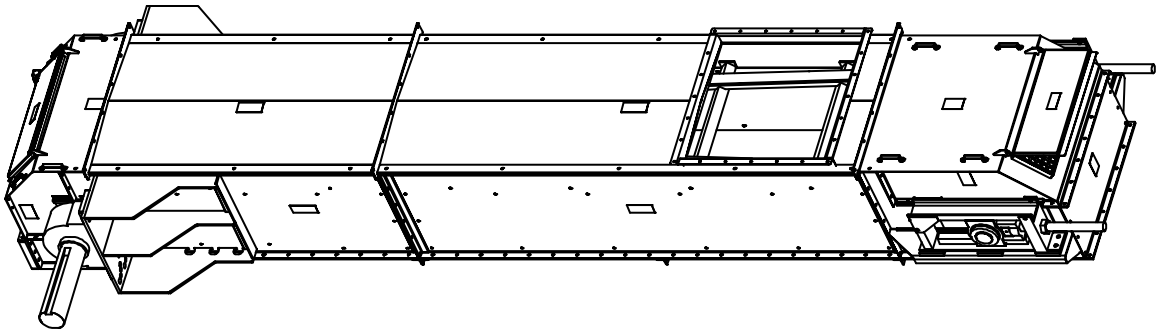
Chain Conveyor

En- Masse Chain Conveyors



Series 2 26" & 32" Tall

Installation and Operation Manual

PNEG-1043

MATERIAL HANDLING

THE GSI GROUP

SAFETY GUIDELINES

This manual contains information that is important for you, the owner/operator, to know and understand. This information relates to protecting ***personal safety*** and ***preventing equipment problems***. It is the responsibility of the owner/operator to inform anyone operating or working in the area of this equipment of these safety guidlines.To help you recognize this information, we use the symbols that are defined below.
Please read the manual and pay attention to these sections. Failure to read this manual and it's safety instructions is a misuse of the equipment and may lead to serious injury or death.

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 **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION **CAUTION** used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

NOTE **NOTE** indicates information about the equipment that you should pay special attention to.

Use of the Equipment Information page will help you identify your equipment in the case that you need to call your dealer or installer. This information should be filled out and kept on record.

Equipment Information

Model Number:_____

Serial Number:_____

Date Purchased:_____

Dealer/Distributor Name and Phone Number:

_____

_____

_____

_____

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e-mail: gsi@grainsystems.com

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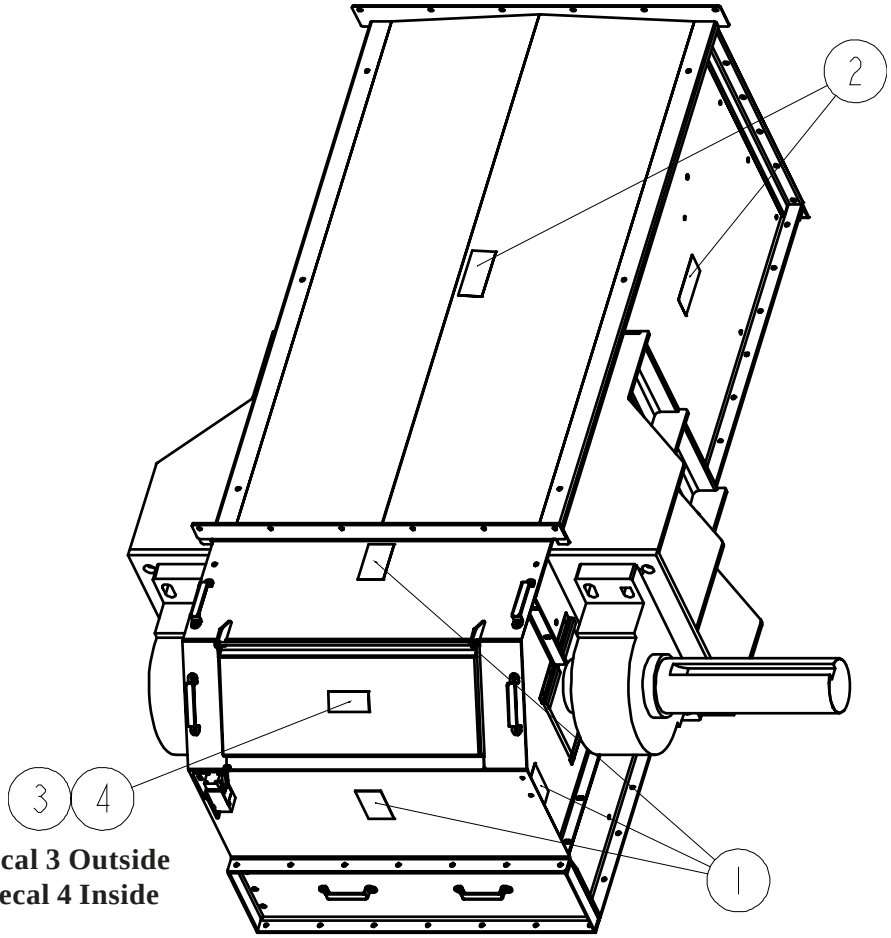
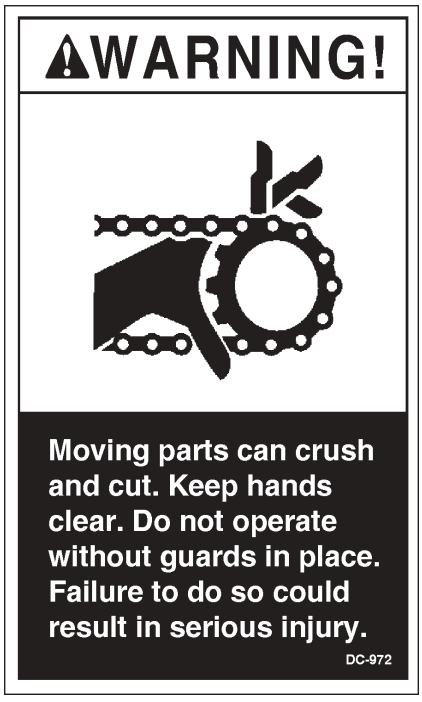


Decal 3 Outside
Decal 4 Inside

1



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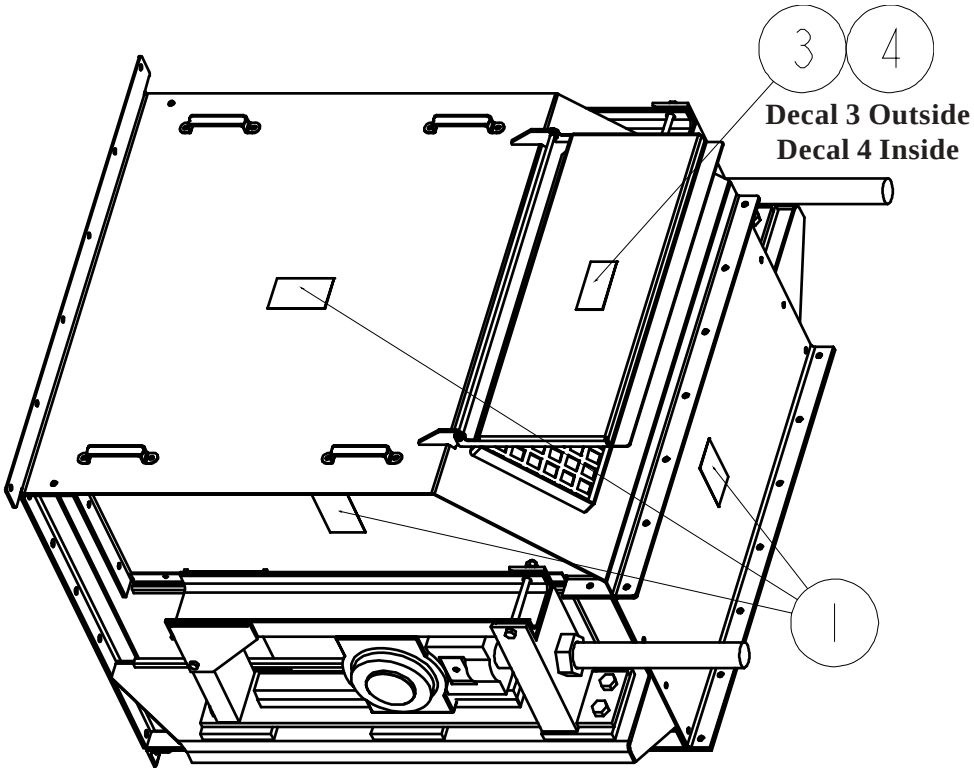
Tail Section Decal Locations



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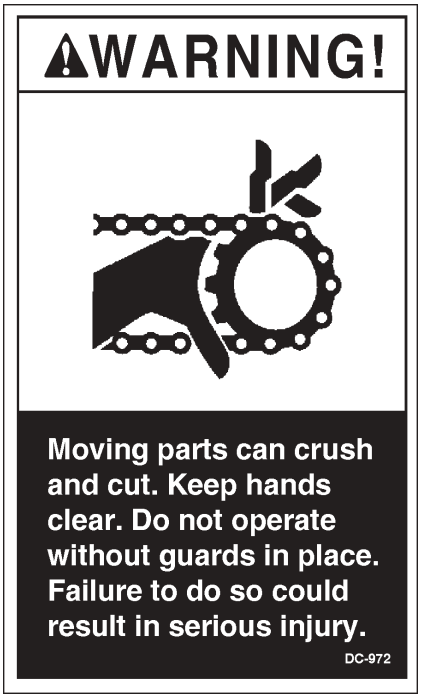

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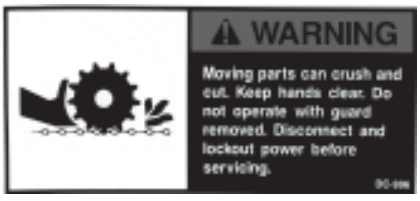

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General Precautions

CAUTION:

- Do not operate the unit before reading and understanding the operator's manual.
- Keep all safety shields and devices in place.
- Keep all covers in place.
- Make certain everyone is clear of the equipment before operating.
- Keep hands, feet and clothing away from moving parts.
- Shut off and lock out all power to adjust, service, clean or unclog.
- Keep off the equipment at all times.
- Keep children, visitors and all untrained personnel away from the machine while in operation.
- Do not operate electric motor equipped units until motors are properly grounded.
- Disconnect power on electrical driven units before resetting motor overloads.
- Do not repetitively stop and start the drive in order to free a plugged condition. Jogging the drive in this type of condition can damage the conveyor and/or drive components.

Receiving Inspection

Carefully inspect the shipment as soon as it is received. Verify that the quantity of parts or packages actually received corresponds to the quantity shown on the packing slip. Any discrepancies should be clarified immediately. Please remember that any damage or missing parts must be noted on the bill of lading at the time of delivery. Report any damage or shortage to the delivering carrier as soon as possible. GSI's responsibility for damage to the equipment ends with acceptance by the delivering carrier.

Save all paperwork and documentation furnished with any of the enmasse conveyor components.

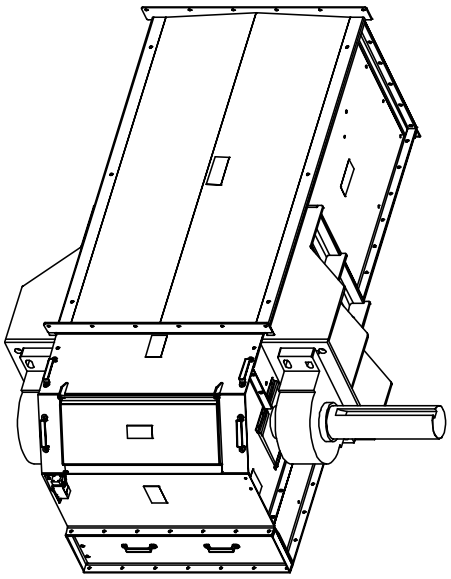
Pre-Installation Preparation

Familiarize yourself thoroughly with this manual and all the conveyor parts. Read the operators manual and all safety signs before using or servicing equipment. Taking the time to do so will aid in the assembly of your conveyor.

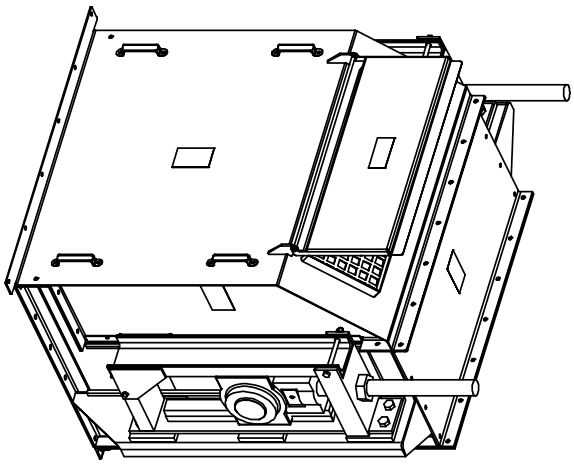
Remove any banding and crating material. Arrange all the conveyor components in such a fashion that all are easily accessible.

Locate sturdy items to serve as blocking (i.e. wood blocks, saw horses, etc.). Blocking is used to support the conveyor sections above the ground to help in assembly. Locate and place the conveyor sections on the blocking in order, starting with the head section and concluding with the tail section.

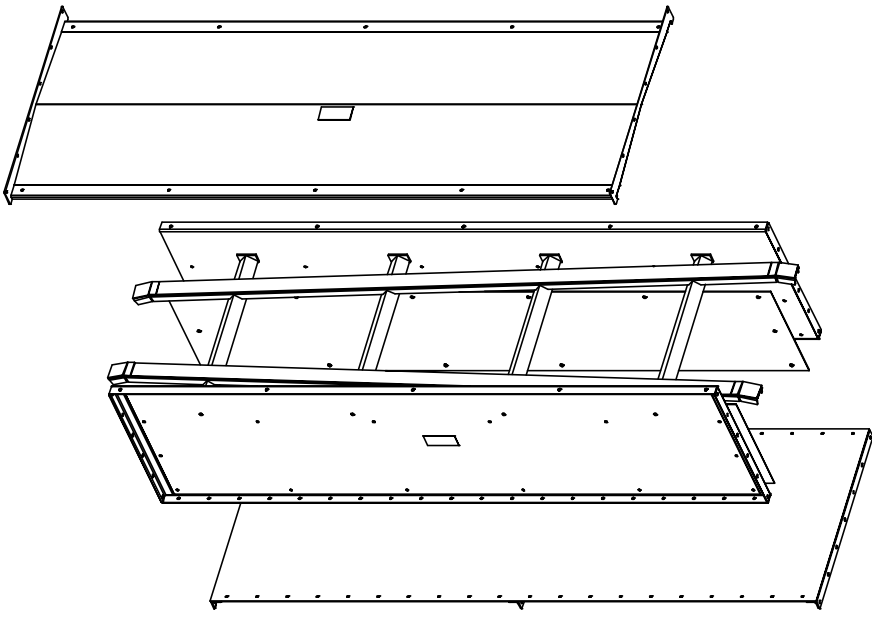
The head and tail sections of the chain conveyor are shipped pre-assembled direct from the factory. Intermediate trough sections come both factory pre-assembled or unassembled. Your order will serve as a reference to how your trough section should arrive. If you have any questions, please refer to your order confirmation.



Head Assembly



Tail Assembly



Intermediate Trough Assembly

Typical Intermediate Trough Section Assembly

Intermediate Trough Section Assembly

An en masse conveyor may be purchased with unassembled trough sections. The following recommendations may prove useful in their assembly.

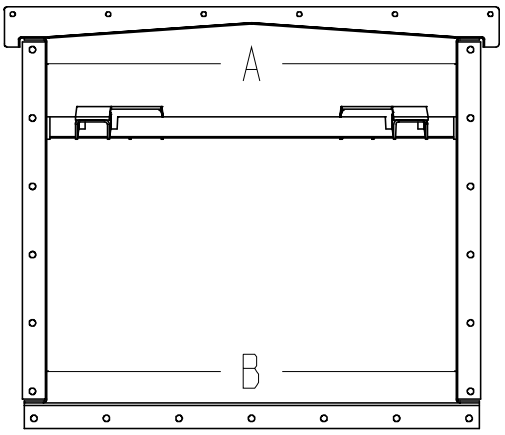
Before assembling conveyor trough sections together remove covers. It is recommended that you store your covers in a protected area in order to minimize any possible damage. Remember to retain factory shipped hardware for conveyor cover installation.

Take a moment to familiarize yourself with your trough assembly. Install the slide rail returns so that the wide ends of the rail returns face *away from* the discharge end of the conveyor. The narrow end, therefore, will face *toward* the discharge end.

Intermediate trough sections are supplied in standard ten foot (10') lengths. Depending on your application and individual specifications however, shorter sections may be required to accommodate a desired overall length.

Lay bottom plate weldment onto blocking material. Next, loosely attach side weldments to bottom plate with 3/8" hardware provided. Then fasten slide rail return weldment to intermediate sides with the 1/2" hardware.

Note: It is critical for straightness of the conveyor that the sides and bottom flanges are aligned flush. Also, it is important that the inside dimensions of the box measure equidistant from side-to-side both top and bottom of the trough box (Dimension A = Dimension B). See diagram below.



End View of Trough Section
(Liners not shown for clarity)

After making sure the flanges are aligned, tighten all hardware on the trough section. Abrasion Resisting (A.R.) liners are installed with the 3/8" flat countersunk hardware provided. Adequately tighten liners to conveyor sides. Check that the countersunk hardware is not protruding above the surface of the A.R. liners.

During assembly of each trough section to the next section, carefully inspect each flange joint to ensure that the inside bottom and side surfaces of the troughs are flush. A chalk line is helpful during this phase of the assembly to ensure the proper alignment of the trough surfaces. The maximum run-out in any direction should be +/- 1/4". This proper alignment will minimize wear on flights and other potential damage to the conveyor. Make sure the conveyor is level in horizontal applications.

Proceed by attaching the head and tail assemblies using the same alignment procedures and precautions noted in the preceding paragraph.

Cover Assembly Installation

Fasten covers to the enmasse conveyor with the 3/8" and 1/2" hardware provided. Adequately tighten the 1/2" bolts and nuts so that the vertical cover seams are in tight contact with each other.

When an inlet is on the conveyor, a cover section may have to be cut accordingly to accommodate the inlet. For installation of an inlet, see Inlet Assembly and Installation below.

Inlet Assembly and Installation

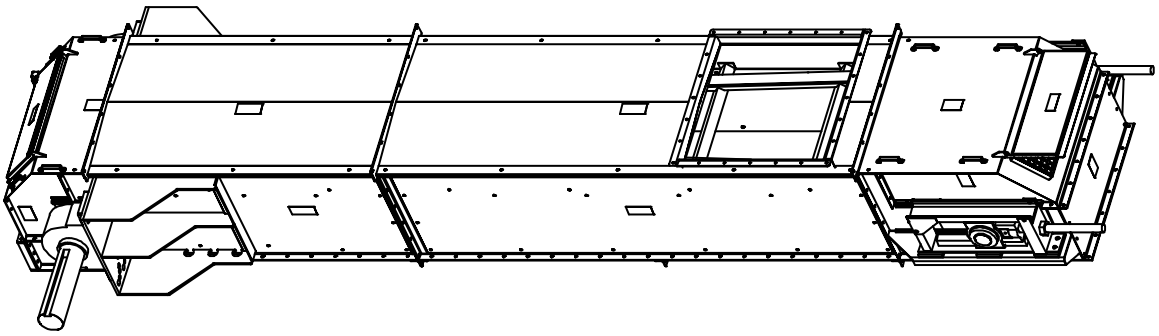
One inlet is typically provided per conveyor. GSI's recommendation for inlet installation includes a minimum distance of no less than 6" between the closest edge of the inlet and the tail assembly. See detail on page 12.

The inlet can be attached with continuous weld seams. If intermittently welded, it is important to use caulking or sealing around the inlet area in order to seal the unit.

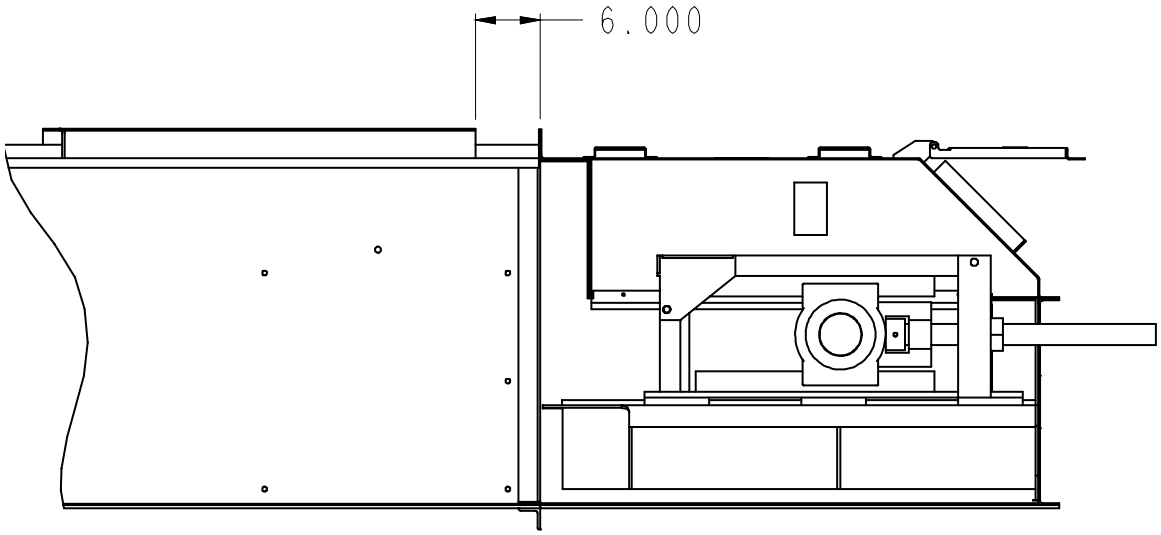
Similarly GSI recommends that if inlets are welded onto the conveyor, this procedure should occur prior to installation of motor and/or other electrical devices. By not following this precaution, owner assumes all risks associated with this type of installation.

Inlet Assembly

Standard Inlet



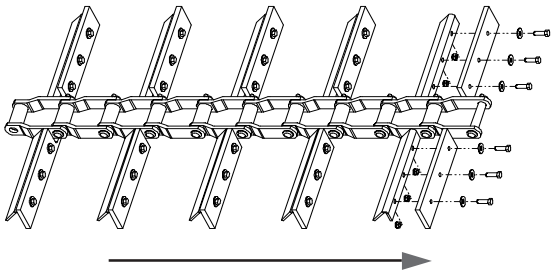
Head Discharge End **Tail End**



Drag Chain Assembly Installation

All chain supplied with new conveyors will be installed in a similar manner, regardless of type. Correct total chain length has been determined for your installation by GSI. The conveyor drag chain is shipped in approximate 10 foot lengths with an additional pre-cut short section if necessary (refer to packing list). If welded chain (WH132, WH155 or WH157) has been supplied with the conveyor, a minimum of five (5) feet of chain with cottered pin connectors will be supplied. These pin connectors and links may be removed as necessary for chain take-up. The chain may be installed at any time during conveyor assembly.

It is recommended however, that you position the chain over the slide rail returns and the sprockets in the head and tail assemblies. The UHMW wear pads should be in front of the welded chain flights in the direction of chain travel (see diagram below). Connect chain lengths together with connecting links and/or pins.



Direction of Chain Travel
Bottom Run

Tighten the drag chain assembly using the take-up screws located on each side of the tail section or on the take-up head. The chain should be able to be lifted slightly when sufficiently tightened. After the chain is tight, check that the head and tail shafts are square to the box sides. If the shafts are not square, loosen the tighter of the two take-up screws until the shafts are square. Lock the take-up screws by tightening the jam nuts.

Rotate the chain, now on the sprockets, at least one complete revolution. Check to see that the chain and its wear pads are not catching on flanges or rubbing on the trough liners. Ensure a “break-in” period whereby the chain is allowed to run and seat itself. After running it for an adequate period of time stop the machine, disconnect and lockout the power source. Retighten as necessary and remove any excess chain portions. Repeat this process as necessary.

Installing Shaft Mount Reducers

Assemble torque arm bracket to conveyor per installation instructions found on page 17.

To aid in the installation of the reducer onto the shaft, remove any protective coating film from shaft. Slide the reducer onto the drive shaft extending from the side of the conveyor head section. Using the instructions and hardware supplied with the reducer, assemble it to the conveyor drive shaft.

Assemble motor mount to the reducer. Refer to installation instructions provided with motor mount.

Install the rear panel of the drive guard before mounting the sheaves. The rear panel has four (4) mounting brackets with slotted holes. Attach the lower brackets to the matching reducer assembly bolts. Attach the upper brackets to the matching holes in the front motor mount support.

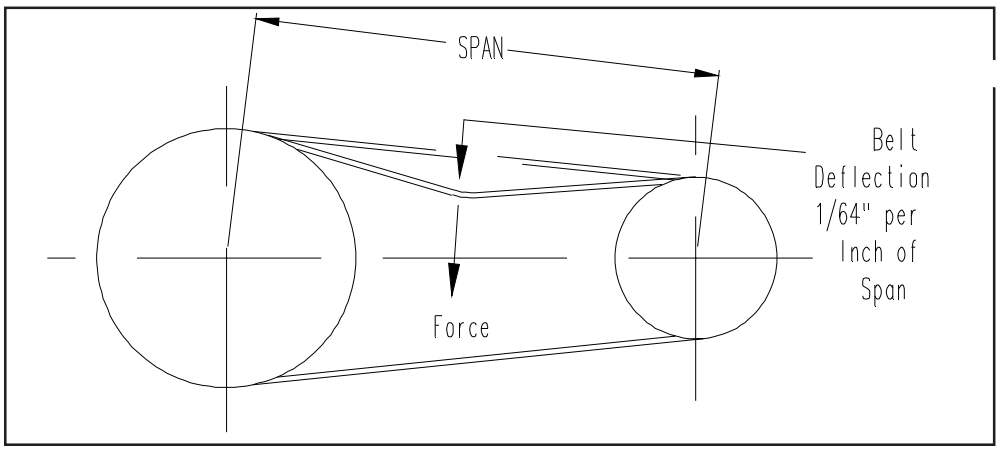
Assemble the V-belt driven sheave to the input shaft of the shaft mount reducer. Slide the sheave hub onto the shaft and insert the square key. Attach the hub sheave using the supplied retaining screws. The retaining screws pass through the non-threaded holes of the hub and into the sheave. Align the driver and driven sheaves and tighten the retaining screws. During tightening, it is possible for the sheave to move out of alignment or become out of square. For maximum V-Belt life, the driven sheave should remain both perpendicular to the drive shaft and aligned with the drive sheave. Slip the V-belts over both the driver and driven sheaves.

Adjustment of V-belt tension is achieved by tightening the hex nuts located on the four (4) jackscrews of the motor base. Adjust motor base equally at all four jackscrews to maintain shaft alignment. Belts are designed to fit loose upon installation. When the V-belt tension is correct, tighten the top nut on the jackscrews to lock the motor base in position. Proper tension is 1/64" of deflection per one (1") inch of sheave centers on one side of belt, centered between sheaves.

Note: *Too much tension shortens belt life. Check belt tension frequently during the first 24-48 hours of operation.*

Install the front drive guard panel over the four corner mounting studs. Secure with washers and nuts provided.

Fill the shaft mount reducer with the manufacturer's recommended oil. A list of recommended oil can be found in the gear reducer instructions.



Welding

Welding on or to the conveyor may cause damage to both the conveyor and its electrical system. If welding is necessary, measures should be taken to protect the conveyor. Should it be necessary to fasten anything to the conveyor permanently, careful consideration should be given to methods of maintenance, removal and replacement of the conveyor and/or its parts. (please refer to Inlet Installation for GSI recommended guidelines).

Motor

Connect the conveyor motor to a power source according to the motor manufacturer's instructions and recommendations. To avoid injury it is recommended that a certified electrician perform the motor wiring. A shut off switch should be placed near the motor so that the system may easily be shut down to help prevent accidents during maintenance. It is important to check proper motor shaft rotation before installing drive belts

Support

GSI's recommended general guidelines in this area include adequate support for the conveyor assembly to be installed at intervals no greater than 10 feet. It is recommended that supports be installed at vertical portions of flanges leaving bottoms of trough sections clear. By attaching supports in this manner, the removable bottoms are unobstructed for ease of replacement. Support legs are available as an option.

Clearance

A clearance of at least the width of the conveyor is recommended on all sides of the unit. Less clearance may be acceptable however, serious consideration must be given to methods of maintenance, removal and replacement of the conveyor and/or its parts.

Discharge

The standard conveyor is constructed with one discharge located at the drive end. If intermediate discharges are to be used, the location(s) must be determined before proceeding with the conveyor assembly. Intermediate discharges cannot be installed over a trough joint; therefore, it may be necessary to position a shorter trough section to serve as a spacer in order to accommodate the placement of the discharge(s) where they are required.

The owner assumes all responsibility for any alterations to the equipment.

Care and Maintenance

WARNING!

Before any maintenance is performed to the conveyor, power must be shut off and locked out to prevent accidental start up!

The care and maintenance section is provided with the intention of helping to extend the useful life of the unit. Like all equipment, the useful life of the conveyor is greatly reduced if not used wisely and well maintained.

Please follow the next few simple steps to insure the safety and longevity of your equipment.

- Check all bearings and moving parts daily during use.
- Lubricate bearings according to bearing manufacturer's recommendations.
- Follow manufacturer's recommendations for gear reducer lubrication and maintenance.
- Inspect the V-belts periodically for proper tension and wear. V-belts should be replaced as necessary. If replacement or tension adjustment is required, please refer to the Shaft Mount Reducer Assembly Section on page 14.
- The Drag Chain and Sprockets should be checked periodically for wear, damage and proper adjustment. Any broken or bent paddles should be replaced or straightened. Should adjustment or replacement of the drag chain be required, refer to the Assembly Section on page 13.

Storage

If the unit is to be inactive for an extended period, the following procedures are recommended.

- Thoroughly clean the unit.
- Loosen the drag chain tension. Doing so relieves the stress placed on the bearings and shafts of the drive and tail sections.
- Lubricate drag chains, shafts and drive components with a good grade of light machine oil.

Torque Arm Bracket Installation

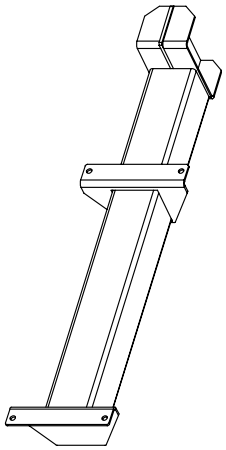
When a drive package is ordered with the conveyor system, a torque arm bracket is provided.

The torque arm bracket is pre-punched for ease of installation to the unit. Begin installation of this option by first determining the location of the torque arm bracket relative to the range of extension allowed by the shaft mount reducer's torque arm. The bracket will extend on the same side of the conveyor as the head shaft. Remove the 5/8" bolts necessary from the bottom of the conveyor head bottom plate.

Set the torque arm bracket in place and attach with the 5/8" hardware previously removed from the bottom plate of the conveyor. Four (4) 5/8" bolts and nuts are required to fasten the torque arm bracket to the conveyor.

Install shaft mount reducer to head shaft per instructions on page 14.

Next, match the size of the hardware to the reducer manufacturer's torque arm. Use this hardware to attach the torque arm to the bracket. Adequately tighten all hardware.

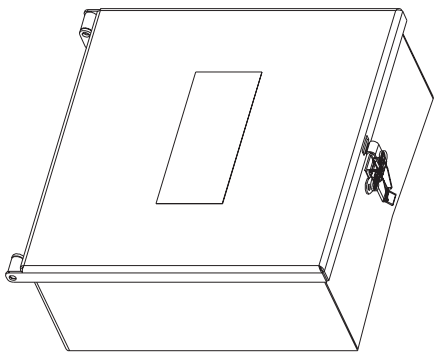


Torque Arm Bracket

Inspection Ports

After determining location(s) for the inspection port(s) on conveyor, cut an 11-3/4" square hole in the cover for each inspection port. Cut the square opening so that it is centered over the peak of the conveyor cover.

Position the inspection port over the square hole until its frame is flush to the cover. Weld inspection port to conveyor cover. Additional caulking may be required so that water will shed from the inspection port.



Plug Relief Door

GSI Series 2 26” and 32” tall enmasse conveyors come equipped with a head discharge plug relief door as a standard feature. A NEMA 4 heavy duty limit switch is standard on the relief door.

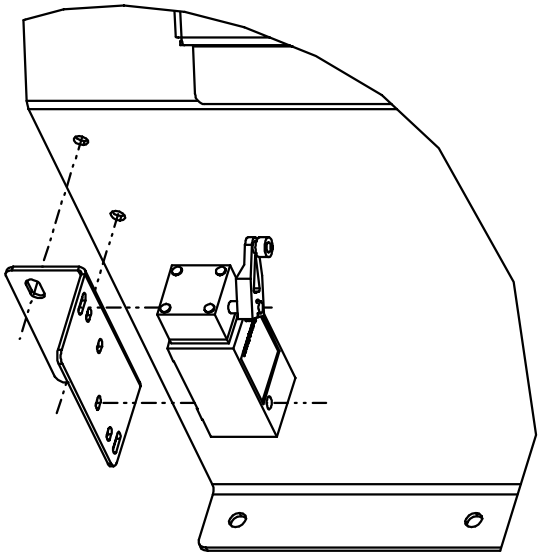
However, in extremely dirty, dusty conditions and/or in enclosed environments, a NEMA 9 heavy duty limit switch should be used on the plug relief door. The NEMA 9 limit switch is available as an added option.

The optional NEMA 9 limit switch (GSI part number CE-00504) attaches to the same universal bracket on the front of the head assembly as the standard NEMA 4 limit switch. The same hardware is used for both limit switches.

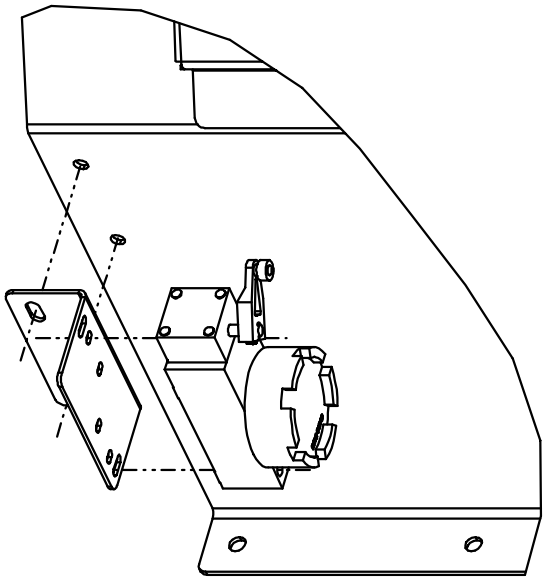
Note: The limit switch bracket must be oriented as shown for proper engagement between limit switch and Plug Relief Door.

Attach the bracket to the hood cover with two (2) 5/16” bolts and nuts where two pre-punched holes are located. Two pairs of pre-punched holes are provided on the removable head hood cover - one pair on the left side and one pair on the right side of hood cover. Next, use two (2) #10 machine screws, nuts and washers to fasten the limit switch to the bracket. The limit switch can be installed either to the left or to the right. Do not tighten these machine screws at this time.

Adjust the limit switch so that the actuator arm keeps sufficient tension against the Plug Relief Door. After the limit switch is properly positioned, tighten the two machine screws.



Standard Plug Relief Door Limit Switch



Optional NEMA 9 Limit Switch GSI part # CE-00504

Slack Chain Assembly

The GSI Group offers a slack chain detector system as an option for its 26” and 32” tall Series II enmasse conveyors. Depending on working conditions and/or environment, either a NEMA 4 or a NEMA 9 limit switch is available.

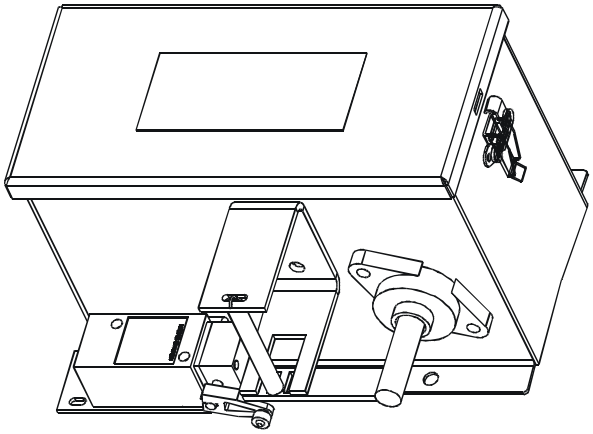
Begin installation of optional slack arm assembly by first cutting a 12” x 5” rectangular hole in the head section cover; see illustration below.

Next, center the slack chain assembly over the rectangular opening. Mark the locations for the four (4) 7/16” diameter holes. Temporarily remove the slack chain assembly, and drill the four 7/16” diameter holes.

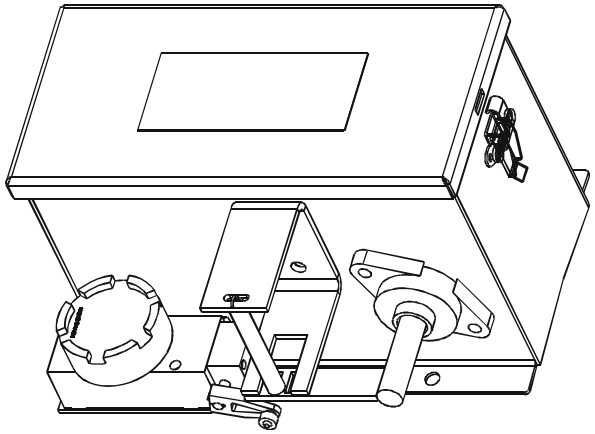
Before attaching slack chain assembly to the conveyor, apply sealant to bottom surfaces of slack chain assembly.

Fasten slack chain assembly to conveyor with 3/8” hardware. See illustration below regarding direction of slack chain assembly on the conveyor.

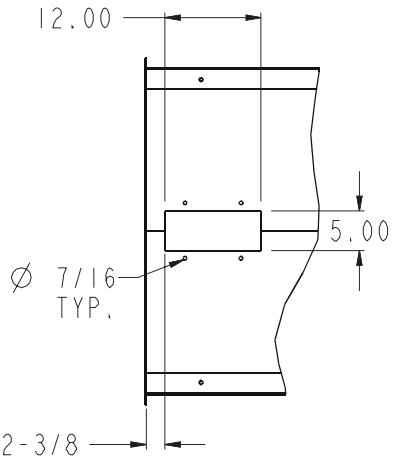
After installation, check that the clearance between the UHMW paddle in the slack chain assembly and the UHMW flights on the chain is approximately 1/2” to 3/4”. Adjust if necessary.

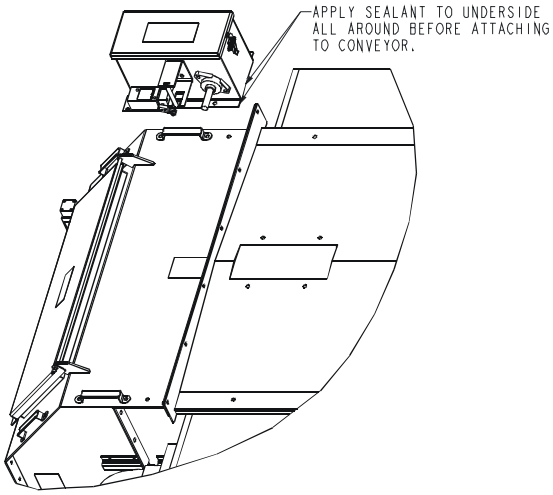


Top Mount Slack Chain with NEMA 4 limit switch



Top Mount Slack Chain with NEMA 9 limit switch





Carry-Over Bars - Reversing Conveyor

For applications where the enmasse conveyor may run in a reversing direction, carry-over bars should be installed in the head assembly. These bars will ensure a smooth transition of the chain and flights from the head discharge into the conveyor box.

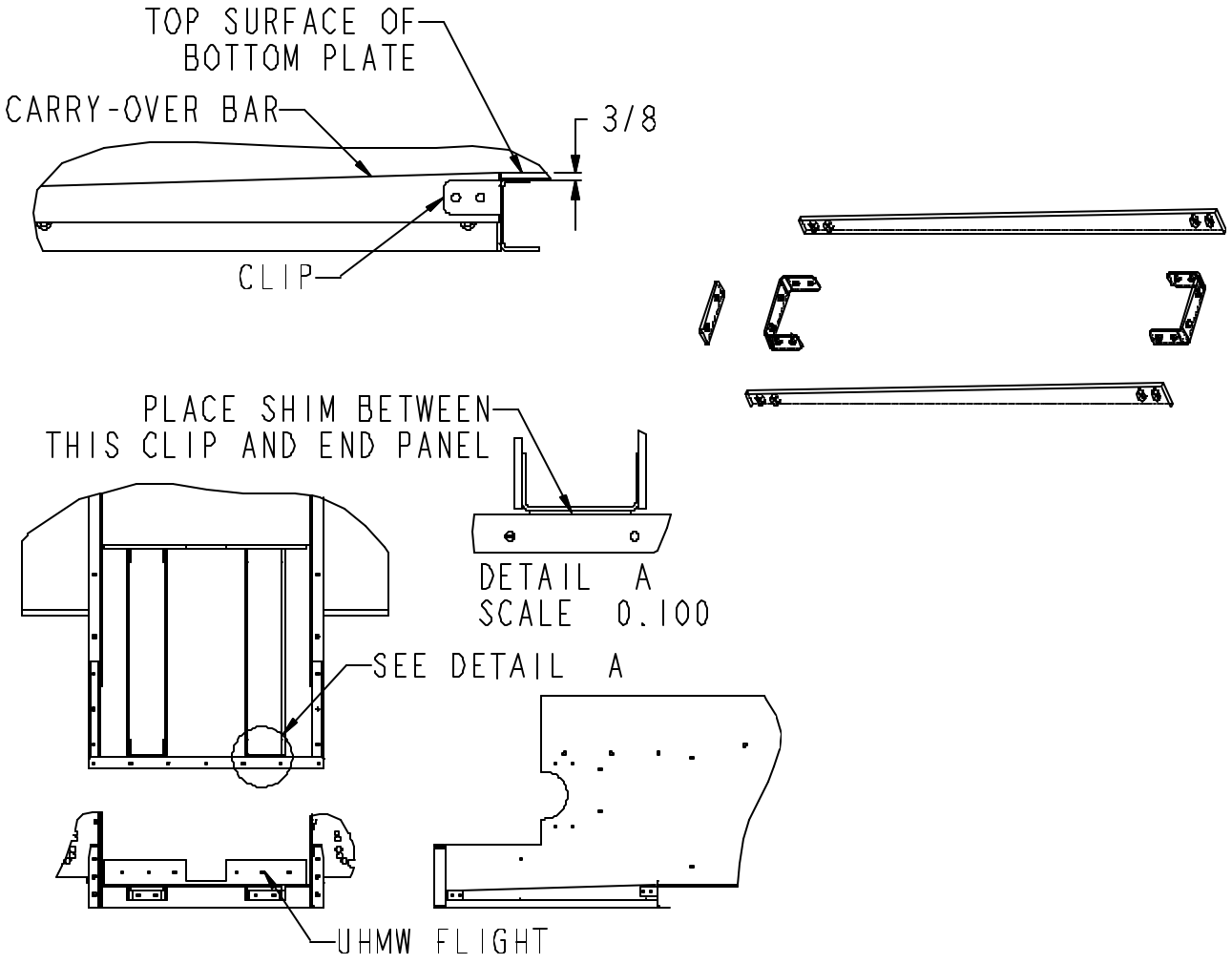
The carry-over bar package consists of four (4) carry-over bars, four (4) clips, and two (2) shims plus the hardware necessary to attach these components within the head assembly.

Pre-assemble the two pairs of carry-over bars and clips using the 3/8" bolts and nuts. Be sure to center the clips to the vertical slots on each end of the carry-over bars.

Next, place the pre-assembled pairs of carry-over bars in the head discharge as shown below. *It is imperative that these carry-over bars be spaced so that they pick up the UHMW flights as shown below.*

After the two pairs of carry-over bars have been positioned, mark the locations for the eight (8) 9/16" diameter holes and drill. Attach with the 1/2" hardware provided.

After installation, check that the top edge of the carry-over bars does not extend above the top surface of the bottom plate.



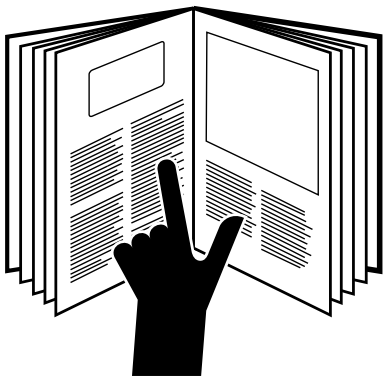
Trouble Shooting Guide

Problem	Cause	Solution
Low capacity	Improper chain speed	Check the shaft RPM
	Improper feed	Check the grain level at inlet
	Plugging	Check the discharges
Noisy operation	Loose UHMW Paddles	Check all bolts on chain
	Bottom or Sides Not Aligned	Check Intermediate Trough Section joints and make flush
	Worn Drive Components	Check oil level and shaft seals belt misalignment; loose belts
	Worn Sprocket	Replace
	Return Rail Alignment	Check Rail Alignment
Uneven UHMW paddle wear	Conveyor Misalignment	Check the conveyor alignment
	Sprocket Slipped	Check set screws on sprockets
	Return Rail Alignment	Check Rail Alignment
Excessive carry-over	Gates Not Fully Opening	Check the gate operation
Uneven sprocket wear	Worn chain	Replace chain (see pg. 13)
	Improper alignment	Check the sprocket alignment
	Material carry-over into discharge sprocket	Check for improper location of inlet (see pg. 11)

Consult your contractor for added assistance.

Employer/Employee Training Sign Off Sheet

GSI is making every effort to warn, guard, and educate the consumer when using the various kinds of equipment that we manufacture. GSI has included this sign off sheet for you and your staff to use in the training process on installation and operation of the equipment described in this manual. Read the entire manual, sign off, and date on chart below.



The GSI Group, Inc. Warranty

THE GSI GROUP, INC. (“GSI”) WARRANTS ALL PRODUCTS WHICH IT MANUFACTURES TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USAGE AND CONDITIONS FOR A PERIOD OF 12 MONTHS AFTER RETAIL SALE TO THE ORIGINAL END USER. THE PURCHASER’S SOLE REMEDY AND GSI’S ONLY OBLIGATION SHALL BE TO REPAIR OR REPLACE, AT GSI’S OPTION AND EXPENSE, PRODUCTS THAT, IN GSI’S SOLE JUDGMENT, CONTAIN A MATERIAL DEFECT DUE TO MATERIALS OR WORKMANSHIP. ALL DELIVERY AND SHIPMENT CHARGES TO AND FROM GSI’S FACTORY WILL BE PURCHASER’S RESPONSIBILITY. EXPENSES INCURRED BY OR ON BEHALF OF THE PURCHASER WITHOUT PRIOR WRITTEN AUTHORIZATION FROM AN AUTHORIZED EMPLOYEE OF GSI SHALL BE THE SOLE RESPONSIBILITY OF THE PURCHASER.

EXCEPT FOR THE LIMITED WARRANTY EXPRESSED ABOVE, GSI MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH (I) PRODUCT MANUFACTURED OR SOLD BY GSI OR (ii) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

GSI SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOSS OF ANTICIPATED PROFITS OR BENEFITS. PURCHASER’S SOLE AND EXCLUSIVE REMEDY IS AS SET FORTH IN THE LIMITED WARRANTY EXPRESSED ABOVE, WHICH SHALL NOT EXCEED THE AMOUNT PAID FOR THE PRODUCT PURCHASED. THIS WARRANTY IS NOT TRANSFERABLE AND APPLIES ONLY TO THE ORIGINAL PURCHASER. GSI SHALL HAVE NO OBLIGATION OR RESPONSIBILITY FOR ANY REPRESENTATIONS OR WARRANTIES MADE BY OR ON BEHALF OF ANY DEALER, AGENT OR DISTRIBUTOR OF GSI.

GSI ASSUMES NO RESPONSIBILITY FOR CLAIMS RESULTING FROM ERECTION DEFECTS OR UNAUTHORIZED MODIFICATIONS TO PRODUCTS WHICH IT MANUFACTURED. MODIFICATIONS TO PRODUCTS NOT SPECIFICALLY DELINEATED IN THE MANUAL ACCOMPANYING THE EQUIPMENT AT INITIAL SALE WILL NULLIFY THE PRODUCT WARRANTY THAT MIGHT HAVE BEEN OTHERWISE AVAILABLE.

THE FOREGOING WARRANTY SHALL NOT EXTEND TO PRODUCTS OR PARTS WHICH HAVE BEEN DAMAGED BY NEGLIGENT USE, MISUSE, ALTERATION OR ACCIDENT. THIS WARRANTY EXTENDS SOLELY TO ONLY PRODUCTS MANUFACTURED BY GSI. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. GSI RESERVES THE RIGHT TO MAKE DESIGN OR SPECIFICATION CHANGES AT ANY TIME.

PRIOR TO INSTALLATION, PURCHASER HAS THE RESPONSIBILITY TO COMPLY WITH ALL FEDERAL, STATE AND LOCAL CODES WHICH MAY APPLY TO THE LOCATION AND INSTALLATION OF PRODUCTS MANUFACTURED OR SOLD BY GSI.

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MATERIAL HANDLING

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