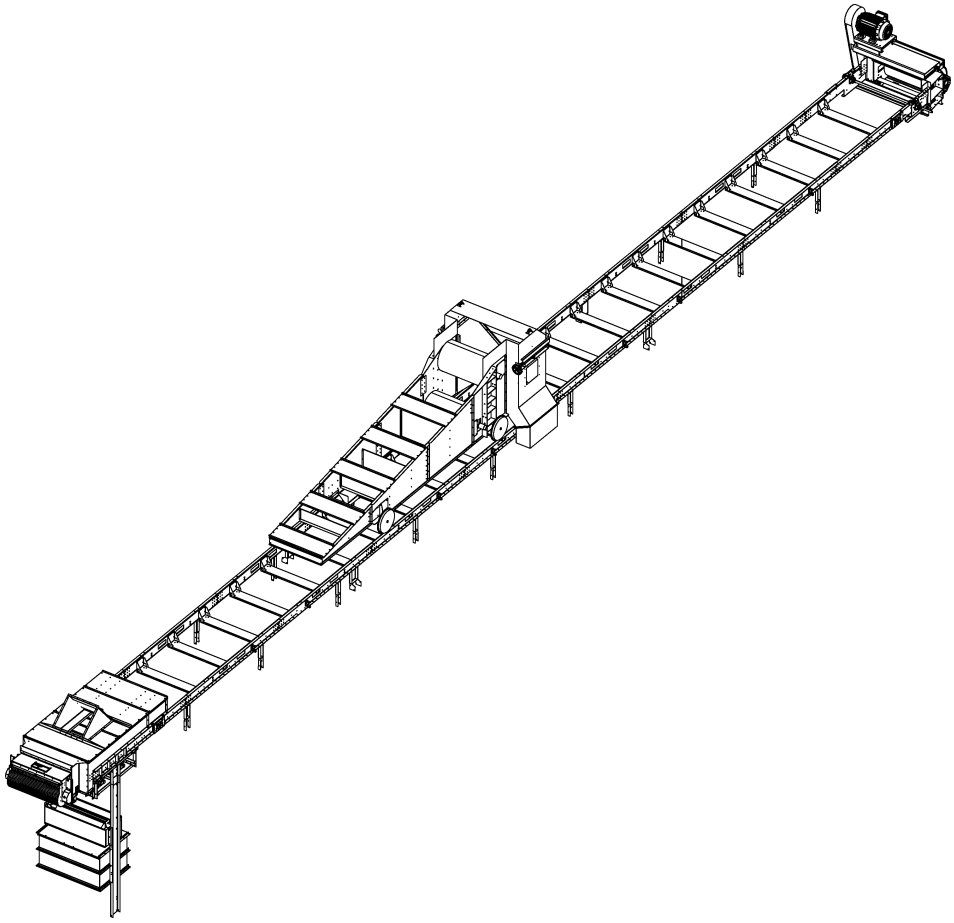


Open Belt Conveyor

Owner's Manual

PNEG-2107

Version: 1.0

Date: 08-12-16

PNEG-2107

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

General Information

InterSystems reserves the right to improve its product whenever possible and practical to do so. We reserve the right to change, improve and modify products at any time without obligation to make changes, improvements and modifications on equipment sold previously.

This manual covers the installation and operation for the Open Belt Conveyor. This manual provides guidelines for installing the product. You must retain a qualified contractor to provide on-site expertise. InterSystems is not responsible for the installation of this product.

General Safety Statements

1. The Open Belt Conveyor is designed and manufactured with operator safety in mind. However, residual hazards remain due to the nature of fertilizer. Use extreme caution at all times.
2. Modifications to equipment may cause extremely dangerous situations that could result in damage to the equipment as well as serious injury or death. Never modify the equipment.
3. InterSystems recommends that you contact the local power company to have a representative survey the installation to ensure wiring is compatible with their system and adequate power is supplied to the unit.

Receiving Inspection

1. Carefully inspect the shipment for damage 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. One or more cartons containing the fasteners required for assembly are included with the shipment. Report any damage or shortage to the delivering carrier as soon as possible.
2. InterSystems responsibility for damage to the equipment ended with acceptance by the delivering carrier. Refer to the bill of lading for more detailed information.
3. Save all paperwork and documentation furnished with any of the Open Belt Conveyor components.

Pre-Installation Preparation

1. The MOST IMPORTANT preparations are retaining a licensed engineer to plan the installation and a qualified millwright or contractor to install the Open Belt Conveyor and the accompanying equipment and structures. Before starting the Conveyor Assembly installation, review this manual, the drawing(s) furnished with the equipment and other applicable documents, including but not limited to, O.S.H.A. Regulations and the National Electrical Code and all other applicable federal, state and local codes and regulations.
2. InterSystems does not assume responsibility for the installation.
3. The installation recommendations contained within this manual are for consideration only. The user or installer will want to consult a civil or structural engineer regarding the design, construction and supervision of the entire installation.

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Save these safety guidelines for future reference.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in SERIOUS INJURY or DEATH.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001-3

Cautionary Symbols Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.

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

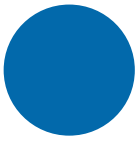
WARNING This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**

CAUTION This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**

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

This symbol indicates a general hazard.

This symbol indicates a prohibited activity.



This symbol indicates a mandatory action.

ST-0005-2

Safety Cautions

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection

Respiratory Protection

Foot Protection

Hearing Protection

Head Protection

Fall Protection

Hand Protection

- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

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

ST-0002-1

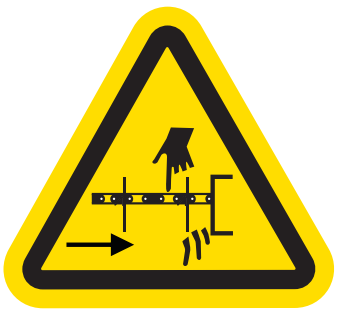
Maintain Equipment and Work Area

- Understand service procedures before doing work. Keep area clean and dry.
- Never service equipment while it is operating. Keep hands, feet, and clothing away from moving parts.
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.

ST-0003-1

Stay Clear of Moving Parts

- Entanglement in rotating sprocket or moving chain will cause serious injury or death.
- Keep all guards and covers in place at all times.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.



ST-0017-1

Operate Motor Properly

- All electrical connections must be made in accordance with applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe). Make sure equipment and bins are properly grounded.
- Lock-out power 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 drive components.

ST-0009-3

Stay Clear of Hoisted Equipment

- Always use proper lifting or hoisting equipment when assembling or disassembling equipment.
- Do not walk or stand under hoisted equipment.
- Always use sturdy and stable supports when needed for installation. Not following these safety precautions creates the risk of falling equipment, which can crush personnel and cause serious injury or death.

ST-0047-1

Sharp Edge Hazard

- This product has sharp edges, which can cause serious injury.
- To avoid injury, handle sharp edges with caution and always use proper protective clothing and equipment.

ST-0036-2

Stay Clear of Slide Gate

- Keep hands away from slide gate opening. Slide gates can crush and dismember. Motor can start at any time.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.

ST-0049-1

Install and Operate Equipment Properly

- Do not modify this equipment from its original specifications.
- This equipment is only intended for fixed applications and is not to be moved or transported.

ST-0052-1

Safety Sign-Off Sheet

Below is a sign-off sheet that can be used to verify that all personnel have read and understood the safety instructions. This sign-off sheet is provided for your convenience and personal record keeping.

Date	*Employee Name*	*Supervisor Name*

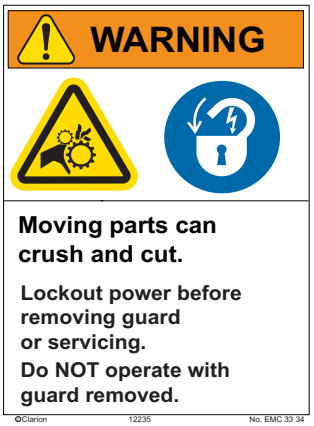
ST-0007

The safety decals on your equipment are safety indicators which must be carefully read and understood by all personnel involved in the installation, operation, service and maintenance of the equipment. To replace a damaged of missing decal, contact us to receive a free replacement.

InterSystems
9575 N. 109th Ave.
Omaha, Nebraska 68142
Toll Free: (800) 228-1483

Location	Decal #	Decals	Description
• On outside of all trunking sections • On the tail end section • On outside side of tripper cart • On either side of weight box	IS 950020		Exposed Belt
• On top of the tail section • On either side of the tripper discharge	EMC 28 34		Eye Protection
• On top of the tail section • On side of weight box • On the drive units near electric motor	EMC 402 34		Lockout

3. Decals

Location	Decal #	Decals	Description
• On either side of the tripper discharge • On the drive units near electric motor	EMC 33 34		Moving Parts
• On outside of Loader section	IS 526		Intersystems Logo
• On the front of tail section • On outside side of tripper cart • On either side of weight box	IS 5517		Intersystems Strip

Conveyor Assembly Overview

1. Remove any banding and crating material. Arrange all the conveyor components in such a manner that all are easily accessible.
2. The conveyor legs rest on the wooden beam and lag bolts are used to mount it. Lag bolts are self-tapping in to wood.
3. 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 take up section, head section and concluding with tail section.
4. The standard conveyor is constructed with one discharge located at the drive end. The intermediate discharge tripper travels to lift the belt and to create an intermediate offload at the point in which it has been stopped.
5. 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.
6. Always consult with the approval prints for exact conveyor layout. Maintain adequate clearance for tail extension.
7. 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.
8. 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 27-34*. These instructions should be followed closely and read thoroughly before starting this step.
9. Check drive belts for tension. Also check the oil level in the speed reducer. ***Reducers are shipped without oil***.

Foundation

1. Open belt conveyors are installed on a suitable wooden beam foundation.
2. Foundation design to be carried out by a qualified engineer.
3. For conveyor dimensions, refer to certified drawings.

Head and Tail End Trunking Installation

Head Section Mounting

Figure 4A shows a typical head section. The head section must be properly supported so there is no vertical or horizontal movement.

The support structure should be attached to the bolted connections of the head section depending on the design of the motor mount.

Mounting supports can be attached to the bearing mounting vertical plate or the bottom head section bolted connections of the head section.

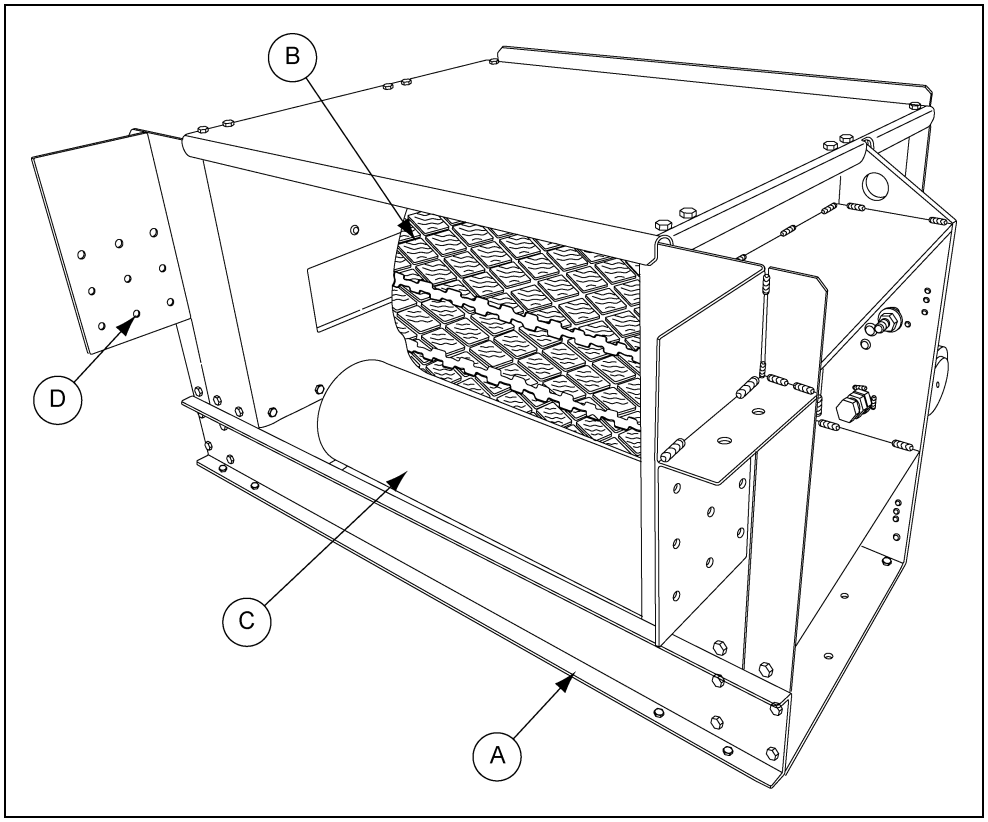


Figure 4A *Head Section*

Ref #	Description
A	Head Section
B	Head Pulley
C	Snubber Pulley
D	Mounting Holes

Tail Section Mounting

The tail section together with take-up section must be properly supported so there is no vertical or horizontal movement of the inner box of the take-up section. *(See Figure 4B.)*

NOTE: *The conveyor tail section must have adequate clearance all around to allow for maintenance.*

The loader/inlet is factory assembled to the take-up section. The loader/inlet must load in same direction that the belt travels, and material should move from spouts and gates at the same speed as the belt.

IMPORTANT: *Off-center loading is harmful to the belt, idlers, and shafting, and will cause belt alignment problems.*

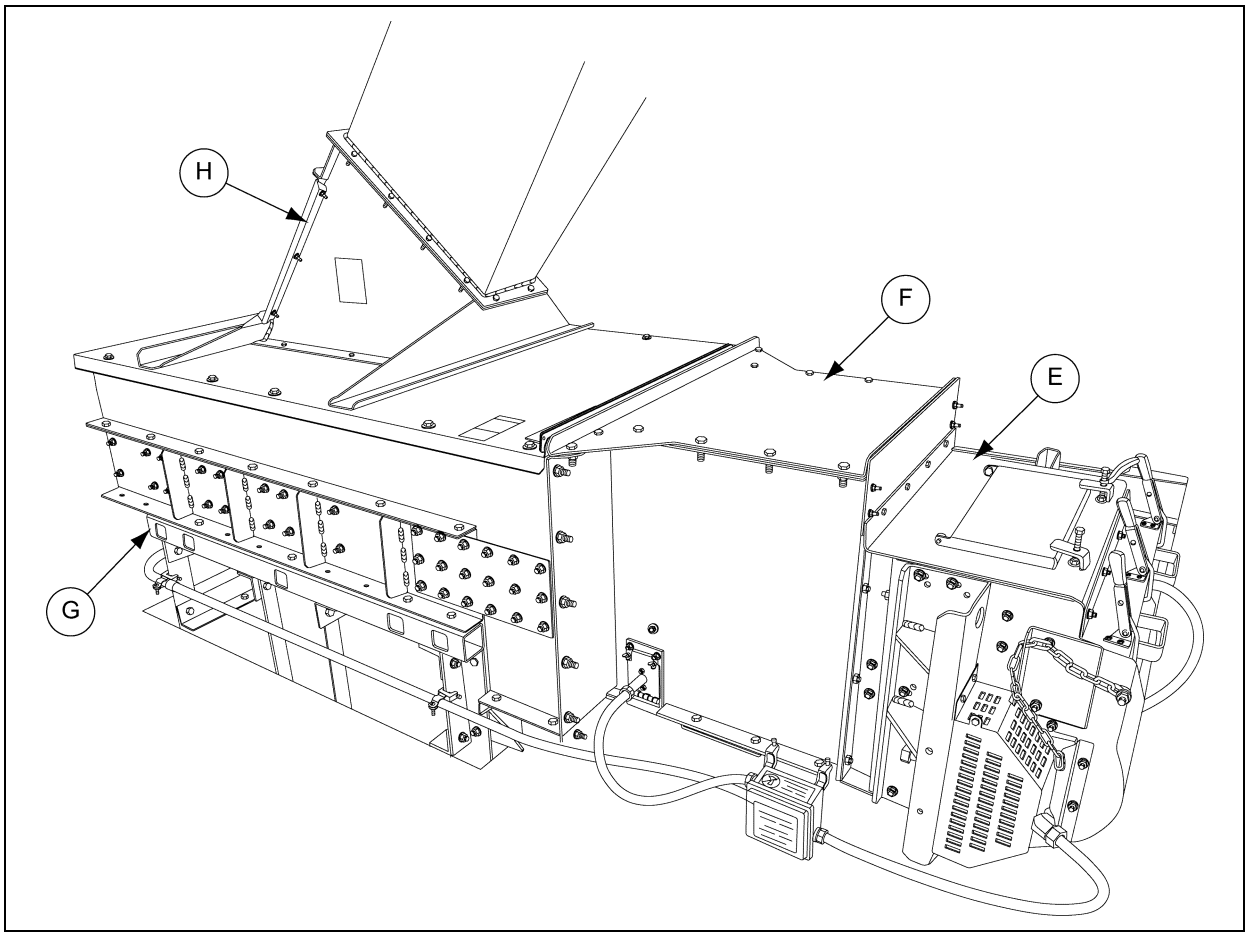


Figure 4B *Tail Section*

Ref #	Description
E	Tail Section
F	Tail Transition section
G	Gravity Take-Up
H	Loader Section

Trunking Installation

1. Install head end trunking. *(See Figure 4C.)*

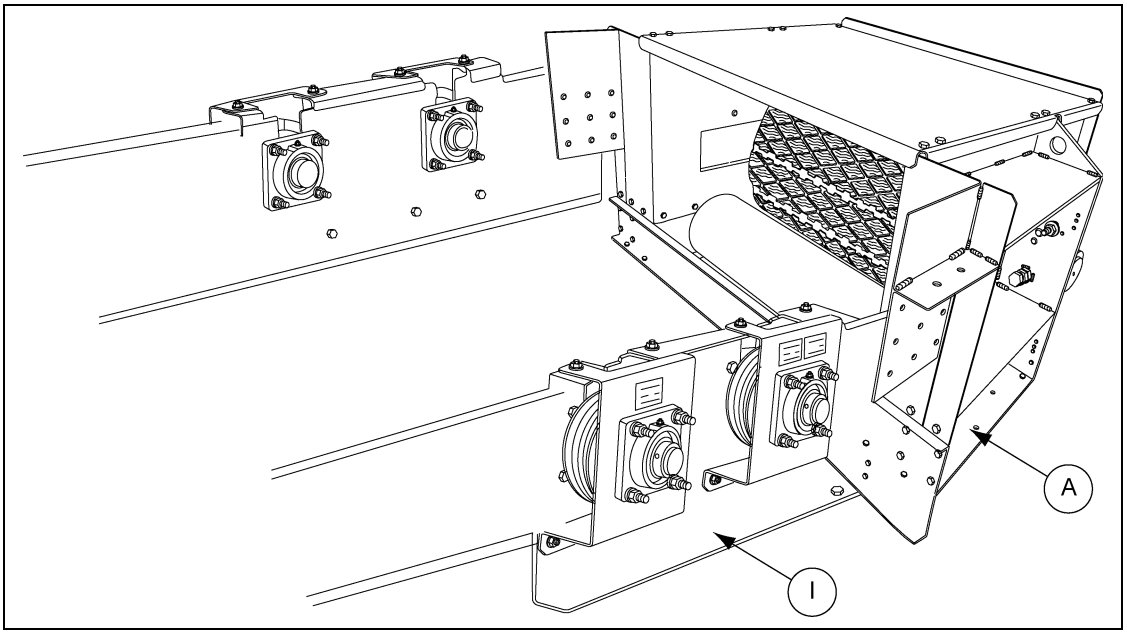


Figure 4C

Ref #	Description
A	Head Section

Ref #	Description
I	Head Trunking Section

2. Take note of the trunking identification/numbering system; use this to help you assemble the trunking in the correct order. *Figure 4D* shows the trunking sections shipped from Intersystems factory.

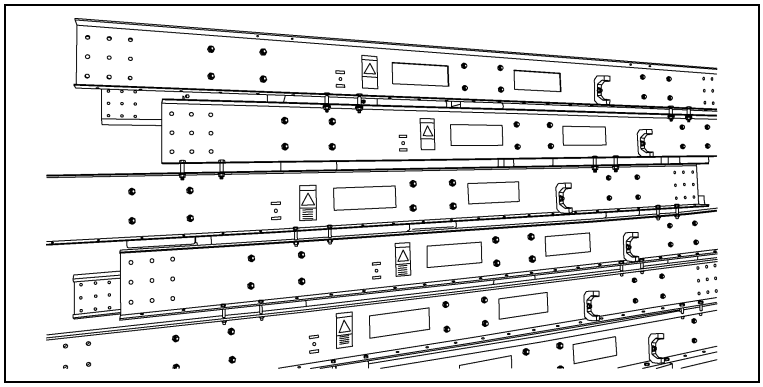


Figure 4D

3. Caulk and seal all exterior bolt-together flanges.
4. Check and double-check with a laser, transit, or wire line that trunking is installed straight and level.
5. Maintain clearances and install head and tail end trunking section.
6. Support legs, feet, and support hangers. Trunking sections must be well supported every 10' of the length of the conveyor.

IMPORTANT: *Support structures and legs must never be welded to the trunking sidewalls or flanges. All connections must be bolted to the trunking or trunking flanges.*

Skirt Installation

The skirts prevent the side spillage of material and keep the load centered on the belt. The skirts are adjustable and can be set to lightly touch the conveyor belt. The skirts are shown mounted underneath and alongside the backplate of the loader. *(See Figure 4E and Figure 4F.)*

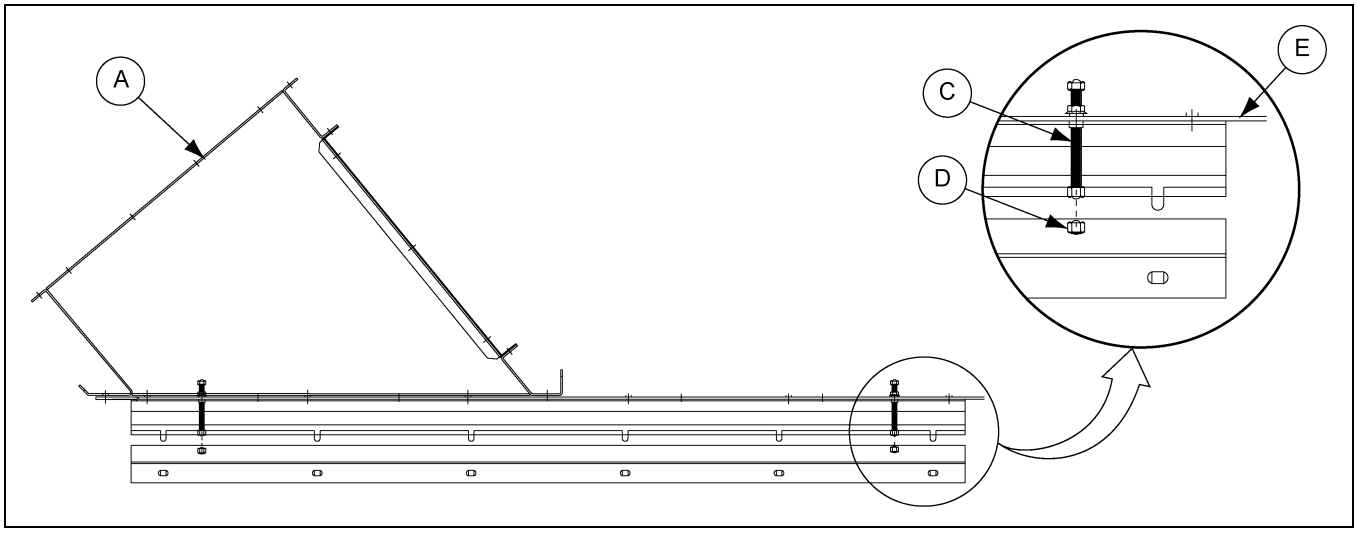


Figure 4E

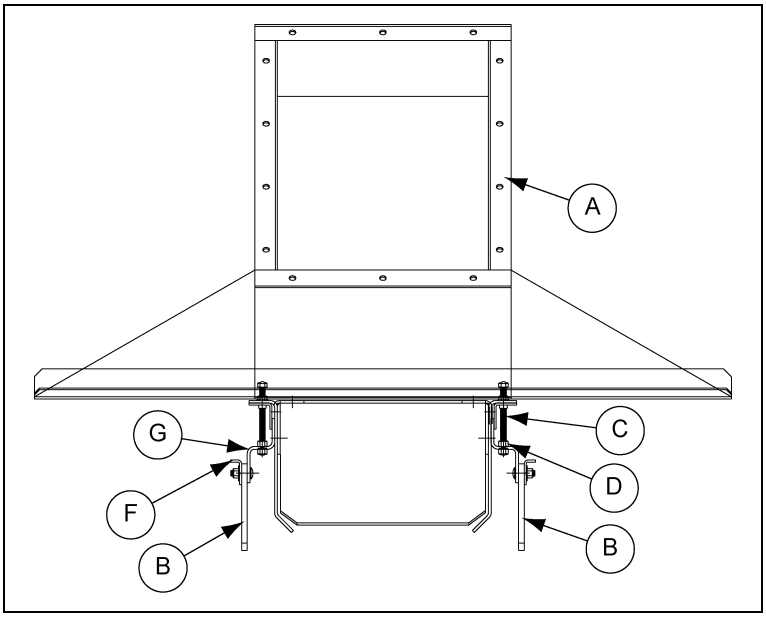


Figure 4F

Ref #	Description
A	Loader
B	Skirt
C	Skirt Bolt
D	Nut

Ref #	Description
E	Lid
F	Skirt Retainer
G	Skirt Board

Idler Installation

The idlers are shipped completely assembled from Intersystems. *Figure 4G* shows a typical troughing and return idlers as shipped from the factory.

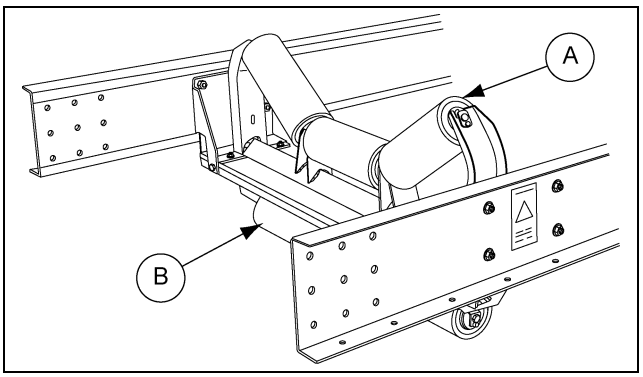


Figure 4G

Ref #	Description
A	Troughing Idler

Ref #	Description
B	Return Idler

Intermediate Discharge Tripper

In order to unload the product at intermediate points along the conveyor, a movable cart is provided. The function of intermediate discharge tripper is to lift the belt and to create an intermediate offload at the point in which it has been stopped. It is manufactured in shaped sheet metal, with a pair of belt return drums. The trolley type of arrangement helps to drop the materials in any location within the specified conveyor length.

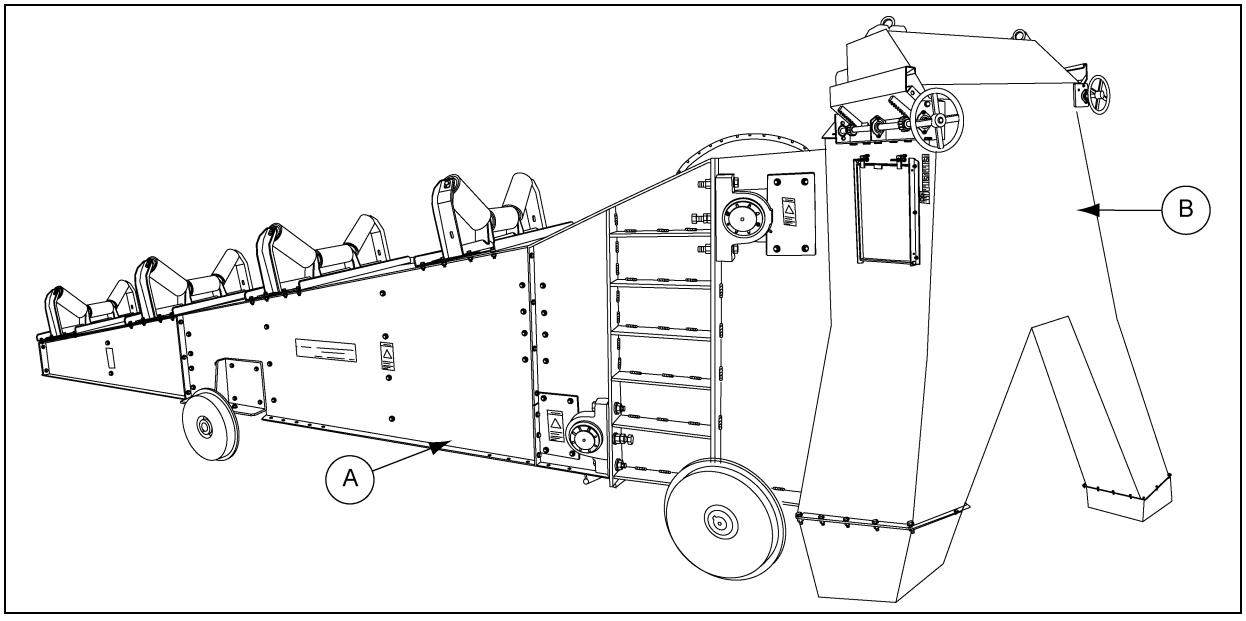


Figure 4H

Ref #	Description
A	Tripper Cart

Ref #	Description
B	Intermediate Discharge

Motor and Torque Arm Reducer Installation

Motor and Shaft Torque Arm II Installation

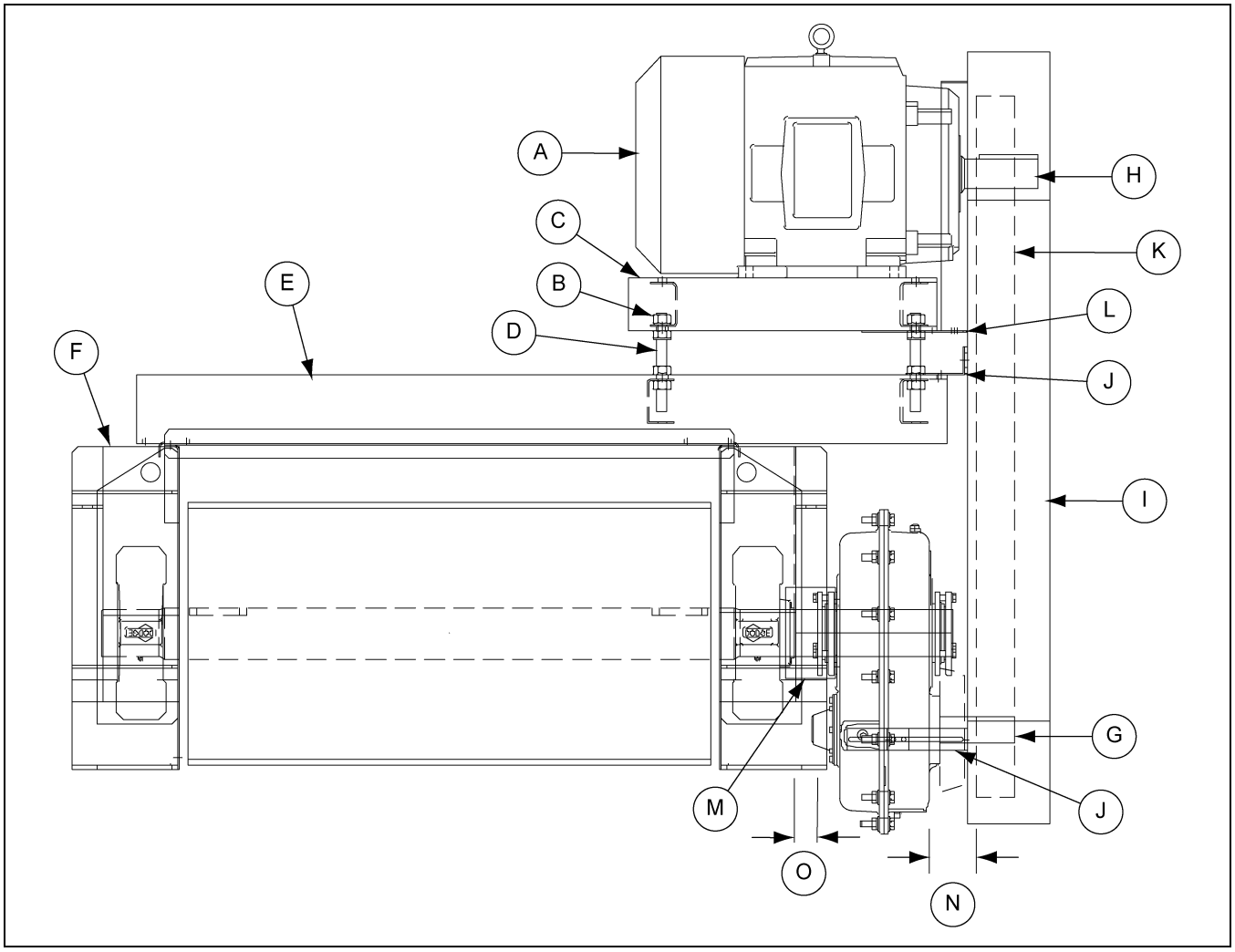


Figure 4I

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
H	Drive Pulley

Ref #	Description
I	Belt Guard
J	Belt Guard Bracket
K	V-Belt
L	Motor Guard
M	Reducer Bushing Guard
N	Keep as close as possible
O	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.*

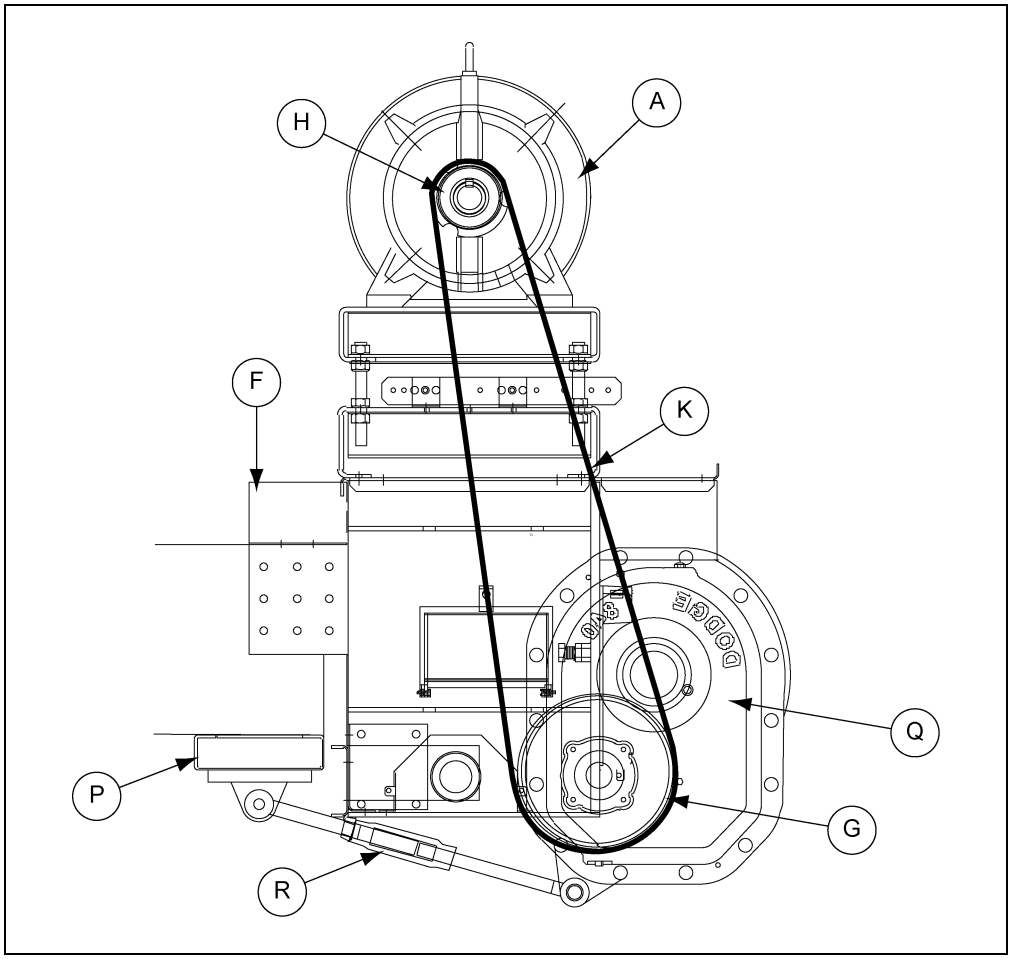


Figure 4J

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

Reducer

1. To aid in the installation of the reducer onto the shaft, remove any protective coating film from the shaft. *(See Figure 4K.)*
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 Figure 4K.)*

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

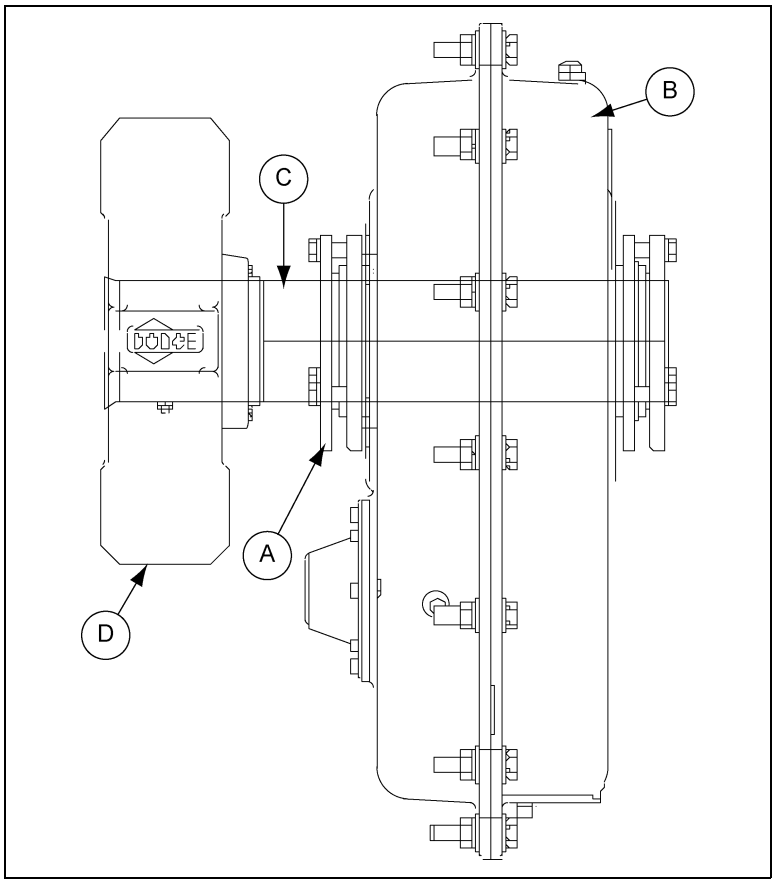


Figure 4K

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

Torque Arm Turnbuckle Assembly

1. Install the torque arm between the two (2) plates that are located on the bottom of the reducer drive.
2. Secure using bolt with washers and lock nuts.
3. Attach the other end to the torque arm bracket on the conveyor using two (2) bolts, washers and lock nuts.
4. Tighten the torque arm by turning the turnbuckle. Adjust the position of the reducer. The reducer should be in a vertical position. *(See Figure 4L.)*
5. The torque arm bracket is mounted under the first intermediate section.

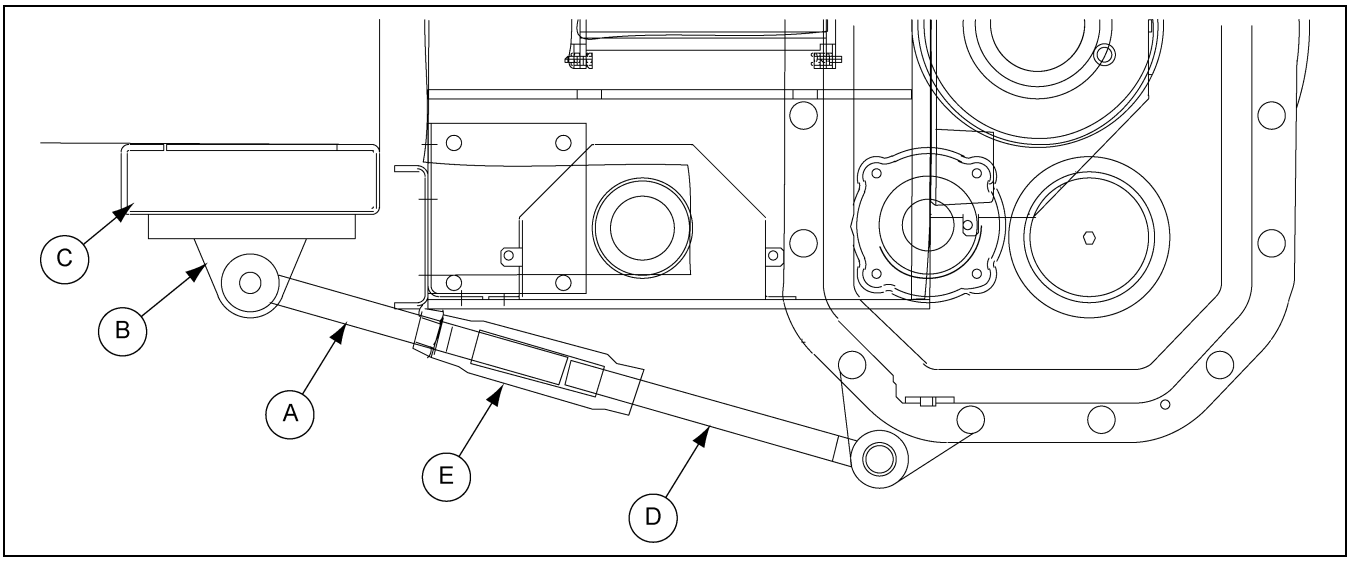


Figure 4L

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

Motor Mount Adjustment Plates

1. 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.
2. 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.
3. Attach the motor to the adjustment plate using bolts and lock nuts. *(See Figure 4M.)*

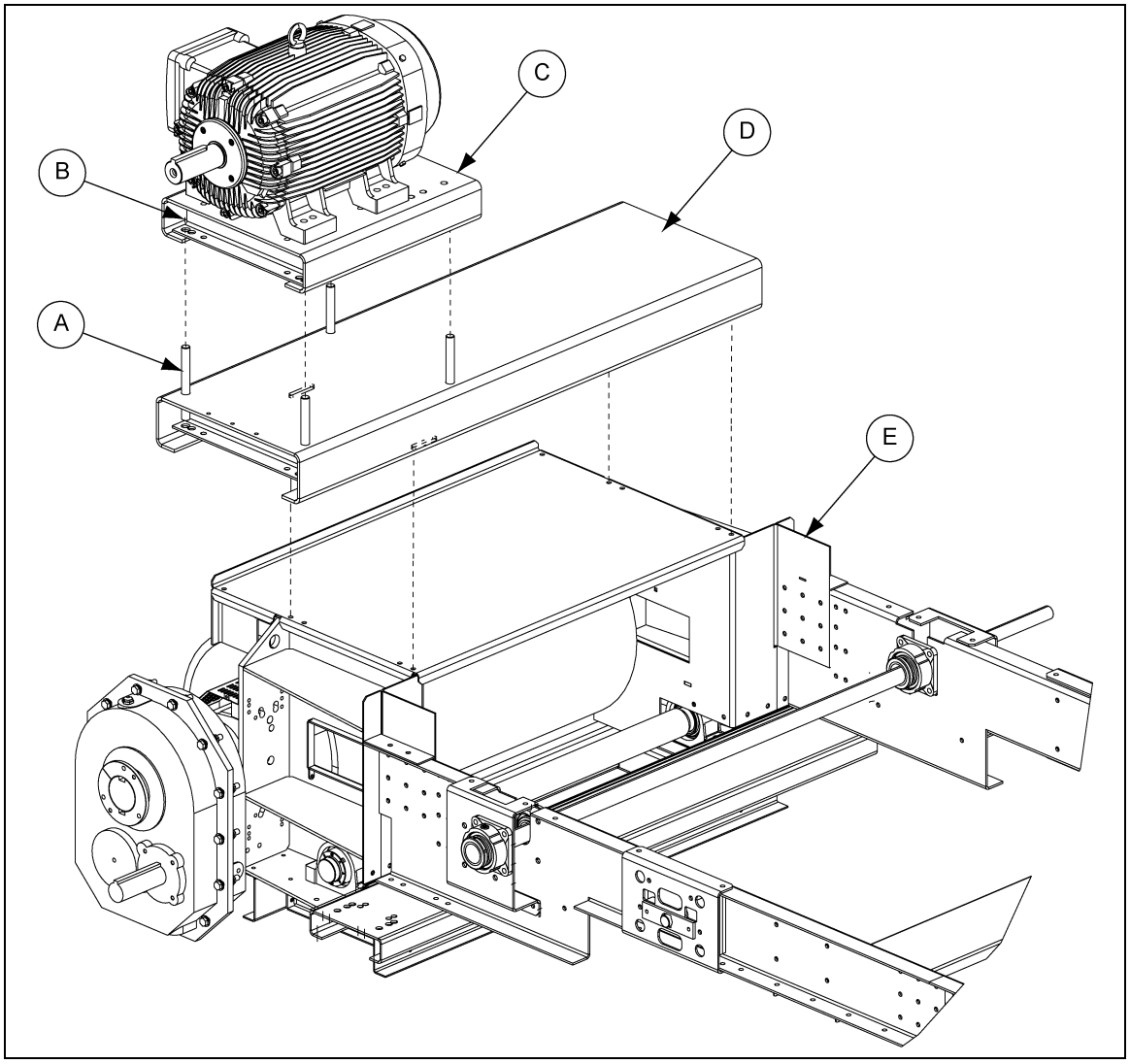


Figure 4M

Ref #	Description
A	Jack Screw
B	Nut
C	Motor Mount Adjustment Plate
D	Base Plate
E	Head Section

Drive Guard Rear Panel

Install the rear panel of the drive guard before mounting the sheaves. The mounting brackets have slotted holes and the other brackets have countersunk holes to mount to brackets and rear panel respectively. Attach the 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.

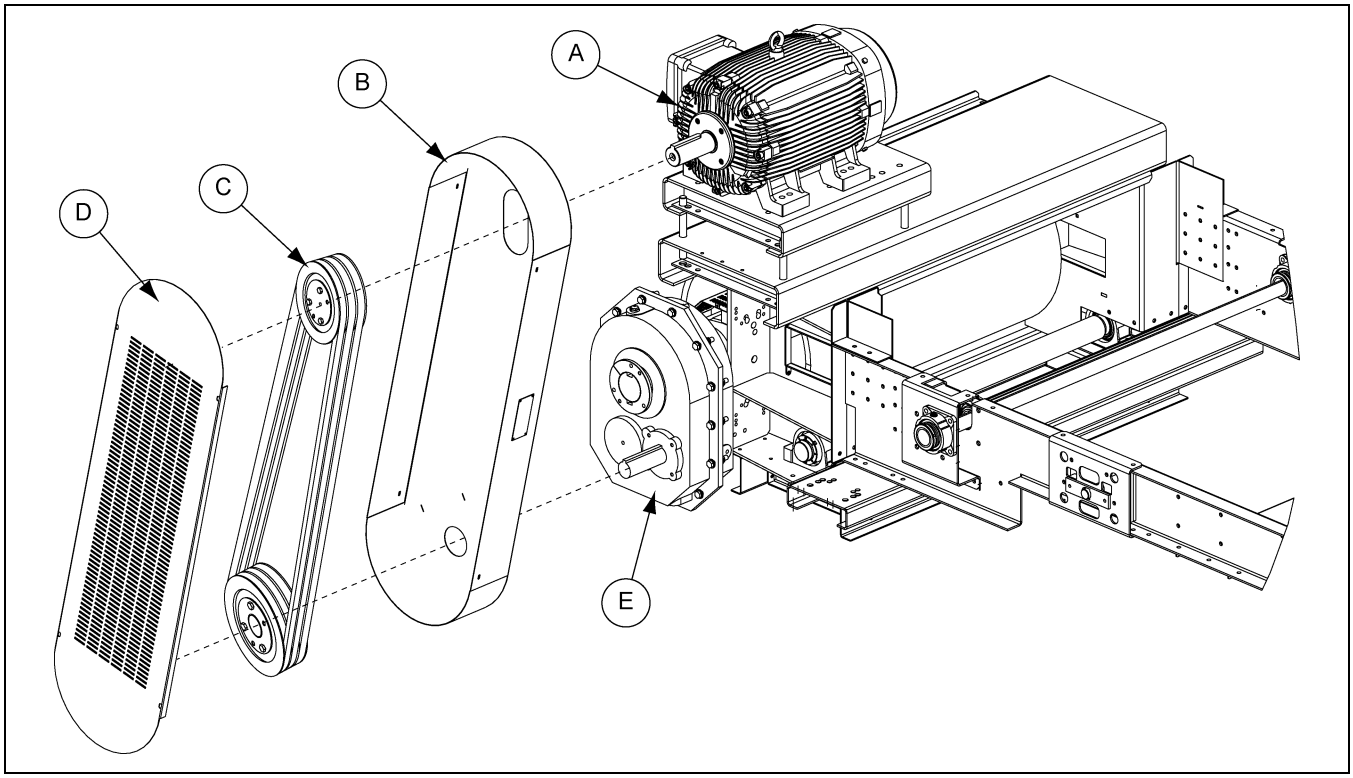


Figure 4N

Ref #	Description
A	Motor
B	Drive Guard Rear Panel
C	Belt Assembly

Ref #	Description
D	Drive Guard Front Panel
E	Torque Arm Reducer

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.

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

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 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 4O.)*

NOTE: *Deflection and force values are listed on certified drawings.*

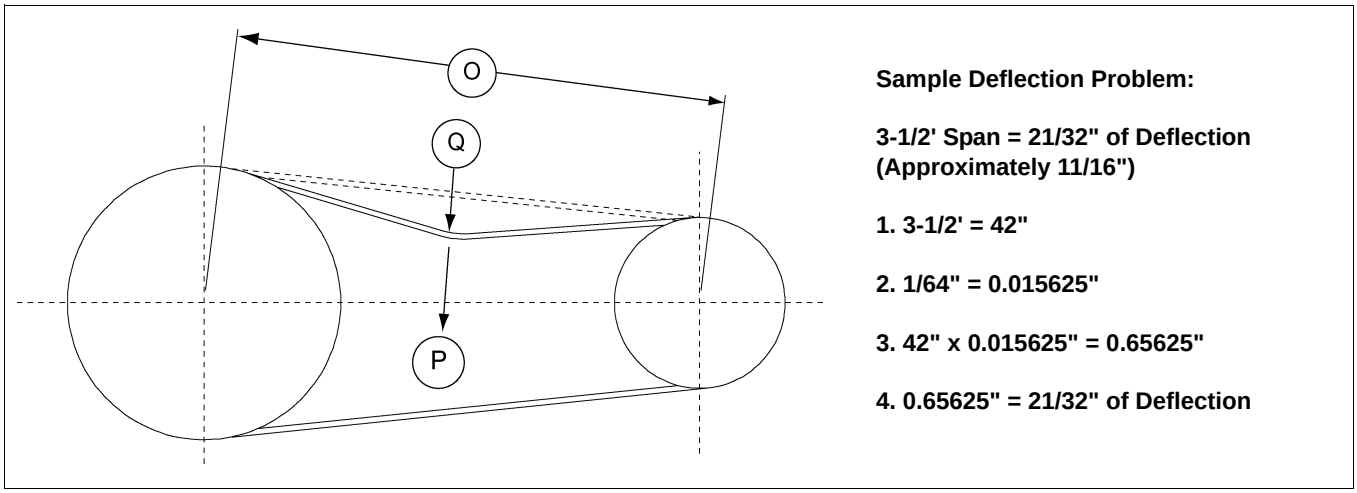


Figure 4O

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

Lubricate Reducer Drive

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

Front Guard Panel

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

Lubricate Bearings

Grease bearings on head, tail and idlers. Lubricate bearings according to bearing manufacturer's recommendations.

Winch Drive Installation

A winch drive is used to pull the tripper cart to different location *(See Figure 4P.)* A winch cable wrap around winch wheel and motor drives the winch wheel *(See Figure 4Q.)*. This will make trolley to move forward and backward.

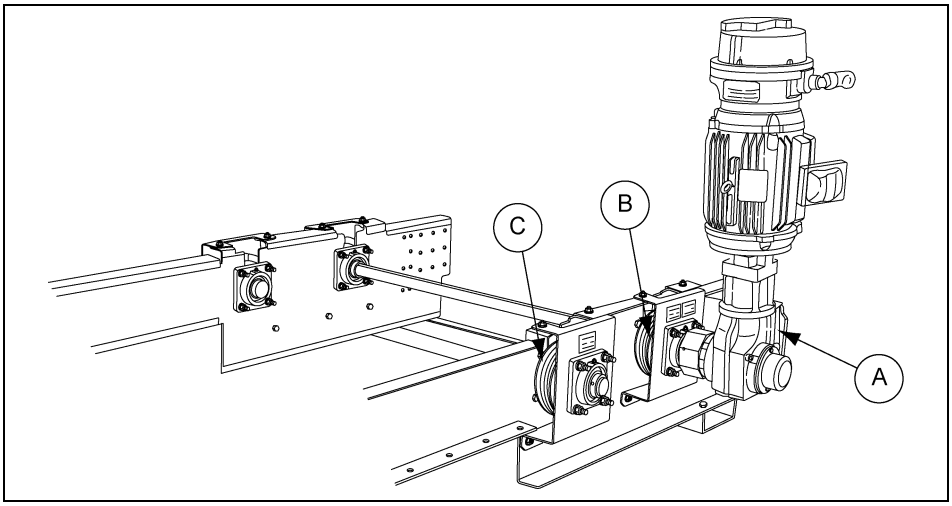


Figure 4P

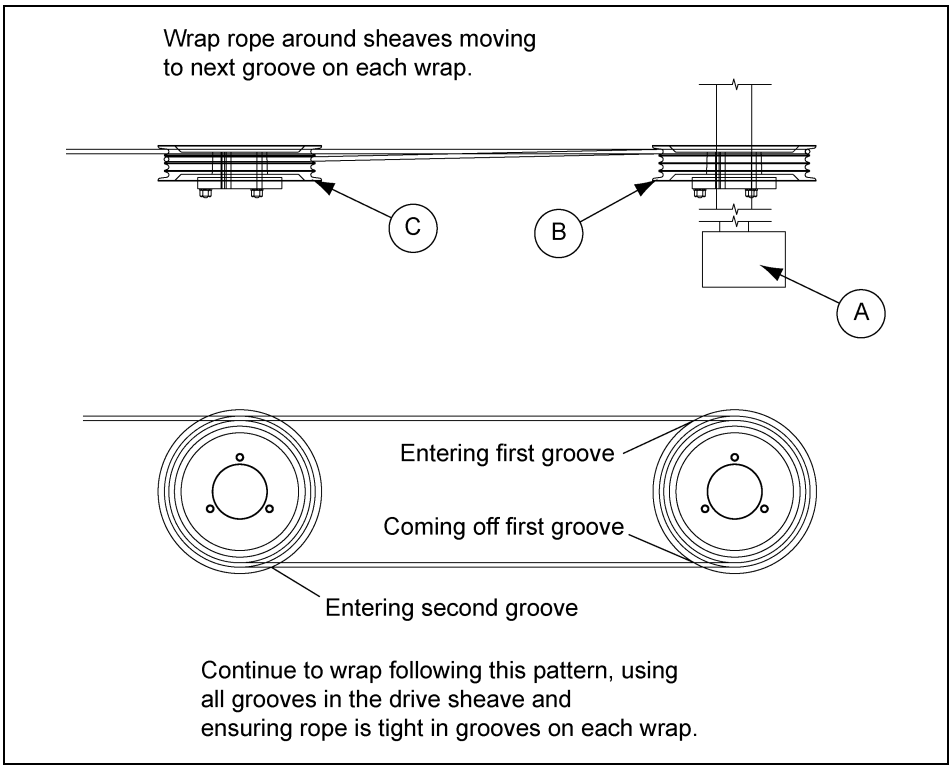


Figure 4Q

Ref #	Description
A	Motor Drive
B	Drive Sheave

Ref #	Description
C	Secondary Sheave

Belt Installation

Finding Belt Centerline

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 4R.)*

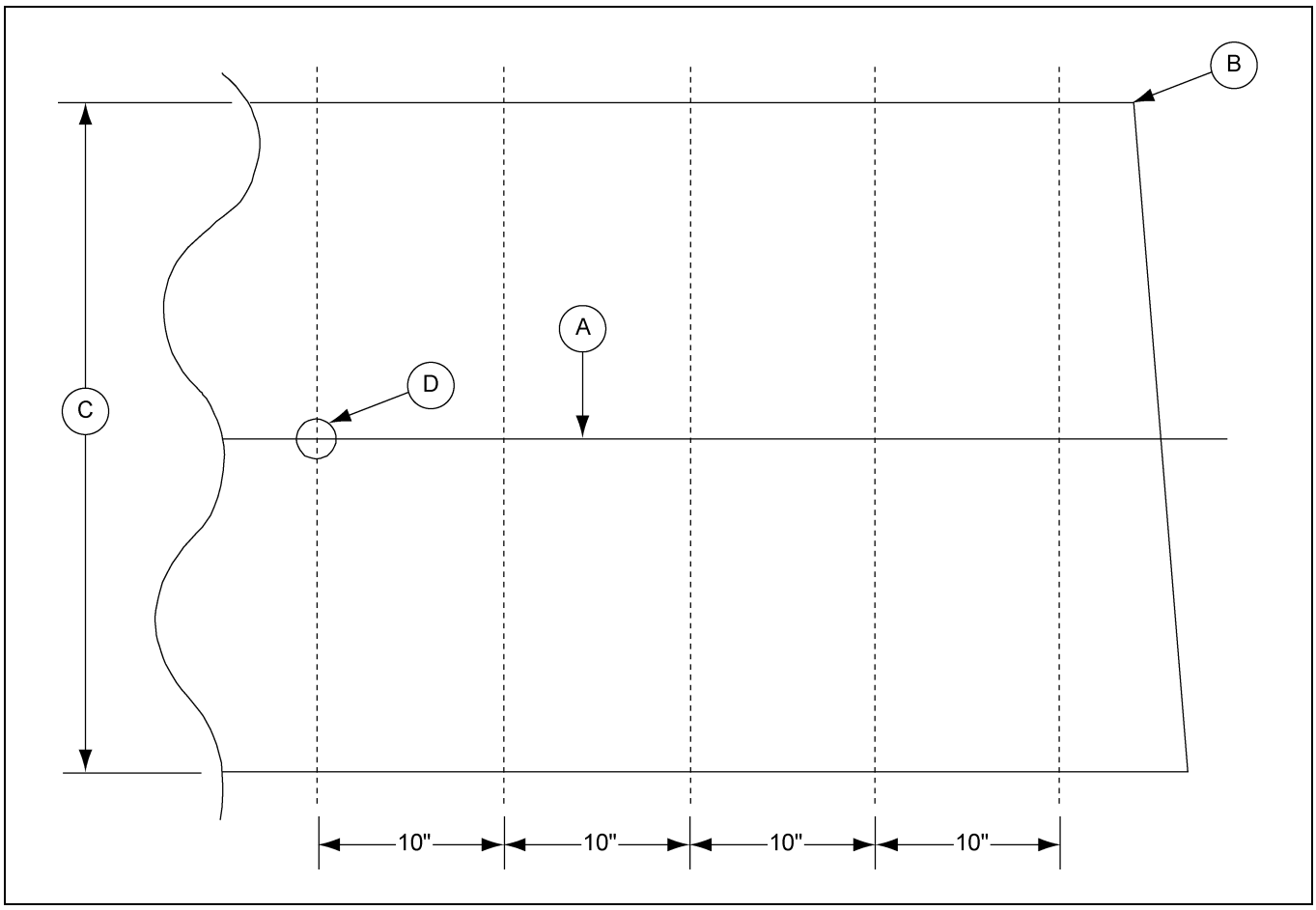


Figure 4R

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

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 4S.)*

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

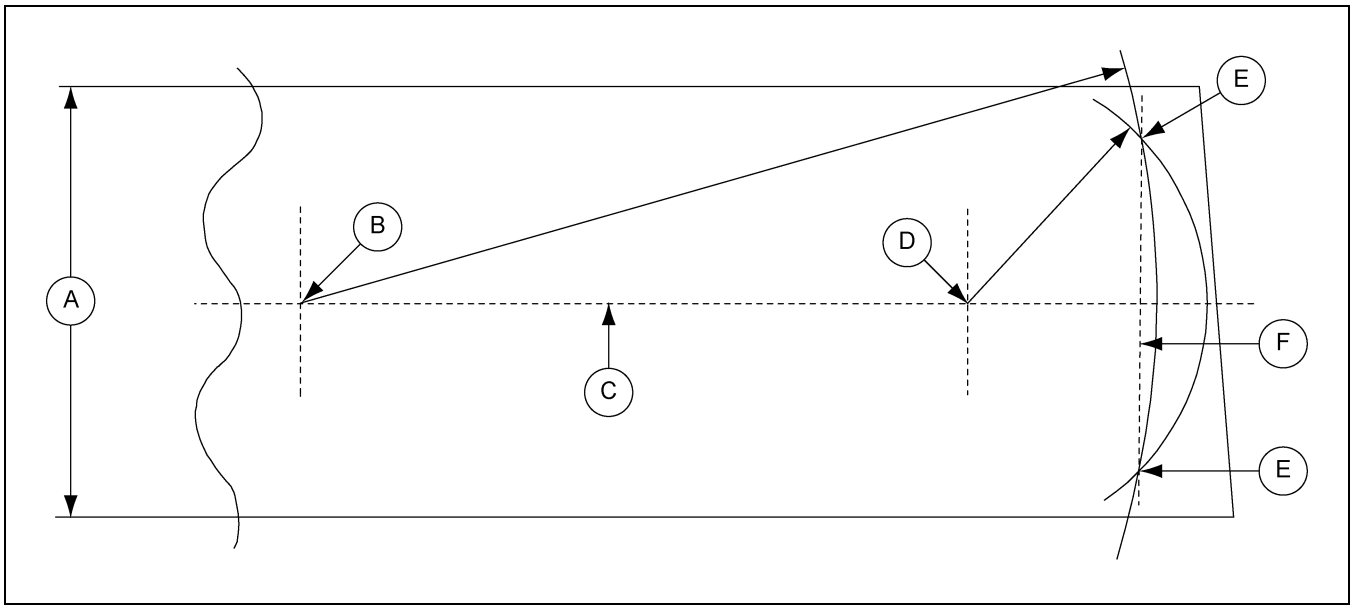


Figure 4S

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 4T.)*

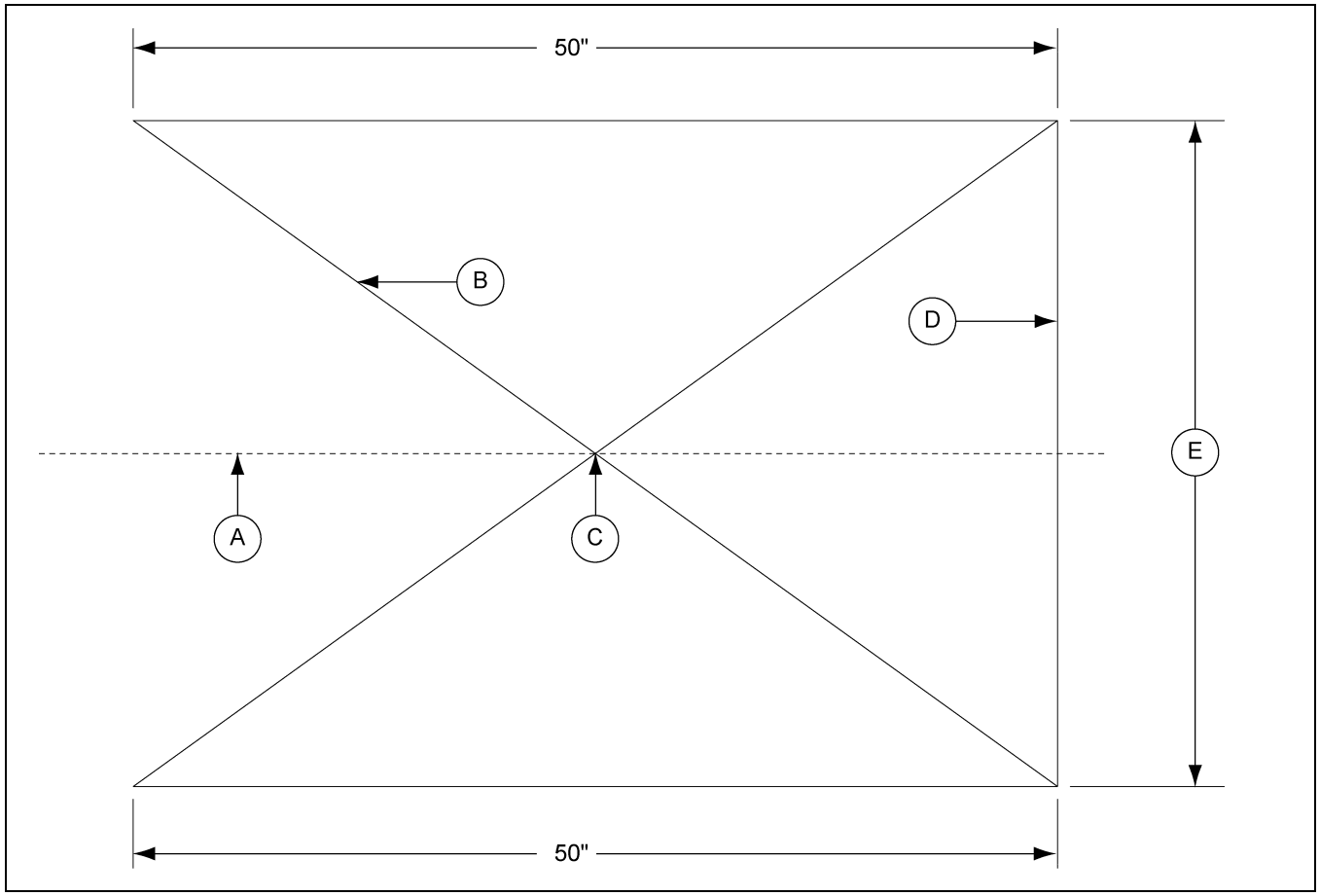


Figure 4T

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

Installation of Belt

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. The belt splice can now be installed following step-by-step directions on.

Splicing the Belt

1. Support belt ends with wood plank. Nail Flexco Template in position with belt ends tight against lugs. *(See Figure 4U.)*

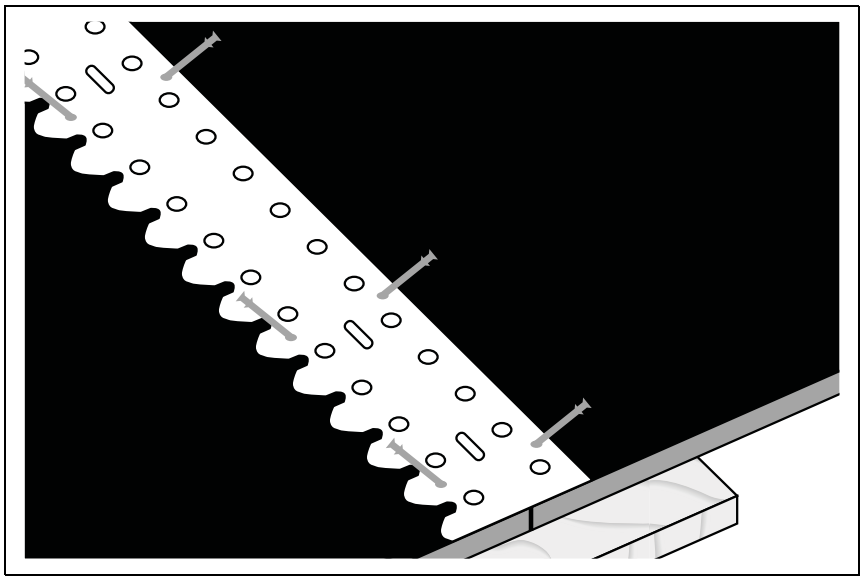


Figure 4U

2. Spray template holes with Flexco Silicone Lubricant. Punch or bore bolt holes. Remove template. *(See Figure 4V and Figure 4W.)*

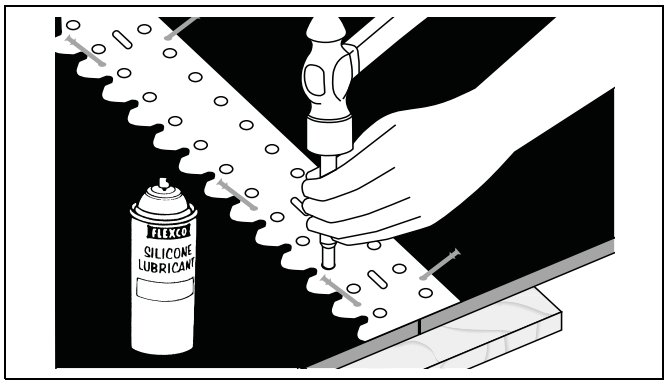


Figure 4V

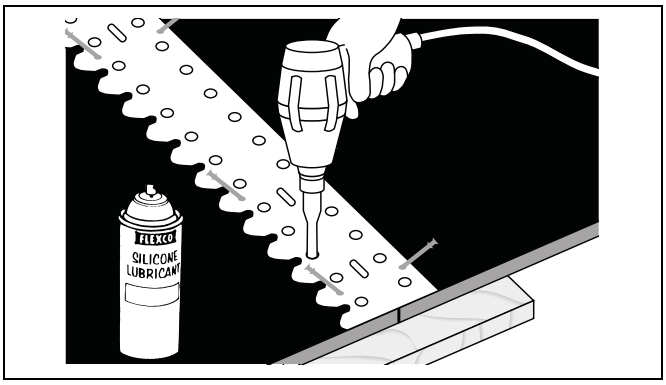


Figure 4W

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

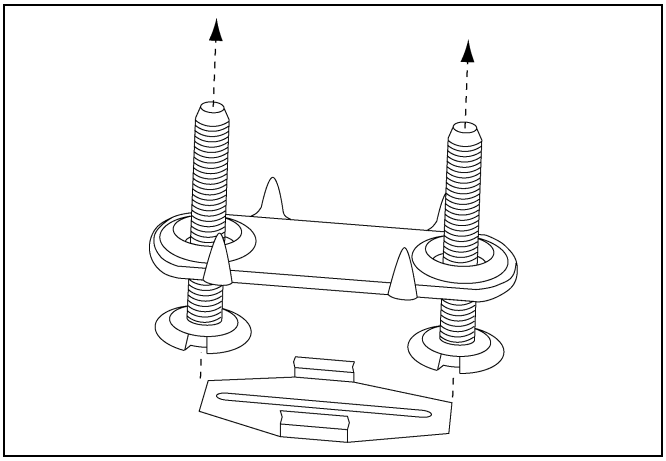


Figure 4X

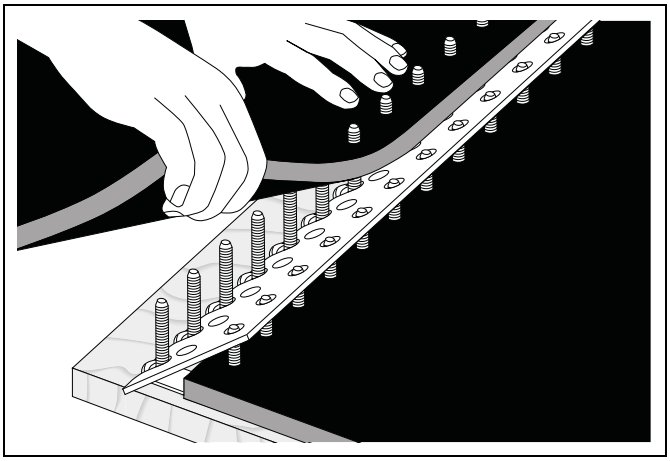


Figure 4Z

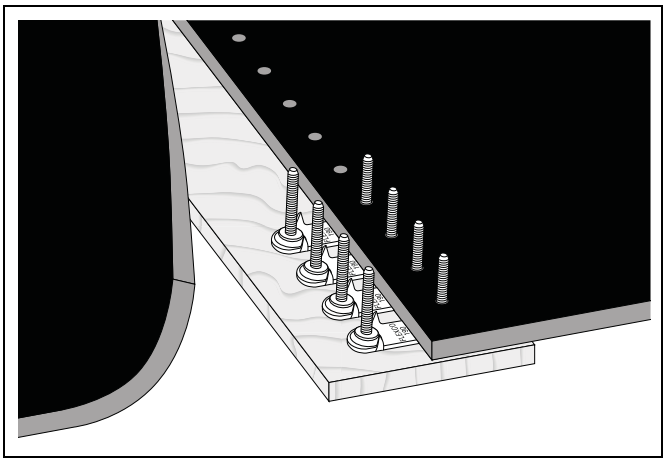


Figure 4Y

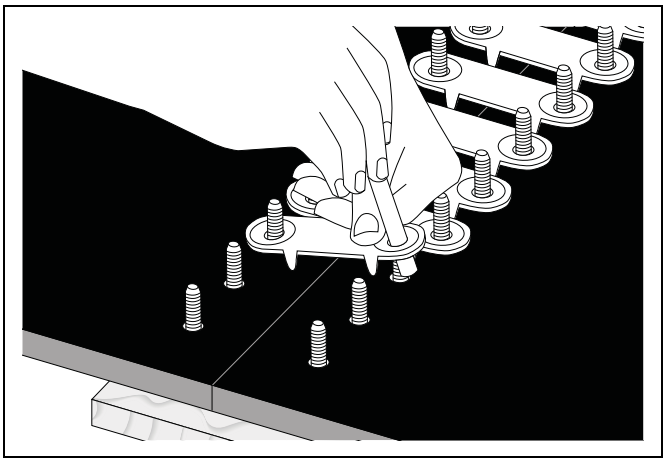


Figure 4AA

7. Start nuts on bolts by hand. *(See Figure 4AB.)*
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 4AC.)*
9. Pull tape tight and hold in position by tightening a fastener at each end. Then tighten all other plates. *(See Figure 4AD.)*
10. Tighten all nuts uniformly. **NOTE:** *A Flexco Power Wrench used with an impact tool will speed this step considerably.* *(See Figure 4AE.)*

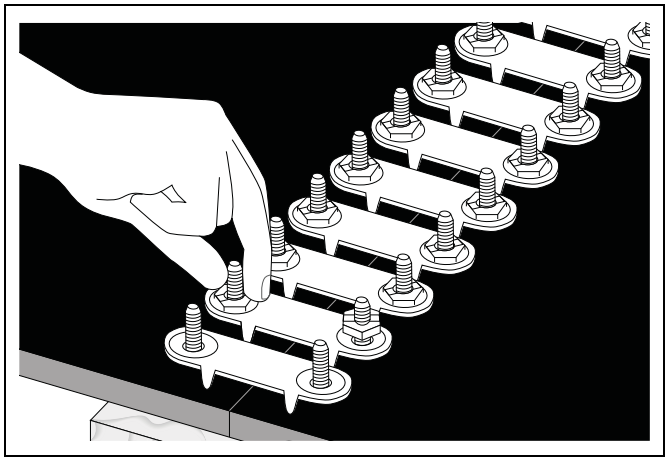


Figure 4AB

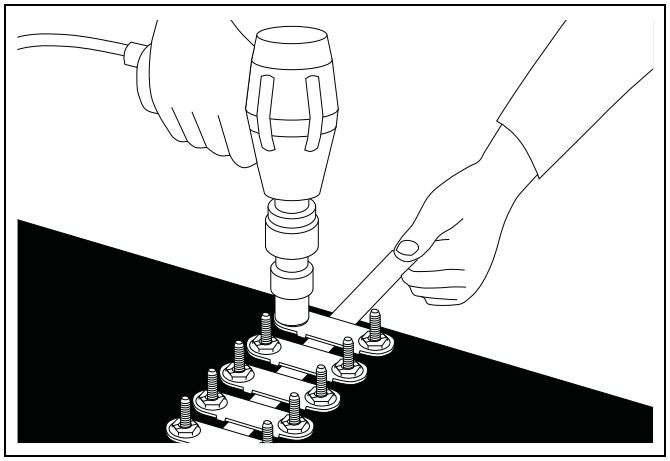


Figure 4AD

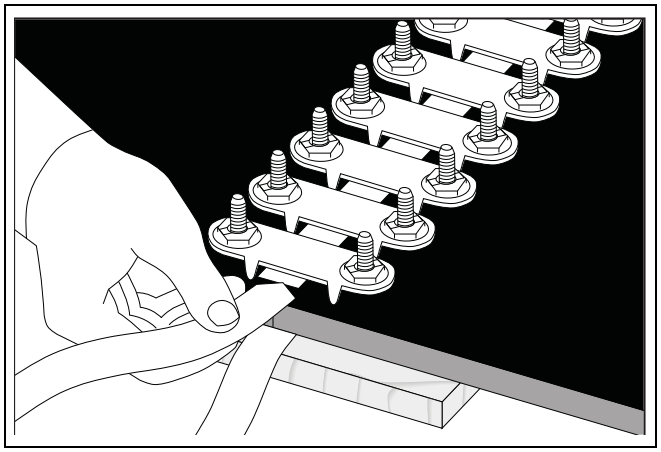


Figure 4AC

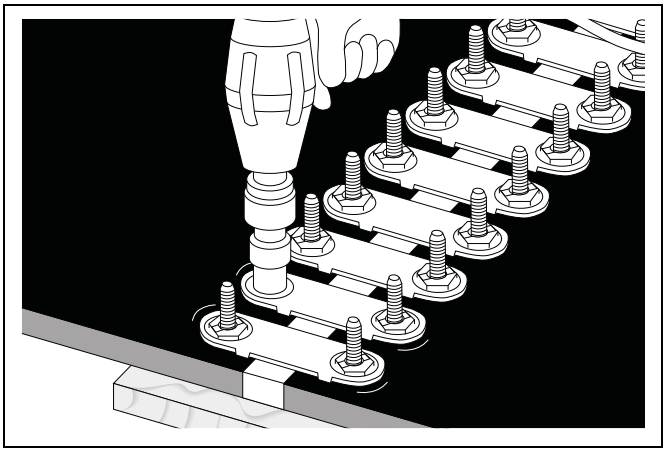


Figure 4AE

11. Hammer plates in belt with wood block. Retighten nuts. *(See Figure 4AF.)*
12. Break off excess bolt ends using two (2) bolt breakers. Peen or grind bolts to finish. *(See Figure 4AG.)*
13. Finished splice.

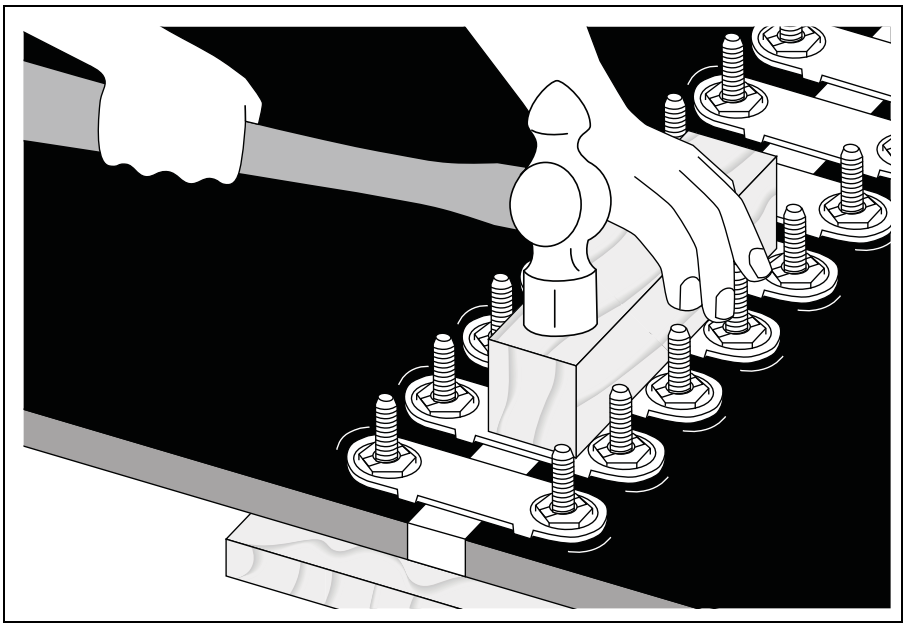


Figure 4AF

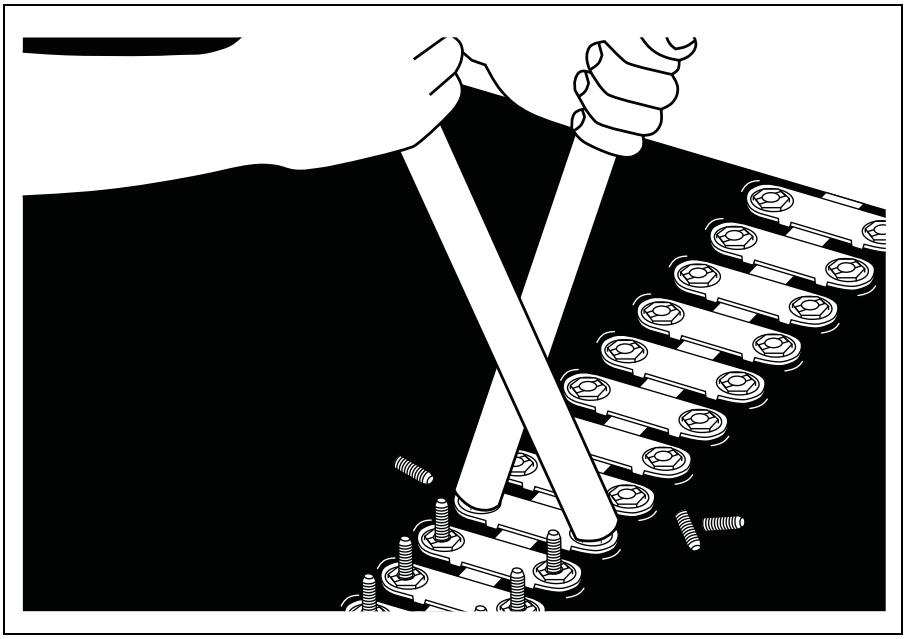


Figure 4AG

Belt Tension

The belt is tightened by gravity tensioner with weights hanging located near the tail section. The weight box is free to slide vertically between channel guides. The conveyor belt should be tightened enough to prevent the belt from slipping on the drive pulley. *(See Figure 4AH.)*

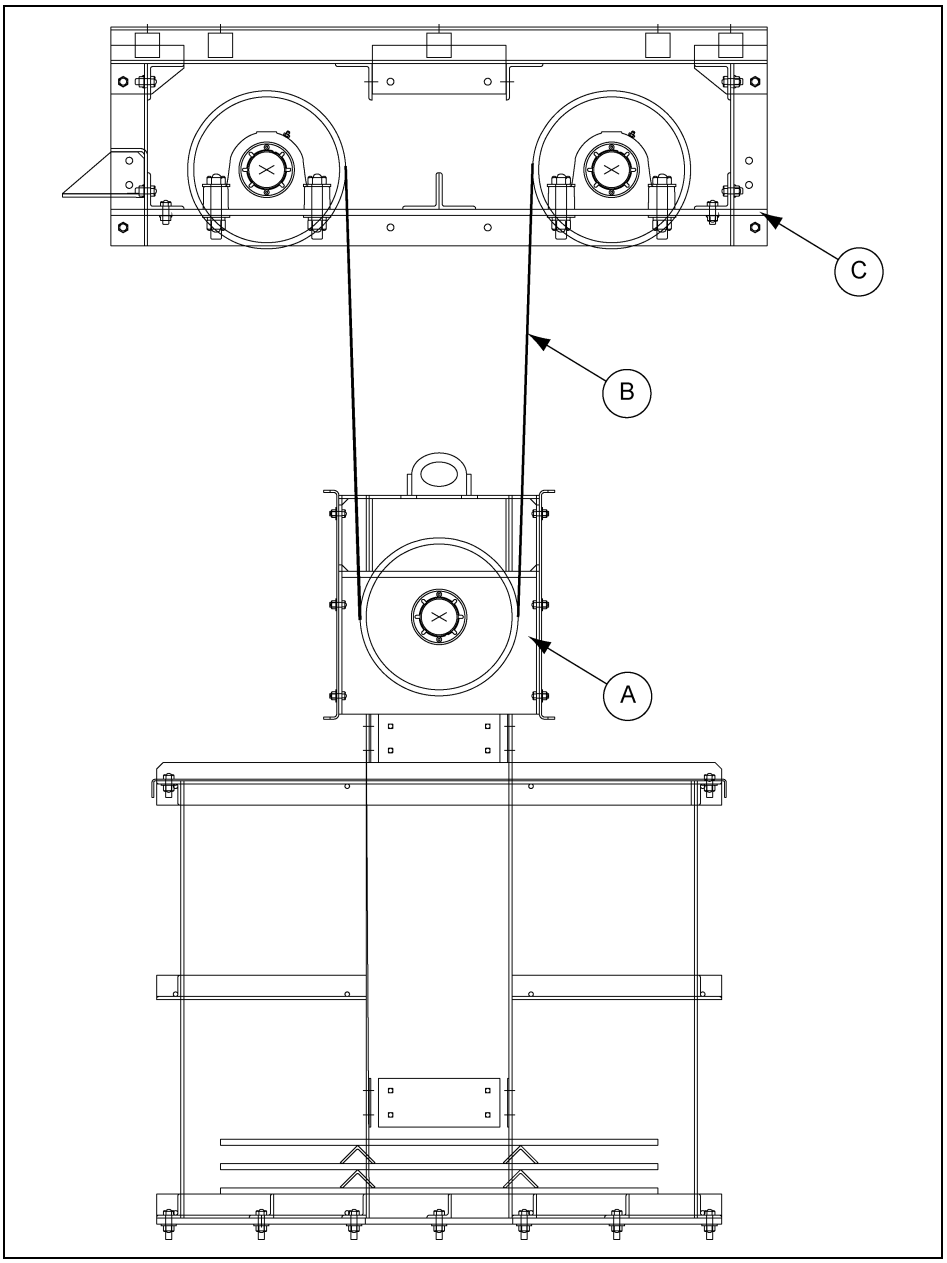


Figure 4AH

Ref #	Description
A	Weight Box
B	Belt
C	Pulley Box

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.
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.

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.
5. Adjustment of the idlers is done by loosening four (4) bolts. After loosening these bolts, the end of the idler can shift either forward or backward.

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.

V-Plow

The v-plow is located just in front of the tail pulley. *(See Figure 4AI.)* The V-plow is installed in the tail section before the belt has been installed. The v-plow:

1. Holds back large amounts of spilled material that would plug the conveyor.
2. Helps direct spilled material to the side of the tail section to be reloaded.

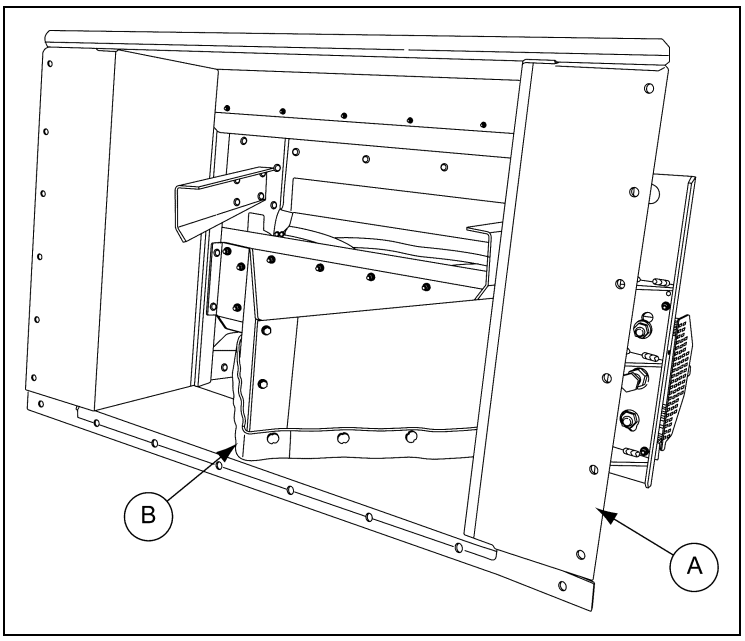


Figure 4AI

Ref #	Description
A	Tail Assembly
B	V-Plow

Limit Switch

2 SPDT Limit Switches are provided to set the ends of travel for the intermediate tripper. End of travel points are shown on the certified drawing.

Loosen and adjust the limit switch arm if required.

Loading

Spouting

1. Below are the recommended and incorrect ways to attach spouting to load the conveyor. Contact the InterSystems if there are any questions about loading conditions.

   Fertilizer stream centered on the belt. Fertilizer moving in the same direction and at the same speed as the belt. *(See Figure 5A.)*

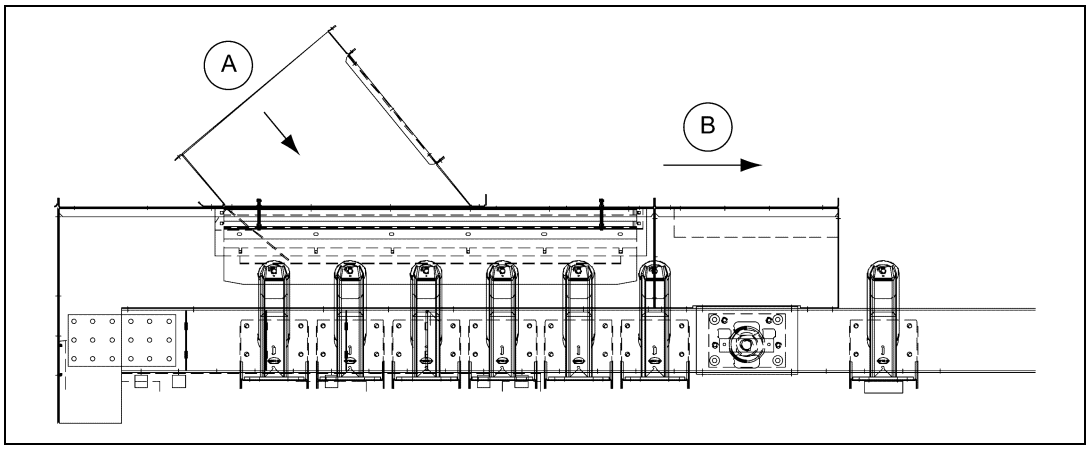


Figure 5A *Recommended*

   Fertilizer should be loaded in the same direction of belt travel and at the same speed. *(See Figure 5B.)*

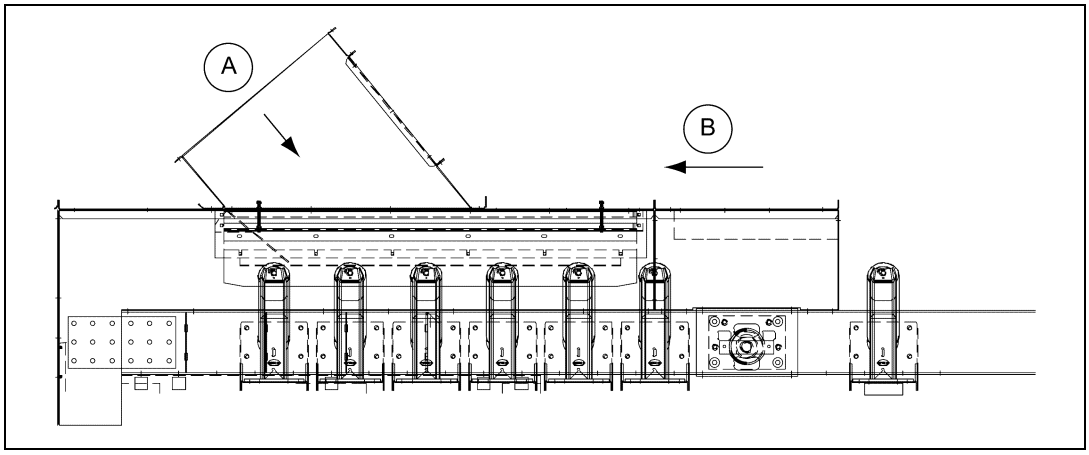


Figure 5B *Incorrect*

Ref #	Description
A	Fertilizer Flow
B	Belt Direction

Spouting Location

Fertilizer should load straight into the conveyor at approximately a 45° angle.

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.

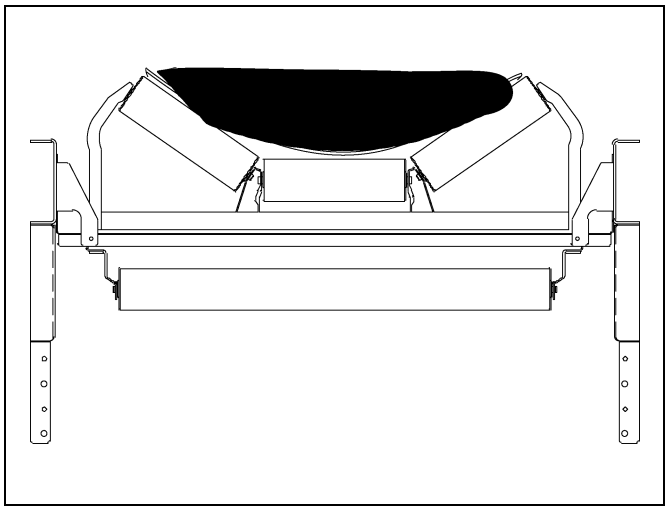


Figure 5C *Correct - Evenly Loaded*

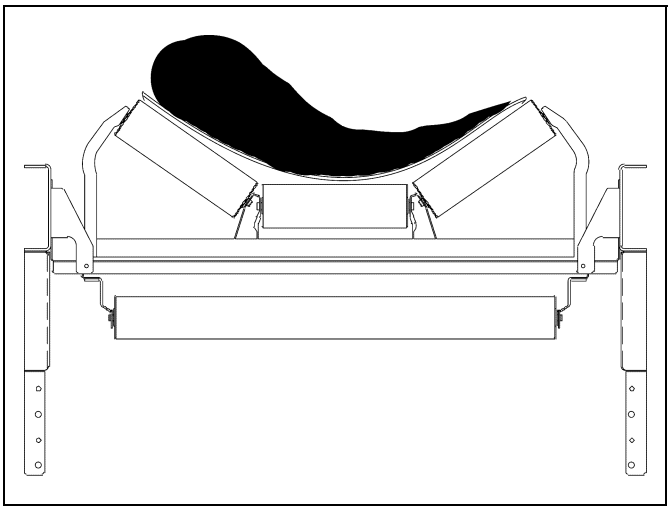


Figure 5D *Incorrect - Loaded to One Side*

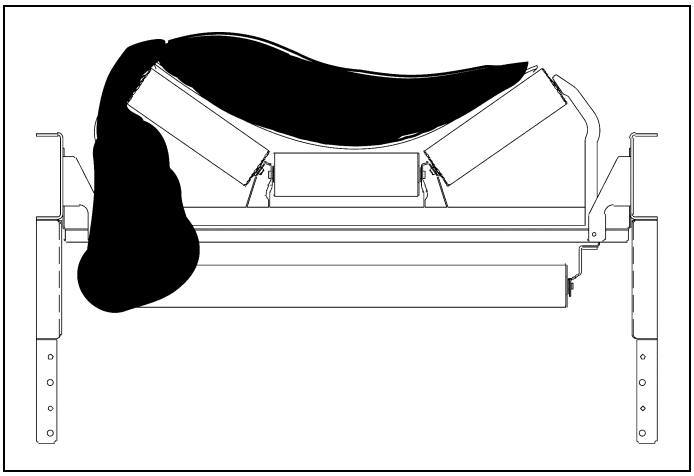


Figure 5E *Effect of Improper Loading*

Options

Motion Sensor Option (Whirligig - WG1-4B-2)

Installation Instructions

> **WARNING**
>
> ***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 5F.)*
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.*

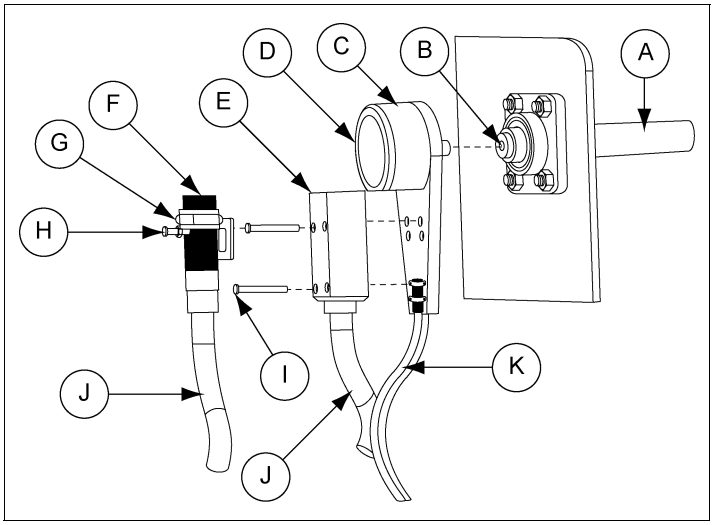


Figure 5F

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

Pull Switch

It is often more convenient and effective to use a cable pull device along the hazard area as the emergency stop device.

These devices use a steel wire rope connected to latching pull switches so that pulling on the rope in any direction at any point along its length will trip the switch to cut off the machine power.

The cable pull switches must detect both a pull on the cable as well as when the cable goes slack. Slack detection ensures that the cable is not cut and is ready for use.

Start-Up

Starting Conveyor

1. Check for and remove any tools or debris that may have been left in the conveyor during installation.
2. Visually check head section, tail section and intermediate trunking sections for proper belt alignment and clearance.
3. Tighten the take-up rods if applicable 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.
4. The conveyor should be inspected from the head section to the tail section to be sure everything is operating properly.
5. Make sure to inspect belt tracking, loading, discharging, clearances, self-cleaning, reloading, etc.

NOTE: *When starting conveyor for the first time, be prepared for an emergency shutdown in case of excessive vibration or noise.*

Secure Shroud During Maintenance

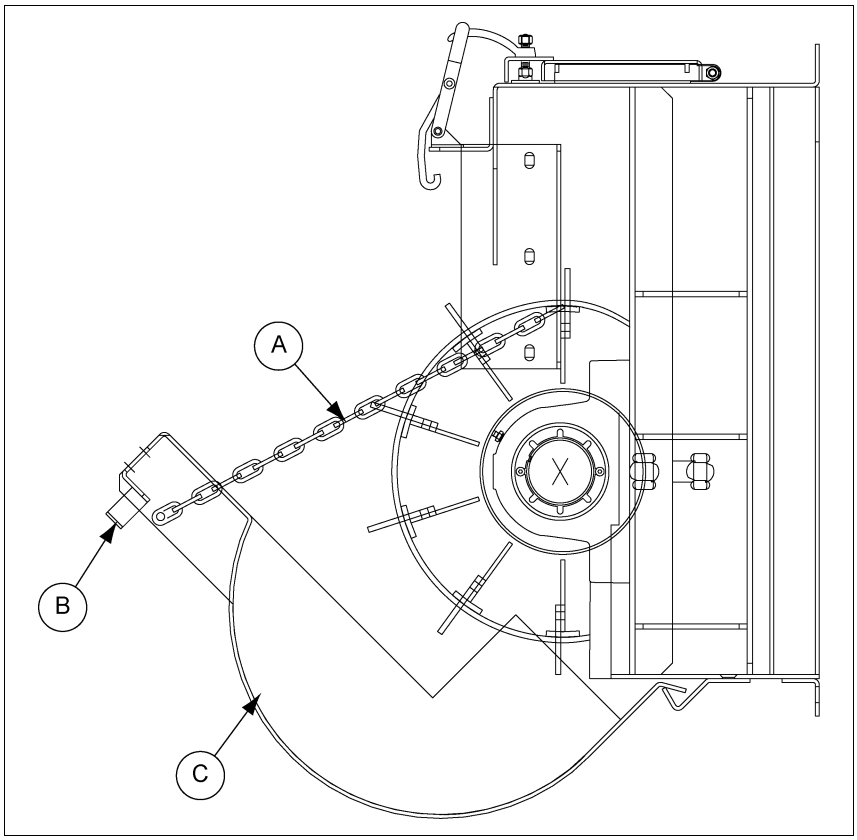


Figure 5G

Ref #	Description
A	Chain
B	Slot
C	Shroud

NOTE: *While accessing the tail pulley, the tail shroud may either be removed or pivoted in down position. If pivoted down, then secure the shroud by placing the chain in the slot as shown in Figure 5G.*

Operating with a Full Load

1. Monitor the conveyor during operation for abnormal noises or vibrations.
2. Shut off all power before making adjustments, servicing, or clearing the machine.

Shut Down

Normal Shut Down

1. Before shutting down the motor, make certain that conveyor is clear.
2. Near the end of a load, decrease the flow of material until conveyor is clear.

Emergency Shut Down

1. If the conveyor is shut down for an emergency, lock out motor before correcting the problem. If the problem is plugging, clear as much material as possible before restarting.

Lock Out

1. Always disconnect and lock out the power source before leaving the work area or before performing any maintenance or service.

Plugging

1. If the conveyor becomes plugged, stop conveyor motor and lockout/tagout motor.
2. Shut inlet feed gates or stop other equipment feeding inlet to stop flow to plugged conveyor and determine the source of the plug.
3. Check tail section first by removing cover or opening inspection doors and clean out.
4. Check head/discharge and clean out.
5. Check the return belt top and bottom for plugging and clean out.
6. When restarting, start normally, then reopen gates or legs feeding conveyor.

Storage

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 belt tension to relieve the stress placed on the bearings and shafts of the drive and tail sections.

ALWAYS shut down and disconnect the power supply before adjusting, servicing or cleaning the conveyor assembly.

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.
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 shaft mount reducer assembly section *on Page 19*.
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

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 apporved 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. 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.

Electric motors and controls shall be installed by a qualified electrician and must meet the standards set by the national elecrical code all other applicable federal, state and local codes and regulations. Reset and motor starting controls shall be located where the operator has unrestricted access to the controls. Do not make alterations or modifications to the unit.

Support

1. Supports must be installed at least every 10' of the length of the conveyor.
2. Support legs or hangers should always be bolted to the trunking vertical or bottom flanges. Supports should never be welded to the trunking sides.

Grounding

Conveyors should be grounded by a qualified electrician according to the local codes and regulations.

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
Conveying belt drifts sideways.	1. Belt not properly tracked.	1. Track belt over pulleys.
	2. Belt splice not square.	2. Check splice squareness, re-splice.
	3. Material not placed on center of belt.	3. Direct material through loader and spouting.
	4. Machine is not straight.	4. Check machine alignment with chalk line or string.
	5. Machine not level.	5. Check and level sections.
	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.
		2. Track conveying belt.
		3. Check machine alignment and levelness.
		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.

NOTES

InterSystems, Inc. reserves the right to make changes in design or in construction of equipment and components without obligation to incorporate such changes in equipment and components previously ordered.

WARRANTY, LIMITATION OF LIABILITY, DISCLAIMER OF IMPLIED WARRANTIES: InterSystems, Inc. manufactured equipment and components are guaranteed against defects in workmanship or materials for one year from date of shipment. The obligation of InterSystems, Inc. with respect to any goods is limited to replacement or repair of defective parts and equipment provided those parts are returned, shipping costs prepaid, to InterSystems' factory and provided the product has not been subject to misuse, negligence, or accident, or repaired or altered outside of our factory, or other than by an Authorized Service Representative. This warranty does not cover the replacement of parts inoperative because of wear occasioned by use, the cost of replacing parts by a person other than an InterSystems employee or an Authorized Service Representative, or the adjustment of a product where the product was improperly adjusted by the purchaser. In addition, this warranty does not cover components manufactured by others such as motors, drives, clutches, cylinders, valves, blowers, and the like. On those components the standard Manufacturers' warranty applies. In any event, liability is limited to the purchase price paid, and InterSystems, Inc. will, under no circumstances, be responsible for special or consequential damages, or for incidental damages.

INTERSYSTEMS, INC. NEITHER MAKES NOR AUTHORIZES ANY WARRANTY OTHER THAN AS HEREIN CONTAINED. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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.

InterSystems
9575 N. 109th Ave.
Omaha, Nebraska 68142
Toll Free: (800) 228-1483
www.intersystems.net

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