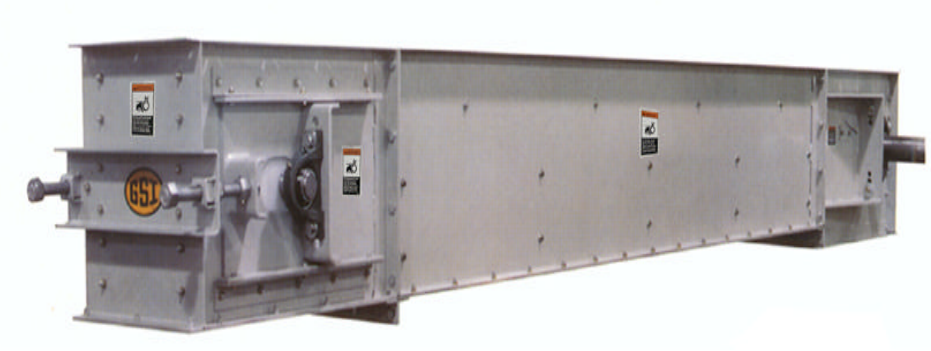
Chain Conveyor

En- Masse Chain Conveyors



Series 2 12”-14”-20” Tall

Installation and Operation Manual

PNEG-763

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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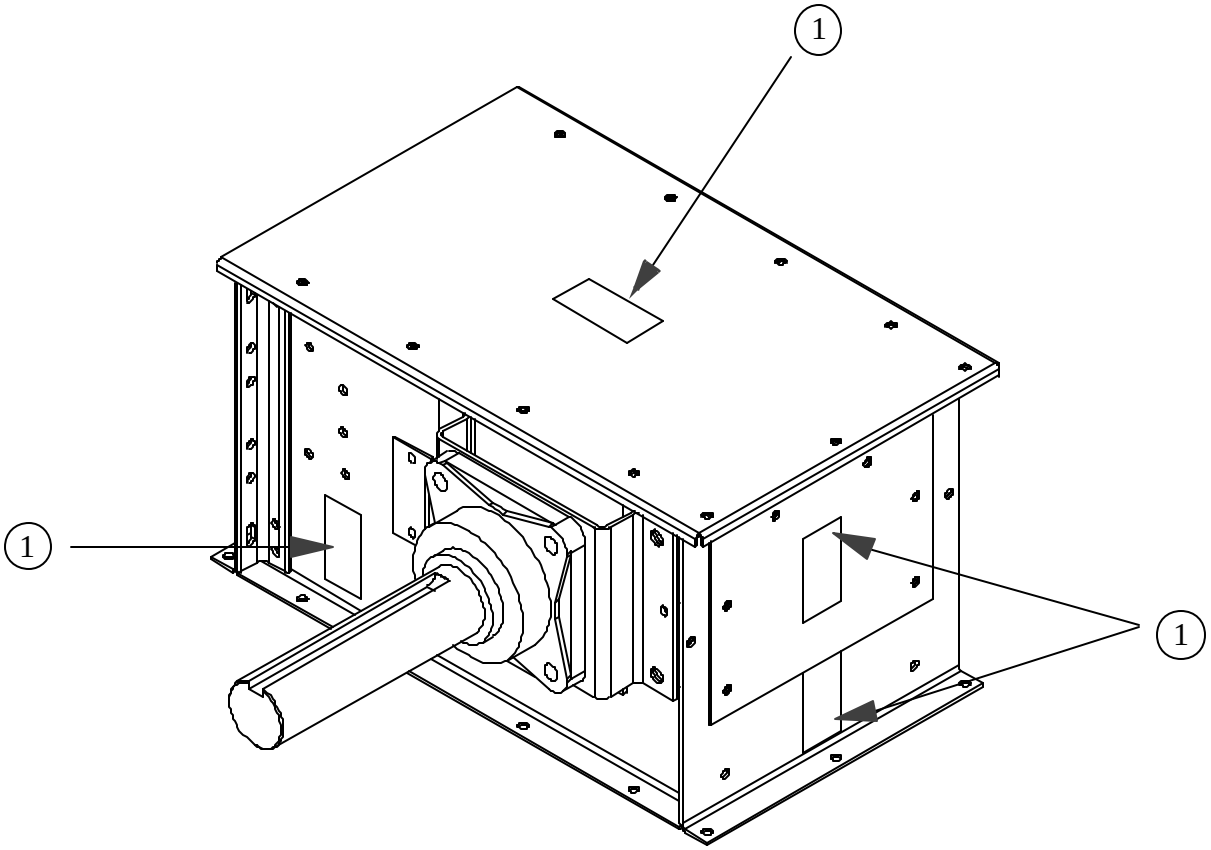
Head Section Decal Locations



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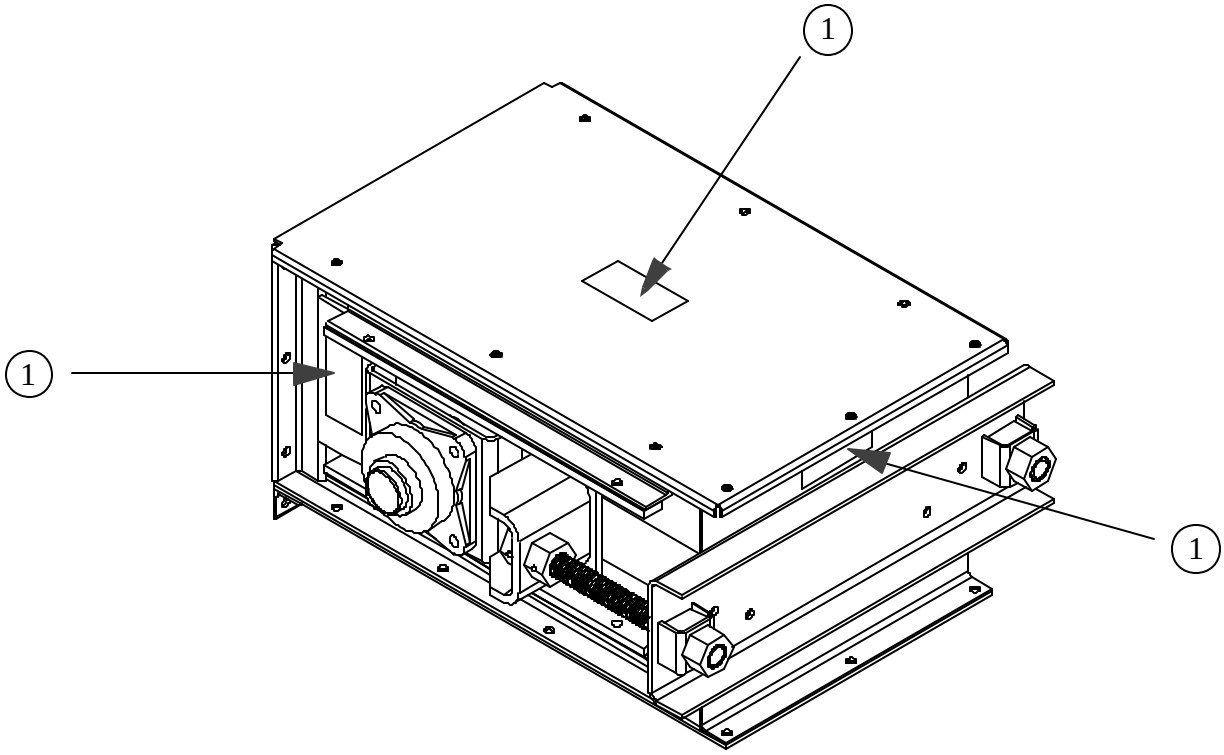
Tail Section Decal Locations



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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 chain conveyor components.

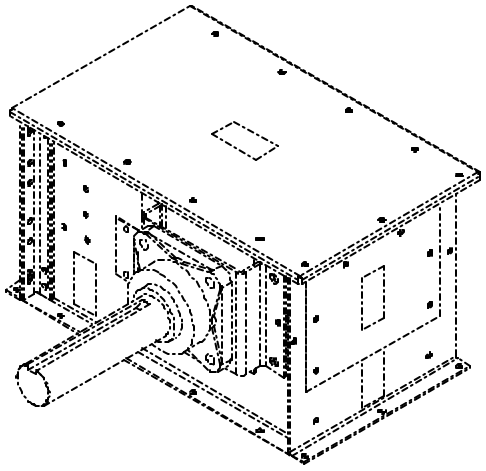
Pre-Installation Preparation

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.

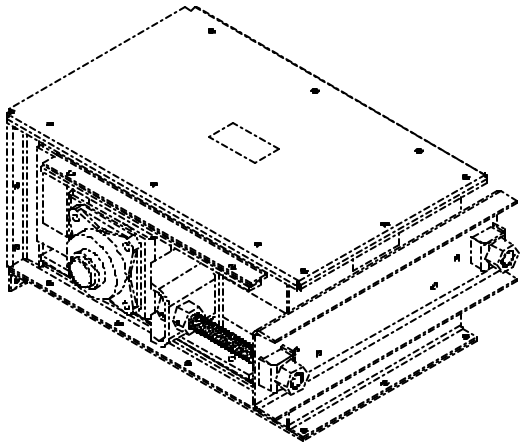
Remove any banding and crating material. Arrange all the conveyor components in such a fashion that all are easily accessible.

Locate some 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.

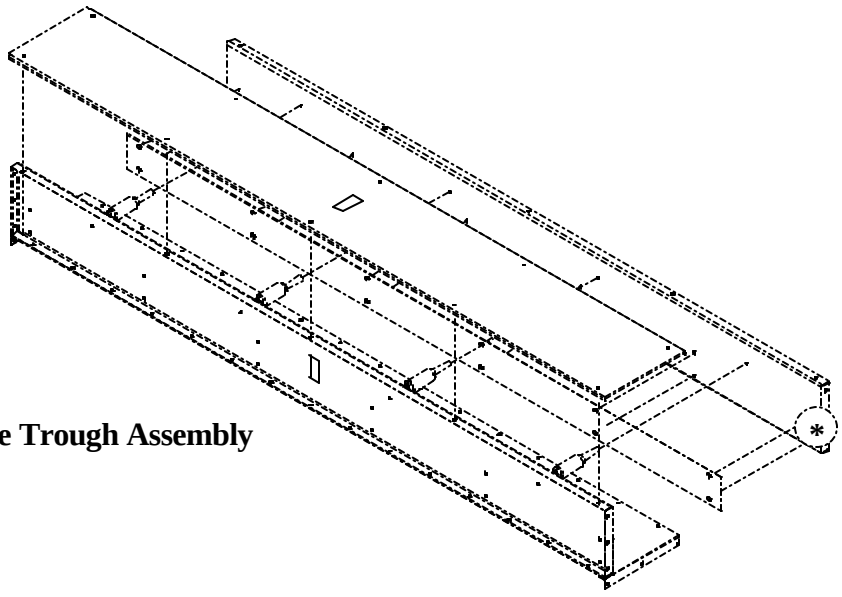
The head and tail sections of the chain conveyor are shipped pre-assembled direct from the factory. Intermediate trough sections come both factory pre-assembled or unassembled. Your order will serve as a reference to how your trough section should arrive. If you have any questions, please refer to your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



Head Assembly



Tail Assembly



Intermediate Trough Assembly

Typical Intermediate Trough Section Assembly with Roller Returns

*** optional AR liner shown**

Intermediate Trough Section Assembly

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

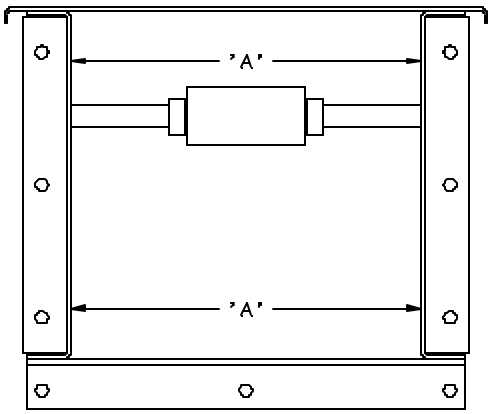
Before assembling conveyor trough sections together remove covers. It is recommended that you store your covers in a protected area in order to minimize any possible damage. Remember to retain factory shipped hardware for conveyor cover installation.

Take a moment to familiarize yourself with your trough assembly. If your conveyor is equipped with UHMW roller returns, check that the rollers turn freely. If the conveyor is equipped with slide rail returns, 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. See illustration on next page.

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 given overall length.

Lay bottom plate weldment onto blocking material. Next, loosely attach side weldments to bottom plate with 3/8" hardware provided. Then fasten UHMW roller returns or slide rail return weldment to intermediate sides with the 5/16" whiz flange capscrews.

Note: When installing UHMW roller returns, check that they are centered within the box. It is important that the inside dimensions of the box are equidistant from the bottom plate to the roller/slide rail shafts (see diagram below).

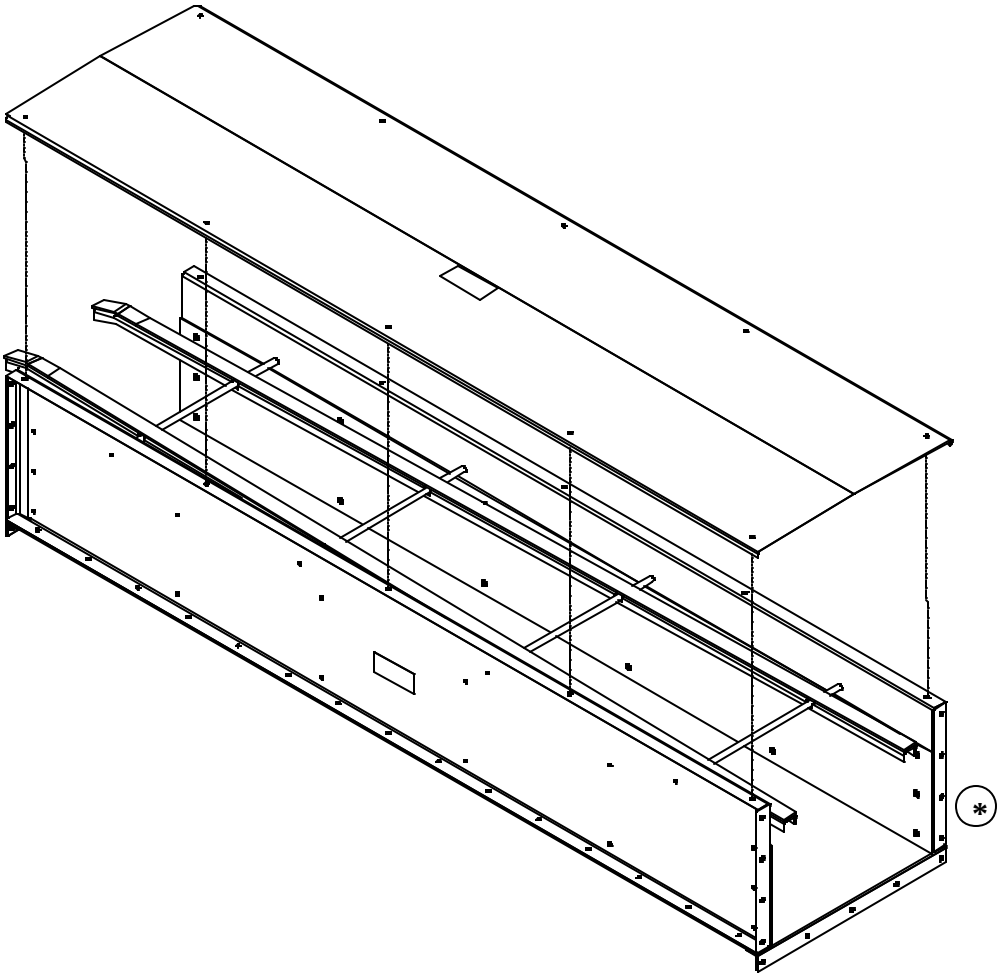


It is critical for straightness of conveyor that the sides and bottom flanges are aligned flush. After making sure the flanges are aligned, tighten all hardware on the trough section. When any optional Abrasion Resisting (A.R.) liners are ordered, they may be installed with the 3/8" flat countersunk 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 trough 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 that 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.

Head (Discharge) End



Tail End

Typical Intermediate Trough Section Assembly with Slide Rail Returns

*** optional AR liner shown**

Cover Assembly Installation

Before installing the covers, adhesive back foam strip may be applied to provide a seal against the elements. Starting at the tail assembly, place the Tail Section Cover on top of the Tail Section assembly. Apply the adhesive back foam strip to the top surface of the protruding lip before installing the next cover (see Cover Trough Assembly diagram on page 14). This recommended installation sequence should ensure that water will shed away from cover seam connections.

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.

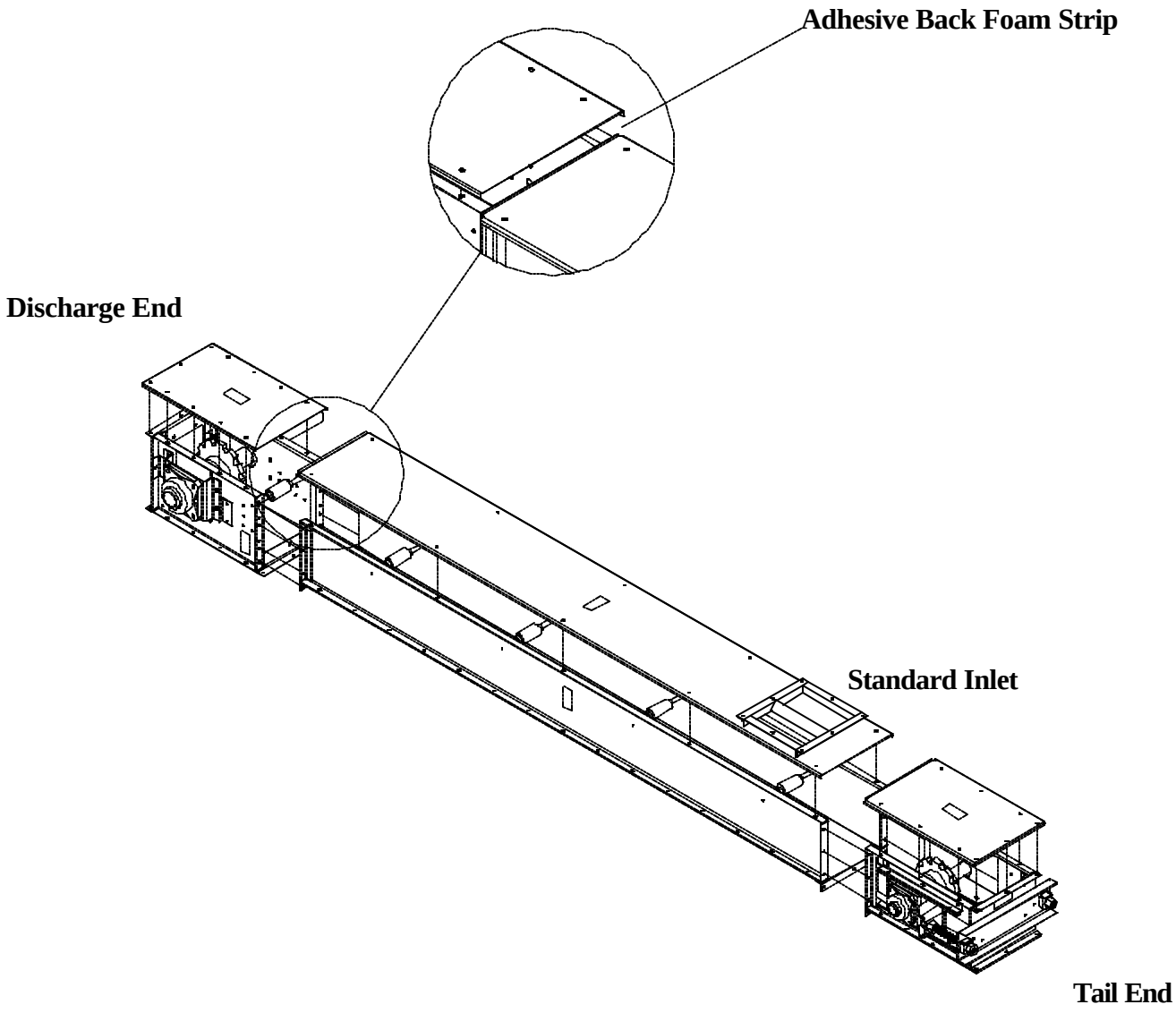
Inlet Assembly and Installation

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.

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.

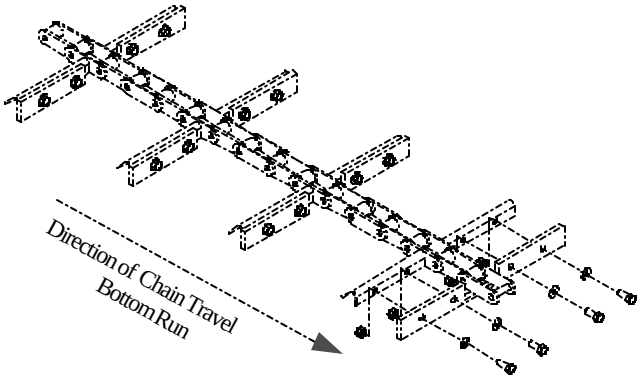
Cover Trough Assembly



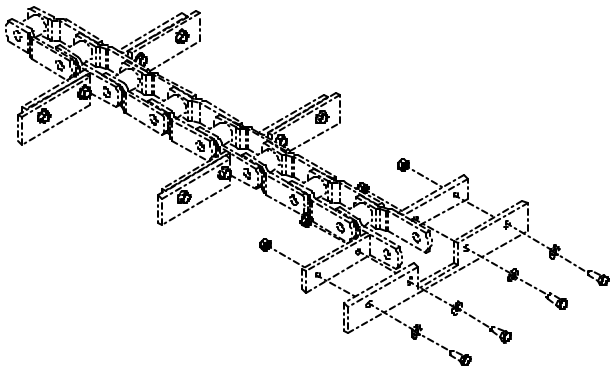
Drag Chain Assembly Installation

All chain now supplied with new conveyors will be installed in a like 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 precut short section, if necessary (refer to packing list). The chain may be installed at any time during conveyor assembly.

It is recommended however, that you position the chain over the roller return assemblies 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. This assembly recommendation also applies to conveyors with slide rail returns.



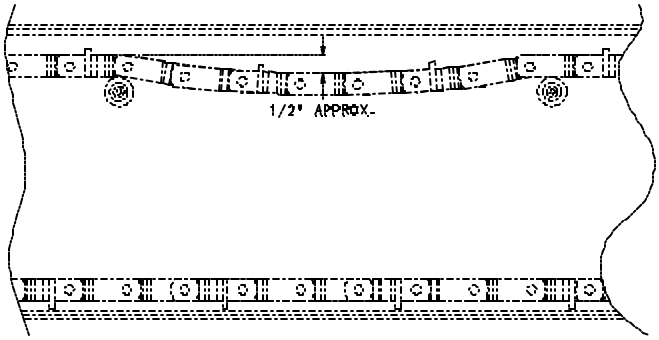
81X Chain Assembly



4" Pitch Roller Chain Assembly

Tighten the drag chain assembly using the take-up screws located on each side of the tail section or on the take-up head. On conveyors with roller returns, the chain is at the proper tension when a maximum of 1/2" deflection occurs at a point midway between the rollers (see diagram below). On conveyors with slide rail returns, 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 adjuster screws until the shafts are square. Lock the adjuster screws by tightening the hex nuts against the cross-ways "C" channel.

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 sides due to the sprockets not being centered within the box. 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 19.

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.

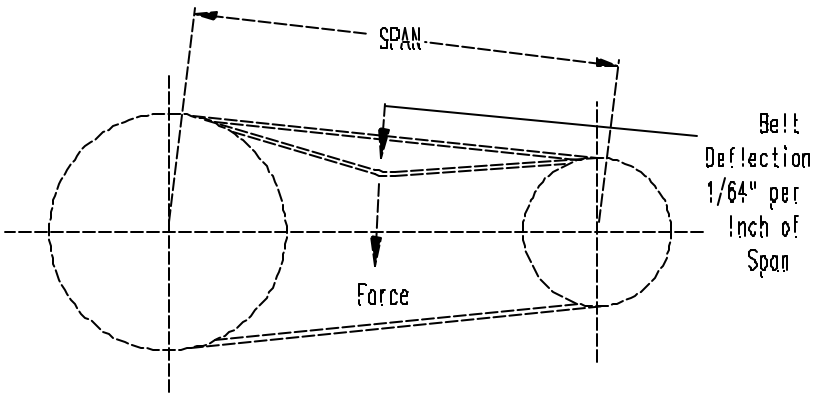
Assemble the V-belt driven sheave to the input shaft of the shaft mount reducer. Slide the sheave hub onto the shaft and insert the square key. Attach the hub sheave using the supplied retaining screws. The retaining screws pass through the non-threaded holes of the hub and into the sheave. Align the 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 bolts 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 as 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 ensure 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 16.
- 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 15.

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 four bolts necessary from the bottom of the conveyor plate.

Drill the four holes in the conveyor's bottom to accomodate the 5/8" hardware provided. Attach the torque arm bracket to the conveyor using four 5/8" hardware. *Under any circumstances, **do not** use the 3/8" bolts previously removed from the conveyor bottom to attach the torque arm to the conveyor.*

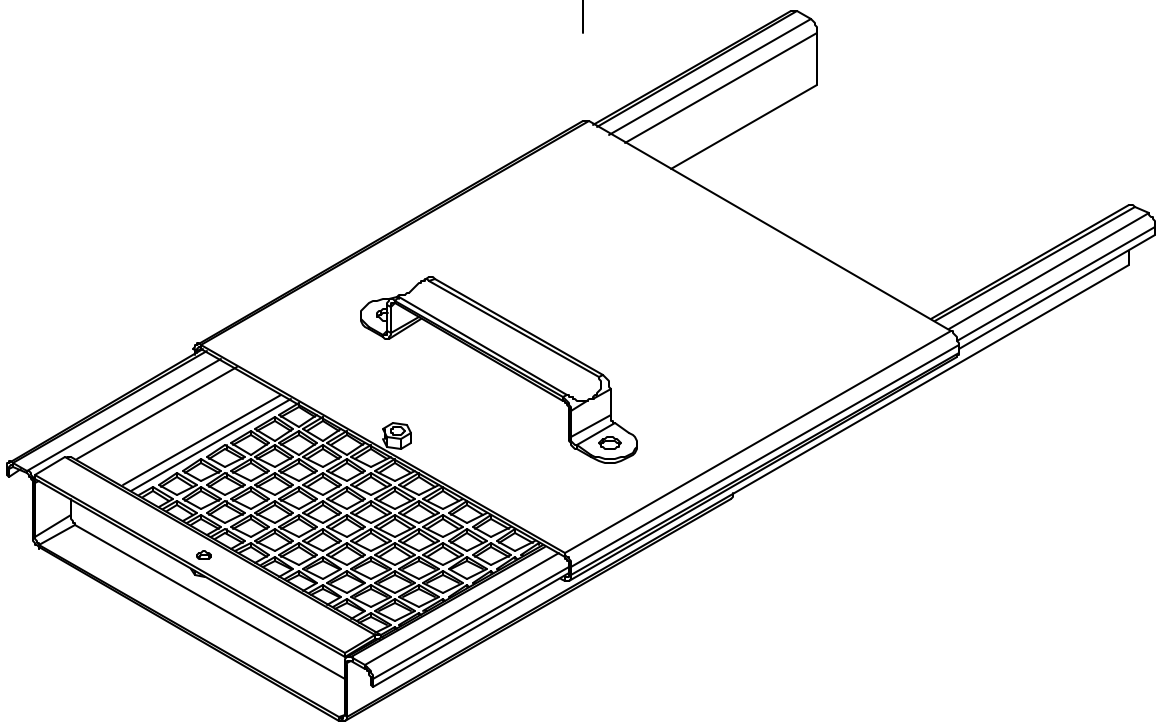
Install shaft mount reducer to head shaft per instructions on page 16.

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.

Inspection Ports

After determining location(s) of inspection port(s) on conveyor, cut an 8 3/16" square hole in the cover for each inspection port.

Insert inspection port into hole until its frame is flush to the cover. Weld inspection port to conveyor cover. Additional caulking may be required to ensure that water will shed from the inspection port.



Plug Relief Door

Remove cover plate from head section end channel. When installing Plug Relief Door, be certain that the unit's offset bottom lip is inserted inside the conveyor. Use the existing hardware from the cover plate to attach the Plug Relief Door to the head section. The bolts should be inserted from inside the conveyor to the outside.

Liberally apply the provided sealant around the Plug Relief Door. Follow label directions on sealant cartridge.

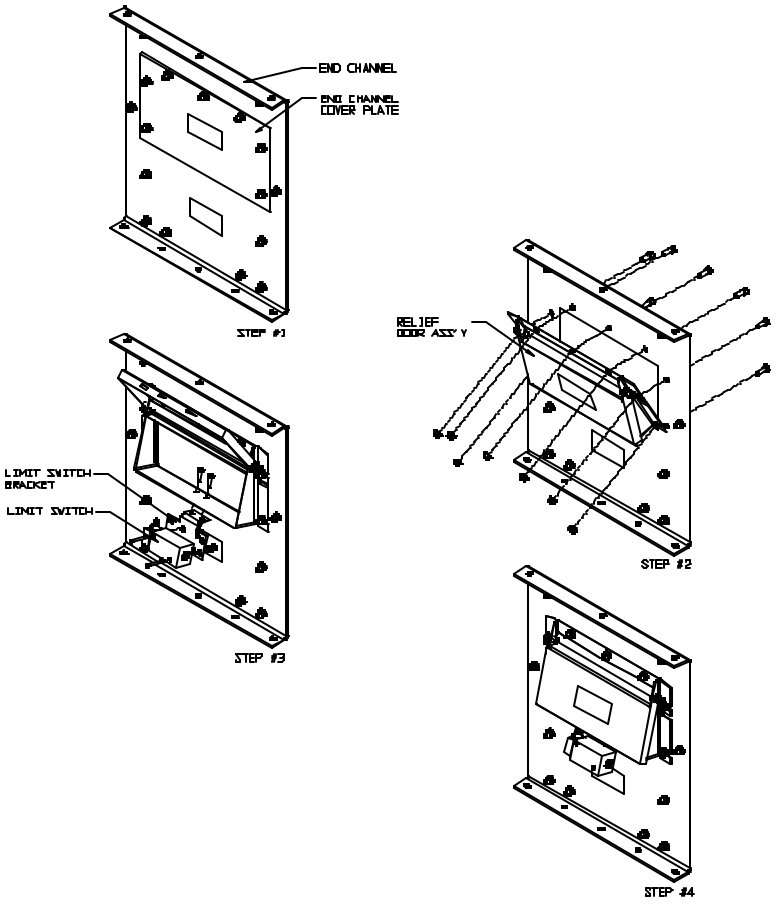
Attach limit switch clip to the Plug Relief Door with the hardware provided. Refer to the illustration below for correct orientation.

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

Next, use two (2) machine screws, nuts and washers to fasten the limit switch to the clip. The limit switch can be installed with its conduit port facing either to the left or to the right. Do not tighten these machine screws at this time.

Adjust the limit switch so that the roller actuator keeps sufficient tension against the Plug Relief Door. The roller actuator will fit into one of the pre-punched slots in the Plug Relief Door lid. After the limit switch is properly positioned, tighten the two machine screws.

A NEMA 4 limit switch is shown below. A NEMA 9 limit switch is should be used in extremely dirty, dusty conditions and/or in enclosed environments.



Plug Relief Door

Slack Chain - Roller Returns

Inspect the slack chain components to verify quantity. A typical slack chain assembly contains:

(1) One Slack Chain lever arm weldment
(1) One Interval lever weldment
(2) Two bearings
(1) One limit switch clip
(1) One limit switch
(1) One spring
(1) One spring Bracket
(1) One hardware package

Begin installation of optional slack arm assembly by first determining which side of the Head Section that the Limit Switch will be attached.

Next, remove the two (2) cover plates from the sides of the Head Section. Attach the two (2) bearings to the sides of the Head Section. Insert the lever arm weldment through the internal lever weldment and both bearings as illustrated below. Remove any paint, scale or rust from the lever arm weldment rod before assembling. **The internal lever weldment must face away from the head sprocket (as shown in the illustration).**

Position the external lever arm approximately 4 1/8" from head section side. The lever arm should be oriented horizontally. Tighten locking collars on the bearings.

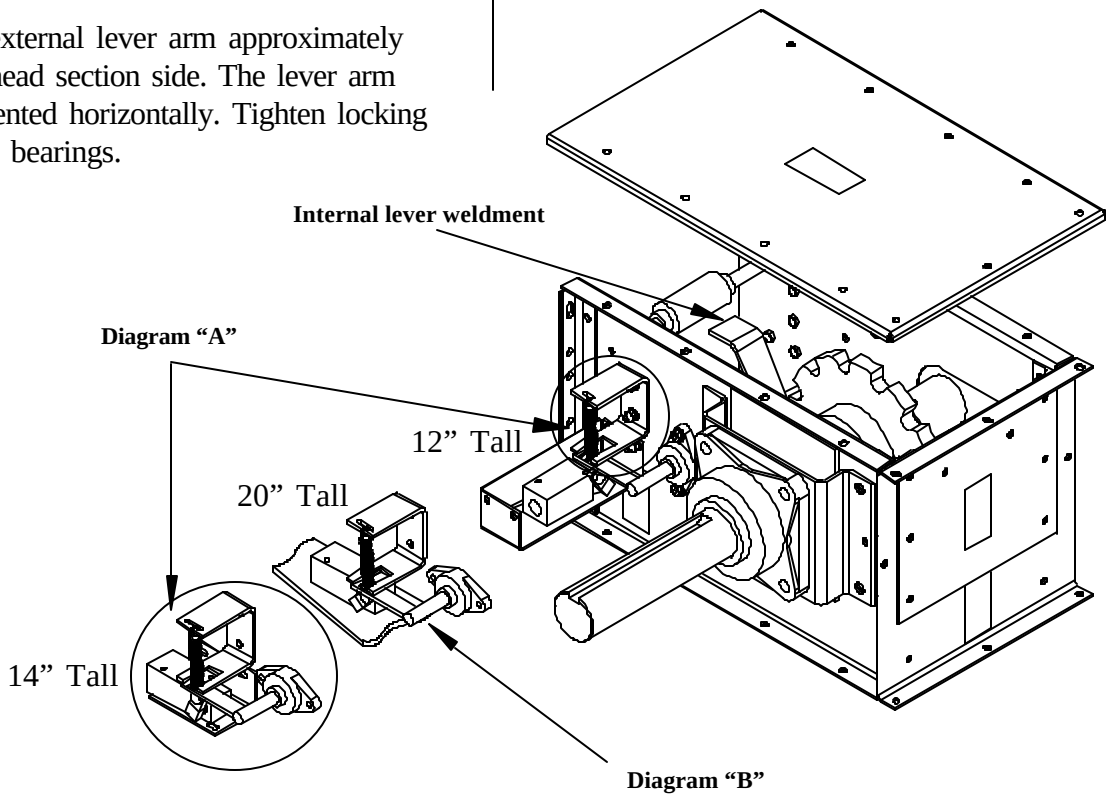
Attach limit switch bracket to conveyor head section. Note the orientation of the limit switch brackets as illustrated in the diagram (see diagram A). Also, please note that some 20" tall conveyors will not use the limit switch clips. The limit switch may be attached directly to pre-punched holes in the bearing plate gussets (see diagram B).

Fasten the limit switch to the clip or gusset with the hardware provided.

Install the spring bracket above the limit switch. Attach the spring to the bracket and to the external lever arm (see diagram "C" next page).

Finally, center the internal lever weldment between the head section sides. This internal lever should be directly below conveyor drag chain. Orient the internal lever so that approximately 1" is between the lever and the chain (see diagram "D" next page).

A NEMA 4 limit switch is shown below. A NEMA 9 limit switch is should be used in extremely dirty, dusty conditions and/or in enclosed environments.



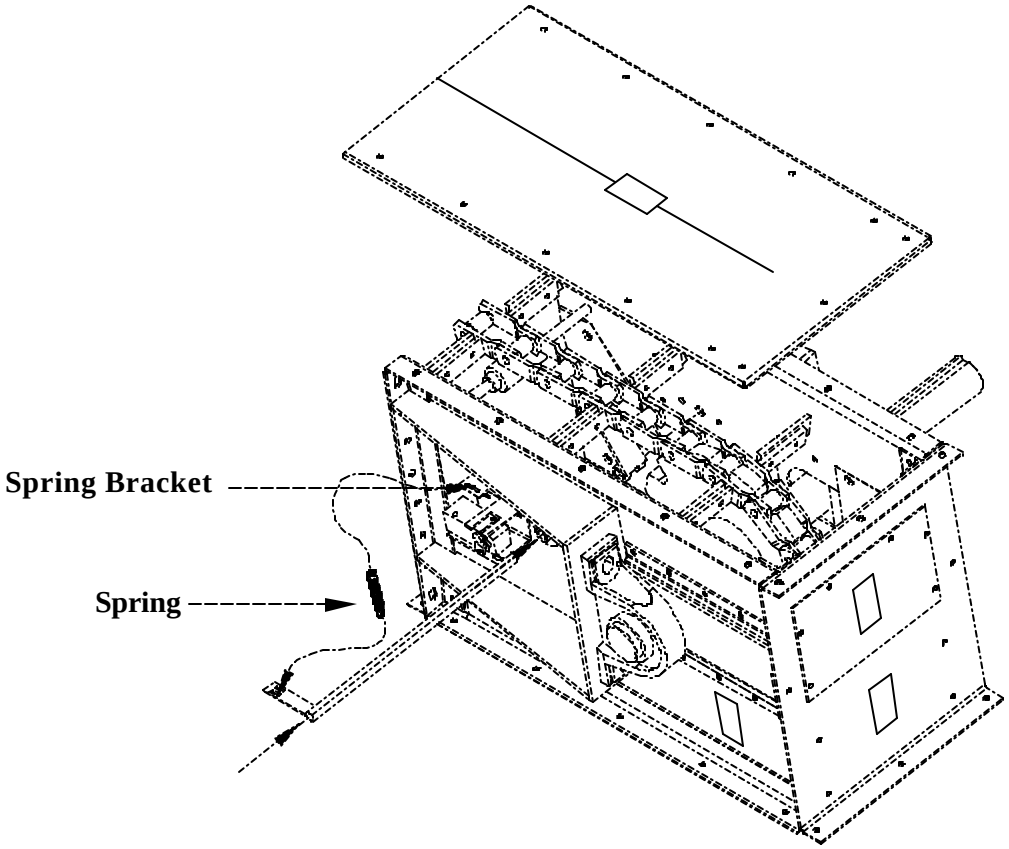


Diagram "C"

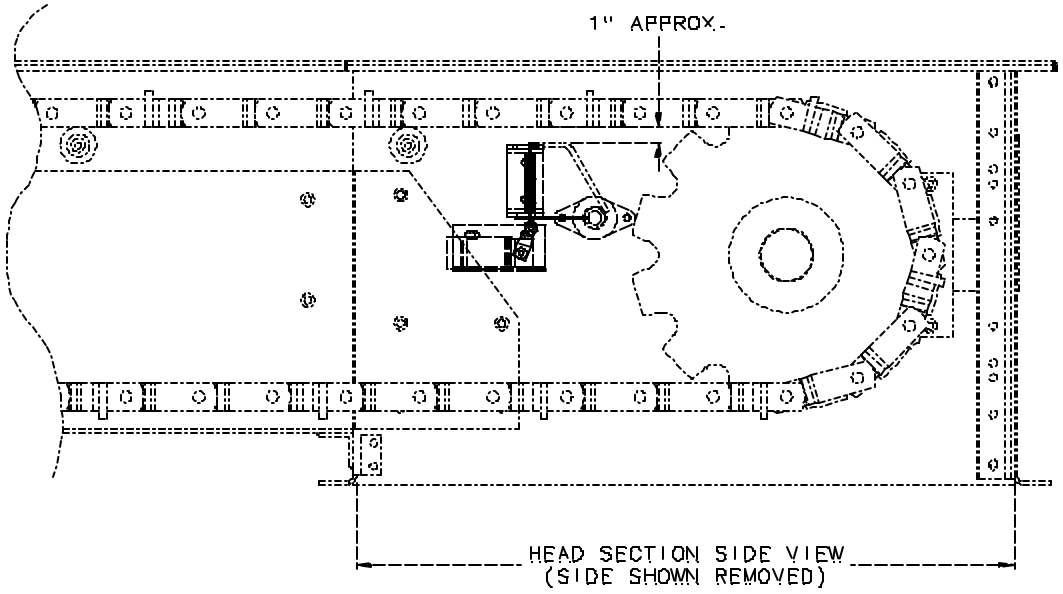


Diagram "D"

Slack Chain - Slide Rail Returns

When an enmasse conveyor is equipped with slide rail returns, an optional slack chain detector may be installed. Depending on working conditions and/or environment, either a NEMA 4 or a NEMA 9 limit switch is available.

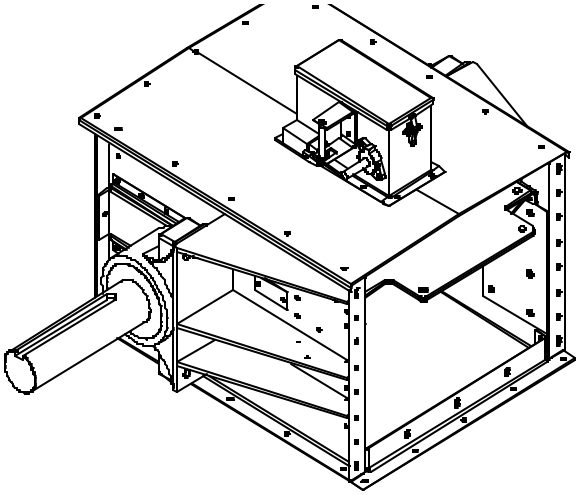
Begin installation by cutting a 13" x 6" rectangular opening in cover. The opening should be 6 1/2" from edge of cover and centered across the width of the cover; see illustration lower right on this page.

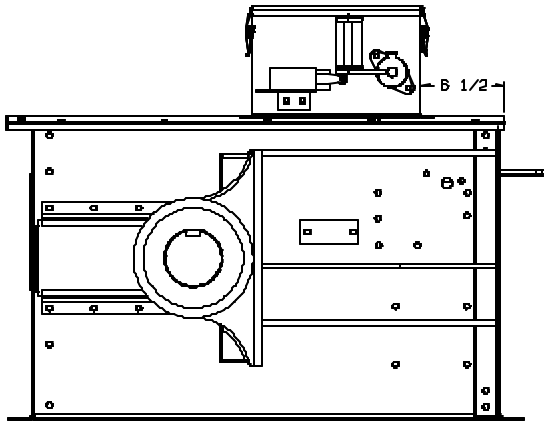
Next, place the slack chain assembly over the rectangular opening. Mark the locations for the eight (8) 7/16" diameter holes. Temporarily remove the slack chain assembly, and drill the eight 7/16" diameter holes.

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

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

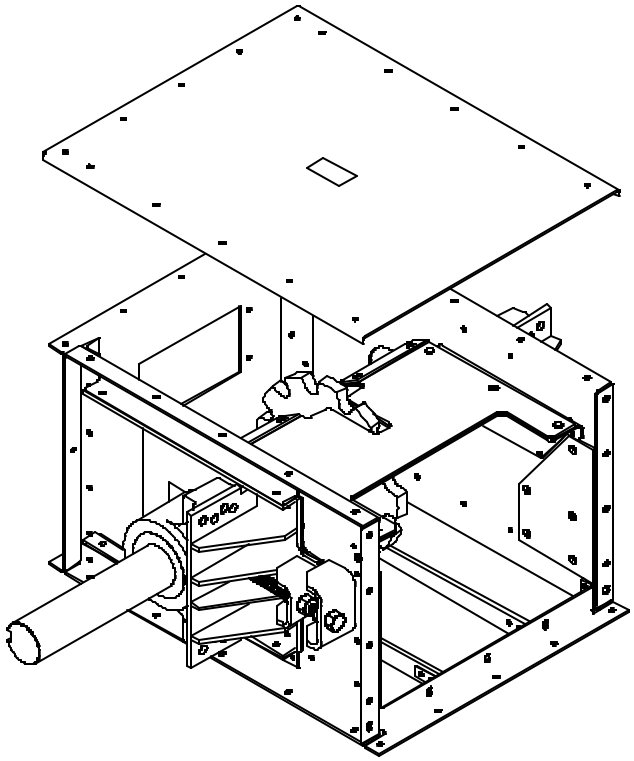
After installation, adjust the clearance between the UHMW paddle in the slack chain assembly and the UHMW flights on the chain to approximately 1".





Head Discharge with Take-Up

For applications where the enmasse conveyor may run in a reversing direction, or where a clean-out fixed tail section is supplied, an optional head discharge assembly with take-up may be used.



Reversing Take-Up Head with Carry-Over Bars

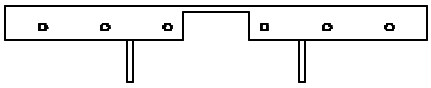
Carry-Over Bars

On reversing conveyor applications, optional carry-over bars should be installed in both discharge assemblies. These bars help ensure a smooth transition of the chain and flights from the head discharge into the conveyor box.

The carry-over bar package consists of two (2) carry-over bars, two (2) clips, and the hardware required for assembly. To assemble, first remove the 1/2" nuts and bolts from the end panel, and attach two clips to end panel. Then attach carry-over bars to these clips with the 3/8" hardware provided. Next, on the other end of the carry-over bars, determine which 1/2" bolts and nuts to remove by gaging with the remaining clips. Remove the appropriate 1/2" hardware, and attach these clips. Fasten carry-over bars to the clips with 3/8" hardware.

The carry-over bars should be spaced so that they pick up the UHMW flights as shown below.

After installation, adjust carry-over bars so that they are even with the top edge of the bottom plate. *Do not extend carry-over bars above the top surface of the bottom plate.* Tighten all hardware.



End view of UHMW flight on Carry-over Bars

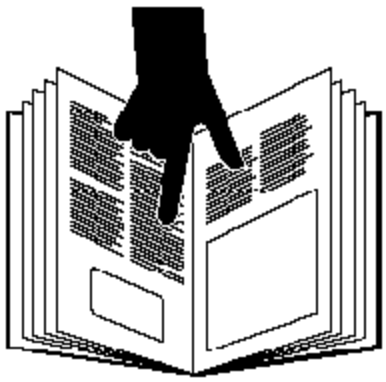
Trouble Shooting Guide

Problem	Cause	Solution
Low capacity	Improper chain speed	Check the shaft RPM
	Loose chain	Check the sag between idlers
	Improper feed	Check the grain level at inlet
	Plugging	Check the discharges
Noisy operation	Loose UHMW Paddles	Check all bolts on chain
	Bottom Not Aligned	Check Intermediate Trough Section joints and make flush
	Worn Return Roller	Check Return Idlers; they should turn freely
	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. 15)
	Improper alignment	Check the sprocket alignment
	Material carry-over into discharge sprocket	Check for improper location of inlet (see pg. 13)

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.



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