

Series II 20 Inch Tall En-Masse Chain Conveyors

Assembly Manual

PNEG-1848

Date: 01-03-13

GSI GROUP



PNEG-1848

Equipment Information

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

Equipment Information

Model Number: _____

Date Purchased: _____

Serial Number: _____

Dealer/Distributor Name and Phone Number:

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.

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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 its 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 a hazardous situation which, if not avoided, will result in death or serious injury.



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



CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to personal injury.

2. Safety

Safety Instructions

Our foremost concern is your safety and the safety of others associated with this equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems that may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards, and precautions exist, and to inform all personnel associated with the equipment or in the area. Safety precautions may be required from the personnel. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation where **SERIOUS INJURY** or **DEATH** may occur.

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 installations are made.

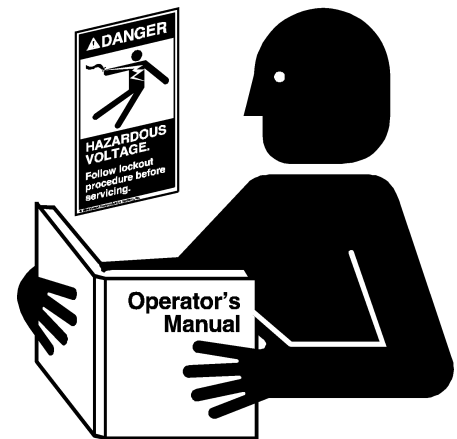
Follow Safety Instructions

Carefully read all safety messages in this manual and safety signs on your machine. 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 or need assistance, contact your dealer.



Read and Understand Manual

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 away from rotating parts.

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



Maintain Equipment and Work Area

Remove Paint Before Welding or Heating

Avoid potentially toxic fumes and dust.

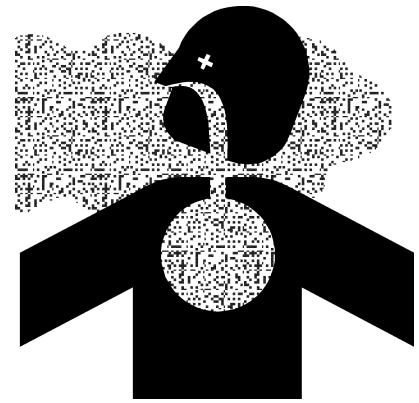
Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

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.



Breathing Hazard

Operate Motor Properly

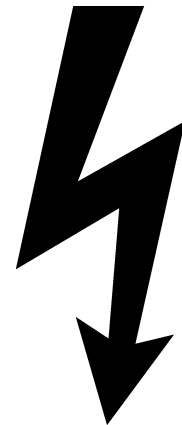
In an emergency, shut down the power source.

Turn OFF and lock out all power sources before performing any maintenance.

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 manner can damage the equipment and/or drive components.



Electric Shock Hazard

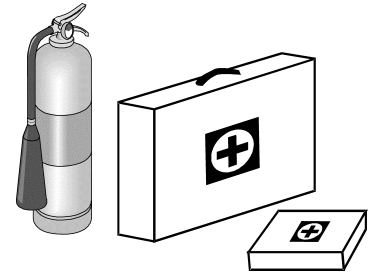
2. Safety

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.



Keep Emergency Equipment Quickly Accessible

Wear Protective Clothing

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

Remove all jewelry.

Tie long hair up and back.

Wear safety glasses at all times to protect eyes from debris.

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

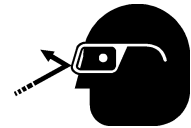
Wear steel-toed boots to help protect your feet from falling debris. Tuck in any loose or dangling shoestrings.

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

Wear a hard hat to help protect your head.

Wear appropriate fall protection equipment when working at elevations greater than six feet (6').

Eye Protection



Gloves



Steel-Toed Boots



Respirator



Hard Hat



Fall Protection

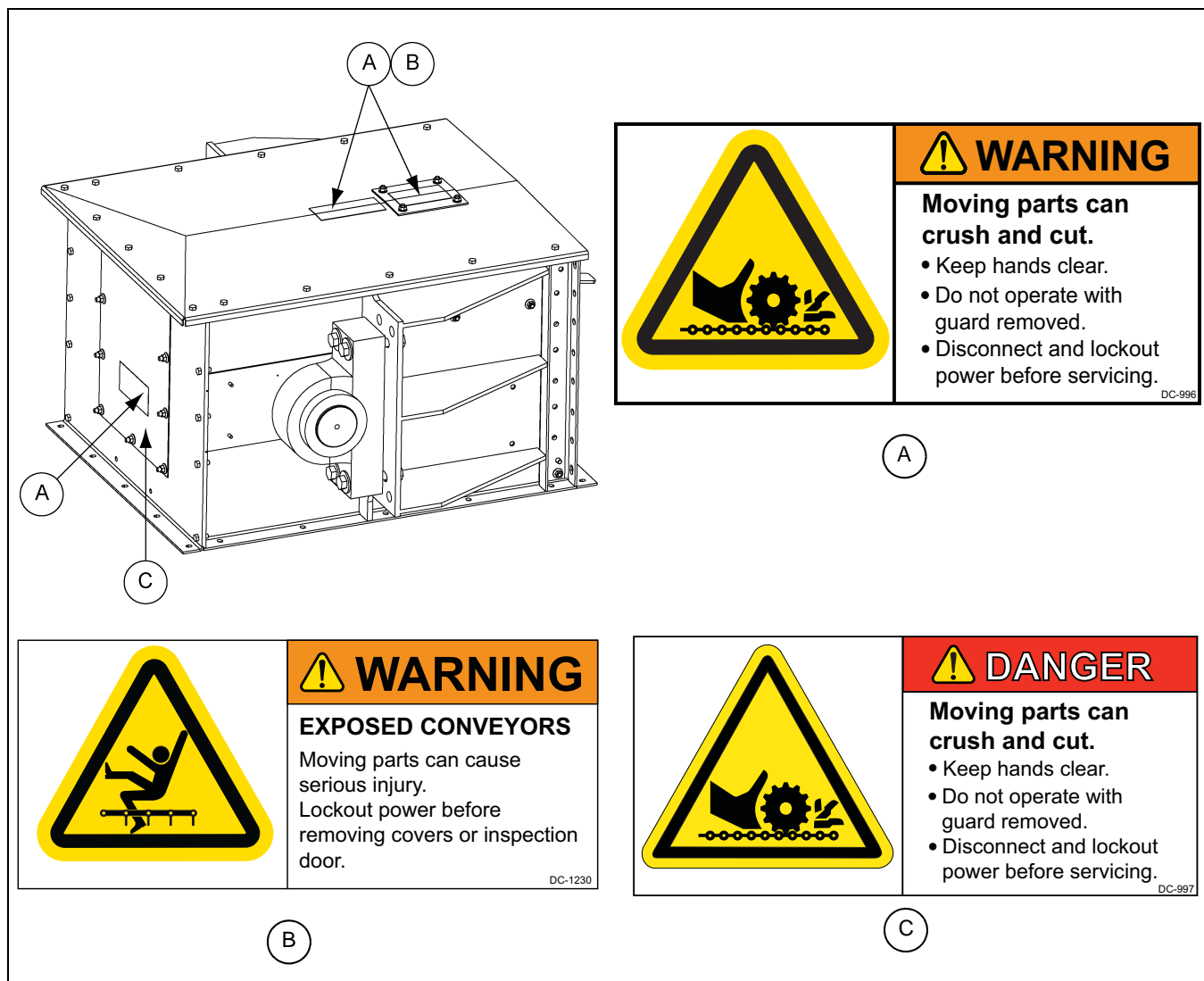


Keep safety decals clean and legible at all times. Replace safety decals that are missing or have become illegible. Contact the manufacturer for a free replacement decal.

GSI Decals

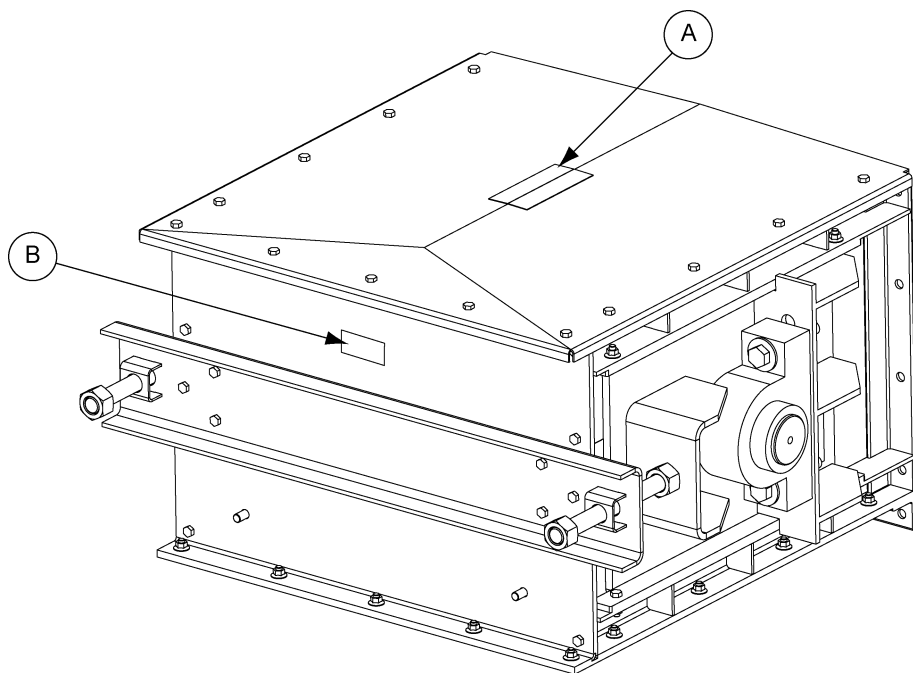
1004 E. Illinois St.
 Assumption, IL. 62510
 Phone: 1-217-226-4421

Head Section Decal Locations



Ref #	Part #	Description	Qty
A	DC-996	Decal, Warning Chain Sprocket (Not Visible Here)	2
B	DC-1230	Decal, Chain and Flight Warning, 2-3/4" x 6-1/4"	1
C	DC-997	Decal, Danger Chain Sprocket (Not Visible Here)	1

Tail Section Decal Locations



! WARNING

EXPOSED CONVEYORS

Moving parts can cause serious injury.
Lockout power before removing covers or inspection door.

DC-1230

A



! WARNING

Moving parts can crush and cut.

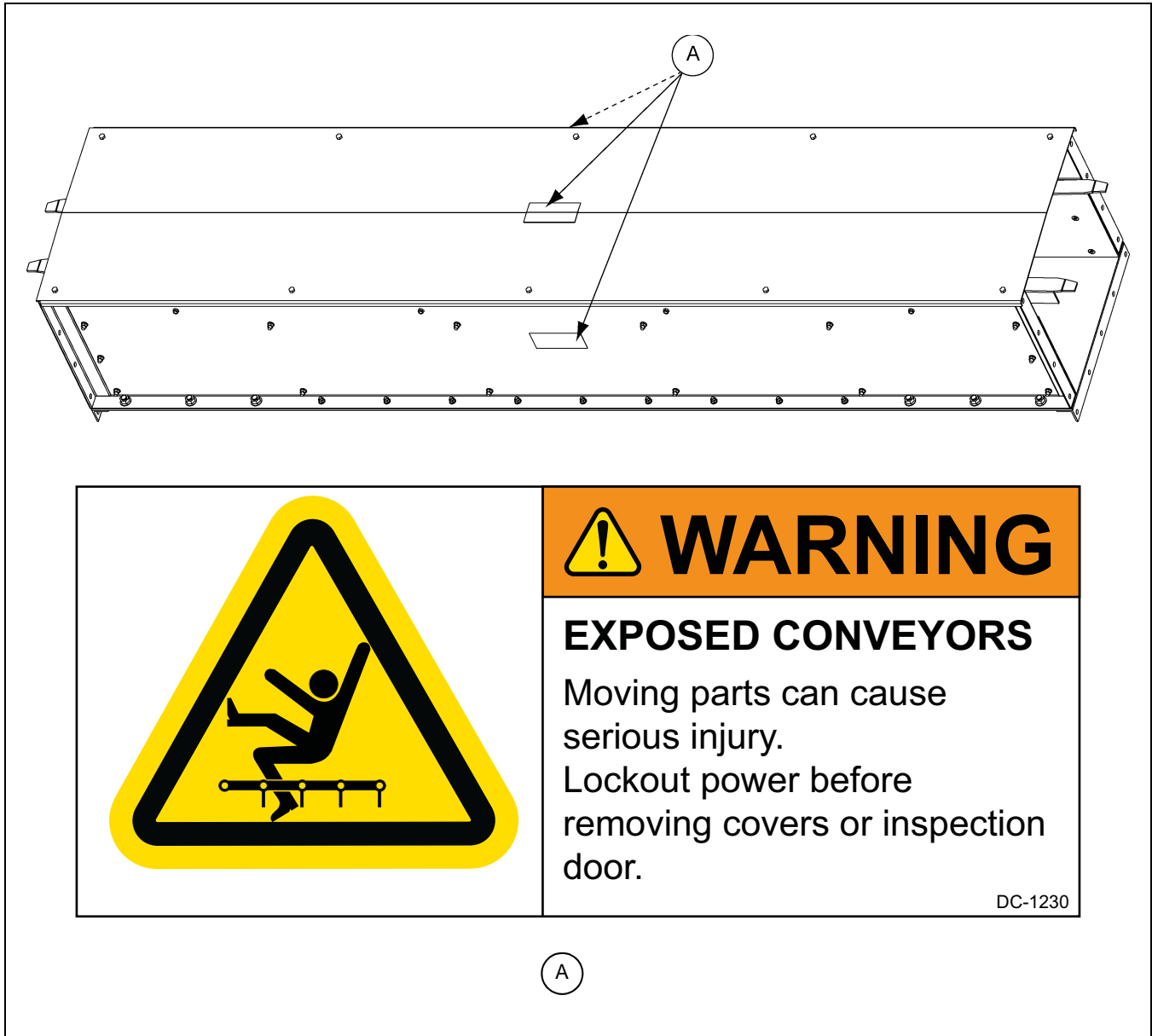
- Keep hands clear.
- Do not operate with guard removed.
- Disconnect and lockout power before servicing.

DC-996

B

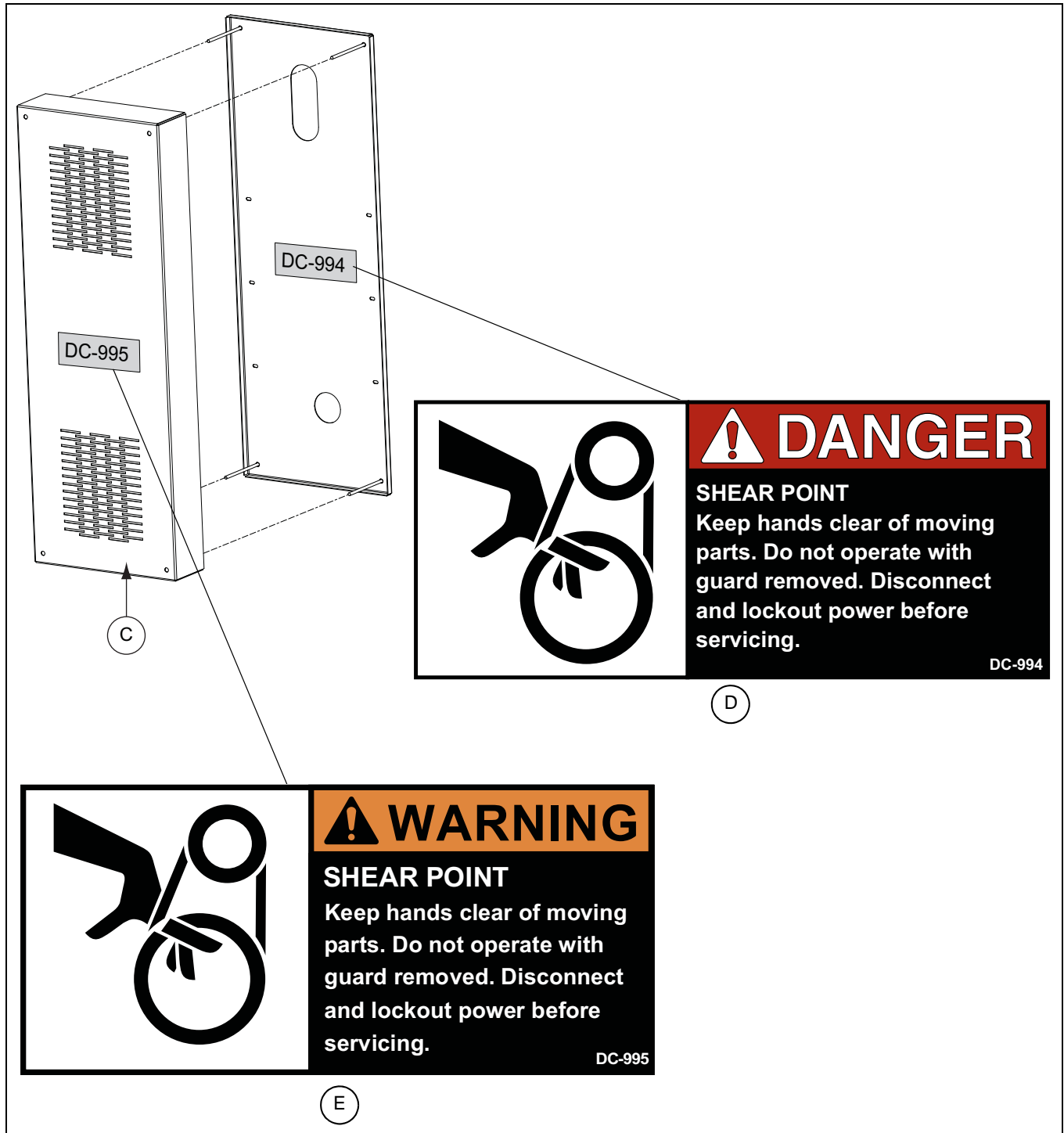
Ref #	Part #	Description	Qty
A	DC-1230	Decal, Chain and Flight Warning, 2-3/4" x 6-1/4"	1
B	DC-996	Decal, Warning Chain Sprocket (Not Visible Here)	1

Intermediate Section Decal Locations



Ref #	Part #	Description	Qty
A	DC-1230	Decal, Chain and Flight Warning, 2-3/4" x 6-1/4"	3

Belt Guard Cover



Ref #	Part #	Description	Qty
C		Belt Guard Cover	1
D	DC-994	Decal, Danger Shear Point	1
E	DC-995	Decal, Warning Shear Point	1



- 1. Read and understand the Operator's Manual BEFORE operating the unit.**
- 2. Keep all safety shields and devices in place.**
- 3. Keep all covers in place.**
- 4. Make certain everyone is clear of the equipment before operating.**
- 5. Keep hands, feet and clothing away from moving parts.**
- 6. Shut OFF and lock out all power to adjust, service, clean or unclog the unit.**
- 7. Keep off the equipment at all times.**
- 8. Keep children, visitors and all untrained personnel away from the machine when in operation.**
- 9. Do not operate electric motor equipped units until motors are properly grounded.**
- 10. Disconnect power on electrical driven units before re-setting motor overloads.**
- 11. Do not repetitively stop and start the drive in order to free a plugged condition. "Jogging" the drive in this manner can damage the conveyor and/or drive components.**

Welding



Remove paint before welding or heating. Toxic fumes can be generated when paint is heated by welding, soldering or using a torch. Always wear an approved respirator and work in well-ventilated area.

Welding on or to the conveyor may cause damage to both the conveyor and its electrical system. If welding is necessary, precautions should be taken to protect the conveyor. If it is 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.

5. Inspection

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 damaged 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 all manuals and safety signs before using or servicing equipment. Taking the time to do so will aid in the assembly of the conveyor.

Remove all banding and crating material. Arrange the conveyor components so that they 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 aid in assembly. Locate and place the conveyor sections on the blocking in order, starting with the head section and concluding with the tail section.

Support

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

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. See inline gate manual (PNEG-1732 for instructions for cutting intermediate bottom).

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

6. Installation

Head and Tail Identification

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

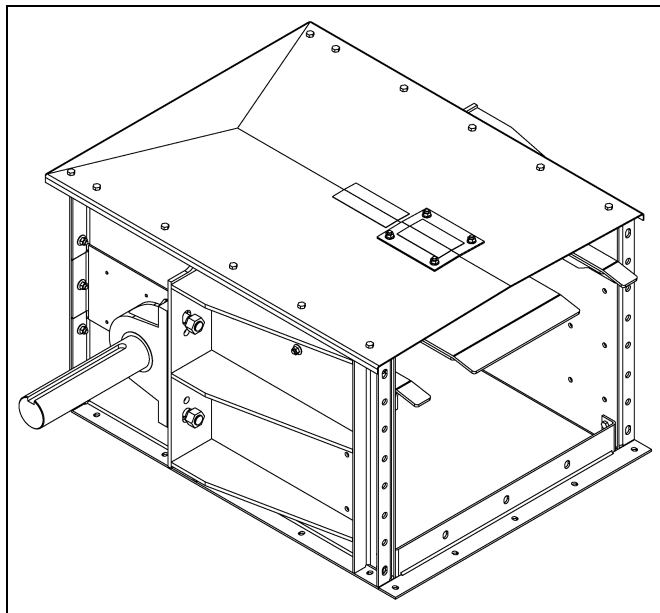


Figure 6A 20 Inch Tall Fixed Head Assembly

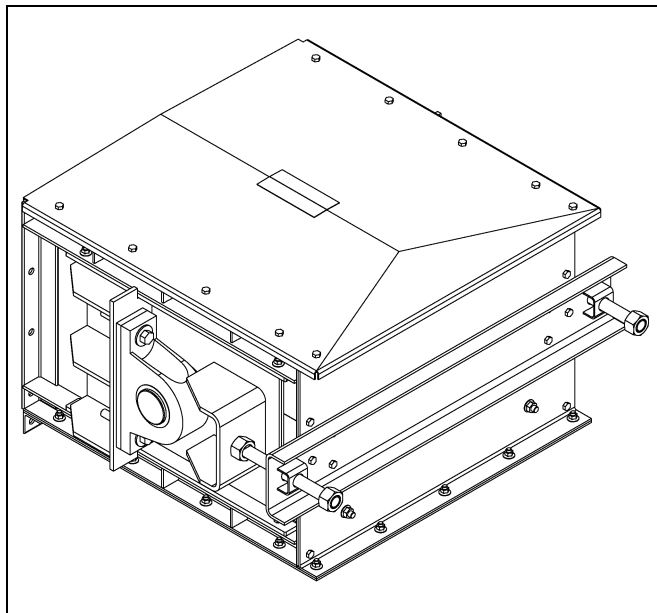


Figure 6C 20 Inch Tall Take-Up Tail Assembly

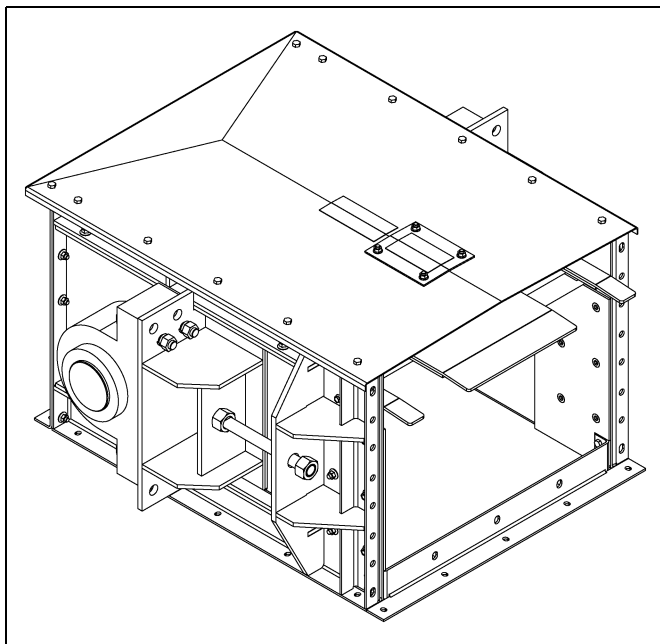


Figure 6B 20 Inch Tall Take-Up Head Assembly

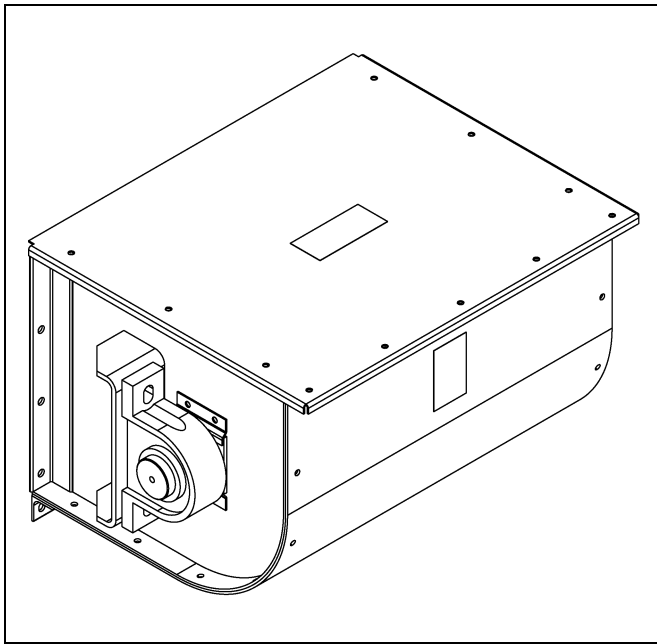


Figure 6D 20 Inch Tall Clean Out Tail Assembly

6. Installation

Assembling an Un-Assembled Intermediate Section

In most cases, intermediate sections are shipped assembled, but can be purchased un-assembled. Below are the recommended assembly steps for an un-assembled intermediate section.

Take a moment to familiarize yourself with the intermediate assembly components. (See Figure 6E.) Covers can be placed in a protected area to minimize any possible damage. Locate the supplied hardware. Do not fully tighten hardware until the assembly is fully completed.

1. Lay the bottom plate weldment (A) onto blocking material.
2. Attach the side weldments (C) to the bottom plate weldment (A) with both 3/8 inch and 5/8 inch hex bolts and flange nuts.
3. Install side liners (B) with 3/8 inch countersunk bolts and flange nuts, making sure the end edges of the liners are flush with the flanges of side weldments (C). (**NOTE: Side liners are optional.**)
4. Install the rail return weldment (E) with 5/16 inch flange bolts.
5. Once all the components are in place, make adjustments to ensure that the end of each side liner (B) is flush with the flanges of the side weldments (C). Also, ensure that the flanges of the side weldments are flush with the flanges of the bottom plate weldment (A).
6. Check the spacing between the side weldments at the top and bottom of the intermediate and measure to the nominal conveyor width ensuring a square assembly. (See Note and Figure 6F on Page 17.)
7. Tighten all hardware, make sure that no countersunk hardware protrudes above the liner surface.

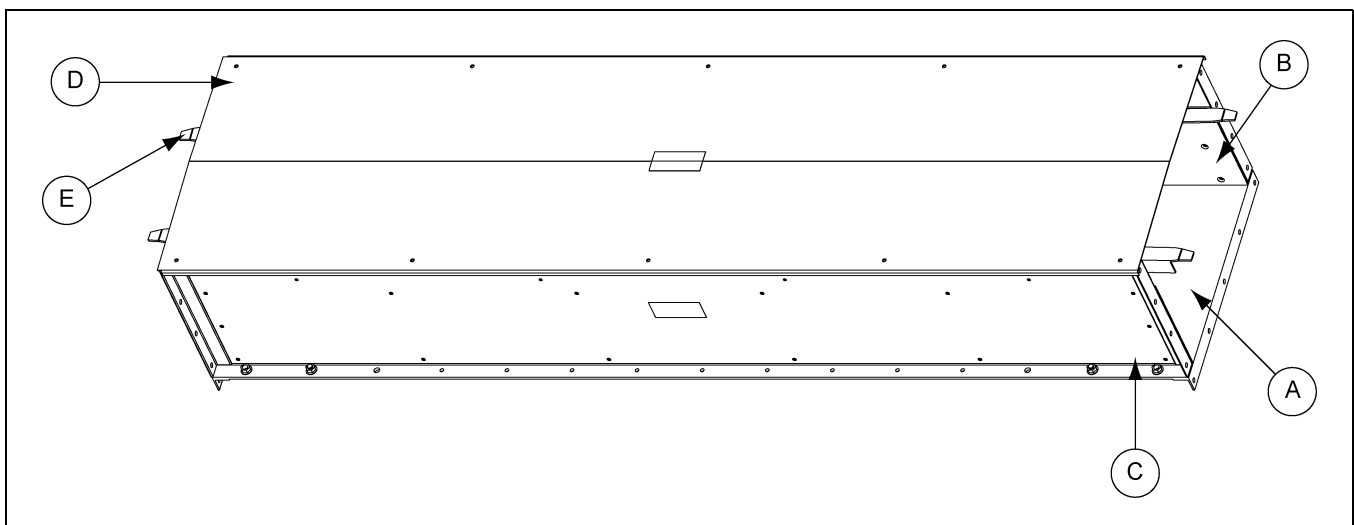


Figure 6E Typical Intermediate Trough Section Assembly with Slide Rail Returns

Ref #	Description
A	Bottom Plate Weldment
B	Optional Abrasion Resistant (AR) Liner Shown
C	Side Weldment
D	Cover
E	Rail Return Weldment

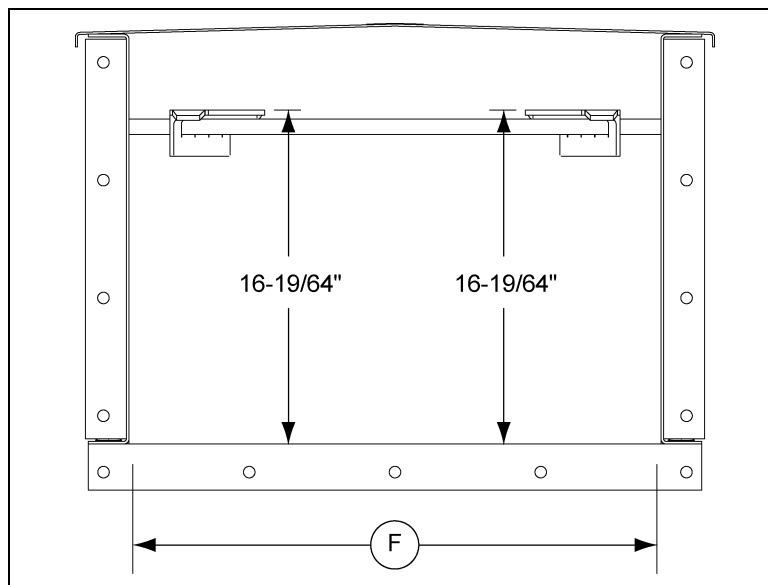


Figure 6F Typical Intermediate Trough Section Assembly with Slide Rail Returns

Ref #	Description
F	Inside Width Dimensions of Box

NOTE: 20 Inch tall trough sections are manufactured for inside width dimensions (*F*) of 14, 16, 20, 26 or 32 inches. (See Figure 6F.) These dimensions do not include liners. It is important that the inside dimensions of the box are equidistant from the bottom plate to the slide rail shafts.

Intermediate Section Assembly

It is critical for straightness of the conveyor and to prevent chain assembly damage that the intermediate interior surfaces of the bottom plate weldment and the side weldments and any optional side liners be flush from one intermediate section to the next. This also extends to head, tail, bypass inlet and dump hopper section installation. A chalk line is helpful during this phase of the assembly to ensure proper alignment of the surfaces. The maximum run-out in any direction should be plus or minus 1/4 inch. Failure to follow these installation guidelines may result in wear on chain assembly flight pads and other potential damage to the conveyor. Make sure that the conveyor is level in horizontal applications. Inspect the transition of each rail return weldment from one intermediate to the next to ensure that the top surfaces are flush and adjust if necessary.

1. Before connecting the intermediate conveyor sections together, remove the covers and place them in a protected area to minimize any possible damage.
2. Locate supplied hardware and retain factory installed hardware for re-installation.
3. Determine the intermediate section installation order. Note that the narrow, tapered end of the rail return weldment of each intermediate section will point towards the head (discharge) end of the conveyor.
4. Attach the intermediate sections together with the supplied 1/2 inch hex bolts and flange nuts. (See Figure 6G on Page 18.)
5. Once each flange joint (B) is aligned, tighten hardware (A).
6. Repeat procedure for each intermediate section.

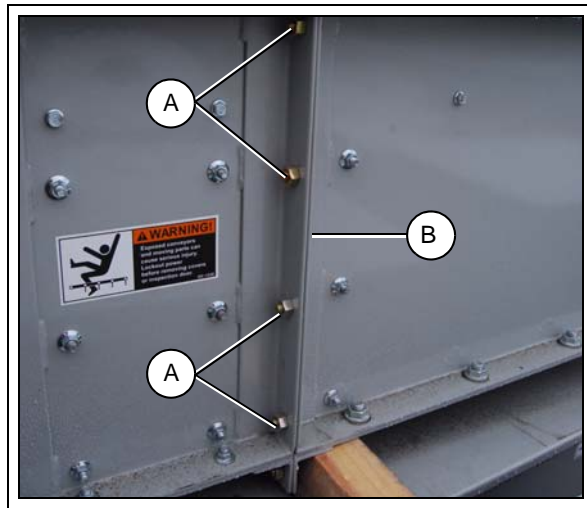


Figure 6G

Ref #	Description
A	Flange Joint Hardware
B	Flange Joint

Head and Tail Section Assembly

Follow the same procedure as the intermediate section assembly.

Stripper Plate Adjustment

1. Loosen the three (3) stripper plate mounting bolts (C) on both sides of the conveyor.
2. Adjust the stripper plate (B) so that the top surface of the stripper plate is flush with the top surface of each rail (A).
3. After the stripper plate is properly aligned, tighten the stripper plate mounting bolts (C).
(See Figure 6H.)

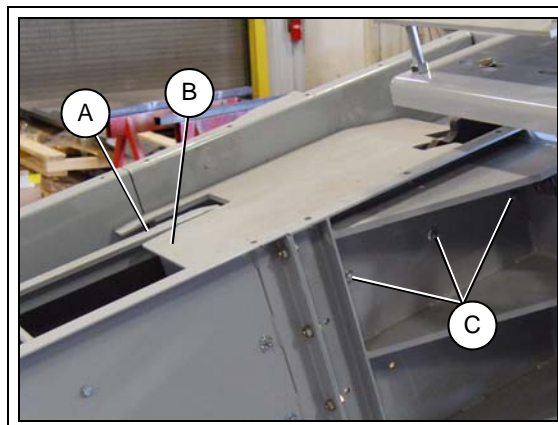


Figure 6H

Ref #	Description
A	Rail
B	Stripper Plate
C	Stripper Plate Mounting Bolts

Intermediate Cover Assembly Installation

1. Position cover with notch (D) facing towards head (discharge) end. (See Figure 6I.)

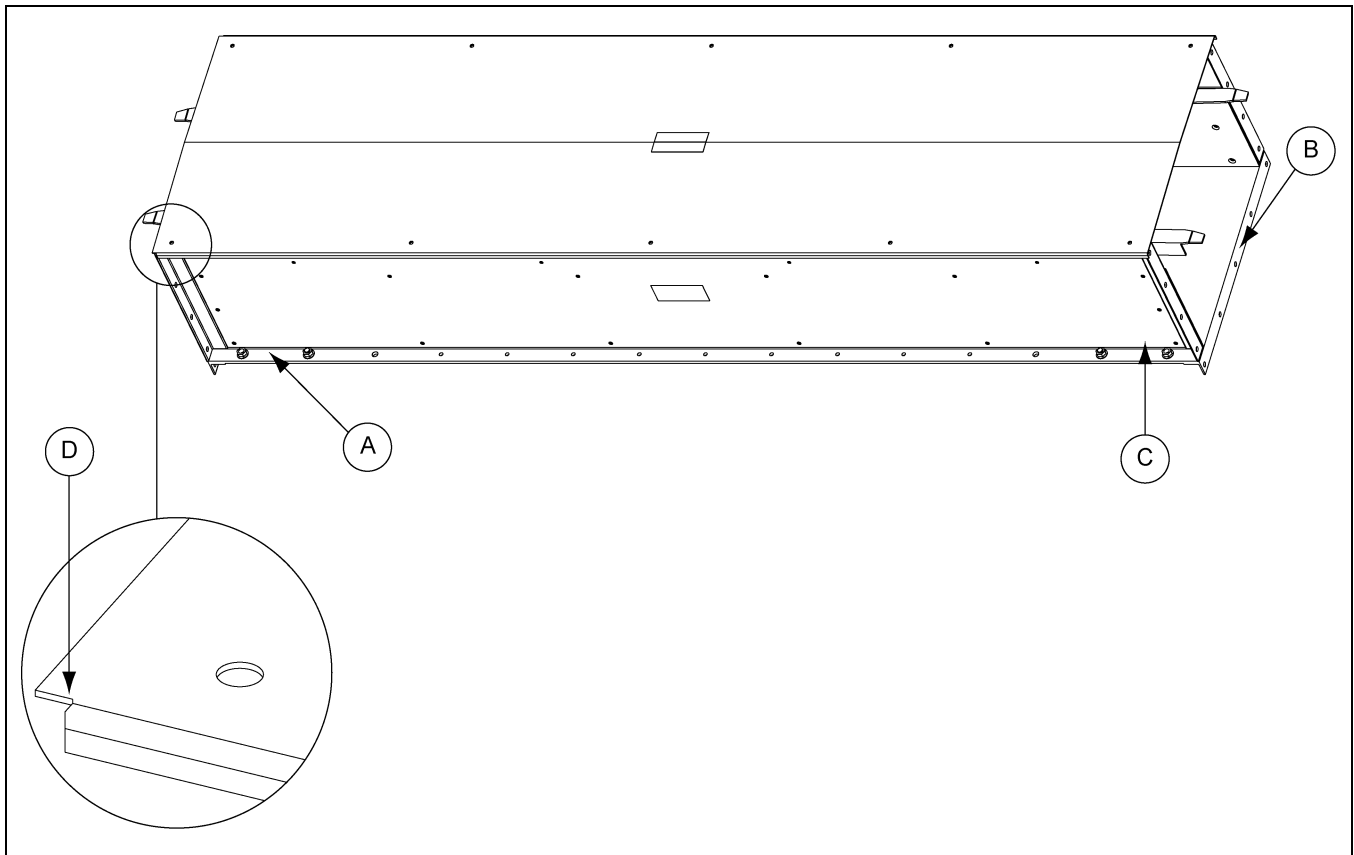


Figure 6I Typical Intermediate Trough Section Assembly with Slide Rail Returns

Ref #	Description
A	Head (Discharge) End
B	Optional Abrasion Resistant (AR) Liner Shown
C	Tail End
D	Notch on Cover

2. Starting at the tail end (H), place the tail section cover on top of the tail section assembly.
3. Apply the adhesive back foam strip (F) to the top surface of the protruding lip before installing the next cover. See cover trough assembly in [Figure 6J on Page 20](#). This recommended installation sequence should ensure that water will shed away from cover seam connections.

When a bypass inlet (G) is installed on a conveyor, a cover section will have to be cut accordingly to accommodate the inlet. For installation, see modifying the intermediate cover when using a bypass inlet on [Page 21](#).

6. Installation

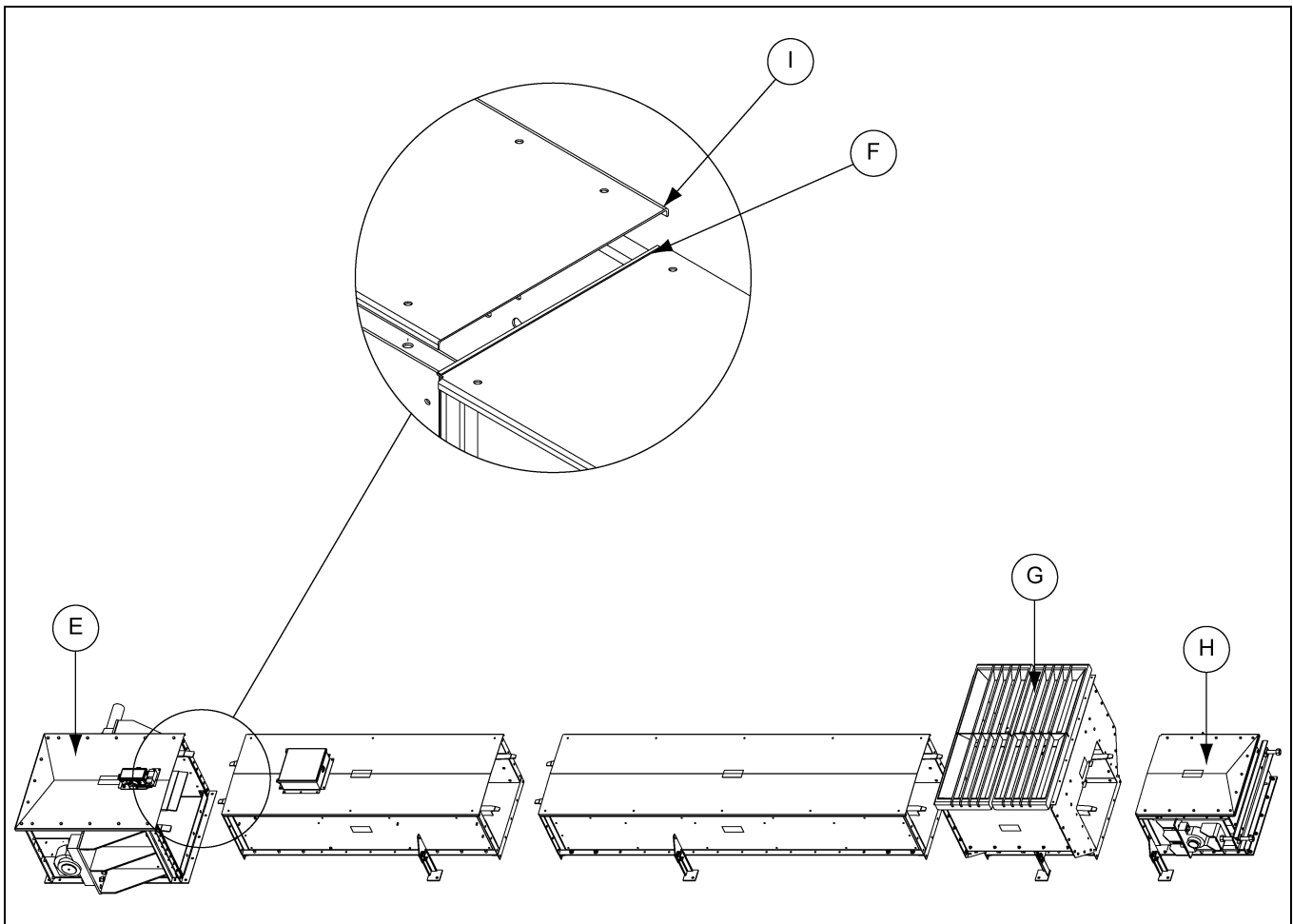


Figure 6J Cover Trough Assembly

Ref #	Description
E	Head (Discharge) End
F	Adhesive Back Foam Strip (Bulk Packed)
G	Bypass Inlet
H	Tail End
I	1/2" Overhang Lip

Modifying the Intermediate Cover when Using a Bypass Inlet

The cover of the intermediate section that is located next to the discharge end of the bypass inlet must be field modified. The 1/2 inch overhang lip as shown in [Figure 6J on Page 20](#) of the non-notched end of the intermediate cover will need to be removed.

1. Use the etched line on the bottom of the intermediate section cover as a removal guide. If etch line is not visible measure 1/2 inch back from the end of the cover and scribe a guide line.
2. If the line is not visible, measure and scribe a line to use for a cutting guide.
3. Paint the exposed metal to prevent corrosion.
4. Install the intermediate covers on both sides of the bypass inlet so that the covers rest on the tabs shown in [Figure 6K](#).
5. Seal the seams with caulk.

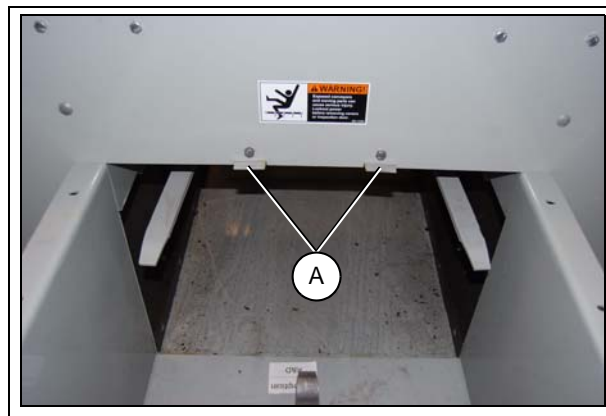


Figure 6K

Ref #	Description
A	Clips

Installing the Intermediate Cover with a Dump Hopper

No field cutting of the intermediate covers is necessary, lap seams as described in cover assembly installation then seal seam with caulk. ([See Figure 6L.](#))

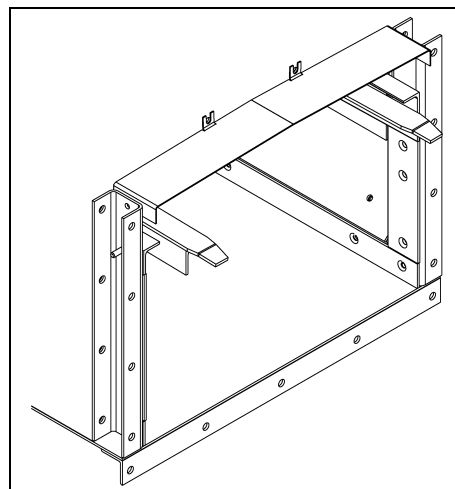


Figure 6L

6. Installation

Dump Hopper Adjustment

Dump hoppers are used in drive-over applications and can provide flow control to the conveyor.

Dump hoppers have two (2) bolts (A) for capacity adjustment. These bolts will adjust the entire hog-back up or down to increase or decrease the open area. (See Figure 6M.)

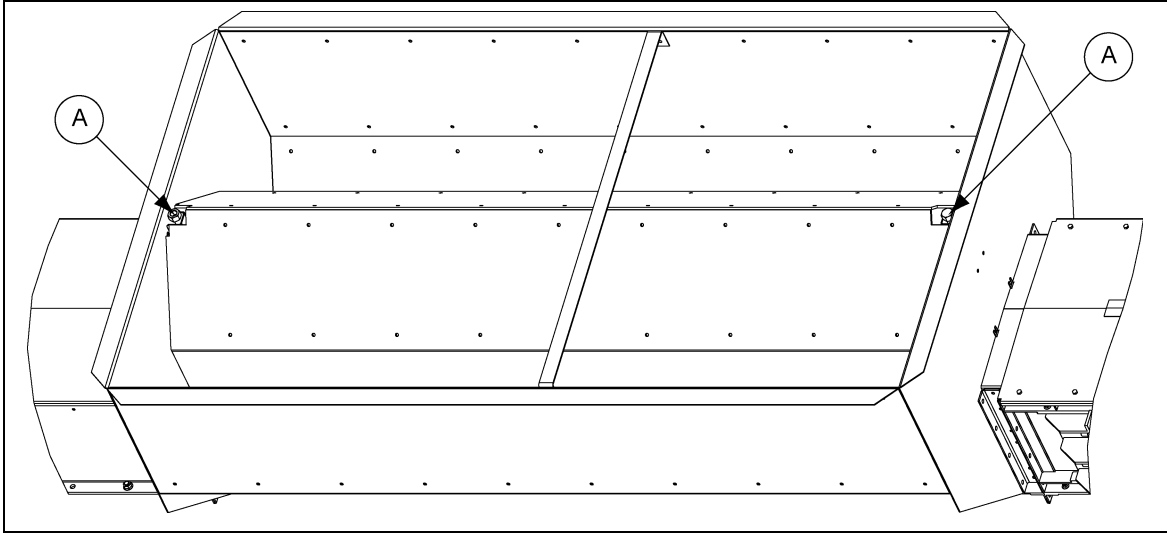


Figure 6M Dump Hopper

Ref #	Description
A	Adjustment Bolts

Standard Inlet Installation

The recommendation for inlet installation includes a minimum distance of not less than 6 inches between the closest inside edge of the inlet and the tail assembly. (See Figure 6N.)

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.

If inlets are welded onto the conveyor, this procedure should occur prior to installation of motor and/or other electrical devices. If the owner fails to follow this precaution, the owner assumes all risks associated with this installation.

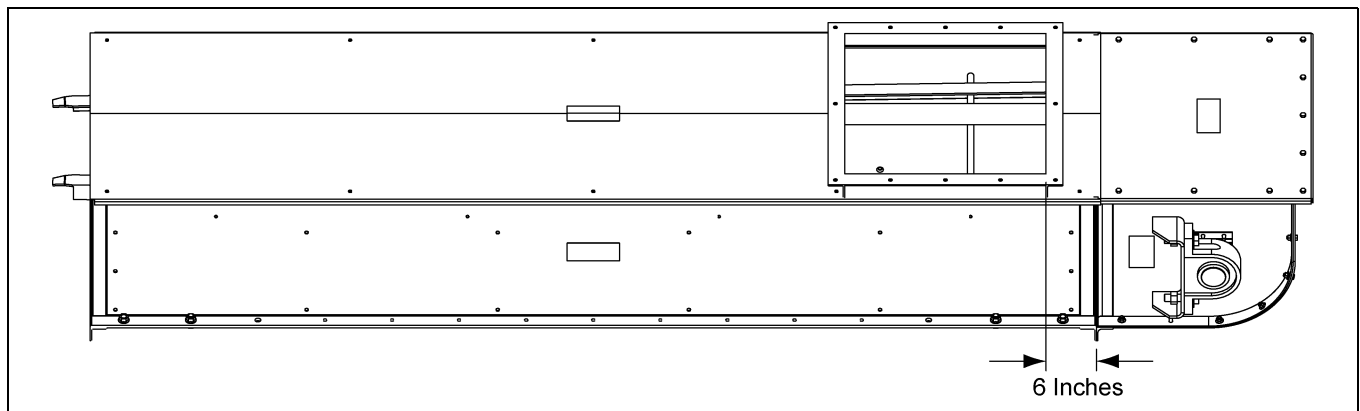


Figure 6N



REMOVE PAINT BEFORE WELDING OR CUTTING.

Avoid hazardous fumes that can be generated when paint is heated by welding or torching. Do all work outside or in a well-ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- **If you use 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 for at least 15 minutes before welding or heating.**

Drag Chain Assembly Installation

The chain will travel sliding on the bottom plate weldment with the metal “V-cup” in front and opening to the bottom of the conveyor with the UHMW flight pads trailing behind towards the discharge (head section). (See [Figure 60.](#)) When returning, the chain will travel towards the tail section sliding on top of the rail return weldments. The correct total chain length has been predetermined and shipped for the installation.

NOTE: All 10' chain assemblies are riveted and all 5' chain assemblies are cotter pinned.

1. Always install the 5' sections as they are required for adjusting the chain length for proper tension.
2. Connect the chain assemblies together using the supplied cotter pins and links.

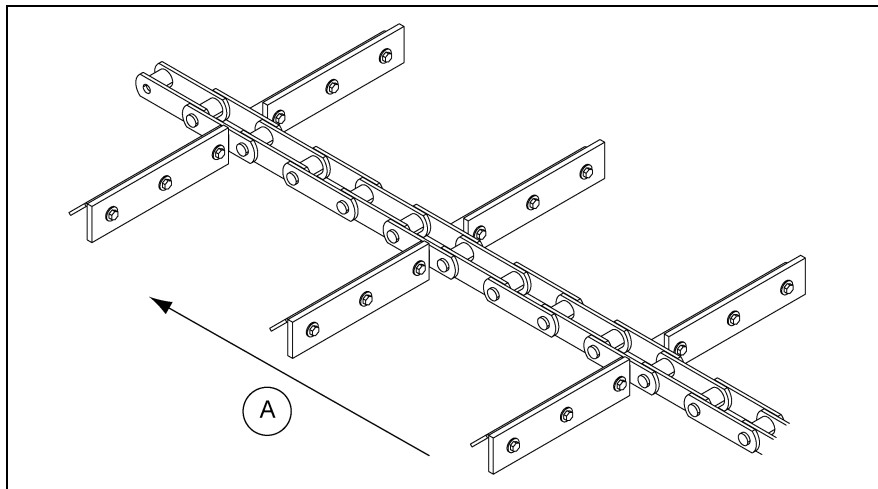


Figure 60 4 Inch Pitch Roller Chain Assembly

Ref #	Description
A	Direction of Chain Travel Bottom Run

3. Tighten the drag chain assembly using the take-up screws (B) located on each side of the tail section or on the take-up head. (See [Figure 6P on Page 24.](#)) On conveyors with slide rail returns, the chain should be able to be lifted slightly when sufficiently tightened.

6. Installation

4. After the chain is tight, check that the head and tail shafts are square to the box sides.
(See Figure 6Q.)
5. If the shafts are not square, loosen the tighter of the two (2) take-up screws until the shafts are square.
6. Lock the take-up screws by tightening the hex nuts against the horizontal “C” channel (C).



Figure 6P

Ref #	Description
B	Take-Up Screw
C	Horizontal “C” Channel

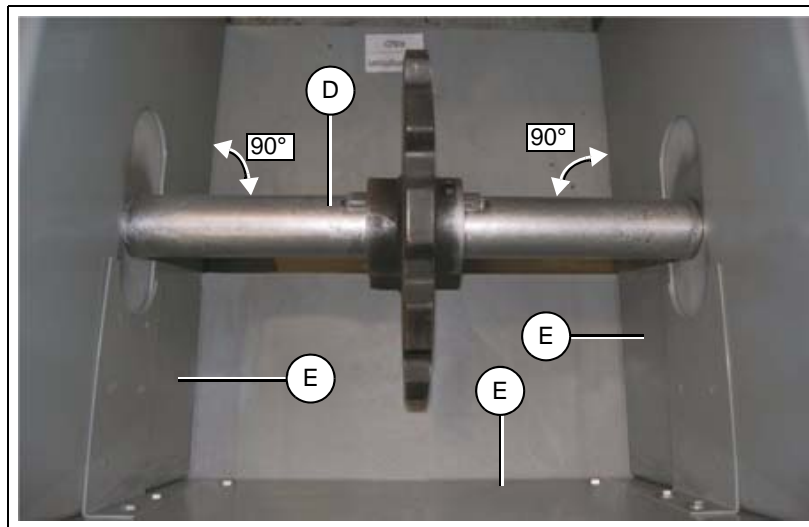


Figure 6Q

Ref #	Description
D	Shaft
E	Box Sides

Torque Arm II Reducer Installation

Shaft Mount Reducer

1. To aid in the installation of the shaft mount reducer (D) onto the conveyor drive shaft (C), remove any protective coating film from the shaft. *(See Figure 6R.)*
2. Place key (B) in the keyway on the conveyor drive shaft (C).
3. Attach inside bushing back-up plate and secure with supplied retaining ring to the reducer hub.
4. Line up the keyway on reducer with key on shaft and slide the reducer drive onto the drive shaft.
5. Slide outside back-up bushing onto shaft and secure with supplied retaining ring to reducer hub. Once reducer drive is in place, fully tighten both bushings. *(See Figure 6S on Page 26.)*

NOTE: For more detailed motor mounting details specific to the installation, refer to the manual provided with the motor.

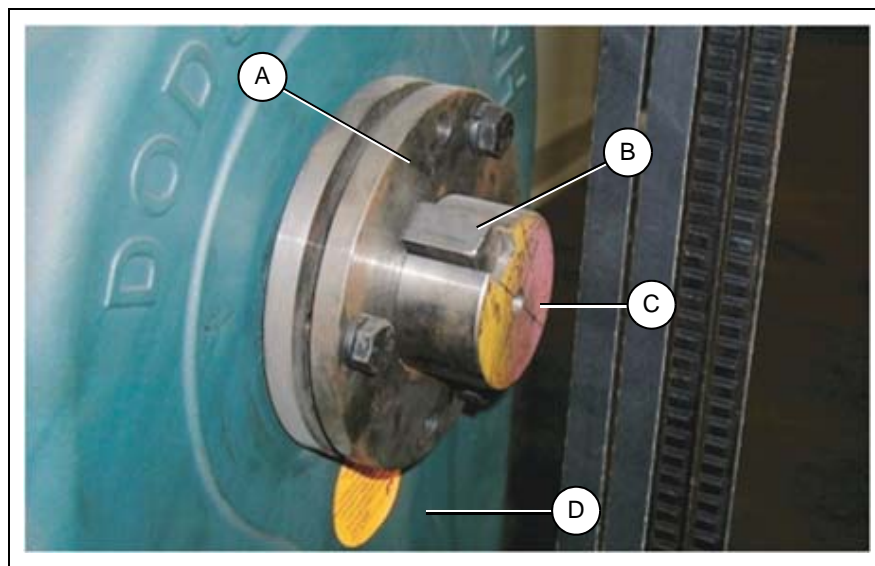


Figure 6R

Ref #	Description
A	Bushing
B	Key
C	Conveyor Drive Shaft
D	Shaft Mount Reducer

6. Installation

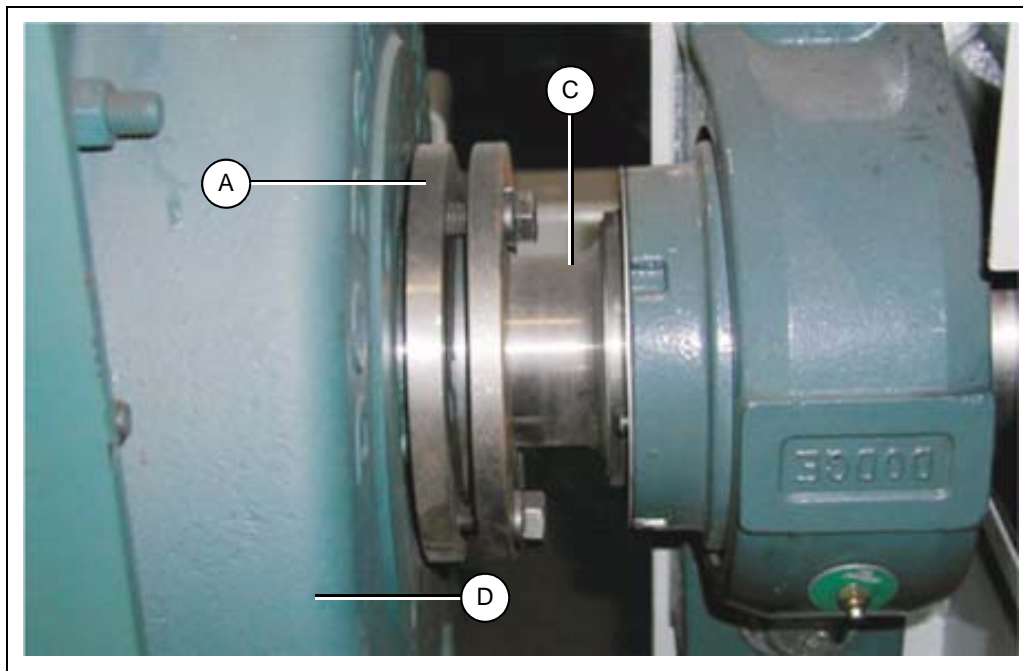


Figure 6S

Ref #	Description
A	Bushing
C	Conveyor Drive Shaft
D	Shaft Mount Reducer

Torque Arm Bracket and Turnbuckle Installation

When a drive package is ordered with the conveyor system, a torque arm bracket (C) is provided. [\(See Figure 6U on Page 27.\)](#)

The torque arm bracket (C) is pre-punched for easy installation to the unit. Begin installation of this option by determining the location of the torque arm bracket relative to the range of extension allowed by the shaft mount reducer's torque arm assembly (E). The bracket will extend on the same side of the conveyor as the head shaft. Remove the four (4) bolts from the bottom of the conveyor plate as necessary.

[\(See Figure 6V on Page 27.\)](#)

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.

The torque arm bracket (C) is mounted under the first intermediate section. Locate bracket by matching an existing set of holes in the intermediate side that allows the turnbuckle assembly (E) to be as short as possible with the reducer in a position perpendicular to the length of the conveyor. [\(See Figure 6V on Page 27.\)](#)

Install the torque arm turnbuckle (F) between the two (2) plates (B) that are located on the bottom of the reducer drive. [\(See Figure 6V on Page 27.\)](#) Secure using bolt with washer and lock nut. [\(See Figure 6T on Page 27.\)](#) Attach the other end to the torque arm bracket (C) on the conveyor using two (2) bolts, washers and lock nuts. Adjust the torque arm (D) by turning the turnbuckle. [\(See Figure 6W on Page 28.\)](#)

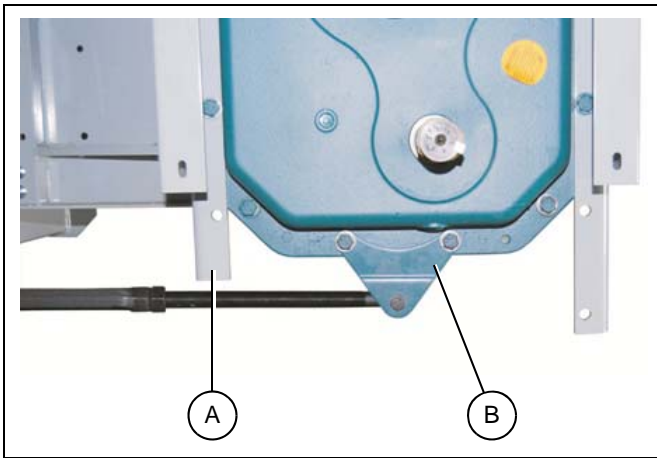


Figure 6T

Ref #	Description
A	Motor Mount Upright Bracket
B	Plates on Reducer Drive

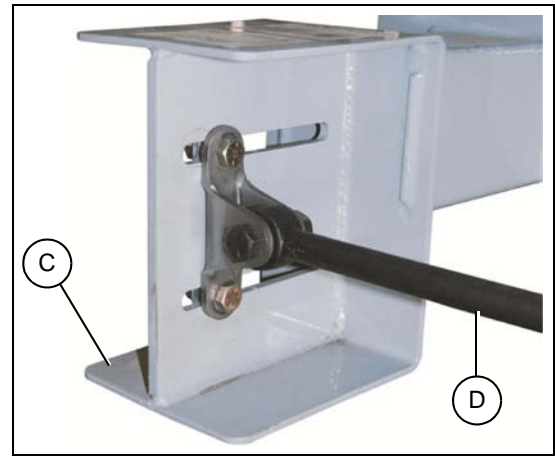


Figure 6U

Ref #	Description
C	Torque Arm Bracket
D	Torque Arm

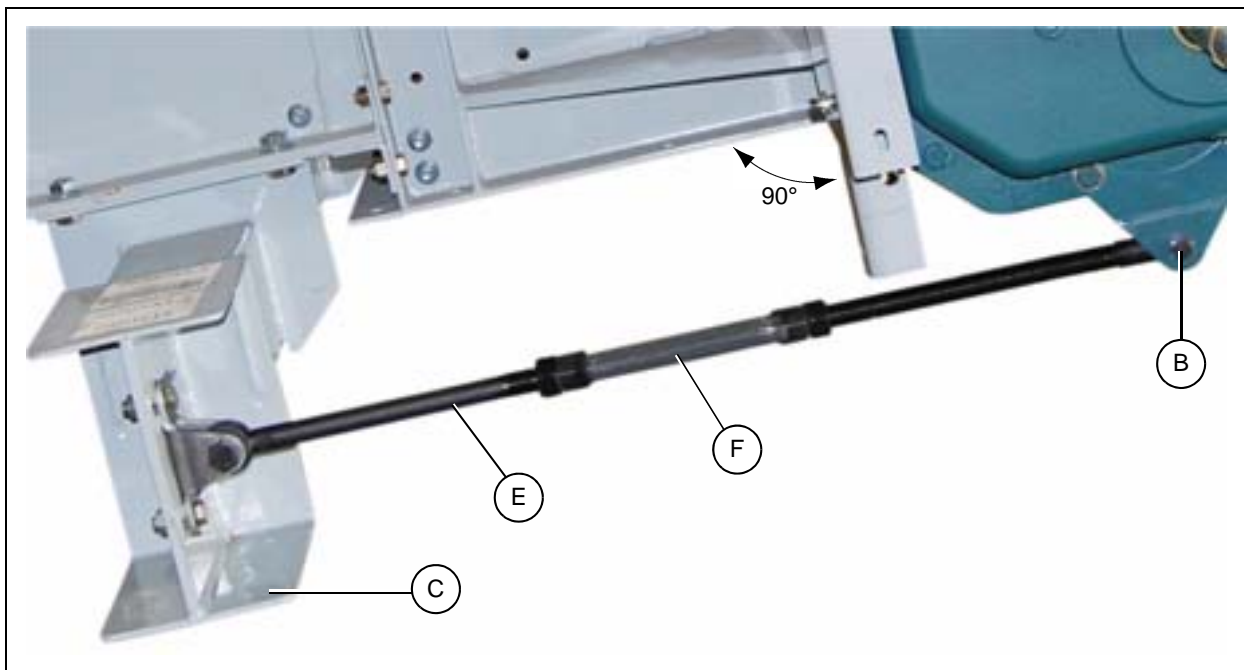


Figure 6V

Ref #	Description
B	Plates on Reducer Drive
C	Torque Arm Bracket
E	Torque Arm Assembly
F	Turnbuckle

6. Installation

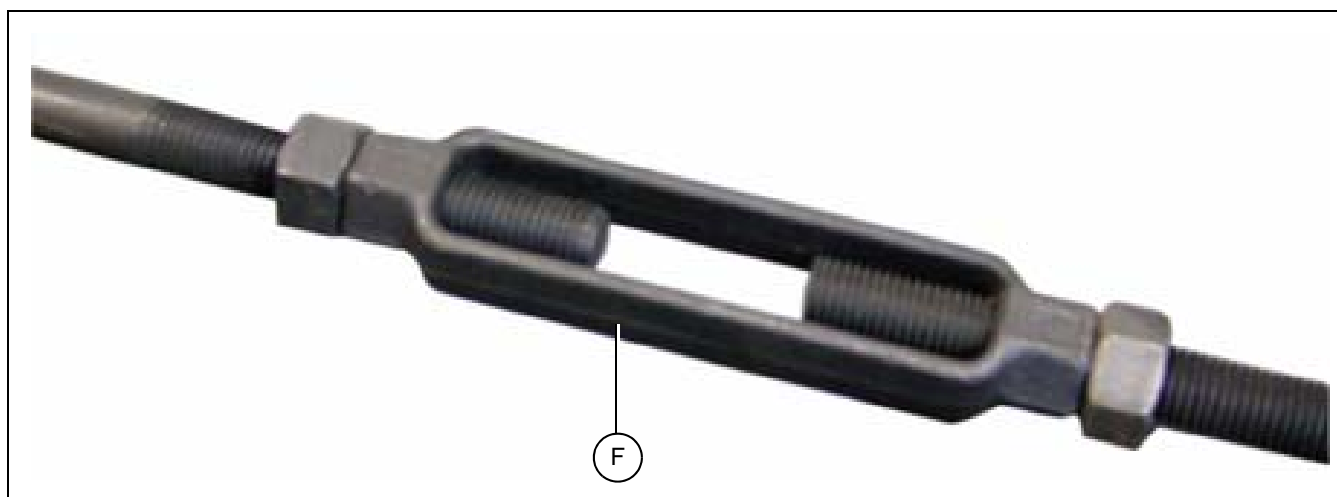


Figure 6W

Ref #	Description
F	Turnbuckle

Reducer Drive Shaft Guard

Guarding for the shaft protrusion between the reducer and the side of the head must be installed.
(See [Figure 6X.](#))

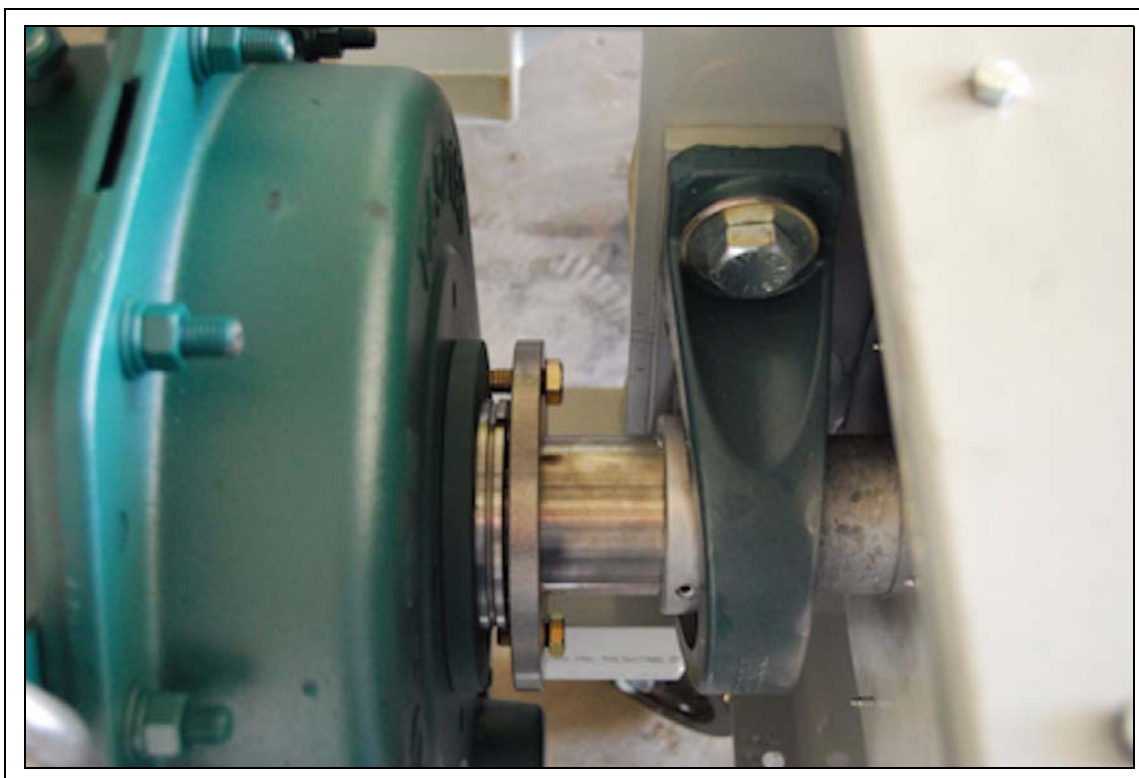


Figure 6X Unguarded Reducer Drive Shaft

Installing Bracket Clips

1. Measure height of shaft guard shield (A). This will determine the distance between the shaft guard clips. (See [Figure 6Y.](#))



Figure 6Y

Ref #	Description
A	Height of Shaft Guard Shield

2. Install four (4) reducer shaft guard clips (B) to gear reducer using supplied bolts and lock washers. Tighten only finger tight at this time. (See [Figure 6Z.](#))

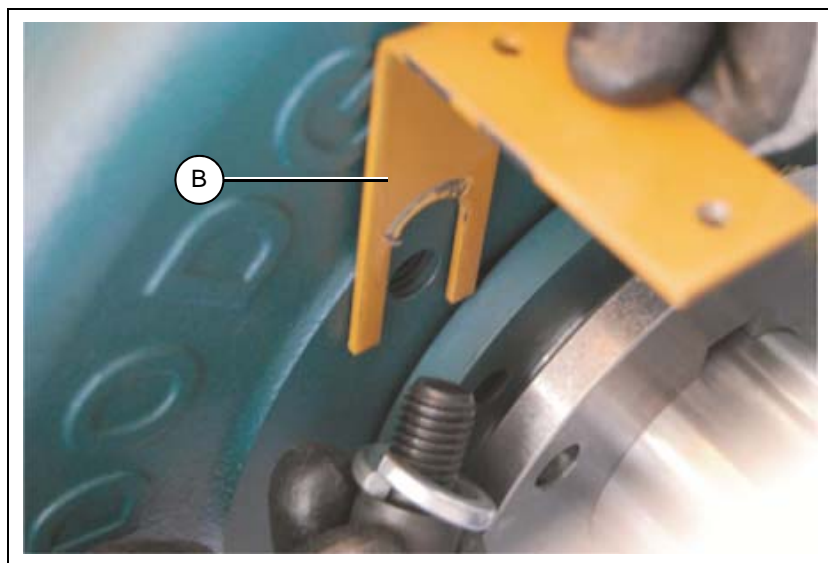


Figure 6Z

Ref #	Description
B	Reducer Shaft Guard Clip

6. Installation

- Adjust the shaft guard clips so the distance between the clips (A) is the same as the height of the shield guard measurement taken in [Step 1 on Page 29](#). Center distance on the center of the reducer shaft. Clips should line up horizontally and vertically across. Tighten bolts on clips. (See [Figure 6AA](#).)

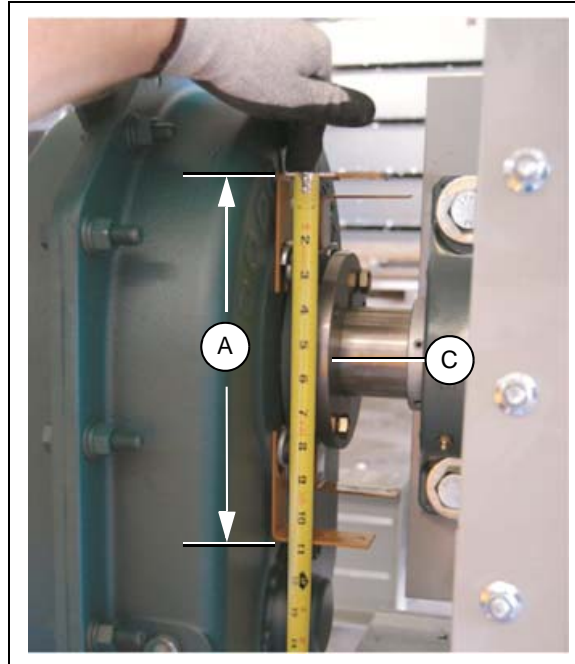


Figure 6AA

Ref #	Description
A	Height of Shaft Guard Shield
C	Shaft Center

Cutting the First Shield

- Measure distance (A) from gear reducer to conveyor side. (See [Figure 6AB](#).)

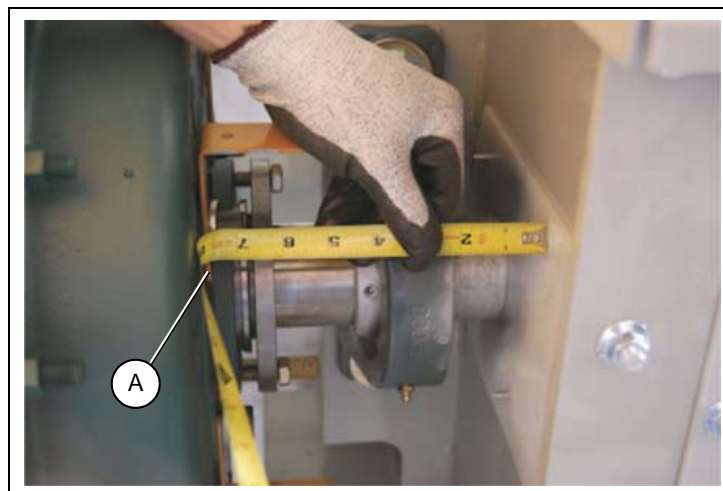


Figure 6AB

Ref #	Description
A	Distance from Gear Reducer to Conveyor Side

2. Transfer measurement to shield guard and cut with tin snips. (See Figure 6AC.)



Wear gloves and safety glasses when cutting shield material.



Figure 6AC

Ref #	Description
A	Distance from Gear Reducer to Conveyor Side

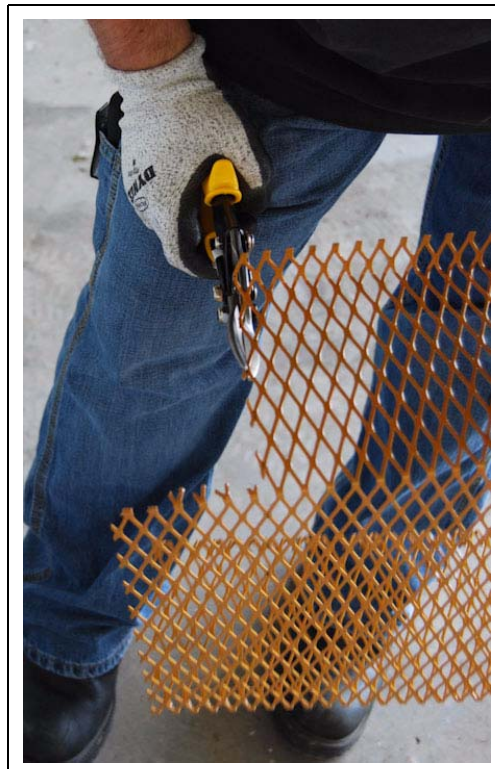


Figure 6AD

6. Installation

Cutting the Second Shield

1. Measure distance (A) from conveyor side to the outside of the bearing mount. Record measurement. Use this measurement to cut the depth of the shield. (See measurement "A" in [Figure 6AE](#) below and in [Figure 6AG](#) on Page 33.)

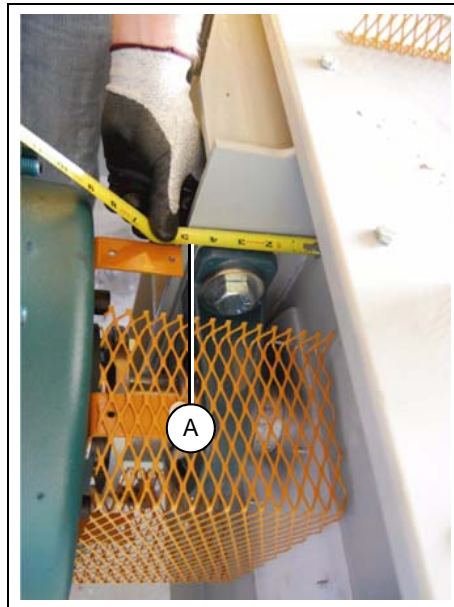


Figure 6AE

Ref #	Description
A	Distance from Conveyor Side to the Outside of the Bearing Mount

2. Measure distance (B) from first shield half to the outside of the bearing mount. Record measurement. Use this measurement to cut the width of the shield. (See measurement "F" in [Figure 6AF](#) below and [Figure 6AG](#) on Page 33.)

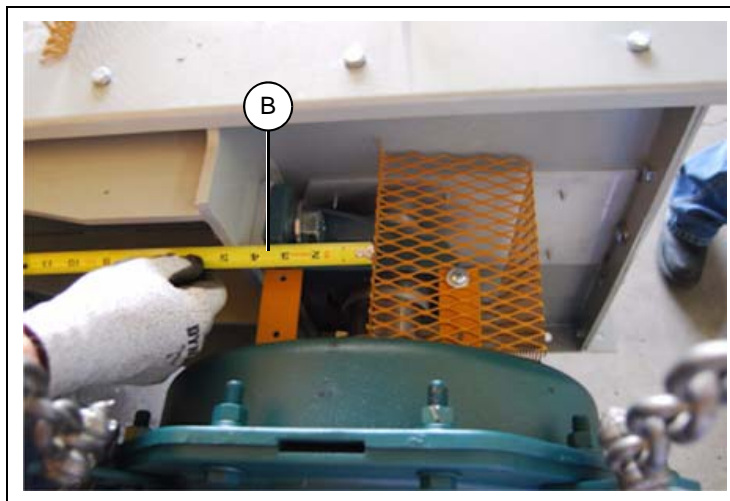


Figure 6AF

Ref #	Description
B	Distance from First Shield Half to the Outside of the Bearing Mount

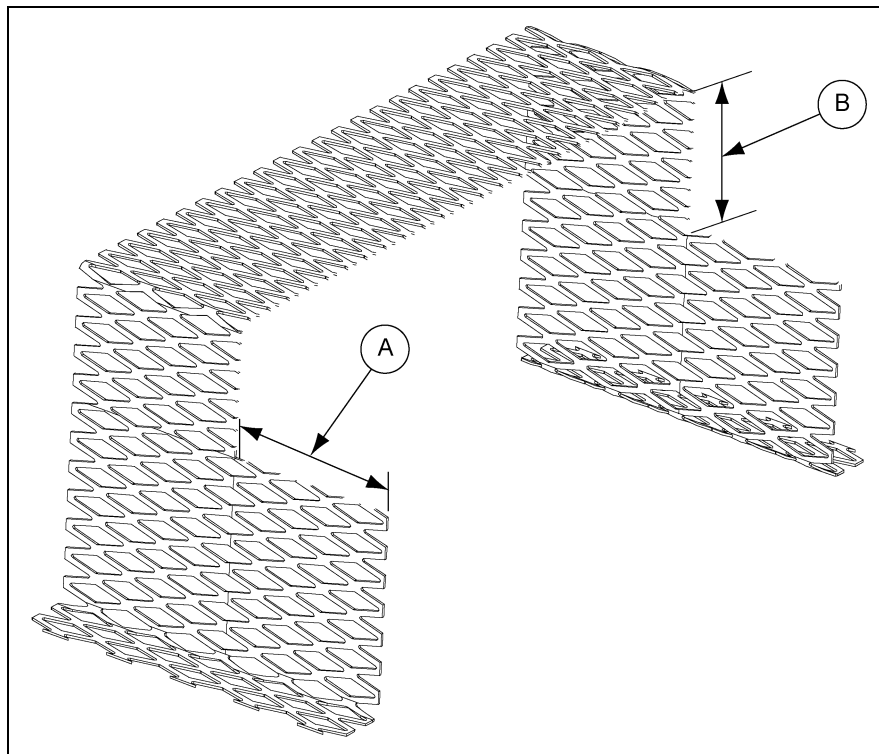


Figure 6AG

Ref #	Description
A	Distance from Conveyor Side to the Outside of the Bearing Mount
B	Distance from First Shield Half to the Outside of the Bearing Mount

3. Transfer measurements to the shield and cut. (See Figure 6AH.)

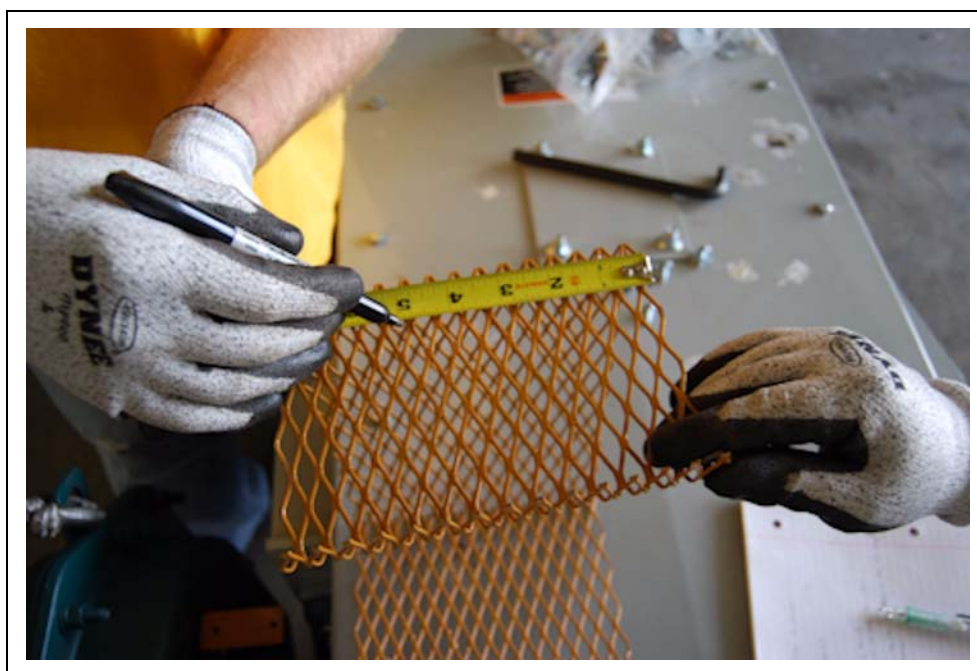


Figure 6AH

6. Installation

Reducer Drive Shaft Guard Installation

1. Secure guards to reducer using supplied bolts and washers. Place self-tapping screws (B) through washer then through guard screen and into guard clips. (See [Figure 6AI.](#))
2. Fasten guards together by inserting bolts (A) through top and bottom flanges on guards. Fasten with nuts.

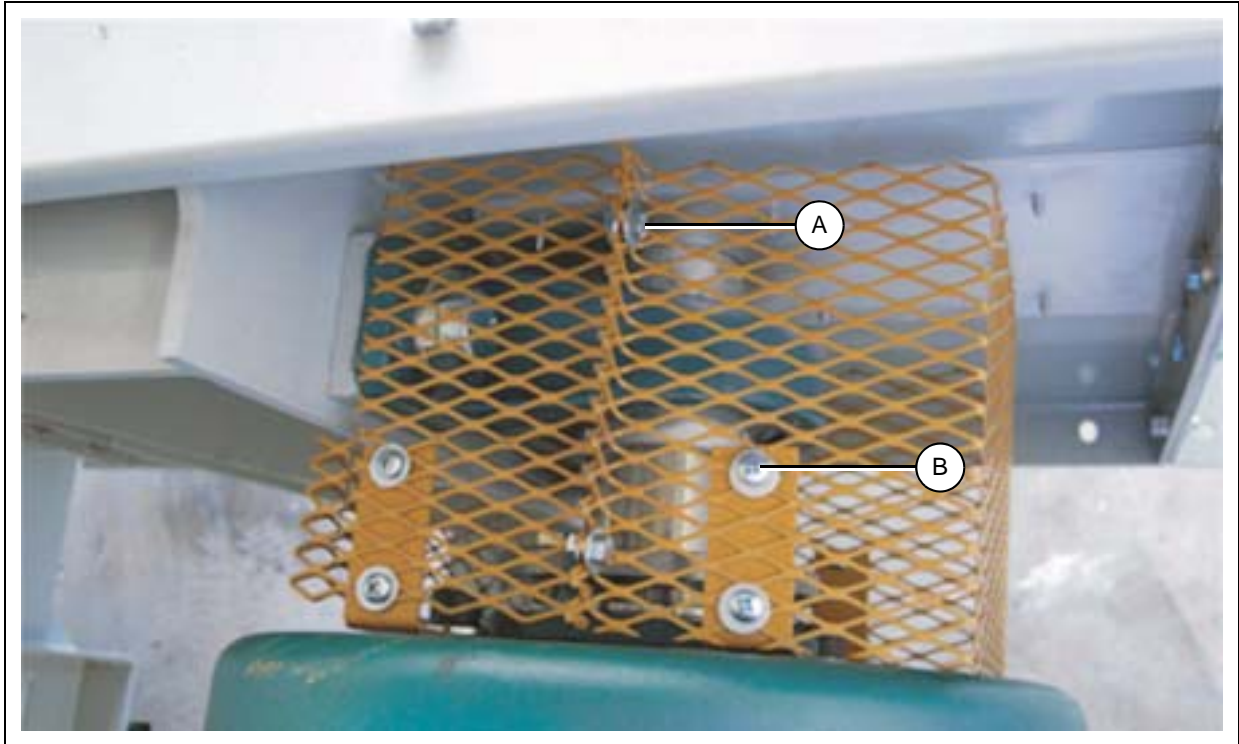


Figure 6AI *Installed Reducer Drive Shaft Guard*

Ref #	Description
A	Bolt on Guard Flange
B	Self-Tapping Screws to Guard Clip

Motor Mount Brackets

1. Remove three (3) bolts from each side of the reducer housing.
2. Use a set of holes in the motor mount upright brackets that allows the motor plate to be as close as possible to the top of the conveyor. (See [Figure 6AJ on Page 35.](#))
3. Check this location by temporarily positioning the belt guard on the reducer with the hole in the guard centered over the reducer input shaft. This will show the correct motor position for the lengths of V-belts provided.
4. Attach by replacing bolts through brackets and housing
5. Tighten bolts securely. (**NOTE:** *Motor mount upright bracket may have to be trimmed for torque arm clearance.*) (See [Figure 6AK on Page 35.](#))

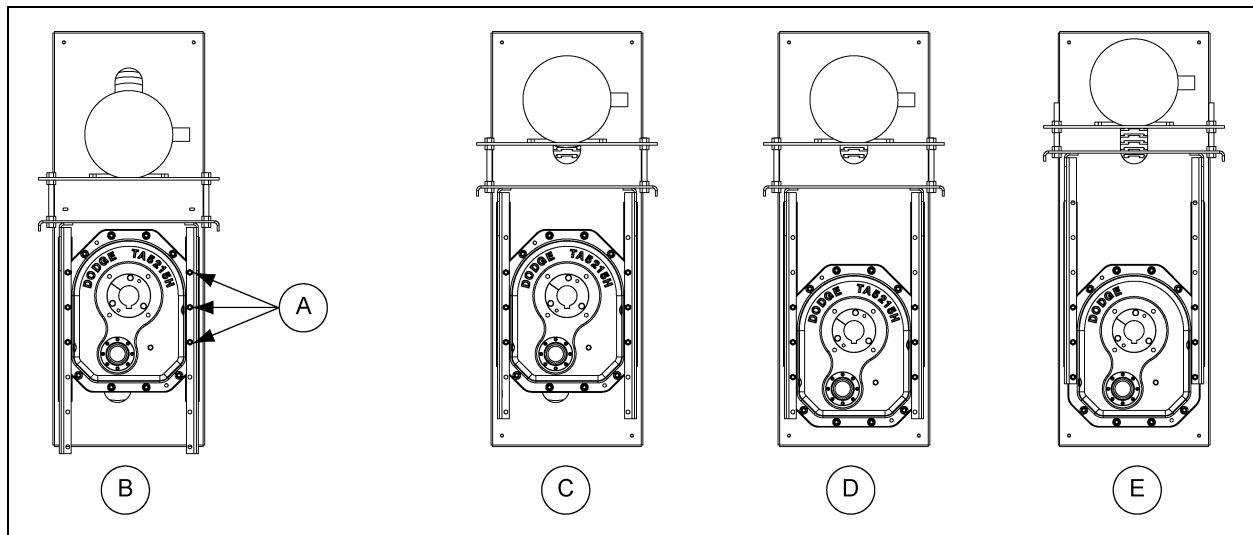


Figure 6AJ

Ref #	Description
A	Three (3) Bolts to Remove for Motor Mount Bracket
B	M1 Position
C	M2 Position
D	M3 Position
E	M4 Position

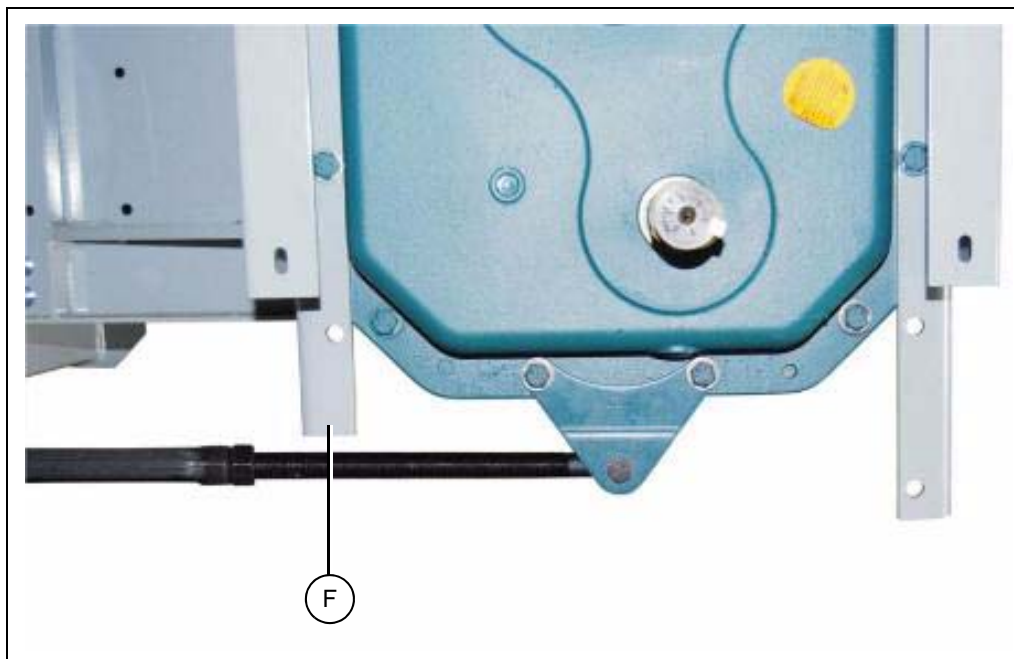


Figure 6AK Motor Mount Bracket Attached to Reducer

Ref #	Description
F	Trimmed Motor Mount Upright Bracket

6. Installation

Part # Breakdown

Part # as written: **53918T2BV2**

5	39	18	T	2	B	V	2
Horsepower*	Output RPM	Input Motor RPM (x 100)	Manufacturer	Motor Mount Configuration	Reducer Bushing Bore Size	Drive Configuration	Drive Class
		"18" = 1750 RPM@60HTZ "15" = 1450 RPM@50HTZ	"T" for Dodge TA II Reducer	"1" = M1 Position "2" = M2 Position "3" = M3 Position "4" = M4 Position	"A" = 1-7/16" "B" = 1-15/16" "C" = 2-3/16" "D" = 2-7/16" "E" = 2-15/16" "F" = 3-7/16" "G" = 3-15/16" "H" = 4-7/16" "I" = 4-15/16"	"V" = V-Belt Drive "H" = HTD Belt Drive	"1" or "2"

* **NOTE:** Horsepower identification may contain 1 to 3 digits.

Motor Mount Adjustment Plates

1. Thread nuts (D) onto jack screws (A). Thread another nut onto jack screws to secure. Repeat for three (3) remaining jack screws. (See Figure 6AL.)
2. Thread another nut onto all four (4) jack screws. Place motor mount adjustment plate (B) onto jack screws. Thread another nut onto each jack screw to secure motor mount adjustment plate. Use these nuts to adjust the motor height.
3. Attach the motor to the motor mount adjustment plate using bolts and lock nuts.
4. The base plate is adjustable. Use the slots to flush the face of the motor to the face of the outer bushing of the reducer. This will ensure the maximum guard covering and motor shaft utilization.

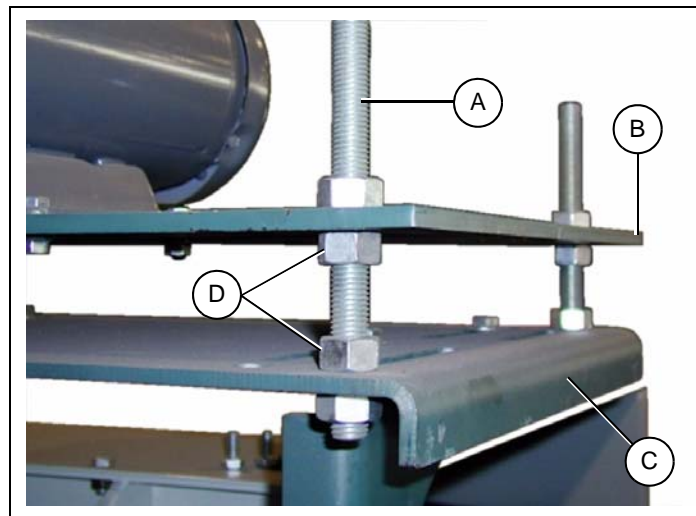


Figure 6AL

Ref #	Description
A	Jack Screw
B	Motor Mount Adjustment Plate
C	Base Plate
D	Nuts

Drive Guard Rear Panel

Install the drive guard rear panel (A) before mounting the sheaves.

1. The drive guard rear panel includes belt guard mounting brackets (B) with slotted holes (C) for adjustment. Attach the left hand and right hand belt guard mounting brackets to the motor mount upright brackets (D).
2. Fasten the drive guard rear panel to the belt guard mounting brackets. *(See Figure 6AM.)*

Guard should be set as close to the outer bushing of the reducer as possible without contacting the bushing.

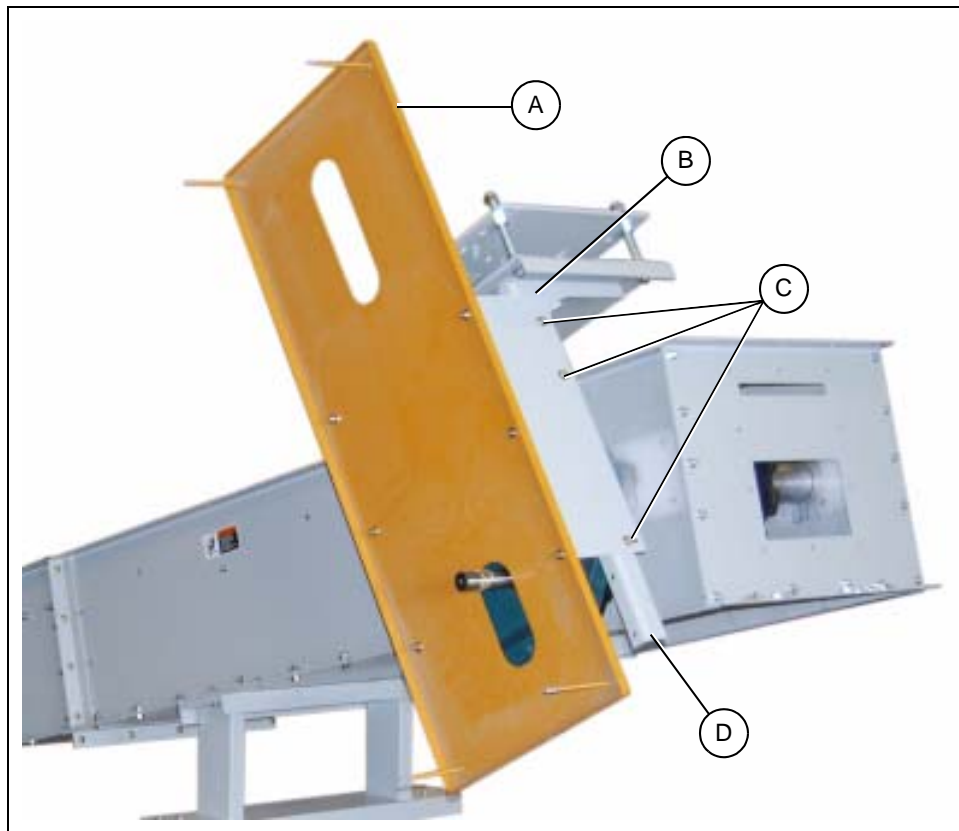


Figure 6AM Drive Guard Rear Panel

Ref #	Description
A	Drive Guard Rear Panel
B	Belt Guard Mounting Bracket (Right Hand Shown)
C	Slotted Holes
D	Motor Mount Upright Bracket (Right Hand Shown)

Sheaves and Belts

Assemble the V-belt driven sheave to the input shaft of the shaft mount reducer. Insert the bushing into sheave hub. Match holes in bushing and hub (not threads). Put screws into holes that are farthest apart. Slip entire unit with key onto shaft. 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.

6. Installation

V-Belt Adjustment

Adjustment of V-belt tension is achieved by tightening the hex nuts located on the four (4) jack screws of the motor base. Adjust motor base equally at all four (4) jack screws to maintain shaft alignment. Belts are designed to fit loosely upon installation. When the V-belt tension is correct, tighten the top nut on the jack screws to lock the motor base in position. Proper tension (B) is 1/64 inch of deflection per one inch (1") of sheave centers on one side of belt, centered between sheaves. (See Figure 6AN.)

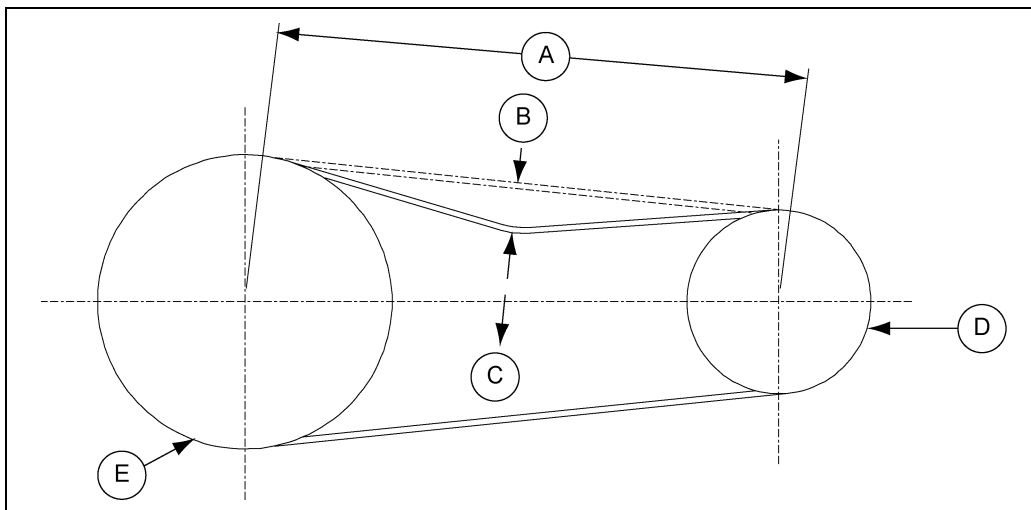


Figure 6AN

Ref #	Description
A	Span
B	Belt Deflection
C	Force
D	Motor
E	Reducer

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

Sample Deflection Problem:

3-1/2' Span = 21/32" of Deflection (approximately 11/16")

1. 3-1/2' = 42" (Span)
2. 1/64" = 0.015625" (Belt deflection per inch of span)
3. 42" x 0.015625" = 0.65625" (Span x Belt deflection)
4. 0.65625" = 21/32" of Deflection for 3-1/2" span

Front Guard Panel

Install the front drive guard panel over the four (4) corner mounting studs. Secure with washers and nuts provided.

Lubricate Reducer Drive

Fill the shaft mount reducer with the manufacturer's recommended oil.

Initial Start-Up and Break-In Section



A certified electrician must perform electrical wiring for equipment.

1. Connect the conveyor motor to a power source according to the motor manufacturer's instructions and recommendations.
2. A shut off switch should be placed near the motor so that the system may easily be shut down.
3. Check proper motor shaft rotation before installing drive belts.
4. 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.
5. Ensure a "break-in" period whereby the chain is allowed to run and seat itself.
6. After running it for an adequate period of time, stop the machine, disconnect and lock out the power source.
7. Re-tighten as necessary and remove any excess chain portions.
8. Repeat this process as necessary.

7. Care and Maintenance



Before any maintenance is performed on the conveyor, power must be shut OFF and locked out to prevent accidental start-up.

The care and maintenance section is provided to help extend the life of the unit. Like all equipment, the useful life of the conveyor is greatly reduced if not used properly and well-maintained.

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

1. Check all bearings and moving parts daily during use.
2. Lubricate bearings at regular intervals to bearing manufacturer's recommendations. If one bearing is re-lubricated, all other bearings should also be lubricated. Do not over lubricate as this will destroy bearing seals.
3. Follow manufacturer's recommendations for gear reducer lubrication and maintenance.
4. 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 V-belt adjustment section on [Page 38](#).

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

1. Ensure all material is conveyed out of the unit.
2. Thoroughly clean the unit.
3. Loosen the V-belt tension to relieve the stress placed on the bearings and shafts of the drive and tail sections.
4. Lubricate shafts and drive chain components with a good grade of light machine oil.
5. Loosen the drag chain tension to relieve the stress placed on the bearings and shafts of the drive and tail sections.

Installation Instructions (Whirligig® - WG1-4B)



Always observe lock out and tag out procedures before, during and after installation.

Do not remove the Whirligig cover. The rotating components under the cover could cause serious injury.

1. Tail shaft ends (G) are pre-drilled and tapped from the factory.
2. Thread the Whirligig (E) onto the machine shaft (H) using 5/8" open ended wrench and suitable thread locking adhesive (Loctite® or similar). (See Figure 9A.)
3. Install the sensor (D) to the Whirligig base plate. Two (2) sets of pre-drilled holes are provided for M800 sensor. Fit the sensor to leave an approximate 2 mm gap between sensor face and cover (F). A universal bracket (B) (WGB18/30) is supplied for fitting 18 mm or 30 mm sensors.
4. Connect the sensor in accordance with manufacturer's instructions and observe all relevant electrical and O.S.H.A., regulations.
5. Fix the flexible strap (I) securely to the static structure (if required).

TIP: The M800 speed switch and system function can be tested by placing a thin metal plate between the sensor and the cover of the Whirligig. When installing other industry standard sensors, leave a small gap between the sensor and the Whirligig cover for this purpose.

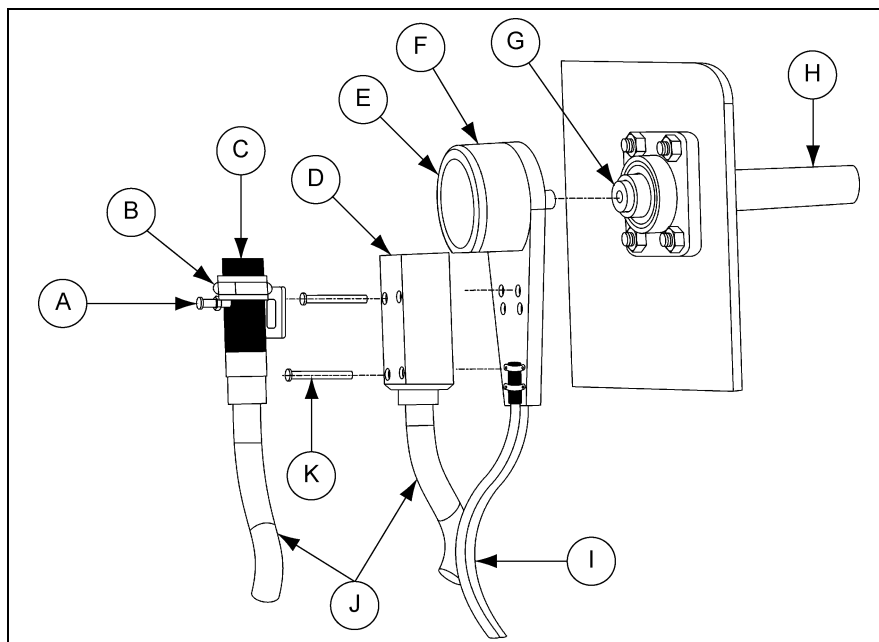


Figure 9A

Ref #	Description
A	10 mm Screws Four (4) (Supplied)
B	18/30 mm Bracket (Supplied)
C	Cylindrical Sensor
D	M800 Sensor
E	Whirligig
F	Cover

Ref #	Description
G	Tap Shaft for 1/2" UNC Centered
H	Machine Shaft
I	Flexible Strap
J	Flexible Conduit
K	50 mm Screws Four (4) (Supplied)

Inspection Ports

There are two (2) sizes of inspection ports, a 12 x 12 inch port (A) and an 8 x 8 inch port (B).
(See Figure 10A.)



Remove paint before welding or heating. Toxic fumes can be generated when paint is heated by welding, soldering or using a torch. Always wear an approved respirator and work in well-ventilated area.

To install the 12 x 12 inch inspection port:

1. Cut a 12 inch square hole into the cover.
2. Align the inspection port over the hole. Using the holes in the flanges as a template, field drill the holes through the cover.
3. Caulk around the entire opening to form a seal when the port is aligned over the opening.
4. Align the holes in the flanges with the holes in the cover, then bolt the port to the cover.

To install the 8 x 8 inch inspection port:

1. Cut an 8-3/16 inch square hole into the cover.
2. Align the inspection port over the hole and weld the port into place.
3. Apply caulk if needed to create water tight seal.

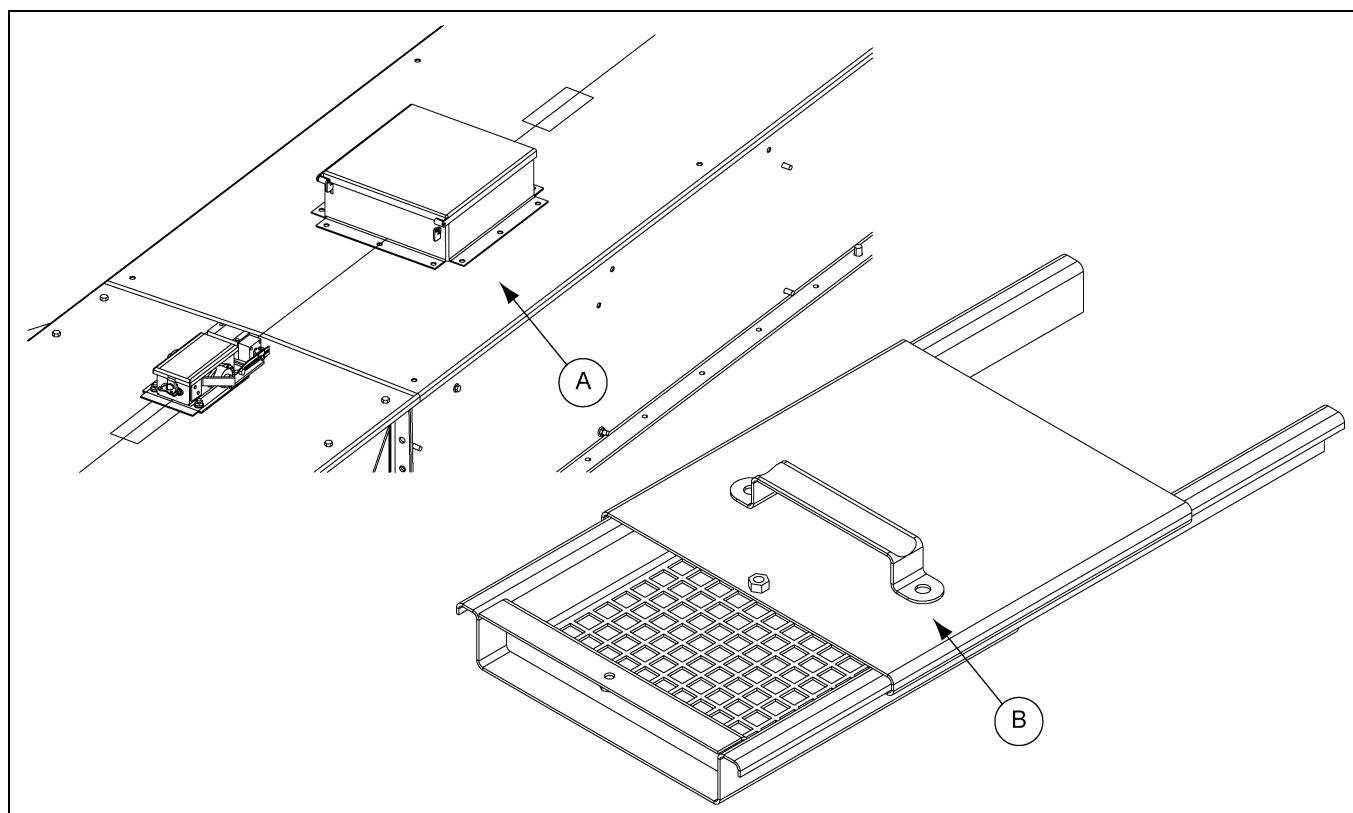


Figure 10A

Ref #	Description
A	12 x 12 Inch Inspection Port
B	8 x 8 Inch Inspection Port

Relief Door Assembly Overview

There are two (2) types of relief doors assemblies, overflow relief doors and plug relief doors. Some field assembly is required to mount the relief doors, determine which type you are installing before proceeding. Both types come supplied with factory knock-out bolt hole locations for mounting standard and explosion proof limit switches in both a “left hand” and “right hand” orientation to facilitate conduit connections, determine the best orientation of the limit switches prior to punching out the knock-out holes for mounting the limit switches. The limit switches will be mounted using the threaded holes in the body of the limit switch so note the threaded hole locations in relation to the knock-outs as well before punching out the knock-out holes. Explosion limit switches should be used in extremely dirty or dusty conditions and/or in enclosed environments. Relief doors should be checked periodically for impediments to free movement of trigger mechanisms

Installing an Overflow Relief Door

1. Remove the cover plate (B) from the end channel (A) by removing the flange nuts, retain the nuts for re-use.
2. Install the overflow relief door oriented as shown using flange nuts. *(See Figure 10B on Page 45.)*
3. Install the limit switch by removing the appropriate knock-outs. (Refer to the manufacturers supplied instruction sheet for wiring limit switches.)
4. Limit switch (D) trigger adjustments can be made by removing and re-installing the lever arm in a different clockwise or counterclockwise orientation or by adjusting the length of the lever arm. (Refer to the manufacturers supplied instruction sheet for the window of operation.)
5. Overflow relief doors (E) come supplied with a tension spring to prevent false triggers due to reasons other than material build-up (such as positive pressure venting, spring fatigue, etc.). Tension can be adjusted to a stronger setting if necessary by moving the spring end to a higher hole location on the door.
6. Check for free movement of the door and adjust hinge bolts if necessary.

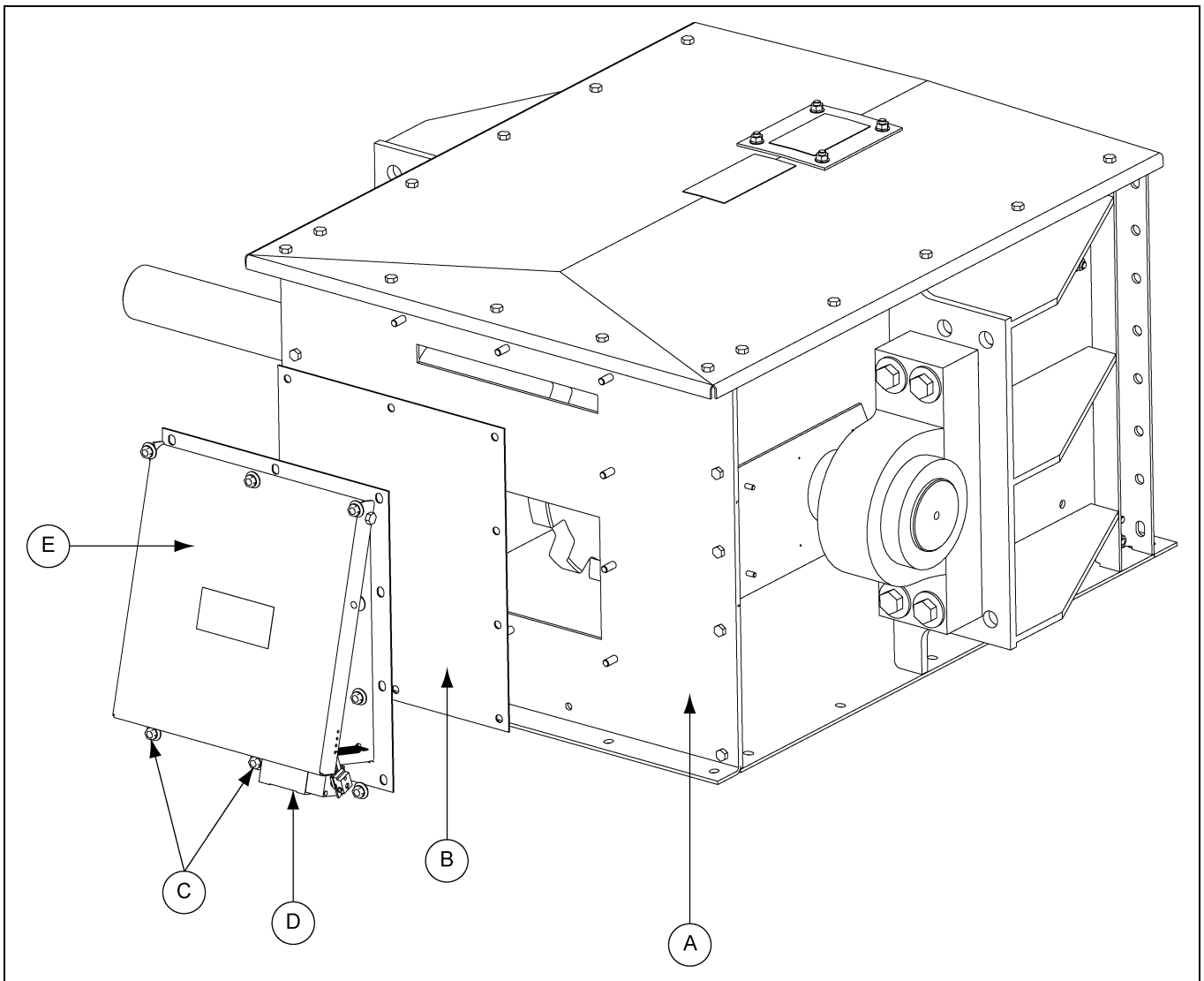


Figure 10B 20 Inch Tall Plug Relief Door without Head Gate

Ref #	Description
A	End Channel (as Shipped)
B	Cover Plate
C	Knock-Out Plugs
D	Limit Switch
E	Overflow Relief Door Assembly

Installing a Plug Relief Door

1. Remove the cover plate from the end channel by removing the flange nuts, retain the nuts for reuse.
2. Install the plug relief door (A) oriented as shown using flange nuts. (See Figure 10B on Page 45.)

NOTE: The two (2) baffle plates (C) should be removed to install the plug relief door and will be re-installed after the main assembly of the plug relief door is installed. (See Figure 10C.) The tongue attached to the pivot shaft will rest lying on the upper thin slot in the end channel. During re-installation, the baffle plates should be spread to the widest coverage possible. Make sure to leave enough clearance to not impede the pivot of the baffle and pivot plate for the doors trigger operation.

3. Install the limit switch (B) by removing the appropriate knock-outs. (Refer to the manufacturers supplied instruction sheet for wiring limit switches.)
4. Limit switch trigger adjustment can be made by removing and re-installing the lever arm in a different clockwise or counterclockwise orientation or by adjusting the length of the lever arm. (Refer to the manufacturers supplied instruction sheet for the window of operation.)

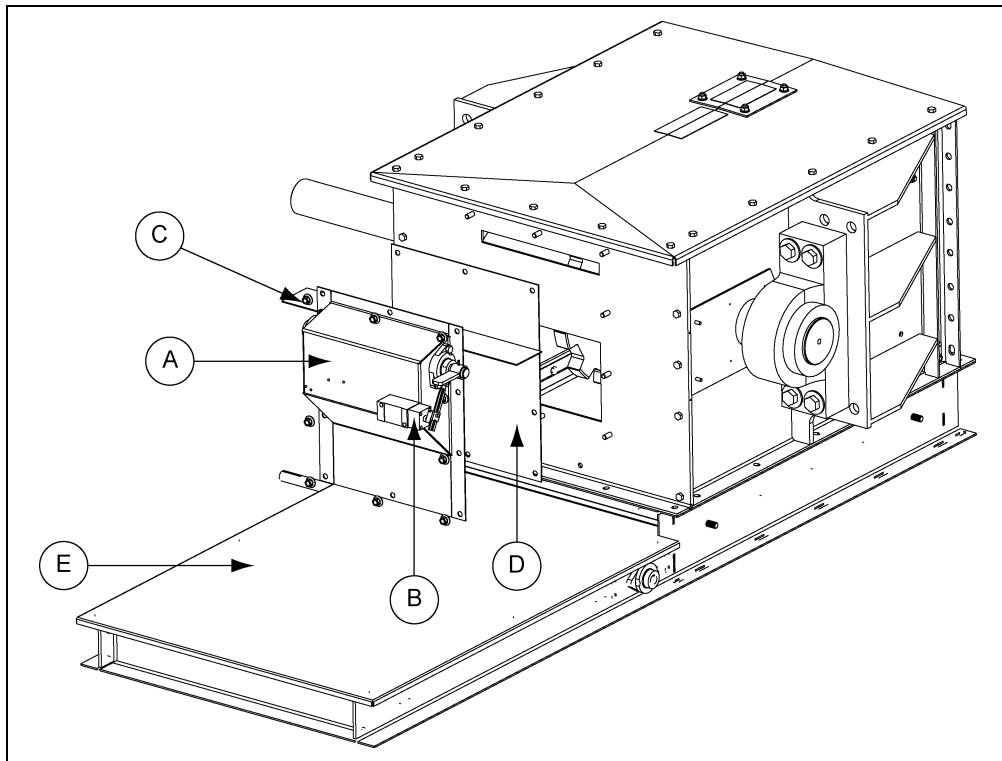


Figure 10C 20 Inch Tall Plug Relief Door with Head Gate

Ref #	Description
A	Plug Relief Door
B	Limit Switch
C	Baffle Plates
D	Cover Plate
E	Head Gate

Slack Chain Detector Option

Optional slack chain detectors are available. Detectors come pre-assembled with the limit switch installed. Explosion proof limit switches should be used in dusty conditions or in an enclosed environment. Slack chain should be checked periodically to ensure the trigger mechanisms can move freely.

To install the slack chain detector:

1. Remove the small plate located on the head section cover and retain the flange nuts for re-use.
2. Apply caulk sealant to the bottom of the slack chain detector flange.
3. Install the detector in the orientation shown using the removed flange nuts. *(See Figure 10D.)*
4. Adjust by sliding the UHMW pad that hangs inside the conveyor up or down, this is the point the chain will make contact to operate the pivot plate.
5. Ensure the clearance between the chain flight wiper pad and the UHMW pad is between 1/2 inch and 5/8 inch.

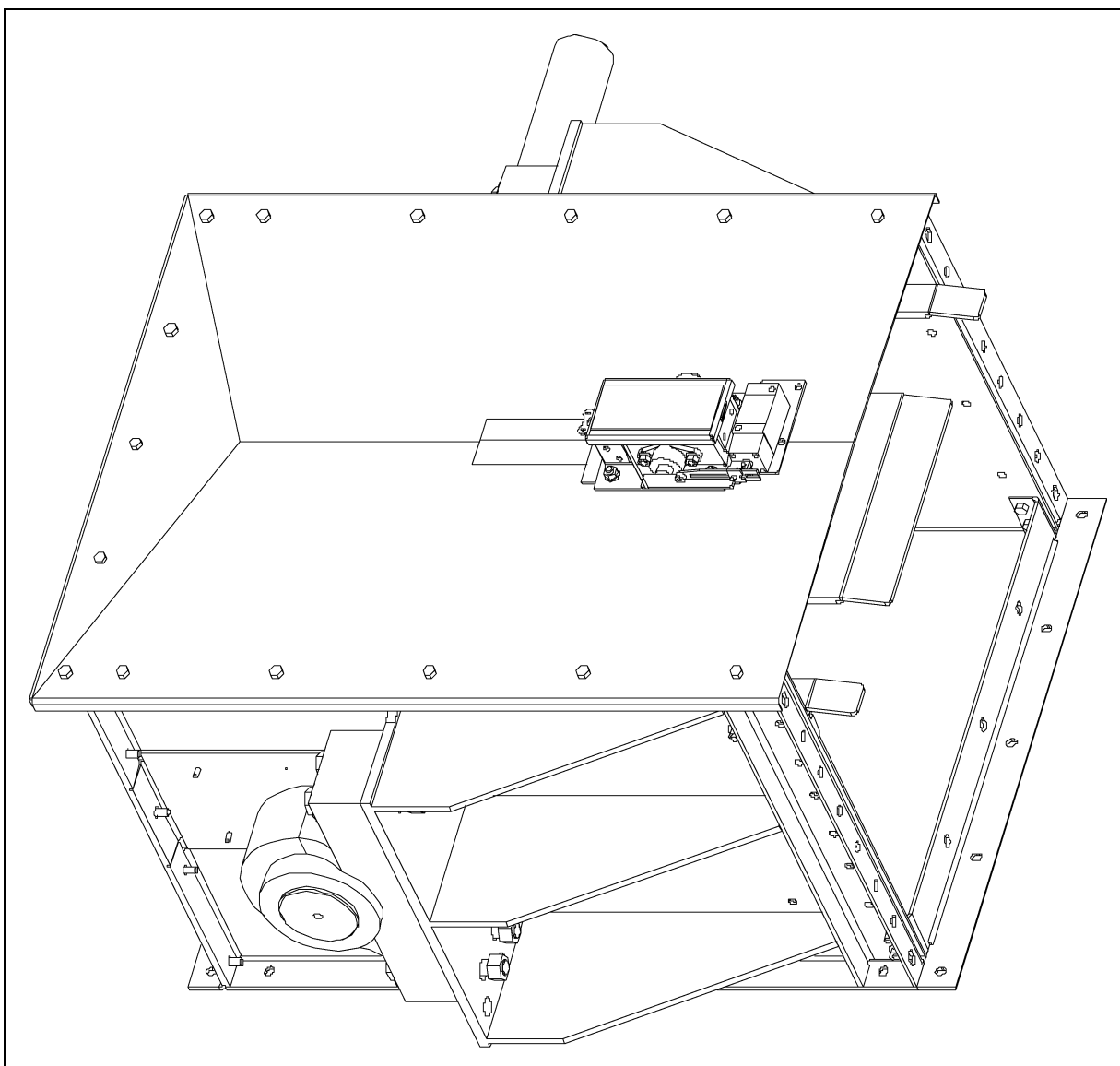


Figure 10D Slack Chain Detector

Bypass Inlet with Baffles

The bypass baffle (B) has an adjustment of 2-1/2 inch to help control the amount of grain flow into the conveyor. (See [Figure 10E](#).)

NOTE: Use flange nuts (A), located at alternating slot locations, to adjust the baffle (B) on 20 inch tall bypass inlets with baffles. (See [Figure 10E](#).) Adjust baffle to obtain uniform opening along entire length of bypass inlet.

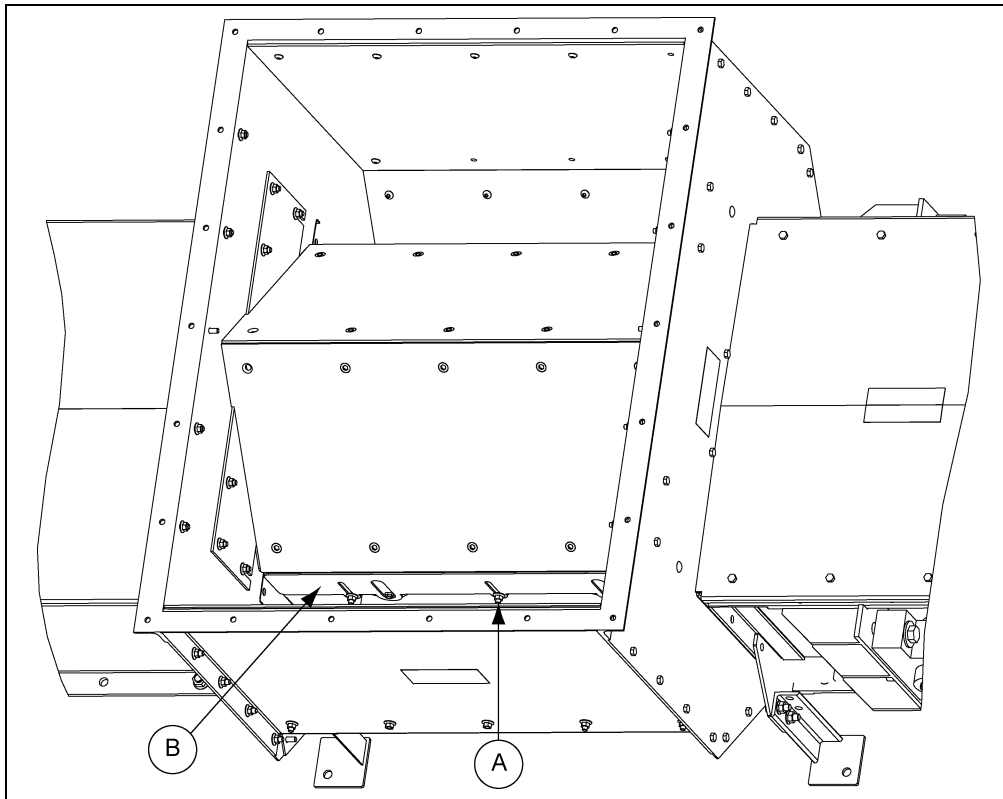


Figure 10E 20 Inch Tall Bypass Inlet with Baffles

Ref #	Description
A	Flange Nuts
B	Baffle

Reversing Head with Carry-Over Bars

On reversing conveyor applications, carry-over bars (A) 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. (See [Figure 10F on Page 49](#).)

The carry-over bar package consists of two (2) carry-over bars and the hardware required for assembly. Attach carry-over bars with the 3/8 inch and 1/2 inch hardware provided.

The carry-over bars should be spaced so that they pick up the UHMW flights (B) as shown in [Figure 10G on Page 49](#).

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.

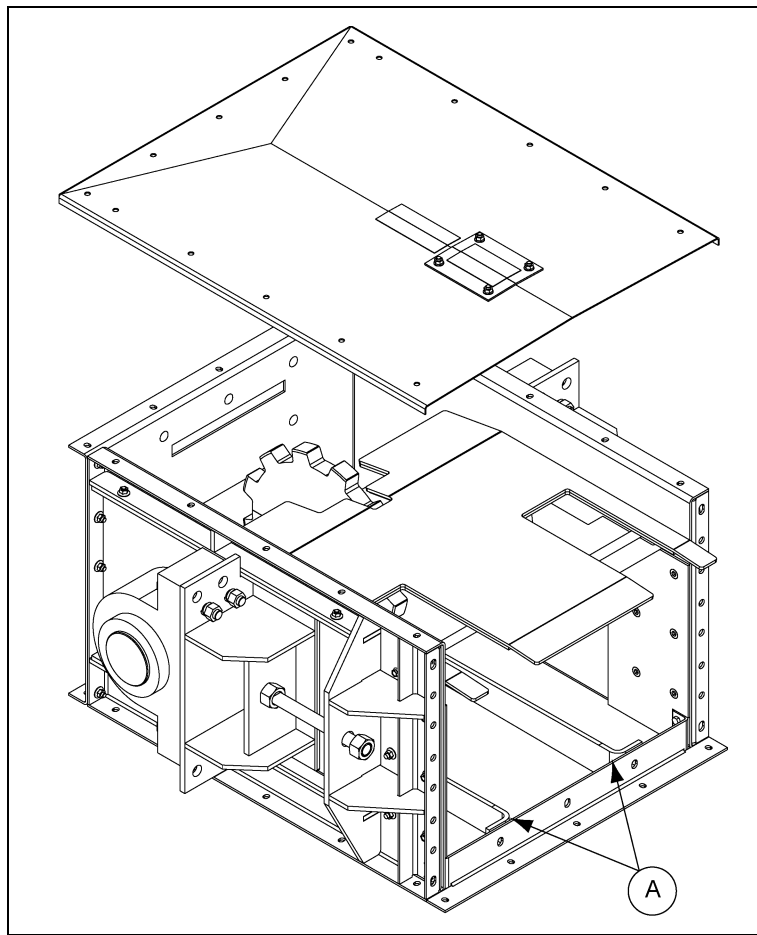


Figure 10F Reversing Take-Up Head with Carry-Over Bars

Ref #	Description
A	Carry-Over Bars

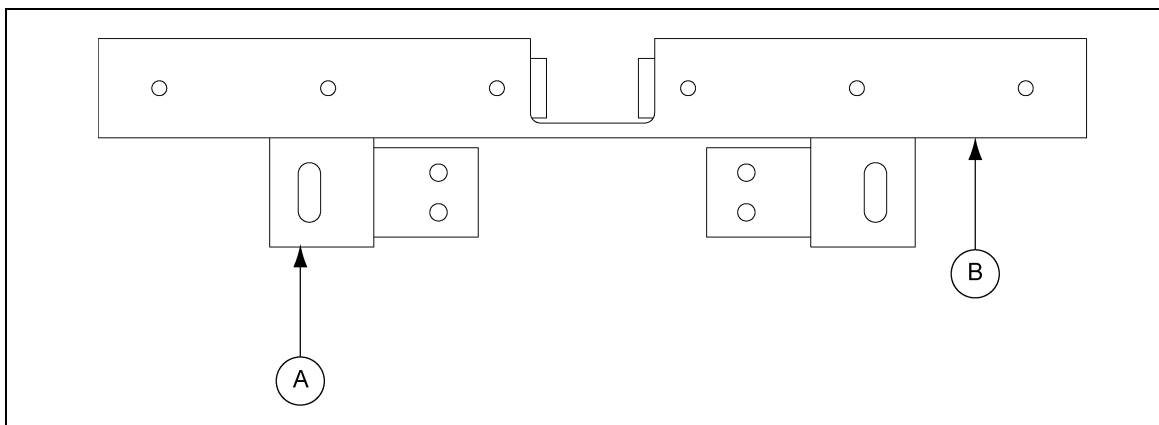


Figure 10G End View of UHMW Flight on Carry-Over Bars

Ref #	Description
A	Carry-Over Bars
B	UHMW Flight on Top of Bars

11. Troubleshooting

Troubleshooting Guide

Problem	Cause	Solution
Low capacity	<ol style="list-style-type: none"> 1. Improper chain speed. 2. Loose chain. 3. Improper feed. 4. Plugging. 	<ol style="list-style-type: none"> 1. Check the shaft RPM. 2. Check the sag between idlers. 3. Check the grain level at inlet. 4. Check the discharges.
Noisy operation	<ol style="list-style-type: none"> 1. Loose UHMW paddles. 2. Bottom not aligned. 3. Worn drive components. 4. Worn sprocket. 5. Return rail alignment. 	<ol style="list-style-type: none"> 1. Check all bolts on chain. 2. Check intermediate trough section joints and make flush. 3. Check oil level and shaft seals; belt misalignment; loose belts. 4. Replace. 5. Check rail alignment.
Uneven UHMW paddle wear	<ol style="list-style-type: none"> 1. Conveyor misalignment. 2. Sprocket slipped. 3. Return rail alignment. 	<ol style="list-style-type: none"> 1. Check the conveyor alignment. 2. Check set screws on sprockets. 3. Check rail alignment.
Excessive carry-over	<ol style="list-style-type: none"> 1. Gates not fully opening. 	<ol style="list-style-type: none"> 1. Check the gate operation.
Uneven sprocket wear	<ol style="list-style-type: none"> 1. Worn chain. 2. Improper alignment. 3. Material carry-over into discharge sprocket. 	<ol style="list-style-type: none"> 1. Replace chain. (See Page 23.) 2. Check the sprocket alignment. 3. Check for improper location of inlet.

Consult the contractor for added assistance.

GSI Group, LLC Limited Warranty

The GSI Group, LLC ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user's sole remedy (and GSI's only obligation) is to repair or replace, at GSI's option and expense, products that in GSI's judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

Warranty Extensions:

The Limited Warranty period is extended for the following products:

	Product	Warranty Period	
AP Fans and Flooring	Performer Series Direct Drive Fan Motor	3 Years	* Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 25% 5 to 7 years - end-user pays 50% 7 to 10 years - end-user pays 75%
	All Fiberglass Housings	Lifetime	
	All Fiberglass Propellers	Lifetime	
Cumberland Feeding/Watering Systems	Feeder System Pan Assemblies	5 Years **	** Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 50%
	Feed Tubes (1-3/4" and 2.00")	10 Years *	
	Centerless Augers	10 Years *	
	Watering Nipples	10 Years *	
Grain Systems	Grain Bin Structural Design	5 Years	† Motors, burner components and moving parts not included. Portable dryer screens included. Tower dryer screens not included.
Grain Systems Farm Fans Zimmerman	Portable and Tower Dryers	2 Years	
	Portable and Tower Dryer Frames and Internal Infrastructure †	5 Years	

GSI further warrants that the portable and tower dryer frame and basket, excluding all auger and auger drive components, shall be free from defects in materials for a period of time beginning on the twelfth (12th) month from the date of purchase and continuing until the sixtieth (60th) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH ABOVE. SPECIFICALLY, 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. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction 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 void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which 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 installations are made.

G S I G R O U P



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