

SERIES 2
**Incline Chain
Conveyor**

Installation and Operation Manual



PNEG-1187



PNEG-1187

Introduction

READ THIS MANUAL carefully to learn how to properly use and install equipment. Failure to do so could result in personal injury or equipment damage.

INSPECT THE SHIPMENT immediately upon arrival. The Customer is responsible for ensuring that all quantities are correct. Report any damage or shortages by recording a detailed description on the Bill of Lading to justify the Customer's claim from the Transport Firm. Our responsibility for damage to the equipment ends with acceptance by the delivering carrier. Save all paperwork and documentation furnished with any of the incline conveyor components.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your equipment and should be easily accessible when needed.

WARRANTY is provided as part of the company's support program for customers who use and

maintain their equipment as described in the manual. The warranty is explained on the warranty page located on the inside back cover of this manual.

This warranty provides you the assurance that the company will back its products where defects appear within the warranty period. In some circumstances, the company also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the factory specifications, the warranty will become void and field improvements may be denied.

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:

Material Handling

1004 East Illinois Street
Assumption, Illinois 62510 USA
Phone: (217) 226-4421
FAX: (888) 741-3004
e-mail: gsi@grainsystems.com

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All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

NOTES

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



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



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.

GENERAL SAFETY GUIDELINES

1. **DO NOT** make any alterations to the equipment. Such alterations may produce a very dangerous situation, where **SERIOUS INJURY** or **DEATH** may occur.
2. This equipment shall be installed in accordance with any regulations or installation codes that are required by law. Authorities having jurisdiction should be consulted before installations are made.
3. Untrained operators subject themselves and others to **SERIOUS INJURY** or **DEATH**. **NEVER** allow untrained personnel to operate this equipment.
4. Keep children and other unqualified personnel out of the working area at **ALL** times.
5. **NEVER** start equipment until **ALL** persons are clear of the work area.
6. **DO NOT** operate electric motor equipped units until motors are properly grounded.
7. Keep hair, loose clothing, and shoestrings away from rotating and moving parts.
8. **NEVER** allow any person intoxicated or under the influence of alcohol or drugs to operate the equipment.
9. Disconnect power on electrical driven units before resetting motor overloads.
10. Make sure someone is nearby who is aware of the proper shutdown sequence in the event of an accident or emergency.
11. **NEVER** work alone.
12. **ALWAYS** think before acting. **NEVER** act impulsively around the equipment.
13. Do not repetitively stop and start the drive in order to free a plugged condition. Jogging the drive like this can damage the conveyor and/or drive components.
14. Keep off the equipment at all times.
15. **NEVER** attempt to assist machinery operation or to remove trash from equipment while in operation.

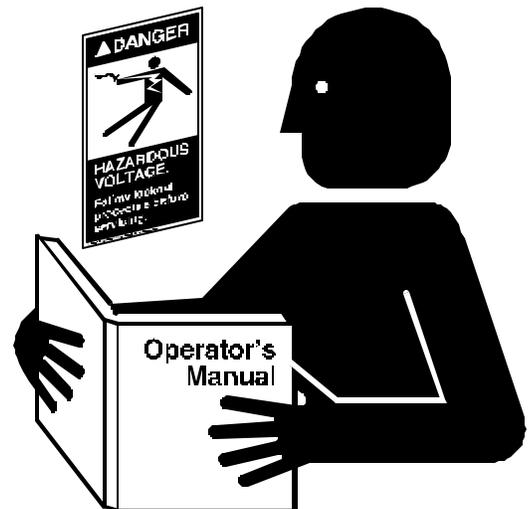
FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and on your machine safety signs. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machinery in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your dealer.

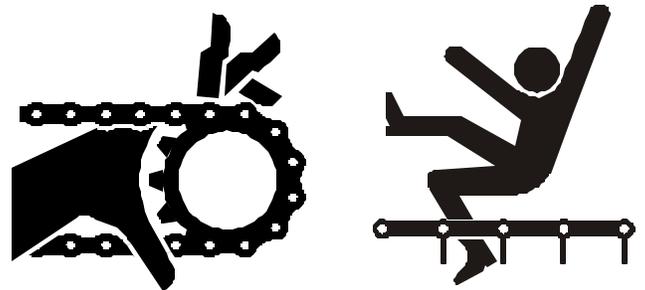


STAY CLEAR OF MOVING PARTS

Entanglement in rotating sprockets, chains, and wiper flights can cause serious injury or death.

Keep all shields and covers in place at all times.

Wear close fitting clothing. Stop and lock out power source before making adjustments, cleaning, or maintaining equipment.



OPERATE MOTOR PROPERLY

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.



PRACTICE SAFE MAINTENANCE

Understand service procedures before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is in operation. Keep hands, feet, and clothing from rotating parts.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any build up grease, oil, or debris.



REMOVE PAINT BEFORE WELDING OR HEATING

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

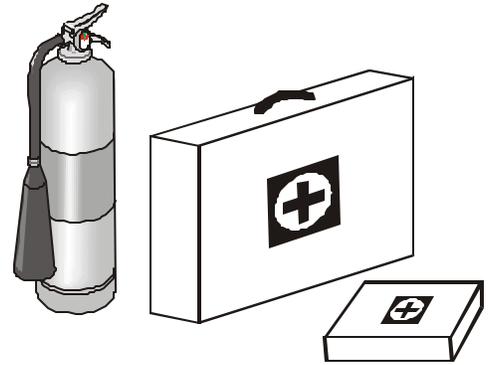


PREPARE FOR EMERGENCIES

Be prepared if fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

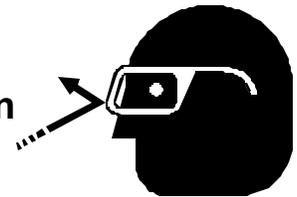
Safety glasses should be worn at all times to protect eyes from debris.

Wear gloves to protect your hands from sharp edges on plastic or steel parts.

A respirator may be needed to help prevent breathing potentially toxic fumes and dust.

Wear hard hat and steel toe boots to help protect your head and toes from falling debris.

Eye Protection



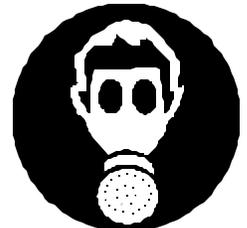
Gloves



Steel Toe Boots



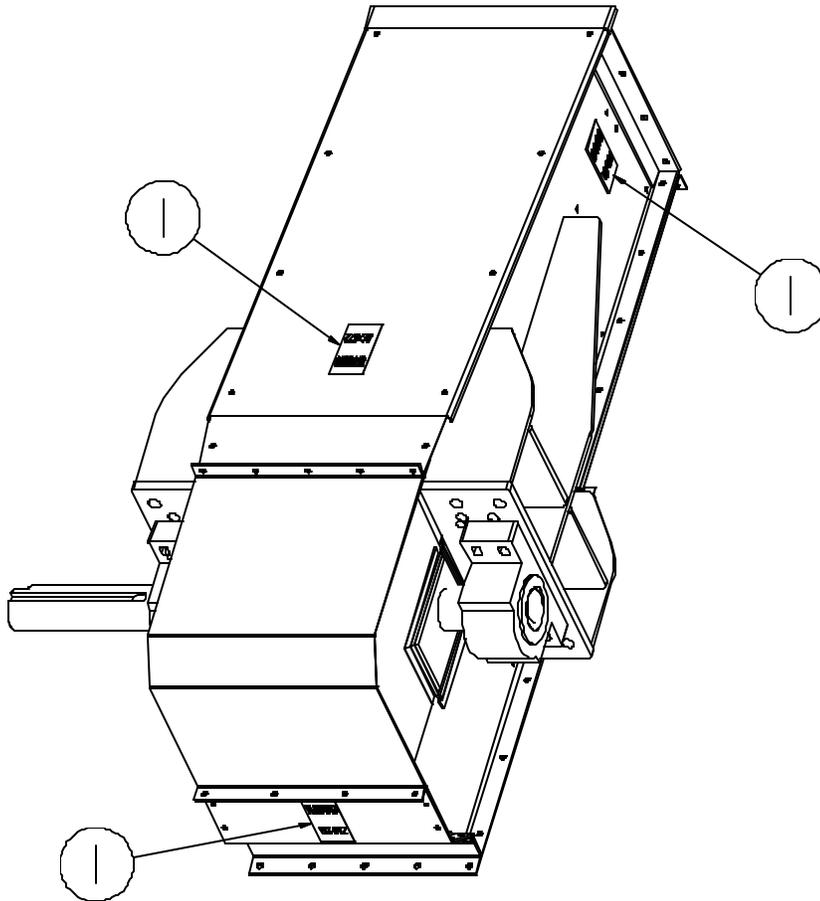
Respirator



Hard Hat



Head Section Decal Locations



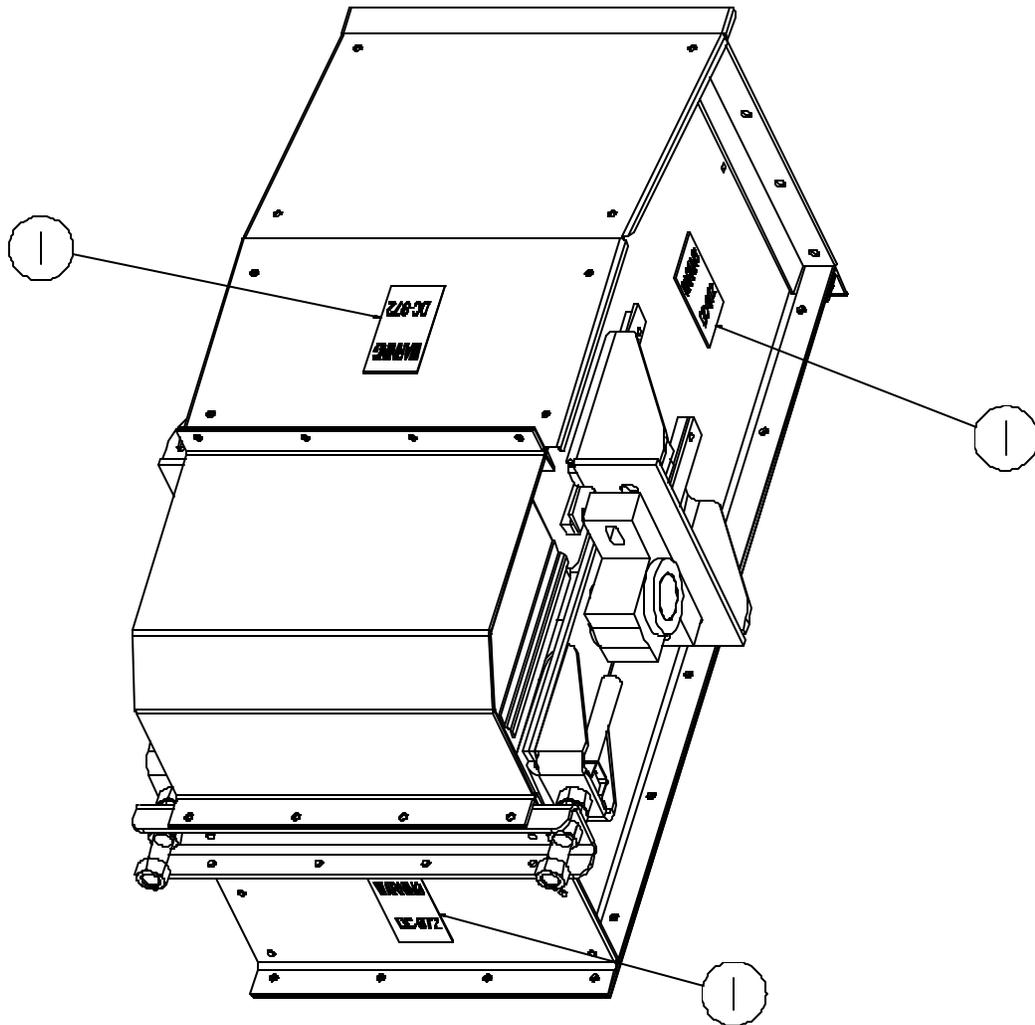
1

⚠ WARNING!

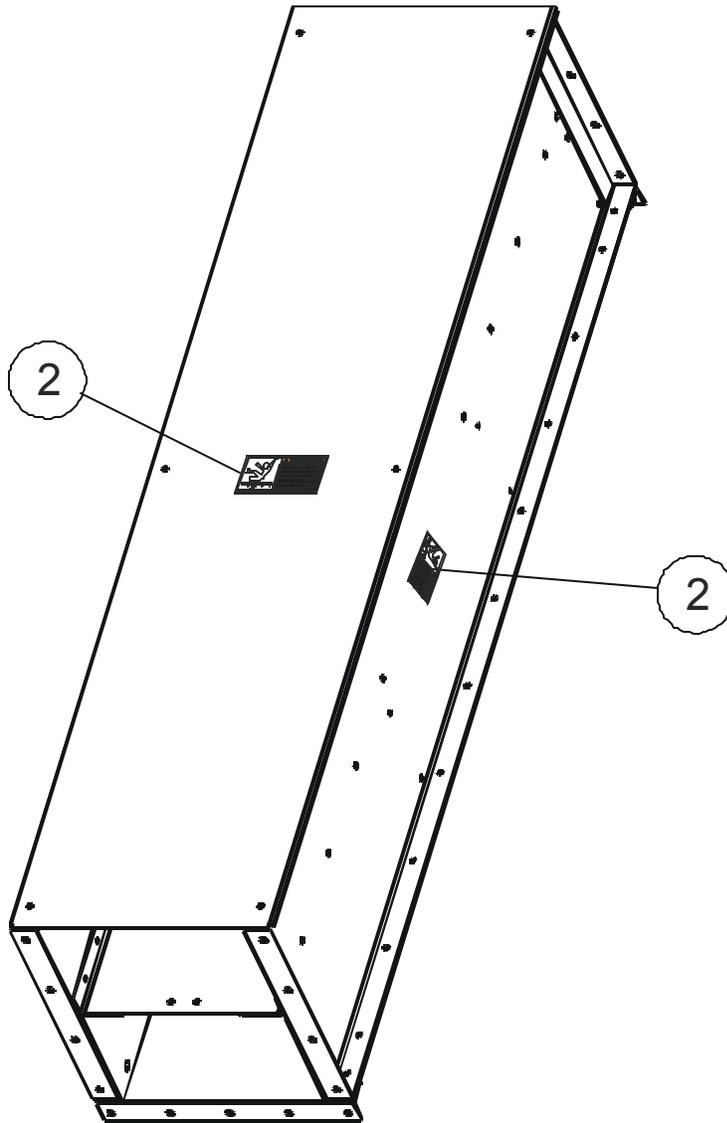
Moving parts can crush and cut. Keep hands clear. Do not operate without guards in place. Failure to do so could result in serious injury.

DC-972

Tail Section Decal Locations



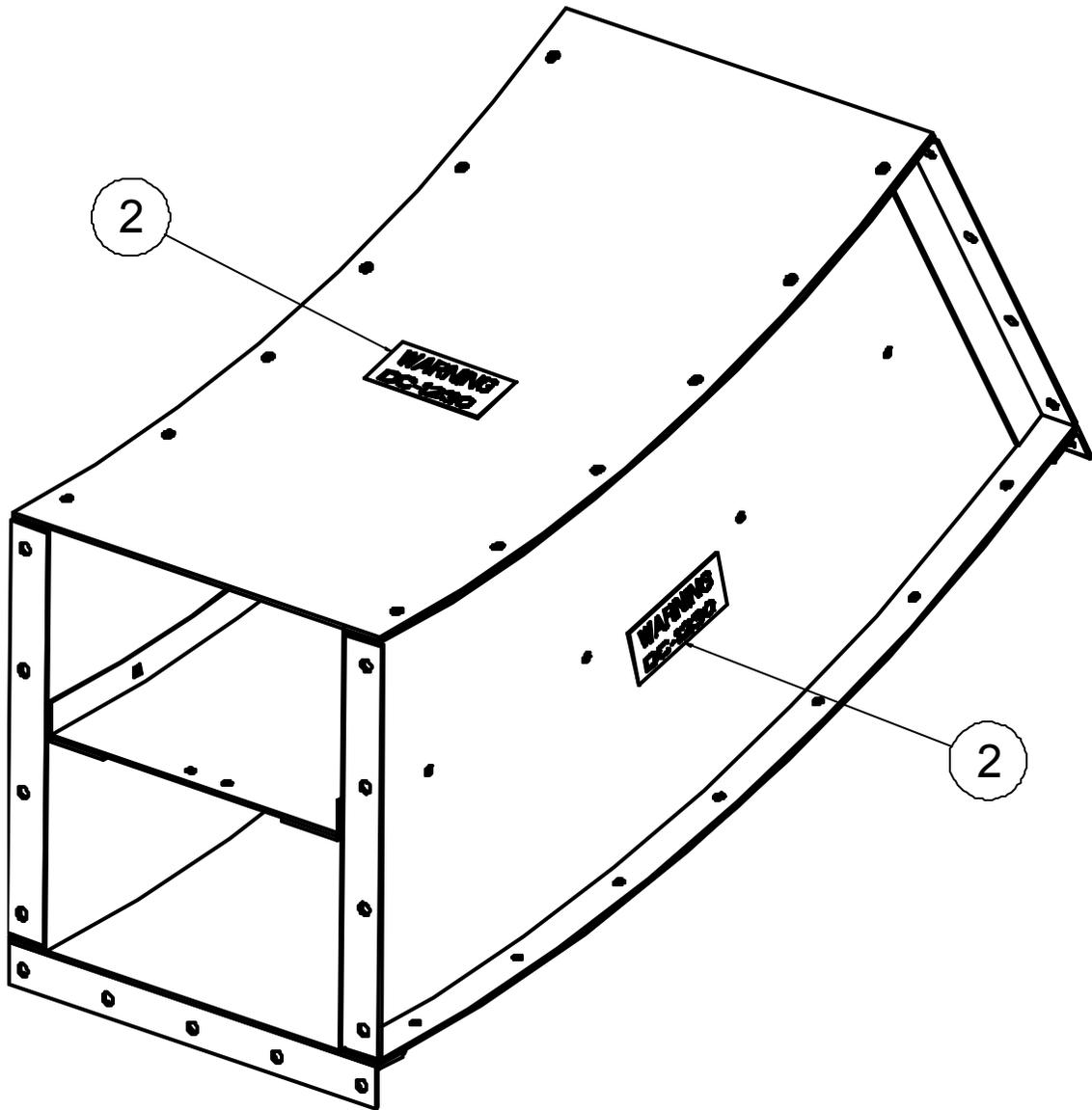
Trough Section Decal Location



2

A black silhouette of a person falling backwards from a conveyor belt. The person's arms are outstretched, and their legs are bent. Below them is a horizontal conveyor belt with four rollers.	<p>! WARNING!</p> <p>Exposed conveyors and moving parts can cause serious injury. Lockout power before removing covers or inspection door.</p> <p>DC-1230</p>
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Bend Section Decal Location



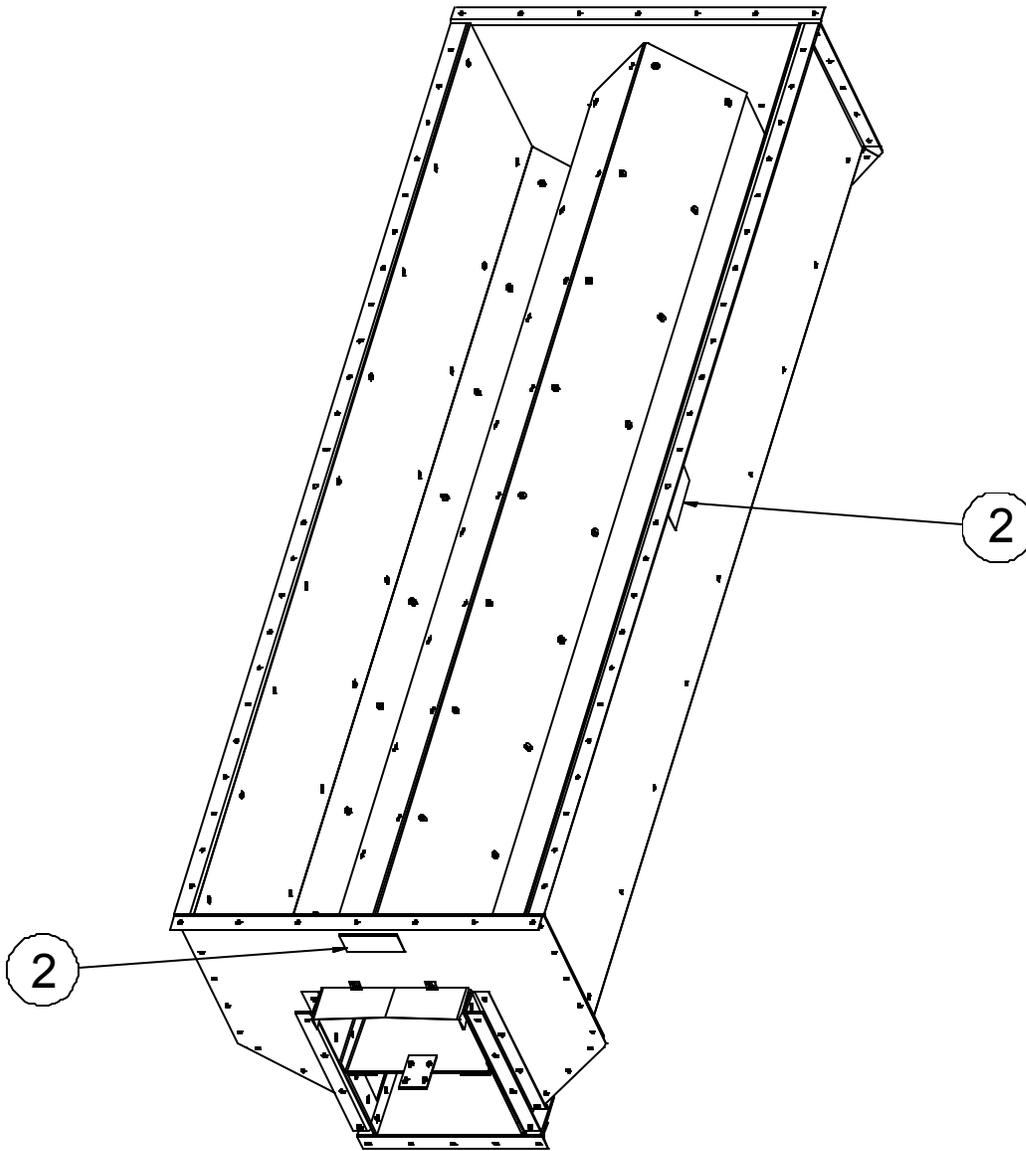
2



⚠ WARNING!
Exposed conveyors and moving parts can cause serious injury. Lockout power before removing covers or inspection door.

DC-1230

Bypass Inlet Decal Location



2



⚠ WARNING!
Exposed conveyors and moving parts can cause serious injury. Lockout power before removing covers or inspection door.

DC-1230

A warning decal with a black background and white text. On the left, there is a white silhouette of a person falling backwards from a conveyor belt. The conveyor belt is represented by a horizontal line with four vertical supports. The word 'WARNING!' is in large, bold, white letters with a black outline, preceded by a white exclamation mark inside a black triangle. Below this, the text 'Exposed conveyors and moving parts can cause serious injury. Lockout power before removing covers or inspection door.' is written in white. In the bottom right corner, the code 'DC-1230' is printed in white.

The head, tail, and intermediate sections of the chain conveyor are shipped pre-assembled direct from the factory.

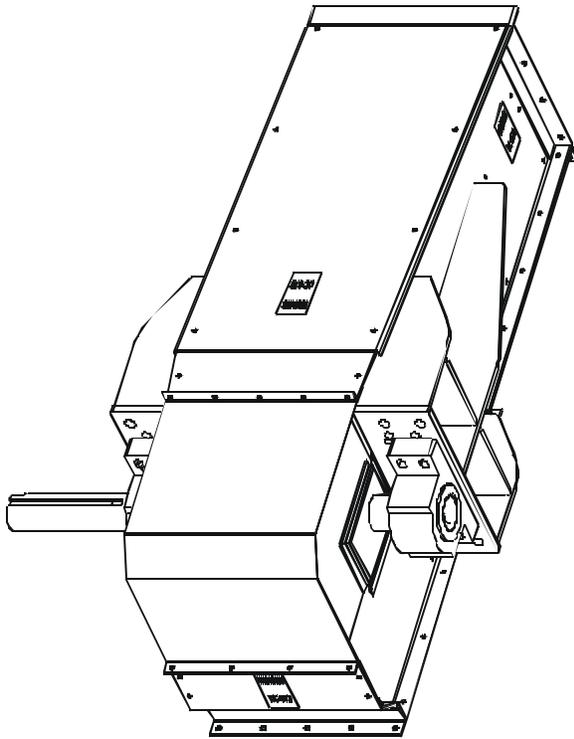


FIG. 1
Head Assembly

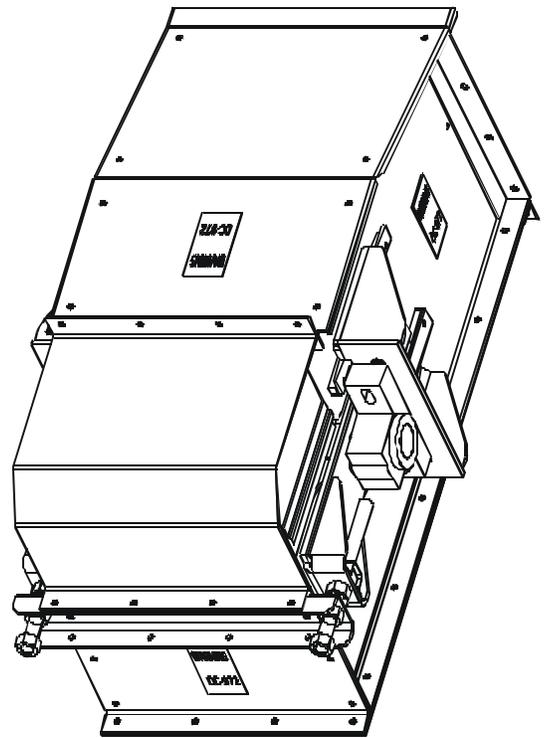


FIG. 2
Tail Assembly

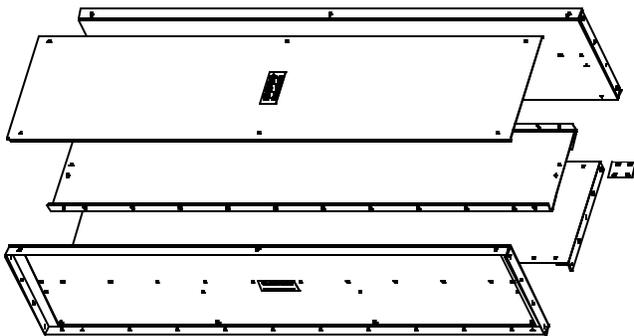


FIG. 3
**Intermediate Trough Assembly
with Center Pan**

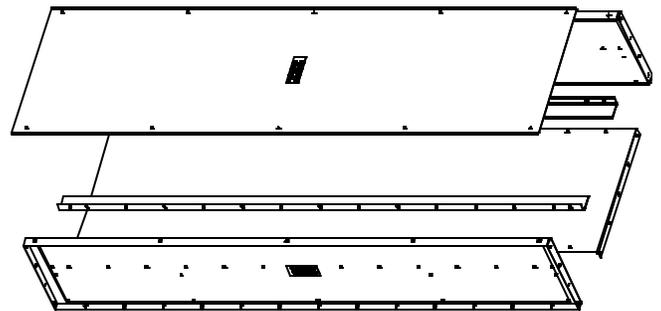


FIG. 4
**Intermediate Trough Assembly
with Slide Rails**

Intermediate Trough Section 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.

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.

Intermediate sections are supplied with slide rails or a center pan. The sections with slide rails are generally used on the horizontal portion of the conveyor. The sections with the center pans are generally used on the inclined portion of conveyor.

Note: It is critical for straitness 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 Fig. 5.

During assembly of each trough section to the next section, carefully inspect each flange joint to ensure that the inside bottom and center pan/slide rail 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 $\pm 1/4"$. 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.

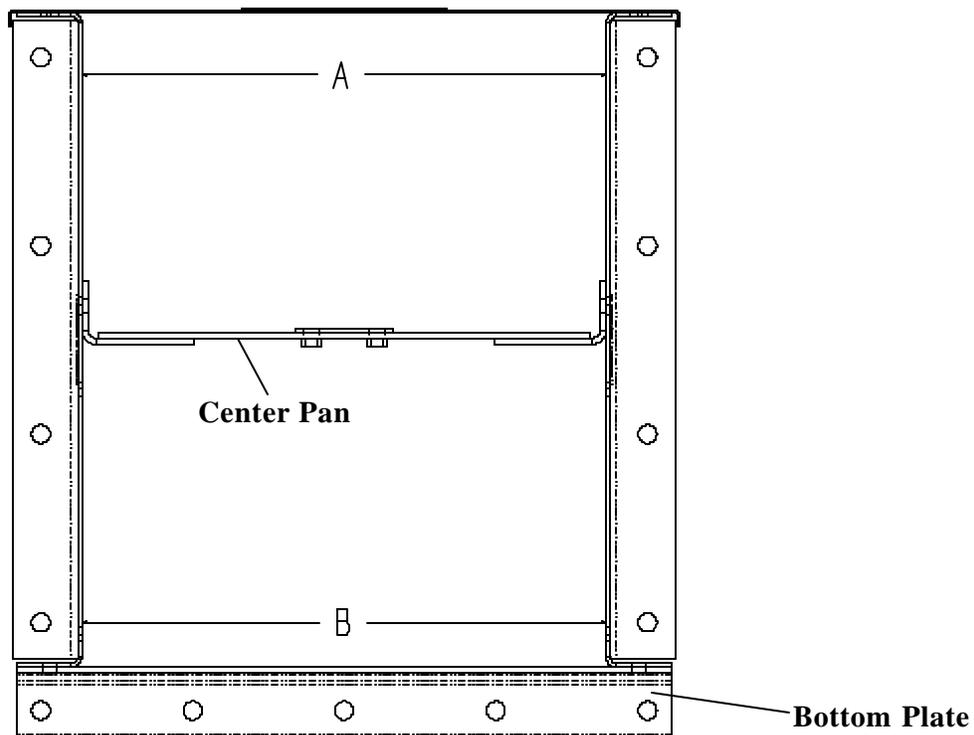


FIG. 5
Center Pan Trough Section Shown

Cover Assembly Installation

Before installing the covers, an 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 Fig. 7). 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. Inlets mounted too close to the tail chain sprocket will allow grain to come in contact with the sprocket and chain pinch. This may cause excessive damage to any grain being conveyed. The minimum distance from tail splice joint to the nearest edge of the inlet assembly should be 6".

If the conveyor is control fed and has a center pan, another opening in the center pan should start at the edge of the inlet and extend a distance of twice the inlet opening, towards the tail. The width of the opening should be determined by starting the opening a distance of 1-1/4" from the inside edge of the conveyor. (See Fig. 6)

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, it is recommended 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.

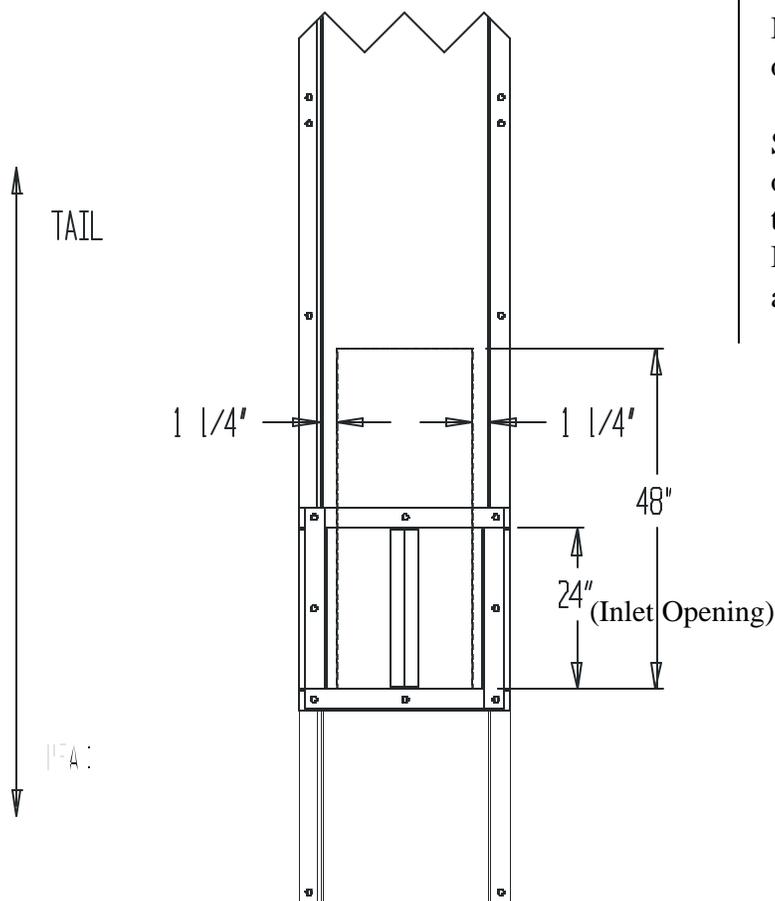


FIG. 6
Inlet Assembly

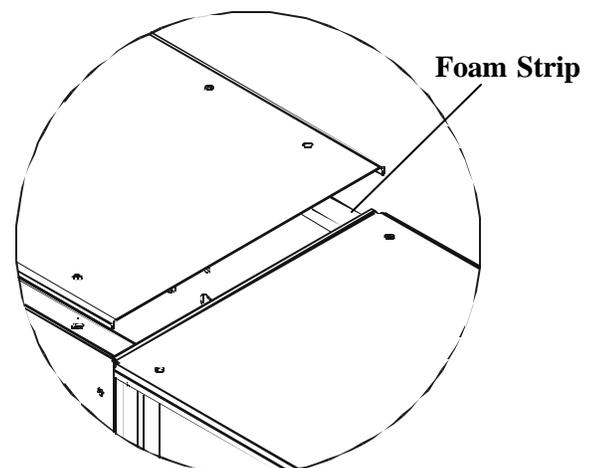


FIG. 7
Foam Strip Placement

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 the manufacturer. The conveyor drag chain is shipped in approximate 10 foot lengths with an additional pre-cut 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 center pan or slide rail 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.

Tighten the drag chain assembly using the take-up screws located on each side of the tail section or on the take-up head. 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.

FIG. 8
81X Chain Assembly

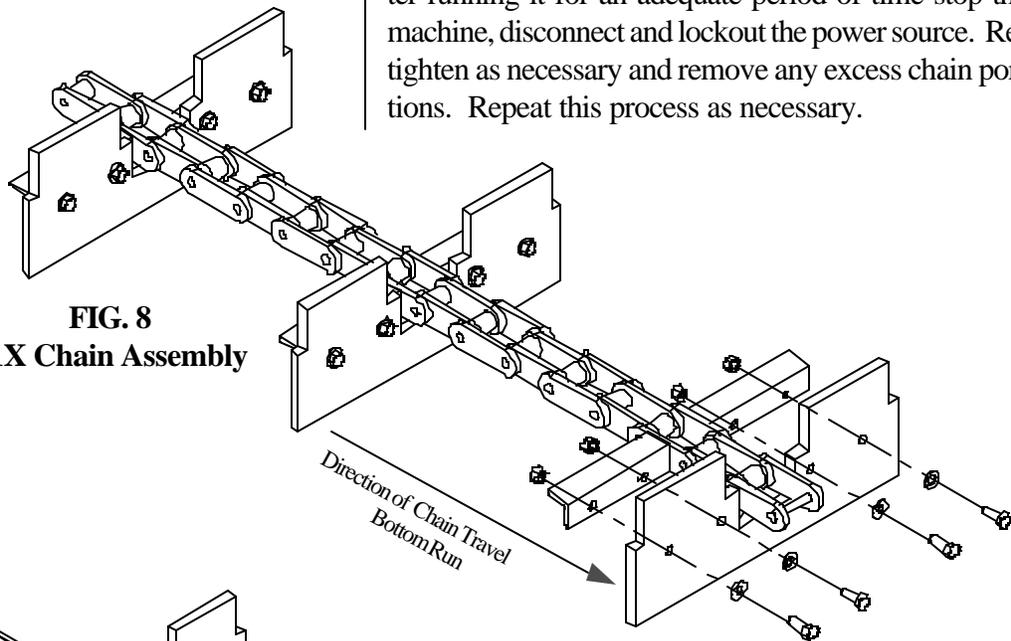
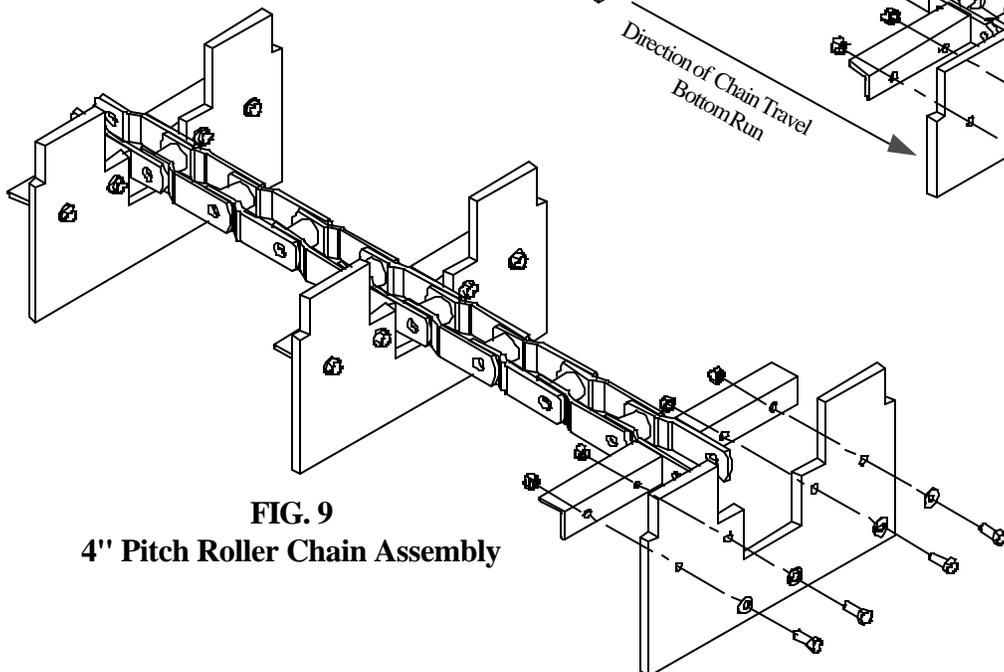


FIG. 9
4" Pitch Roller Chain Assembly



Installing Shaft Mount Reducers

Assemble torque arm bracket to conveyor per installation instructions found on page 18.

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.

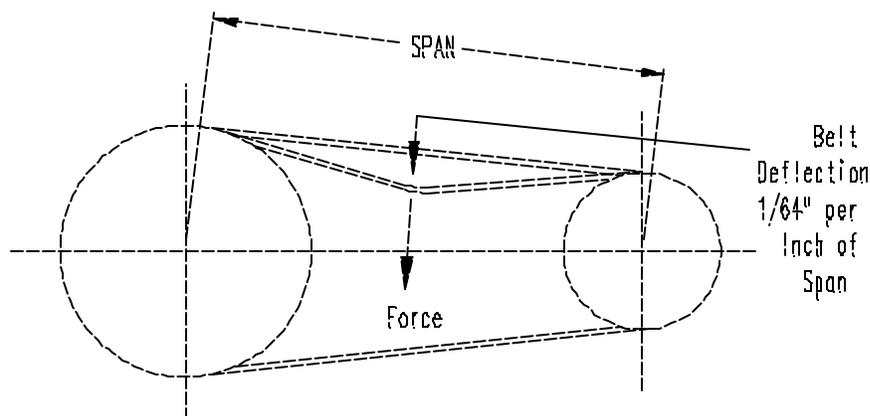


FIG. 10
Belt Deflection

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 on pg.13 for the 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

The 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.

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 15.
- ◆ 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 14.

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 accommodate 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 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.

Standard Bypass Inlets

The Bypass Inlets come pre-assembled from the factory. The inlets are available in 3' and 10' sections. The hogback is stationary in bypass inlets. Bypass inlets must be mounted horizontally. If not mounted horizontally, capacity will be reduced.

NOTE

When installing torque arm bracket keep angle (A) of torque arm and reducer between -15° and $+15^{\circ}$ of 90° per manufacturer's recommendations. This angle is shown in Fig. 11.

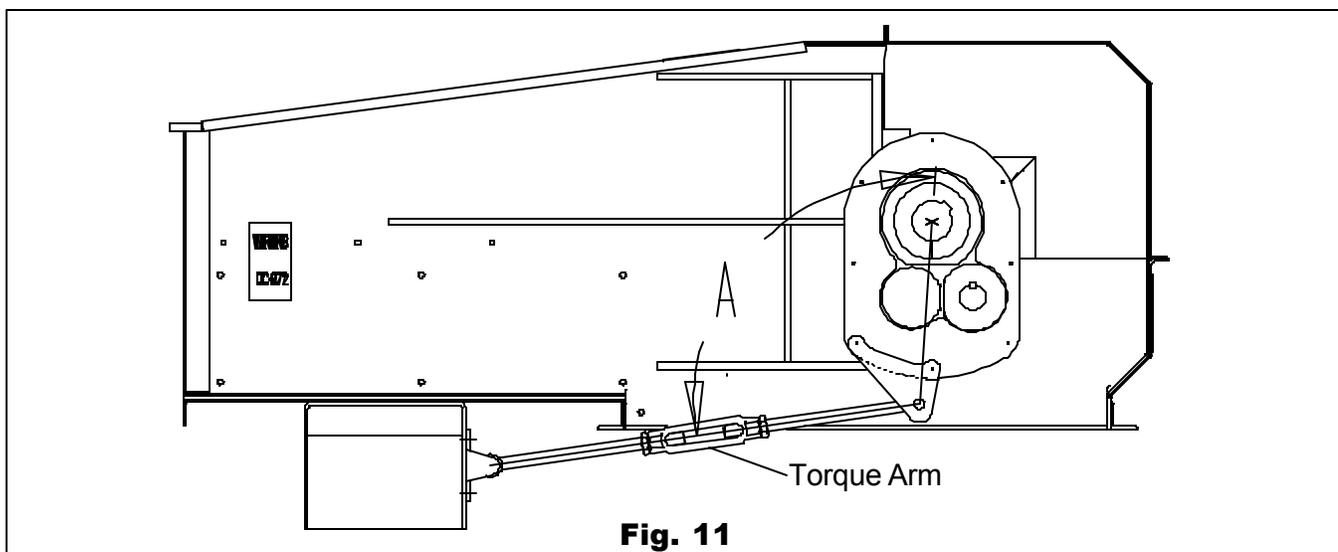


Fig. 11

Trouble Shooting Guide

<u>Problem</u>	<u>Cause</u>	<u>Solution</u>
<u>Low capacity</u>	Improper chain speed Improper feed Plugging	Check the shaft RPM Check the grain level at inlet Check the discharges
<u>Noisy operation</u>	Loose UHMW Paddles Bottom and /or Center Pan/ Slide Rails Not Aligned Misalignment at Flange Connections Worn Drive Components Worn Sprocket	Check all bolts on chain and Intermediate Sections Check Intermediate Trough Section joints and make flush Check Intermediate Trough Section joints and make flush Check oil level and shaft seals belt misalignment; loose belts Replace
<u>Uneven UHMW paddle wear</u>	Conveyor Misalignment Sprocket Slipped	Check the conveyor alignment Check set screws on sprockets
<u>Uneven sprocket wear</u>	Worn chain Improper alignment	Replace chain (see pg. 14) Check the sprocket alignment

Consult your contractor for added assistance.

NOTES

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.

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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.

This Equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installation occurs.



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