



Enclosed Belt Conveyor

Installation and Operation Manual

PNEG-1204

Date: 10-28-13

GSI GROUP



PNEG-1204

Use of the equipment information page will help you identify the 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 #: _____

Serial #: _____

Date Purchased: _____

Dealer/Distributor Name and Phone #: _____

Material Handling

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

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.

Contents

Chapter 1 Introduction	4
Chapter 2 Safety	5
Safety Guidelines	5
Safety Instructions	6
Chapter 3 Decals	9
Head Section Decal Locations	9
Tail Section Decal Locations	10
Loader Section Decal Locations	11
Intermediate Section Decal Locations	12
Belt Guard Cover	13
Chapter 4 Conveyor Assembly	14
Conveyor Assembly Overview	14
Intermediate Section Installation	15
Cover Installation	18
Loader Installation	20
Chapter 5 Motor Assembly	22
Motor and Shaft Torque Arm II Installation	22
Motor and Torque Arm II Reducer Installation	24
Chapter 6 Belting Assembly	29
Finding Belt Centerline	29
Squaring the Belt End	30
Check the Squareness of the Belt Cut	31
Installation of Belt	32
Splicing the Belt	33
Belt Tension	37
Belt Tracking	38
Chapter 7 Loading	41
Spouting	41
Spouting Location	42
Belt Conveyor Loading	43
Chapter 8 Options	44
Motion Sensor Option (Whirligig - WG1-4B)	44
Pressure Plug Switch Option	45
Chapter 9 Start-Up	46
Starting Conveyor	46
Secure Shroud During Maintenance	46
Chapter 10 Care and Maintenance	47
Bearings	47
Welding	47
Motor	47
Support	47
Storage	48
Chapter 11 Troubleshooting	49
Chapter 12 Appendix 1 - Reference Information	50
Chapter 13 Warranty	51

1. 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. The customer should report and note any damage or shortage on the bill of lading to justify their claim to the transport company.

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

This warranty provides you the assurance that the company will back its products when 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.

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.

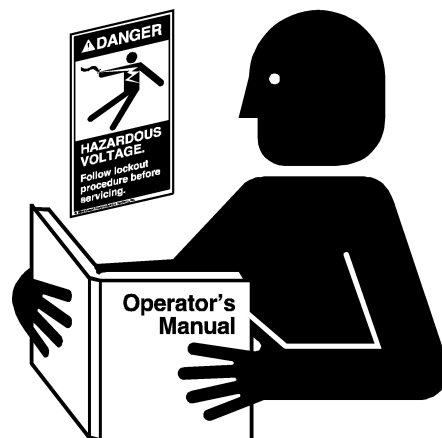
Follow Safety Instructions

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

Stay Clear of Rotating Idler

Entanglement in rotating idlers 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.



Entanglement 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

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.

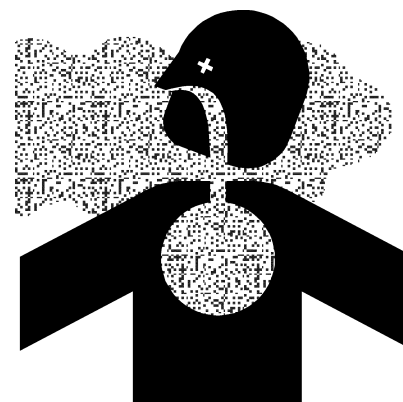
Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

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

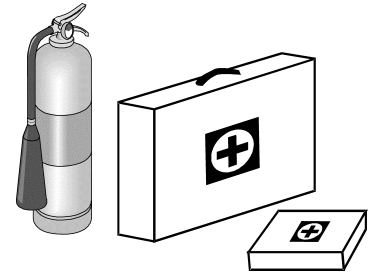
2. Safety

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.

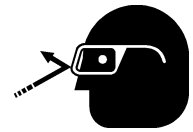
Wear steel-toed boots to help protect your feet from falling debris. Tuck in any loose or dangling shoestrings.

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



Head Section Decal Locations

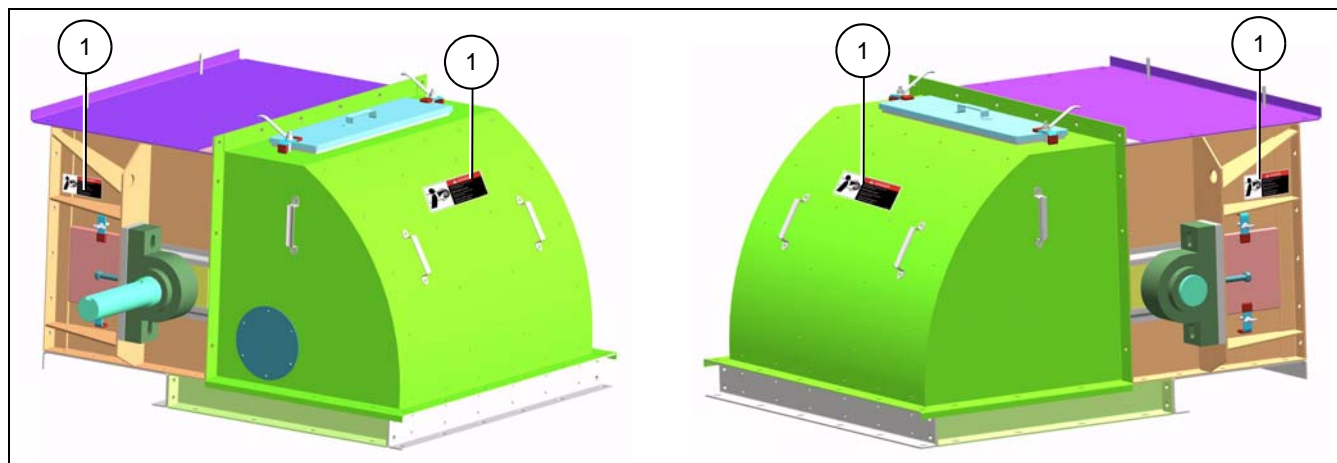


Figure 3A Standard Head Section

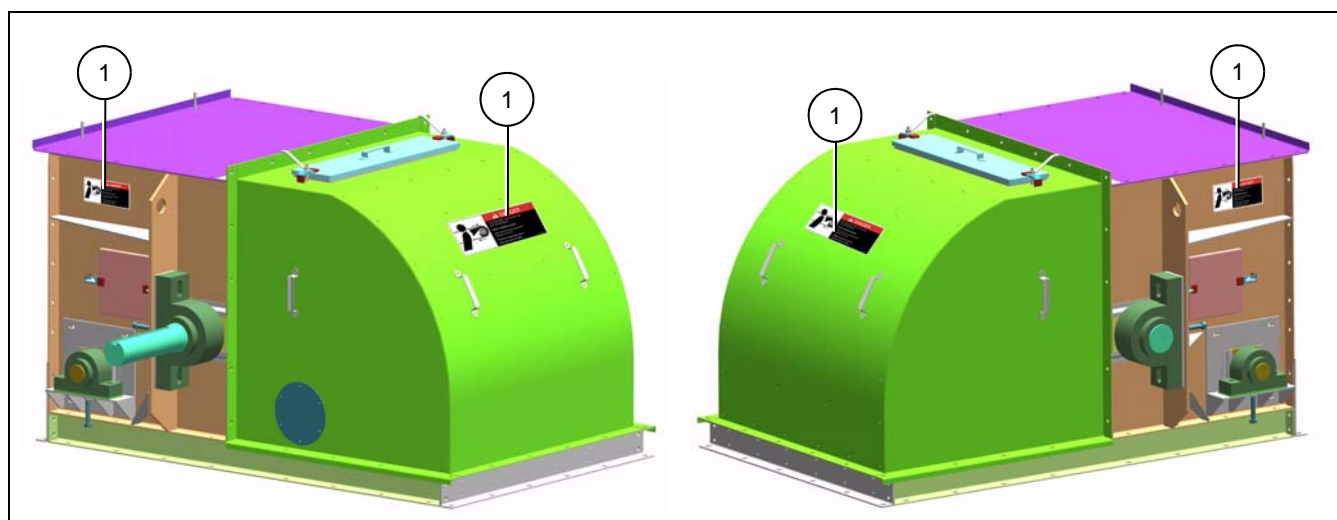


Figure 3B Snub Head Section

	DANGER
	<p>ROTATING BELT AND PULLEY WILL CUT OR ENTANGLE.</p> <p>KEEP HANDS CLEAR</p> <p>Disconnect and lockout power before adjusting or servicing.</p> <p>Failure to heed will result in personal injury or death.</p>
<p>DC-1672</p> <p>DC-1672</p>	<p>DC-1672</p> <p>DC-1672</p>

Tail Section Decal Locations

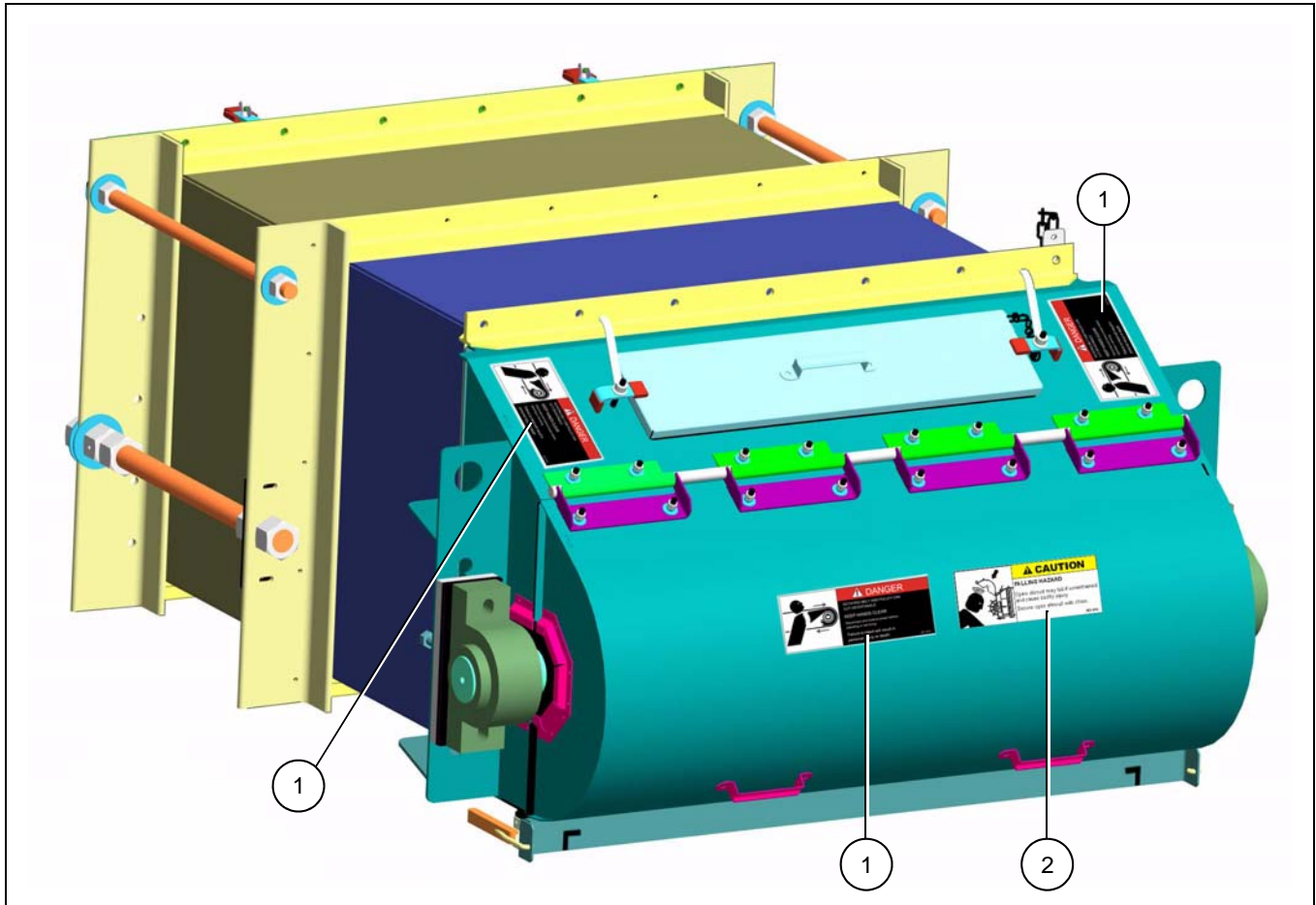


Figure 3C Belt Conveyor Tail Section

	<p>! DANGER</p>
	<p>ROTATING BELT AND PULLEY WILL CUT OR ENTANGLE.</p> <p>KEEP HANDS CLEAR</p> <p>Disconnect and lockout power before adjusting or servicing.</p> <p>Failure to heed will result in personal injury or death.</p>

1

DC-1672

	<p>! CAUTION</p>
	<p>FALLING HAZARD</p> <p>Open shroud may fall if unrestrained and cause bodily injury.</p> <p>Secure open shroud with chain.</p>

2

DC-1690

Loader Section Decal Locations

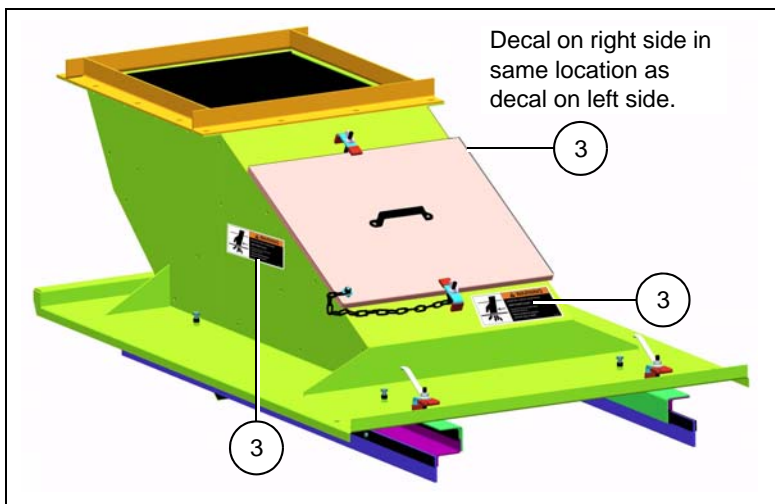


Figure 3D Fixed Skirt Loader

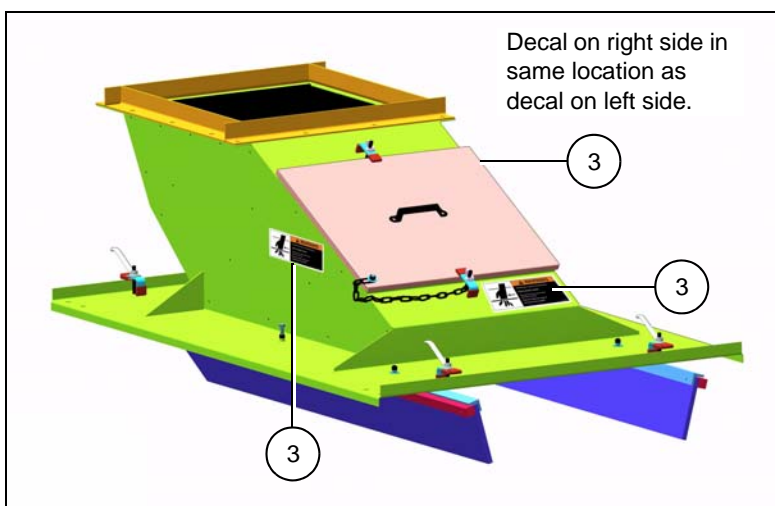


Figure 3E Swing-Up Skirt Loader

	 WARNING
	<p>MOVING BELT CAN CUT OR ENTANGLE. KEEP HANDS CLEAR</p> <p>Disconnect and lockout power before adjusting or servicing.</p> <p>Failure to heed can result in personal injury or death.</p>

3

DC-1671

Intermediate Section Decal Locations

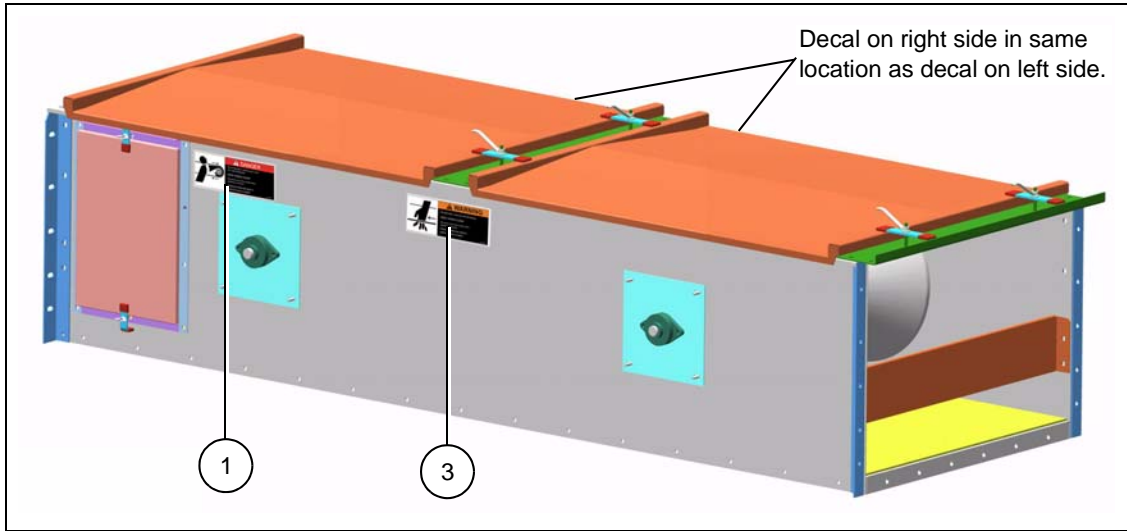


Figure 3F Intermediate Inspection Section

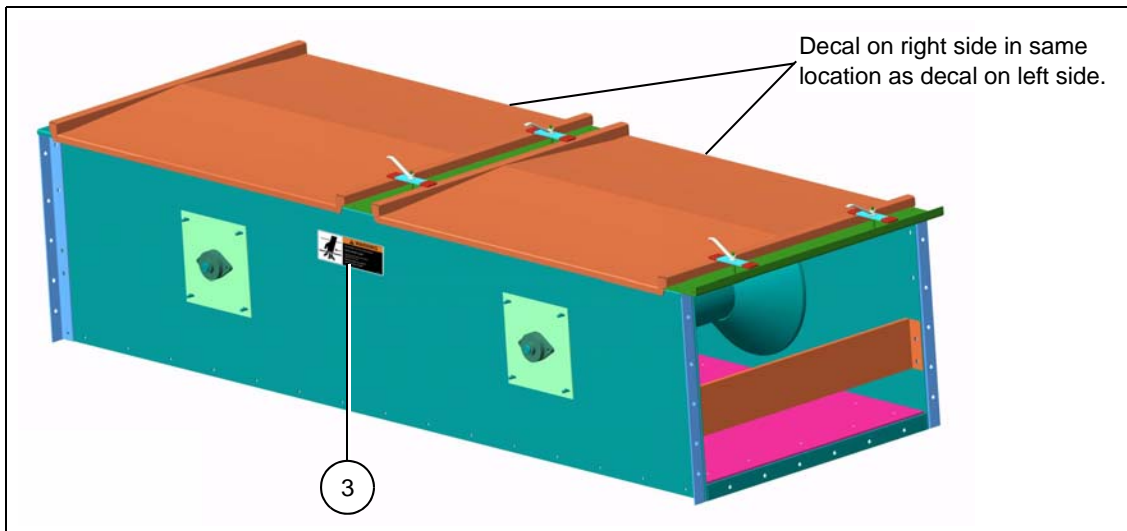


Figure 3G Standard Intermediate Section



OSI Group 217-226-4421

! DANGER

ROTATING BELT AND PULLEY WILL CUT OR ENTANGLE.

KEEP HANDS CLEAR

Disconnect and lockout power before adjusting or servicing.

Failure to heed will result in personal injury or death.

DC-1672

1

DC-1672



OSI Group 217-226-4421

! WARNING

MOVING BELT CAN CUT OR ENTANGLE.

KEEP HANDS CLEAR

Disconnect and lockout power before adjusting or servicing.

Failure to heed can result in personal injury or death.

DC-1671

3

DC-1671

Belt Guard Cover

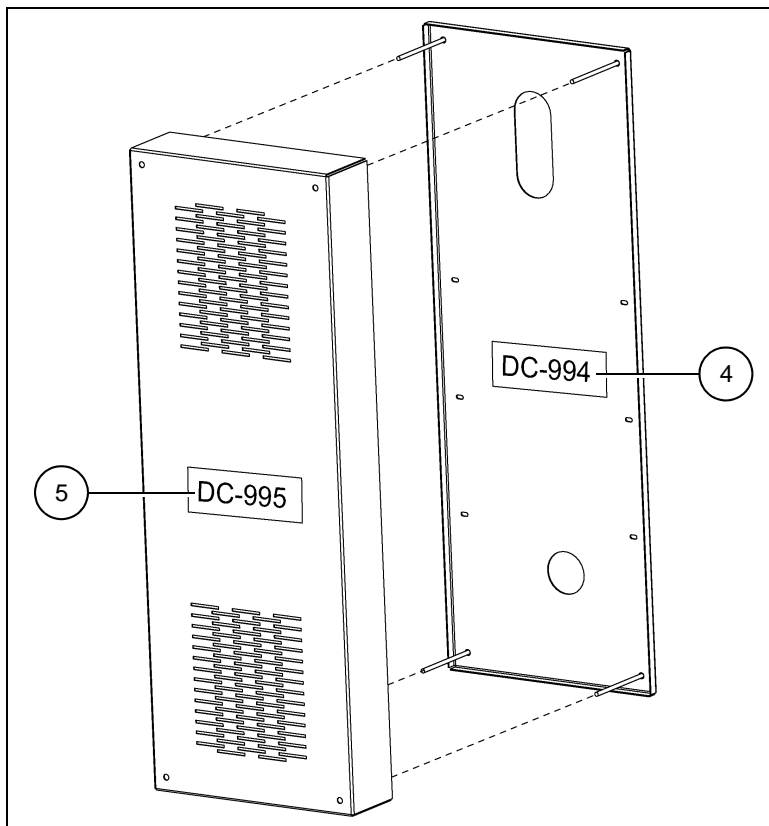


Figure 3H Belt Guard Cover



! DANGER

SHEAR POINT
Keep hands clear of moving parts. Do not operate with guard removed. Disconnect and lockout power before servicing.

DC-994

4

DC-994



! WARNING

SHEAR POINT
Keep hands clear of moving parts. Do not operate with guard removed. Disconnect and lockout power before servicing.

DC-995

5

DC-995

Conveyor Assembly Overview

1. Remove any banding and crating material. Arrange all the conveyor components in such a fashion that all are easily accessible.
2. Locate sturdy items to serve as blocking (i.e. wood blocks, saw horses, etc.). Blocking is used to support the conveyor sections above the ground to help in assembly. Locate and place the conveyor sections on the blocking in order, starting with the head section and concluding with the tail section.
3. 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.
4. The standard conveyor is constructed with one discharge located at the drive end. If tripper discharge sections are to be used, the location(s) must be determined before continuing with the conveyor assembly. It may be necessary to position a shorter intermediate section to serve as a spacer in order to accommodate the placement of the tripper discharge(s) where required.
5. Always consult with the approval prints for exact conveyor layout. Maintain adequate clearance for tail extension.
6. During installation of the conveyor, string a chalk line along the conveyor sides to assure that the conveyor is being assembled in a straight line. All hardware should be included with your conveyor. It is recommended that all flanges be caulked to seal the conveyor to keep the dust in and the weather out.
7. After all sections are caulked and bolted, the loader(s) is/are ready to be installed. Loaders must be installed with the grain stream moving in the same direction and same speed as the conveyor belt. ([See Page 41](#) for recommended spout loading.)
8. After location of the loader(s) (as to spouts, gates and valves) has been established, the loader(s) are bolted to the conveyor. Do not weld loader(s) to the conveyor. ([See Page 20](#) for loader installation.)
9. Belt may now be hand fed through the conveyor. Make sure when splicing belt that each cut is clean, square and straight. Detailed belt assembly instructions are listed [on Pages 29-40](#). These instructions should be followed closely and read thoroughly before starting this step.
10. Check drive belts for tension. Also check the oil level in the speed reducer. **Reducers are shipped without oil.** Refer to [Page 50](#) for the type and quantity of oil. (DO NOT overfill reducer.)

Intermediate Section Installation

NOTE: Make sure to read assembly overview [on Page 14](#).

1. Intermediate sections are supplied in standard ten feet (10') lengths. Depending on your application and individual specifications however, shorter sections may be required to accommodate a desired overall length.
2. After making sure the flanges are aligned, tighten all hardware on the trough section. (It is recommended that the flanges are caulked to ensure sealing from dust and outside moisture.)
3. During assembly of the intermediate sections, carefully inspect each flange joint to ensure that the inside bottom and side surfaces of the intermediates are flush. A chalk line is helpful during this phase of the assembly to ensure the proper alignment of the intermediate section surfaces. The maximum run-out in any direction should be $\pm 1/4"$. Make sure the conveyor is level in horizontal applications.
4. Proceed by attaching the head and tail assemblies using the same alignment procedures and precautions noted in the preceding paragraph.

NOTE: It is critical for straightness of the conveyor that the sides and bottom flanges are aligned flush. Also, it is important that the inside dimensions of the box measure equidistant from side-to-side both top and bottom of the intermediate section (Dimension A = Dimension B). (See Figure 4A.)

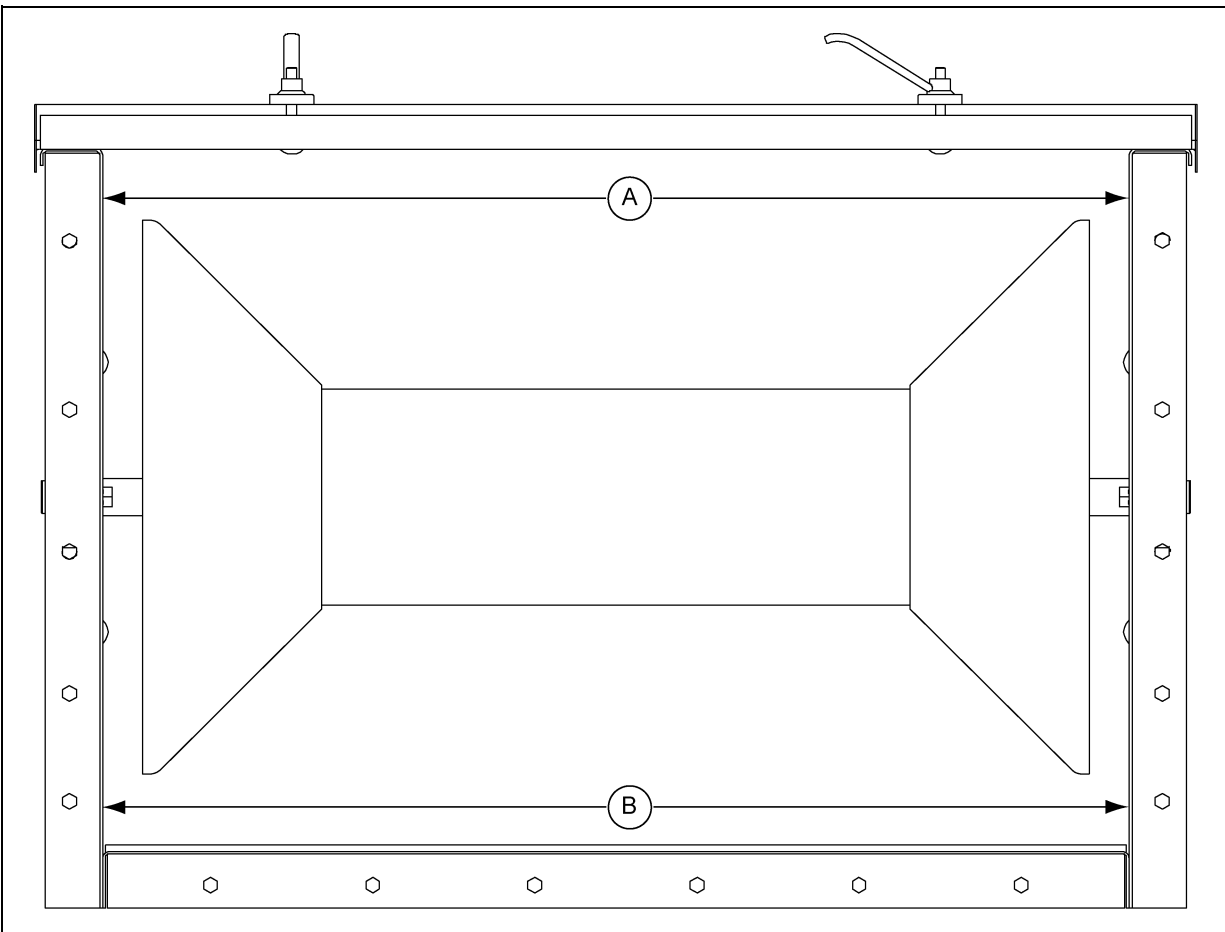


Figure 4A End View of Intermediate Section (Liners not shown for clarity.)

Intermediate Section Installation (Continued)

- Intermediate sections bolt together along the side and bottom flanges. The covers are fastened to the cover channels by flat clips and easy grip handles. (See Figure 4B.)

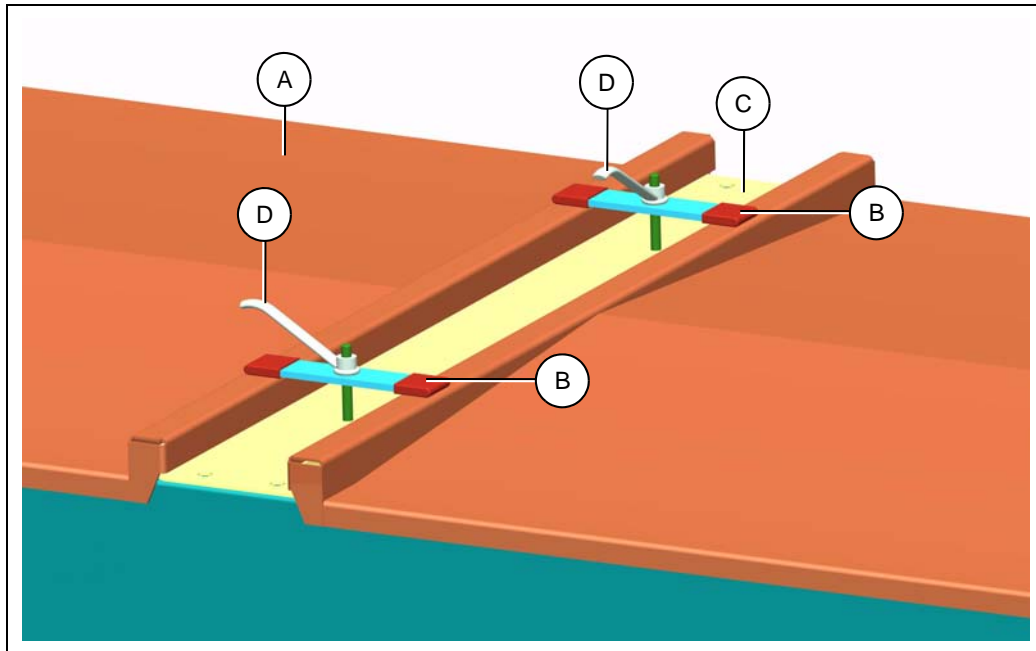


Figure 4B

Ref #	Description
A	Cover
B	Flat Clips

Ref #	Description
C	Cover Channel
D	Easy Grip Handles

- Standard intermediate sections do not have a direction in which they bolt to other intermediate sections. The cover channels connect intermediate sections on both ends.
- Two (2) inspection intermediate sections are included on each installation. They should be assembled at the head and tail. The inspection holes should be oriented closest to the head or tail. (See Figure 4C.)

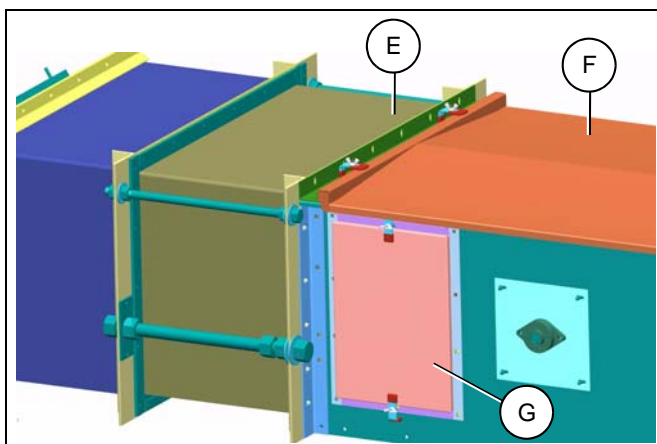


Figure 4C

Ref #	Description
E	Tail Section
F	Intermediate Inspection Section
G	Inspection Door

Intermediate Section Installation (Continued)

4. The inspection door end of each intermediate section has adapter angles with slotted holes for bolting to head or tail sections. (See [Figure 4D.](#))

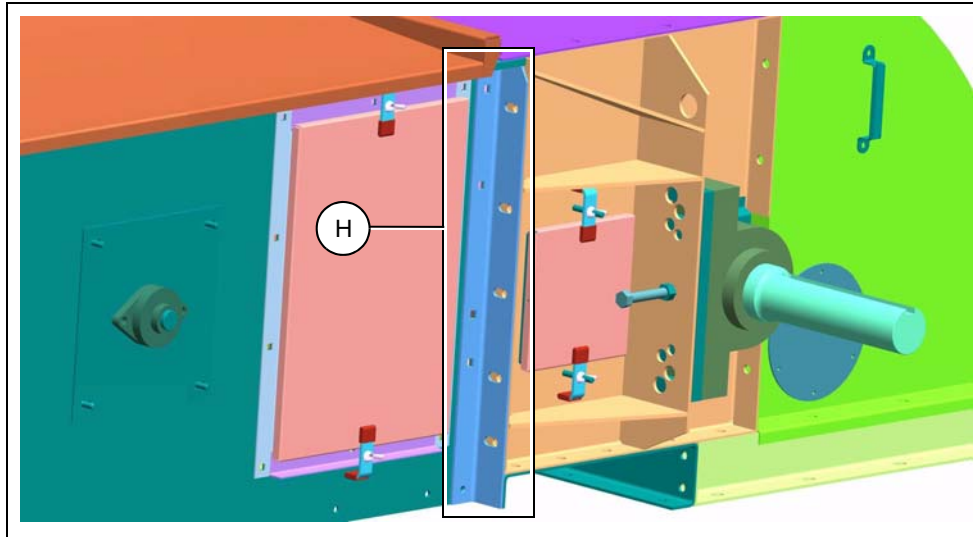


Figure 4D

Ref #	Description
H	Adapter Angle with Slotted Holes

5. A special cover channel is provided with the tail as shown [in Figure 4E.](#)

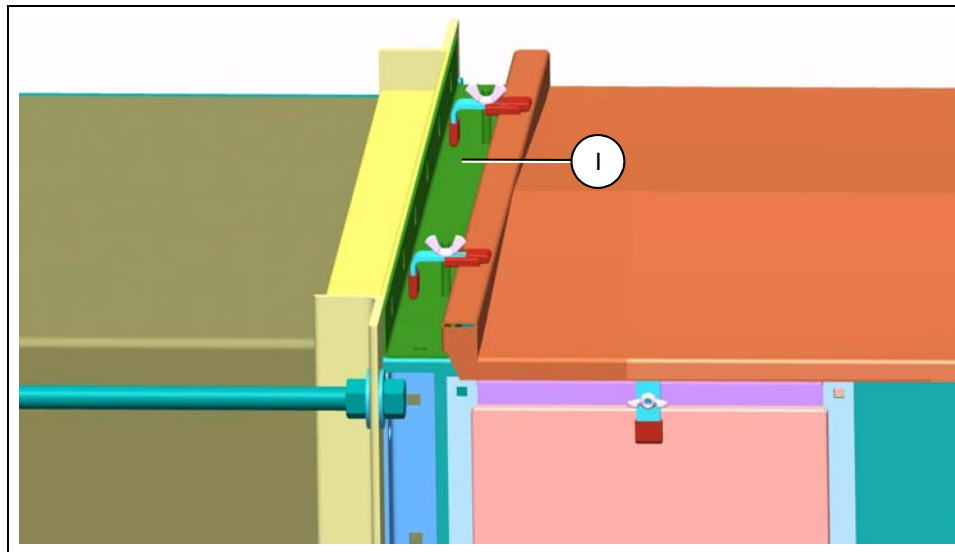


Figure 4E

Ref #	Description
I	Tail Cover Channel

Cover Installation

1. Fasten covers to the belt conveyor with the 3/8" easy grip handles provided. Adequately tighten the 3/8" handles so that the covers are in tight contact with conveyor cross channels. (See [Figure 4F.](#))

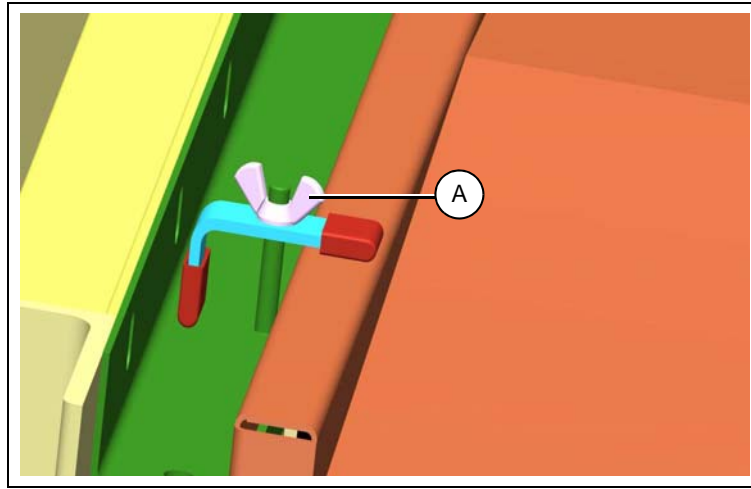


Figure 4F

Ref #	Description
A	3/8" Wing nut on tail section to secure cover

2. When a loader is on the conveyor, the cover section may have to be cut accordingly to accommodate the loader. (See [Figure 4G.](#)) For installation of a loader, see loader installation [on Page 20.](#)

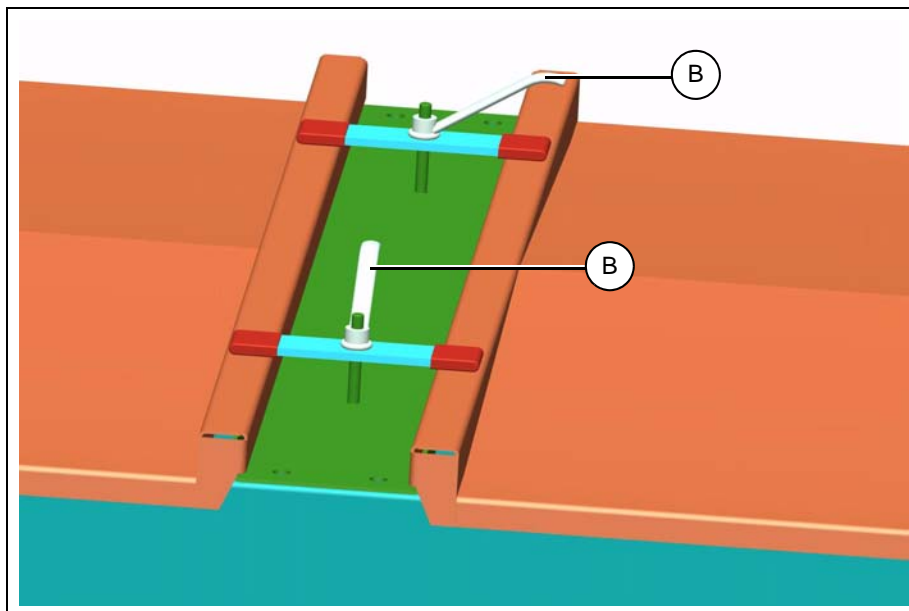


Figure 4G

Ref #	Description
B	Easy Grip Handles

Cover Installation (Continued)

3. Conveyor covers are made to fit over the entire width and half the length of a conveyor intermediate section. Standard covers measure approximately 4'-7" in length. When a loader is ordered, the cover may be measured and cut to take up the displacement of the loader housing. This depends on the position of the loader. (See [Figure 4H.](#))

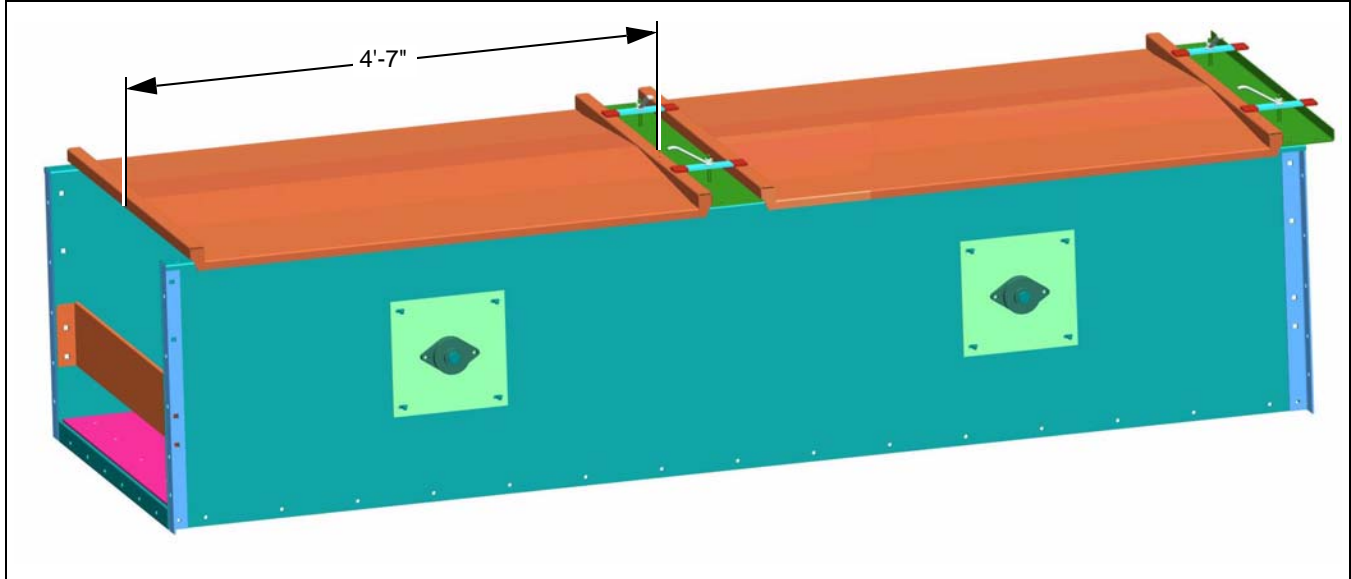


Figure 4H Standard Cover Length

NOTE: DO NOT walk on conveyor covers.

4. Conveyor Assembly

Loader Installation

Fixed Skirt Loader

1. The fixed skirt loader always attaches at the tail end so no cover modifications should be necessary. The soft rubber skirts are adjustable and can be set to lightly touch the conveyor belt. (See Figure 4I.)

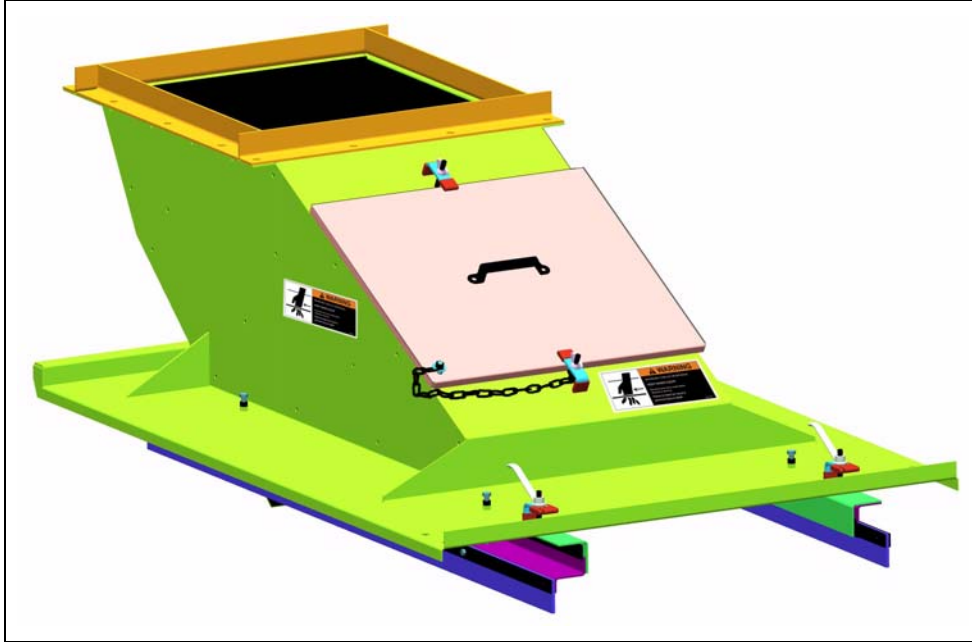


Figure 4I Fixed Skirt Loader

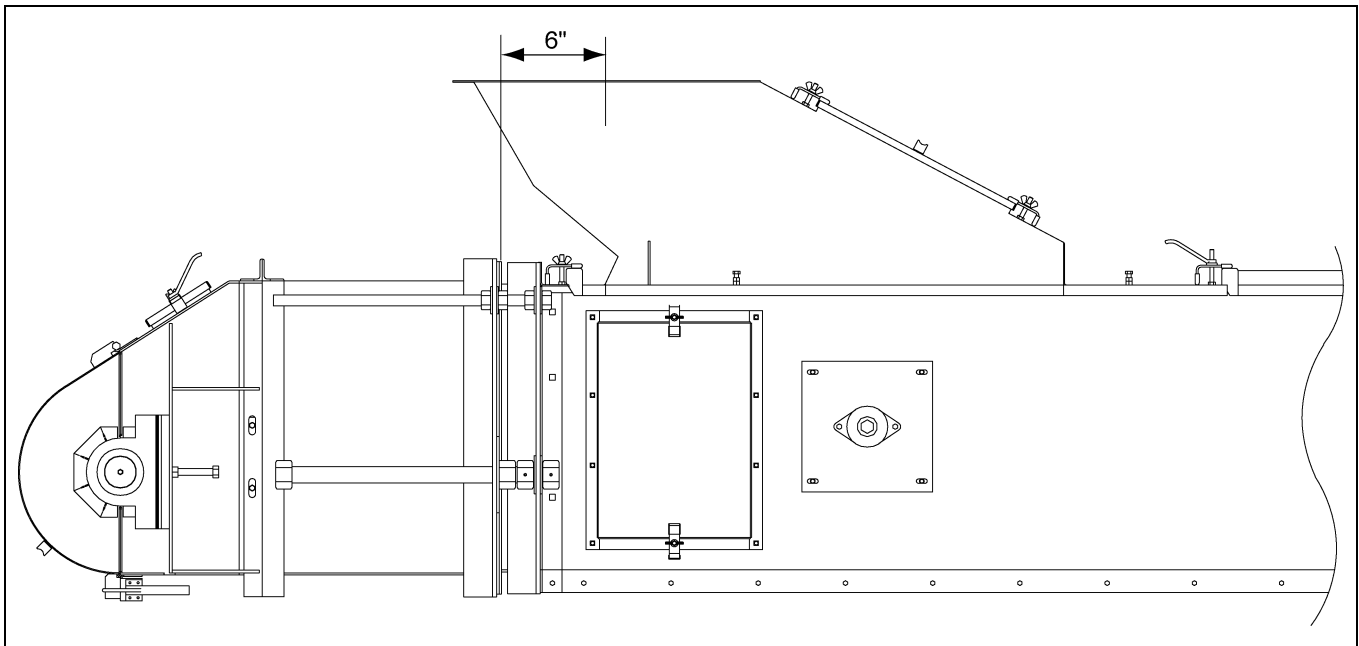


Figure 4J

NOTE: GSI's recommendation for loader installation includes a minimum distance of no less than 6" between the center of loader inlet and the tail assembly. (See Figure 4J.)

Loader Installation (Continued)

Swing-Up Skirt Loader

1. If the loader does not line up exactly with an intermediate cover, the intermediate covers will need to be cut to fit. If this is necessary, properly position loader and cut a section from the covers so they will fit between the cover channel bolted to next section and the loader flange. Weld cover back together to achieve required length. Repaint welded area to prevent rusting. (See Figure 4K.)

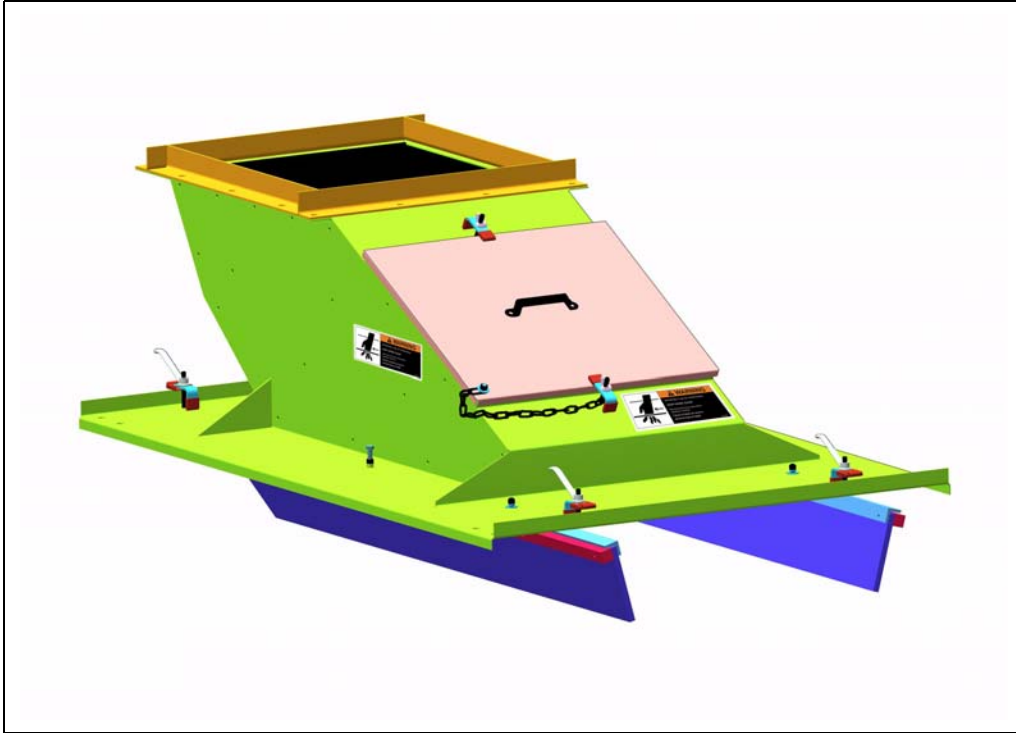


Figure 4K Swing-Up Skirt Loader

2. The UHMW swing-up skirts should not touch the conveyor belt as they can cause wear to the belt. Use the adjustable set screws to locate the position of the skirts.



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.**

Motor and Shaft Torque Arm II Installation

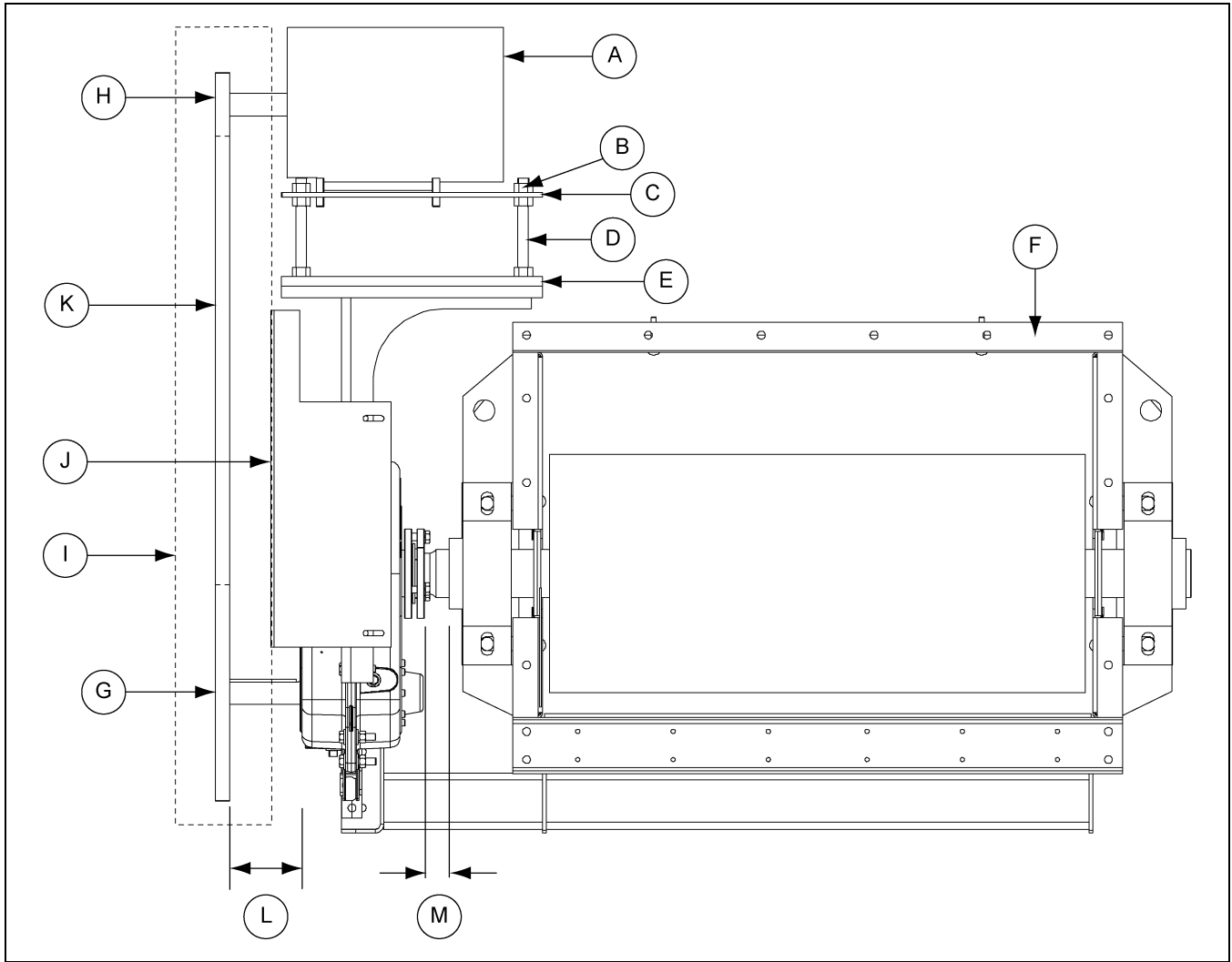


Figure 5A

Ref #	Description
A	Motor
B	Hex Nut
C	Motor Adjustment Plate
D	Jack Screw
E	Motor Mount Base Plate
F	Head Section
G	Driven Pulley

Ref #	Description
H	Drive Pulley
I	Belt Guard
J	Belt Guard Bracket
K	V-Belt
L	Keep as close as possible
M	Allow sufficient distance between bushing and bearing to remove bushing assembly bolts.

Motor and Shaft Torque Arm II Installation (Continued)

NOTE: Belt guards not shown for clarity.

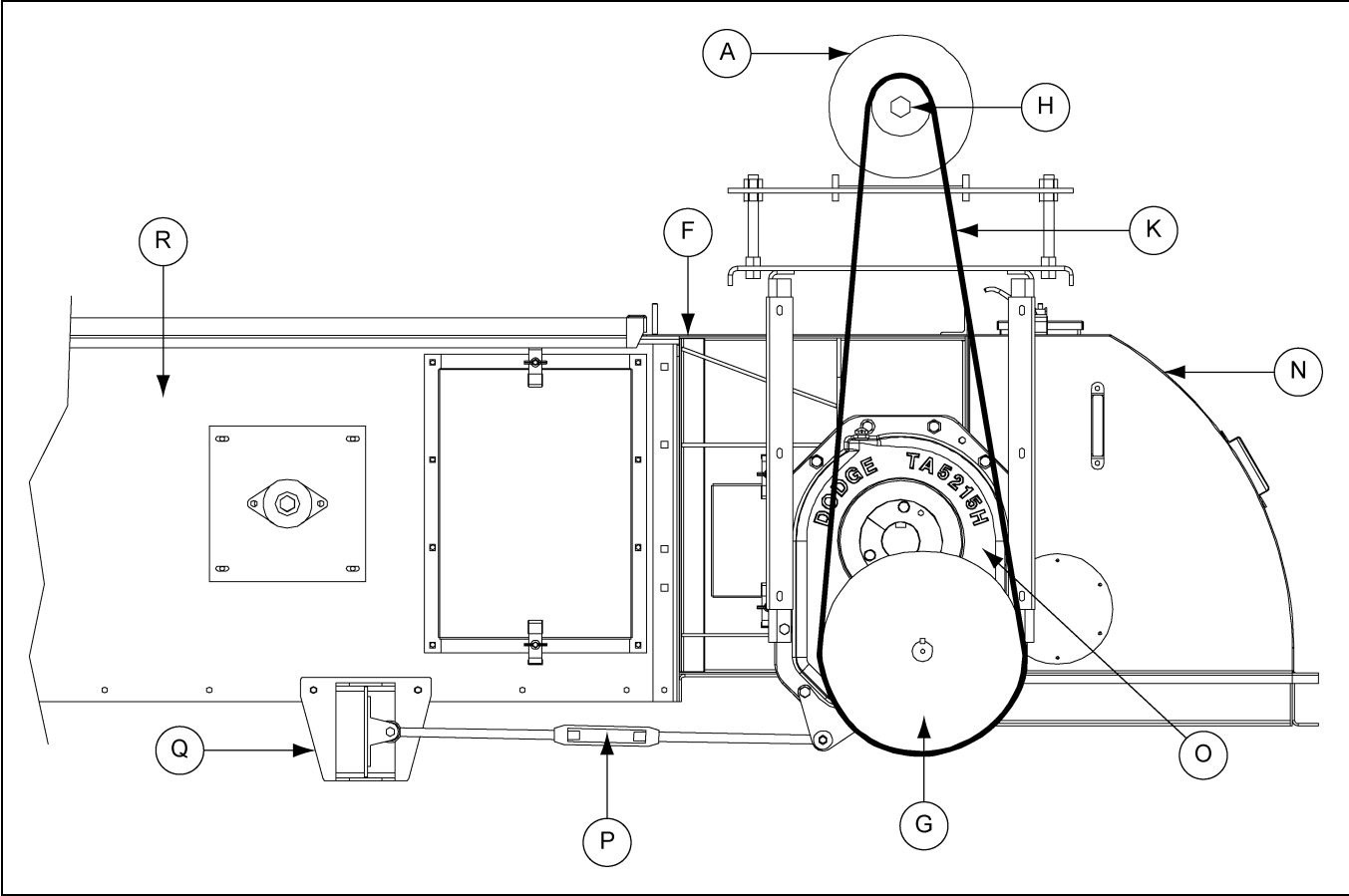


Figure 5B

Ref #	Description
A	Motor
F	Head Section
G	Driven Pulley
H	Drive Pulley
K	V-Belt
N	Hood
O	Reducer Drive
P	Torque Arm Turnbuckle Assembly
Q	Torque Arm Bracket
R	Intermediate Inspection Section

Motor and Torque Arm II Reducer Installation

Reducer

1. To aid in the installation of the reducer onto the shaft, remove any protective coating film from the shaft. (See Figure 5C.)
2. Place key in the keyway on the drive shaft.
3. Attach inside bushing to the reducer drive.
4. Line up the keyway on reducer with key on shaft and slide the reducer drive onto the drive shaft.
5. Slide outside bushing onto shaft and attach to reducer drive. Once reducer drive is in place, fully tighten both bushings. (See Page 50 for more details.) (See Figure 5D.)

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

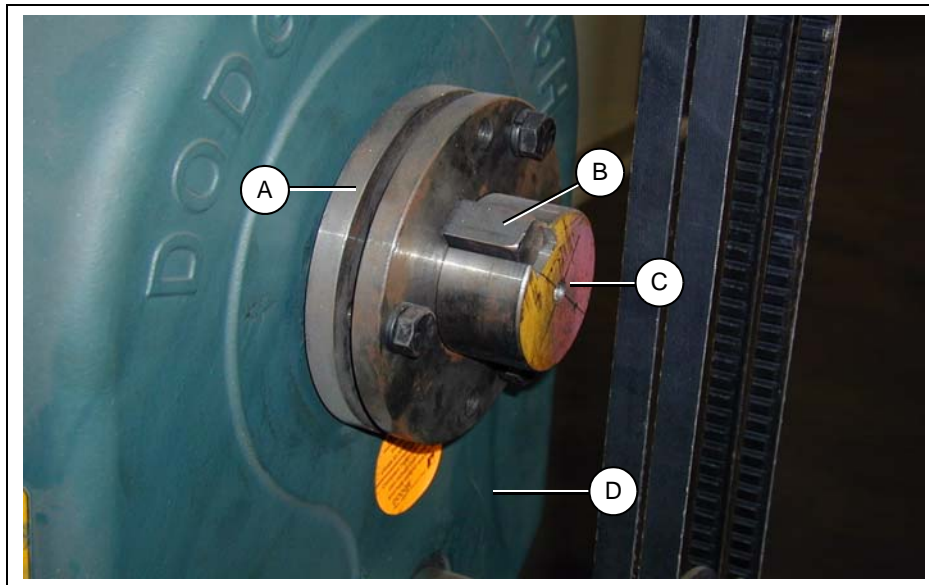


Figure 5C

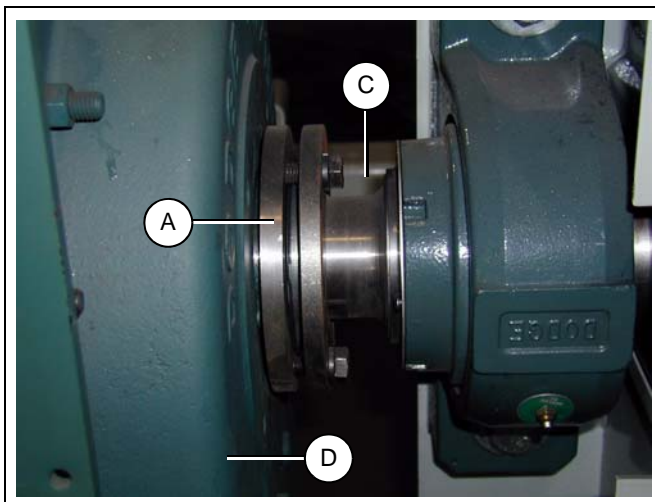


Figure 5D

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

Motor and Torque Arm II Reducer Installation (Continued)

Torque Arm Turnbuckle Assembly

- 6. Install the torque arm between the two (2) plates that are located on the bottom of the reducer drive. Secure using bolt with washers and lock nuts. Attach the other end to the torque arm bracket on the conveyor using two bolts, washers and lock nuts. Tighten the torque arm by turning the turnbuckle. Adjust the position of the reducer. The reducer should be in a vertical position as shown on [Page 23](#). (See [Figure 5E](#).)

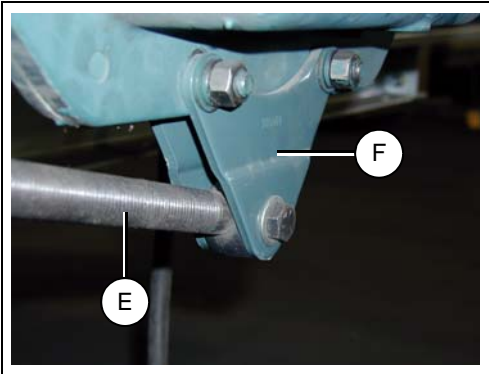


Figure 5E

Ref #	Description
E	Torque Arm
F	Plates on Reducer Drive
G	Torque Arm Bracket
H	Torque Arm Assembly
I	Turnbuckle

Torque Arm Turnbuckle Assembly

- 7. The torque arm bracket 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 to be as short as possible with the reducer in a vertical position. (See [Figure 5F](#), [Figure 5G](#) and [Figure 5H](#).)

NOTE: The holes in the intermediate side must be drilled out to 9/16" diameter. Attach with provided hardware.

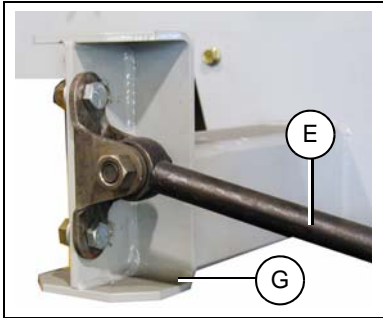


Figure 5F

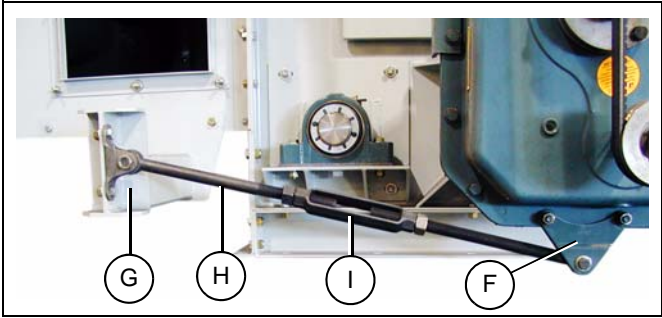


Figure 5G

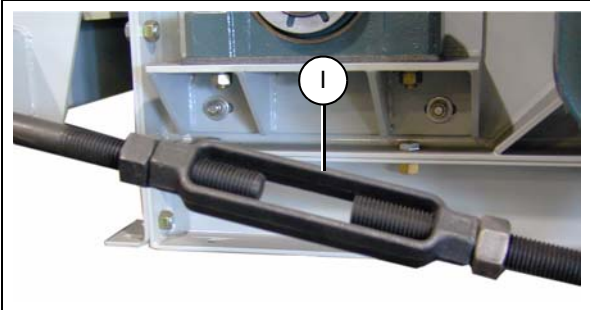


Figure 5H

Motor and Torque Arm II Reducer Installation (Continued)

Motor Mount Brackets

8. Remove three (3) bolts from each side of the reducer housing. 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. 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. Attach by replacing bolts through brackets and housing. Tighten bolts securely. *(See Figure 5I.)*

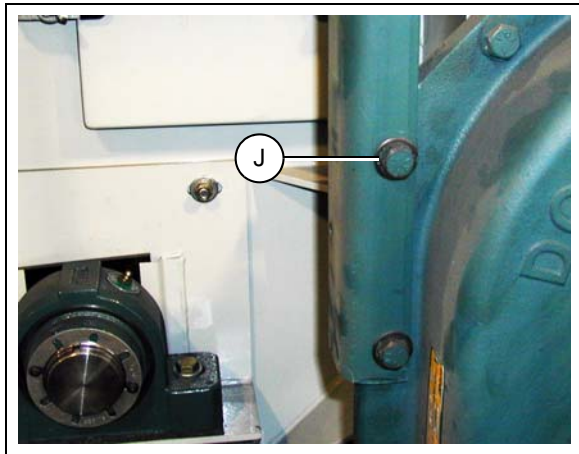


Figure 5I

Ref #	Description
J	Motor Mount Bracket Attached to Reducer
K	Jack Screw
L	Nut
M	Motor Mount Adjustment Plate
N	Base Plate

Motor Mount Adjustment Plates

9. Thread nuts onto jack screws. Place bolt through motor mount bracket and base plate. Thread another nut onto jack screws to secure. Repeat for three (3) remaining jack screws.
10. Thread another nut onto all four (4) jack screws. Place adjustment plate onto jack screws. Thread another nut onto each jack screw to secure adjustment plate. Use these nuts to adjust the motor height.
11. Attach the motor to the adjustment plate using bolts and lock nuts. *(See Figure 5J.)*

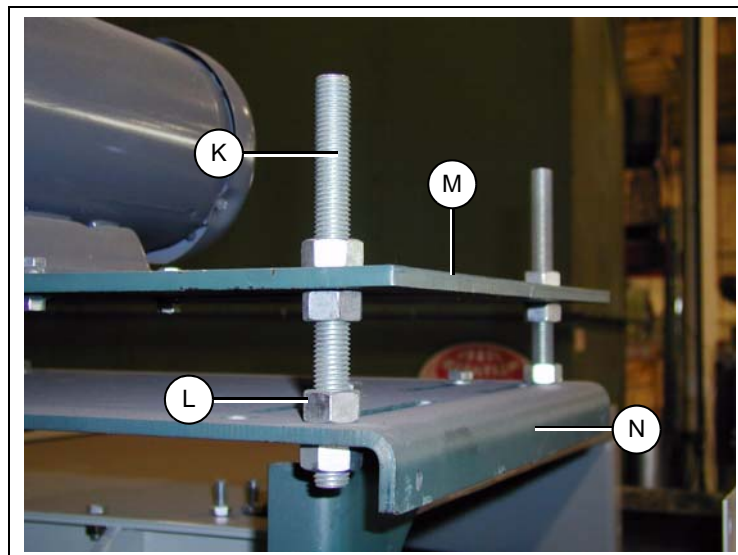


Figure 5J

Motor and Torque Arm II Reducer Installation (Continued)

Drive Guard Rear Panel

12. Install the rear panel of the drive guard before mounting the sheaves. The rear panel has two (2) mounting brackets with slotted holes. Attach these left hand and right hand belt guard mounting brackets to the motor mount frame. Then fasten rear panel of belt guard to the belt guard brackets. After the rear panel is in place, install sheaves onto motor and reducer.

Sheaves and Belts

13. 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.

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

V-Belt Adjustment

14. 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 loose 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 is $1/64$ " of deflection per one inch (1") of sheave centers on one side of belt, centered between sheaves. (See Figure 5K.)

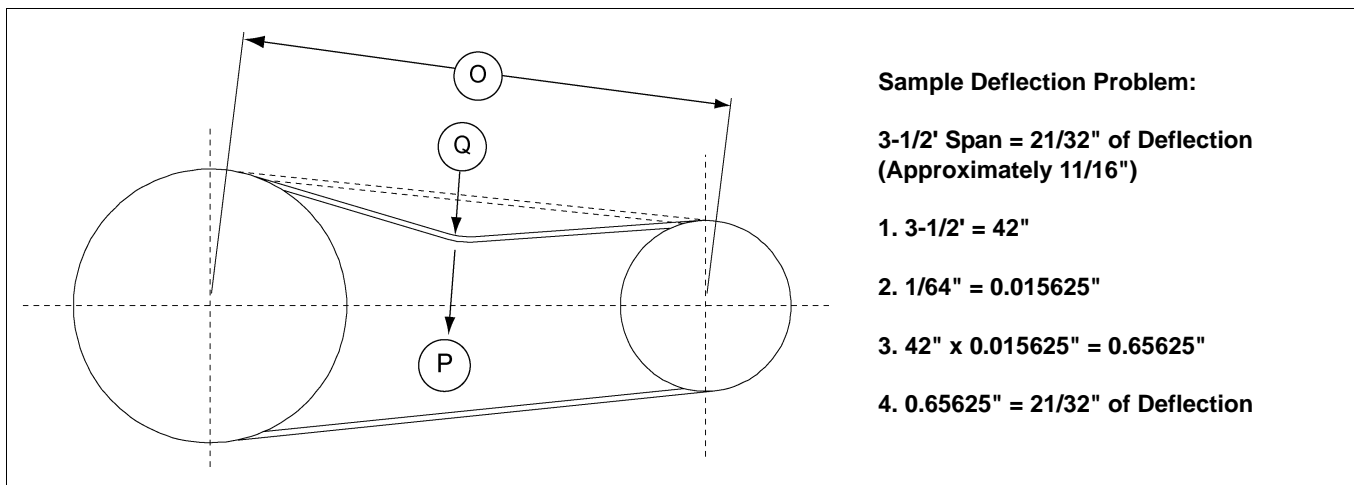


Figure 5K

Ref #	Description
O	Span
P	Force
Q	Belt Deflection $1/64$ " per inch of Span

5. Motor Assembly

Motor and Torque Arm II Reducer Installation (Continued)

Front Guard Panel

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

Lubricate Reducer Drive

16. Fill the shaft mount reducer with the manufacturer's recommended oil. ([See Page 50.](#))

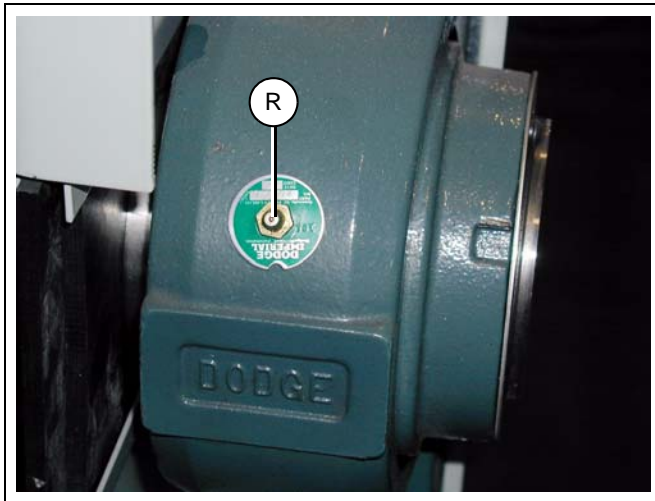


Figure 5L

Ref #	Description
R	Grease Bearing Housing

Lubricate Bearings

17. Grease bearings on head, tail and idlers. Lubricate bearings according to bearing manufacturer's recommendations. ([See Page 50.](#))

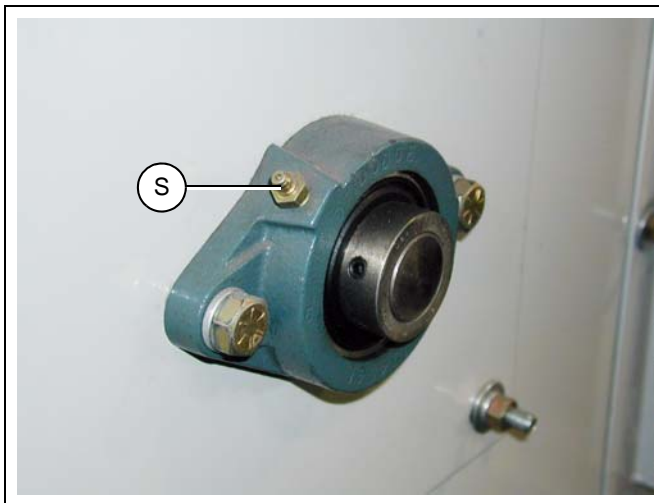


Figure 5M

Ref #	Description
S	Grease Idler Bearings

Finding Belt Centerline

1. To find the belt centerline, measure the belt width at five (5) points. Starting near the end of the belt, measure the belt width in 10" intervals, marking them as you measure. Each measurement shall then be divided in two (2) and marked. Using a straight edge, draw a centerline using the points as a guide. (See Figure 6A.)

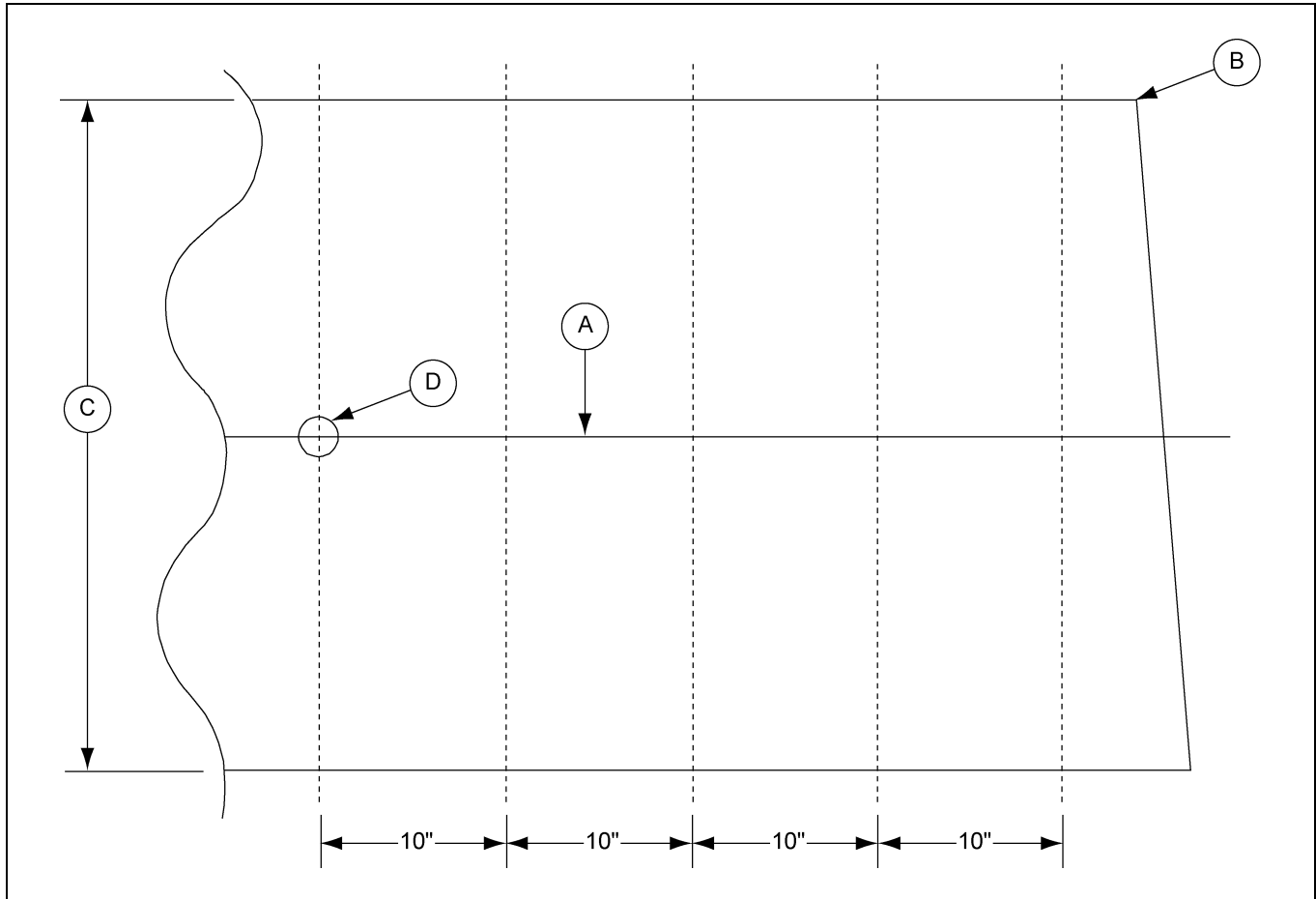


Figure 6A

Ref #	Description
A	Centerline
B	Belt End
C	Belt Width
D	Center Point of Width Measurements

6. Belting Assembly

Squaring the Belt End

1. A double arc method is used on establishing a cut line on the belt. After a centerline has been drawn, pick a point on the centerline about two (2) times the belt width. From this point, strike an arc across the width of the belt end. A nail may be used as a pivot point with twine used as the arm of the arc. Tie a marking tool (chalk, for example) to the end of the twine.
2. A second set of arcs is struck with the pivot point of the arc on centerline and close to the belt end. Where the two (2) arcs intersect each other are points on which a cut line is drawn. (See Figure 6B.)

NOTE: The second arc should be slightly less than half of the width of the belt.

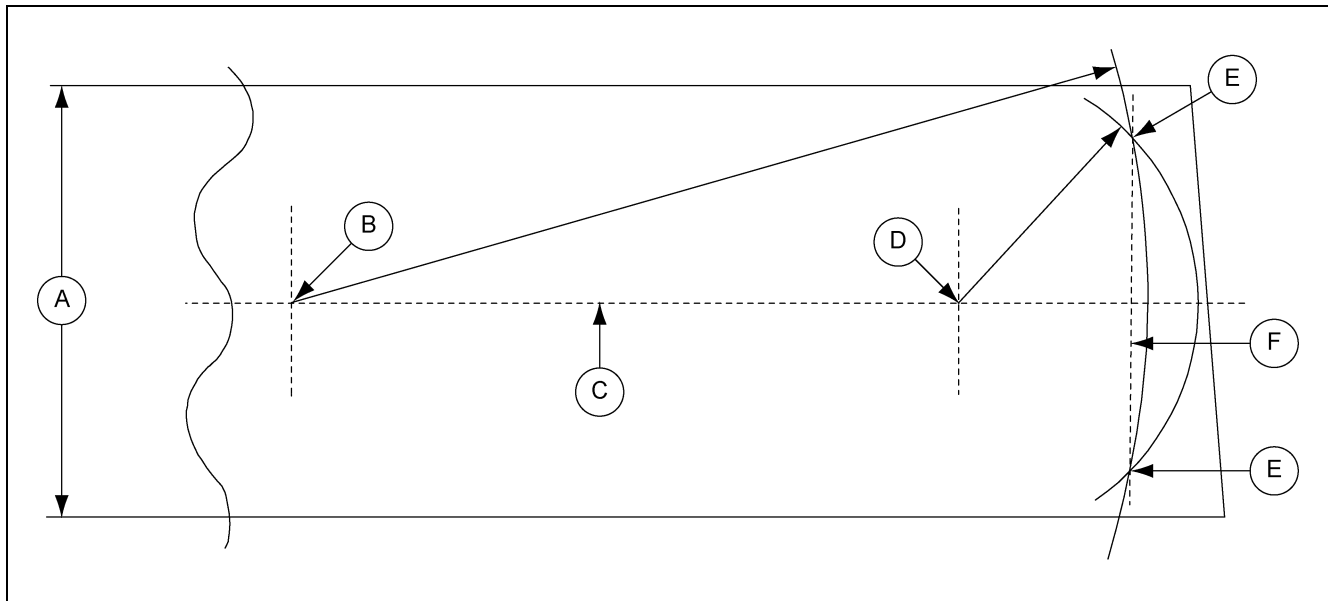


Figure 6B

Ref #	Description
A	Belt Width
B	Pivot Point of First Arc
C	Centerline
D	Pivot Point of Second Arc
E	Intersection Point
F	Cut Line

Check the Squareness of the Belt Cut

- To check for the accuracy of the cut made, measure lengthwise 50" from each edge of the belt. Using a straight edge, draw a line diagonally across the belt. This should be done from the 50" point to the end corner on the opposite side of the belt. Do the same procedure in reverse to form an "X". The intersection point of the two (2) lines of the "X" should be in line with the centerline of the belt. (See Figure 6C.)

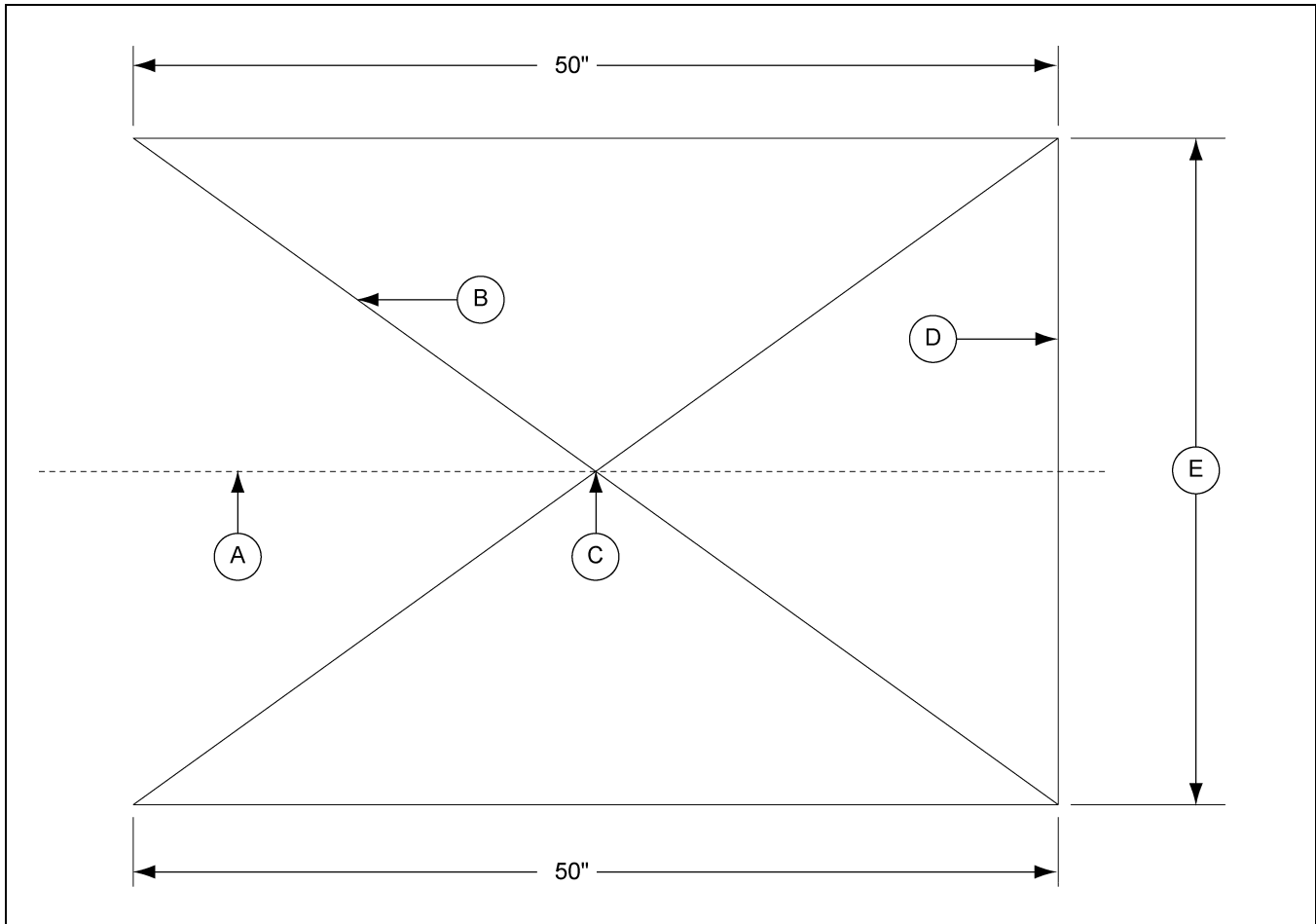


Figure 6C

Ref #	Description
A	Belt Centerline
B	Diagonal Line
C	Intersection Point
D	Cut Edge of Belt
E	Belt Width

6. Belting Assembly

Installation of Belt

1. Hand thread the belt through the conveyor with the tail section in a retracted position. Attach a tightening device to each end of the belt to prevent damage to the belt. Place a 2" x 12" piece of wood width wise on top of an intermediate section where the belt ends are to be brought together. Bring the belt seam together over the 2" x 12" piece of wood for a working surface to be used for splicing. (See Figure 6D and Figure 6E.) The belt splice can now be installed following step-by-step directions on Pages 33-36.

IMPORTANT: Install belting into tail end. Note the direction of the flippers on belt. Flippers are installed to aid in cleanout of tail shroud. (See Figure 6E.)

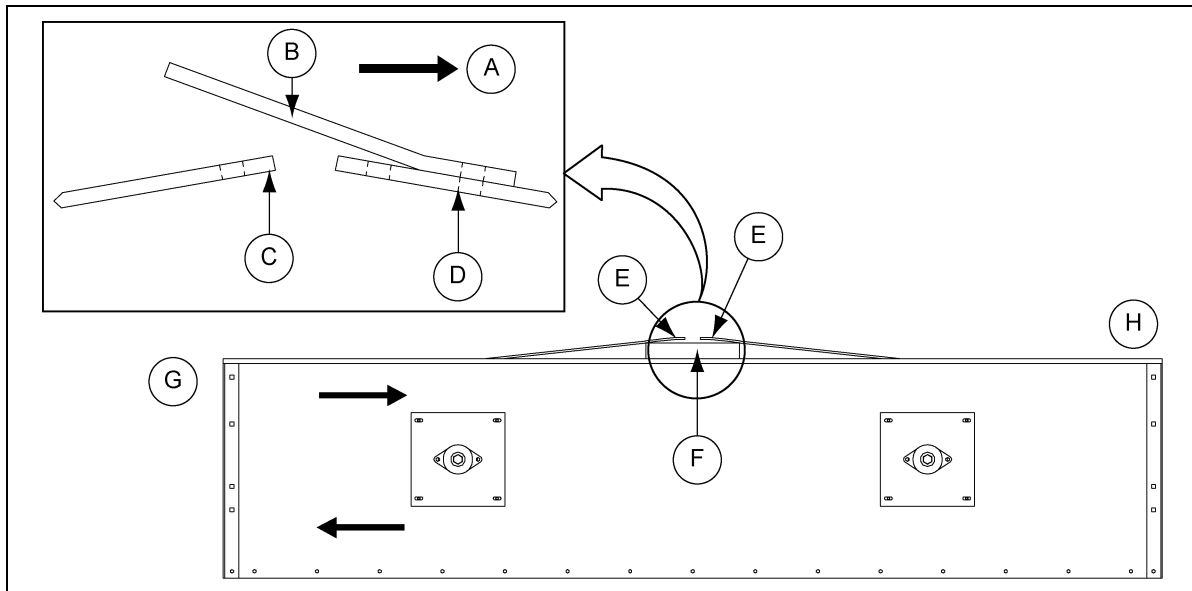


Figure 6D Intermediate Section with Covers Removed

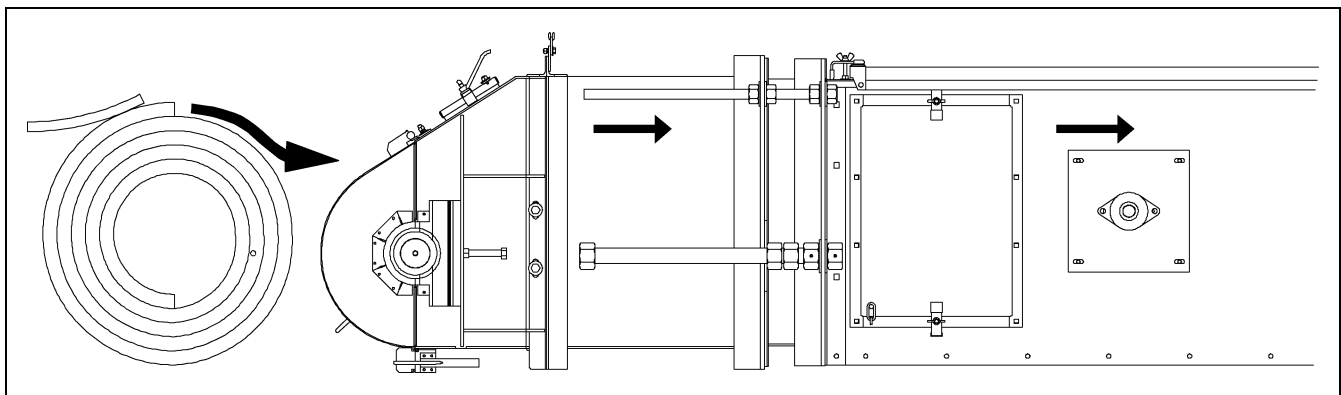


Figure 6E Detail Installation of Belting into Conveyor

Ref #	Description
A	Direction of Belt Travel
B	Factory Supplied Splice Protector (Flipper)
C	Field cut, square and punch holes in field this end of belt.
D	Install flippers on end belt that has been pre-punched and cut by factory.

Ref #	Description
E	Conveyor Belt Ends
F	2" x 12" Block of Wood
G	Tail End
H	Head End

Splicing the Belt

1. Support belt ends with wood plank. Nail Flexco Template in position with belt ends tight against lugs.
(See [Figure 6F](#).)

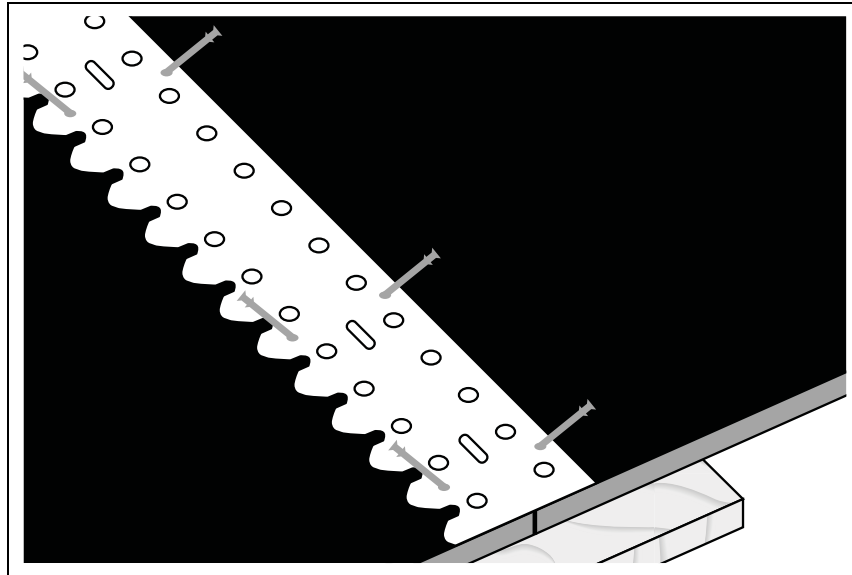


Figure 6F

2. Spray template holes with Flexco Silicone Lubricant. Punch or bore bolt holes. Remove template.
(See [Figure 6G](#) and [Figure 6H](#).)

NOTE: Splice protector design may vary due to type of conveyor. I.E. - Reversible conveyors and conveyors with low profile head discharges do not have splice protectors with tails (flippers).

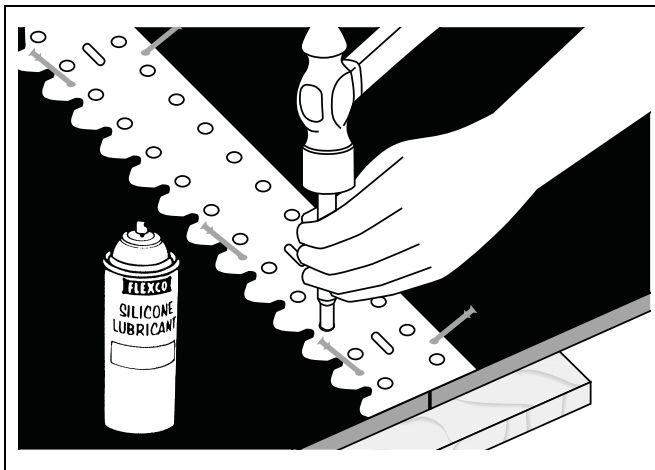


Figure 6G

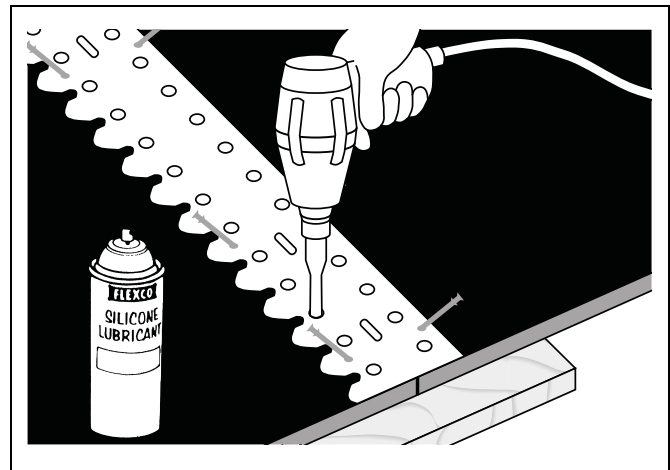


Figure 6H

6. Belting Assembly

Splicing the Belt (Continued)

3. To assemble bottom plate insert two (2) bolts and attach clip. *(See Figure 6I.)*
4. Fold one belt end back and insert bolts in one row of holes. *(See Figure 6J.)*
5. Align bolts with template teeth and place the other belt end over bolts. Remove template. *(See Figure 6K.)*
6. Place top plates over bolts using bolt horn. *(See Figure 6L.)*

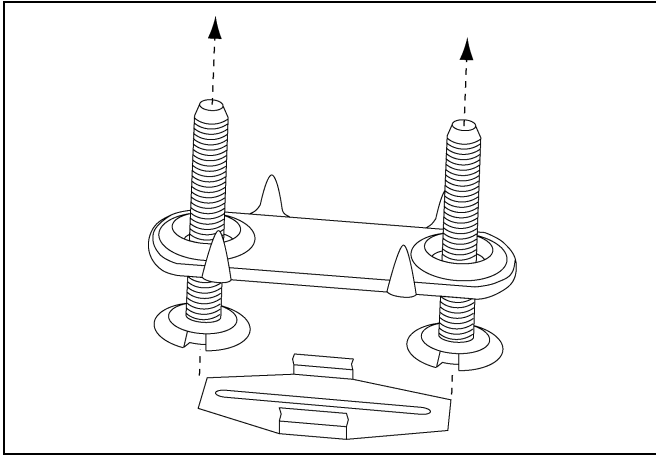


Figure 6I

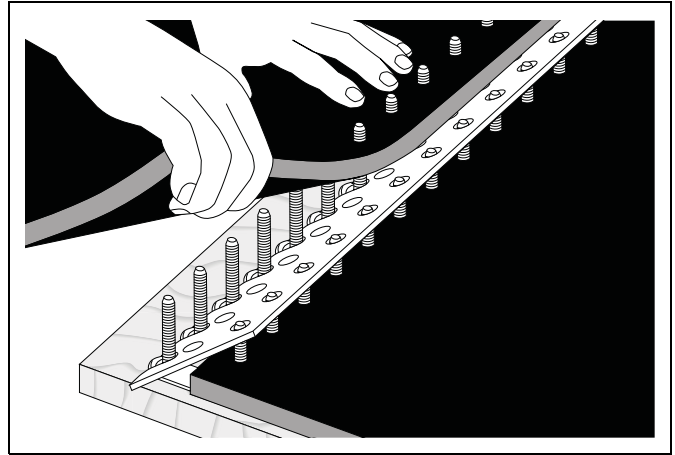


Figure 6K

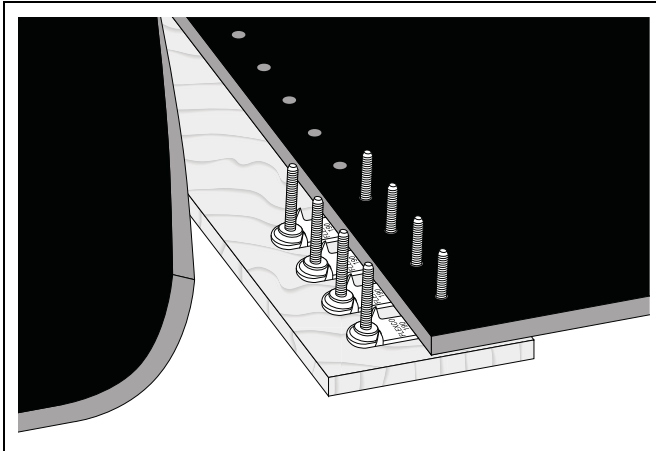


Figure 6J

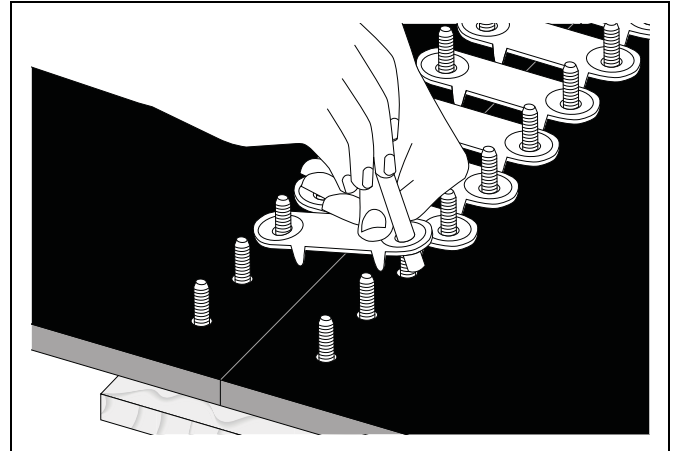


Figure 6L

Splicing the Belt (Continued)

7. Start nuts on bolts by hand. (See Figure 6M.)
8. Cut Flexco-Lok Tape 3-1/2 times the belt width and feed tape under top plates, under the bottom plates, then back under top plates. (See Figure 6N.)
9. Pull tape tight and hold in position by tightening a fastener at each end. Then tighten all other plates. (See Figure 6O.)
10. Tighten all nuts uniformly. **NOTE:** A Flexco Power Wrench used with an impact tool will speed this step considerably. (See Figure 6P.)

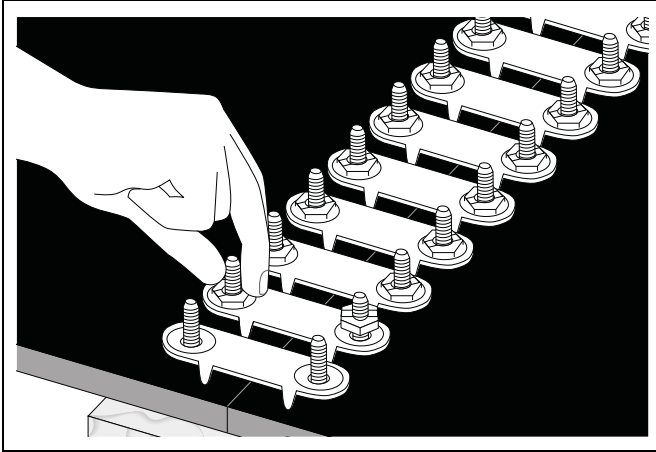


Figure 6M

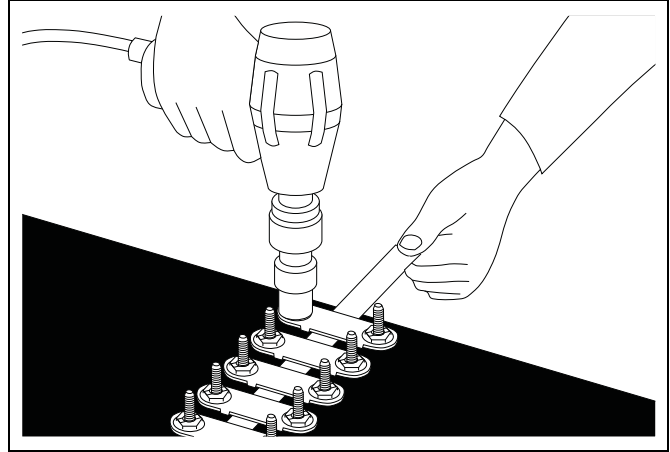


Figure 6O

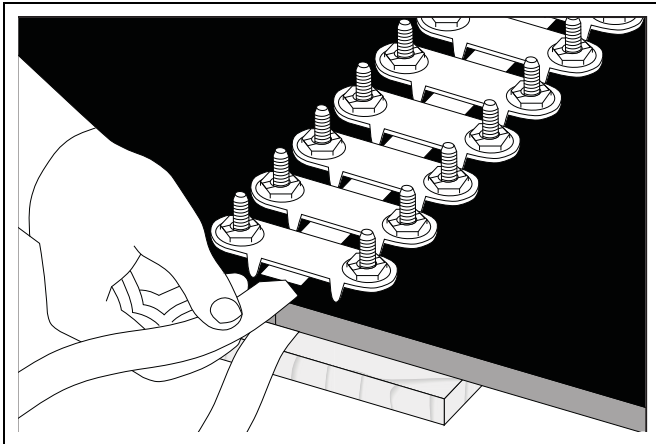


Figure 6N

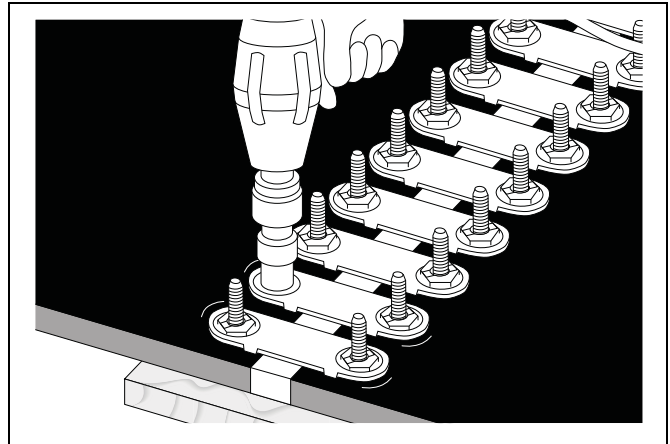


Figure 6P

6. Belting Assembly

Splicing the Belt (Continued)

11. Hammer plates in belt with wood block. Retighten nuts. (See Figure 6Q.)
12. Break off excess bolt ends using two (2) bolt breakers. Peen or grind bolts to finish. (See Figure 6R.)
13. Place flippers on belt. The flipper should be located so the tail of the flipper covers the splice. **Note direction of belt travel.** The flippers are evenly spaced across the belt with a 1/4" gap between them. There will be a larger gap between the outside flipper and the edge of the belt. (See Figure 6S.)
14. Punch or bore holes. Attach flippers using same connectors as splice. Repeat [Steps 10 on Page 35-12 above](#).
15. Finished splice.

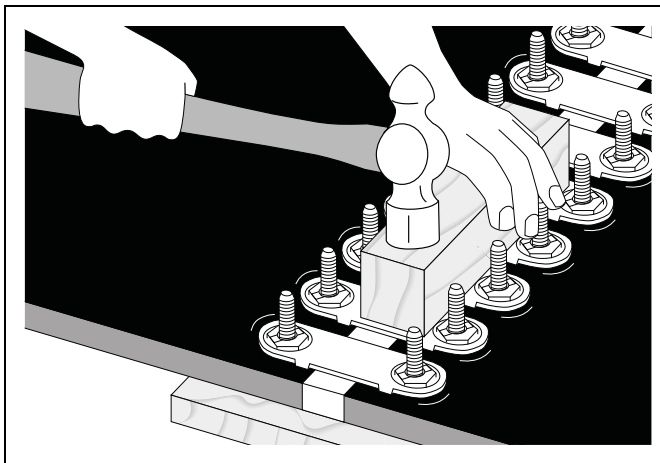


Figure 6Q

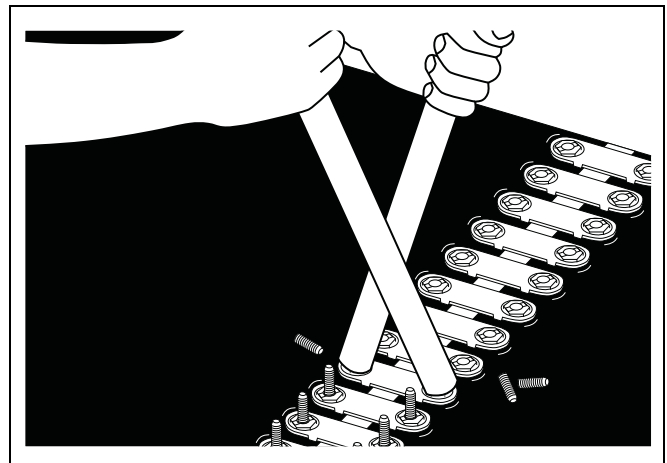


Figure 6R

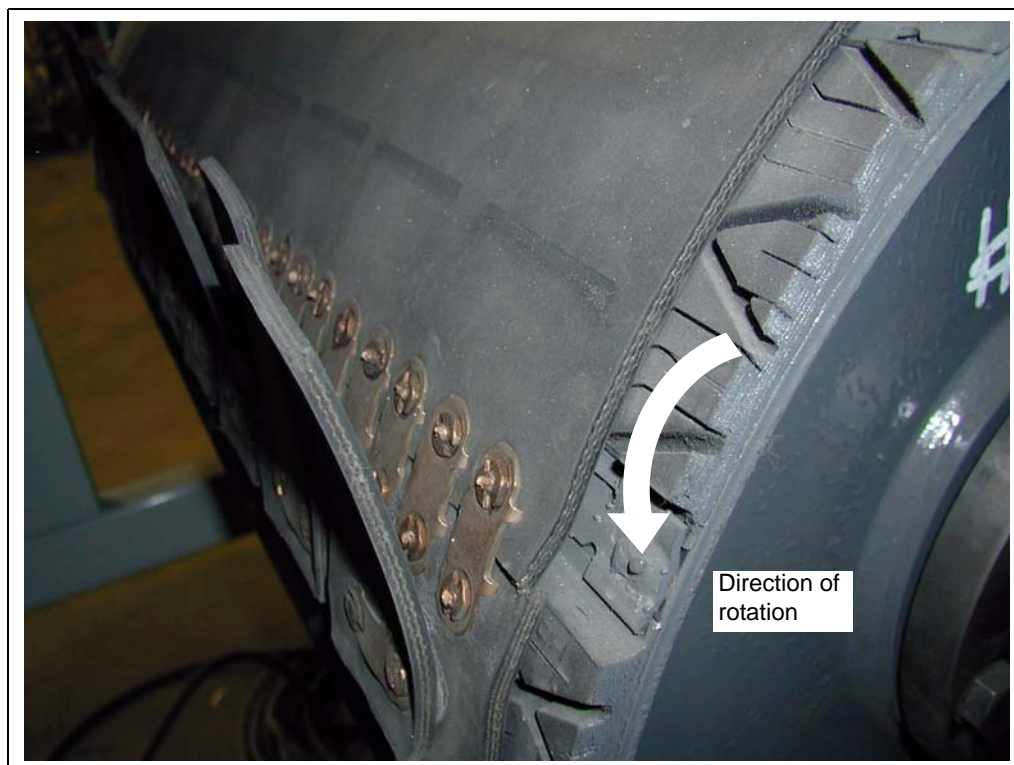


Figure 6S

Belt Tension

IMPORTANT: The belt tension should be checked every day of use for the first few days.

NOTE: After an hour of running, the belt should be retightened and thereafter checked at regular intervals. **Take-up rods are for tightening belt only. They are not to be used to adjust belt tracking.**

1. Conveyor belts stretch when new and must be checked at regular intervals. After approximately two (2) weeks of usage, checks of belt tension may be done at less frequent intervals.
2. After splice has been installed and 2" x 12" piece of wood is removed, belt is ready to be tightened.
3. The belt is tightened by turning the take-up rods located on the tail section. Make sure that they are adjusted equally to prevent misalignment. The conveyor belt should be tightened enough to prevent the belt from slipping on the drive pulley. When done adjusting take-up rods, tighten nuts against flanges to lock in place. (See Figure 6T and Figure 6U.)

NOTE: Do not over tighten belt. Over tightening can cause premature wear of bearings and shafts.

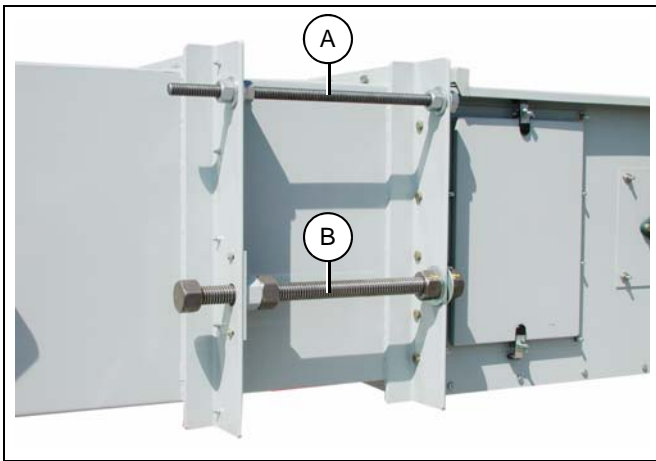


Figure 6T

Ref #	Description
A	Leveling Rod
B	Take-Up Rod
C	Nuts
D	Flanges
E	To tighten belt tension, adjust tail section in this direction.

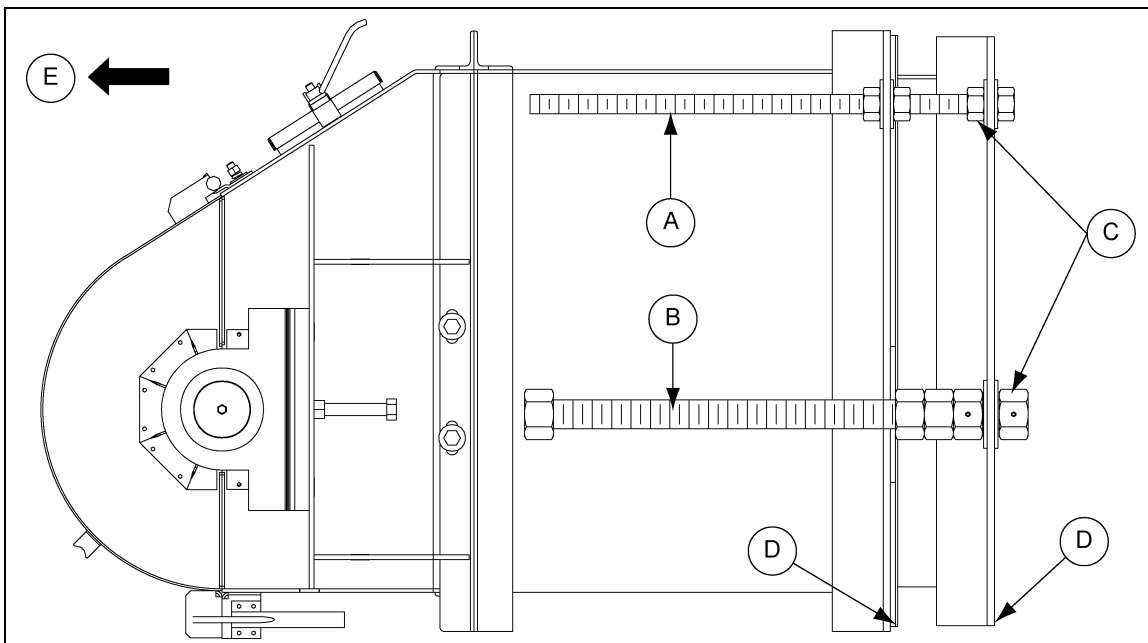


Figure 6U Tail Section

6. Belting Assembly

Belt Tracking

Squareness of the Conveyor

1. Before tracking procedure is begun, each section should be square and straight so there is no unequal weight distribution. Check conveyor intermediate sections for any extensive damage such as cave-in sides, etc. Idlers should be checked for looseness. If idlers are loose, re-center and tighten set screws on bearing lock collar.
2. After intermediate sections are bolted together, a chalk line should be strung along the sides of the conveyor, making sure that it is in a straight line. Loosening bolts on the intermediate frames will permit slight adjustment of the intermediate sections.
3. After conveyor has been installed, check to see if the unit is level (width wise). The conveyor must be level for proper belt tracking. (See Figure 6V.)

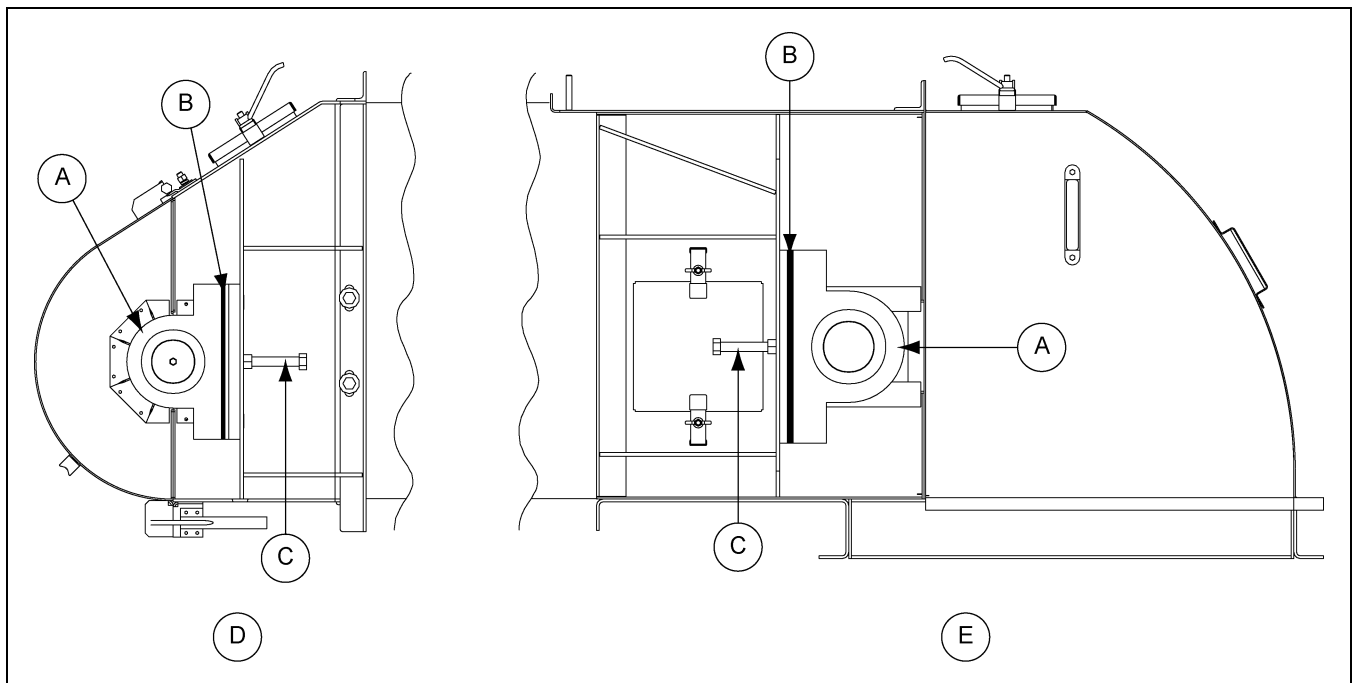


Figure 6V

Ref #	Description
A	Bearing
B	Shims
C	Bearing Adjustment Bolts
D	Tail Section
E	Head Section

Belt Tracking (Continued)

Tracking Adjustment

4. Belt tracking adjustment is initiated by moving the bearing adjustment bolts. These are located on both sides of the head and tail sections. Belt tracking adjustments are made by adding or removing shims under bearing as necessary. **DO NOT** use take-up rods to correct belt tracking. (See [Figure 6W](#) and [Figure 6X](#).)



Figure 6W

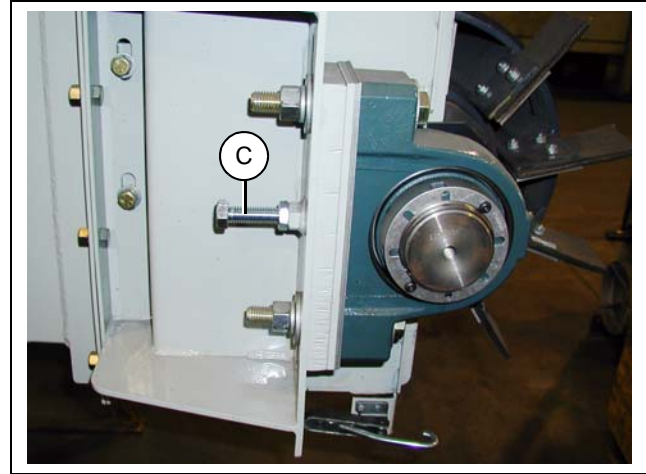


Figure 6X

5. Adjustment of the idlers is done by loosening eight (8) bolts. These bolts hold the bearings in place and are located on both sides of the conveyor sections (four (4) on each side). After loosening these bolts, the end of the idler can shift either forward or backward. (See [Figure 6Y](#).)

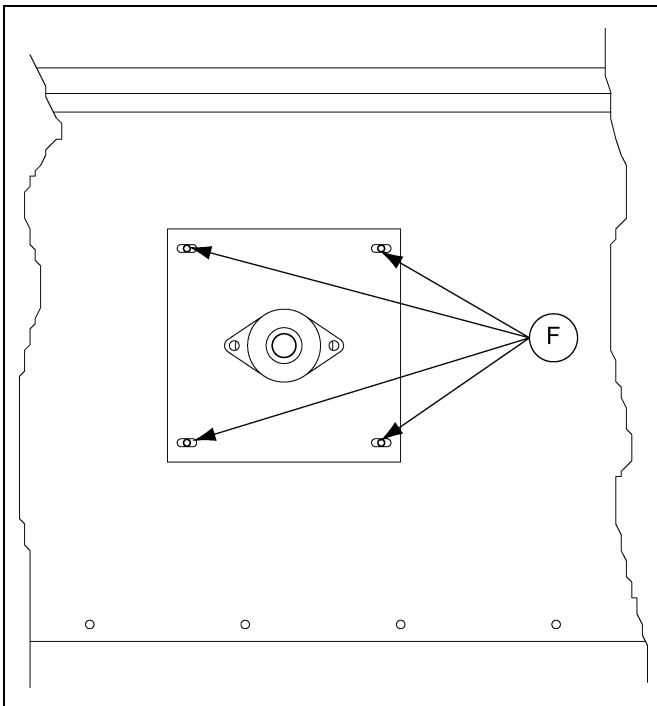


Figure 6Y

Ref #	Description
C	Bearing Adjustment Bolts
F	Loosen these four (4) nuts on both sides for adjustment.

Belt Tracking (Continued)

General Tracking/Training Procedures

6. Tracking the belt is a process of adjusting idlers, pulleys and loading conditions in a manner that will correct any tendencies of the belt to run other than true.
7. A normal sequence of training is to start with the top pulleys in the direction of belt travel. Start with the belt empty. After tracking is completed, run the belt with a full load and recheck tracking.
8. Tracking adjustment is done while the belt is running and should be spread over some length of the conveyor preceding the region of trouble. The adjustment may not be immediately apparent, so permit the belt to run for several minutes and at least three (3) full belt revolutions after each idler adjustment to determine if additional "tracking" is required.
9. After adjustment, if the belt has overcorrected, it should be restored by moving back the same idler and not by shifting additional idlers or rollers.
10. If the belt runs to one side at a particular point or points on the conveyor structure, the cause will probably be due to the alignment or leveling of the structure or to the idlers and pulleys immediately preceding that particular area or a combination of these factors.
11. If a section or sections of the belt run off at all points along the conveyor, the cause is possibly in the belt itself, in the belt not being joined squarely or in the loading of the belt. With regard to the belt, this will be due to camber. Its condition should improve after it is operated under full load tension. It is a rare occasion when a cambered belt (less than 1/2%) needs to be replaced.
12. When replacing a used belt, go through the system and square and level all rollers, idlers, pulleys and bed before training a new belt.
13. The basic and primary rule which must be kept in mind when tracking a conveyor belt is simple, "**THE BELT MOVES TOWARD THAT END OF THE ROLL/IDLER IT CONTACTS FIRST**".
14. The reader can demonstrate this for himself very simply by laying a small dowel rod or round pencil on a flat surface in a skewed orientation. If a book is now laid across the dowel rod and gently pushed by one's finger in a line directly away from the experimenter, the book will tend to shift to the left or right depending upon which end of that dowel rod the moving book contacts first. (See Figure 6Z.)

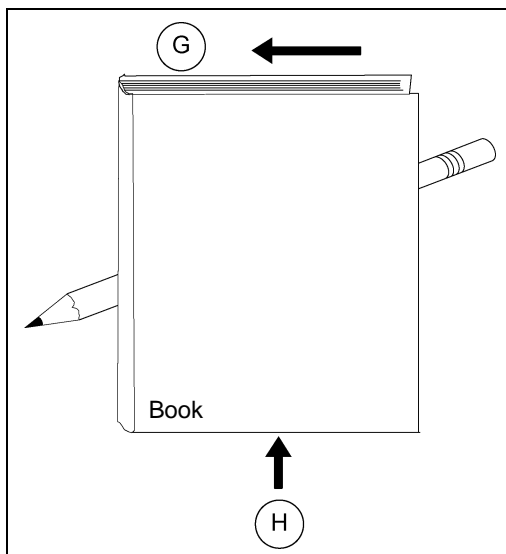


Figure 6Z

Ref #	Description
G	Book moves like this direction
H	Push

Spouting

- Below are the recommended and incorrect ways to attach spouting to load the conveyor. Contact the GSI Material Handling Department if there are any questions about loading conditions.

Grain stream centered on the belt. Grain moving in the same direction and at the same speed as the belt. (See Figure 7A.)

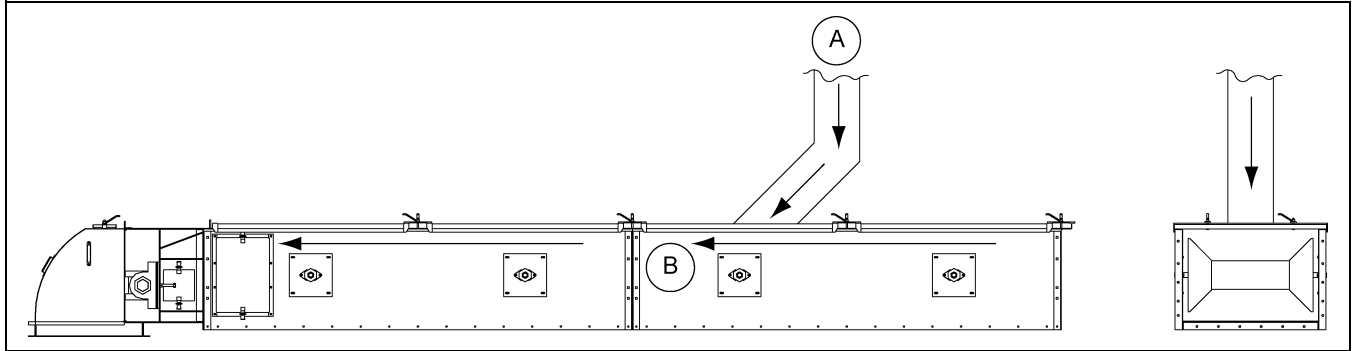


Figure 7A Recommended

This causes excessive wear of belting and off center loading on belt which causes spillage. This method of loading results in grain tumbling on belt. (See Figure 7B.)

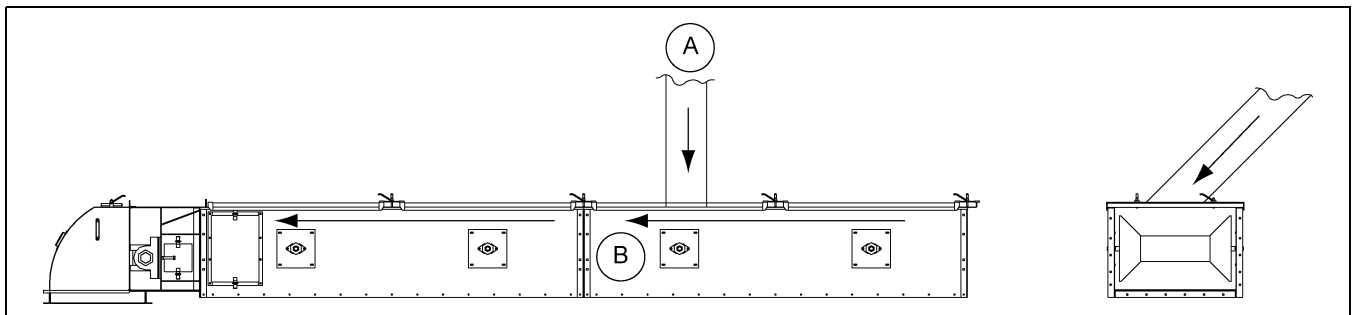


Figure 7B Avoid

Grain should be loaded in the same direction of belt travel and at the same speed. (See Figure 7C.)

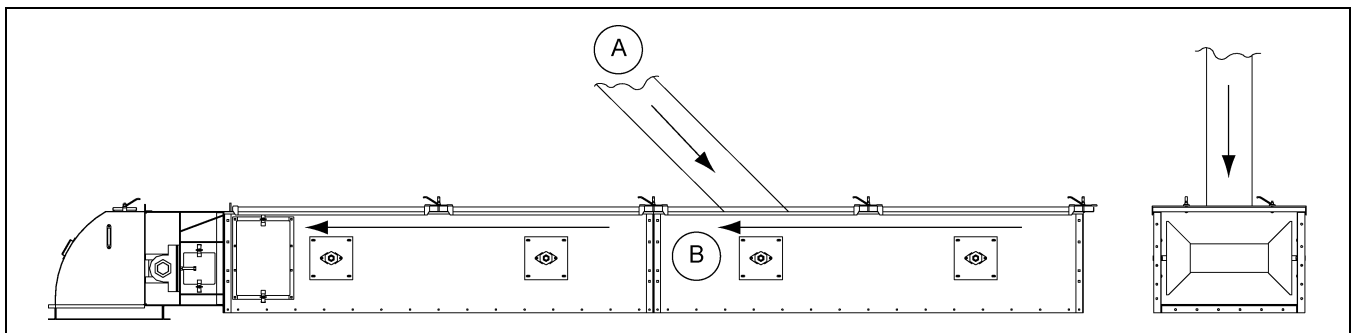


Figure 7C Incorrect

Ref #	Description
A	Grain Flow
B	Belt Direction

7. Loading

Spouting Location

1. Grain should come out from storage and make a 90° turn by use of baffles and load straight into the conveyor at approximately a 45° angle. (See Figure 7D.)

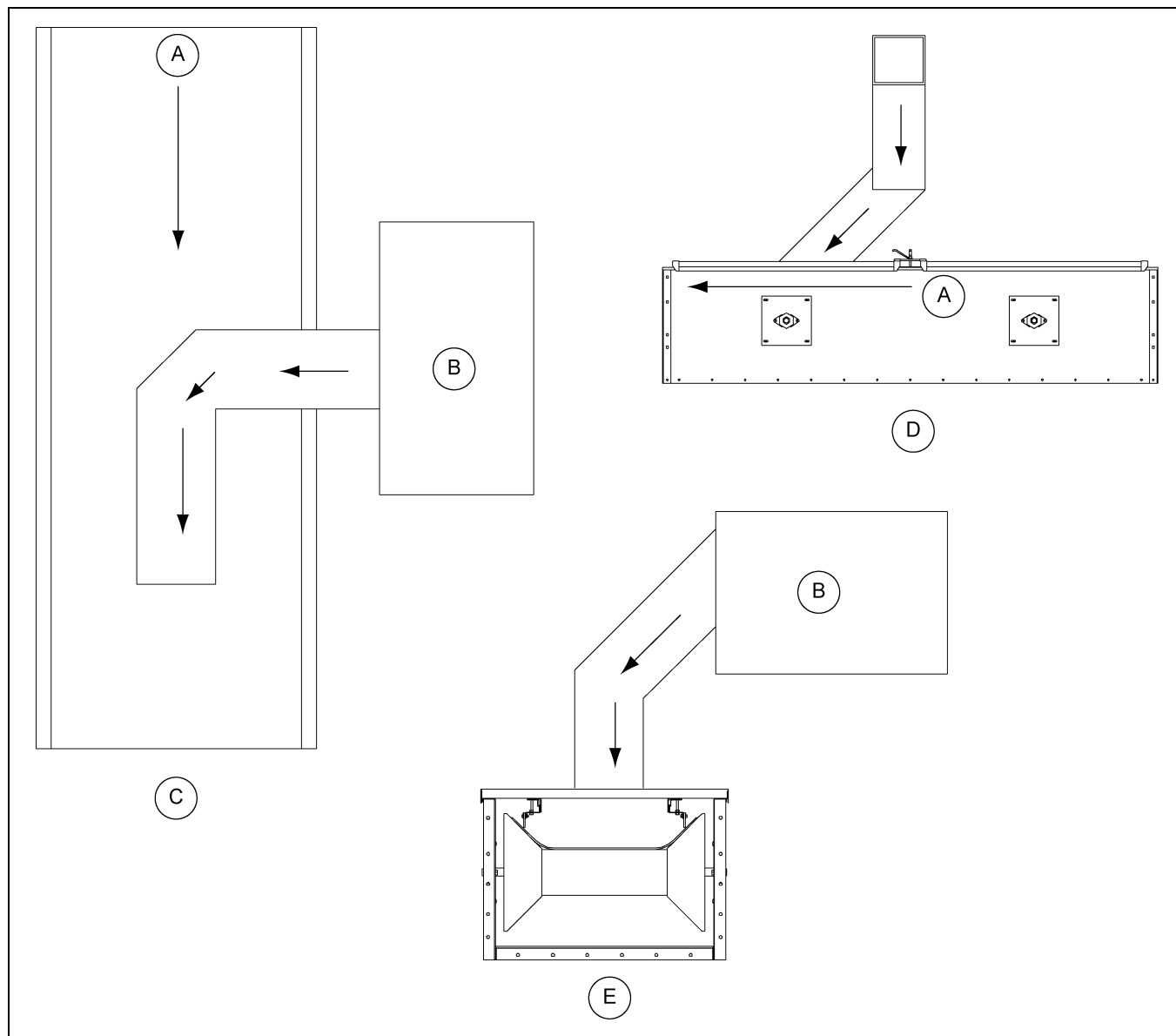


Figure 7D

Ref #	Description
A	Belt Direction
B	Pit or Bin
C	Top View
D	Side View
E	End View

Belt Conveyor Loading

1. Start with a light load and gradually work up to the load that the conveyor was designed to handle. Check chutes to see that the material is being directed onto the center of the belt. Off-center load will affect belt alignment in that the belt will run off center. A central load will maintain belt alignment.
2. The loading point of a belt conveyor is the critical point. Here the conveyor receives its major abrasion and practically all of its impact. The ideal condition is to have the material flow onto the belt at the same speed and direction of travel as the belt, with a minimum amount of impact and to load the belt on center.
3. Adjust the skirts to prevent side spillage of material and to keep the load central on the belt. The maximum distance between skirt boards customarily is two thirds the width of a trough belt.
4. The skirt lengths are designed to stop side spillage. The material should also be at rest on the belt before it reaches the end of the skirt. If the material is still tumbling as it passes the skirt end, the skirts should be lengthened.

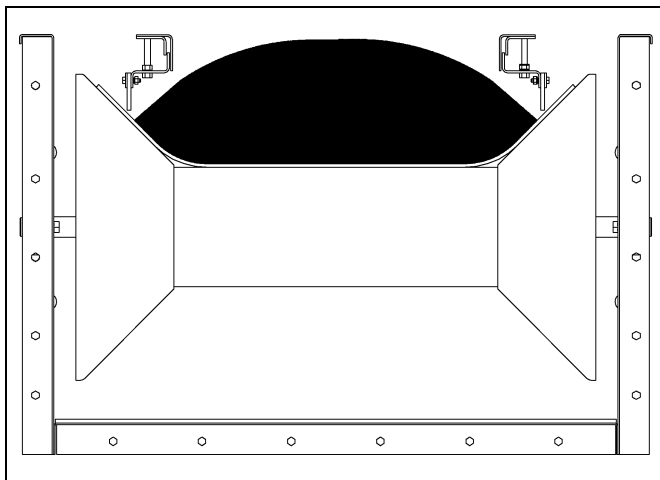


Figure 7E CORRECT - Evenly Loaded

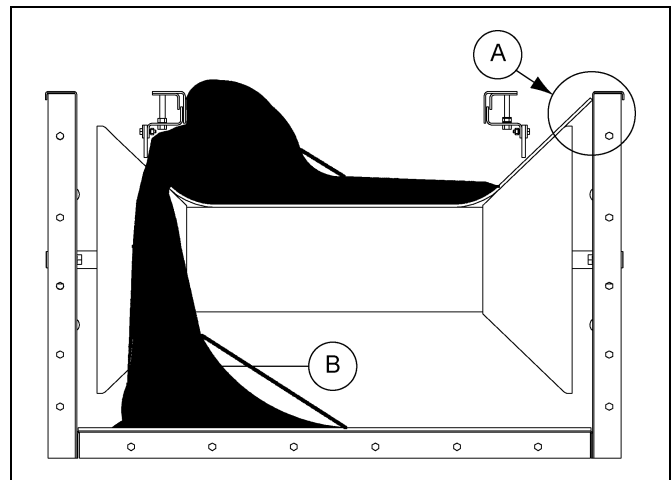


Figure 7G Effect of Improper Loading

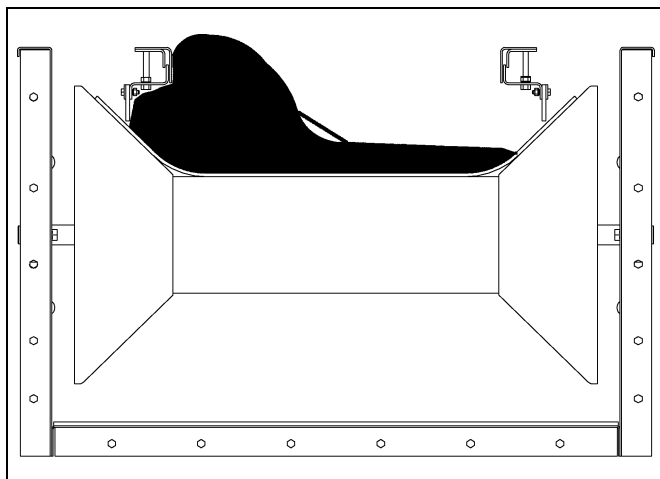


Figure 7F INCORRECT - Loaded to One Side

Ref #	Description
A	Belt Shift
B	Spill

8. Options

Motion Sensor Option (Whirligig - WG1-4B)

Installation Instructions



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. Shaft ends are pre-drilled and tapped from the factory.
2. Thread the Whirligig onto the machine shaft using 5/8" open ended wrench and suitable thread locking adhesive (loctite or similar). (See Figure 8A.)
3. Install the sensor 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. A universal bracket (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 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.

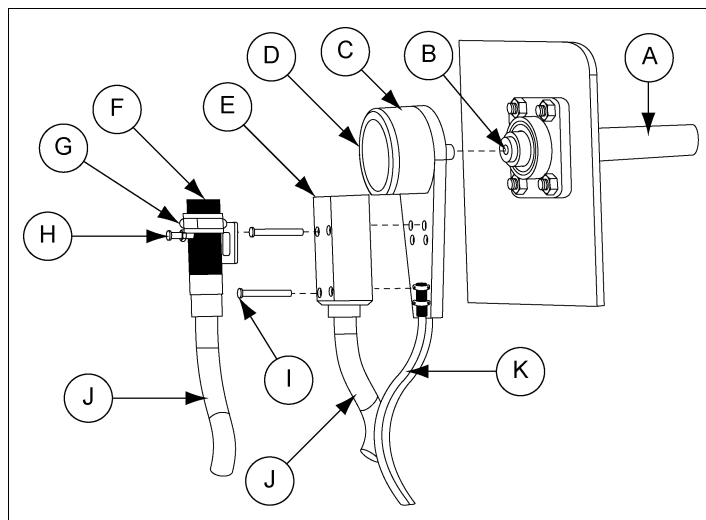


Figure 8A

Ref #	Description
A	Monitored Shaft
B	Tap Shaft for 1/2" UNC Centered
C	Cover
D	Whirligig
E	M800 Sensor
F	Cylindrical Sensor

Ref #	Description
G	18/30 mm Bracket (Supplied)
H	10 mm Screws Four (4) (Supplied)
I	50 mm Screws Four (4) (Supplied)
J	Flexible Conduit
K	Flexible Strap

Pressure Plug Switch Option

Monitor MODEL GX, Part # 7-8150 - Neoprene diaphragm, standard switch.

Electrical Installation

- Hazardous Location Precautions:** Observe the regulations listed in the National Electrical Code regarding equipment in hazardous locations. In particular, ensure power is disconnected whenever the cover is removed, ensure the cover and case mating surfaces are not damaged and upon completion, ensure cover screws are secure and that no gaskets or sealer has been used between the cover and case surfaces.
- Output Contacts:** Route wires through the 1/2" NPT conduit entrance. No power is required to operate the diaphragm bin monitors. All electrical installation is done directly to the terminals of the output switch. The switch terminals are designated with "3" (COM - common), "2" (N.C.- normally closed) and "1" (N.O. - normally open). When the diaphragm is not sensing material, the switch is in the normal condition (i.e. N.C. contact is closed to COM and N.O. contact is open to COM). However, when the diaphragm senses material, the switch is opposite from normal condition (i.e. N.C. contact is open to COM and N.O. contact is closed to COM). Be sure to comply with all electrical specifications listed within this bulletin.

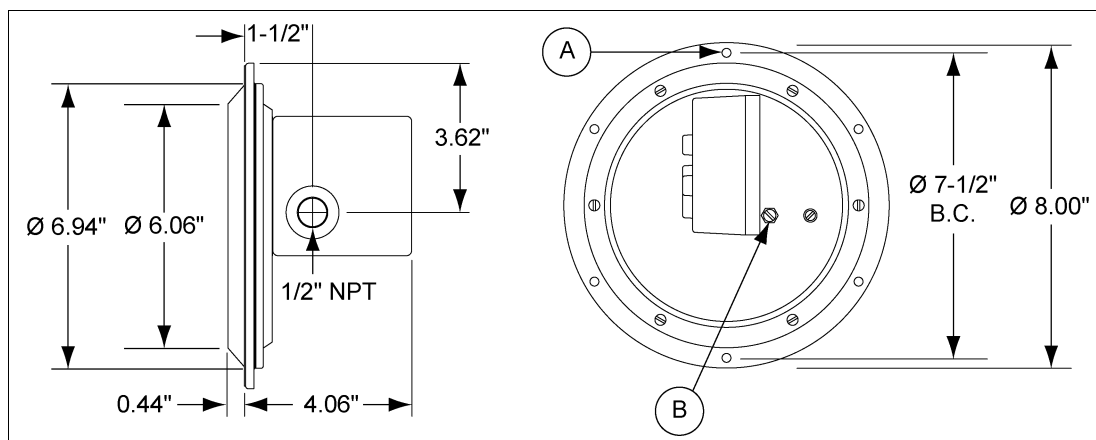


Figure 8B Models GX/GX-SS

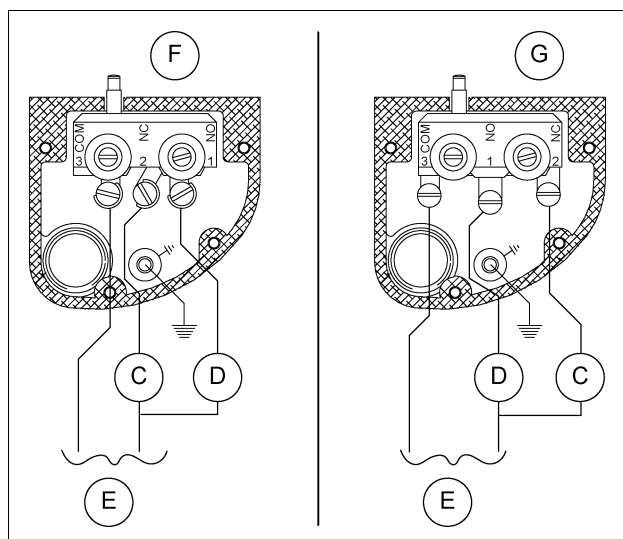


Figure 8C Wiring Diagrams

Ref #	Description
A	Ø 0.22" Six (6) Places (For #10 Screws)
B	Sensitivity Adjust
C	Load 1
D	Load 2
E	Power Source within Load and Bin Monitor Specifications
F	Standard Switch
G	X-Sens. Switch

9. Start-Up

Starting Conveyor

1. Check for and remove any tools or debris that may have been left in the conveyor during installation.
2. Tighten the take-up rods on the tail section equally. The belt should be tightened sufficiently to prevent slippage between the drive pulley and belt and to conform to the crown on the crowned head pulley.
3. Install covers after belt has been trained.

Secure Shroud During Maintenance

NOTE: While accessing the tail pulley, the tail shroud may either be removed or pivoted in an upright position. If pivoted upright, then secure the shroud by placing the chain in the slot as shown in Figure 9A.

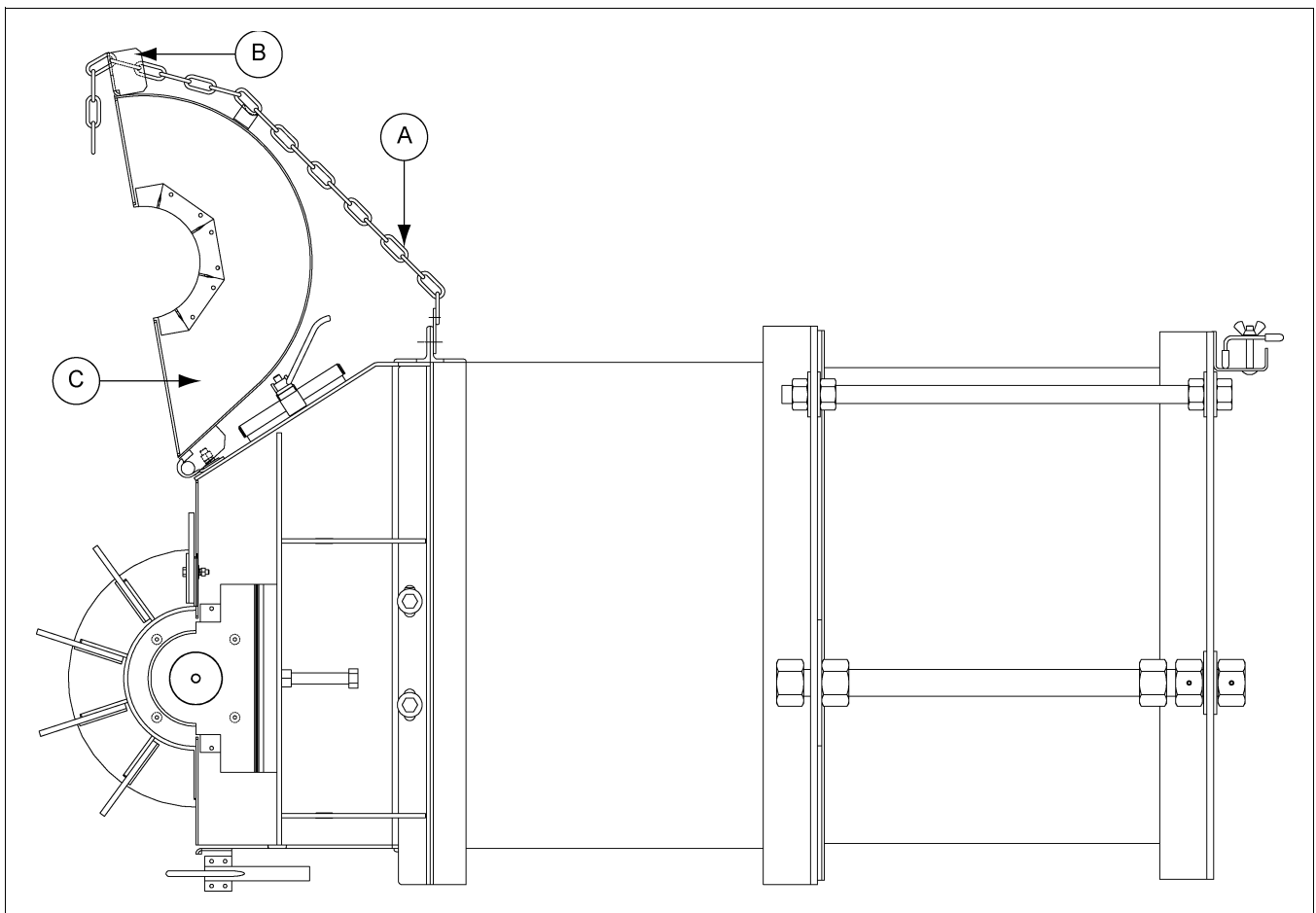


Figure 9A

Ref #	Description
A	Chain
B	Slot
C	Shroud



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 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 the equipment.

1. Check all bearings and moving parts daily during use.
2. Lubricate bearings according to bearing manufacturer's recommendations. *(See Page 50.)*
3. Follow manufacturer's recommendations for gear reducer lubrication and maintenance. *(See Page 50.)*
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 shaft mount reducer assembly section *on Page 24.*
5. The belting and belt idlers should be checked periodically for wear and damage. Should replacement of these components be required, contact the manufacturer.

Bearings

Lubricate bearings at regular intervals. If one bearing is re-lubricated, all other bearings should also be lubricated. Do not over lubricate as this will destroy bearing seals.

Welding

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. 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.

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

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.

Storage

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

1. Thoroughly clean the unit.
2. Loosen the V-belt tension to relieve the stress placed on the bearings and shafts of the drive and tail sections.
3. Lubricate shafts and drive chain components with a good grade of light machine oil.

Troubleshooting Guide

Problem	Problem	Solution	Page
Conveying belt drifts sideways.	1. Belt not properly tracked.	1. Track belt over pulleys.	38, 39, 40
	2. Belt splice not square.	2. Check splice squareness, re-splice.	32
	3. Material not placed on center of belt.	3. Direct material through loader and spouting.	41, 42,43
	4. Machine is not straight.	4. Check machine alignment with chalk line or string.	14, 15, 38
	5. Machine not level.	5. Check and level sections.	38
	6. Material build-up on pulleys.	6. Clean pulleys, retrack belt.	-
Material build-up on idler pulley, drive pulley or between sections and belt.	1. Material getting under belt.	1. Remove build-up from pulleys and sections.	38, 39, 40
		2. Track conveying belt.	
		3. Check machine alignment and levelness.	14, 15, 38
		4. Eliminate point(s) where material may be entering under belt.	-
	2. Loader not being used.	5. Use loader to position material on center of belt. All material must be directed through hopper.	-
Lack of capacity.	1. Conveying belt slippage.	1. Tighten so belt conforms to crowned pulleys.	46

12. Appendix 1 - Reference Information

Information regarding the torque arm, roller bearings and pillow blocks can be downloaded from the Baldor website.

Go to www.baldor.com/support/product_manuals.asp

Enter the required manual number into the search field. See list below.

MN1601 - Dodge Torque-Arm II Speed Reducer Installation

MN3033 - Dodge S-2000 Spherical Roller Bearings

MN3040 - Dodge TAF Pillow Blocks and S-1 Units

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



GSI Group
1004 E. Illinois St.
Assumption, IL 62510-0020
Phone: 1-217-226-4421
Fax: 1-217-226-4420
www.gsiag.com



GSI is a worldwide brand of AGCO Corporation.