

Major Metro Owned Fixed Equipment:

Metro South

Emergency generator - Katolight model # D210FRV4 210 kW

Compactors - 2 each Shredding Systems Inc. model # 4500SPH single bale ; scheduled for refurbishment 2009-2010

Metro Central

Emergency generator - Caterpillar model # 3406B 300 kW

Compactors - 2 each Shredding Systems Inc. model # 4500SPH single bale ; mechanical & structural refurbishment completed in 2008-2009

- 1 each modified Shredding Systems Inc. two bale ; mechanical refurbishment completed in 2007 (backup compactor)

Baler - C&M Horizontal MSB series

Original install 1990 ; refurbished 2001

Shredder - Shredding Systems Inc. model # 6000-ED 300hp mfg. 1990

Hammer mill - Duraquip Inc. 300 hp mfg. 1990

**2008 Metro Replacement and Renewal Account
Schedule 1 - R and R Equipment List**

		Year Installed	Estimated Life Span	Mfg Suggested Life Span
Metro Central Station				
1.1.1	Water Supply System			
1.1.2	Sewer			
1.1.2.1	Sanitary System			
1.1.2.2	Storm Drain System	1991	19	25
1.1.3	Electrical	1991	25	25
1.1.3.3	Stand-by Power Generator (CAT 3406)	1991	20	20
1.1.4	Fire System	1991	25	15
<hr/>				
1.2				
<hr/>				
1.2.1	Main Transfer Station	1991		
1.2.1.2	<i>Translucent Roof</i>	2003	25	25
1.2.1.5	Ventilation System - Extraordinary Repair	Various	20	20
1.2.1.3	Metal Wall System	1991	20	20
1.2.1.4	Concrete Floor Repair	1991	11	15
1.2.1.7	<i>Bay 3 Concrete Floor Repair</i>	2005	10	10
1.2.1.8	<i>Bay 2 Concrete Floor Repair</i>	2000	10	5
1.2.1.6	Rollup Doors	1991	20	20
1.2.2	Scalehouses			
1.2.2.1	Scalehouse "A"	1991		
1.2.2.1.1	Scale #1	2009	15	20
1.2.2.1.2	Scale #2	2009	15	20
1.2.2.2	Scalehouse "B"	1991		
1.2.2.2.1	Scale #3	2006	15	20
1.2.2.2.3	Radiation Detector	1997	15	15
1.2.2.3	Scalehouse "C"	1991		
1.2.2.3.1	Scale #4	1997	15	20
1.2.2.4	Scale #5 - Transfer Trailer Scale	2008	15	20
1.2.2.5	Heat Pumps (2) - Scale Houses		15	15
1.2.4	Truck Wash Facilities	1991	19	20
1.2.5	Support Buildings			
1.2.6	Buildings - Extraordinary Repairs	2001	20	20
<hr/>				
1.4				
<hr/>				
1.4.1	Roadways - Pavement Repairs	1991	5	5
<hr/>				
1.5				
<hr/>				

**2008 Metro Replacement and Renewal Account
Schedule 1 - R and R Equipment List**

		Year Installed	Estimated Life Span	Mfg Suggested Life Span
1.5.1	Transfer Operation			
1.5.1.1	Compactors			
1.5.1.1.1	SSI #1 (Re-Built in 2008)	2000	8	10
1.5.1.1.1.1	Feed Conveyor - SSI #1	2003	15	15
1.5.1.1.2	SSI #2 (Re-Built in 2007)	1991	8	10
1.5.1.1.2.1	Feed Conveyor - SSI #2 (replace)	2005	15	15
1.5.1.1.3	SSI #3 (Re-built in 2009)	2000	8	10
1.5.1.1.3.1	Feed Conveyor - SSI #3 (replace)	2005	10	15
1.5.1.1.3.2	Compactor Extraordinary Repair	2000	5	5
1.5.1.2	Processing Equipment			
1.5.1.2.1	Wood Processing Line (modified 2005)			
1.5.1.2.1.1	SSI Shredder - Slow Speed	1991	20	15
1.5.1.2.1.2	Duraquip Shredder - High Speed	1991	20	10
1.5.1.2.1.3	Conveyors - Wood Line	2007	15	15
1.5.1.2.1.4	Magnetic Separator - Wood Line	1991	20	15
1.5.1.2.1.5	Trailer Load Paddle System	1995	15	15
1.5.1.2.2	Baler Line			
1.5.1.2.2.1	Baler (Rebuilt in 2001)	1991	15	15
1.5.1.2.2.2	Conveyor -Baler	1991	20	20
1.5.1.3	Compressor And Motor	2006	15	15
<hr/>				
1.6				
1.6.1	Transfer Operation			
1.6.1.2	Grapple	1999	15	15
1.8.5	Lighting - For New system as in Master Plan	1991	24	25
1.8.5.1	Repair of Lighting System by BFI in 2005			

**2008 Metro Replacement and Renewal Account
Schedule 1 - R and R Equipment List**

			Year Installed	Estimated Life Span	Mfg Suggested Life Span
2.1 Metro South Station					
2.1.1	Water				
2.1.2	Sewer				
2.1.2.1	Sanitary Sewer		1983		
2.1.2.1.1	Lift Pump		1993	15	15
2.1.2.1.2	Lift Pump		1995	15	15
2.1.2.1.3	Lift Pump		1997	20	15
2.1.2.1.4	Lift Pump		1999	20	15
2.1.2.2	Storm Drainage System		1983		
2.1.2.2.1	Lift Pump		1993	20	15
2.1.2.2.2	Lift Pump		1995	20	15
2.1.2.2.3	Lift Pump		1997	20	15
2.1.2.2.4	Lift Pump		1999	20	15
2.1.3	Electrical				
2.1.3.1	Site Lighting		1983	20	20
2.1.3.2	1200A Power Supply/Distribution/MCC		1999	25	25
2.1.3.2.1	600A Electrical SWBD - Electrical Room/office		1983	29	25
2.1.3.3	250kW Backup Generator		1996	21	21
2.1.4	Fire System				
2.1.5	Utilities - Extraordinary Repair		2001	20	20
2.2					
2.2.1	Commercial Building		1983		
2.2.1.1	Metal Roof		1993	20	20
2.2.1.2	Wall System		1983	30	20
2.2.1.2.1	Push Wall Repair		2004	30	20
2.2.1.3	Concrete Floor Repair		1983	25	20
2.2.1.3.1					
2.2.1.5	Ventilation System - Extraordinary Repair		1993	17	15
2.2.1.7	Dust Suppression System		1998	15	10
2.2.1.9	Lighting		1992	18	10
2.2.8	Public Building		2000		
2.2.8.1	Metal Roof		2000	20	20
2.2.8.2	Metal Wall System		2000	20	20
2.2.8.3	Concrete Floor Repair		2000	20	20
2.2.8.5	Ventilation System - Extraordinary Repair		2007	15	15
2.2.2	Scales				
2.2.2.1	Scalehouse "A" (#2)		1983		
2.2.2.1.1	Scale #2 - Entrance		1983	20	20
2.2.2.1.2	Scale #3 - Exit		1983	20	20
2.2.2.2	Scalehouse "B" (#1)		1983		
2.2.2.2.1	Scale #1 - Upgraded to Commercial 2001		2002	20	20
2.2.2.2.3	Radiation Detector		1997	15	15
2.2.2.3	Scalehouse "C" (#3)				
2.2.2.3.1	Scale #4		1998	20	20
2.2.2.4	Scale #5 - Transfer Trailer Scale		2000	20	20
2.2.2.6	Computer Network		2001	5	5
2.2.2.7	Heat Pumps (3) - Scale Houses			15	15
2.2.4	Maintenance Building (Old Latex Building)				
2.2.4.1	Ventilation System - Extraordinary Repair		1999	25	25
2.2.4.2	Metal Roof and Siding		1999	20	20

**2008 Metro Replacement and Renewal Account
Schedule 1 - R and R Equipment List**

		Year Installed	Estimated Life Span	Mfg Suggested Life Span
2.4				
2.4.1	Roadways - Pavement Repair	2001	5	20
2.4.2	Retaining Wall	1983	20	20
2.4.4	<i>Compactor Bridge Asphalt Deck</i>	1990	50	50
2.5				
2.5.1	Transfer Operation			
2.5.1.1	Compactors			
2.5.1.1.1	SSI #1 (refurb 2010)	1999	8	10
2.5.1.1.2	SSI #2 (refurb 2010)	1999	8	13
2.5.1.1.2.1	Compactor Extraordinary Repair	1999	5	5
2.5.1.2	Processing Equipment			
2.5.1.2.1	Walking Floor Conveyor	1991	25	15
2.5.1.2.2	Wheel Crusher	2000	3	3

Pre-Load Compactor



INSTALLATION OPERATION AND SERVICE MANUAL

Model: 4500SPH

Serial Number: C1200

Order Number: 408.001828

Job Number: 08.0001580

Customer: Metro Central

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

Introduction

Receiving, Storage & Set-Up

Operation

Preventive Maintenance

Service

Troubleshooting

SSI Warranty

***SSI Parts Lists and
Drawings***

Vendor Literature



**SECTION 1 CONTENTS
INTRODUCTION**

SECTION	PAGE
1.0	1

CONTENTS	1.0
PURPOSE OF THIS MANUAL	1.1
CUSTOMER ASSISTANCE	1.2
SAFETY PRECAUTIONS	1.3.1
MACHINE LOCK-OUT	1.3.2
COMPACTOR SAFETY STICKERS & TAGS	1.3.3
POWER UNIT SAFETY STICKERS & TAGS	1.3.4
CONTROL PANEL SAFETY STICKERS & TAGS	1.3.5
DEFINITIONS AND ABBREVIATIONS	1.4
OPERATING PRINCIPAL	1.5



PURPOSE OF THIS MANUAL

This compactor has been manufactured by SSI Compaction Systems of Wilsonville, Oregon. It has been engineered and manufactured to the highest quality of workmanship.

This instruction book has been carefully prepared to assist you in the installation, operation, and maintenance of the compactor to ensure its maximum performance and dependability. Also included are vendor information, parts lists and assembly drawings. Keep this manual handy for future reference. Any comments and/or recommendations are welcomed.

SSI Compaction Systems, Inc. offers start-up and operator training services designed to optimize your system performance. Contact SSI Compaction Systems for further information of this service.

If any additional assistance is necessary, please call, write or contact your local SSI Compaction Systems sales representative.

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 sections 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.



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

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 SYSTEMS™* 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.

! DANGER

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

! WARNING

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

! CAUTION

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

NOTICE

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 away from the chute loading area while 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 in which the COMPACTOR not designed.
- Do not put fingers in boltholes 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 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 hopper or chamber.
- 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!

⚠ DANGER

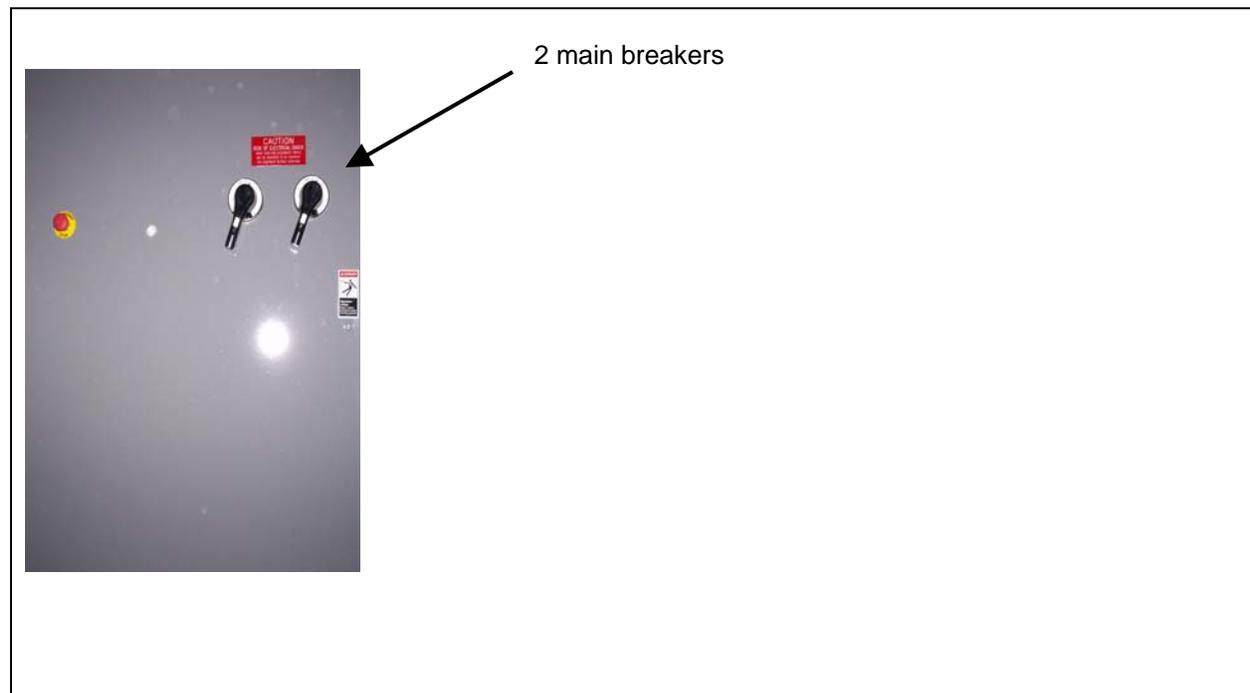
Unexpected machine startup can result in death or severe personal injury.

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.

Switch off the main 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.





LOCK OUT SAFETY PRECAUTIONS & WARNINGS

SECTION

1.3.2

PAGE

2

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 compactors is 110 VDC. Locking out the main disconnect switch eliminates this voltage.

Main Power - The main incoming power will be between 380VAC and 575VAC depending on facility requirements. Locking the main breakers will eliminate this voltage from all of the circuits except the incoming leads on the breakers themselves. To isolate this voltage, the breakers feeding the motor control panel will have to be turned off and locked out.

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

WARNING

When Machine is in Motion.

Moving parts can cause personal injury. Do not work on or enter any part of the compactor while it is operating.

WARNING

Moving Parts 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.

Press in Solenoids 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.



**LOCK OUT
SAFETY PRECAUTIONS & WARNINGS**

SECTION

1.3.2

PAGE

3

⚠ WARNING

Falling Material Hazard.

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

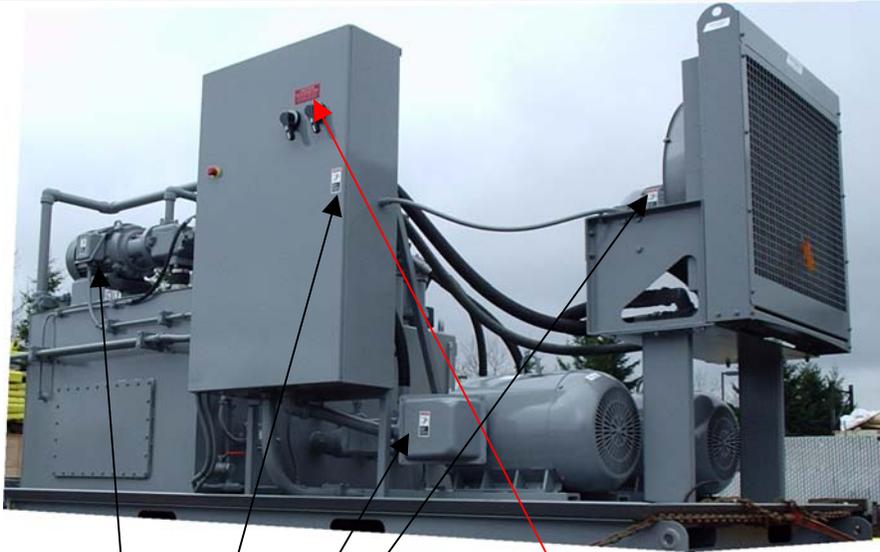
Remove un-compacted material prior to working below the chamber opening.

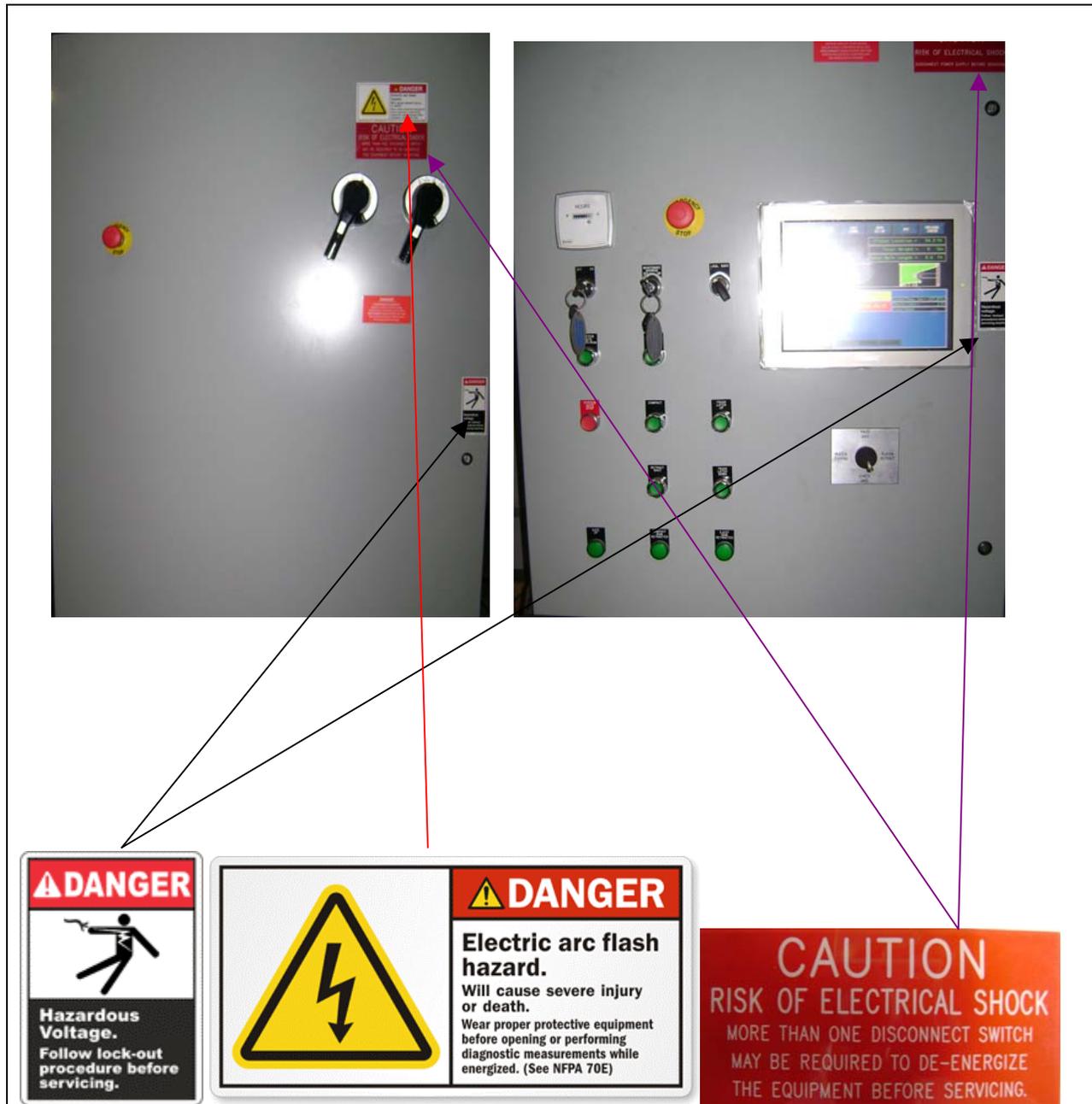
STICKERS & TAGS

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

If stickers become illegible, contact SSI for replacement stickers.







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.

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 - 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.

Data Access Table Monitor (DTAM) - This is used to monitor and input data for compactor operations.

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

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.

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.

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.

Modem – The device that allows the technician at SSI to call into the PLC on the compactor and troubleshoot or amend the program.

Panel View - Used to monitor compactor operation. It is also for inputting data for making bales.

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 manifold and control the flow of hydraulic fluid to the CRAM

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 – This slides along the top of the platen and carriage to keep material from falling behind the platen and damaging the cylinders.

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

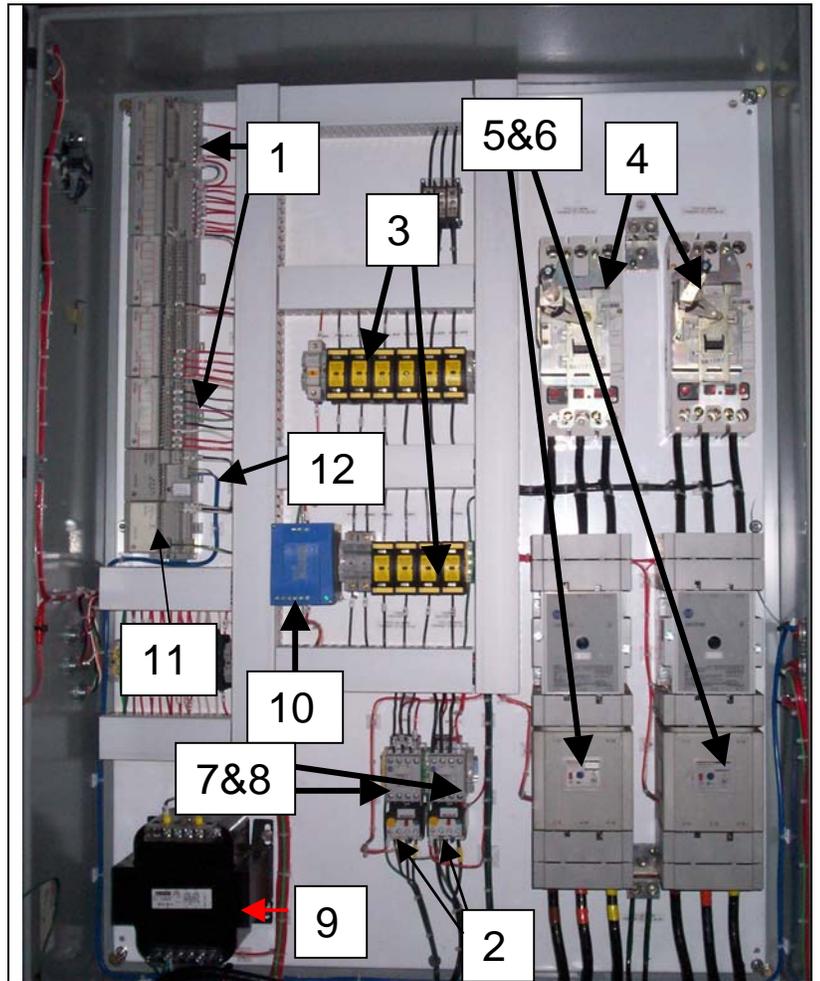
Sign Board – Displays information from the PLC for the operator. Information such as bale weigh, platen location, and any faults that may occur.

Unloaders – These valves are located on the HPU and divert the hydraulic oil flow from returning to tank to perform hydraulic work.

TERMS YOU WILL NEED TO KNOW

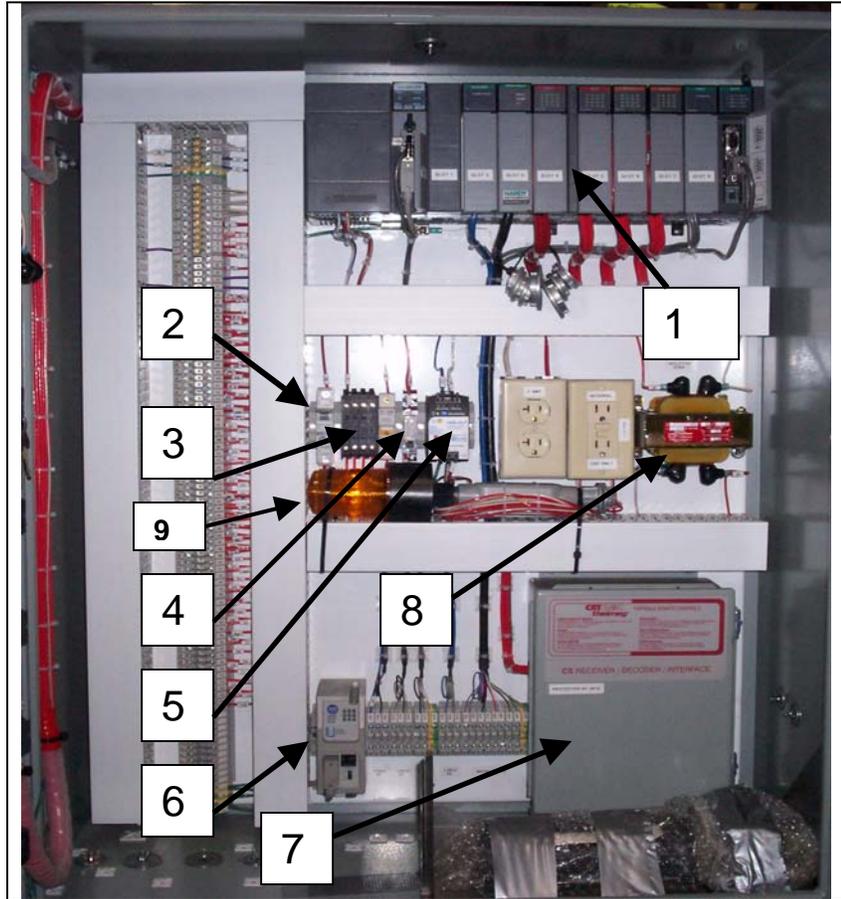
MAIN PANEL COMPONENTS

1. I/O Base
2. Overload Relays
3. Fuse Holders
4. Main Panel Disconnect Switch/s
5. MS-1 Pump #1 Motor Starter
6. MS-2 Pump #2 Motor Starter
7. MS-3 Oil Cooler Motor Starter
8. MS-4 Recirculation/Pilot Pump Motor Starter
9. Transformer
10. Surge Suppressor
11. Power Supply
12. Adapter-Remote I/O

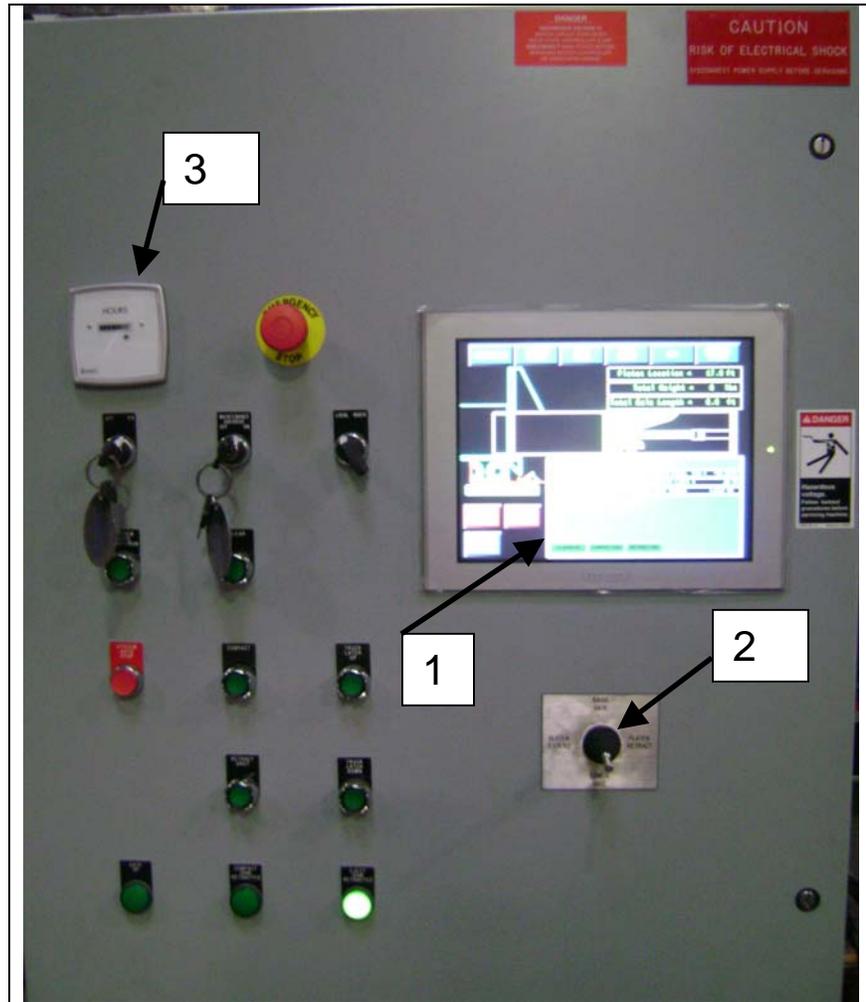


CONTROL PANEL COMPONENTS

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
 - h. MODULE - BASIC
2. CIRCUIT BREAKER - 15 AMP
3. TERMINAL BLOCK - FUSIBLE
 - a. FUSE HOLDER - 1-POLE - CLASS CC
4. RELAY - CONTROL - 120VAC
5. POWER SUPPLY (24VDC)
6. MODEM - KIT, ETHERNET
7. RADIO CONTROL SYSTEM - 12 CHANNEL
8. TRANSFORMER - ISOLATION 250VA
9. STROBE LIGHT

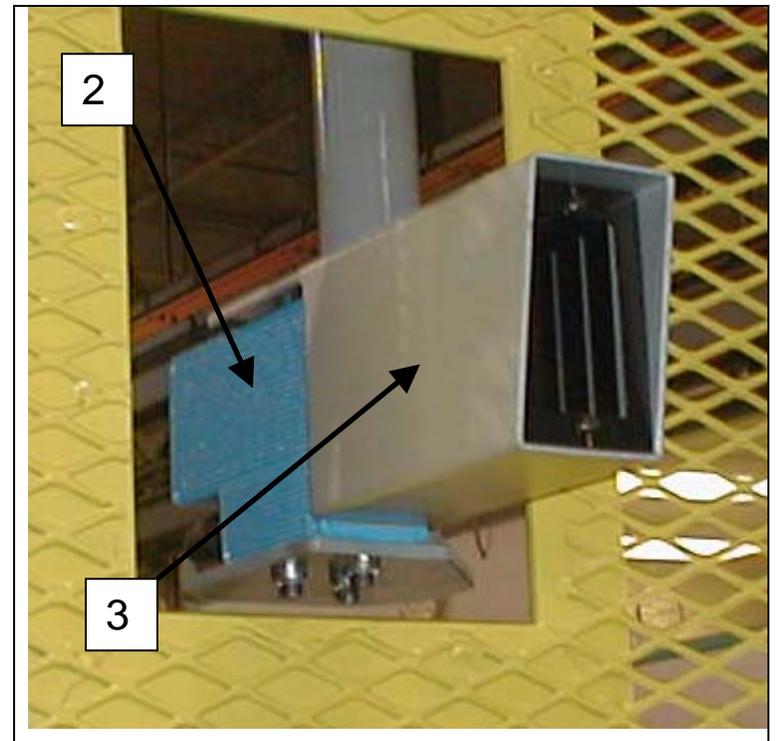
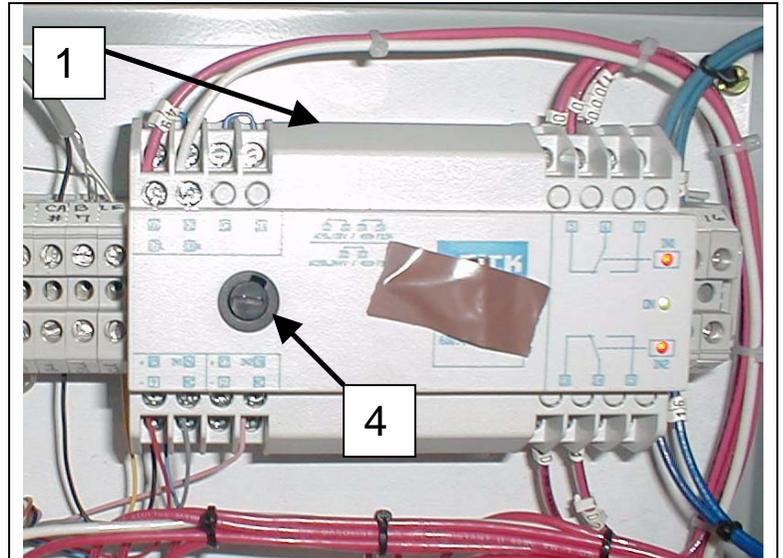


- 1. PANELVIEW
- 2. JOY STICK OPERATOR - 4 POS
- 3. HOUR METER - NEMA 4

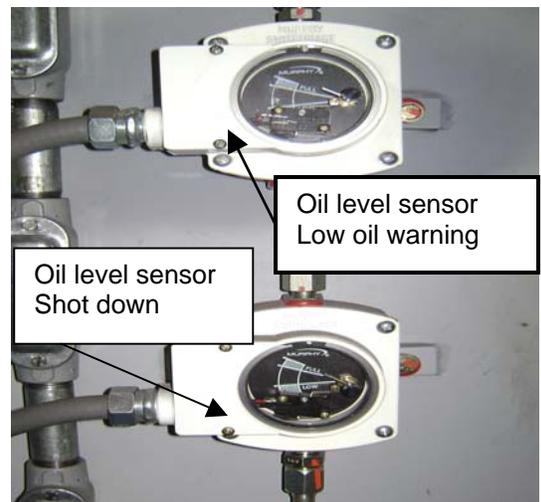
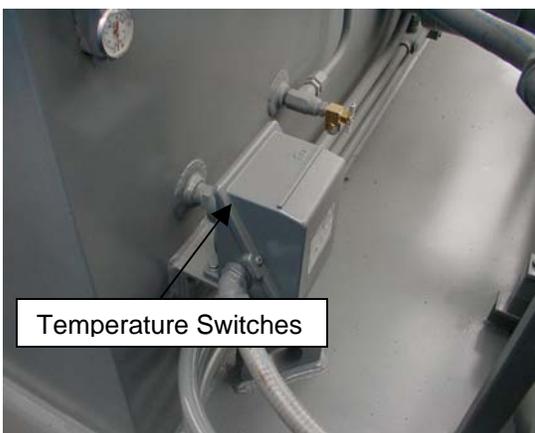
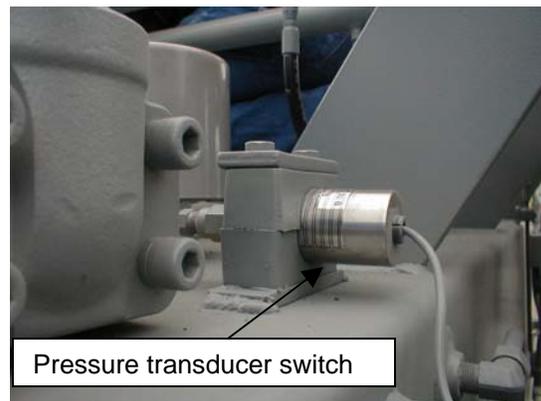
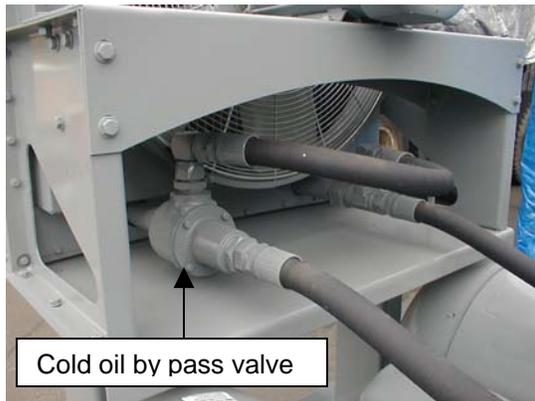
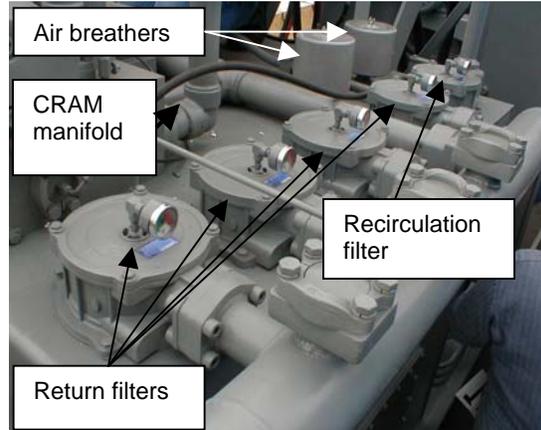
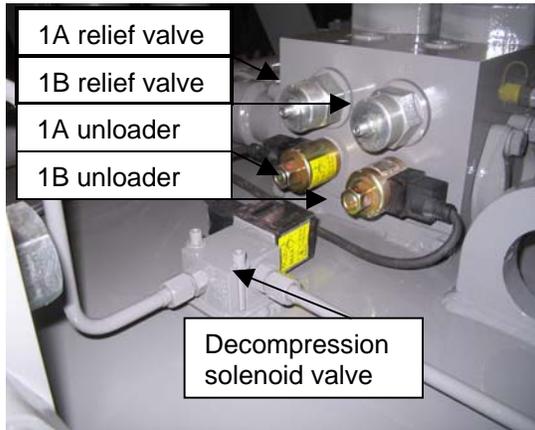


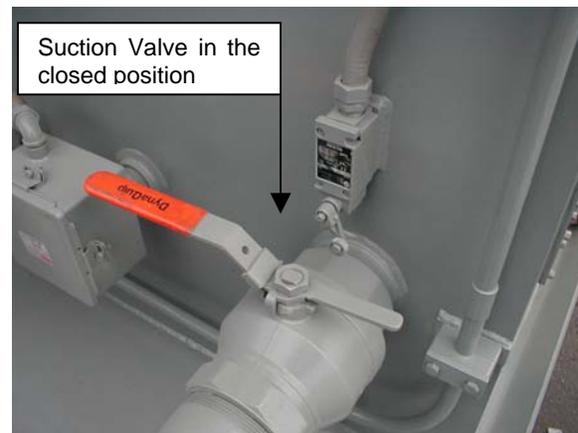
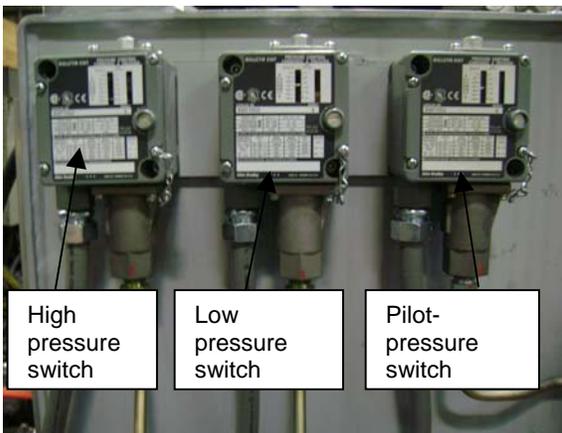
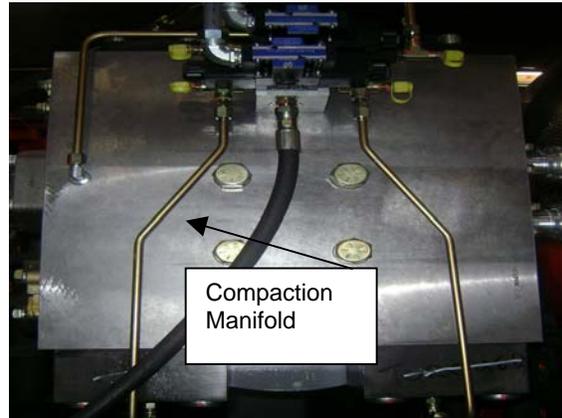
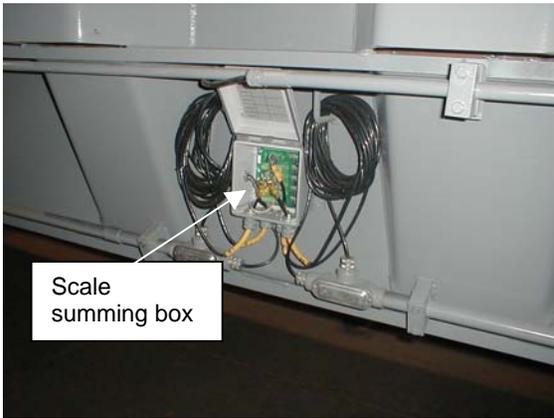
LASER COMPONENTS

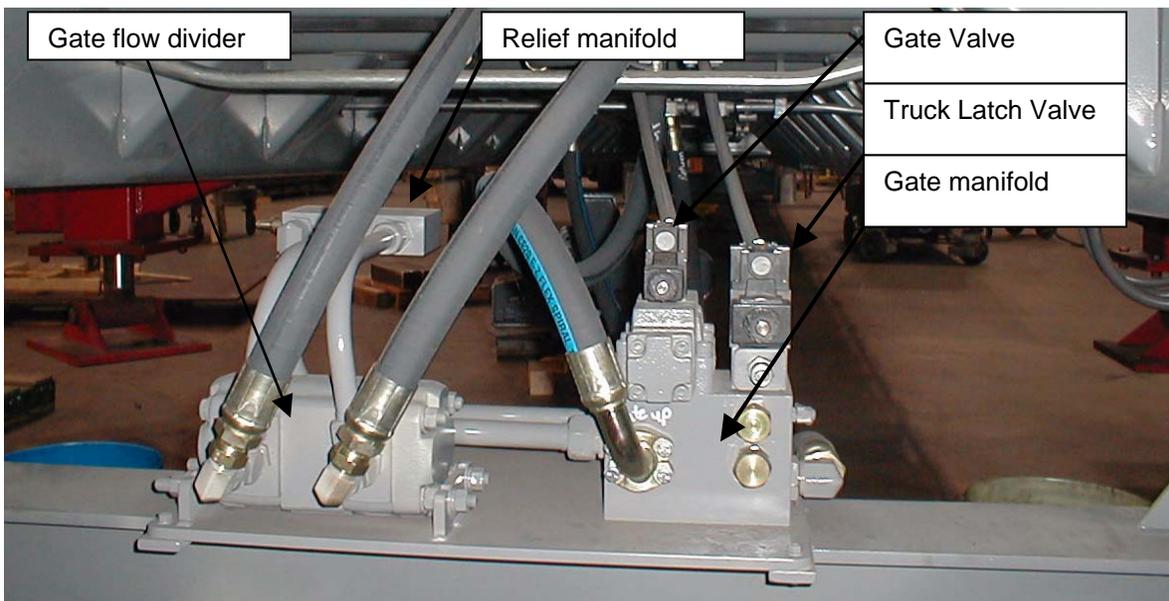
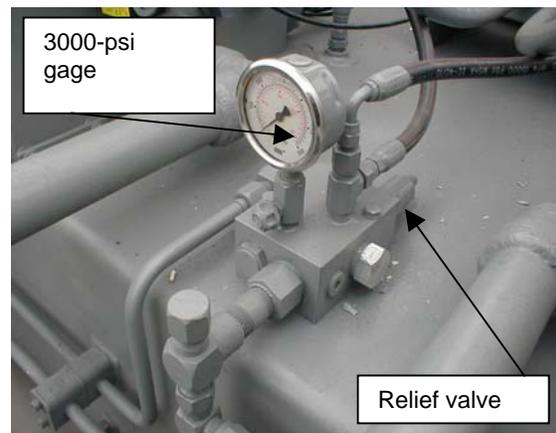
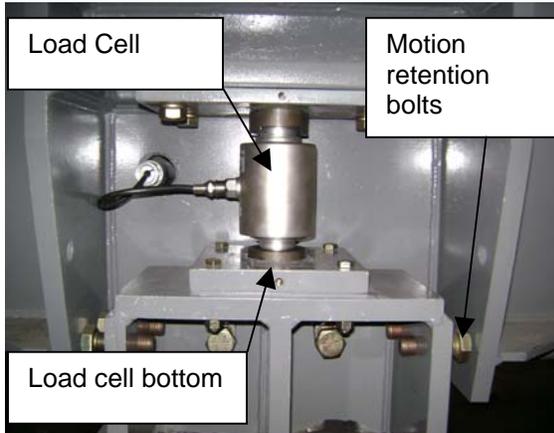
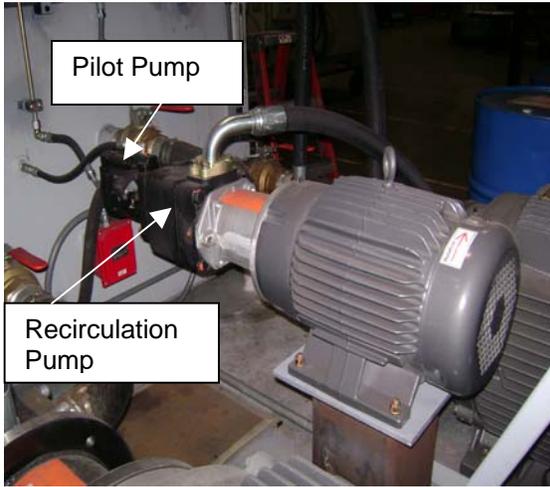
1. POWER SUPPLY - DUAL VOLTAGE
2. LASER - DISTANCE MEASURING
3. DUST SHIELD - LASER
4. FUSE HOLDER

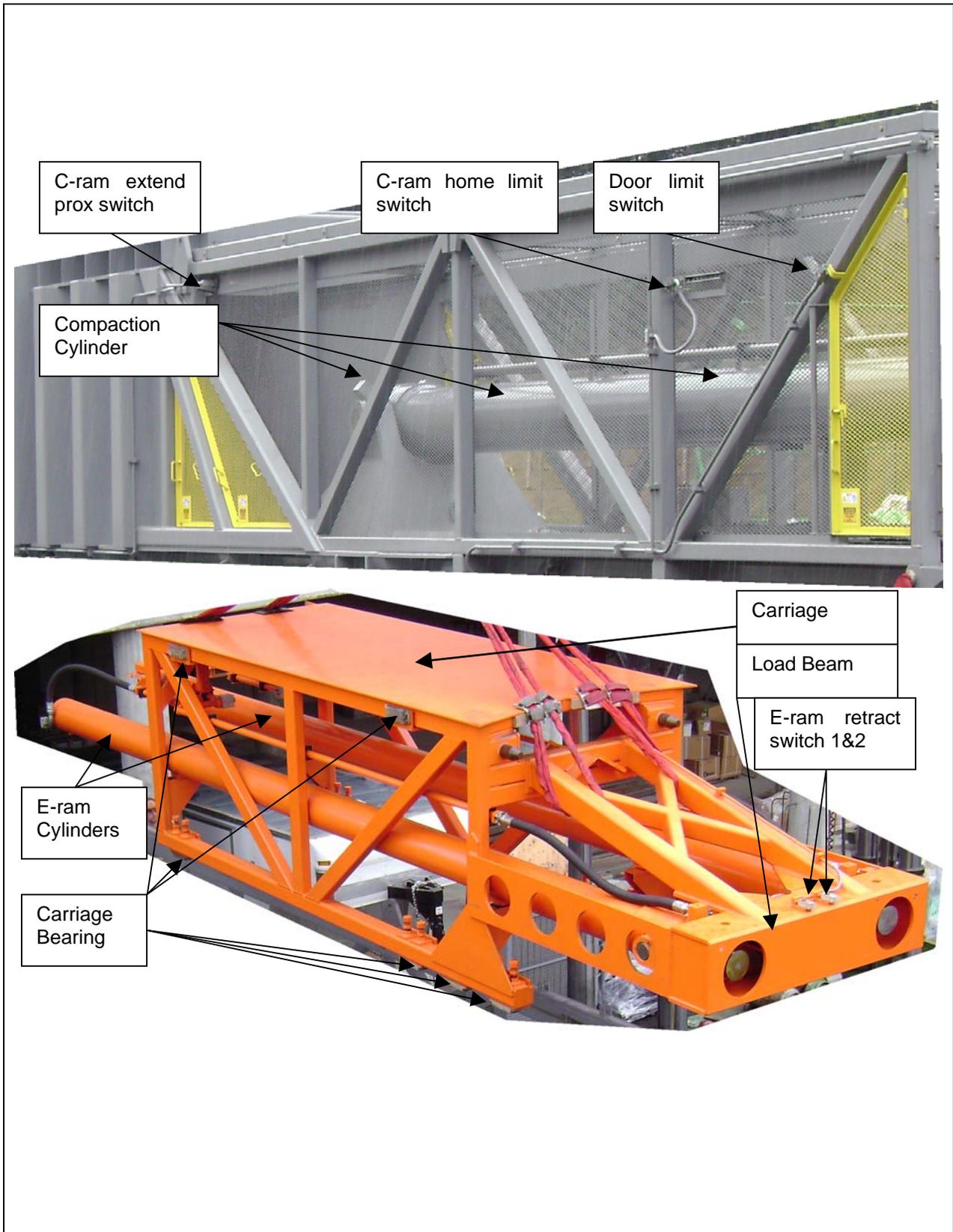


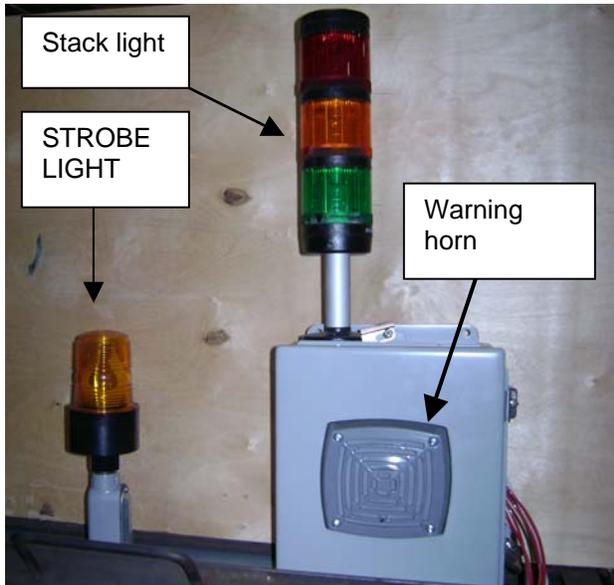
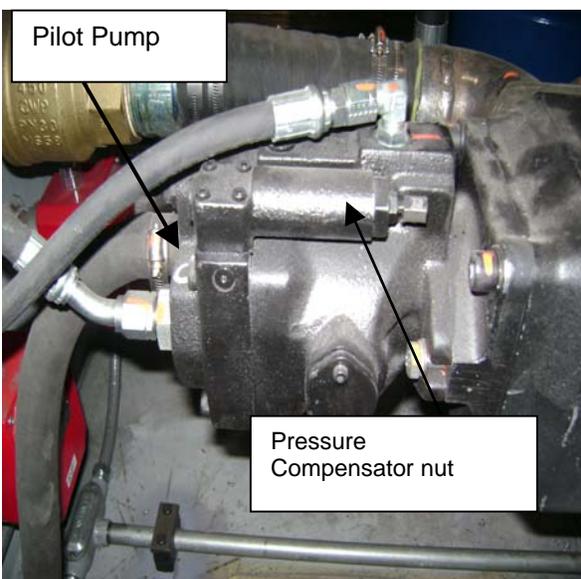
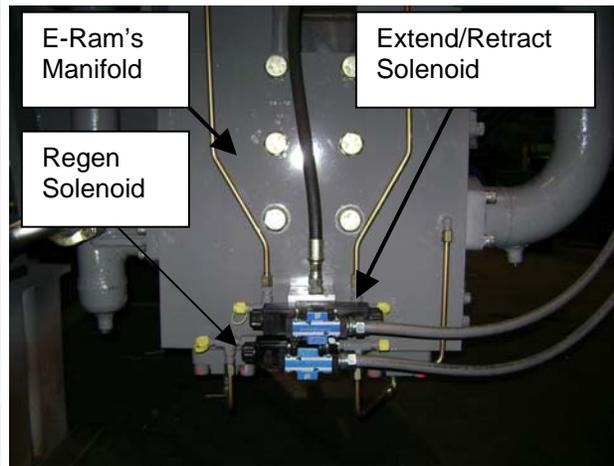
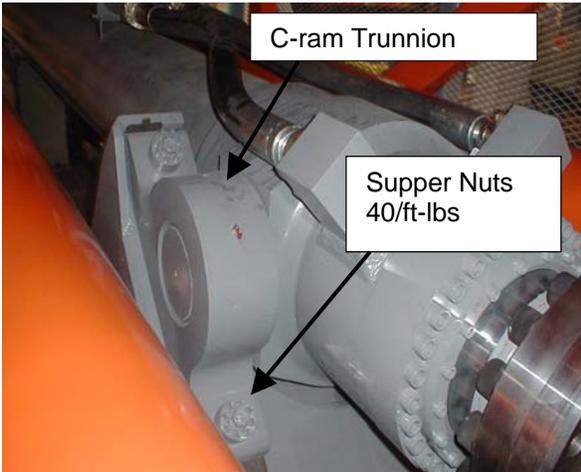
HPU COMPONENTS

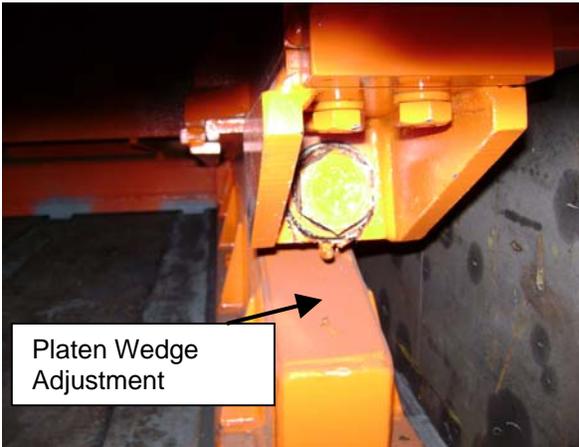
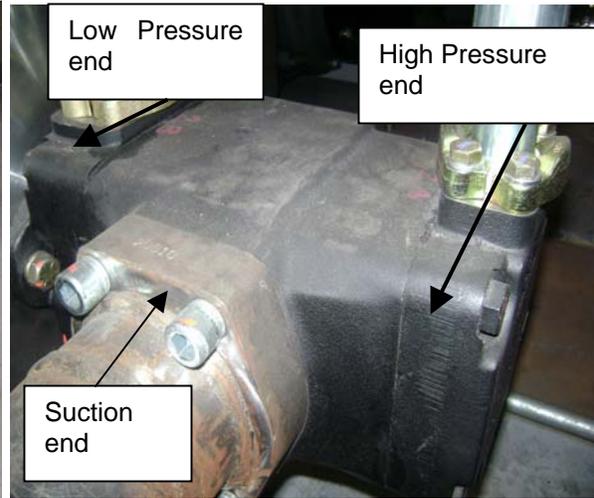
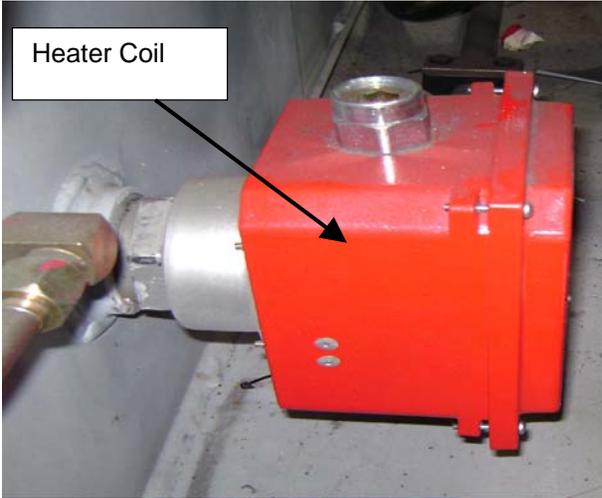














INTRODUCTION

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.



**SECTION 2 CONTENTS
RECEIVING & SETUP CONSIDERATIONS**

SECTION	PAGE
2.0	1

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



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)
 - In some cases direct feeding of material by a front-end loader or crane is used.
- 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 (*un-processable materials*)

- Select areas for inspection and sorting prior to feeding.
- Determine the method for sorting the material to be processed.
- Determine where **un-processable** material will be stored.

Hopper Extensions (*provides for additional hopper space*)

- Contact SSI to determine if hopper extensions are a practical add-on.

Perimeter Clearance

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

GENERAL INSTALLATION

The compactor is shipped assembled, although due to its size in multiple pieces. There will be one or more shipping containers that contain the hydraulic power unit, electrical controls, load cells, pedestals and other smaller parts.

If contracted, SSI can provide technical service representative(s) to direct the compactor installation and shakedown or full installation. If contracted to solely provide supervision it will be necessary to have at least 2 additional persons available to help with the installation, reattachment and assembly of the compactor. Also required are the services of a qualified welder and an electrician.

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.

Typically installation, assembly, testing, shakedown and training will require two weeks. Careful coordination with other contractors at the job site will be necessary to ensure that start-up progresses smoothly.

Cleanliness

Although a machine of this type inherently operates in an area, and under conditions, which are often dusty and dirty, precautions should be taken in the planning of the installation to keep dust to a minimum. The compactor should be cleaned periodically, based upon prevailing conditions.

Provisions for handling the wash-down water and any loose material carried by it should be considered in the foundation design.

Ambient Temperature

The hydraulic power unit oil cooler is sized to allow operation in ambient temperatures up to 110 F. If the hydraulic power unit is installed inside a room or other enclosure that restricts free airflow, forced ventilation will be required. If it is necessary to install the unit in an extremely warm area, consideration

should be given to improve air circulation or remote mounting of the oil cooler. It is recommended to cover the hydraulic power unit to protect it from the weather and shield it from the sun.

If the unit is installed in an area where extreme cold conditions prevail, precautions should be taken to prevent damage to the components. The lubricating oil should be changed to match the expected operating environment as recommended in the maintenance section of this manual. If the high voltage power is applied to the unit at all times, hydraulic fluid heaters will keep the oil warm enough to allow operation. When starting the unit in cold conditions, cycle the cylinders two times before starting production to help move the warm oil from the reservoir into the cylinders.

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 Wiring

Unless specified, mounting and locations of external electrical devices and connections have not been provided. Electrical provisions such as terminal strip tie points are included but there are no knockouts provided in the panel enclosures. Wiring that is not directly mounted to the machine (including required wiring between the operators control panel and the motor starter panel) is not provided by SSI. Note that all conduits between the compactor and anything attached to the ground or another fixed object must be in flexible conduit and mounted in such a way that the weight readings of the machine will not be affected.

 **WARNING** All external wiring, connections and interlock devices must be provided and installed in accordance with the latest National Electric Code, local codes and local electric utility requirements. Only authorized electricians should install, modify, and maintain the electrical system.

The power wiring specifications for the compactors are listed in the unit specifications. Typically, a control transformer is used to produce the necessary control voltage supply. See the Electrical System Drawings supplied in this manual for the specific configuration used on this equipment.

In general, electrical power wiring needs to be connected from the facility power system to the main circuit breaker located in the motor starter panel. Additional motor wiring connections between the motor starter panel and the motors may need to be made.

Additional wiring hook-ups may be required for optional accessory equipment. Refer to the Electrical System Drawings supplied in this manual for a complete wiring diagram.

Refer to the *Technical Specifications* section of this manual for electrical requirements. A power supply is used to produce the necessary control power voltage for the programmable controller (usually 110vac)

Hydraulic System Components

A self-contained, skid-mounted Hydraulic Power Unit (HPU) powers the compactor. The HPU is typically located within 15 feet of the compactor and connected with a minimum of two large high-pressure fluid lines. Greater separation is possible with due consideration given to pipe diameter. It is recommended to cover the hydraulic power unit to protect it from weather and shield it from the sun.

Installation of the compactor often requires selection and installation of hydraulic piping and/or hoses not provided by SSI. To assure satisfactory performance and safe operation, all hydraulic components and connections must conform to accepted industry standards. Specific design recommendations are discussed below.

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"	104.5 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

Your SSI Shredding Systems compactor has been operationally tested at the factory and all of the adjustments properly set. For satisfactory performance, attachment of the hydraulic power unit to the compactor should follow accepted industry standards. 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.

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, (Item 2 Dwg. #80-2255-D). Tighten positioning bolts to outside pocket assembly centering upper pedestal assembly, (Item 16 & 17 Dwg. #80-2255-D).
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" 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. See page 5 for flushing instructions.
8. Position and connect operators control panel and main control panel.
9. Attach upper gate track and gate track.
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.



13. Check all electrical connections and conduit. Apply power to the system and check motor rotation.
- 14. Check all system shut downs and Emergency Stops for proper function.**
15. Start the hydraulic power unit. Check all manual operations on the compactor. Check for hydraulic fluid leaks.
16. Check all automatic functions and operations.
17. Calibrate the scale system. To maintain warranty on the scale system, authorized technicians must perform service. Contact SSI for assistance in locating authorized technicians.

⚠ 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.

⚠ 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:

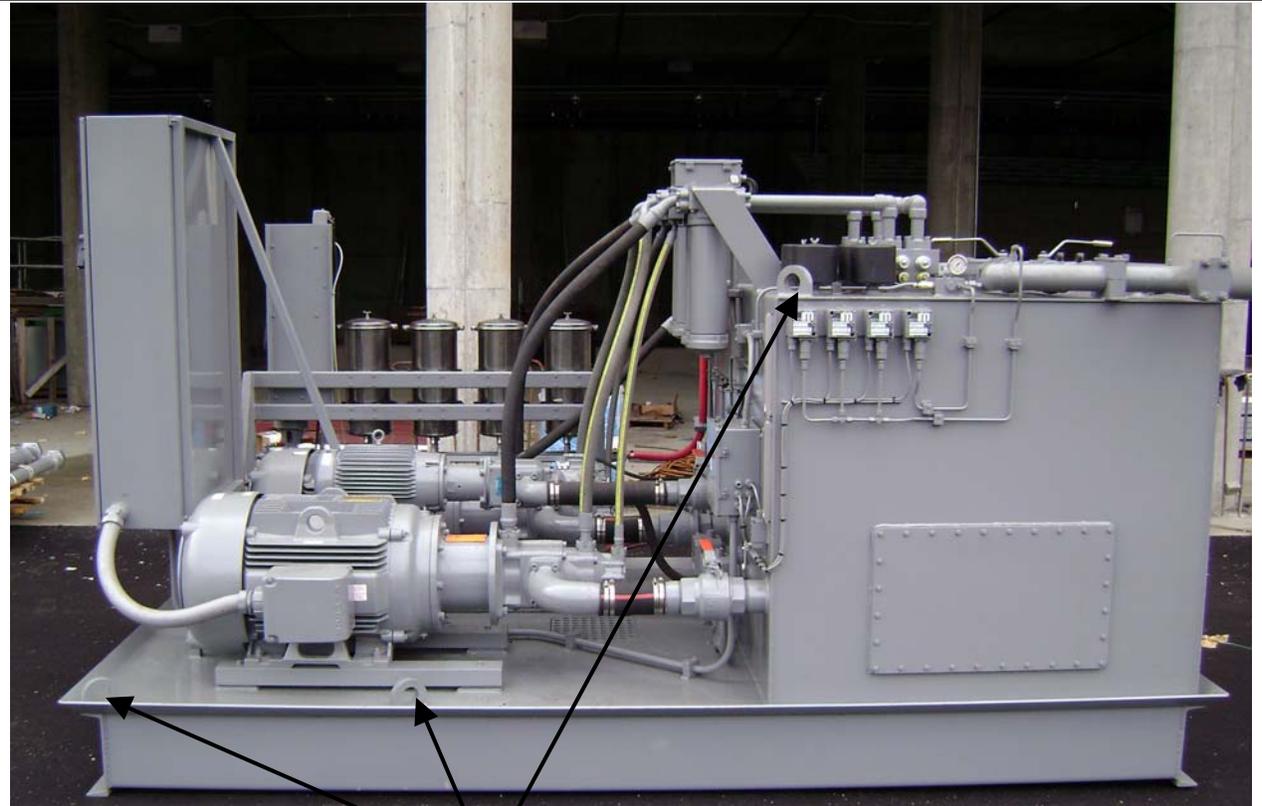
1. By forklift, as shown below.
2. By crane, using the lifting eyes provided at multiple points on the unit.

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.



Safe lifting points here and 3 more on the opposite site.

⚠ 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 cables, carefully read and understand Set-Up Considerations in Section 2.

When installing the hydraulic hoses and sensor 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.
2 C-ram pressure hoses, 3 C-ram return hoses, 1 return and 1 pressure for gate.
4 E-ram hoses.
2. Fill the reservoir; Make sure you can see the oil level on sight glass.
3. **High-Pressure Leaks Hazard is possible.** Make sure to be on alert at initial start up.
Do a walk around and make sure 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.

1. Connect the prewired wires to the correct location on the terminate strips on the main panel and J box on the Compactor.
2. Reattach Control Panel to the Compactor and terminate all the prewired wires to the Control Panel.
3. Install the Sign Board in location where visibility would be good.
4. Check all electrical connections and conduit.

The compactor is shipped assembled, although due to its size in multiple pieces. There will be one or more shipping containers that contain the hydraulic power unit, electrical controls, load cells, pedestals and other smaller parts.

If contracted, SSI can provide technical service representative(s) to direct the compactor installation and shakedown or full installation. If contracted to solely provide supervision it will be necessary to have at least 2 additional persons available to help with the installation, reattachment and assembly of the compactor. Also required are the services of a qualified welder and an electrician.

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.

Typically installation, assembly, testing, shakedown and training will require two weeks. Careful coordination with other contractors at the job site will be necessary to ensure that start-up progresses smoothly.

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 6*. Make sure that any wiring that has taken place during installation, including any accessory equipment, is in accordance with the schematic.

⚠ WARNING

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.

⚠ WARNING

Electric Shock Hazard.

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

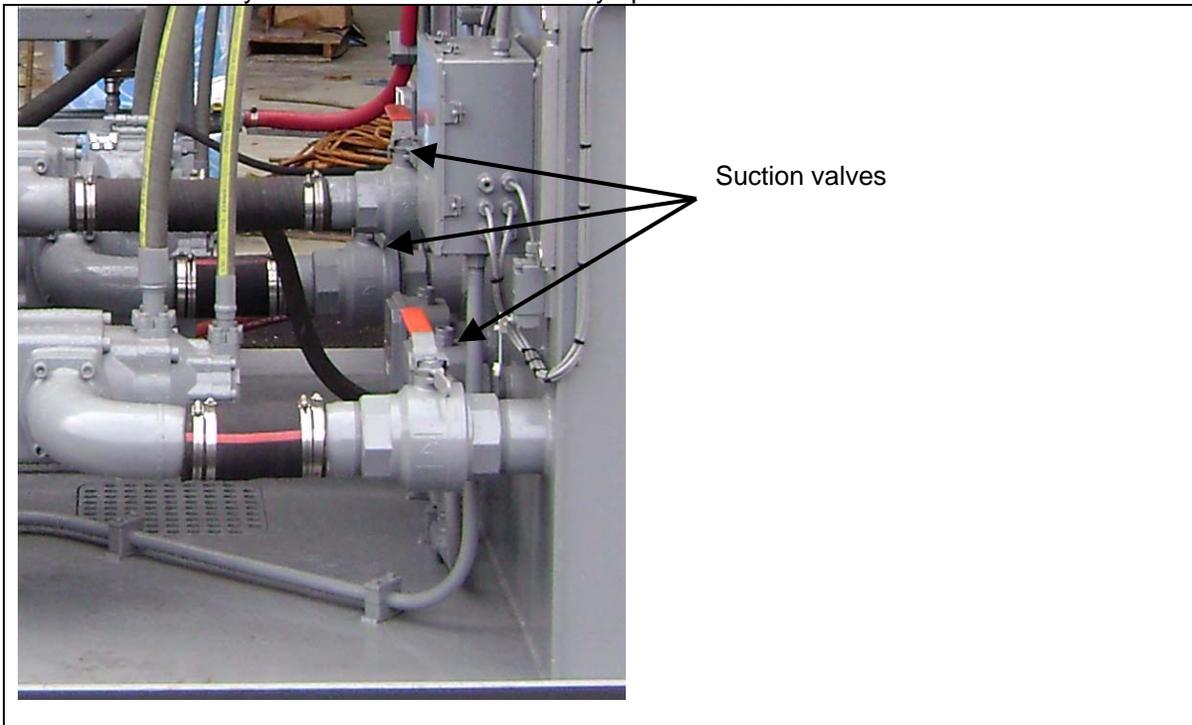
Lock out and tag out all power to panels and electric components before servicing.

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.

NOTICE

Check the Compactor 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.

6. Ensure that all hydraulic suction valves are fully open. See below.



7. 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.
8. Start the HPU by pressing and holding the HPU START/RUN button until the horn no longer sounds (about 5 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 motor starter panel was mounted to the HPU and the motors wired by SSI: Swap any two leads on the line side of the motor starter 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 shipped loose 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 5 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 2 seconds. Scan the lights to see that none of them are burned out.
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 the **HPU START/RUN** touch cell on the Panel View. 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.



SECTION 3 CONTENTS OPERATION

SECTION	PAGE
3.0	1

CONTENTS	3.0
RANGE OF APPLICATIONS	3.1
CONTROL PANEL FUNCTIONS	3.2
CONTROL PANEL MESSAGES	3.2.1
STARTING THE COMPACTOR	3.3
OPERATING THE COMPACTOR	3.4
STATUS LIGHTS & WARNING HORN	3.5
RADIO REMOTE CONTROL (Optional)	3.6
ENTERING THE HOPPER/CUTTING CHAMBER	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.

Materials recommended include:

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

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
- 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	4
HPU Screen	5
PLC Inputs	6
PLC Outputs.....	7
Last 46 Truck Loads.....	8
Alarm History.....	9
Maintenance Record 1	10
Maintenance Record 2.....	11
Auto Weight.....	12
Truck Setup.....	13

CONTROL PANEL



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

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

(E) HPU Systems Auto Start/Run

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

(I) Systems Auto Stop Button

Stops the auto operation.

(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.

(J) COMPACT

Causes the platen to push material until it compacts it against the gate and then returns to the fully retracted position.

(G) 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.

(K) MOMENTARY CONTACT - FOUR POSITION JOY STCK

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).

(N) 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

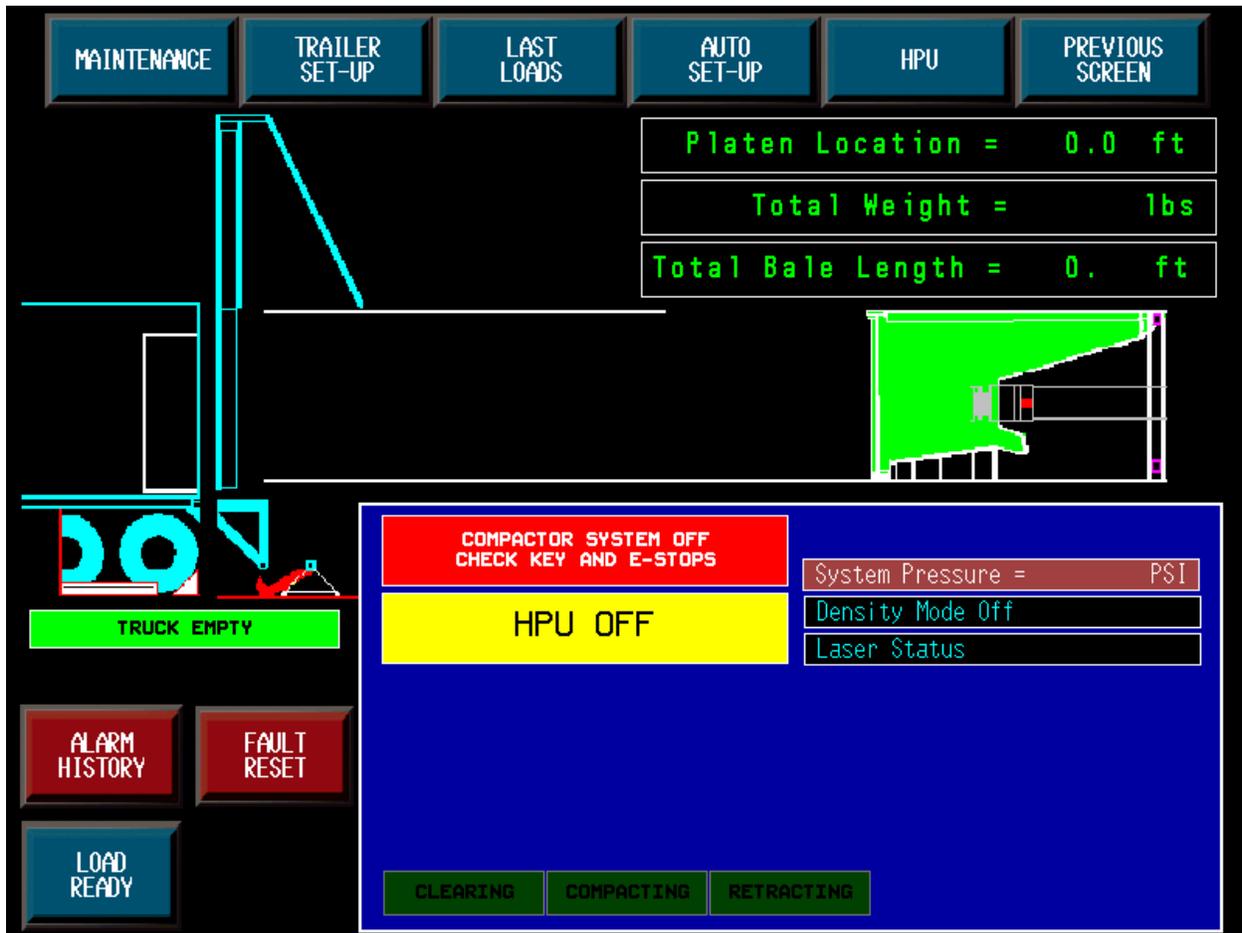
The system uses a touch sensitive computer monitor to permit activating functions or moving to new screens by simply touching the button or indicator shown on the screen. Care should be used to prevent damaging the screen. Dirty gloves or hands can transfer grit to the screen, which will scratch it and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

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

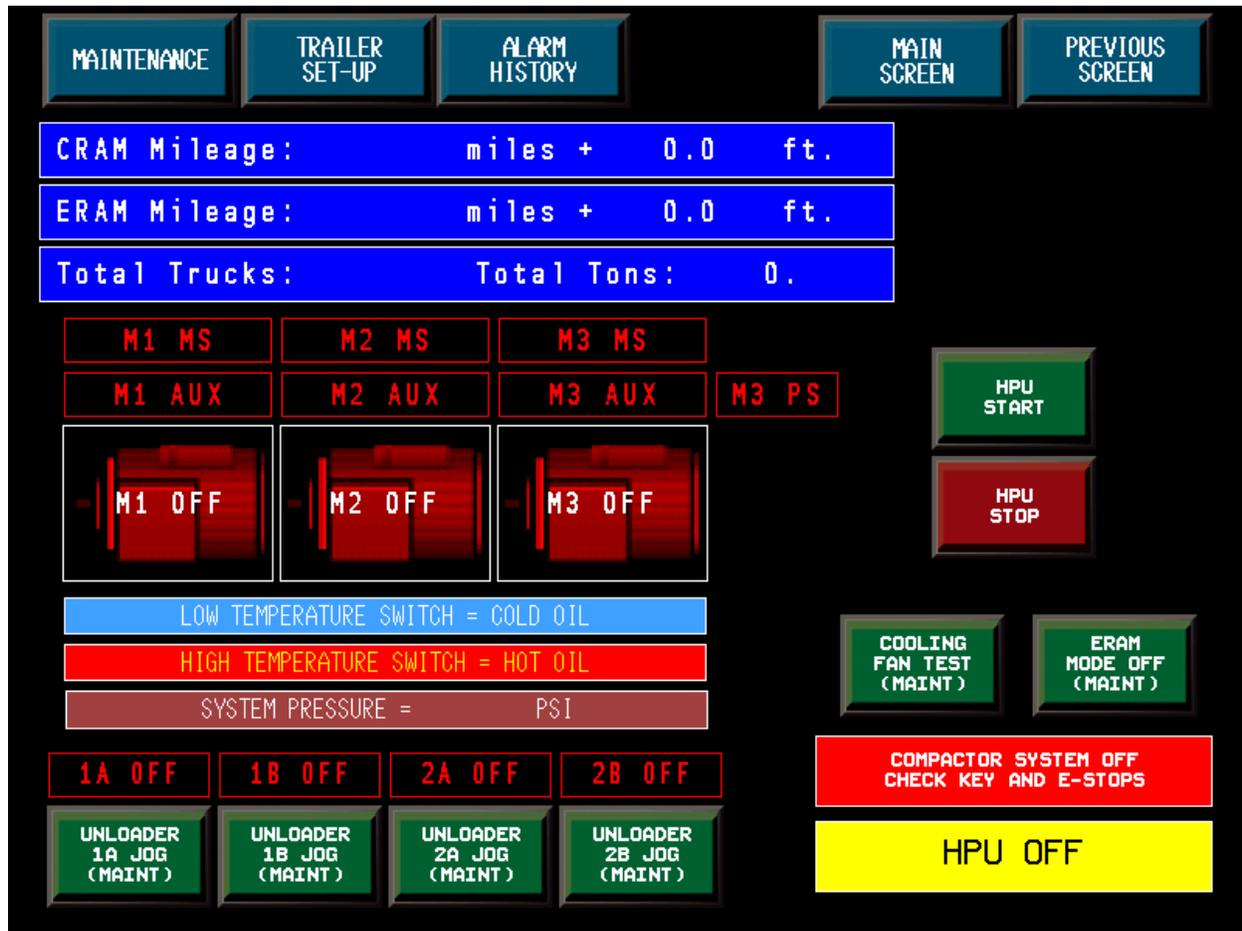
Bale weight and length for the bale is displayed. Also if it is done and has been moved is displayed.

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, monitors solenoids, density mode.



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.

		HPU	OUTPUTS	MAIN SCREEN	PREVIOUS SCREEN
Control Power KeySwitch OFF			Radio Compact Input OFF		
Maintenance KeySwitch OFF			Radio Shut Input OFF		
			Radio Clear Input OFF		
			Radio Load Ready Input OFF		
			Radio Stop Input OFF		
Laser Plausible Input OFF			Laser Input Integer = 0		
Laser Service Input OFF			Laser Feet = 0.0		
GRAM Extend Switch OFF			Scale Input Integer = 0		
GRAM Retract Switch OFF			Scale Weight = 0		
ERAM Retract Switch #1 OFF					
ERAM Retract Switch #2 OFF					
Gate UP Switch OFF			Hopper Level Switch OFF		
Gate DOWN Switch OFF			System Pressure Switch OFF		
HPU M1 Suction Valve OFF					
HPU M2 Suction Valve OFF			HPU Oil Hot Input OFF		
HPU M3 Suction Valve OFF			HPU Oil Level Input OFF		
HPU Oil Warm Input OFF					
HPU FanStat Input OFF					

3. INPUT STATUS SCREEN

The following information is displayed:

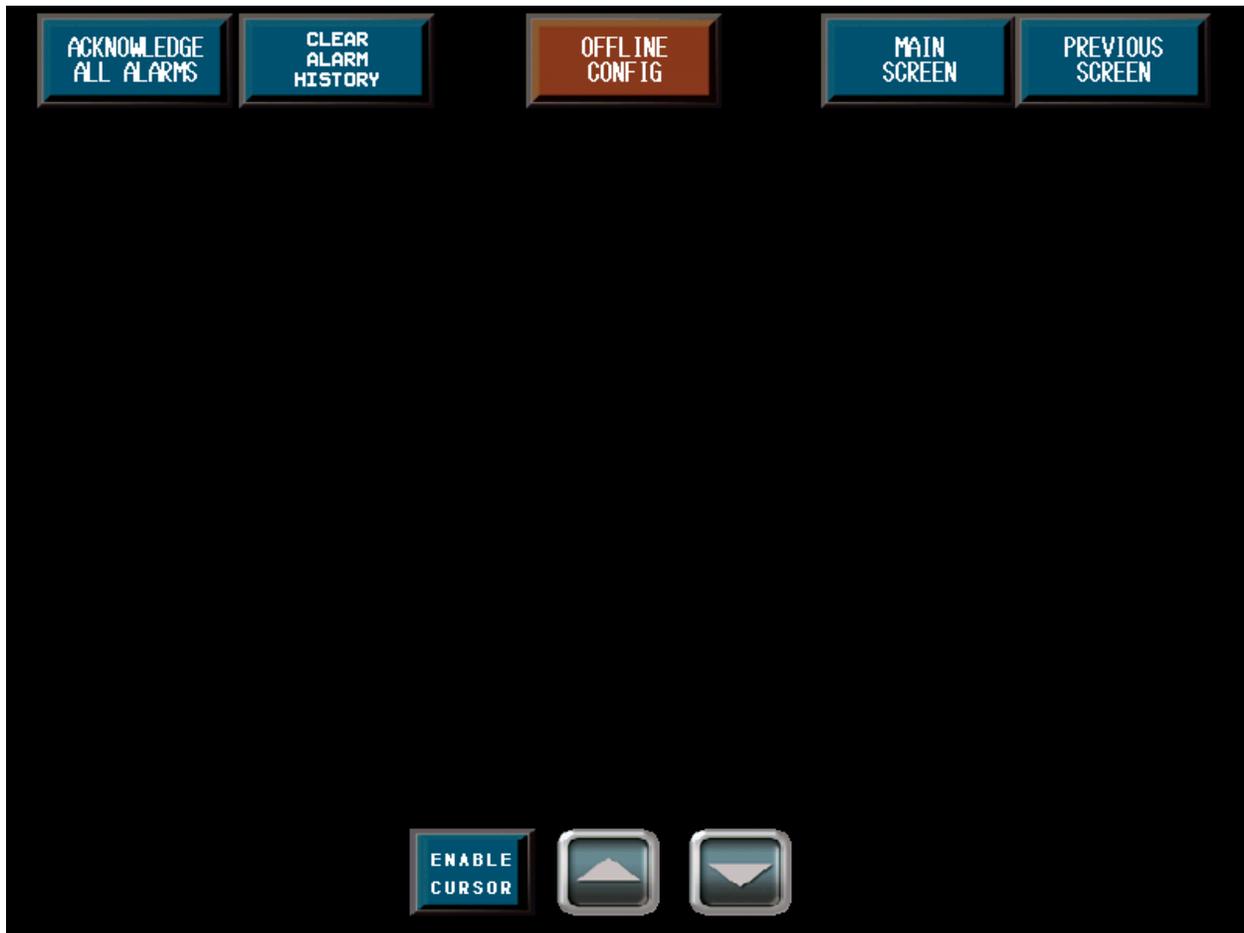
This screen allows the operator or maintenance personnel to monitor the various inputs to the PLC. This is a very valuable trouble-shooting tool for the compaction system.

<div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> HPU INPUTS MAIN SCREEN PREVIOUS SCREEN </div>	
Hour Meter OFF	
GRAM Extend Solenoid OFF	
GRAM Regen Solenoid OFF	
GRAM Retract Solenoid OFF	
ERAM Extend Solenoid OFF	
ERAM Decompress Solenoid OFF	
ERAM Retract Solenoid OFF	
Hook UP Solenoid OFF	Hook UP Light OFF
Hook DOWN Solenoid OFF	Hook DOWN Light OFF
Gate UP Solenoid OFF	HPU Fan Starter OFF
Gate DOWN Solenoid OFF	
Unloader Pressure Switch OFF	
Unloader #1A Solenoid OFF	Unloader #1A PSI = 0
Unloader #1B Solenoid OFF	
Unloader #2A Solenoid OFF	
Unloader #2B Solenoid OFF	

4. OUTPUT STATUS SCREEN

The following information is displayed:

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

**6. ALARM HISTORY SCREEN**

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

DAILY MAINTENANCE CHECKLIST**1. Inspect and Clean Power Unit**

CHECK A. Remove trash from motors, valves, and oil cooler.

CHECK B. Check machine for leaks, loose fittings and bolts, frayed wire, worn hoses, etc.

CHECK C. Check oil level (with cylinders fully retracted). Add as needed.

2. Remove trash behind platen and carriage

CHECK A. Check for trash on DME LASER reflector. Remove and clean if any is found.

CHECK B. Inspect hose track for damage. Replace any damaged sections.

3. General Inspection

CHECK A. Observe operation of compactor. Check for unusual noise or vibration.

**NEXT
MAINTENANCE
SCREEN****MAIN
SCREEN****PREVIOUS
SCREEN****WEEKLY MAINTENANCE CHECKLIST**

CHECK I. Inspect platen and chamber knife for damage and looseness. Inspect compaction walls.

CHECK II. Measure knife gap. Inspect platen face face to floor clearance. Inspect carriage height. Inspect carriage side bearings. Inspect gate track wear strip thickness.

CHECK 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.

CHECK IV. Hose and pipe inspection.

7. MAINTENANCE SCREEN #

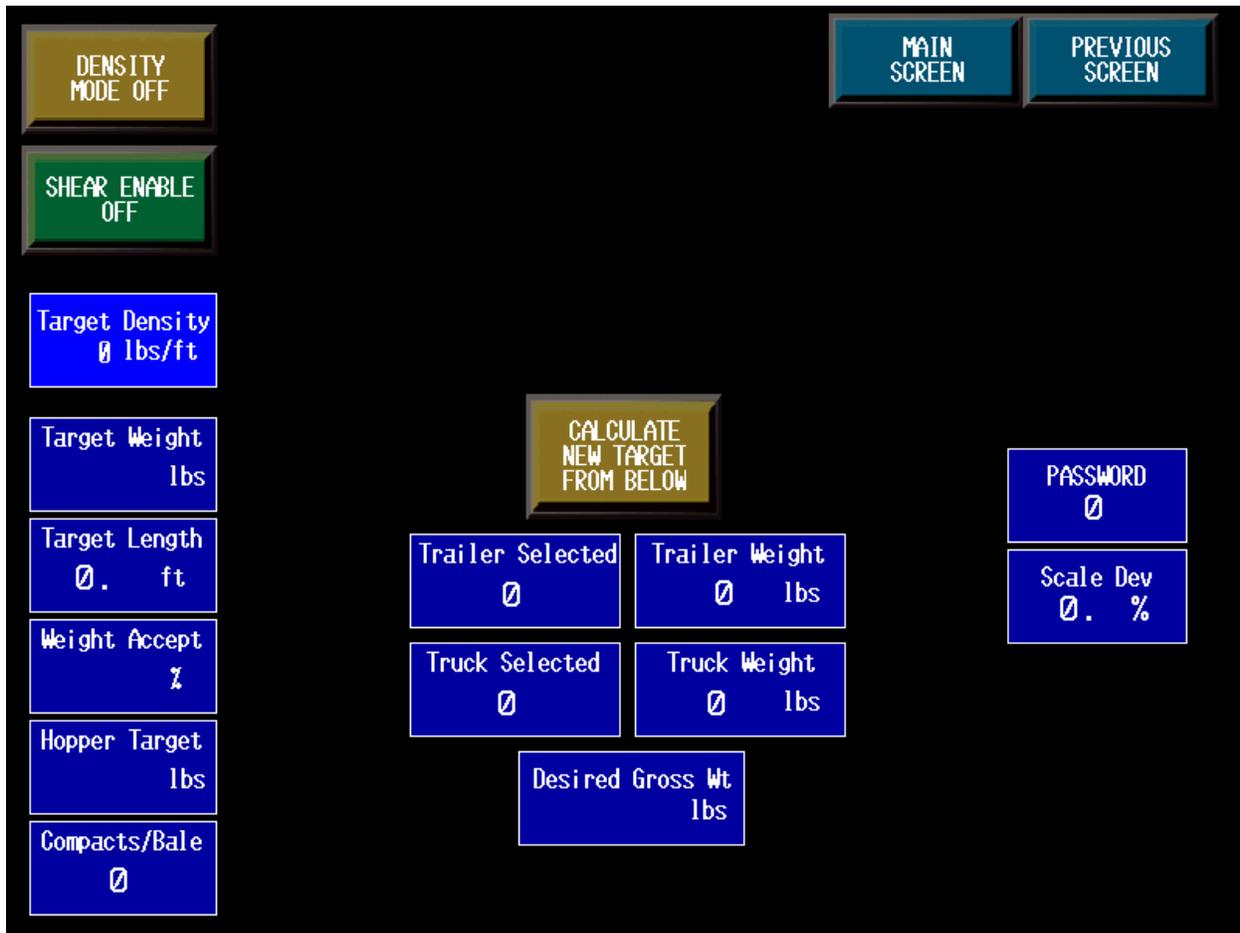
This screen shows the compactors Daily and Weekly maintenance requirements and this need to be checked off as they are completed.

The screenshot shows a control panel interface with a navigation bar at the top containing buttons for ALARM HISTORY, INPUTS, OUTPUTS, NEXT MAINTENANCE SCREEN, MAIN SCREEN, and PREVIOUS SCREEN. Below the navigation bar, there are five blue boxes, each representing a maintenance task with a due time and a list of instructions:

- 150 Hour maintenance due in 0.00 hours**
 1. General inspection.
 2. Take hydraulic oil sample and replace HPU filters.
- 750 Hour maintenance due in 0.00 hours**
 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.
- 3000 Hour maintenance due in 0.00 hours**
 1. Replace PLC battery.
 2. Replace hydraulic oil, and replace HPU filters.
- Compaction cylinder rebuild due in 0.00 miles**
 1. Replace seals, wipers, and wear bearings.
- Ejection cylinder rebuild due in 0.00 miles**
 1. Replace seals, wipers, and wear bearings.

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.



Compact #1 Wt = 0 Accept = 0 Done = NO	<p>MAIN SCREEN</p> <p>PREVIOUS SCREEN</p> <p>COMPACTOR SYSTEM OFF CHECK KEY AND E-STOP</p> <p>HPU OFF</p>				
Compact #2 Wt = 0 Accept = 0 Done = NO					
Compact #3 Wt = 0 Accept = 0 Done = NO					
Compact #4 Wt = 0 Accept = 0 Done = NO					
Compact #5 Wt = 0 Accept = 0 Done = NO					
Compact #6 Wt = 0 Accept = 0 Done = NO					
Compact #7 Wt = 0 Accept = 0 Done = NO					
<p>Target Density = 0 lbs/ft</p> <p>Target Weight = 0 lbs</p> <p>Target Length = 0.0 ft</p> <p>Bale Density = 0 lbs/ft</p>					
SELECT TRAILER 1	SELECT TRAILER 2	SELECT TRAILER 3	SELECT TRAILER 4	SELECT TRAILER 5	<p>Weight Accept %</p> <p>Hopper Target lbs</p> <p>Compacts/Bale 0</p>
Target Weight lbs	Target Weight lbs	Target Weight lbs	Target Weight lbs	Target Weight lbs	
Target Length 0. ft	Target Length 0. ft	Target Length 0. ft	Target Length 0. ft	Target Length 0. ft	

10. Truck Setup Screen

This screen allows the operator to set, up to five different traile



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.

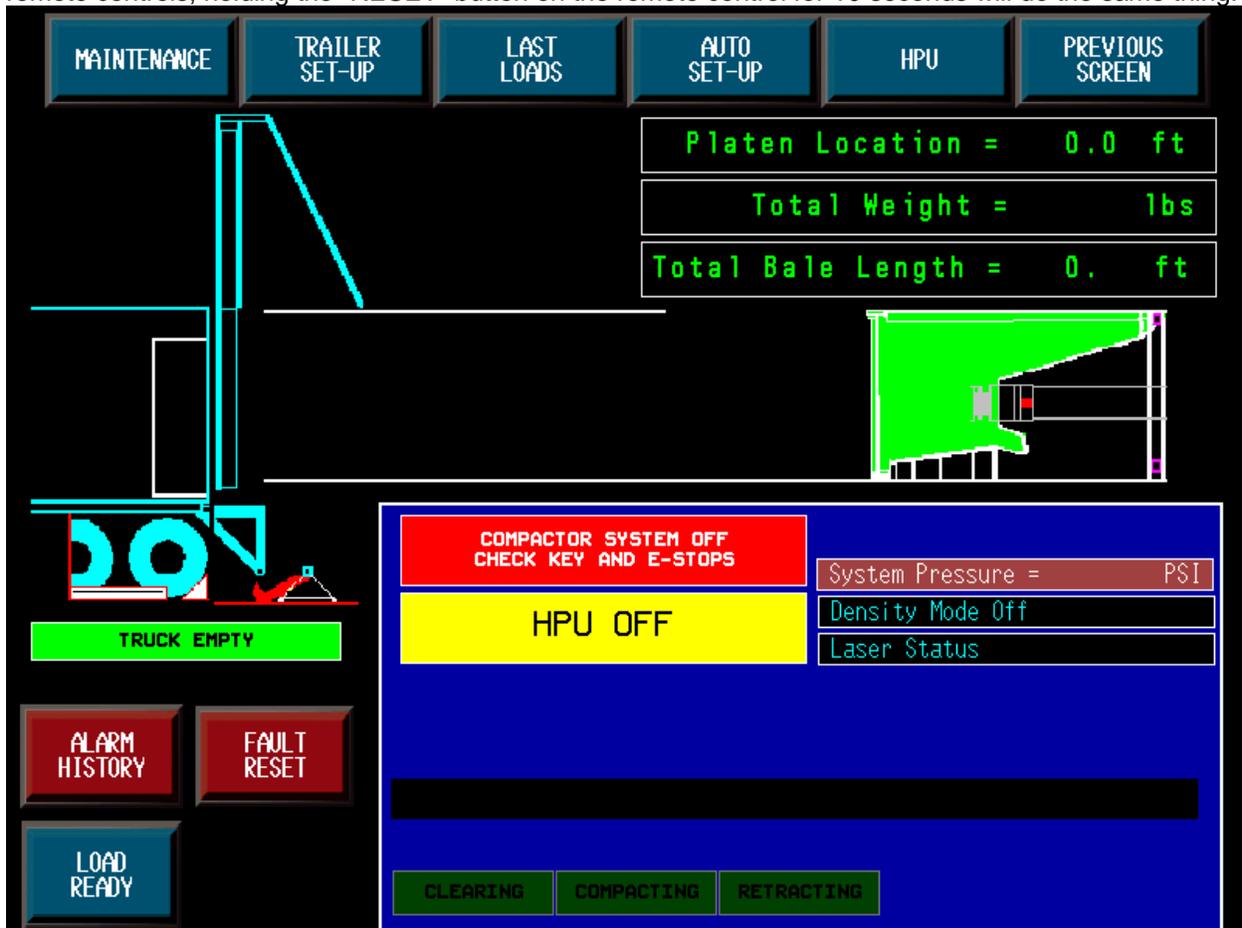
Fault Messages – Displayed in the fault messages bar on the main screen. All of the faults require the operator to fix the situation prior to restarting the process.

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. On units equipped with radio remote controls, pressing the “RESET” button on the remote control will do the same thing.

To reset the fault, hold the SYSTEM FAULT/RESET button for 10 seconds. On units equipped with remote controls, holding the “RESET” button on the remote control for 10 seconds will do the same thing.





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.

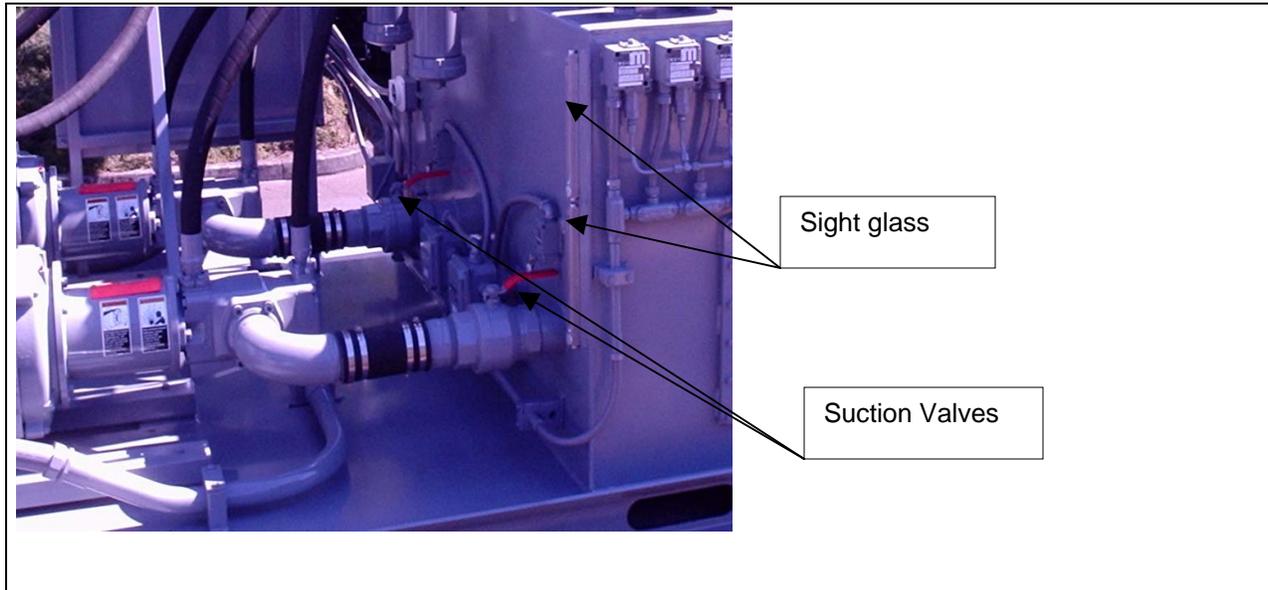
HPU COLD OIL

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

MOTOR 1 SOFT START FAULT (MOTOR 2 SOFT START FAULT if second motor is provided)

If the main motor is started using an electronic soft start, 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 Soft Start 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.



CONTROL PANEL MESSAGES

SECTION

PAGE

3.2.1

4

MOTOR 1 AUX CONTACT FAULT (MOTOR 2 AUX CONTACT FAULT if second motor is provided)

If the main motor is started using a relay this message indicates that the electric motor overloads have tripped. Determine why the motor is overloaded and wait for the overloads to cool down. When the overloads have reset themselves, reset the fault and restart the HPU.

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 bit win platen and carriage.

WARNING

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

WARNING

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, engage power to the Motor Starter Panel from the power source.
2. Turn ON all of the main breakers located on the front of the Motor Starter Panel.
3. 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.
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 of the HPU electric motors in sequence. If the HPU does not start, check all EMERGENCY STOP buttons and pull out any that are depressed and check the access doors.

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.

5. When the green status light is on all three motors, the compactor is ready to process material.

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

WARNING

Trained, authorized personnel should only operate this equipment.

WARNING

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.

WARNING

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

WARNING

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.

Correcting the problem and then pulling 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 place the platen in the load chamber and close 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 PREVENTIVE 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 safely clear of the machine prior to starting operation. 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 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. See 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. Normally, material is placed into the compactor by automatic methods such as rubber belt or steel pan conveyors. In some 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.

DANGER

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.

WARNING

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.

DANGER

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

The compactor controls has a "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. The following is a list of material that 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. The process is an efficient means of condensing MSW to minimize transportation costs.

Material is loaded into the charge chamber 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.

Two Mode Bale

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 compact.

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.

Different materials act in different ways when being compacted. The compactor will build a denser or heavier bale with more compaction strokes, possibly four, than with less compaction strokes, possibly two, with the average of three. A very heavy wet MSW material would require less compaction strokes to compress the material into a bale and in some cases may not be able to build a bale that will maintain its shape for moving into a container or trailer. In this case, the compactor would be programmed to build a shorter bale at the same weight to compress the material to a greater density and then placed farther in the container to maintain the proper transporting weight distribution. A very 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 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 latched, 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.

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 full up position.

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

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.

Setting Bale Size, Weight, and Cycles

The operating parameters for the compactor will be set up during the initial start up of the system. If refinements to the set-up are desired, please contact SSI Customer Service for assistance. The following is provided for information only.

The Panel View is located on the control panel can be used to input the desired bale weight, bale length and bale cycle using the **Auto Set-UP**.

Press the **WEIGHT TARGET** button then use the keypad to enter the weight desired. For bale length use **LENGTH TARGET** button then the key pad to enter length. Use the COMPACTS PER BALE to enter compaction strokes.

For automatic operation, the bale cycle is controlled using the Constant Density feature. When the Constant Density feature is on, then the bales will be built to a constant density. This means that the bale length and weight will be made to the target values if possible. If the Constant Density feature is off, then the bale will be compressed to its minimum length on each compaction full pressure cycle.

It is recommended to operate the compactor with the Constant Density feature ON.

For automatic clear cycles, the feed chamber fill weight can be revised to change the fill level of the material in the feed chamber. Entering in the weight using **HOPPER TARGET** does this, and then enters in the desired weight. When this amount of material has been added to the feed chamber, a clear cycle will be initiated (in **AUTO** cycle mode only). If a level indicator is used to determine the fill level, a time delay can be adjusted using the Panel View to control the fill

See the section on **PANEL VIEW OPTIONS** to review data input to the compactor PLC.



Compactor™ system is equipped with three status lights mounted on the wall of the dumping floor 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

WARNING HORN

Solid - Manual warning horn, operator is pressing the horn button on the radio

Steady beeping - 5 seconds of warning horn are sounded prior to any machine operations

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

Strobe light

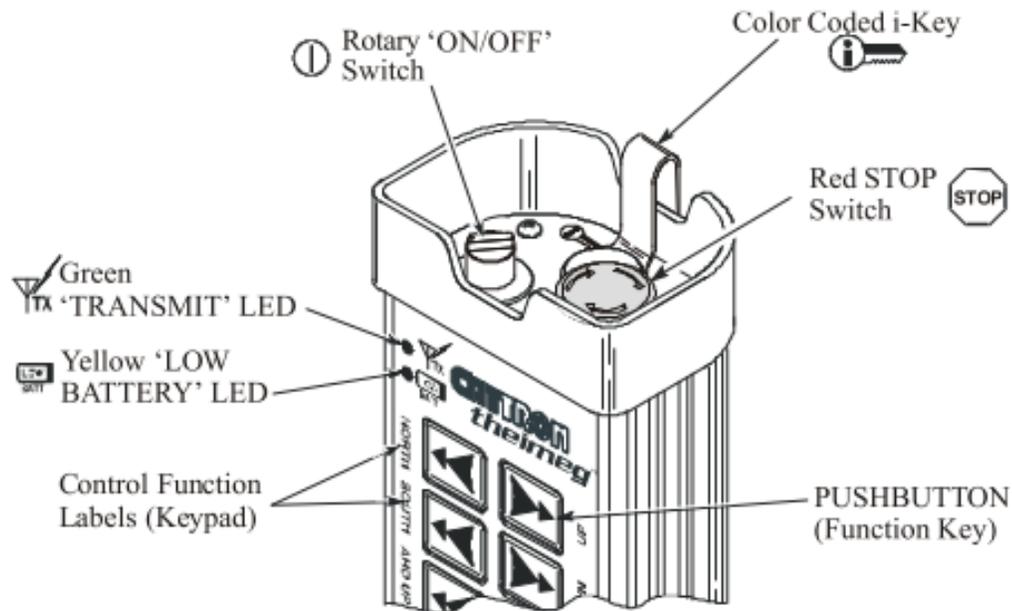
Will flash when load is ready

The Compactor may be operated from two controls – the control panel and the radio remote control. 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, load ready button and 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).

Figure 3-1. Operator controls and indicators



Note: The emergency stop is only functional when the remote control is ON and in use.

To activate the remote control:

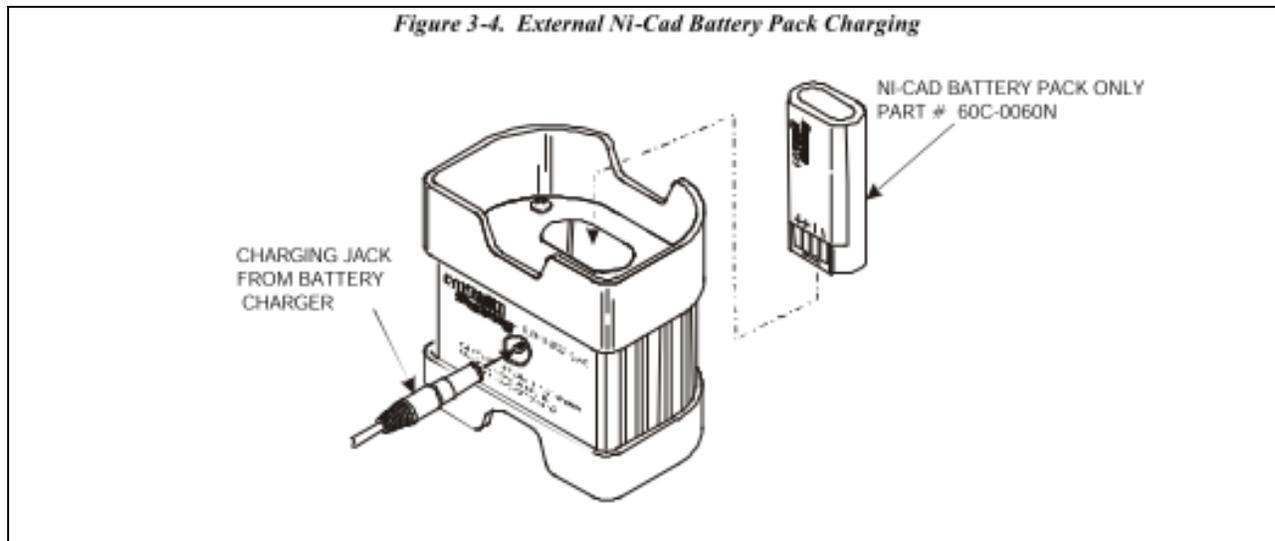
1. Turn the ON/OFF key (knob on top of unit) to the ON position.
2. Watch the green LED. When it starts to blink, the remote control is communicating with the receiver in the control panel. When it stops blinking radio is ready.
3. Any of the push buttons may now be used to control the Compactor.
4. If the **emergency stop** is activated the green LED automatically blinks for one minute.

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, shut off the conveyors if present.
4. **Retract button.** If the platen is not in the home position, this button will cause the platen to return to the fully retracted position.
5. **Load Ready button.** Button can be pressed after a manual compaction, allowing the gate to be raised and the bale ejected. See the Ejecting Bale section below for the ejection sequence of operations.

CHARGING THE RADIO REMOTE CONTROL BATTERIES

The rechargeable batteries are charged inside the operator control panel. It is also possible to purchase non-rechargeable AA batteries for the remote control. They should not be charged in these chargers.



The remote control batteries are charged from control power. The charger is located inside the operator control panel. Batteries typically last at least one shift, so they should be in the charger when they are not in use.

Keep this box securely closed at all times to keep it from becoming full of dirt.

⚠ 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.

On Compactors, 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.



Main Power

There are several sources of electrical energy to consider.

1. Control Voltage. The maximum voltage on the control circuit of the Compactor 115 VAC. Locking out the main disconnect eliminates this voltage.
2. Main Power. The main incoming power will be between 460VAC and 575VAC depending on facility requirements. Locking the main breaker will eliminate any voltage to all the circuits except the incoming leads to the breakers themselves. To isolate this voltage, the breakers feeding the motor control panel will have to be turned off and locked out.

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

CONTENTS	4.0
LOCKING OUT THE COMPACTOR	4.1
DAILY INSPECTION	4.3
MAINTENANCE WEEKLY (A)	4.4
MAINTENANCE INITIAL 150 HOURS (B)	4.5
MAINTENANCE EVERY 750 HOURS (C)	4.6
MAINTENANCE EVERY 3000 HOURS (D)	4.7
CYLINDER MAINTENANCE (E)	4.8
PREVENTATIVE MAINTENANCE RECORD	4.9
INSPECTION FORMS	4.10

⚠ DANGER

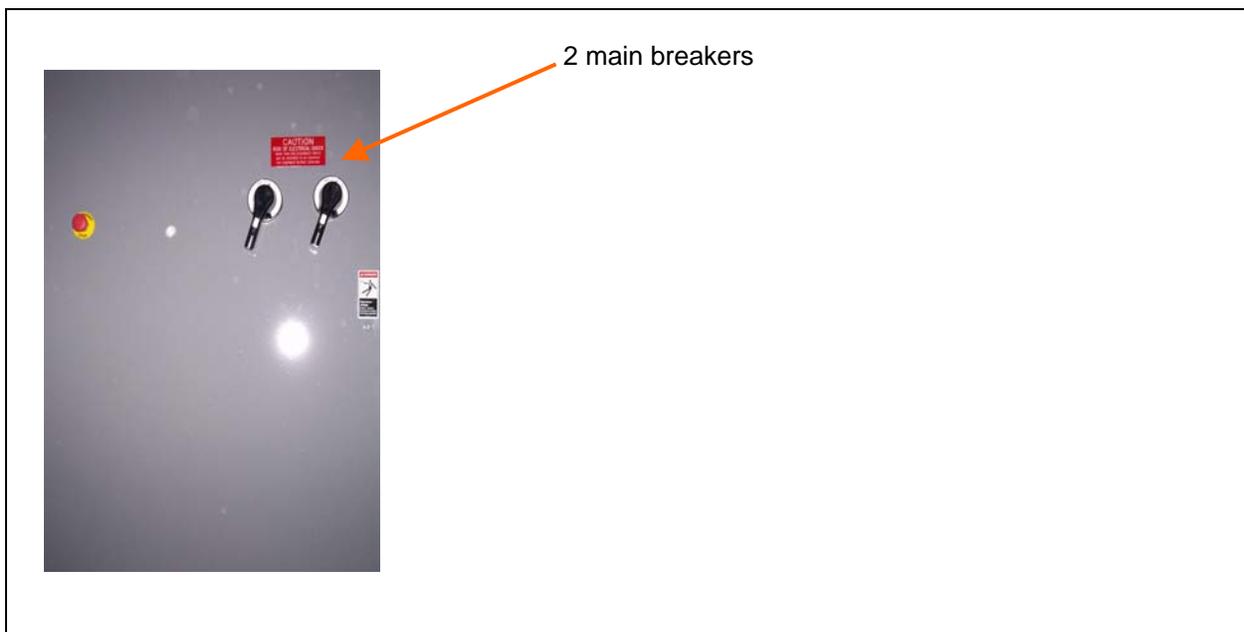
Unexpected machine startup can result in death or severe personal injury.

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.

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.



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 mobile compactors is 24 VDC. Locking out the main disconnect switch prevents eliminates this voltage.

Main Power - The main incoming power will be between 380VAC and 575VAC depending on facility requirements. Locking the main breakers will eliminate this voltage from all of the circuits except the incoming leads on the breakers themselves. To isolate this voltage, the breakers feeding the motor control panel will have to be turned off and locked out.

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

⚠ WARNING

When Machine is in Motion.

Moving parts can cause personal injury. Do not work on or enter any part of the compactor while it is operating.

⚠ WARNING

Stored Energy in Cylinders.

Hydraulics cylinders may contain pressurized hydraulic fluid after the motors have been turned off. Bleed of all pressure prior to working on the cylinders or the hoses leading to them.

⚠ WARNING

Moving Parts 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.

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

⚠ WARNING

Burn Hazard.

Hydraulic fluids 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

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.

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 4.1, Locking Out the Compactors.*

WARNING

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

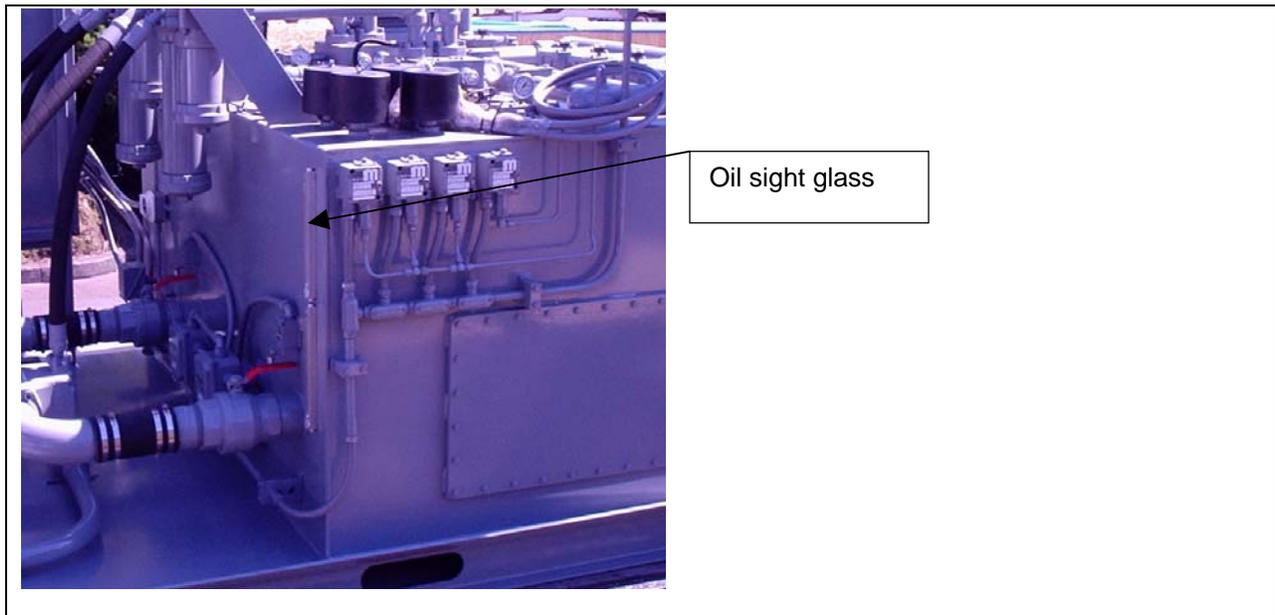
WARNING

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.

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



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.

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



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.*

⚠ WARNING

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

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 Inspection A

PRIOR TO INSPECTION

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. 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 75 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).

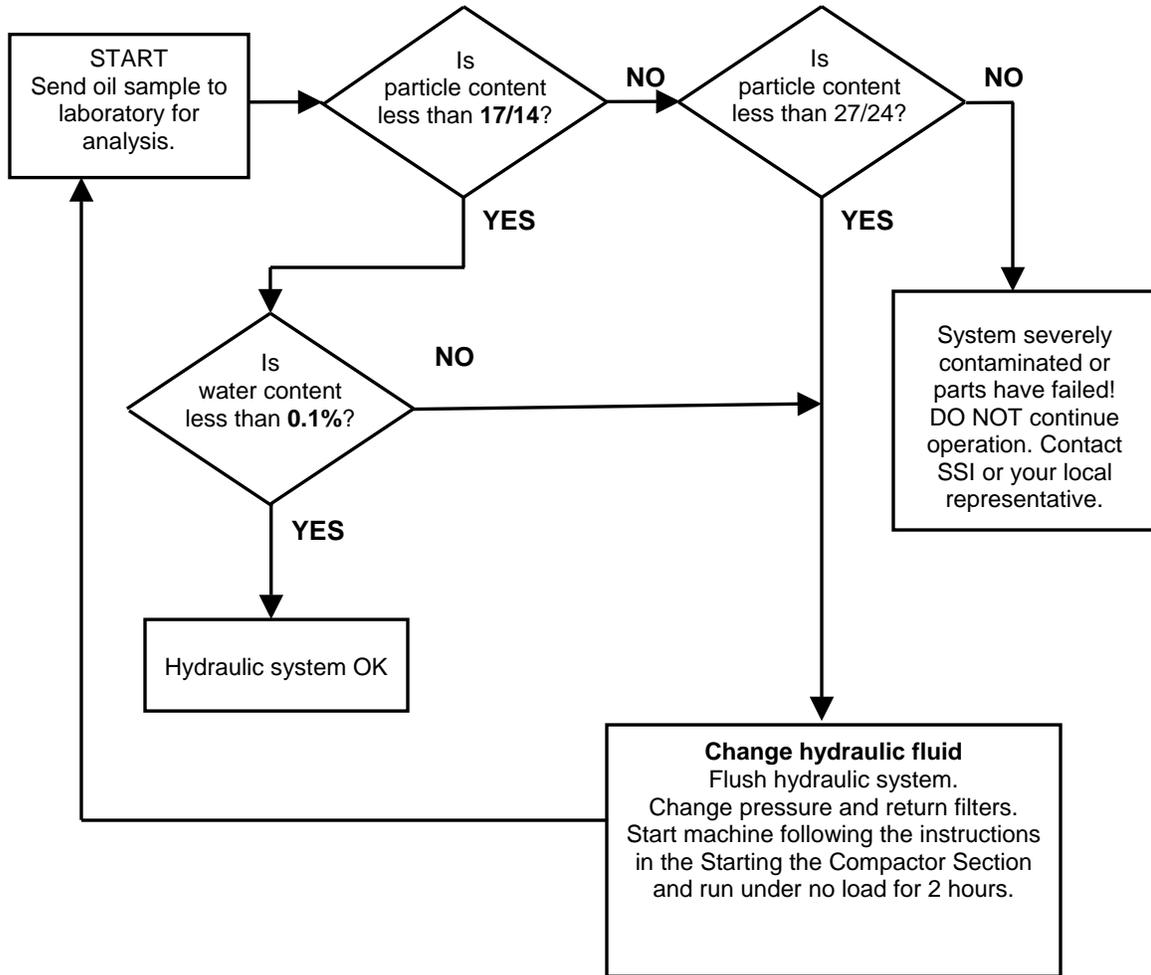
⚠ WARNING

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 bottle, obtain a sample from the hydraulic oil reservoir 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:





INSPECTION AND SERVICE C 750 HOURS

SECTION

4.5

PAGE

3

Replace all filter elements.

General inspection of the system.

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 and the *Parts Lists* section 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 and the *Parts Lists* section for the correct part number).
3. Replace the filter element on the tank filler breather (if provided) (Refer to the *Parts Lists* section for the correct part number).



INSPECTION AND SERVICE D 3000 HOURS

SECTION

4.6

PAGE

1

Performed every 1000 hours of operation

3000 hour inspection includes the following along with Daily Inspection and Inspection A

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. 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 and the *Parts Lists* section 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 and the *Parts Lists* section for the correct part number).
3. Replace the filter element on the tank filler breather (if provided) (Refer to the *Parts Lists* section for the correct part number).
4. Replace the Hydraulic Oil.



**Performed every 378 miles of operation
378miles inspection includes the following along with Daily Inspection and
Inspection A**

To our Compactor Customers

Tips for Care and maintenance of your Cylinders

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 years of duty, internal wear rings and seals will need to be replaced under normal circumstances.

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.

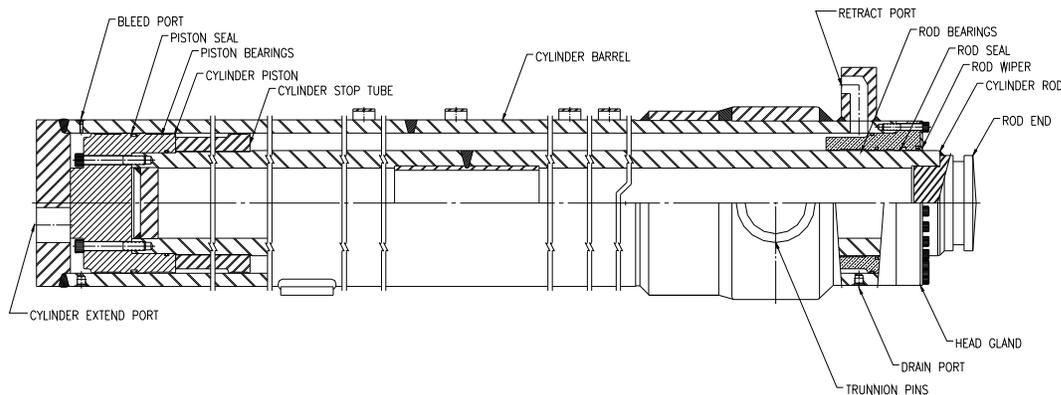
Please contact SSI if you wish to have us help to inspect your cylinders or change seals for you.

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.

HYDRAULIC CYLINDER OPERATION

Double Acting Hydraulic Cylinder – Is a device which converts hydraulic oil pressure and flow into linear mechanical force and motion. It consists of a Piston attached to the end of a Rod that is in a cylindrical bored Barrel and is contained by a cylinder Head Gland. Hydraulic oil pressure and flow are forced into the Extend Port at the end of the cylinder to extend the Rod. Hydraulic oil and flow are forced into the Retract Port of the cylinder to retract the rod. This action is what forces the cylinders to move the Platen and Carriage (CRAM cylinder), Discharge Gate (Gate Cylinders) and the Trailer Latch (Trailer Latch Cylinder).

As an added feature of the SSI Cylinder design, all steel surfaces that can come in contact with one and another if bearings wear beyond their recommended replacement period, all these surfaces have been overlaid with an Aluminum-Bronze material. Aluminum-Bronze is an excellent bearing material in its own right, but having this added feature prolongs the life of a cylinder if bearings are not changed at appropriate intervals. SSI requires Hydraulic Oil Sampling during the warranty period of these cylinders. Maintaining good clean hydraulic oil is a must to insure long life for hydraulic components. Early detection of elevated levels of Aluminum-Bronze is a benefit of taking routine oil samples of the hydraulic system with respect to cylinder wear.

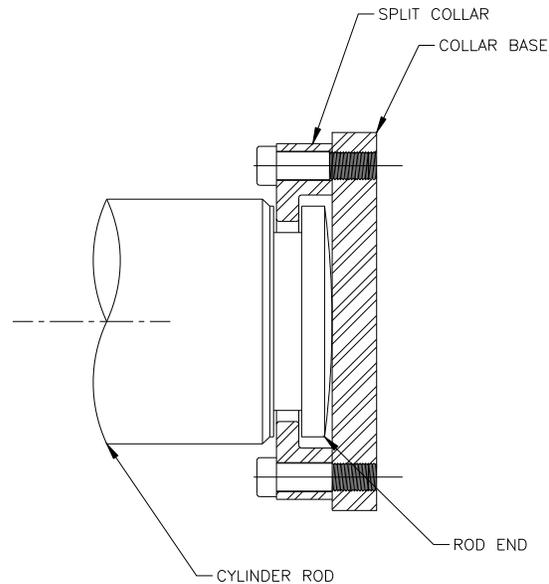


The double acting piston cylinders used in the SSI Compaction System are specifically designed to the application of the waste compactor. From many years of constructing compaction systems for the waste handling and transportation industry, SSI has designed these cylinders with the following components and their benefits.

Cylinder Barrel – is a heavy wall tube that has been bored to a specific dimension and honed to a smooth surface to prolong the life of Piston Seals and Piston Bearings.

Cylinder Rod – Is a hollow heavy wall steel tube that is machined to a specific outside dimension and is chrome plated to extend the life of the rod bearings and seals.

Cylinder Rod End – Is a solid hardened steel plug that is welded to the end of the cylinder rod. It is specifically designed to fit into the SSI Rod end collar assembly that allows for Platen and Carriage Bearing wear. As shown on the sketch below, the Split Collars are bolted to the Collar Base. As the Cylinder Rod extends, the hardened steel Cylinder Rod End pushes directly against the Collar Base Plate. As the Cylinder Rod retracts, the rear face of the Cylinder Rod End pulls against the Split Collars. The Split Collar Bolts should be checked for proper tightness occasionally according to the Owners and Operators Maintenance Manual.





Daily Preventive Maintenance Check list

Date: _____ Hour meter Reading: _____

Performed by: _____

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.	

Torque Spec's

Trunnion mounting Super nuts e-ram: 40/ft-lbs/ and c-ram 75/ft-lbs/

- ERAM coupling: 410/ft-lbs
- ERAM Head gland bolts: 120 – 130/ft-lbs
- CRAM Coupling: 680/ft-lbs
- CRAM Head gland bolts: 250 – 275/ft/lbs

Comments:



Weekly Preventive Maintenance Check List

Date: _____ Hour Meter: _____

Performed by: _____

- I. 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	

- II. 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	

- III. 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	



IV. 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	



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

	INSPECTION FORMS	SECTION 4.9	PAGE 1
---	-------------------------	-----------------------	------------------

Please contact SSI SHREDDING SYSTEMS, INC. for these forms.



**SECTION 5 CONTENTS
SERVICE**

SECTION

5.0

PAGE

1

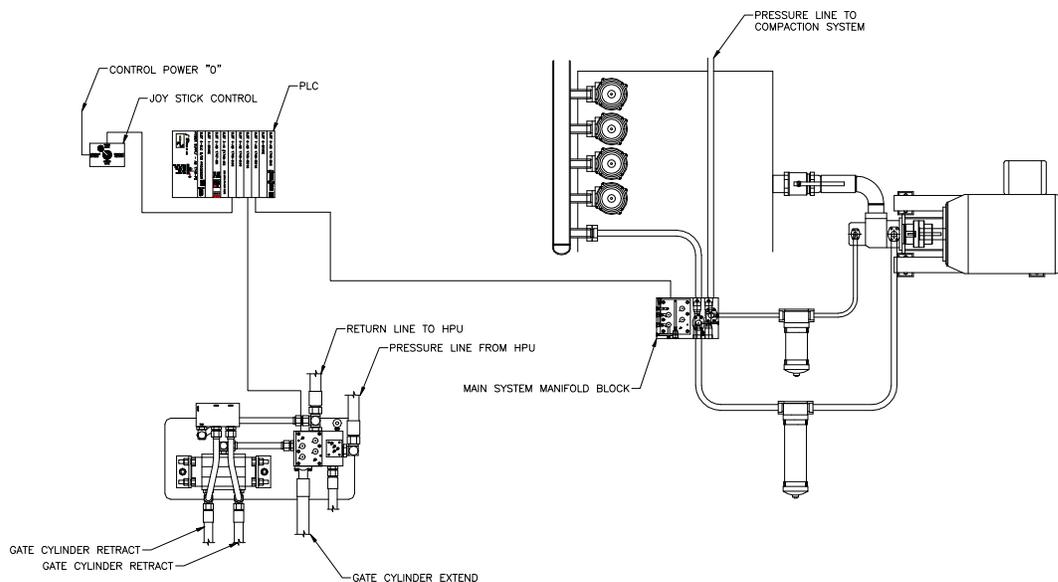
CONTENTS	5.0
CONTROL SYSTEM THEORY OF OPERATION	5.1.0
HYDRAULIC THEORY OF OPERATION	5.1.1
LOCKING OUT THE COMPACTOR	5.2
HYDRAULIC PRESSURE CHECK PORTS	5.4
CHANGING THE RETURN FILTERS	5.5
CHANGING THE PRESSURE FILTERS	5.6
MAIN PUMP PRESSURE SETTINGS	5.9
INSTRUMENTATION CALIBRATION	5.10
HEAT EXCHANGER SERVICE	5.15

PROGRAMMABLE LOGIC CONTROLLER OPERATION

The **Programmable Logic Controller (PLC)** is the heart 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. On the next pages, an example of RS-Logic software is shown. 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.



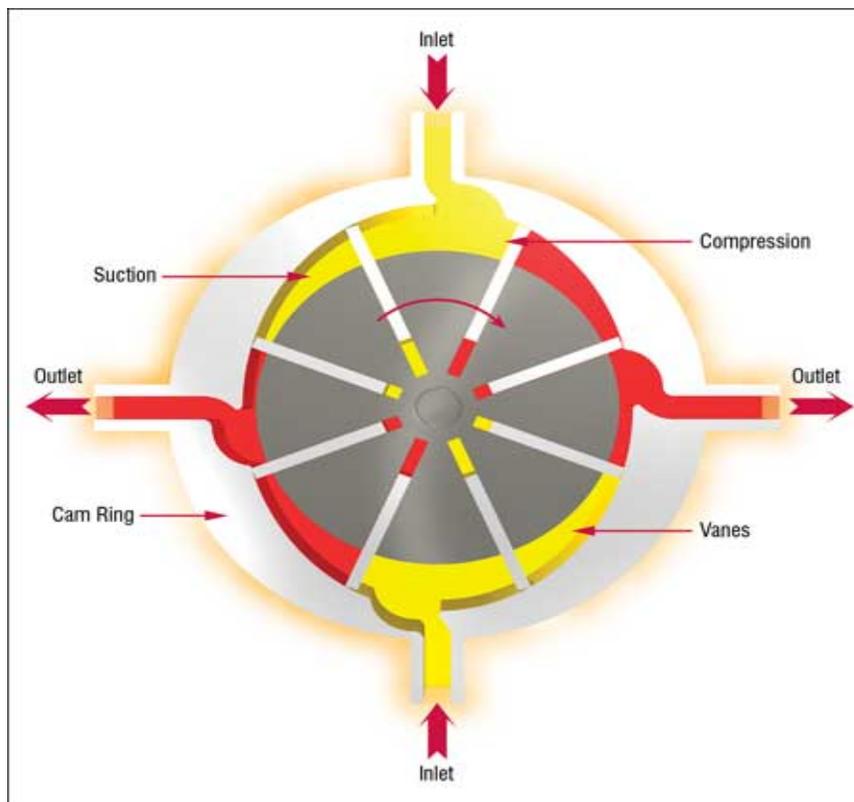
TYPICAL PLC OPERATION

HYDRAULIC POWER UNIT OPERATION

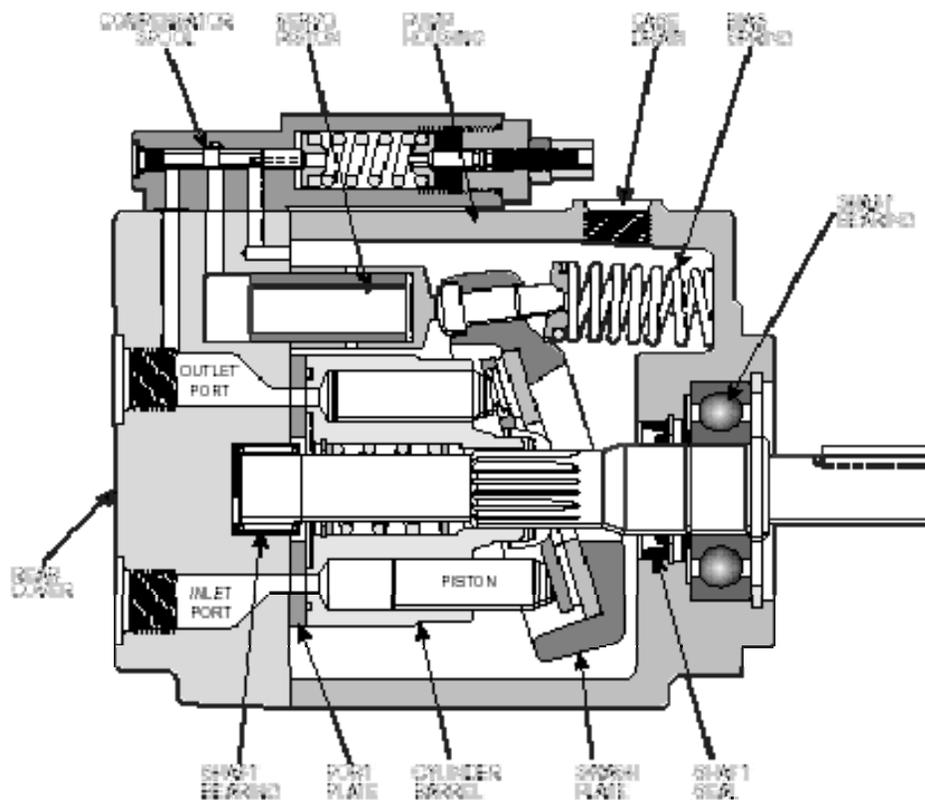
The Hydraulic Power Unit (HPU) is a stand-alone assembly that provides hydraulic oil pressure and hydraulic oil flow to the Compaction System. Its sole function is to provide the energy to actuate the hydraulic cylinders on the compactor to extend and retract the CRAM Cylinder, to extend and retract the ERAM Cylinders, to raise and lower the Gate Cylinders and to raise and lower the Trailer latch Cylinder.

There are two types of Hydraulic Pumps utilized on the HPU to supply hydraulic pressure and flow to the compactor cylinders, Pilot Pressure Circuit and the heat exchanger 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 the pump shaft is rotated by the electric motor, the individual vanes are force out against the ring and sucking oil from the inlet port and delivering hydraulic oil flow to the pressure port. These pumps produce a constant flow of oil to the hydraulic system.



Variable Displacement Piston Pump - The hydraulic system requires a Pilot Pressure Circuit that utilizes a small amount of hydraulic oil flow put at a high pressure. This system is required to actuate valve components on the hydraulic system in order to control the CRAM Cylinder and the ERAM Cylinders. The hydraulic Pump used to produce this high pressure, low flow circuit is a Variable Displacement Piston Pump. The pump is designed with several separate piston and cylinder chambers that is actuated to pump oil as it rotates by a variable inclined Swash Plate. When the pump shaft is rotated by the electric motor, the pump builds pressure until it reaches its set point. Then the Swash Plate moves to a vertical position and maintains pressure on the circuit but does not produce oil flow. As soon as flow is required, the Swash Plate inclines to produce flow at the preset pressure.


Features

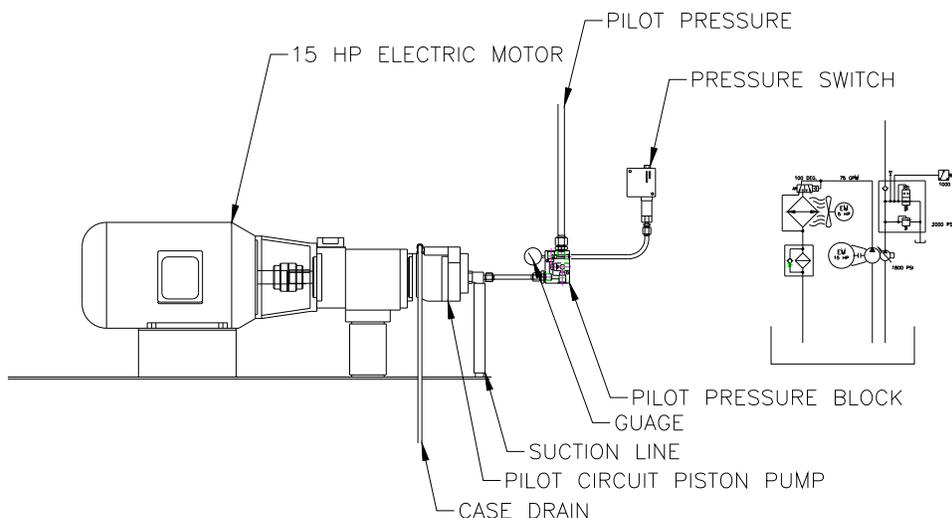
- High Strength Cast-Iron Housing
- Fast Response Times
- Two Piece Housing for Ease of Service
- Metric Pilot, Shaft and Ports Available
- Replaceable Bronze Clad Port Plate
- Thru-Shaft Capability
- Low Noise Levels
- Replaceable Piston Slipper Plate

Controls

- Pressure Compensation
- Load Sensing
- Horsepower Limiting
- Horsepower and Load Sensing
- Remote Pressure Compensation
- Adjustable Maximum Volume Stop
- Hi/Lo Torque (Power) Limiting (PVP 41/48, 60/76, 100/140 Only)
- Low Pressure Standby

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.

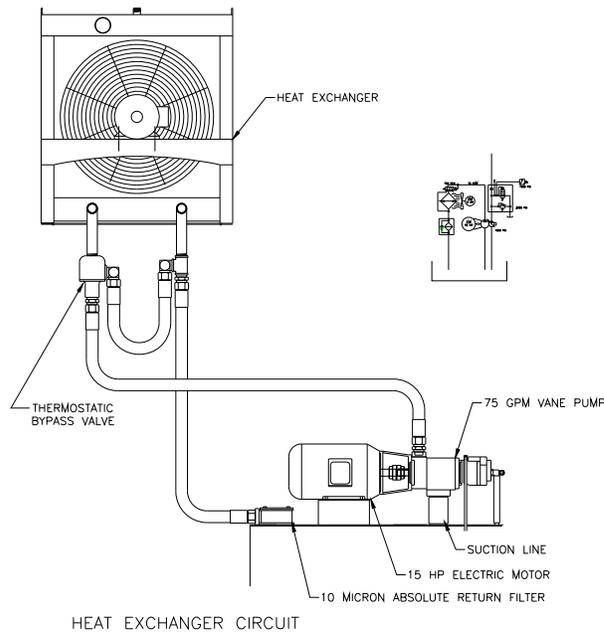
The **Pilot Pressure Circuit** is shown below. The electric motor starts the Piston Pump rotating creating pressure for the pilot circuit. This hydraulic oil pressurizes the Pilot Pressure Block and the system. The Piston Pump Compensator is set at 1800 PSI and the pump charges the pilot system to this 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 for the Hydraulic System so inadvertent cylinder movement does not occur when the main pumps start. Pilot pressure is required to maintain all the HPU valving to be closed in order for the cylinders to “hold 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.



PILOT PRESSURE CIRCUIT

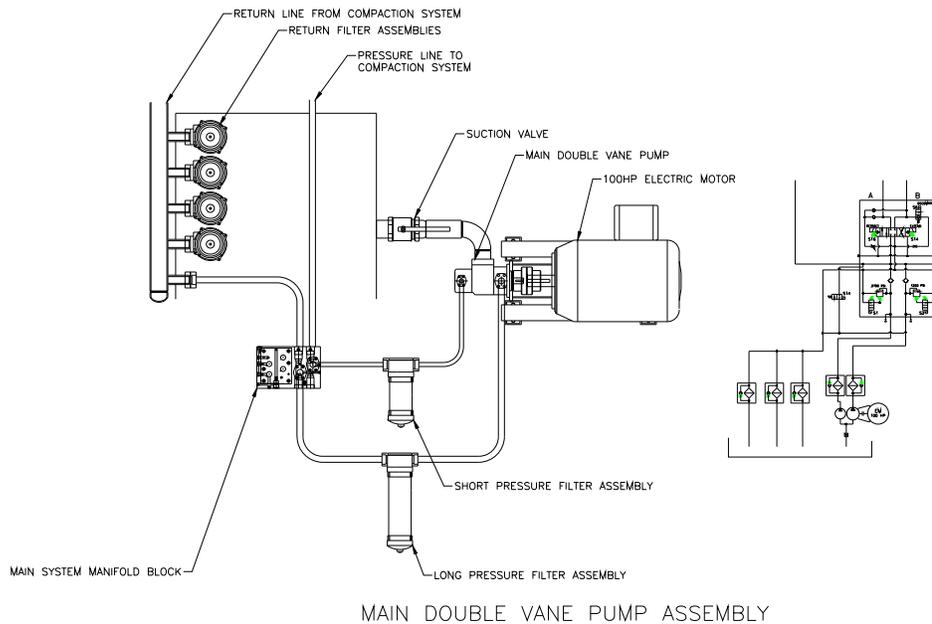
The **Heat Exchanger Circuit** (shown below) starts at the same time as the Pilot Pressure circuit since the two pumps are coupled together and are powered by the same 15 HP electric motor. This circuit is required to keep the hydraulic oil in the reservoir tank within required operating temperatures. 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 degree F. This keeps the oil from being cooled when it is already cold. Once the oil is above 100 degree 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 degree F, the power unit will start but will not operate. This is to insure that pump damage does not occur from cold oil. Once the hydraulic oil is above 65 degree F, the switch closes and the Compaction System will operate. When the Hydraulic oil reaches 105 degree 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 degree F. Once the temperature reaches 160 degree F, the third switch will open signaling the PLC that the hydraulic oil temperature is to 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 it proper operating range.



All the hydraulic oil is filtered when it returns from the Heat Exchanger Circuit. It all flows thru 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.

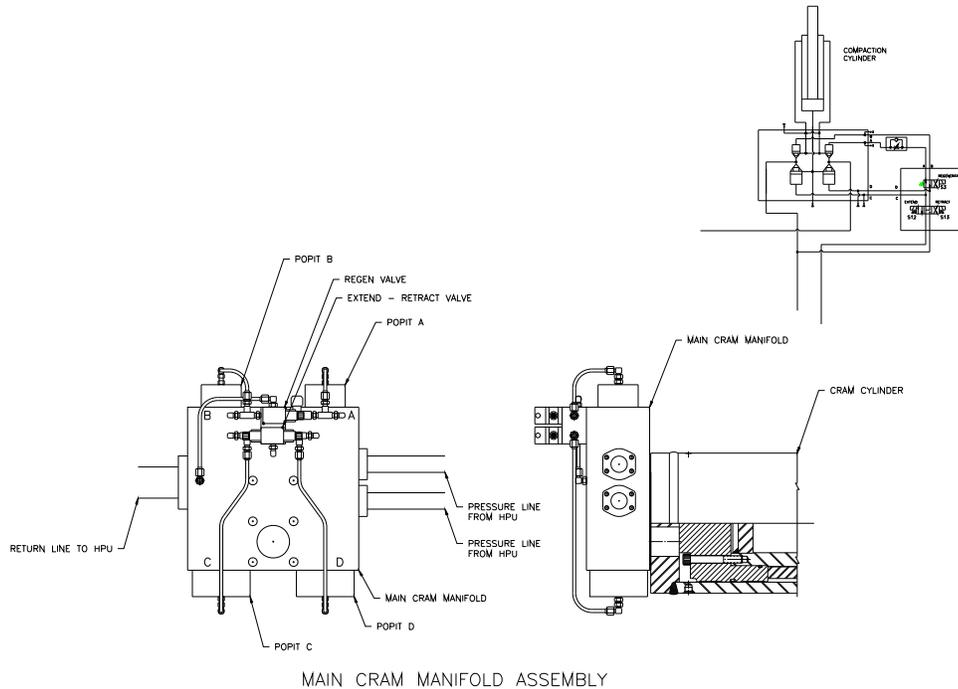
Once the Pilot Circuit has been turned ON, and Pilot Pressure is confirmed, the **Main Vane Pumps** will be brought on line to supply constant hydraulic oil flow to the Compaction System. The two main 100 HP electric motors are turned on in sequencial order, once one has started and confirmed to be running, the second motor is then started. When these Main Double Vane Pumps are running, constant flow of 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 Main Double Vane 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.

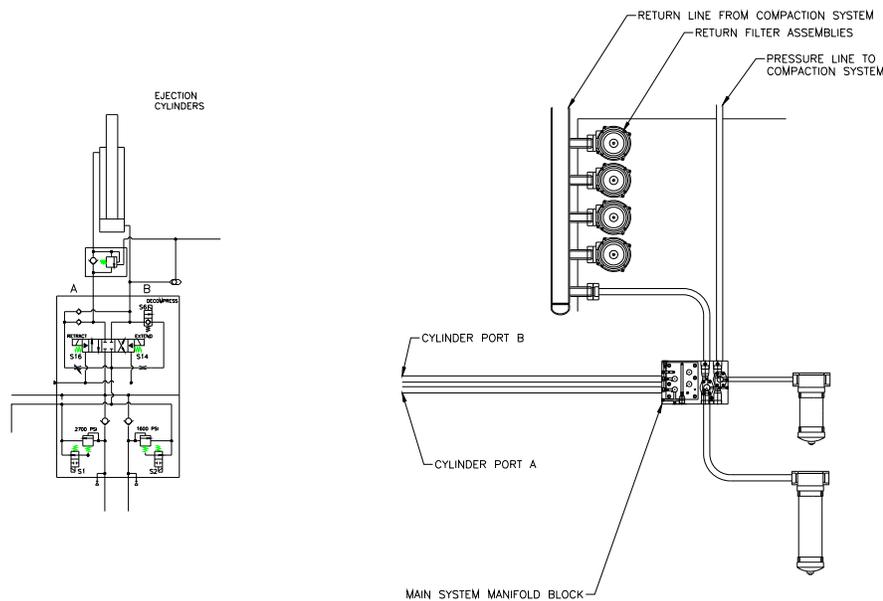
When ever the Compaction System needs to actuate the **Main Compactor Cylinder (CRAM)**, the PLC sequences the HPU in the following manner. When the Compaction System is at rest, Pilot Pressure is open to all four of the Popit Assemblies on the CRAM Manifold. This keeps the cylinder rod static and held 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 Popit D and Popit B go to tank (no pressure). Second, (refer to the Main Double Vane 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 Popit D. The hydraulic oil that is on the rod side of the CRAM cylinder then flows through Popit 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 Popit C and Popit A go to tank (no pressure). Second, as above (refer to the Main Double Vane 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 Popit A. The hydraulic oil that is on the piston

side of the CRAM cylinder then flows through Popit C and back to the HPU through the Return Filter Assemblies.



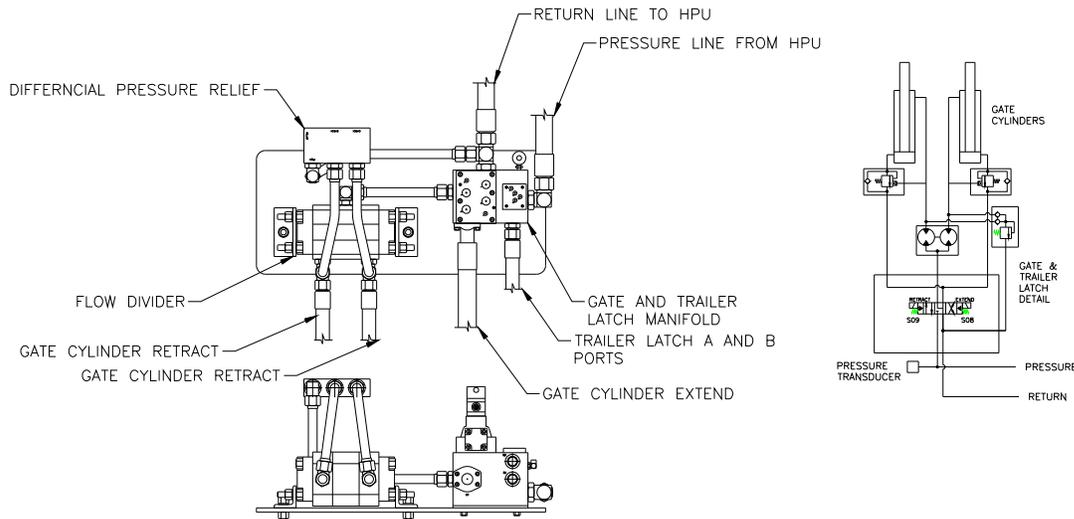
An added feature of this CRAM Cylinder Manifold is its ability to make put the CRAM Cylinder into **Regen Mode**. In Regen, the CRAM cylinder has the ability to extend faster with less hydraulic oil displaced therefore speeding up the cylinder operation greatly. This feature is only actuated in a low-pressure 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 Popit B and Popit D are open, the Regen valve allows Pilot Pressure to gain close Popit B and open Popit 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 even 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 trough 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.



ERAM CYLINDER OPERATION

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 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.



GATE AND TRAILER LATCH OPERATION

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 1500 PSI, a pressure switch opens and breaks contact signaling the PLC the system has reached that pressure. At 200 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 1500 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.

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



HYDRAULIC THEORY OF OPERATION

SECTION

PAGE

5.1.2

9

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.

⚠ DANGER

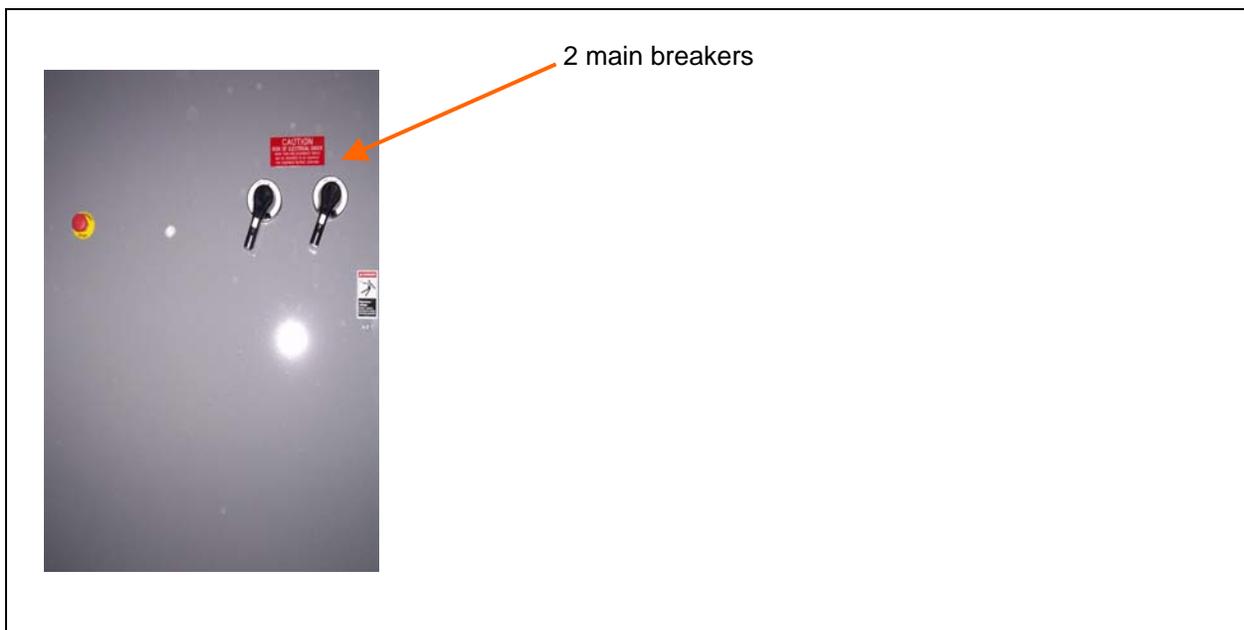
Unexpected machine startup can result in death or severe personal injury.

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.

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.



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 mobile compactors is 24 VDC. Locking out the main disconnect switch prevents eliminates this voltage.

Main Power - The main incoming power will be between 380VAC and 575VAC depending on facility requirements. Locking the main breakers will eliminate this voltage from all of the circuits except the incoming leads on the breakers themselves. To isolate this voltage, the breakers feeding the motor control panel will have to be turned off and locked out.

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

⚠ WARNING

When Machine is in Motion.

Moving parts can cause personal injury. Do not work on or enter any part of the compactor while it is operating.

⚠ WARNING

Stored Energy in Cylinders.

Hydraulics cylinders may contain pressurized hydraulic fluid after the motors have been turned off. Bleed of all pressure prior to working on the cylinders or the hoses leading to them.

⚠ WARNING

Moving Parts 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.

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

⚠ WARNING

Burn Hazard.

Hydraulic fluids 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

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.



LUBRICANT SPECIFICATIONS

SECTION

5.3

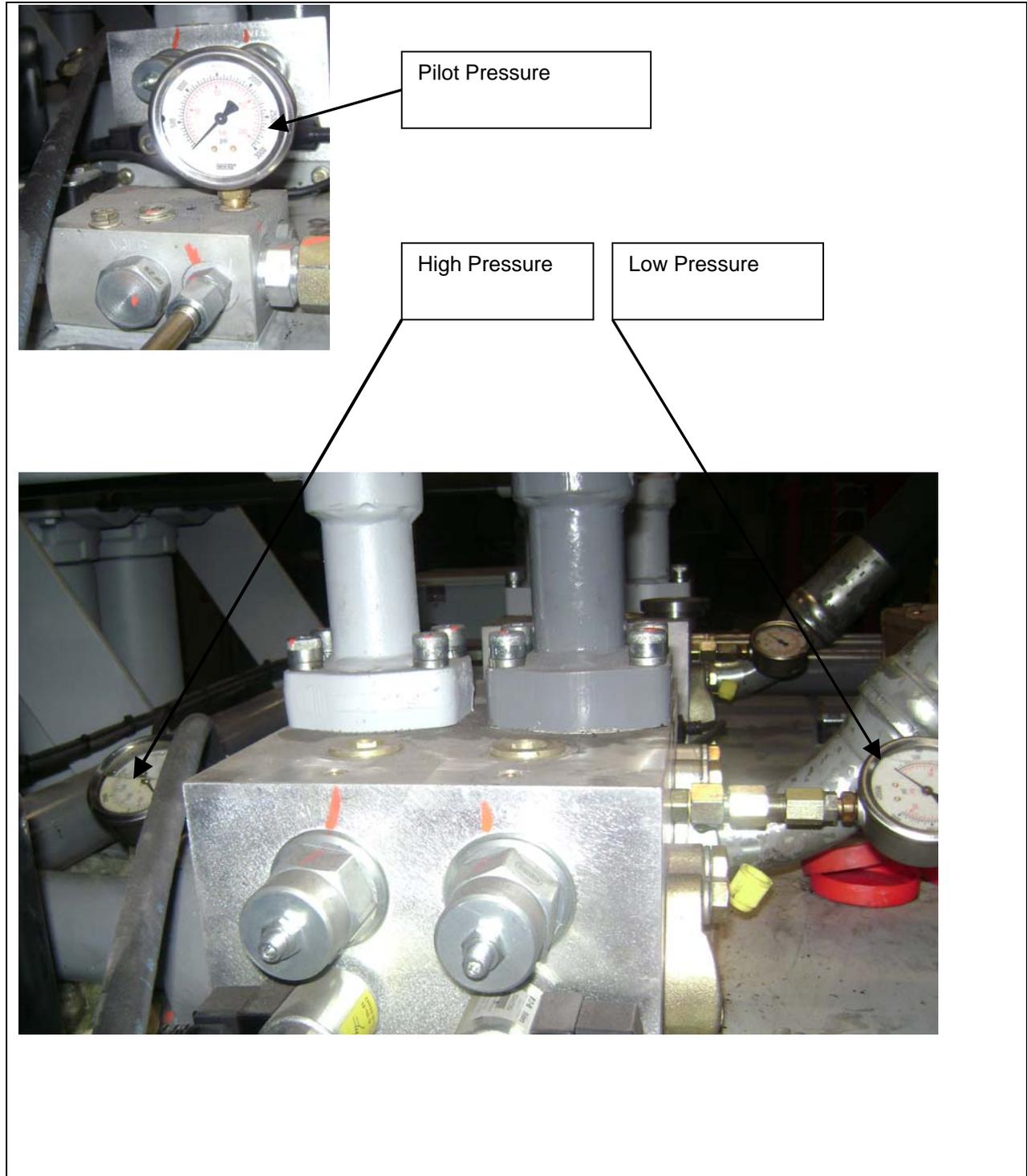
PAGE

1

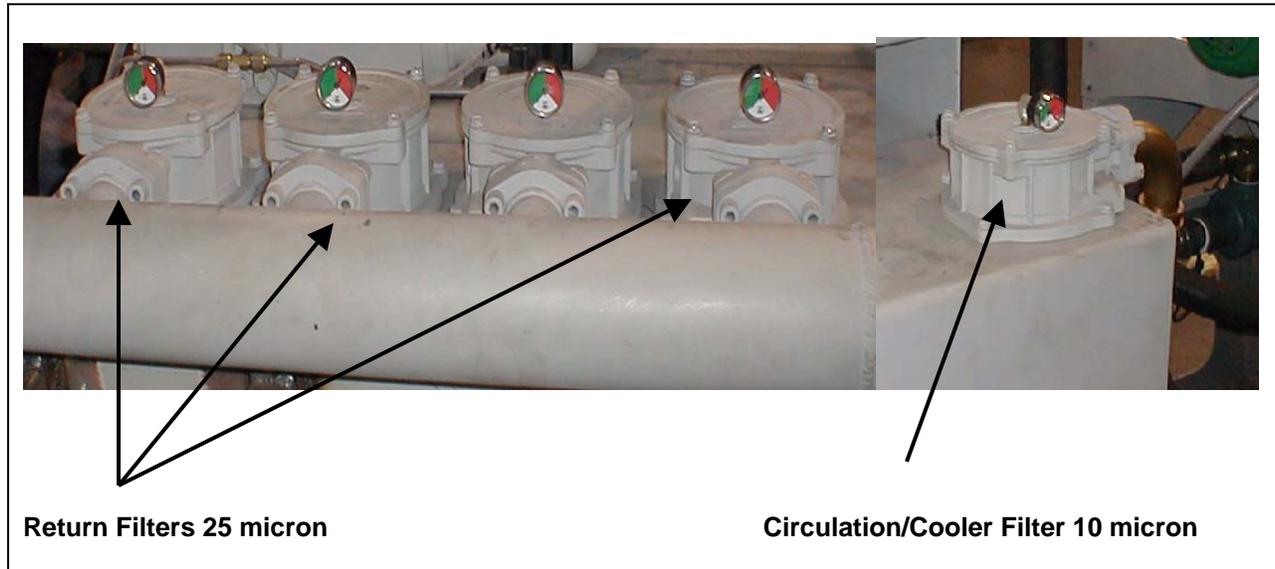
Component	Ambient Temperature	Recommended Lubricant
Hydraulic Oil	35°F - 110°F	ISO grade 46 / AGMA grade 2 With anti-wear additives <i>Chevron Hydraulic Oil AW 46*</i>
Electric Motor Bearings	All	NLGI grade 2 high temperature for High-speed electric motors <i>Chevron SRI®*</i>
Gate pins, Trunnion pins, and all other pressure fittings	0°F - 50°F	NLGI grade 0 <i>Chevron Dura-LithÔ Grease EP 0*</i>
	15°F - 85°F	NLGI grade 1 <i>Chevron Ultra-Duty Grease EP 1*</i>
	50°F - 100°F	NLGI grade 2 <i>Chevron Ultra-Duty Grease EP 2*</i>

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

The following illustration shows the locations of the hydraulic pressure gages. These indicators are used during hydraulic system adjustment and service.



COMPONENT IDENTIFICATION (TYPICAL)



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 hydraulic motor) 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 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

⚠ WARNING

High Pressure Hazard.

Hydraulic system contains high pressure fluid.

Follow lock out procedures before servicing.

⚠ 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.

With the machine turned off, electrically locked out and tagged *Refer to Section 5.1, 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.
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.



CHANGING THE RETURN FILTERS

SECTION

PAGE

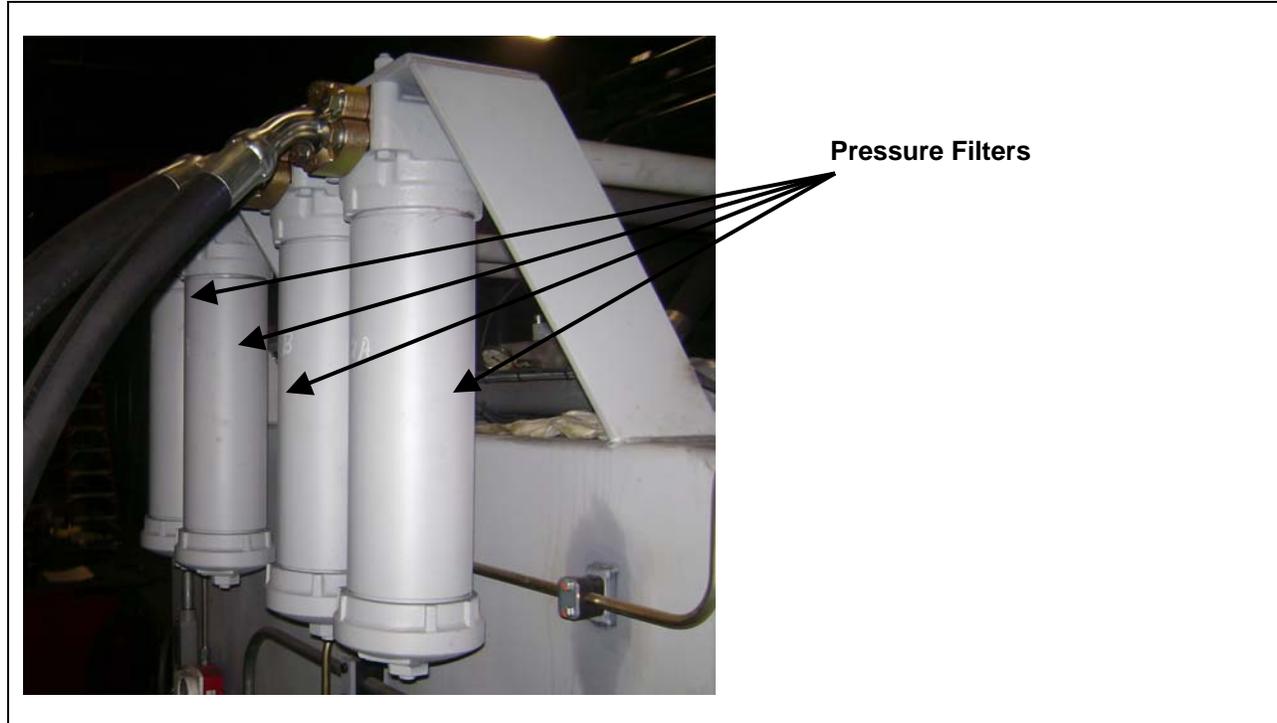
5.5

3

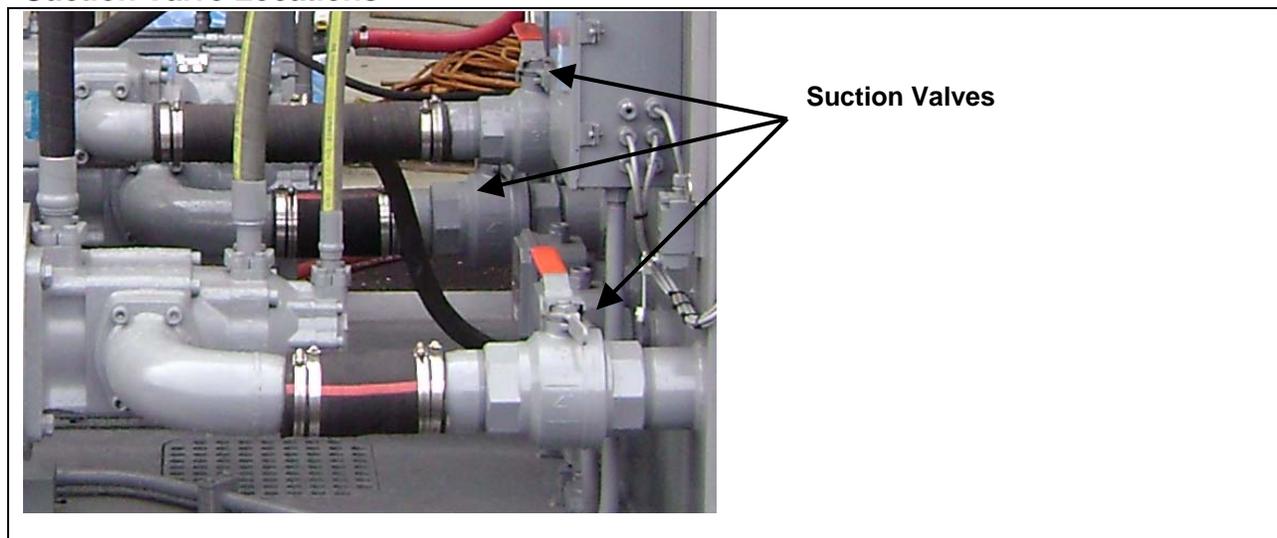
12. Unlock the machine
13. Follow the procedure in the *De-Aerating the Hydraulic System* section to remove any air from the hydraulic system prior to operation

COMPONENT IDENTIFICATION (TYPICAL)

Pressure Filters Location



Suction Valve Locations



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 into any motors and valves.

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

WARNING

High Pressure Hazard.

Hydraulic system contains high pressure fluid.

Follow lock out procedures before servicing.

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.

With the machine turned off, electrically locked out and tagged *Refer to Section 5.1, Locking Out the Compaction.*

CHANGING THE FILTERS

1. Shut down and lock out the machine (refer to Section 5.1).
2. Close the suction valves 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.



CHANGING THE PRESSURE FILTERS

SECTION

5.6

PAGE

3

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.
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.
15. Follow the procedure in *Section 5.8, De-Aerating The Hydraulic System* to remove any air from the hydraulic system prior to operation.

⚠ 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

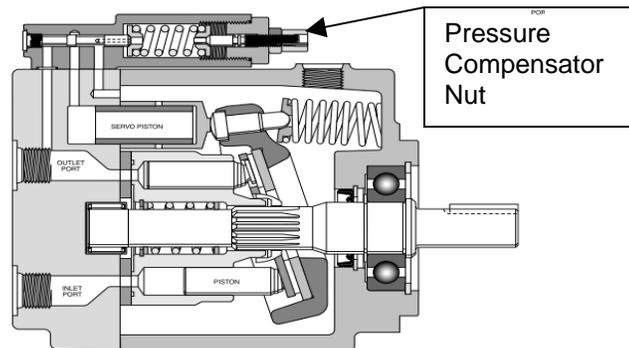
The main pumps that drive the COMPACTOR require three pressure adjustments, low-pressure setting, high-pressure setting, pilot pressure setting.

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.

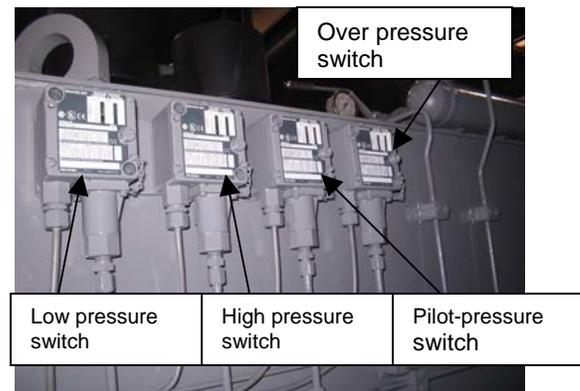
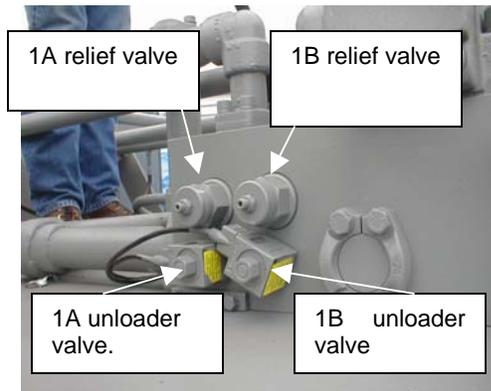


2. Adjust the pressure compensator nut inward and set the relief valve on the startup manifold to 2100 psi and lock the adjustment. The pressure compensator nut on the pump will need to be turned to increase the pressure to 2200 psi to adjust the relief valve.

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.



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.

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. Locate the operating pressure switches. Turn the adjustment screw in (clockwise) to 1,500 psi on the low operating pressure switch and 2,600 psi on the high operating pressure switch. The left pressure switch should be the low pressure and right pressure switch should be the high pressure.
3. Remove the covers from the pressure switches.
4. Start the hydraulic unit. Have an assistant stand by the Panel view.
5. Press the 1B unloader button set the un-loader pressure to 1,500 psi. Set the low-pressure switch by turning the setscrew counter clockwise until the switch trips. This can be observed by watching the pressure switch with the cover removed or with a voltmeter attached to the normally open contacts and watch it change states. Once the pressure switch trips, lock down the adjustment screw lock nut.
6. Now set the 1A un-loader pressure to 2,600 psi. Set the high-pressure switch by turning the setscrew counter clockwise until the switch trips. This can be observed by watching the switch with the cover removed or with a voltmeter attached to the normal open contacts and watch it change states.



MAIN PUMP PRESSURE SETTINGS

SECTION

PAGE

5.9

3

7. Reattach the cover plates in the switches.

8. Depress unloader 1B button and set the relief to 1600 psi, then depress unloader 1A and set relief to 2700 psi.

9. Depress unloader 2B and set relief to 1600 psi, then depress unloader button 2A and set the relief to 2700 psi

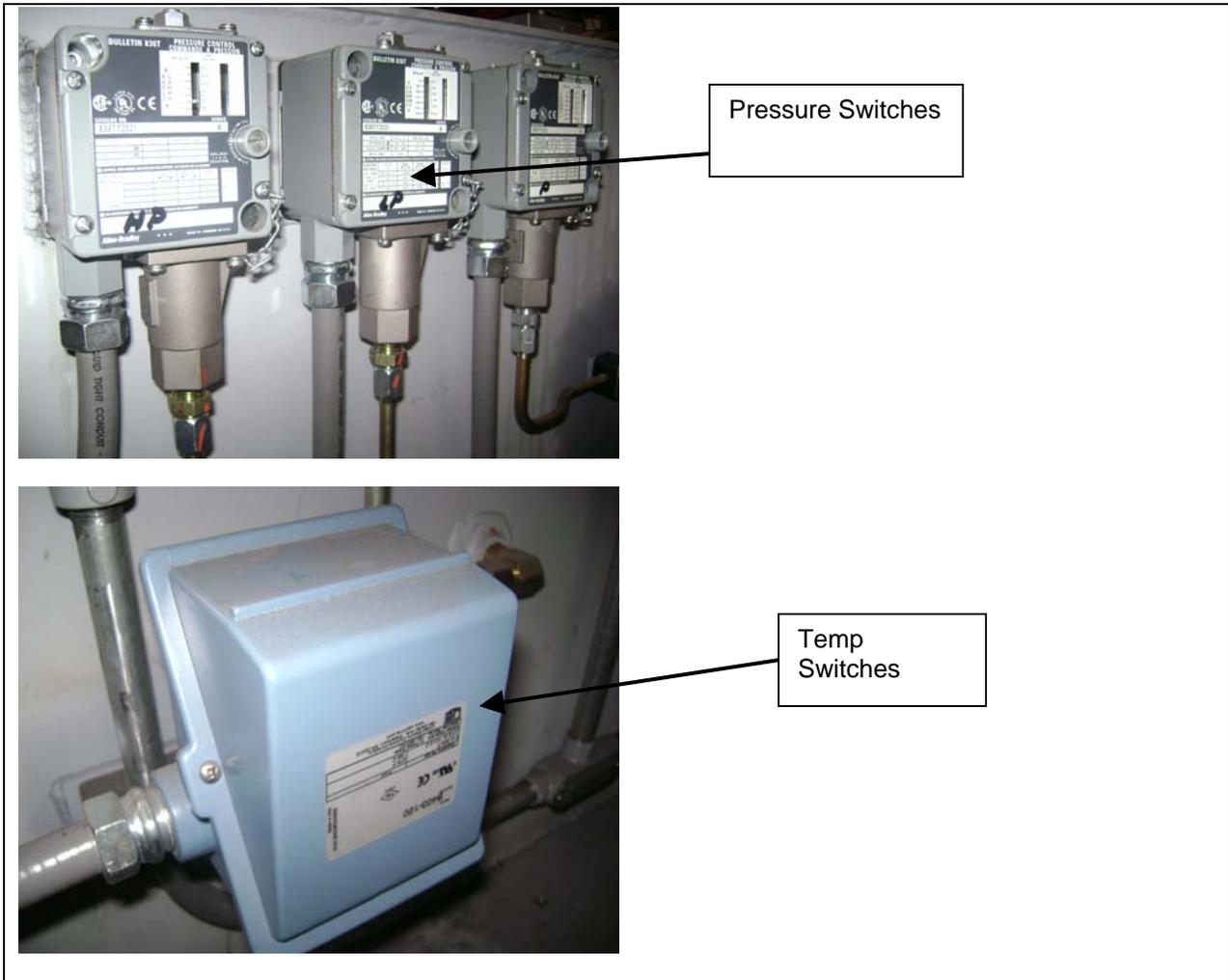
The system is now set to operate at 2,600 psi and 1,500 psi in the operating mode. 2,600 psi for 1A and 2A un-loaders and 1,500 psi for 1B and 2B un-loaders system relief pressure.

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 and temperature switches on the Compactor.





Pressure 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.

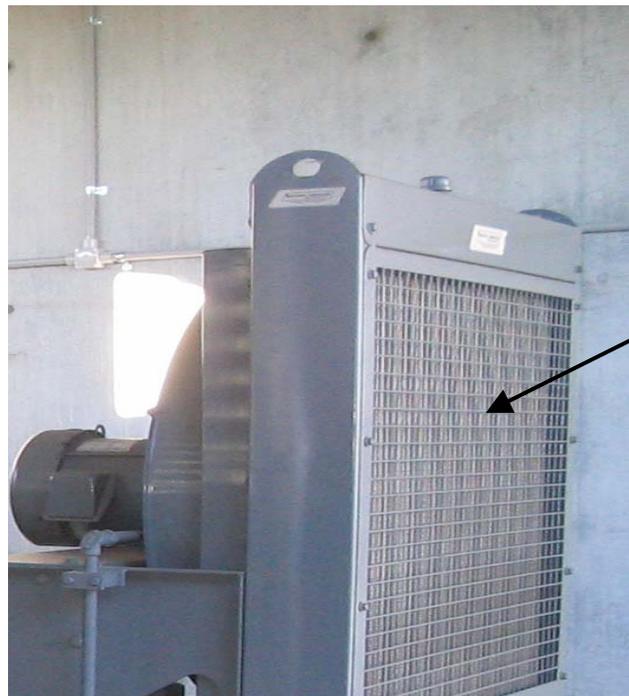
⚠ WARNING**High Pressure Hazard.**

Hydraulic system contains high pressure fluid.

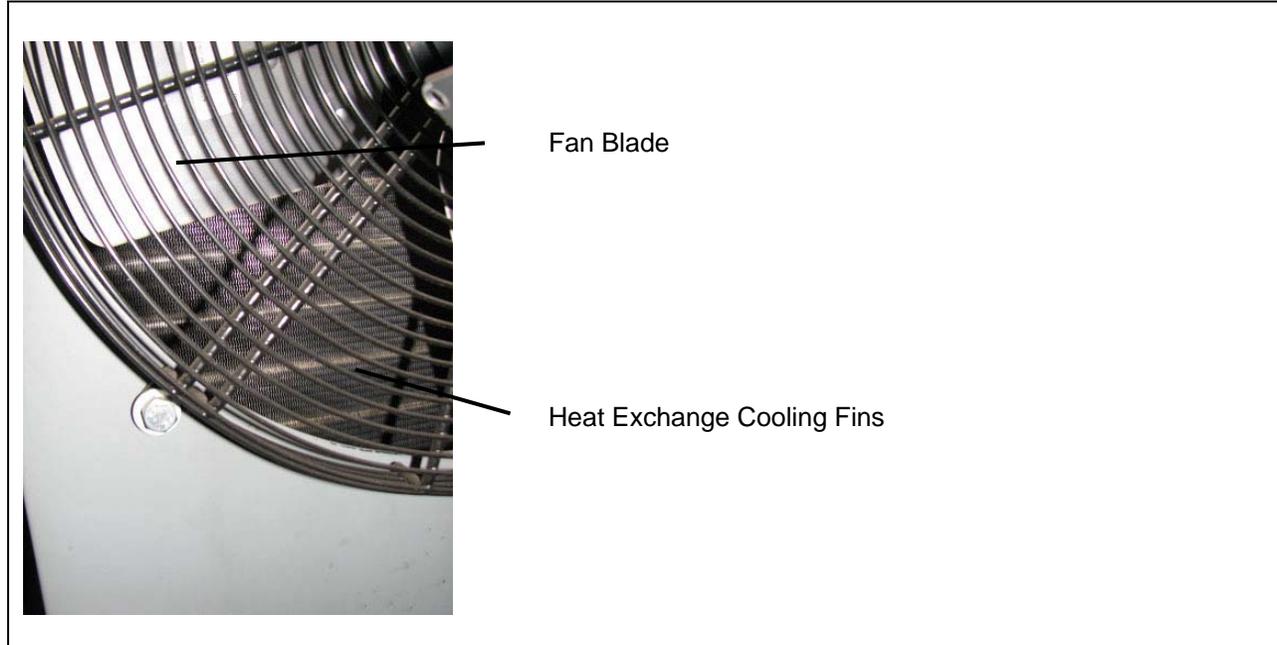
Follow lock out procedures before servicing.

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



CLEANING PROCEDURE

1. Shut down and lock out the compactor per the Locking Out section of this manual.
2. Using compressed air, clean the heat exchanger cooling fins and pre-filter 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 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.

	SECTION 6 CONTENTS TROUBLESHOOTING	SECTION 6.0	PAGE 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.

Hydraulic Power Unit Fails to Start After Pushing START/RUN Button	
<i>Cause</i>	<i>Correction</i>
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.
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> .
Access Doors	Make sure all access doors are close.

Truck Latch Malfunction	
<i>Cause</i>	<i>Correction</i>
Truck mis-aligned with compactor	Make sure truck is aligned.
Bumper Bar on truck damage or wrong type	Consult SSI for proper truck latch construction.
Latch selector pushbuttons defective	1. Check latch unlatch pushbuttons at operator's control panel. 2. Check related wiring. (<i>See electrical schematic</i>).
Latch Up/Down solenoid defective	Check electrical circuit and solenoid, repair and/or replace as needed.
Unloader 1A or related circuitry malfunctioning	1. Check electrical circuit and solenoid on the unloader 1A. 2. Check the relive valve if defective.



High Fluid Temperatures (above 150°F)	
Cause	Correction
Oil cooler fan not operating	<ol style="list-style-type: none">1. Check thermostat input light (07 on slot 3 input card) If light is not on, have a qualified electrician check thermostat and wiring. If light is on, go to next step.2. Check cooler fan output light (09 on slot 5 output card)<ol style="list-style-type: none">a. If the light is not on, have a qualified electrician check the circuit breaker, motor-starter overloads, and output module fuse.3. Check the cooler fan motor for damage or overheating.
Oil cooler airflow restricted	<ol style="list-style-type: none">1. Louvers must be fully open.2. Clean or blow off heat exchanger coils.3. Remove any object stored in immediate path of fan airflow.
Air temperature in the HPU room is too high	Provide adequate ventilation.
Circulating Pump	Check and make sure circulating pump is functioning properly.

Discharge Gate will not go up	
Cause	Correction
Manual/Auto selector-switch in auto.	Switch to manual mode.
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">1. Check electrical circuit and solenoid on the unloader 1A.2. Check the relive valve, replace if defective.
Gate up proximity switch is active or damaged.	Check Gate Up proximity switch. Replace if need to.
Local/Radio switch	Make sure Local/Radio switch is in Local.

Discharge Gate will not go down	
Cause	Correction
Manual/Auto selector-switch in auto.	Switch to manual mode.
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">1. Check electrical circuit and solenoid on the unloader 1A.2. Check the relive valve, replace if defective.
Local/Radio switch	Make sure Local/Radio switch is in Local.
Gate down proximity switch is active or damaged.	Check Gate down proximity switch. Replace if need to.

**Platen Will Not Retract In Manual Mode**

<i>Cause</i>	<i>Correction</i>
Manual/Auto selector-switch in auto	Switch to manual mode
Laser error	<ol style="list-style-type: none">1. Check laser make sure it's functional.<ol style="list-style-type: none">a. Check laser fuse on power supply.b. Check laser service and laser plausibility lights slot 2 input card 14 and 15 should be on. If light is not on, have a qualified electrician check electrical circuit.2. Check laser target that there is no abstraction.3. Check laser lance, wipe with damp towel.
Home limit switch actuated or damaged	Check Home Limit switch.
Platen separation, if not retracting past 28' feet.	<ol style="list-style-type: none">1. Check proximity switches2. Check for objects on the platen and carriage joint
Valves not functioning	Ensure solenoids and directional valves are working.
Bad communication	Ensure inputs are being made.
Cold Oil	Ensure that oil temp is 67° or above.
Local/Radio switch	Make sure Local/Radio switch is in Local.

Platen Will Not Extend in Manual Mode

<i>Cause</i>	<i>Correction</i>
Manual/Auto selector-switch in auto	Switch to manual mode.
Laser error	<ol style="list-style-type: none">1. Check laser make sure it's functional.<ol style="list-style-type: none">c. Check laser fuse on power supply.d. Check laser service and laser plausibility lights slot 2 input card 14 and 15 should be on. If light is not on, have a qualified electrician check electrical circuit.2. Check laser target that there is no abstraction.3. Check laser lance, wipe with damp towel.
C-ram extend switch is actuated or damaged	Check C-ram extend switch.
Gate is not up all the way	<ol style="list-style-type: none">1. Ensure gate up light is on, on the control panel.2. Ensure gate up prox switch is functional.
Valves not functioning	<ol style="list-style-type: none">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.
Local/Radio switch	Make sure Local/Radio switch is in Local.
Cold Oil	Ensure that oil temp is 67° or above.
Bad communication	Ensure inputs are being made.

**Platen Will Not Eject Load**

<i>Cause</i>	<i>Correction</i>
Pressure switch malfunction	Ensure max pressures are being met; check panel view and gauges for pressure reading needs to be near or at 2600psi.
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.

Laser Faults

<i>Cause</i>	<i>Correction</i>
Laser will not read distance	1: Check laser make sure it's functional. e. Check laser fuse on power supply. f. Check laser service and laser plausibility lights slot 2 input card 14 and 15 should be on. If light is not on, have a qualified electrician check electrical circuit. 2. Check laser target that there is no abstraction. 3. Check laser lance, wipe with damp towel.

Platen Will Not Extend in Auto Mode

<i>Cause</i>	<i>Correction</i>
Manual/Auto selector-switch in auto	Switch to auto mode.
Laser error	1. Check laser make sure it's functional. g. Check laser fuse on power supply. h. Check laser service and laser plausibility lights slot 2 input card 14 and 15 should be on. If light is not on, have a qualified electrician check electrical circuit. 2. Check laser target that there is no abstraction. 3. Check laser lance, wipe with damp towel.
C-ram extend switch is actuated or damaged	Check C-ram extend switch.
Gate is not up all the way	1. Check up proximity switch. 2. Check for objects on the platen and carriage joint.
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 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.
Bad communication	Ensure inputs are being made.

**Platen Will Not Retract In Auto Mode**

<i>Cause</i>	<i>Correction</i>
Manual/Auto selector-switch in auto	Switch to auto mode
Laser error	<ol style="list-style-type: none">1. Check laser make sure it's functional.<ol style="list-style-type: none">i. Check laser fuse on power supply.j. Check laser service and laser plausibility lights slot 2 input card 14 and 15 should be on. If light is not on, have a qualified electrician check electrical circuit.2. Check laser target that there is no abstraction.3. Check laser lance, wipe with damp towel.
Home limit switch actuated or damaged	Check Home Limit switch.
Platen separation, if not retracting past 28' feet.	<ol style="list-style-type: none">1. Check proximity switches2. Check for objects on the platen and carriage joint
Valves not functioning	Ensure solenoids and directional valves are working.
Bad communication	Ensure inputs are being made.
Cold Oil	Ensure that oil temp is 67° or above.
Local/Radio switch	Make sure Local/Radio switch is in Local.
Pressure switch malfunction	Ensure max pressures are being met; check panel view and gauges for pressure reading needs to be near or at 2600psi.

Hydraulic Power Unit Shut Downs

<i>Cause</i>	<i>Correction</i>
Oil too hot	<ol style="list-style-type: none">1. Simply allow the oil in the HPU unit to cool down.2. Make sure HPU is clean. Thick layer of dust is like heat blanket.
Frequent HPU shut downs	<ol style="list-style-type: none">1. Louvers must be fully open.2. Clean or blow off heat exchanger coils.3. Remove any object stored in immediate path of fan airflow.4. Provide adequate ventilation.
HPU low oil shut down	Check oil level, have maintenance personnel add oil to an acceptable level.
Circulating Pump	Check and make sure circulating pump is functioning properly.

Main Motors Will Not Start

<i>Cause</i>	<i>Correction</i>
Pilot Pressure Not Being Made	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.
Blown Fuses/Tripped Overload	Inspect related fuses, check overload relay.
Suction Fault	Ensure suction valves are open and making limit switches.
Motors	Motors failure, have a qualified electrician inspect motors.

**Pump Noise/Motor Noise**

<i>Cause</i>	<i>Correction</i>
Bad pump section	Replace pump or cartridge.
Love-Joy Coupling Problem	Pull orange inspection cover and rotate and inspect.
HPU low oil shut down	Check oil level, have maintenance personnel add oil to an acceptable level.
Low Volume flow	Inspect pressure filters for obstruction or collapse.
Case Drain	On pilot pump ensure oil is high enough that pump case cannot syphen off overnight.
Motor Bearings	Replace Bearings.

Desired Hydraulic Pressure Not Obtained

<i>Cause</i>	<i>Correction</i>
Faulty Relief Cartridge	Inspect.
Pump Failure	Inspect and Replace pump or cartridge sections.
Faulty Pressure Switch	Check pressure setting on the switch and inspect wiring after lock out.
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.
Relief Cartridge	Make sure relief valves have correct pressure settings.
Sticking Puppets	Apply gauges to puppets gauge ports and monitor pressure.
Extend/Retract valve	Make sure that the valve is not sticking.

Radio Will Not Work

<i>Cause</i>	<i>Correction</i>
Local/Radio switch	Make sure Local/Radio switch is in Radio.
Battery	Make sure battery is fully charged.
Cattron Radio Control Unit	Ensure Cattron Radio Control Unit has power, check fuses.
Antenna damaged or not installed properly.	Inspect antenna for any damage, including shorts, opens, and improper grounds.
Bad Controller	Substitute a spare MKCS controller.
Bad Receiver	Replace Receiver/Decoder board. Call SSI Customer Service for assistance.

	SECTION 10 WARRANTY	SECTION 10.0	PAGE 1
---	--------------------------------	------------------------	------------------

LIMITED WARRANTY	10.1
WARRANTY SIGN-OFF REQUIREMENTS	10.2



LIMITED WARRANTY

WHO IS COVERED. *This Limited Warranty applies only to the original purchaser of the Equipment from SSI Compaction Systems, a division of SSI Shredding Systems, Inc. (“SSI”) or from its authorized sales agent.*

WHAT IS COVERED. *This Limited Warranty covers only Equipment that is manufactured by SSI and supplied by SSI or its authorized sales agent. It does not cover consumable items such as fluids, filters, seals, wear strips, bearings, knives, cutters, cleaning fingers, belts, or wiper blades.*

WARRANTY. *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.*

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.*



LIMITED WARRANTY

SECTION

10.1

PAGE

2

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 four (2) million linear feet of rod travel.**

HOW DO YOU 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 due to operating the machine in a way that allows pieces of debris to become entangled in the conveyor belts or other moving objects.
- 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

SERVICE SPECIFICATIONS	11.1.1
HYDRAULIC POWER UNIT (HPU) SPECIFICATIONS	11.1.2
ELECTRICAL & CONTROL SPECIFICATIONS	11.1.3
PARTS LISTS & DRAWINGS	11.2

**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 Setting	2,600 psi
Low Pressure Setting	1,100 psi
Overload Pressure Switch if Present	3,000 psi
Pilot Pressure Switch	1,800 psi

FLUID CAPACITY

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

DIMENSIONAL DATA

Overall Length	71'-3 9/16" (21731mm)
Overall Width	9'
Overall Height	13' (21'-1"at gate)
In feed Opening	6'X10'
Compaction Chamber Size	7'X7'X24'
Hopper Capacity	18 cubic yards

**Model 4500SPH****COMPONENT DATA**

Electric Motors	2
Manufacturer	Baldor
Power	125 hp (150 kW)
Speed (synchronous)	1,800 rpm
Model	CM4410TS-F2-4
Main Hydraulic Pumps	2
Manufacturer	DENISON
Model	T6ED-085-050-1R01-A1
Description	Vane pump mobile application
Heat Exchanger	1
Manufacturer	AMERICAN INDUSTRIAL
Model	AOCS1005-3
Circulating/Pilot Motor	1
Manufacturer	Baldor
Power	15 hp (150 kW)
Speed (synchronous)	1,800 rpm
Model	CM2333T
Pilot Pump	1
Manufacturer	PARKER
Model	PV6-1R1E-C0000PB
Description	Axial Piston Pump
Circulating Pump	1
Manufacturer	DENISON
Model	T6ER-050-3R00-A20-A1
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	575 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	400 Amp
Disconnect	Lockable Handle
Manufacturer	Cutler-Hammer
Main Motor Starter	
Style	Soft Start
Manufacturer	Allen-Bradley
Heat Exchanger Motor Starter	
Style	Across the Line / Reversing

CONTROL PANEL

Enclosure Rating	Nema 4
Control Power Voltage	115 VAC
Programmable Logic Controller Mfg	Allen-Bradley
Touch Screen/Alarm Panel Mfg	Pro-Face
Radio Remote Controls Mfg	CATTRON



DRAWINGS

80-1796-D	GENERAL ARRANGEMENT
80-2577-B	CHAMBER KNIFE INSTALLATION
80-1485-D	ASSEMBLY PLATEN
80-1494-D	ASSEMBLY-CARRIAGE
80-2206-B	ASSEMBLY-TRUNNION
80-1216-B	ASSEMBLY-SCRAPER
80-2705-B	CRAM EXTEND LIMIT SWITCH
80-2679-D	ASSEMBLY-VERTICAL GATE
80-1133-D	ASSEMBLY-LOAD CELL
80-2267-D	LOAD SEAL & CHUTE ASSEMBLY
80-1499-B	HYDRAULIC SCHEMATIC
80-1381-D	ERAM MANIFOLD DETAIL
80-2881-D	CRAM MANIFOLD DETAIL
80-1407-B	GATE - TRAILER LATCH HYDRAULIC DETAIL
80-1517-D	ERAM PLUMBING DETAIL
80-1707-D	COMPACTOR PLUMBING DETAIL
80-1685-B	COMPACTOR ELECTRICAL SYSTEM

**Walsh Trucking Co
1650 NW Sundial Road
Troutdale , Or 97060
Jan-2008**

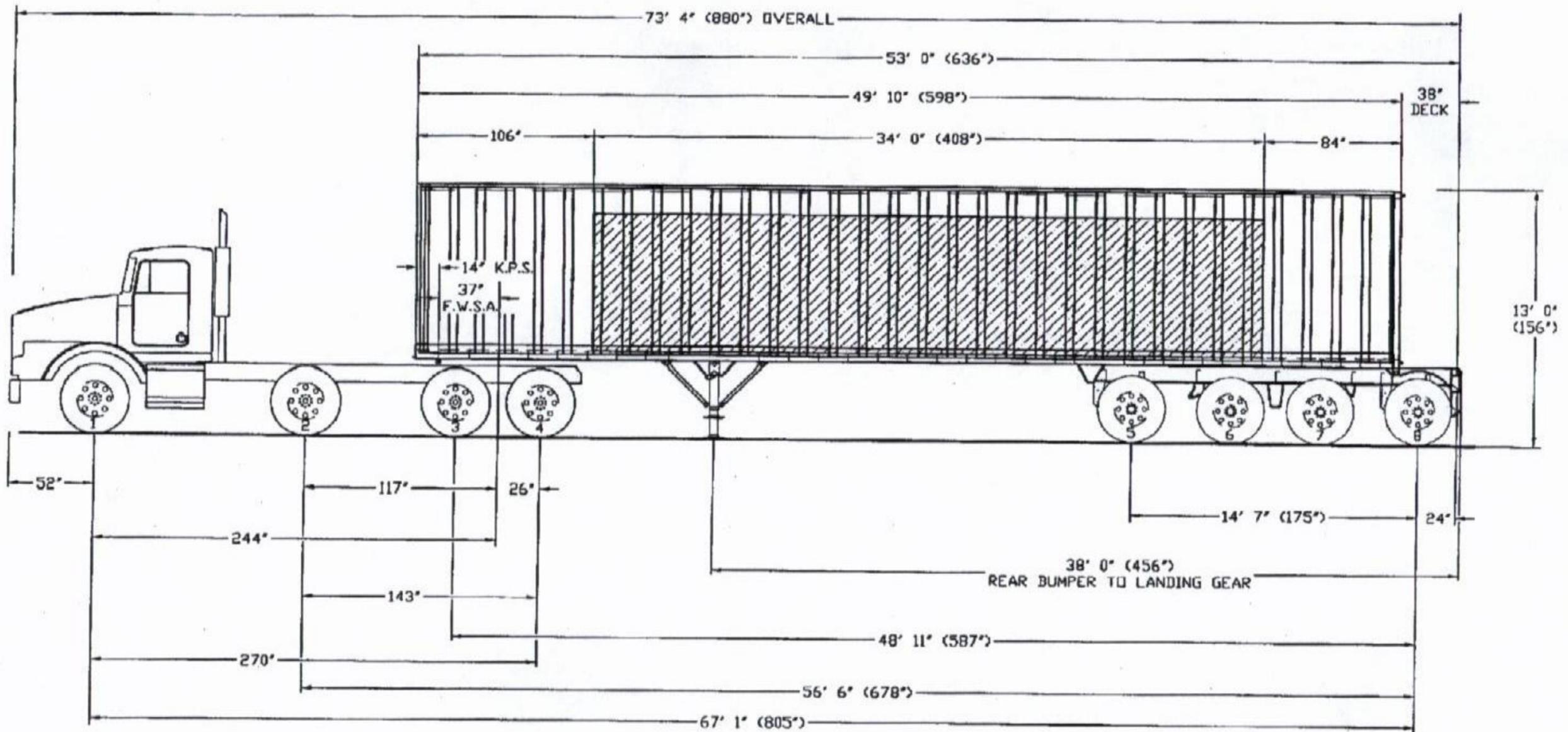
BASE SPECIFICATIONS: 99-95116 (Walsh Trucking)

Trailer Series	Solid Waste Transfer Trailer
Trailer Model	53' Quad Semi
Trailer Length	53' 0" (50' 0" Body with 3' Deck)
Trailer Width	102"
Trailer Height	13' 0" with a 49" 5th wheel
Kingpin Setting	14"
Landing Gear Setback	225" (34' 6" from rear bumper blade)
Rear Axle Setting	24"
Axle Spread	14' 7" Overall , 54 1/2" Spring Tandem
Axle Configuration	Quad
GVWR	85,000 lbs (52,000 # on Quad)
Volume	127.2 cubic yards
Suspension	Hutchens CH9700 Spring Axles # 2 & 3 Composilite Lift/Non Steer Axles # 1 & 4
Spring Part No.	*H324, High Arch, 2 Leaf
Axle Track	71.5"

*Optional,
See Accessory Page

**Livelfloor 99-95016
Printed on- 1/10/2008**

3/8/2008 1:22:35 PM, mbanks



102" WIDE TRAILER
NOTE: TRAILER VOLUME IS 127.2 CUBIC YARDS

AXLE LOADINGS (lbs)			VEHICLE WEIGHTS (lbs)		
GROUP	MAX WGT.	ACTUAL	GROUP	MAX WGT.	ACTUAL
1	13,200	12,825	3-8	83,000	82,883
1-4	57,500	51,618	5-8	52,000	52,090
1-8	104,000	103,708			
2	8000	8000			
2-4	45,000	38,794			
2-8	91,000	90,883			
3-4	34,000	30,794			

REV B: _____
REV A: _____ BY: _____

WESTERN TRAILERS®

(208) 344-9928 6701 BUSINESS WAY, BOISE, IDAHO 83716 www.westerntrailer.com

**PORTLAND METRO PROJECT
53' REFUSE FLATFLOOR SEMI**

STATES: OREGON

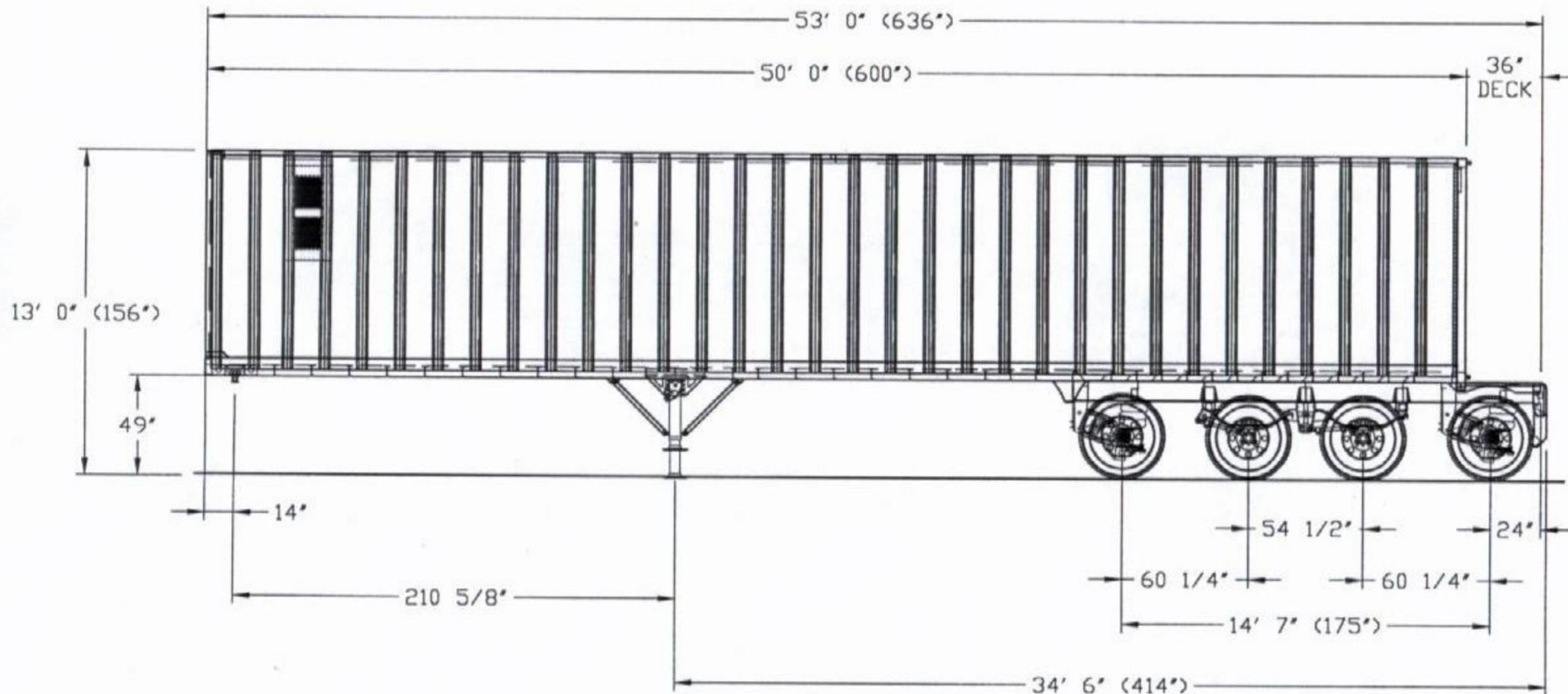
SCALE: 1/8"=1'-0" DATE: 02-18-08 DRAWN BY: M.E.B. MODEL NO. 99-WALSH

This drawing is the sole property of Western Trailer Company, and cannot be used for any purpose detrimental to our interests. To do so would be in violation of U.S. Copyright Code Public Law No. 94-533.

2083421046 WESTERN TRAILER Mar 08 2008 1:54PM

Option 2 - 36" Deck

1/2/2008 2:37:24 PM, mbanks



WESTERN TRAILER-

TRAILER VOLUME IS 127.2 CUBIC YARDS

ROUTE	REV
1	A
2	B
3	C
4	D
5	E

WESTERN TRAILERS®

(208) 344-9928 6701 BUSINESS WAY, BOISE, IDAHO 83716 www.westerntrailer.com

WALSH & SONS TRUCKING
53' REFUSE FLATFLOOR SEMI

STOCK	<input type="checkbox"/>	SCALE	1" = 1'-0"	DATE	12-10-07	DRW. BY	M.E.B.
SUBLET	<input type="checkbox"/>	TRAILER NO.		WEIGHT (POUNDS)	0.000	PART NO.	53RFSM

This drawing is the sole property of Western Trailer Company, and cannot be used for any purpose detrimental to our interests. To do so would be in violation of U.S. Copyright Code Public Law No. 94-533.