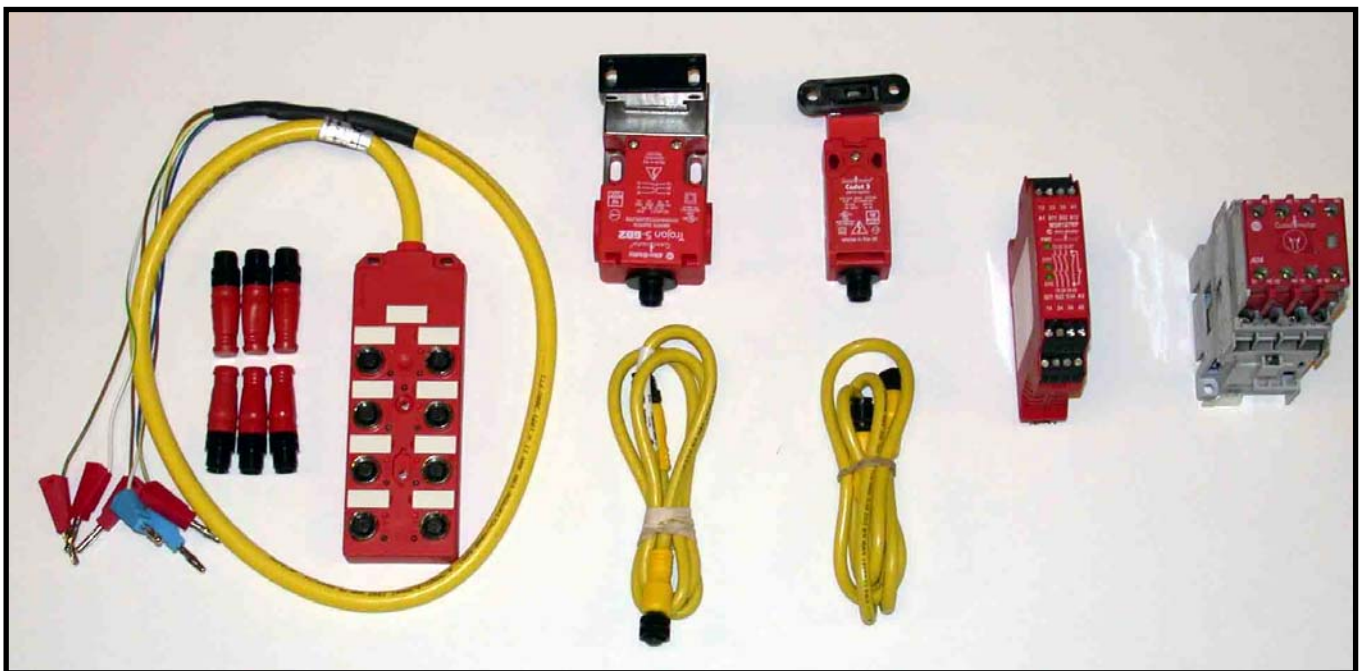
**NOTE: VENDOR LITERATURE NOT SUPPLIED IN MANUAL MAY BE OBTAINED BY CONTACTING SSI SHREDDING SYSTEMS**

# Safety Relay Troubleshooting Guide



## Troubleshooting Safety Relay Based Systems

### MSR127



# Table of Contents

- 1) Introduction..... 3
- 2) Startup Conditions ..... 5
- 3) Power Supply ..... 5
- 4) Input Circuit – 2NC ..... 7
- 5) Input Circuit – Distribution Block ..... 9
- 6) Input Circuit – Light Curtain ..... 10
- 7) Reset / Monitoring Circuit ..... 11
- 8) Output Circuits..... 13
- 9) Recovery Time..... 14

## 1) Introduction

The troubleshooting process for the MSR127 safety relay follows a straight forward process. The process starts with the power supply and follows the normal sequence of events that take place in the relay.

The troubleshooting process is as follows:

1. Power
2. Inputs
3. Reset/Monitoring
4. Outputs
5. Timing

The MSR127 safety relay goes into a lockout state when it detects a fault condition. The fault condition can be either external or internal to the MSR127, as the MSR127 monitors external devices as well as itself. This lockout state prevents the safety outputs from being energized, until the fault condition is corrected and the MSR127 is satisfied.

If an external fault is corrected, the MSR127 is reset in one of two methods:

Clearing the MSR127:

1. Cycle an input device (the preferred method)
2. Cycle the power.

In many cases, the fault will be either an open-circuit or a short-circuit condition. In these cases, a digital multimeter can be used to accomplish the troubleshooting. An oscilloscope is needed when timing issues are suspected of causing lockouts.

To begin the process, a block diagram of the MSR127 and an application schematic is needed. We also need to know which type of reset is being used. The MSR127 comes with either Monitored Manual reset or automatic/manual reset. The internal sequence of events is slightly different for each.

For monitored manual reset, the input devices must be closed prior to the closing of the reset circuit. For automatic/manual, the reset circuit can be closed either before or after the inputs are closed.

In this guide, the reader is asked to make measurements with a multimeter. An example of the terminology used is "S12/S22", where one test lead is placed on terminal S12 and the other terminal is placed on terminal S22.

EOT = End of Troubleshooting

---

### ATTENTION



Troubleshooting safety relay based systems sometimes requires the application of power. Troubleshooting must be performed by trained persons familiar with safety publications ANSI NFPA70E and ANZI Z244.1 and local applicable codes.

---

# Example Schematics

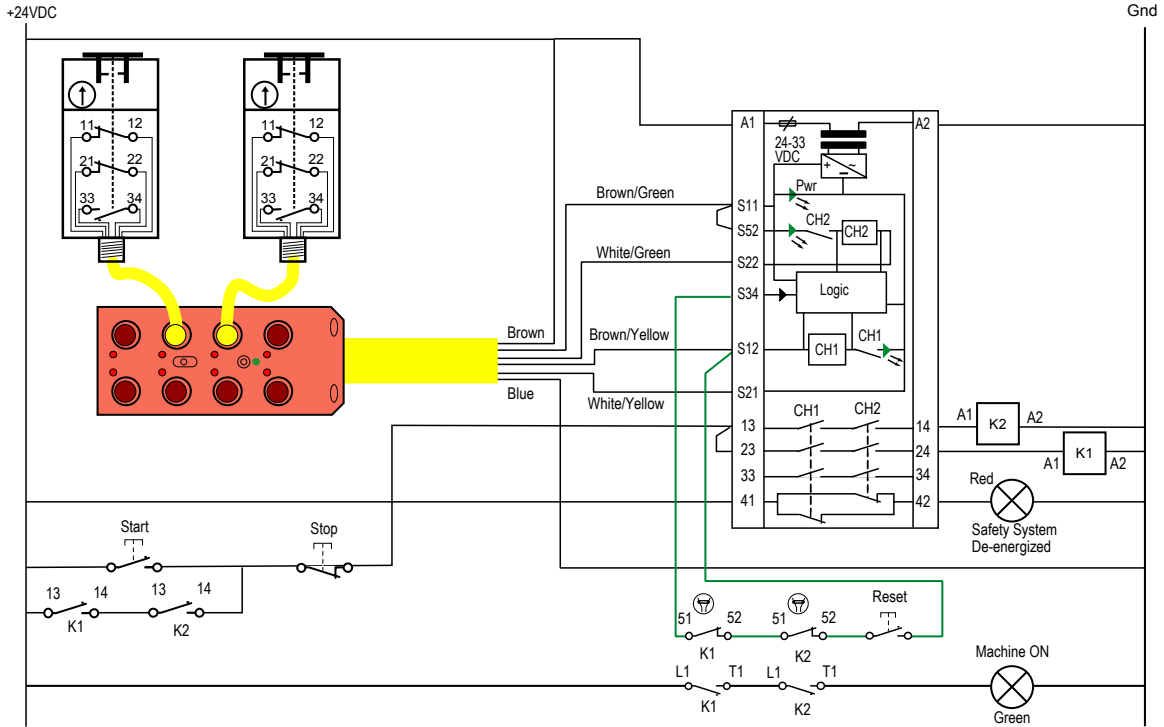


Figure 2. Example Schematic #1 – Multiple Devices using 2 Normally Closed Contacts

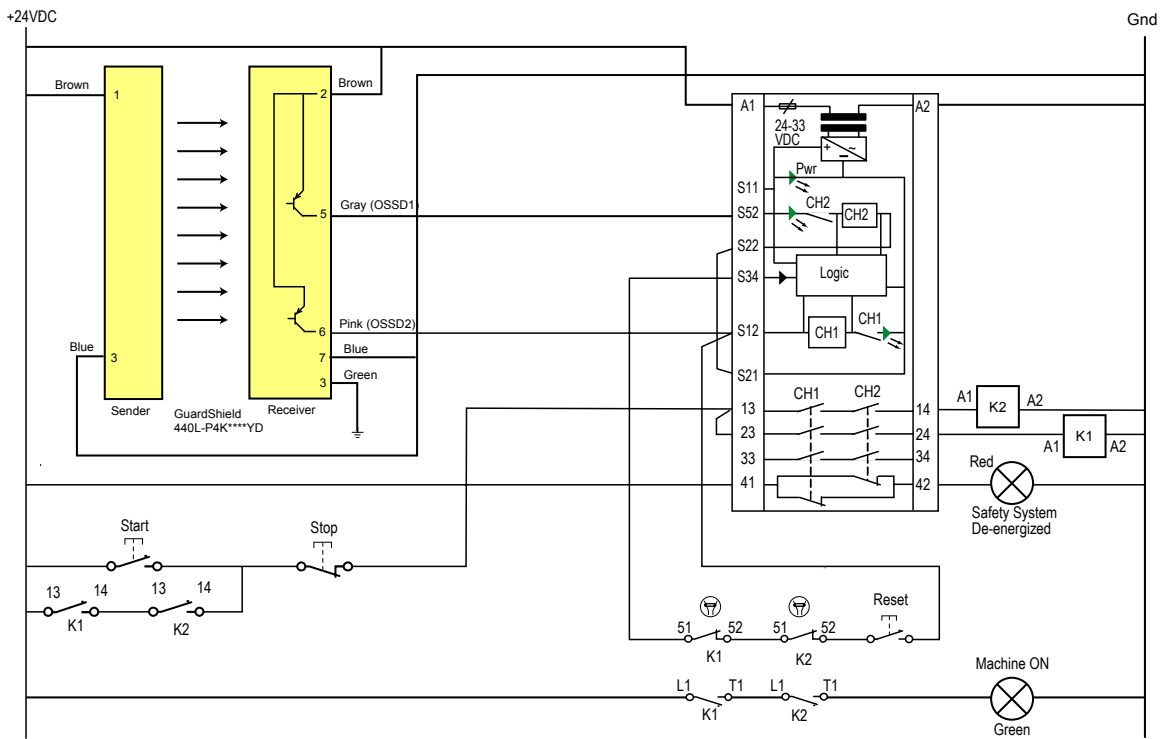


Figure 1. Example Schematic #2 – Light Curtain with 2 OSSD Outputs

## 2) Startup Conditions

Troubleshooting must start from a known condition. Turn on the power supply and close all gates.

## 3) Power Supply

The power supply is protected by a PTC (positive temperature coefficient) electronic fuse in the A1 circuit - as the current increases, the resistance increases. If a short circuit or overload occurs, the resistance goes up to prevent damage to the MSR127. When the fault is cleared, the resistance returns to normal, and the MSR127 begins to operate properly.

### Step P1

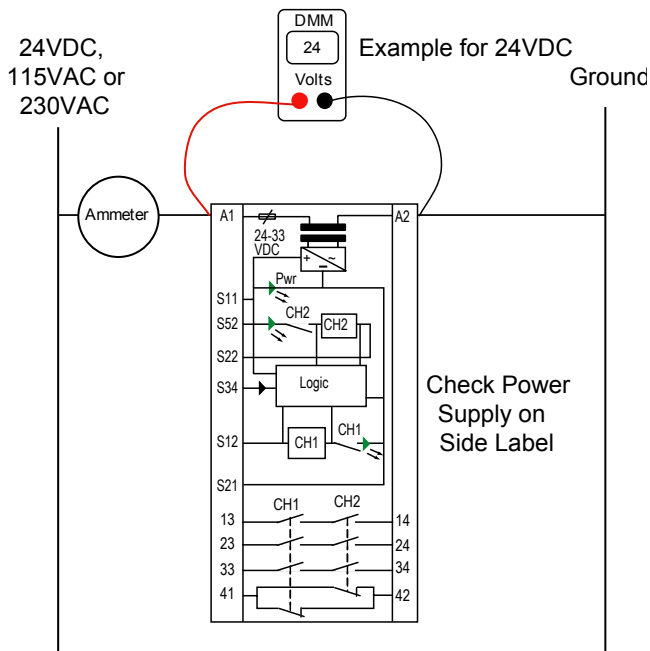
Is power LED on?

If yes, go to Step P3.

If not, go to Step P2.

### Step P2

Measure supply voltage at A1/A2 for 24VDC, 115VAC, or 230VAC.



#### Reference Information: Power Supply Current

The power supply current depends on the type of input and short circuit faults. Use an ammeter to measure the current. Values shown with safety outputs energized.

Light Curtain      1.6mADC @ 19.2VDC  
                           2.1mADC @ 24.0VDC  
                           2.3mADC @ 26.4VDC

2 NC Contacts      31mADC @ 19.2VDC  
                           39mADC @ 24.0VDC  
                           44mADC @ 26.4VDC

14mAAC @ 92VAC  
 20mAAC @ 115VAC  
 24mAAC @ 126VAC

Crossfault          1.2A @ 24VDC  
 (Decays to        60mA @ 24VDC)

If OK, go to Step P3.

If not, verify that the equipment power switch is set to ON?

Is the equipment connected to the power source?

Is the unit rated for the appropriate voltage – see label on side of unit? Go to Step P1.

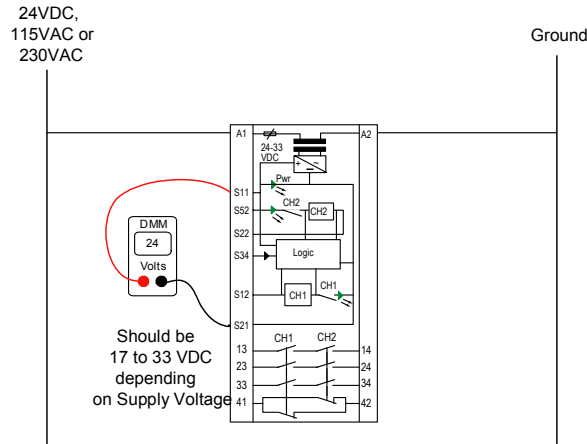
As a reference, the current used by the MSR127, with its safety outputs energized, is shown in the side table. This tables shows the typical current when the MSR127 is functional and its safety outputs are energized.

### Step P3

Measure the internal supply voltage of the MSR127 - S11/S21 should be 17 to 33 VDC . The internal voltage is not tightly regulated and depends on the external power supply.

If OK, go to Input Circuits.

If not, remove the wire(s) from terminal S11. [Go to Step P4.](#)



### Step P4

Did the Power LED on?

If yes, pop out the top terminal block. Use your ohm meter and check for shorts between the following terminals.



When connected properly, the values should be as follows:

<u>Terminals</u>	<u>Should Measure</u>
S11/S21	O.L (open circuit)
S52/S21	O.L (open circuit)
S12/S21	O.L (open circuit)

If a short is found, trace the input wiring and remove the short. Re-insert the top connector. [Go to Input Circuits.](#)



## 4) Input Circuit – 2NC

### Step I1

Press the reset button. Do CH1 and CH2 LEDs turn on?

If yes, go to Step O1.

If not, and only CH1 LED turns on, then there is an open circuit on Ch2. Go to Step I2.

If not, and only CH2 LED turns on, then there is an open circuit on Ch1. Go to Step I2.

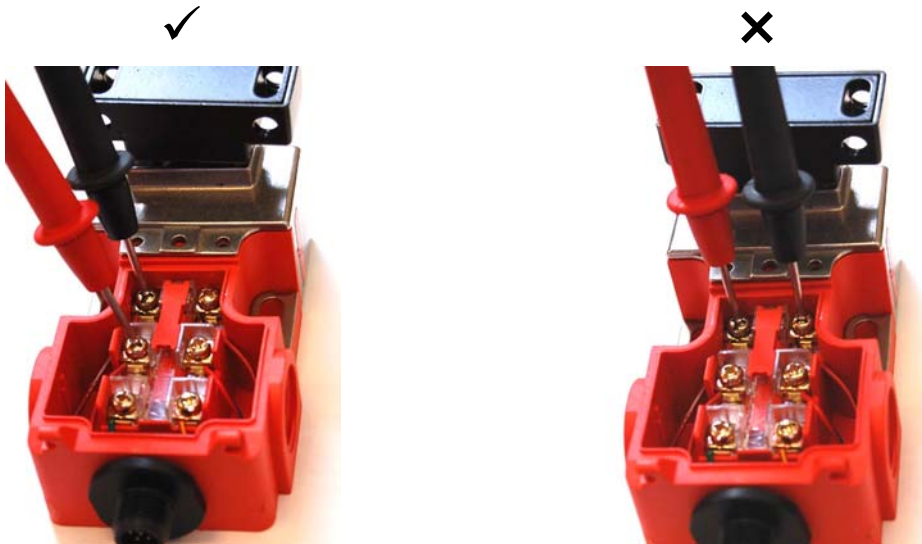
If not, and neither Ch1 nor Ch2 LEDs turn on, then there may be one of two causes: 1) both Ch1 and Ch2 circuits may be open; go to Step I2, or 2) the reset circuit may be open; go to Step R1.

### Step I2

At the MSR127, measure the cross channel voltages:

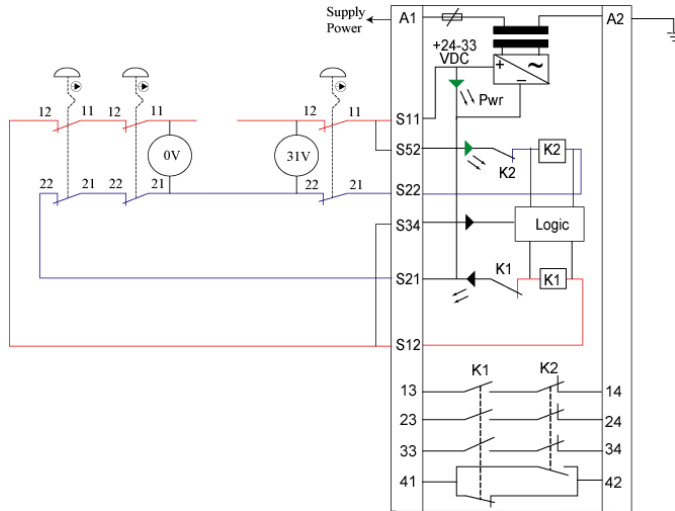
<u>Relay Terminals</u>	<u>Voltage</u>	<u>Look for:</u>
S52/S22	24V	Both Channels are OK
S21/S12	24V	
S52/S22	0V	Both Channels are open. Check to make sure all gates are closed and e-stops released.
S21/S12	0V	
S52/S22	24V	Channel 1 is open.
S21/S12	0V	
S52/S22	0V	Channel 2 is open.
S21/S12	24V	

When troubleshooting 2NC circuits, the easiest approach is to measure the cross channel voltage at each of the devices. Open the cover of an interlock to expose the wiring terminals. The two contacts closest to the actuator are the safety contacts. Using a voltmeter, measure the voltage from Channel 1 to Channel 2.

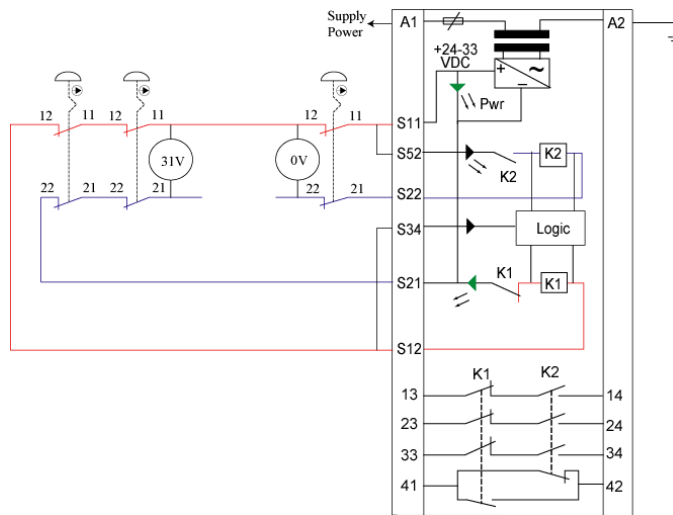


Check the input devices for open circuits.

The following two diagrams show typical examples of wiring 2NC series circuits. With all the input devices closed and the MSR127 powered, measure the cross channel voltages at each of the input devices until a voltage difference is found. The open circuit lies between the voltages. The actual voltage measured is a nominal 24VDC but can range from 17 to 33V.



Open Circuit on Ch1



Open Circuit on Ch2

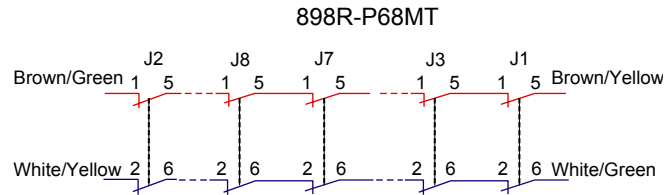
Reference Information: Input Currents

The currents going into S12 (Ch1) and S22 (Ch2) depend on the supply voltage. Use a DC ammeter to measure these currents.

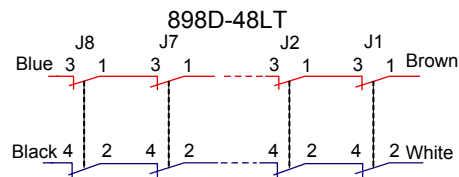
$V_{Supply}$	Ch1	Ch2
19.2VDC	14.6mA	16.0mA
24.0VDC	18.9mA	20.4mA
26.4VDC	20.8mA	22.6mA

## 5) Input Circuit – Distribution Block

When troubleshooting devices connected to the distribution blocks, the order in which the devices are connected becomes important. The picture and wiring diagrams show that the connection flow. Note that the 6-pin 8-port flows through the even side and then through the odd side. The 4-pin 8-port flows in numerical order. This can be used to help identify the location of an open circuit, as described in the 2NC section above.



6-Pin QD



4-Pin QD

## 6) Input Circuit – Light Curtain

This section uses Example Schematic #2, which has a light curtain with two solid-state output signal switching devices (OSSD). The devices are PNP type transistors, which crossfault monitoring.

### Step LC1

With the light curtain made (nothing between the sender and receiver), does the voltage at terminals S12 and S52 measure 24VDC. [With the light curtain broken (object between the sender and receiver), the voltage at terminals S12 and S52 should measure 0VDC.]

If yes, [Go to Step LC2](#).

If not, check to make sure the ground reference of the light curtain is the same as the MSR127. For DC powered MSR127's, this can be A2 or S21. For AC power MSR127's, the reference must be to S21.

If either S12 or S52 measures zero volts, check the wiring going back to the light curtain.

### Step LC2

Press the reset button. Do CH1 and CH2 LEDs turn on?

If yes, [go to Step O1](#).

If not, [go to Step R1](#).

Note: Light curtains perform their own diagnostics. For example, a crossfault from Ch1 to Ch2 will be detected by the light curtain, not by the MSR127. Faults detected by the light curtain are usually indicated by red blinking LEDs on the light curtain. This troubleshooting guide is not intended to cover light curtain troubleshooting.

## 7) Reset / Monitoring Circuit

The reset and monitoring form one circuit. For applications using automatic reset with a jumper from S12 to S34, the reset circuit should be opened momentarily, where stated below.

### Step R1

With the gates closed and measure the reset voltages.

<u>Terminals</u>	<u>Reset Released</u>	<u>Reset Pressed</u>
S12/S21	24VDC	24VDC
S34/S21	0V	24VDC

For applications using automatic reset with a jumper from S12 to S34, the reset circuit should be opened momentarily to confirm 0V between S34 and S21. [Go to Step R2.](#)

### Step R2

Measure the circuit resistance of each component in the reset circuit. Pop out the top and bottom wiring terminals, and measure the resistance of the reset wiring.

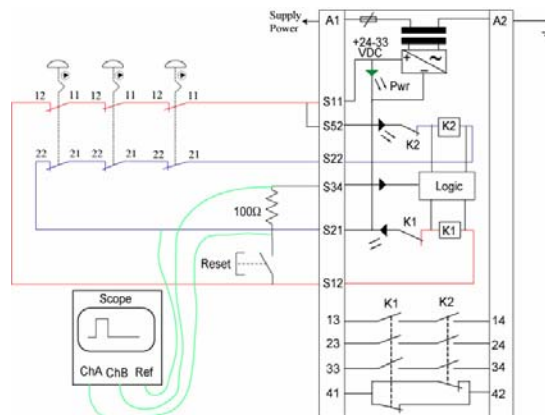
<u>Terminals</u>	<u>Reset Released</u>	<u>Reset Pressed</u>
S12/S34	O.L	few ohms (must be less than 110 ohms)

If circuit is O.L when the button is pressed, then follow the circuitry, point by point until the open circuit is found. In Example Schematic #1, the following points should be tested.

<u>Terminals</u>	<u>Checks the</u>
S12/Reset	wiring
Reset/Reset	contact (button pressed)
Reset/K2-52	wiring
K2-52/K2-51	contact
K2-51/K1-52	wiring
K1-52/K1-51	contact
K1-51/S34	wiring

### Step R3

An oscilloscope is needed to measure the reset signal because the reset signal of the MSR127 appears only momentarily. A resistor is needed in the reset circuit to view the current. In this case, a 100 ohm resistor is used

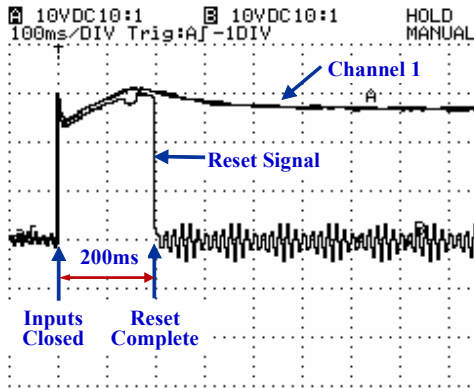


### Automatic Reset

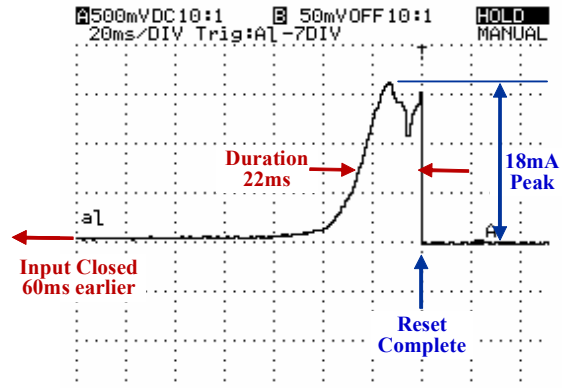
The left picture shows the voltage on channel A of an oscilloscope, measured at terminal S12, and the reset signal (Channel B), measured on terminal S34, both with reference to S21. Notice that the reset signal starts when the last input device is closed and its duration is only 200ms. When the reset is complete, the safety outputs are closed, the auxiliary outputs are open, and the CH1 and CH2 indicator LEDs are on.

To be more precise, the reset actually takes place at the tail end of the reset voltage signal. This can be shown by placing a resistor in reset signal and measuring at the voltage across that resistor. For automatic reset MSR127, the duration of the reset current is 22ms and it has a peak amplitude of 18mA.

Automatic Reset – Voltage Waveform



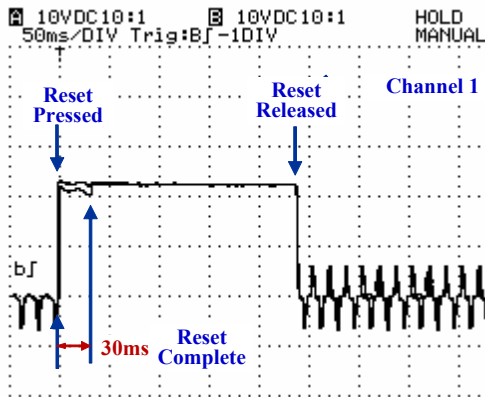
Automatic Reset – Current Waveform



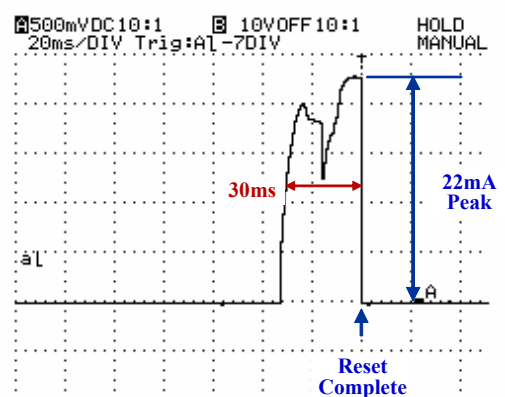
### Monitored Manual Reset

The reset voltage is present for as long as the reset button is held depressed, as shown in the left figure below. The actual reset of the MSR127R takes place in the first 30 milliseconds.

Manual Reset – Voltage Waveform

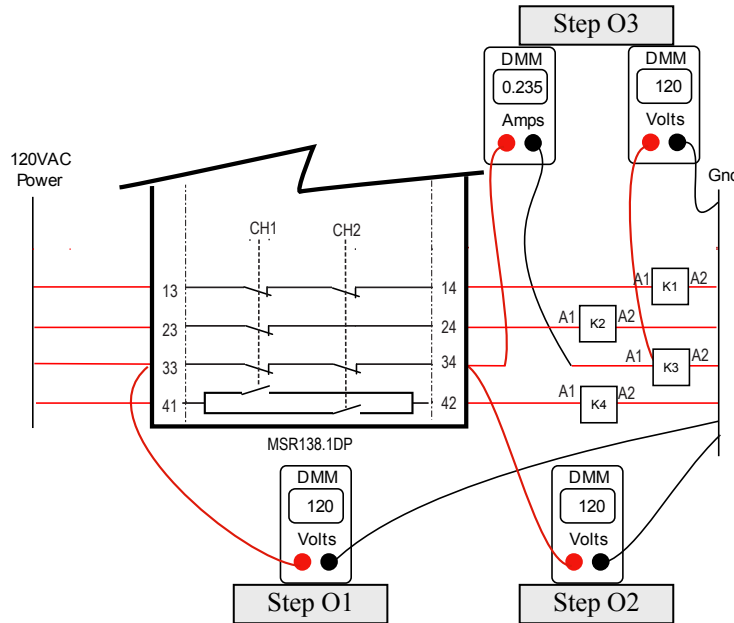


Manual Reset – Current Waveform



## 8) Output Circuits

The output circuits are redundant voltage-free, electromechanical contacts. Initial contact resistance should be less than 1 ohm. Over the life of the contacts, resistance may go up, but should remain less than a couple ohms. Follow the steps below using the figure below as a guide.



### Step O1

Check the supply side of the output contacts. Does the voltage at terminals 13, 23, 33 and 41 with respect to the appropriate power supply reference (this may not be the same as A2 or S21), meet expectations?

If yes, [go to Step O2](#).

If not, check the upstream fuses and wiring.

### Step O2

With the CH1 and CH2 LEDs on, do the voltages on the load side of the safety relay meet expectations?

If yes, [go to Step O3](#).

If not, then the output contact in the MSR127 may be worn or contaminated. To confirm this, remove the power wires from the terminals (both the supply and load side) and use an ohm meter to measure the contact resistance. [This is not shown in the figure above.] Cycle the inputs and measure the resistance a few times, as the circuit may be intermittent.

### Step O3

The output voltage is ok. Does the load energize?

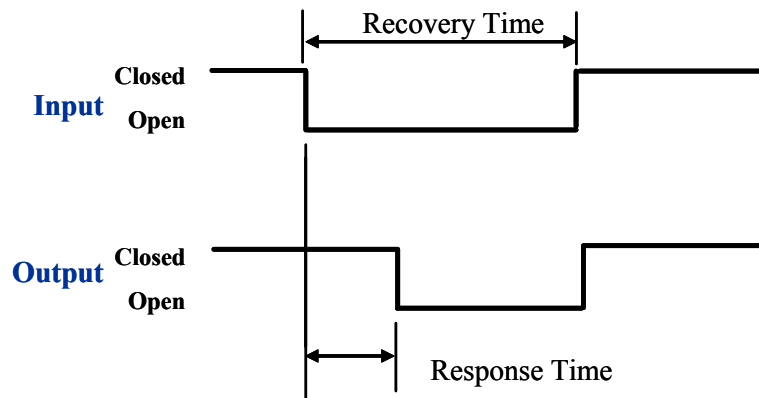
If yes, then MSR127 works OK. EOT.

If not, the trouble resides with the wiring to the load or the load itself. The load may be disconnected or not functioning properly. Measure the voltage at the load. Measure the current going to the load. Replace the load, if necessary.

## 9) Recovery Time

Recovery time is characteristic of safety relays that can be violated and cause the relay to lockout. Recovery time is the minimum duration in which the input circuits must be opened. This duration allows the safety relay to recover from a safety demand. The recovery time of the MSR127 is 100ms.

A demand is placed on the safety relay when the input is opened. For example, opening a safety gate, pressing an e-stop, or breaking a light curtain places a demand on the safety relay. The safety relay responds by opening its safety output – this is known as the response time. Now the safety relay must get ready for the closing of the input circuit, that is, get ready for the next demand. This is known as the recovery time.

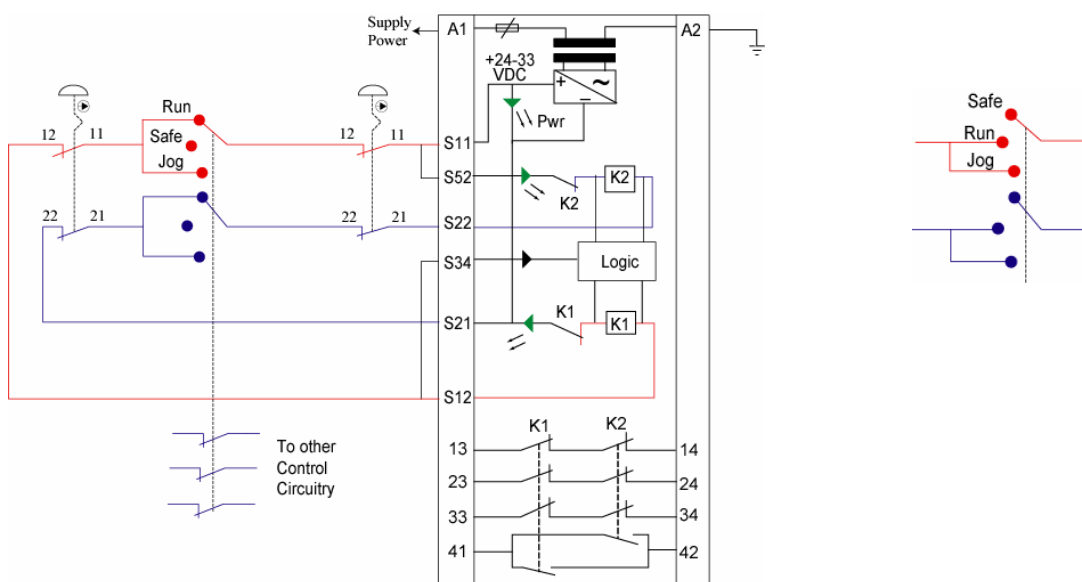


In the following schematic, a three position switch is used to place the machine in either the Run, Safe or Jog state. The user will likely want to switch from Run to Jog Mode, without having to create a safety stop. When this happens, the rotation of the switch must pass through the safe position each time. Switching from Run to Jog can easily be accomplished within the recovery time of the safety relay. When this happens the safety relay goes into lockout. In this example, an e-stop would have to be pushed and then released to reset the safety relay and allow the user to jog the machine.

To fix this, the switch must be rewired to move the Safe stop to an outside position. In addition, a keyed switch should be used to allow the operator to lock the machine in a safe state.

Recovery Time Lockout using Rotary Switch

Fix



Recovery time lockouts can also occur when using light curtains, as objects can pass through the light curtain in less than 100ms.



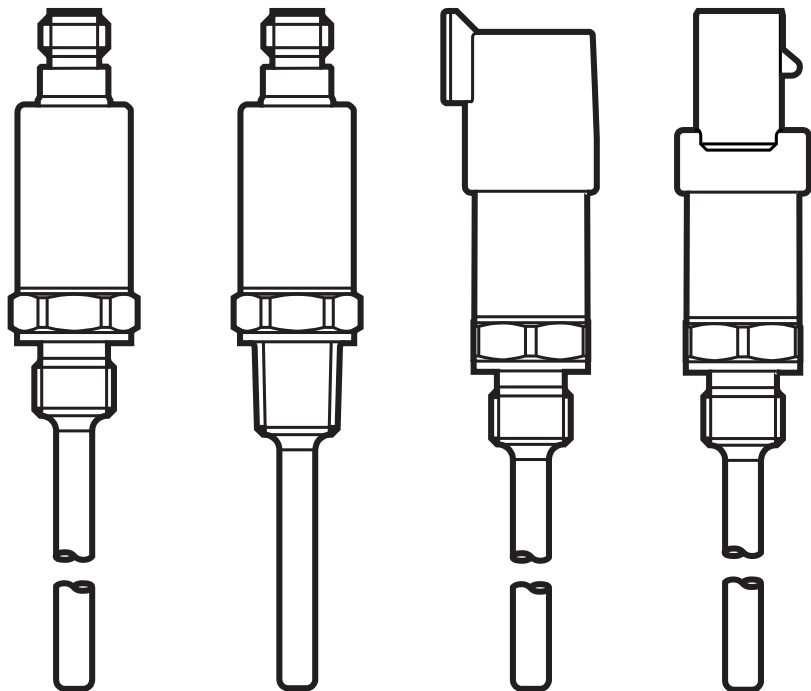


## Installation Instructions Temperature transmitters

**TA3xxx**  
**TA4xxx**  
**TA5xxx**  
**TU3xxx**  
**TU4xxx**  
**TU5xxx**

**UK**

80270009 / 00 10 / 2017



# 1 Safety instructions

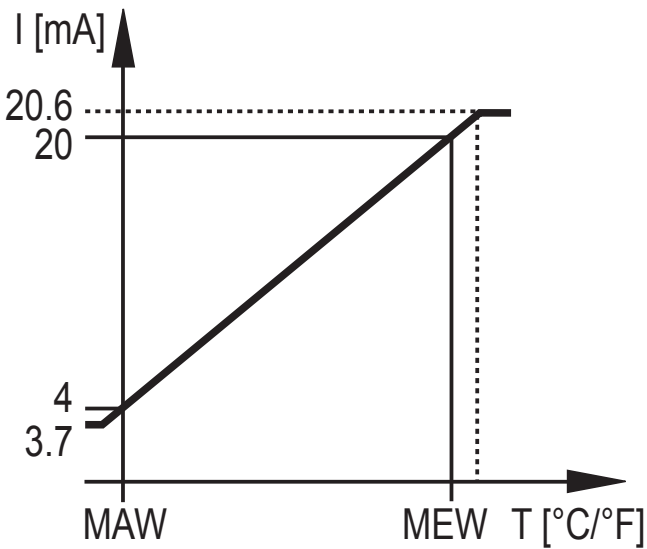
- Please read this document prior to set-up of the unit. Ensure that the product is suitable for your application without any restrictions.
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property can occur.
- Improper or non-intended use may lead to malfunctions of the unit or to unwanted effects in your application. That is why installation, electrical connection, set-up, operation and maintenance of the unit must only be carried out by qualified personnel authorised by the machine operator.
- In order to guarantee the correct condition of the device for the operating time the device must only be used in media to which the wetted parts are sufficiently resistant (→ Technical data).
- The responsibility whether the measurement devices are suitable for the respective application lies with the operator. The manufacturer assumes no liability for consequences of misuse by the operator. Improper installation and use of the devices result in a loss of the warranty claims.

## 2 Functions and features

The unit detects the medium temperature and converts it into an analogue output signal.

### 3 Function

Fig. 1: Current output



TAxxxx:

In the measuring range the output signal is between 4 and 20 mA.

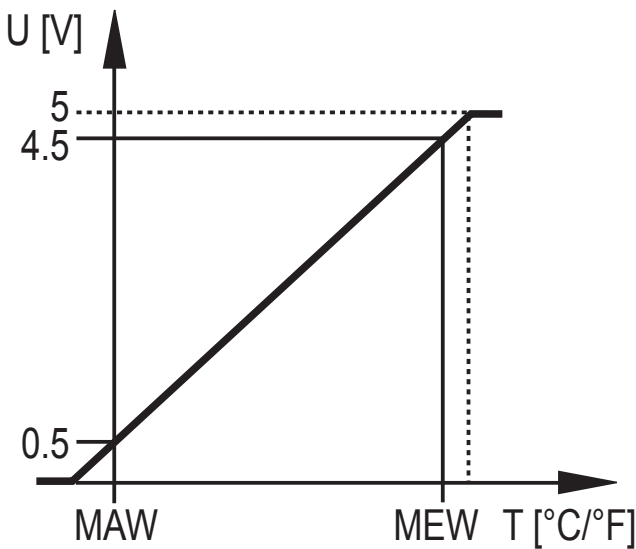
If the temperature is above or below the measuring range, the analogue output behaves as follows:

Temperature above the measuring range: 20...20.6 mA.

Temperature below the measuring range: 4...3.7 mA.

UK

Fig. 2: Voltage output



TUxxxx:

In the measuring range the output signal is between 0.5 and 4.5 V.

If the temperature is above or below the measuring range, the analogue output behaves as follows:

Temperature above the measuring range: 4.5...5V.

Temperature below the measuring range: 0.5..0 V.

T = Temperature

MAW = initial value of the measuring range

MEW = final value of the measuring range

## 4 Installation



Before installing and removing the unit: make sure that no pressure is applied to the system.

► Insert the unit in the process connection and tighten firmly.

- Tightening torque for units with G $\frac{1}{4}$ : 35 Nm.
- Tightening torque for units with  $\frac{1}{4}$ " NPT: tighten by hand plus 1.5 turns.
- Tightening torque for units with M10x1: 20...25 Nm.

## 5 Electrical connection




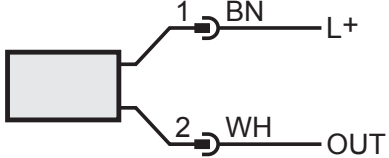
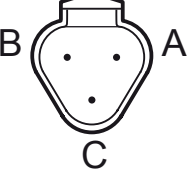
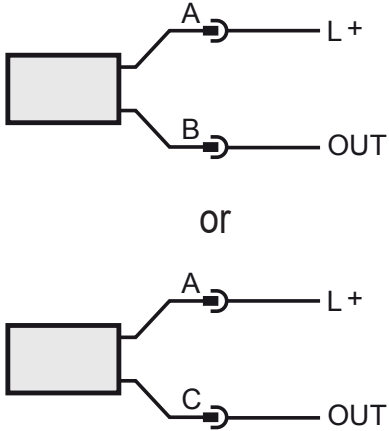
The unit must be connected by a qualified electrician.

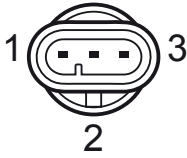
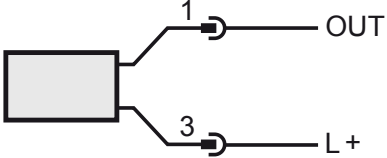

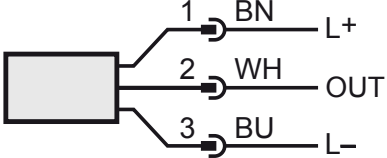
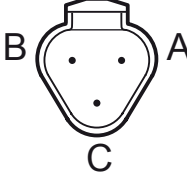
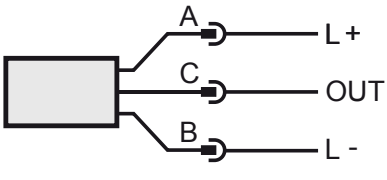
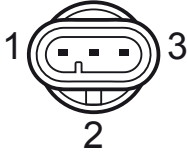
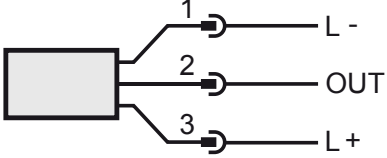
The national and international regulations for the installation of electrical equipment must be adhered to.

Voltage supply to EN 50178, SELV, PELV.

► Disconnect power.

► Connect the unit as follows:

TA3xxx	 <p>M12</p>	 <p>OUT: analogue output 4...20 mA</p>
TA4xxx	 <p>DEUTSCH DT04-3P</p>	 <p>→ Datasheet at <a href="http://www.ifm.com">www.ifm.com</a></p> <p>OUT: analogue output 4...20 mA</p>

TA5xxx	 <p>AMP Superseal</p>	 <p>OUT: analogue output 4...20 mA</p>
TU3xxx	 <p>M12</p>	 <p>OUT: analogue output 0.5...4.5 V</p>
TU4xxx	 <p>DEUTSCH DT04-3P</p>	 <p>OUT: analogue output 0.5...4.5 V</p>
TU5xxx	 <p>AMP Superseal</p>	 <p>OUT: analogue output 0.5...4.5 V</p>

Colours to DIN EN 60947-5-2

BK: black, BN: brown, BU: blue, WH: white

## 6 Operation

After power on, the unit is in the Run mode (= normal operating mode).

## 7 Technical data

Technical data and scale drawing at [www.ifm.com](http://www.ifm.com).

UK

ifm electronic



Operating instructions  
Electronic pressure sensor

**efector500<sup>®</sup>**

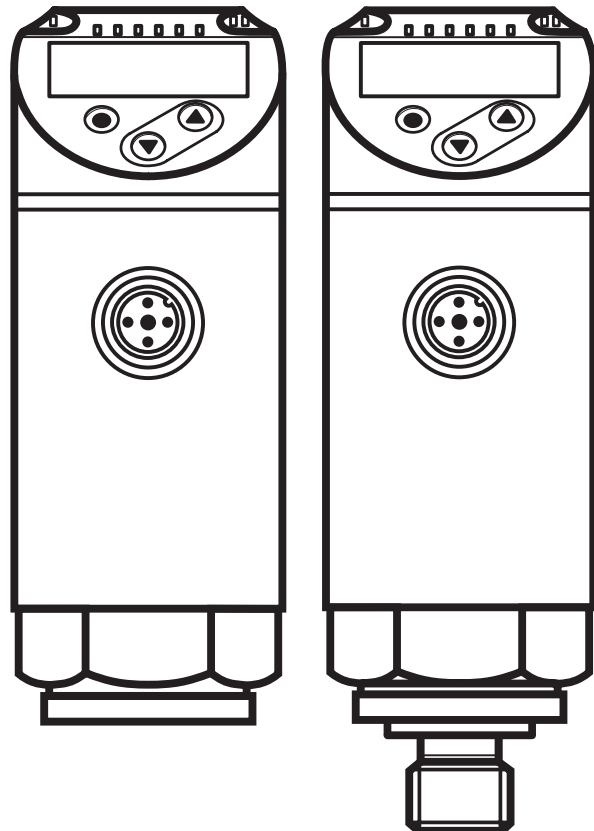
**PN72xx**

**PN73xx**

**PN76xx**

**UK**

80012464 / 00 06 / 2014



# Contents

1	Preliminary note.....	4
1.1	Symbols used .....	4
2	Safety instructions .....	4
3	Functions and features .....	5
3.1	Applications .....	5
4	Function.....	7
4.1	Communication, parameter setting, evaluation .....	7
4.2	Switching function.....	7
4.3	IO-Link .....	8
5	Installation.....	9
6	Electrical connection.....	9
7	Operating and display elements .....	10
8	Menu.....	11
8.1	Menu structure: Main menu .....	11
8.2	Explanation of the menu .....	12
8.2.1	Explanation of the menu level 1 .....	12
8.2.2	Explanation of the menu level 2 .....	12
9	Parameter setting .....	13
9.1	Parameter setting in general .....	13
9.2	Configure display (optional).....	16
9.3	Set output signals .....	16
9.3.1	Set output functions.....	16
9.3.2	Define switching limits for the hysteresis function .....	16
9.3.3	Define switching limits for the window function .....	17
9.4	User settings (optional).....	17
9.4.1	Set delay for the switching outputs.....	17
9.4.2	Set output logic for the switching outputs .....	17
9.4.3	Set damping for the switching signal .....	17
9.4.4	Read min/max values for the system pressure .....	17
9.4.5	Reset all parameters to factory setting .....	18
9.4.6	Set colour change of the display .....	18
9.4.7	Graphical depiction of the colour change of the display .....	19

- 10 Operation .....21
  - 10.1 Read set parameters .....21
  - 10.2 Self-diagnosis / error indications .....22
- 11 Technical data and scale drawing .....23
  - 11.1 Setting ranges.....23
  - 11.2 Further technical data .....24
- 12 Factory setting .....25



# 1 Preliminary note

## 1.1 Symbols used

► Instructions

> Reaction, result

[...] Designation of keys, buttons or indications

→ Cross-reference



Important note

Non-compliance can result in malfunction or interference.



Information

Supplementary note.

## 2 Safety instructions

- Please read this document prior to set-up of the unit. Ensure that the product is suitable for your application without any restrictions.
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property can occur.
- Check the compatibility of the product materials with the media to be measured in all applications.
- Correct condition of the device for the operating time can only be guaranteed if the device is only used for media to which the wetted materials are sufficiently resistant → 3.1 Applications.
- If the devices are used in gas applications with pressures > 362 psi (25 bar) the notes in chapter 3.1 for devices with the marking \*\*) must be absolutely observed.



The responsibility whether the measurement device is suitable for the respective application lies with the operator. The manufacturer assumes no liability for consequences of misuse by the operator. Improper installation and use of the devices results in a loss of the warranty claims.

### 3 Functions and features

The device monitors the system pressure of machines and installations.

#### 3.1 Applications

Type of pressure: relative pressure

Order no.	Measuring range		Permissible overpressure *)		Bursting pressure	
	psi	bar	psi	bar	psi	bar
Pressure sensors with internal thread 1/4 - 18 NPT						
PN7270	0...5800	0...400	11580	800	24650	1700
PN7271	0...3620	0...250	7250	500	15950	1100
PN7292**	0...1450	0...100	4350	300	9400	650
PN7293**	0...362	0...25	2175	150	5075	350
PN7294**	-14.5...145	-1...10	1087	75	2175	150
PN7296	0...36.2	0...2.5	290	20	725	50
PN7297	0...14.5	0...1	145	10	450	30
PN7299	-14.5...14.5	-1...1	290	20	725	50
Pressure sensors with external thread 1/4 - 18 NPT						
PN7670	0...5800	0...400	11580	800	24650	1700
PN7671	0...3620	0...250	7250	500	15950	1100
PN7692**	0...1450	0...100	4350	300	9400	650
PN7693**	0...362	0...25	2175	150	5075	350
PN7694**	-14.5...145	-1...10	1087	75	2175	150
PN7696	0...36.2	0...2.5	290	20	725	50
PN7697	0...14.5	0...1	145	10	450	30
PN7699	-14.5...14.5	-1...1	290	20	725	50
Pressure sensors with internal thread 7/16" - 20 UNF						
PN7370	0...5800	0...400	11580	800	24650	1700
PN7392	0...1450	0...100	4350	300	9400	650
*) With static overload pressure or max. 100 million pressure cycles. **) For gas applications > 362 psi (25 bar) it is necessary to use devices with a measuring range $\geq$ 3620 psi (250 bar)!						
MPa = (measured value in bar) $\div$ 10 kPa = (measured value in bar) x 100						

UK



Avoid static and dynamic overpressure exceeding the specified overload pressure by taking appropriate measures.

The indicated bursting pressure must not be exceeded.

Even if the bursting pressure is exceeded only for a short time, the unit may be destroyed. ATTENTION: Risk of injury!



Pressure Equipment Directive (PED):

The units comply with section 3, article (3) of the Directive 97/23/EC and are designed and manufactured for "non-superheated liquids" of group 2 fluids in accordance with the sound engineering practice.

Restriction for stable gases according to PED → 2 Safety instructions.

## 4 Function

- The unit displays the current system pressure.
- It generates output signals according to the operating mode and the parameter setting.
- It moreover provides the process data via IO-Link.
- The unit is laid out for fully bidirectional communication. So, the following options are possible:
  - Remote display: reading and display of the current system pressure.
  - Remote parameter setting: reading and changing the current parameter setting.
  - IO-Link parameter setting → 4.3

UK

### 4.1 Communication, parameter setting, evaluation

<b>OUT1 (pin 4)</b>	<ul style="list-style-type: none"><li>• Switching signal for system pressure limit value.</li><li>• Communication via IO-Link.</li></ul>
<b>OUT2 (pin 2)</b>	<ul style="list-style-type: none"><li>• Switching signal for system pressure limit value.</li></ul>

### 4.2 Switching function

OUT<sub>x</sub> changes its switching state if it is above or below the set switching limits (SP<sub>x</sub>, rP<sub>x</sub>). The following switching functions can be selected:

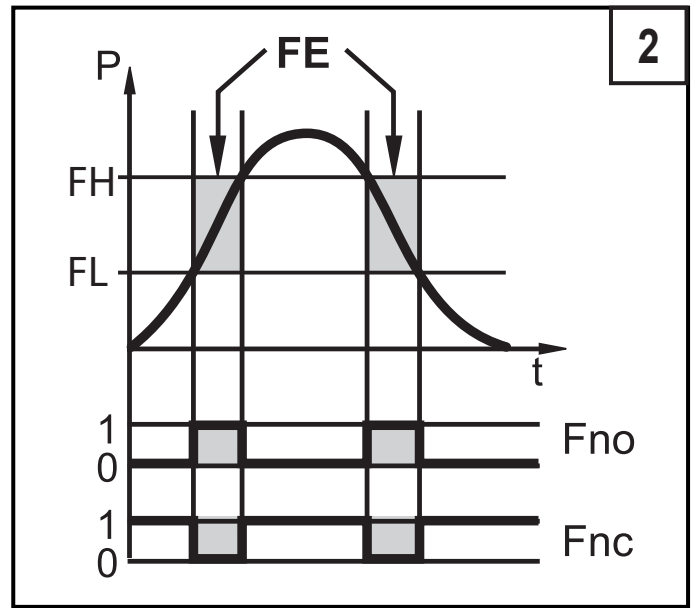
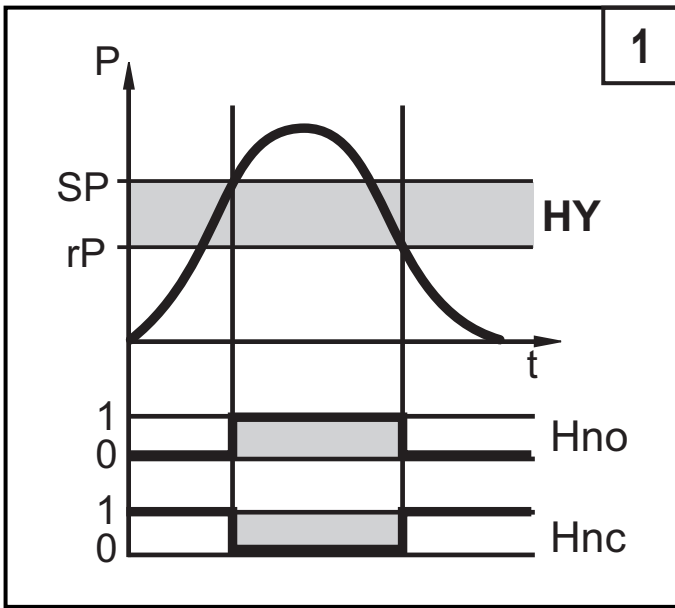
- Hysteresis function / normally open: [OU<sub>x</sub>] = [Hno] (→ fig. 1).
- Hysteresis function / normally closed: [OU<sub>x</sub>] = [Hnc] (→ fig. 1).

First the set point (SP<sub>x</sub>) is set, then the reset point (rP<sub>x</sub>).

The hysteresis defined remains even if SP<sub>x</sub> is changed again.

- Window function / normally open: [OU<sub>x</sub>] = [Fno] (→ fig. 2).
- Window function / normally closed: [OU<sub>x</sub>] = [Fnc] (→ fig. 2).

The width of the window can be set by means of the difference between FH<sub>x</sub> and FL<sub>x</sub>. FH<sub>x</sub> = upper value, FL<sub>x</sub> = lower value.



P = system pressure; HY = hysteresis; FE = window

## 4.3 IO-Link

### General information

This unit has an IO-Link communication interface which requires an IO-Link-capable module (IO-Link master) for operation.

The IO-Link interface enables direct access to the process and diagnostic data and provides the possibility to set the parameters of the unit during operation.

In addition communication is possible via a point-to-point connection with a USB adapter cable.

Further information about IO-Link at [www.ifm.com](http://www.ifm.com) → more product information → Specials → IO-Link.

### Device-specific information

You can find the IODDs necessary for the configuration of the IO-Link unit and detailed information about process data structure,

diagnostic information and parameter addresses at [www.ifm.com](http://www.ifm.com) → more product information → Specials → IO-Link.

### Parameter setting tools

You will find all necessary information about the required IO-Link hardware and software at [www.ifm.com](http://www.ifm.com) → more product information → Specials → IO-Link.

## 5 Installation



Before installing and removing the unit: Make sure that no pressure is applied to the system.

- ▶ Insert the unit in a process connection with a suitable thread.
- ▶ Tighten firmly.

Tightening Torque 1/4-18 NPT threads: 2...3 turns after finger tightened.



To ensure leak-free joints for NPT threads, sealants and lubricants commonly used in the industry should be used.

Tightening Torque 7/16"-20 UNF threads: 25...35 Nm.

UK

## 6 Electrical connection



The unit must be connected by a qualified electrician.

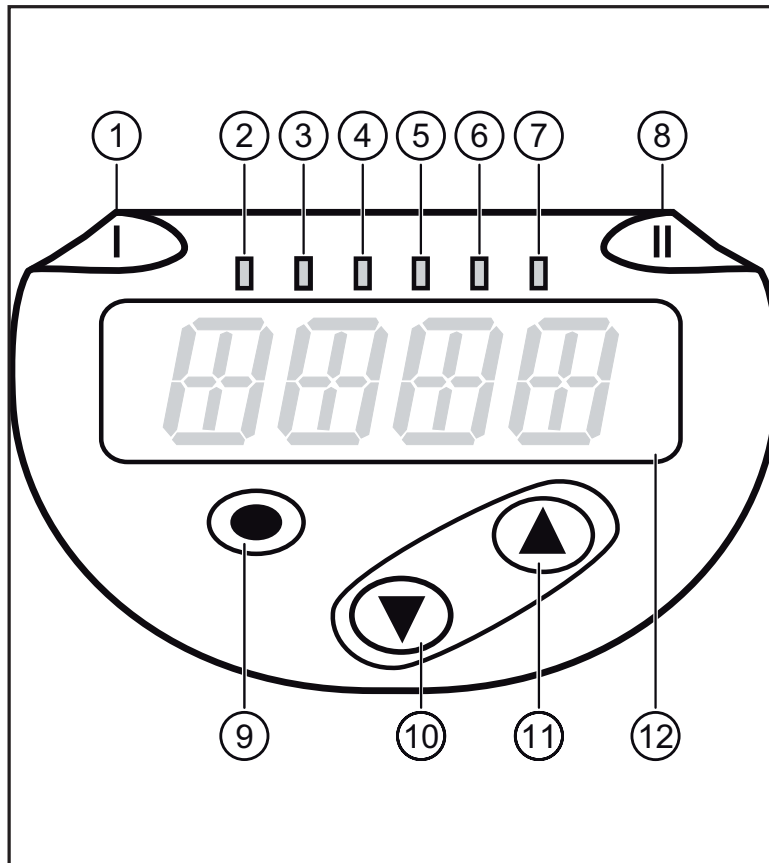
The national and international regulations for the installation of electrical equipment must be adhered to.

Voltage supply according to EN 50178, SELV, PELV.

- ▶ Disconnect power.
- ▶ Connect the unit as follows:

Core colours			
BK	black		
BN	brown		
BU	blue		
WH	white		
			1 BN — L+ 2 WH — OUT2 4 BK — OUT1 3 BU — L-
			OUT1: Binary switching output or IO-Link OUT2: Binary switching output Colours to DIN EN 60947-5-6
Example circuits			
2 x positive switching		2 x negative switching	

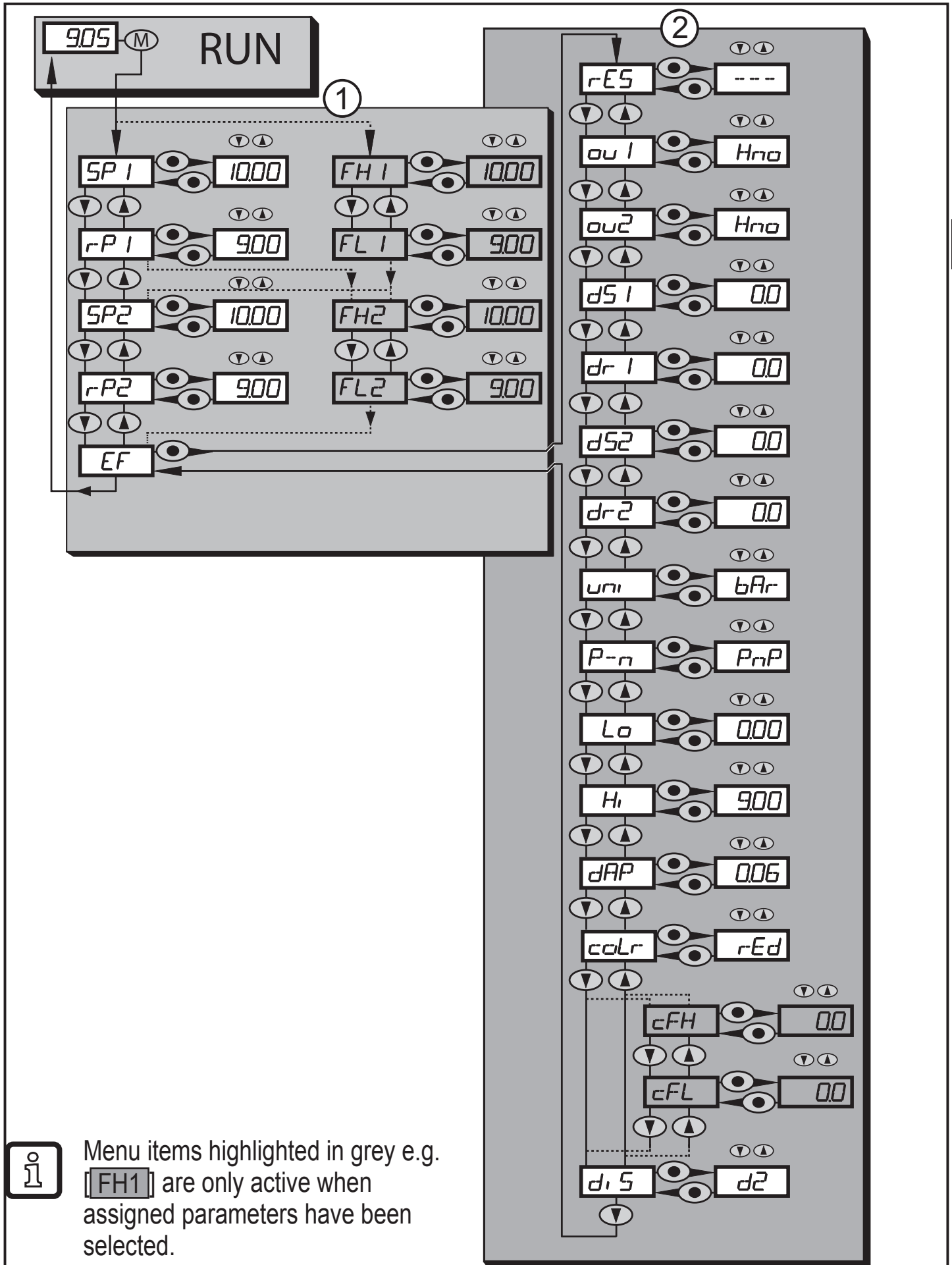
## 7 Operating and display elements



1 to 8: Indicator LEDs	
LED 1	Switching status OUT1 (lights when output 1 is switched).
LED 8	Switching status OUT2 (lights when output 2 is switched).
LEDs 2 - 7	System pressure in the indicated unit of measurement.
9: [Enter] button [●]	
- Selection of the parameters and acknowledgement of the parameter values.	
10 to 11: Arrow keys up [▲] and down [▼]	
- Setting of the parameter values (scrolling by holding pressed; incremental by pressing once).	
12: Alphanumeric display, 4 digits	
- Display of the current system pressure.	
- Indication of the parameters and parameter values.	

# 8 Menu

## 8.1 Menu structure: Main menu





## 8.2 Explanation of the menu

### 8.2.1 Explanation of the menu level 1

SPx/rPx	Upper / lower limit value for system pressure at which OUT1 switches with hysteresis setting. SPx/rPx is displayed if the parameter [Hno] or [Hnc] for OUTx was set in the extended functions "EF" menu.
FHx/FLx	Upper / lower limit value for system pressure at which OUT1 switches with window setting. FHx/FLx is displayed if the parameter [Fno] or [Fnc] for OUTx was set in the extended functions "EF" menu.
EF	Extended functions / opening of menu level 2.

### 8.2.2 Explanation of the menu level 2

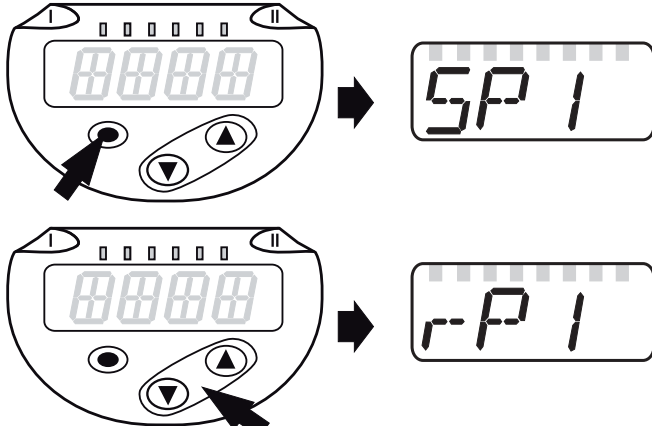
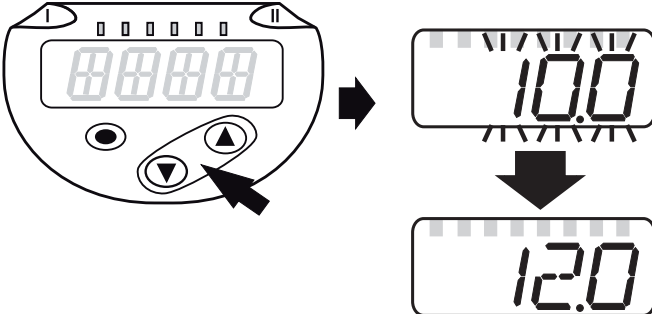
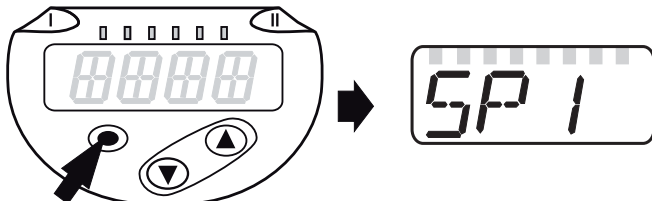
rES	Restore factory setting.
ou1	Output function for OUT1: <ul style="list-style-type: none"><li>• Switching signal for the pressure limit values: hysteresis function [H ..] or window function [F ..], either normally open [. no] or normally closed [. nc].</li></ul>
ou2	Output function for OUT2: <ul style="list-style-type: none"><li>• Switching signal for the pressure limit values: hysteresis function [H . .] or window function [F . .] as normally open (. no) or normally closed (. nc) each.</li></ul>
dS1 / dS2	Switching delays for OUT1 / OUT2.
dr1 / dr2	Switch-off delay for OUT1 / OUT2.
uni	Standard unit of measurement for system pressure (display): [psi] / [bAr] / [mbar] / [MPa] / [kPa] / [inHG]
P-n	Output logic: pnp / npn.
Lo	Minimum value memory for system pressure.
Hi	Maximum value memory for system pressure.
dAP	Damping of the measured signal.
coLr	Assignment of the display colours "red" and "green" within the measuring range.
cFH / cFL	Upper / lower value for colour change. Parameter only active after selection of a freely definable colour window in the coLr parameter: [r-cF] or [G-cF].
diS	Update rate and orientation of the display.

## 9 Parameter setting

During parameter setting the unit remains in the operating mode. It continues to monitor with the existing parameters until the parameter setting has been completed.

### 9.1 Parameter setting in general

3 steps must be taken for each parameter setting:

<p><b>1</b></p>	<p><b>Select parameter</b></p> <ul style="list-style-type: none"> <li>▶ Press [●] to get to the menu.</li> <li>▶ Press [▲] or [▼] until the requested parameter is displayed.</li> </ul>	
<p><b>2</b></p>	<p><b>Set parameter value</b></p> <ul style="list-style-type: none"> <li>▶ Press [●] to edit the selected parameter.</li> <li>▶ Press [▲] or [▼] for min. 2 s.</li> <li>&gt; After 2 s: setting value is changed: incrementally by pressing the button once or continuously by keeping the button pressed.</li> </ul>	
<p>Numerical values are incremented continuously with [▲] or decremented with [▼].</p>		
<p><b>3</b></p>	<p><b>Acknowledge parameter value</b></p> <ul style="list-style-type: none"> <li>▶ Briefly press [●].</li> <li>&gt; The parameter is displayed again. The new setting value is saved.</li> </ul>	
<p><b>Set other parameters</b></p> <ul style="list-style-type: none"> <li>▶ Press [▲] or [▼] until the requested parameter is displayed.</li> </ul>		
<p><b>Finish parameter setting</b></p> <ul style="list-style-type: none"> <li>▶ Press [▲] or [▼] several times until the current measured value is displayed or wait for 30 s.</li> <li>&gt; The unit returns to the process value display.</li> </ul>		

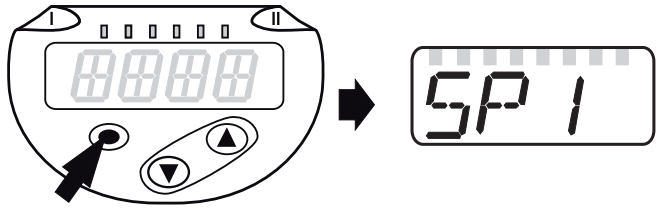
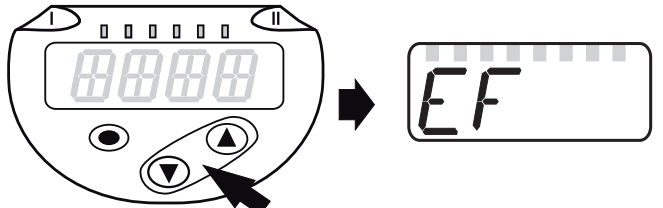
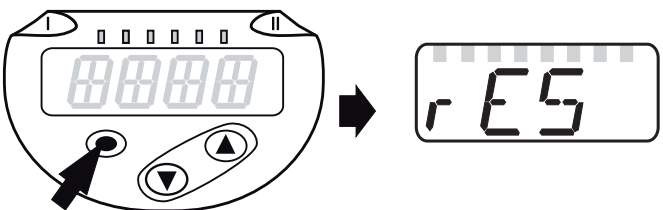


If [C.Loc] is displayed when an attempt is made to modify a parameter value, an IO-Link communication is active (temporary locking).



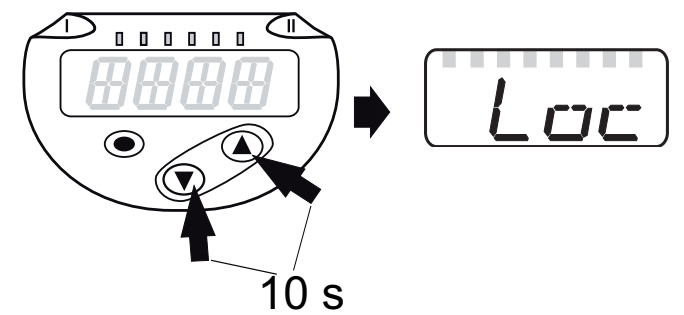
If [S.Loc] is displayed, the sensor is permanently locked via software. This locking can only be removed using a parameter setting software.

- Change from menu level 1 to menu level 2:

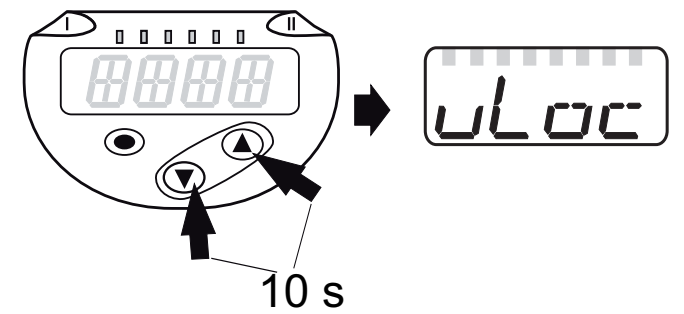
<p>▶ Press [●] to get to the menu.</p> <p>▶ Press [▼] until [EF] is displayed.</p>	 
<p>▶ Press [●].</p> <p>&gt; The first parameter of the submenu is displayed (here: [rES]).</p>	

- Locking / unlocking

The unit can be locked electronically to prevent unintentional settings.

<ul style="list-style-type: none"> <li>▶ Make sure that the unit is in the normal operating mode.</li> <li>▶ Press [▲] + [▼] simultaneously for 10 s.</li> <li>&gt; [Loc] is displayed.</li> </ul>	
--	--

During operation: [Loc] is briefly displayed if you try to change parameter values.

<p>For unlocking:</p> <ul style="list-style-type: none"> <li>▶ Make sure that the unit is in the normal operating mode.</li> <li>▶ Press [▲] + [▼] simultaneously for 10 s.</li> <li>&gt; [uLoc] is displayed.</li> </ul>	
---	--



UK

On delivery: not locked.

- Timeout:

If no button is pressed for 30 s during parameter setting, the unit returns to the operating mode with unchanged values.

## 9.2 Configure display (optional)

<p>▶ Select [Uni] and set the unit of measurement:</p> <ul style="list-style-type: none"> <li>- [Psi],</li> <li>- [bAr], [mbAr],</li> <li>- [MPa], [kPa],</li> <li>- [inHG]</li> </ul>	
<p> The selectable units of measurement depend on the respective unit.</p>	
<p>▶ Select [diS] and set the update rate and orientation of the display:</p> <ul style="list-style-type: none"> <li>- [d1]: update of the measured values every 50 ms.</li> <li>- [d2]: update of the measured values every 200 ms.</li> <li>- [d3]: update of the measured values every 600 ms.</li> <li>- [rd1], [rd2], [rd3]: display as for d1, d2, d3; rotated by 180°.</li> <li>- [OFF] = The measured value display is deactivated in the Run mode. The LEDs remain active even if the display is deactivated. Error messages are displayed even if the display is deactivated.</li> </ul>	
<p> Even with unsteady pressure characteristics [d1] provides optimum readability; the corresponding algorithms are stored.</p>	

## 9.3 Set output signals

### 9.3.1 Set output functions

<p>▶ Select [ou1] and set the switching function:</p> <ul style="list-style-type: none"> <li>- [Hno] = hysteresis function/NO,</li> <li>- [Hnc] = hysteresis function/NC,</li> <li>- [Fno] = window function/NO,</li> <li>- [Fnc] = window function/NC.</li> </ul>	
<p>▶ Select [OU2] and set the function:</p> <ul style="list-style-type: none"> <li>- [Hno] = hysteresis function/NO,</li> <li>- [Hnc] = hysteresis function/NC,</li> <li>- [Fno] = window function/NO,</li> <li>- [Fnc] = window function/NC.</li> </ul>	

### 9.3.2 Define switching limits for the hysteresis function


<p>▶ [ou1] / [ou2] must be set as [Hno] or [Hnc].</p> <p>▶ Select [SP1] / [SP2] and set the value at which the output is set.</p>	
<p>▶ Select [rP1] / [rP2] and set the value at which the output is reset. rPx is always smaller than SPx. The unit only accepts values which are lower than the value for SPx.</p>	

### 9.3.3 Define switching limits for the window function

<ul style="list-style-type: none"> <li>▶ [ou1] / [ou2] must be set as [Fno] or [Fnc].</li> <li>▶ Select [FH1] / [FH2] and set the upper limit value.</li> </ul>	FH1 FH2
<ul style="list-style-type: none"> <li>▶ Select [FL1] / [FL2] and set the lower limit value.</li> </ul> FLx is always lower than FHx. The unit only accepts values which are lower than the value for FHx.	FL1 FL2

## 9.4 User settings (optional)

### 9.4.1 Set delay for the switching outputs

<p>[dS1] / [dS2] = switching delay for OUT1 / OUT2. [dr1] / [dr2] = reset delay for OUT1 / OUT2.</p> <ul style="list-style-type: none"> <li>▶ Select [dS1], [dS2], [dr1] or [dr2] and set a value between 0 and 50 s (at 0 the delay time is not active).</li> </ul>	dS1 dr1 dS2 dr2
 For this unit the parameters [dSx] und [drx] for the set and reset points are designed strictly to the VDMA guideline.	

UK

### 9.4.2 Set output logic for the switching outputs

<ul style="list-style-type: none"> <li>▶ Select [P-n] and set [PnP] or [nPn].</li> </ul>	P--n
--	------


### 9.4.3 Set damping for the switching signal

<ul style="list-style-type: none"> <li>▶ Select [dAP], set the value in seconds; setting range 0.000...4.000 s (<math>\tau</math> value: 63 %). At 0.00 [dAP] is not active.</li> </ul>	dAP
---	-----




### 9.4.4 Read min/max values for the system pressure

<ul style="list-style-type: none"> <li>▶ Select [HI] or [Lo] and briefly press [●].</li> </ul> [HI] = maximum value, [LO] = minimum value. Delete memory: <ul style="list-style-type: none"> <li>▶ Select [HI] or [LO].</li> <li>▶ Press and hold [▲] or [▼] until [----] is displayed.</li> <li>▶ Briefly press [●].</li> </ul>	Hi Lo
---	----------

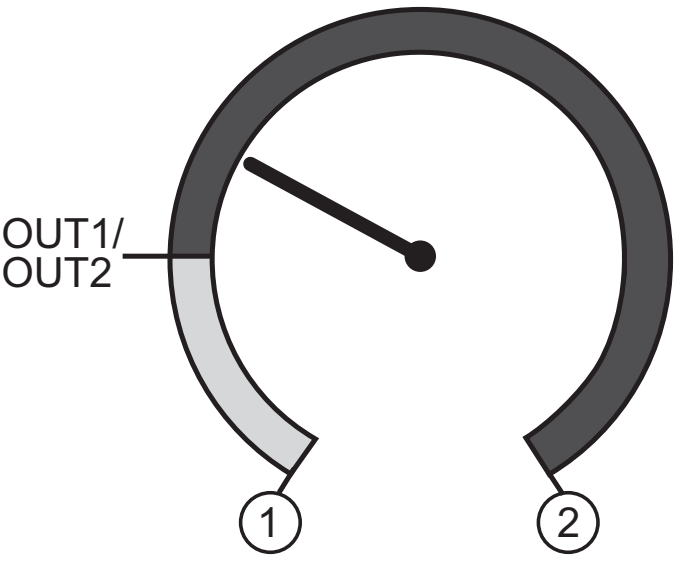
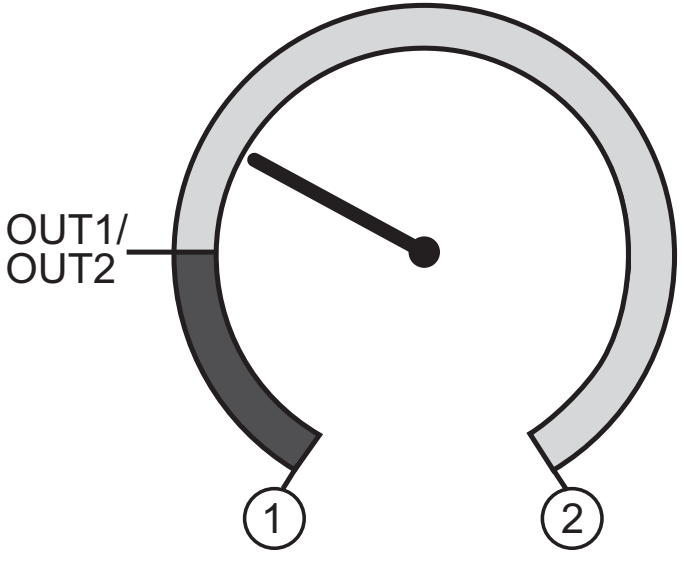
## 9.4.5 Reset all parameters to factory setting

<ul style="list-style-type: none"> <li>▶ Select [rES].</li> <li>▶ Press [●].</li> <li>▶ Press and hold [▲] or [▼] until [----] is displayed.</li> <li>▶ Briefly press [●].</li> </ul> <p>We recommend noting down your own settings before carrying out a reset (→ 12 Factory setting).</p>	
---	---

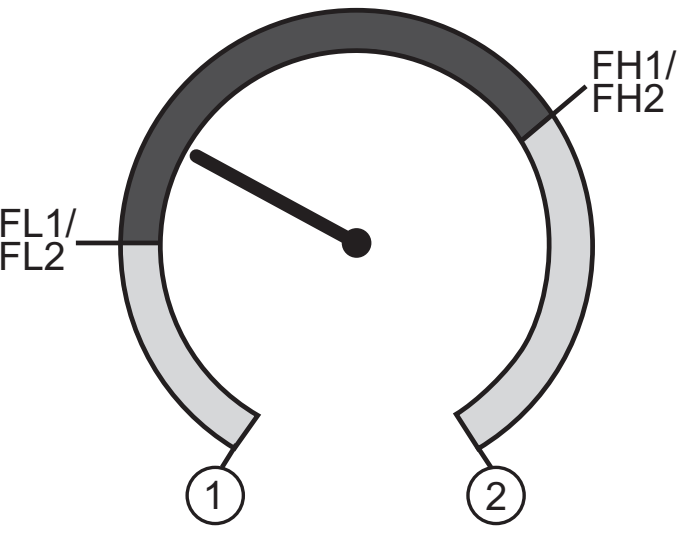
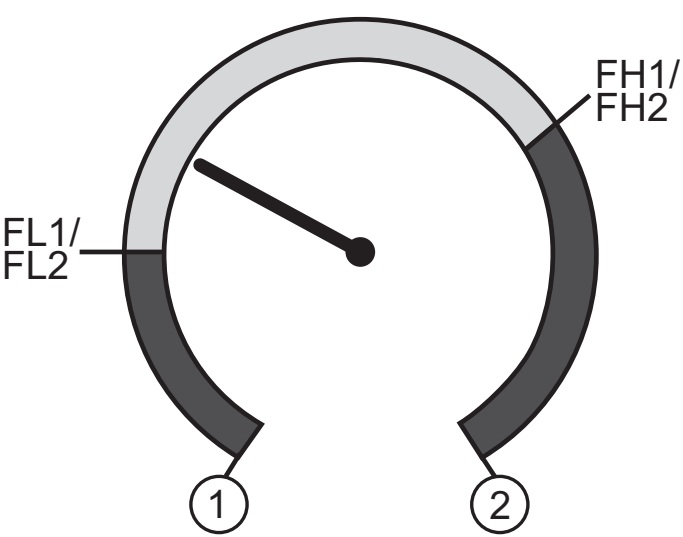
## 9.4.6 Set colour change of the display

<ul style="list-style-type: none"> <li>▶ Select [coLr] and set the function: <ul style="list-style-type: none"> <li>- [rEd] = display colour red (independent of the measured value).</li> <li>- [GrEn] = display colour green (independent of the measured value).</li> <li>- [r1ou] = display colour red when OUT1 switches.</li> <li>- [G1ou] = display colour green when OUT1 switches.</li> <li>- [r2ou] = display colour red when OUT2 switches.</li> <li>- [G2ou] = display colour green when OUT2 switches.</li> <li>- [r-12] = Display colour red when the measured value is between the limit values of OUT1 and OUT2.</li> <li>- [G-12] = Display colour green when the measured value is between the limit values of OUT1 and OUT2.</li> <li>- [r-cF] = Display colour red when the measured value is between the freely definable limit values [cFL]<sup>*)</sup> and [cFH]<sup>*)</sup>.</li> <li>- [G-cF] = Display colour green when the measured value is between the freely definable limit values [cFL]<sup>*)</sup> and [cFH]<sup>*)</sup>.</li> </ul> </li> </ul> <p><sup>*)</sup> The parameters [cFL] and [cFH] can only be selected in the menu tree when [r-cF] or [G-cF] were activated.</p>	
<ul style="list-style-type: none"> <li>▶ Select [cFH] and set the upper limit value. (only possible when [r-cF] or [G-cF] were activated).</li> <li>&gt; The setting range corresponds to the measuring range and its minimum limit is [cFL].</li> </ul>	
<ul style="list-style-type: none"> <li>▶ Select [cFL] and set the lower limit value (only possible when [r-cF] or [G-cF] were activated).</li> <li>&gt; The setting range corresponds to the measuring range and its maximum limit is [cFH].</li> </ul>	

## 9.4.7 Graphical depiction of the colour change of the display

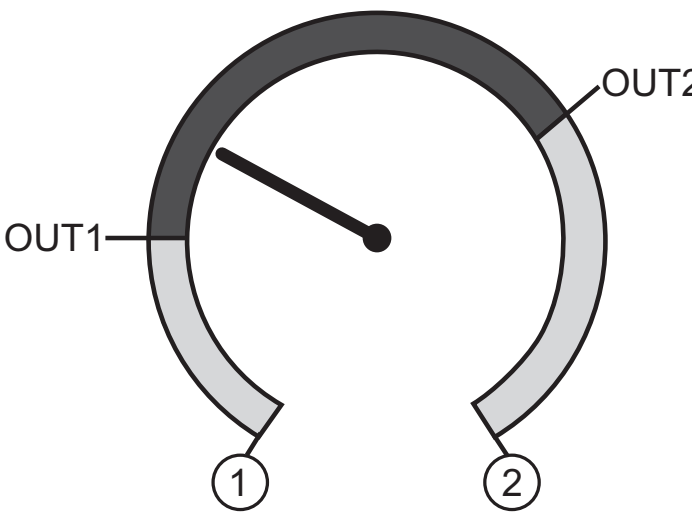
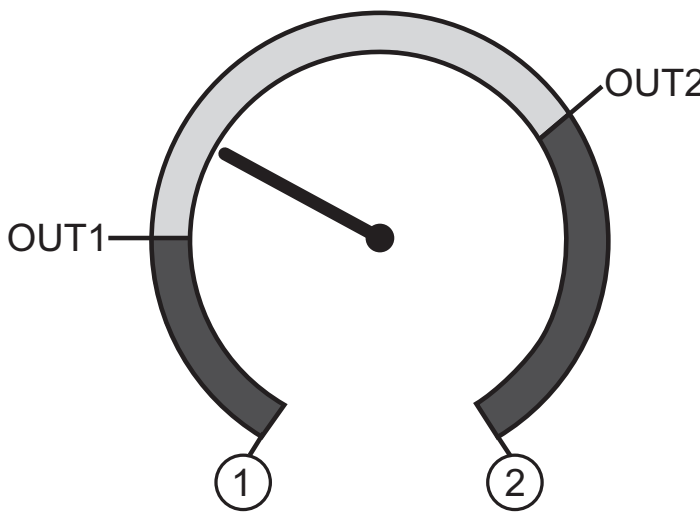
<p>Display colour change for the parameters [r1ou] / [r2ou], mode <b>hysteresis function</b></p>	<p>Display colour change for the parameters [G1ou] / [G2ou], mode <b>hysteresis function</b></p>
	
<p>Measured value &gt; switch point OUT1/OUT2; Display = red</p>	<p>Measured value &gt; switch point OUT1/OUT2; Display = green</p>

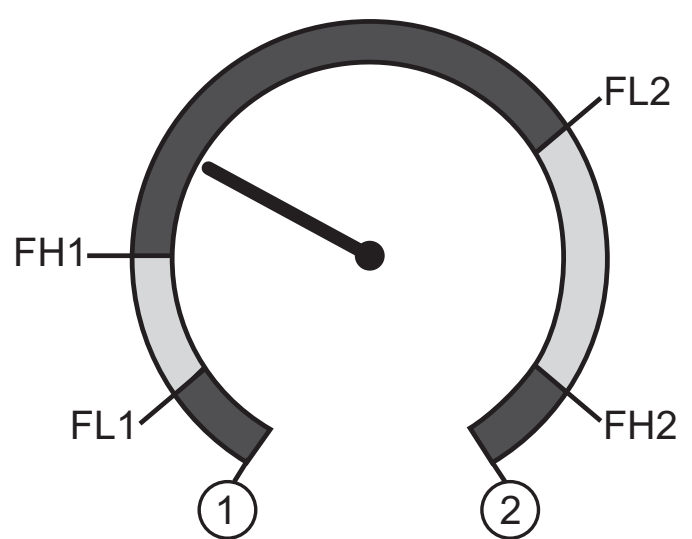
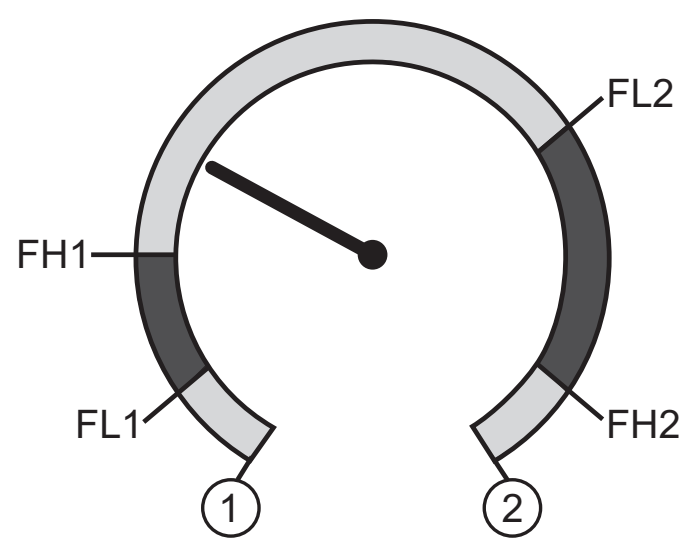
UK



<p>Display colour change for the parameters [r1ou] / [r2ou], mode <b>window function</b></p>	<p>Display colour change for the parameters [G1ou] / [G2ou], mode <b>window function</b></p>
	
<p>Measured value between FL1/FL2 and FH1/FH2; Display = red</p>	<p>Measured value between FL1/FL2 and FH1/FH2; Display = green</p>

	<p>Colour change display green</p>
	<p>Colour change display red</p>
<p>1</p>	<p>Initial value of the measuring range</p>
<p>2</p>	<p>Final value of the measuring range</p>



Display colour change for the parameters <b>[r-12]</b> , mode <b>hysteresis function</b>	Display colour change for the parameters <b>[G-12]</b> , mode <b>hysteresis function</b>
	
Measured value between OUT1 and OUT2; Display = red	Measured value between OUT1 and OUT2; Display = green

Display colour change for the parameters <b>[r-12]</b> , mode <b>window function</b>	Display colour change for the parameters <b>[G-12]</b> , mode <b>window function</b>
	
Measured value outside FL1...FH1 and FL2...FH2; Display = red	Measured value outside FL1...FH1 and FL2...FH2; Display = green

	Colour change display green
	Colour change display red
1	Initial value of the measuring range
2	Final value of the measuring range
FL1/FL2	Lower limit value window function outputs OUT1 / OUT2
FH1/FH2	Upper limit value window function outputs OUT1 / OUT2

Display colour change with parameter <b>[r-cF]</b> independent of OUT1 / OUT2.	Display colour change with parameter <b>[G-cF]</b> independent of OUT1 / OUT2
Measured value between cFL and cFH; Display = red	Measured value between cFL and cFH; Display = green

UK

	Colour change display green
	Colour change display red
1	Initial value of the measuring range
2	Final value of the measuring range
cFL	Lower limit value (independent of the output function)
cFH	Upper limit value (independent of the output function)

## 10 Operation

After power on, the unit is in the Run mode (= normal operating mode). It carries out its measurement and evaluation functions and provides output signals according to the set parameters.

Operating indicators → 7 Operating and display elements.

### 10.1 Read set parameters

- ▶ Press [●].
- ▶ Press [▲] or [▼] until the requested parameter is displayed.
- ▶ Briefly press [●].
- > The unit displays the corresponding parameter value for approx. 30 s; then it changes to the process value display.

## 10.2 Self-diagnosis / error indications

The unit has many self-diagnostic options.

- It monitors itself automatically during operation.
- Warnings and faults are displayed (even if the display is deactivated), in addition they are available via IO-Link.

Display	Status LED OUT1	Status LED OUT2	Type of fault	Corrective measures
none			Supply voltage too low.	► Check / correct the supply voltage.
SC	flashes	flashes	Excessive current at switching outputs OUT1 + OUT2 *)	► Check switching outputs for short-circuit or excessive current; remove the fault.
SC1	flashes		Excessive current at switching output OUT1 *).	► Check switching output OUT1 for short-circuit or excessive current; remove the fault.
SC2		flashes	Excessive current at switching output OUT2* ).	► Check switching output OU2 for short-circuit or excessive current; remove the fault.
C.Loc			Parameter setting locked via pushbuttons, parameter setting is active via IO-Link communication (→ 9.1)	► Wait until parameter setting via IO-Link is finished.
S.Loc			Setting buttons locked via parameter software. Parameter change is rejected (→ 9.1).	► Unlocking only possible via IO-Link interface / parameter software.
OL			Process value too high. (measuring range exceeded)	► Check / reduce system pressure / select unit with corresponding measuring range.
UL			Process value too low (value below measuring range).	► Check / increase system pressure / select unit with corresponding measuring range.

\*) The respective output remains deactivated as long as the excessive current / short circuit continues.

# 11 Technical data and scale drawing

## 11.1 Setting ranges

		SP1 / SP2		rP1 / rP2		$\Delta P$
		min	max	min	max	
<b>PN7270</b> <b>PN7370</b> <b>PN7670</b>	psi	40	5800	20	5780	20
	bar	4	400	2	398	2
	MPa	0.4	40	0.2	39.8	0.2
<b>PN7271</b> <b>PN7671</b>	psi	40	3620	20	3600	20
	bar	2	250	1	249	1
	MPa	0.2	25	0.1	24.9	0.1
<b>PN7292</b> <b>PN7392</b> <b>PN7692</b>	psi	10	1450	5	1445	5
	bar	1	100	0.5	99.5	0.5
	MPa	0.1	10	0.05	9.95	0.05
<b>PN7293</b> <b>PN7693</b>	psi	4	362	2	360	2
	bar	0.2	25	0.1	24.9	0.1
	MPa	0.02	2.5	0.01	2.49	0.01
<b>PN7294</b> <b>PN7694</b>	psi	-13,5	145	-14	144,5	0,5
	bar	-0.9	10	-0.95	9.95	0.05
	MPa	-0.09	1	-0.095	0.995	0.005
<b>PN7296</b> <b>PN7696</b>	psi	0.4	36.2	0.2	36	0.2
	bar	0.02	2.5	0.01	2.49	0.01
	kPa	2	250	1	249	1
<b>PN7297</b> <b>PN7697</b>	psi	0.1	14.5	0.05	14.45	0.05
	mbar	10	1000	5	995	5
	kPa	1	100	0.5	99.5	0.5
	inHG	0.2	29.5	0.1	29.4	0.1
<b>PN7299</b> <b>PN7699</b>	psi	-14.3	14.5	-14.4	14.4	0.1
	mbar	-980	1000	-990	990	10
	kPa	-98	100	-99	99	1
	inHG	-29,0	29.6	-29.2	29.4	0.2

UK

$\Delta P$  = step increment

## 11.2 Further technical data



Further technical data and scale drawing at [www.ifm.com](http://www.ifm.com) → Data sheet search → Enter the article number.

## 12 Factory setting

	Factory setting	User setting
SP1	25% VMR *	
rP1	23% VMR *	
OU1	Hno	
OU2	Hno	
SP2	75% VMR *	
rP2	73% VMR *	
dS1	0.0	
dr1	0.0	
dS2	0.0	
dr2	0.0	
P-n	PnP	
dAP	60	
Uni	Psi	
colr	rEd	
diS	d2	

\* = The indicated percentage of the final value of the measuring range (VMR) of the respective sensor in Psi (for PN7xx9 the percentage of the measuring span) is set.

More information at [www.ifm.com](http://www.ifm.com)

UK