

Installation, Operation, Maintenance Manual



CRUZ[®]belt

IOM Part Number: E0032544
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Seleccione aquí para CRUZbelt
IOM en español

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1 IOM INTRODUCTION

IOM Purpose

It is the intent of MHS Conveyor, through this manual, to provide information that acts as a guide in the installation, operation, and maintenance of MHS Conveyor conveyors.

This manual describes basic installation practices, assembly arrangements, preventive maintenance, and assists in replacement parts identification.

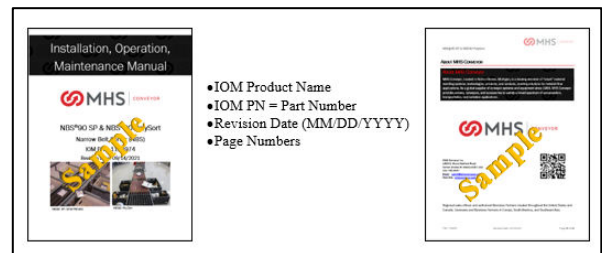
This service manual is intended for use by personnel who are knowledgeable of installation and safe working practices on conveyor systems.

Not all applications and conditions can be covered; therefore, this manual is to be used **ONLY** as a guide.

If additional copies of this manual are needed or if you have any question concerning the conveyor, please contact your MHS Distributor or MHS Lifetime Services at 231-798-4547 or visit MHS at mhs-conveyor.com for maintenance videos and other application information.

Manual Structure

You should receive a separate documentation for each product line of MHS Conveyor implemented in your installation. You can identify the respective product line on the back of the folder or on the cover sheet of the IOM (Installation Operation Maintenance Manual)



- IOM Product Name
- IOM PN = Part Number
- Revision Date (MM/DD/YYYY)
- Page Numbers

⚠ WARNING



- Pay attention to the safety instructions!
- Prior to working at or in the immediate vicinity of the system it is recommended that you make yourself familiar with the safety instructions included in the present document!

2 MHS CONVEYOR POLICIES

MHS Conveyor Equipment Warranty

MHS Conveyor warrants that the material and workmanship entering into its equipment is merchantable and will be furnished in accordance with the specifications stated.

MHS Conveyor agrees to furnish the purchaser without charge any part proved defective within 2 years from date of shipment provided the purchaser gives MHS Conveyor immediate notice in writing and examination proves the claim that such materials or parts were defective when furnished. For drive components specific to XenoROL® (i.e. Xeno belts, slave Xeno belts, drive spools, standard and speed-up, and spacers), this warranty shall be extended to five years of running use, provided the conveyors are applied, installed and maintained in accordance with MHS Conveyor published standards. Other than the above, there are no warranties which extend beyond the description on the face hereof. Consequential damages of any sort are wholly excluded.

The liability of MHS Conveyor will be limited to the replacement cost of any defective part. All freight and installation costs relative to any warranted part will be at the expense of the purchaser. Any liability of MHS Conveyor under the warranties specified above is conditioned upon the equipment being installed, handled, operated, and maintained in accordance with the written instructions provided or approved in writing by MHS Conveyor.

The warranties specified above do not cover, and MHS Conveyor makes no warranties which extend to, damage to the equipment due to deterioration or wear occasioned by chemicals, abrasion, corrosion or erosion; Purchaser's misapplication, abuse, alteration, operation or maintenance; abnormal conditions of temperature or dirt; or operation of the equipment above rated capacities or in an otherwise improper manner.

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EXTENDING BEYOND THOSE SET FORTH IN THIS STATEMENT OF WARRANTY.

Rev 08/12/2021



MHS Conveyor Environment Standards

MHS Conveyor equipment is designed to be installed in a clean, dry warehouse environment. Exposure to extreme humidity, direct sunlight, blowing dirt or rain can permanently damage some components of MHS Conveyor. In particular, the curing agents in concrete are known to attack and degrade the urethane conveyor components.

When installing conveyor on a new construction site, be sure that the concrete is properly cured before setting conveyor on it. In addition, if conveyors are stored in the proximity of curing concrete, proper ventilation must be used to direct the curing agent fumes away from the conveyor.

Failure to comply with these guidelines will void the MHS warranty on any failed components that result from these environment issues.

08/12/2021

 WARNING	
	<ul style="list-style-type: none">• Safety: Always lock out power source and follow recommended safety procedures.

2.1 MHS RECOMMENDS PROPER LABELS FOR CONVEYOR TYPES

Shown below are some samples of labels applicable to conveyor standards.


2.2 WARNINGS AND SAFETY INSTRUCTIONS

Failure to follow the instructions and cautions throughout this manual and warning label on the conveyor may result in injury to personnel or damage to the equipment.


Your MHS Conveyor is powered by a motor and can be stopped only by turning off electrical power to the motor. As with all powered machinery, the drive-related components – including sprockets, chains, shafts, universal joints, and pneumatic devices – can be dangerous. We have installed or provided guards to prevent accidental contact with these parts, along with warning labels to identify the hazards.

Special attention must be paid to the following areas of this manual:

 **DANGER**

- | | |
|---|--|
|  | <ul style="list-style-type: none"> Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations. |
|---|--|



 **WARNING**

- | | |
|--|---|
|  | <ul style="list-style-type: none"> Indicates potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices. |
|--|---|

CAUTION

- | |
|---|
| <ul style="list-style-type: none"> Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. |
|---|

2.2.1 Warnings and Safety Instructions

 <h1 style="margin: 0;">WARNING</h1>	
	<ul style="list-style-type: none"> • After maintenance, REPLACE guards immediately. • Keep ALL warning labels clean and clear of any obstructions. • Never remove, deface, or paint over WARNING or CAUTION labels. Any damaged label will be replaced by MHS Conveyor at no cost by contacting Lifetime Services. • It is very important to instruct personnel in proper conveyor use including the location and function of all controls. • Special emphasis must be given to emergency stop procedures. • It is important to establish work procedures and access areas, which do not require any part of a person to be under the conveyor. • It should be required that long hair is covered by caps or hairnets. • Loose clothing, long hair, and jewelry must be kept away from moving equipment. • Maintain enough clearance on each side of all conveyor units for safe adjustment and maintenance of all components. • Provide crossovers or gates at sufficient intervals where needed to eliminate the temptation for personnel to climb over or under any conveyor. • Walking or riding on a moving conveyor must be prohibited. • Before performing maintenance on the conveyor, make sure the start-up controls are locked out and cannot be turned on by any person other than the one performing the maintenance. • If more than, one crewmember is working on the conveyor, EACH CREW MEMBER MUST HAVE A LOCK ON THE POWER LOCKOUT. • All pneumatic devices must be de-energized and air removed to prevent accidental cycling of the device while performing general maintenance. • Make sure all personnel are clear of all conveyor equipment before restarting the system. • Before restarting a conveyor, which has been stopped because of an emergency, an inspection of the conveyor must be made and the cause of the stoppage determined. The starting device must be locked out before any attempt is made to correct the cause of stoppage.

 WARNING	
	<ul style="list-style-type: none">• Before servicing or performing any work in the motor control panel, disconnect and lock out air and the main incoming service. If only the panel disconnect is off, the incoming side will still be hot. 

2.3 MHS CONVEYOR CONTROLS SAFETY GUIDELINES

The following basic conveyor control safety guidelines are recommended by MHS Conveyor even though Business Partner may or may not purchase conveyor controls from MHS Conveyor. The items listed deal with applications of controls equipment. The actual installation of the equipment must always follow the National Electric Code and all other local codes.

Start-up Warning Horn

Ideally, all conveyors should be within sight of the conveyor start pushbutton. This allows the operator to verify that no one is touching the conveyor or would be in danger if the conveyor were to start up.

If it is not possible to see the entire conveyor being started from the start pushbutton location, then some form of audible warning device is required. It could be a horn, buzzer, bell, or anything unique to that conveyor for that location. It should be loud enough to be heard at any point on the conveyor system. It should sound for approximately five seconds after the start pushbutton is pushed, prior to the actual running of conveyor. Any auxiliary equipment such as vertical lifts, turntables, etc., should also be included in the warning circuitry.

Conveyors that stop and restart under automatic control could also require a horn warning prior to restarting. If it is not easy to distinguish the difference between a fully stopped conveyor system and a momentarily stopped conveyor section, then it is advisable to add a warning horn. All conveyor sections that stop and restart automatically should be marked with appropriate signs or labels.

Start Pushbuttons

Start pushbuttons should be the flush type or guarded such that inadvertently leaning against them will not actuate the conveyor. They should be provided with a legend plate clearly defining which conveyors will be started.

Stop Pushbuttons

Stop pushbuttons should be the extended type such that any contact with it is sufficient to stop the conveyor. They would also be provided with a legend plate clearly defining which conveyors will be stopped.

Operator Controls

Additional operator controls should be designed into the system with the same guidelines that go into start and stop pushbuttons, depending upon their function. Devices which are repeated on multiple control stations, such as emergency stops, should be located at the same relative location on each station (such as lower right corner).

Emergency Stops

All locations where an operator must work directly at the conveyor should be protected by an emergency stop. An operator should not have to move from where he is to actuate the emergency stop.

Conveyors in areas of high pedestrian traffic should also be protected by emergency stop devices.

For all other instances, emergency stops should be located throughout a system such that it is possible to shut down the system without having to walk too far. In these instances the emergency stop is used more to protect the equipment from damage than to protect personnel.

Emergency stops can be of the pushbutton or cable operated switch type. The pushbutton type should be a red, mushroom head maintained pushbutton which requires resetting after it is actuated. Cable operated switches should trip by pulling the cable, and require resetting at the switch.

Actuating an emergency stop must drop-out the start circuit, requiring restarting the system using the start pushbuttons provided.

An emergency stop should normally stop all conveyors in the system. Very large systems may involve dividing a system into zones of control based on proximity of personnel, safety hazards, walls obstacles, etc.

Controls Logic

Solid state controls logic devices, such as programmable controllers are used extensively for conveyor control. They are very reliable, but a hardware failure or software bug would cause an output to function erratically. For this reason, start circuits, warning horn circuits, and emergency stops should usually be configured using conventional relay logic.

Safety Switches

All conveyor control cabinets and motors should be provided with safety (or disconnect) switches. These switches must have provisions for padlocking. As required for maintenance, equipment should be locked in the off position.

Special Devices

Special devices and equipment such as vertical lifts, turntables, high speed conveyors, etc., all have unique design and safety requirements. These should be looked at in each case to determine what the requirements might be.

Rev 08/12/2021

3 CRUZBELT INTRODUCTION

CRUZbelt Features

This manual provides information for installing, operating, and maintaining your MHS Conveyor CRUZ®belt conveyor. A complete parts list has been provided, along with a list of recommended spare parts. Important safety information is included throughout this manual.

MHS Conveyor CRUZ®belt is considerably different than other belt conveyor. An understanding of this manual will help you take advantage of the many unique features of CRUZ®belt.

Features and Benefits:

- CRUZ®channel side frames have integrated cable trays.
- Side frames allow optional shrouds for a sleek appearance.
- Slider bed frames are interchangeable with roller bed frames.
- All intermediate bed sections can be made into end beds.
- End pulleys, snubbers, and take-up pulleys are adjusted with cams. By eliminating the usual threaded rods, adjustments are made in seconds.
- Innovative tube spanners eliminate bed racking.
- Alignment sight holes allow all pulleys to be easily squared before startup.
- Motor mounting allows chain adjustment without affecting sprocket alignment.
- This manual is arranged in the suggested order of installation.



CRUZbelt 4 Center Drive Complete Unit



CRUZbelt 4 and Strip Belt Spur

3.1 DEFINITION OF TERMS

CRUZ[®]belt ABBREVIATIONS LISTING	
ADJ	ADJUSTABLE
ASY	ASSEMBLY
BRG	BEARING
BR*	BELT ON ROLLER
BF	BETWEEN FRAME
BRKT	BRACKET
BRK	BRAKE
WBB	Welded BUTT-BOLT CONNECTION
C	CENTER (2.25”C, 3”C, 4”C, 6”C)
CDR	CENTER DRIVE
CONN	CONNECTOR (Mechanical, Electrical, Pneumatic)
XM	CROSSMEMBER
CZB	CRUZ BELT
DR	DRIVE, DRIVE BED
DL	DUAL LANE
EL	ELEVATION
EDR	END DRIVE
EURO	EURODRIVE
FPM	FEET PER MINUTE
FT	FOOT/FEET
FLA	FULL LOAD AMPS
GALV	GALVANIZED
GR	GUARD RAIL
HD*	HEAVY DUTY
HP	HORSE POWER
HZ	HORIZONTAL TAKE-UP
IN	INCH
INDBLT	INDUCTION BELT
INT	INTERMEDIATE BED
ID	INSIDE DIAMETER
LCD	LACED
LGTH	LENGTH
L/	LESS
LM	LOGIC MODULE
LOW PRO	LOW PROFILE
LP	LOW PROFILE
MAX	MAXIMUM
MM	METRIC
MID	MIDDLE

CRUZ®belt ABBREVIATIONS LISTING	
MIN	MINIMUM
MOD	MODULE
MTR	MOTOR
MNT	MOUNT
MTG	MOUNTING
NPT	NATIONAL PIPE THREAD
NOML	NOMINAL
NO	NOSE OVER
NU	NOSE UNDER
OAL	OVER ALL LENGTH
OAW	OVER ALL WIDTH
PL	PLATE
PLTD	PLATING (Roller Description, previously FLCT)
LBS	POUNDS
PWR	POWER
PRBG	PRECISION BEARING
PRS	PRESSURE
RPM	REVOLUTIONS PER MINUTE
RC	ROLLER CHAIN
SKWLOC	SKWEEZELOCK
SB	SLIDER BED
STD	STANDARD
THD*	THREAD
TB	TIMING BELT
U- ARMS	ADJUSTABLE CHANNEL GUARD RAIL MOUNTS
URO	URETHANE
V	VOLT
WLDMT	WELDMENT

4 CRUZBELT RECEIVING & SITE PREPARATION

General

MHS Conveyor CRUZbelt units are shipped in subassemblies. These subassemblies are packaged to guard against damage in shipment, when handled properly.

Examination immediately following unloading will show if any damage was caused during shipment. If damage is evident, claims for recovery of expenses to repair damage or replace components must be made against the carrier immediately. While unloading, a check must be made against the Bill of Lading, or other packing lists provided, to confirm full receipt of listed items.

CAUTION
<ul style="list-style-type: none">• TAKE CAUTION DURING THE REMOVAL OF EQUIPMENT FROM THE CARRIER. Remove small items and boxes first. Pull and lift only on the skid, not on the frame, cross member or any part of the conveyor equipment.



Preparation of Site

After the conveyor is received, move it to the installation, or designated dry storage, area as soon as possible. Clean up all packing material immediately before parts get lost in it. Loose parts should remain in the shipping boxes until needed.

Prior to starting the assembly of the conveyor, carefully check the installation path to be sure there are no obstructions that will cause interference. Check for access along the path needed to bring in bed sections and components closest to the point where they are needed. It is often necessary to give the area, along the system path, a general cleanup to improve installation efficiency, access, and accuracy.

4.5 PART INVENTORY & IDENTIFICATION

Label Identification

Each subassembly is shipped completely assembled except typical loose parts, which are in boxes with the subassemblies. Separate the conveyor subassemblies by types for inventory and ease of locating during installation.



An identification label is attached to the charged end of the center bed of each CRUZbelt Module unit.

Labels may contain the following information:

- Item number
- Description
- Job Number
- Mfg. Number
- Tag number (if specified)
- Assembler's clock number
- Date of manufacture
- QR (Quick Response) bar code
 - Scan bar code for IOM manual



Scan the QR code to retrieve the IOM Manual, if nothing happens; check your scanner settings to make sure the QR Label setting is enabled.

On the supports, the tag is located on the bottom side of the foot.

On special devices, it is located on a convenient flat surface that is not offensive to the appearance of the equipment but is still accessible for viewing. These numbers can be cross-referenced against the packing list.

Loose parts are boxed and shipped separately.

You should have all conveyor sections and supports for a particular conveyor prior to installation. It is cost-effective to identify and procure any missing parts before they are needed for assembly.

Small items like nuts and bolts are weigh-counted and packaged by size and type.

5 CRUZBELT APPLICATION & INSTALLATION DETAILS

General Procedures

The following procedures are to be used as guidelines only. Specific installation methods will vary somewhat depending on available equipment on site and each installer's preferences based on experience.

5.1 ENVIRONMENT

Temperature range (ambient):

+35° to +100°F. For applications that exceed this temperature range, please consult Applications Engineering.

Ultraviolet Rays:

Avoid exposure of polyurethane O-rings to sunlight.

Oily or Wet Conditions:

Will impair frictional drive characteristics.

Corrosive or Abrasive Substances:

Will adversely affect various components.

Cleaning O-Rings

Manufacturer suggested for cleaning O-rings is to use a cloth with a de-natured alcohol when cleaning the O-ring. This cleaning product would also work for cleaning the rollers.

Note:

Do NOT immerse the O-rings or any component in a container of this cleaning product.

Accumulation with Application Engineering approval.

5.2 DIMENSIONAL REFERENCE POINTS



The path of each conveyor in the system is determined by establishing a reference point at each end. The centerline of the conveyor is established and a chalk line is snapped between these points.

Conveyors should be installed with the centerline of the bed matching the centerline of the conveyor path within 1/8" of true center. Locate and mark the center of the crossmembers at each end of the conveyor. Use a plumb line or other applicable device to ensure accuracy to the chalk line.


Always carry out a thorough check for any obstructions such as building columns, manholes, etc. It may be necessary to reroute the conveyor to avoid the obstruction. In this case it would be advisable to begin installation at this point, using the obstruction as a reference point (Datum), and install the sections in either direction as required.

All conveyor sections must be checked for squareness prior to installation as "racking" or being knocked out of square may have occurred during shipping and handling.



 WARNING	
	<ul style="list-style-type: none">• The Installation Supervisor must be experienced with conveyor and qualified in the mechanics of the equipment and enforce safe working procedures for the protection of the crew, customer, and customer's property.

 WARNING	
	<ul style="list-style-type: none">• Before restarting a conveyor which has been stopped because of an emergency, an inspection of the conveyor must be made and the cause of the stoppage determined. The starting device must be locked out before any attempt is made to correct the cause of stoppage.



5.3 ELECTRICAL / GEARMOTOR

 WARNING	
	<ul style="list-style-type: none"> • All electrical controls must be installed, wired, and connected by a licensed electrician.

All motor controls and wiring must conform to the National Electrical Code as published by the National Fire Protection Association and approved by the American National Standards Institute, Inc. In addition, since specific electrical codes vary from one area to another, be sure to check with the proper authorities before starting the electrical wiring.

 WARNING	
	<ul style="list-style-type: none"> • All Standard Gearmotor with brake Coil Rectifiers are Half-Wave and are suitable only for 480VAC. • Using standard Gearmotor with Brake at 240VAC will void the Gearmotor with brake warranty. • Contact Distributor Services for the correct rectifier for your intended voltage if other than 400-480VAC.

The voltage of the motor will be stamped on the name plate. This voltage must match available voltage. Consult the wiring diagram on the motor for proper connections. If a single direction conveyor with a 3 phase motor runs the wrong direction, two leads must be switched to reverse rotation.

 WARNING	
	<ul style="list-style-type: none"> • VFD s (variable frequency drive) motor controllers may not be directly connected to any Gearmotor with brake. Brake Coil Rectifier as they are not compatible and the motor/brake will not completely release. • VFD connection to Brake Coil Rectifier will void Gearmotor with brake warranty.

Consult the wiring diagram of the inside cover of the starter and pushbutton for the proper electrical connections. Three phase drives require transformers to reduce the pushbutton and control circuit to 115 volts. If primary voltage is changed, the transformer must be changed, according to the wiring diagram found on the transformer.

NEMA enclosure ratings are as follows:

NEMA 1- Indoor use, provides protection against contact with internal components. Suitable for use in warehouse and distribution environments.

Gasket

NEMA 1- Same use as NEMA 1, but with additional protection against dirt and dust.

NEMA 3- Outdoor use, designed to keep out rain and dust.

NEMA 4- Indoor and outdoor use, designed to keep out rain and dust.

NEMA 12- Indoor use, provides protection against dust, dirt, oil seepage, and dripping of non-corrosive liquids. Suitable for use in industrial environments.

NEMA 13- Indoor use, provides protection against dust, dirt, sprayed oil and non-corrosive liquids.

NOTE: All the controls logic, safety switches, and some special devices are covered by the original manufacturer’s warranty.



Conveyor in areas of high pedestrian traffic should also be protected by emergency stop devices.

Emergency stops should be located throughout a system. Their location will depend on likely observation points and areas with special devices or interfaces between equipment.

Emergency stops can be a pushbutton or cable operated switch. The pushbutton should be mushroom-style and red. The pushbutton must require resetting after actuation. Cable operated switches should trip by pulling the cable and require resetting at the switch.

An emergency stop should normally stop all conveyors in the system. Very large systems may involve dividing the system into zones of control.

Actuating an emergency stop must drop out the start circuit and require restarting the system using the start pushbutton.

 WARNING	
	<ul style="list-style-type: none"> • Before restarting a conveyor, which has been stopped because of an emergency, an inspection of the conveyor shall be made and the cause of the stoppage determined. The starting device shall be locked out before any attempt is made to correct the cause of the stoppage.

Controls Logic

Solid state controls logic devices, such as programmable controllers, are used extensively for conveyor control. They are very reliable, but a hardware failure or software bug could cause an output to malfunction. For this reason, start circuits, warning horn circuits, and emergency stops should usually be configured using conventional relay logic.

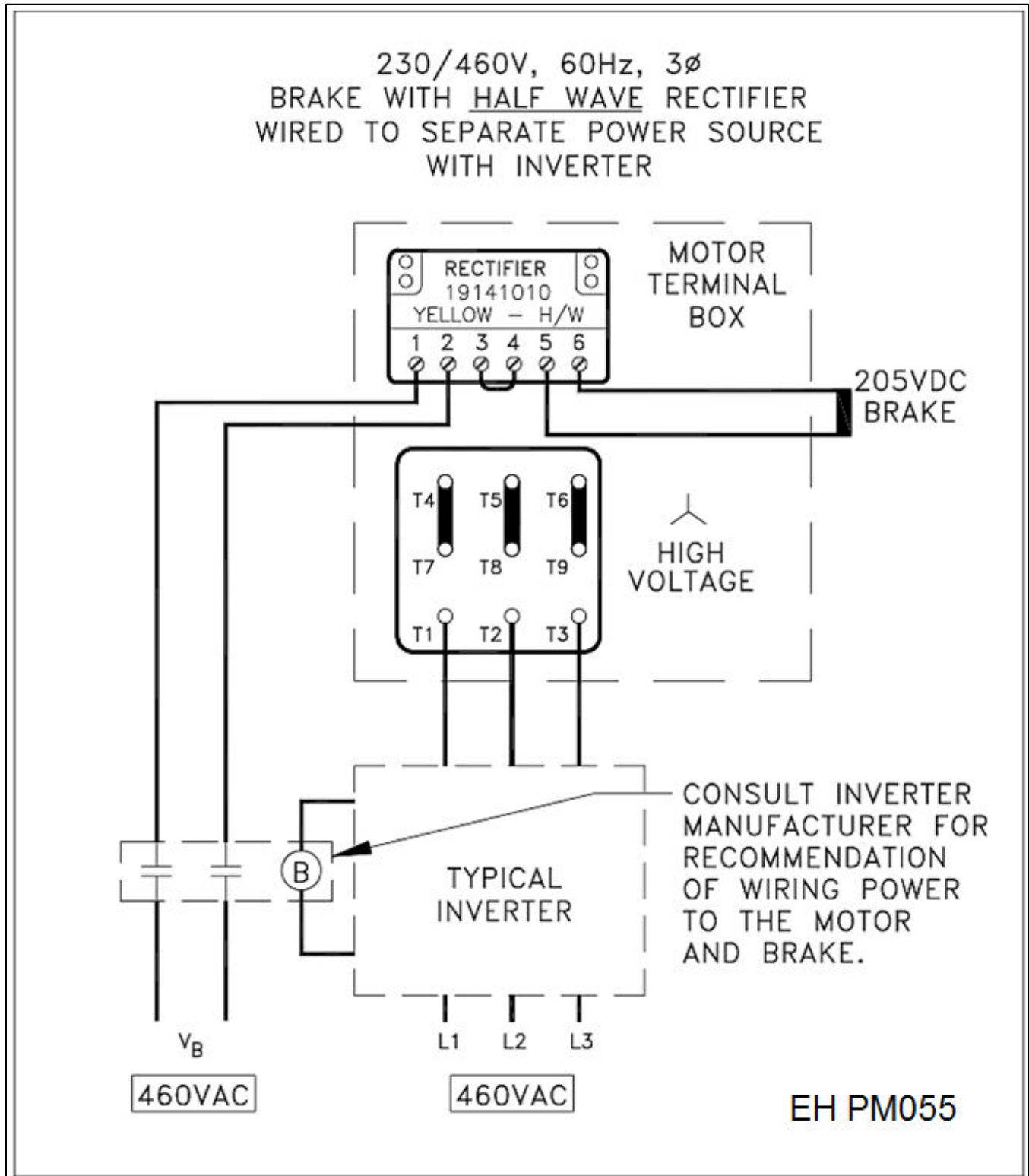
Safety Switches

All conveyor control cabinets and motors should be provided with safety (or disconnect) switches. These switches must have provisions for padlocking. As required for maintenance, equipment should be locked in the OFF position.

Special Devices

Special devices and equipment such as vertical lifts, turntables, high speed conveyors etc. all have unique design and safety requirements and should be evaluated individually.



Reference for Standard Brake Wiring Diagram for 460/230v Motor & 460v Brake.



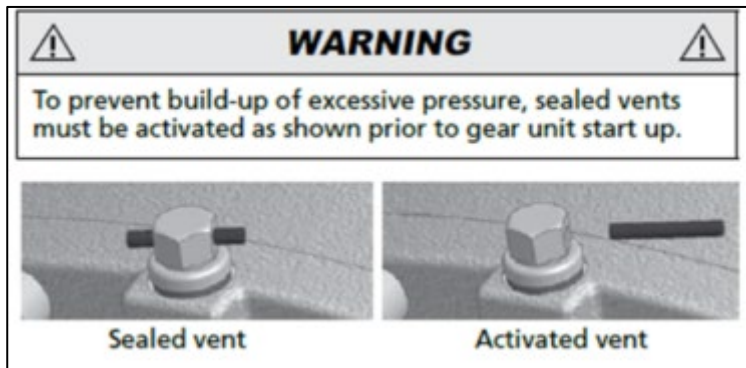
5.4 GEAR MOTOR ACTIVATION

PRIOR to systems activation - Please inspect the gear unit for a vent and if applicable to the product remove the rubber sealing plug to activate. The vent is designed to allow excessive pressure to escape. Each gear unit should have a yellow instruction tag as shown below. The tag can be removed after the plug is removed.

Note: The rubber sealing plug is in place for shipping and storage purpose only.

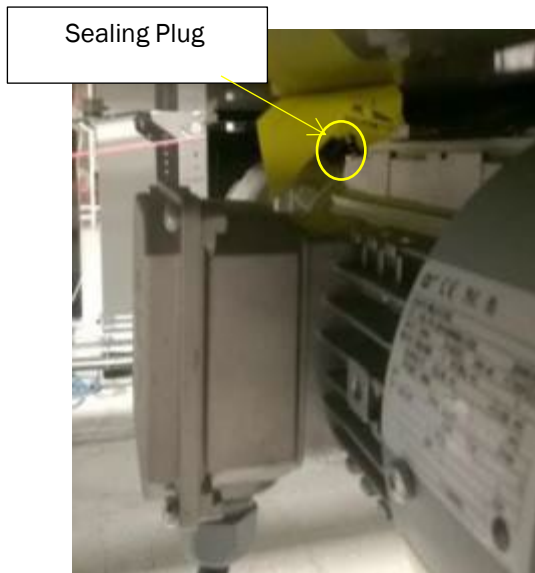
 WARNING	
	<ul style="list-style-type: none">• In order for the gear motor to release pressure, the vent must be activated by removing the rubber sealing plug PRIOR to gear unit start up.

Please check you gear unit for a vent and if applicable to your product, remove the sealing plug to activate. “<https://www5.nord.com>” Operation Manual for Gear Units (B1000).



Note: Yellow tags may be tucked out of sight. Please inspect all motors for a vent and remove sealing plug, if present, to activate.

The following pictures are examples showing where vent plugs may be located depending on the product line and motor position.



5.5 SQUARING CONVEYOR

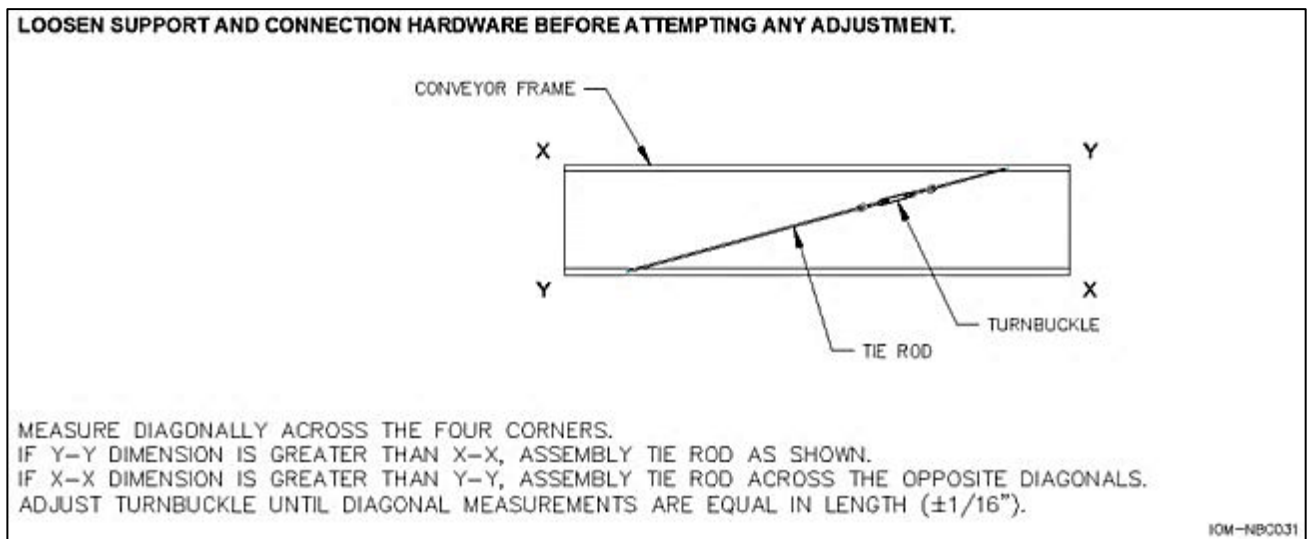
All conveyor sections must be checked for squareness prior to installation as “racked” or being knocked out of square may have occurred during shipping and handling. An out of square conveyor section is a leading cause of belt mistracking.

Measure diagonally across the four corners of the conveyor frame to determine if the frame is out of square. If the measurement is not equal between the two diagonals, the frame is not square. A “racked” conveyor will skew the rollers, causing the belt to wander off center.

The conveyor sections are joined together with welded butt plate connectors. If a conveyor section is determined to be out of square, adjustment must be made before proceeding to the next section. Correct the squareness of the conveyor frame by installing a tie rod along the longest diagonal dimension and adjusting the turnbuckle until the diagonal measurements are equal in length. It is important to loosen the support and connection hardware before attempting any adjustment.

If gaps appear between bed joints as a result of squaring the conveyor, take care not to “re-rack” the conveyor by pulling the sections together at the bed joints. Insert optional shim plates or washers to the required thickness to fill the gap before tightening the connection hardware. Verify the squareness of the conveyor after installation.

CAUTION
<ul style="list-style-type: none">• An out of square conveyor section is a leading cause of belt mistracking.



Squaring conveyor Kit# 1134766

5.6 ELEVATIONS

- All conveyor sections should be installed in accordance with the elevations shown on the drawings. In addition, they must be level across the frame width and length (if horizontal). Leveling of the frames is best done using a rotating laser level or builder's level.

After the first elevation is established at a critical point, the elevation of all other points shall be relative to this first point. Normal practice is to dimension the layout and measure elevations from the floor at each point of support.

As the conveyor system proceeds onto another floor or into another building or room, a new elevation will be measured from the floor at that point. The new elevation will then become the reference from subsequent elevations.

When installing an overhead system, the first elevation is measured from the floor and becomes the reference elevation point until a change in the elevation is shown on the layout. Any new elevation is also measured from the floor and becomes the new reference point. The process is repeated each time an elevation change occurs.

CAUTION

- Consult the building architect or a structural engineer regarding ceiling loading or structural limitations of the building if any conveyor section is ceiling hung.

Component Orientation

Using your conveyor system layout drawing and the numbers on the I.D. tags of each component, position, and orient the conveyor section.

You must know:

- The direction of product flow
- The elevation height
- How the drive is positioned
- Charge and discharge end beds

IMPORTANT! Do not make alterations to the equipment without consulting with user's representative and MHS Conveyor. Unauthorized modifications to the equipment may impair its functions, create a hazardous condition, affect its useful life, and /or void the warranty.

5.7 SUPPORTS & CONNECTIONS

For details on Supports & Connections, see Support & Connections IOM (#1200485) at

mhs-conveyor.com

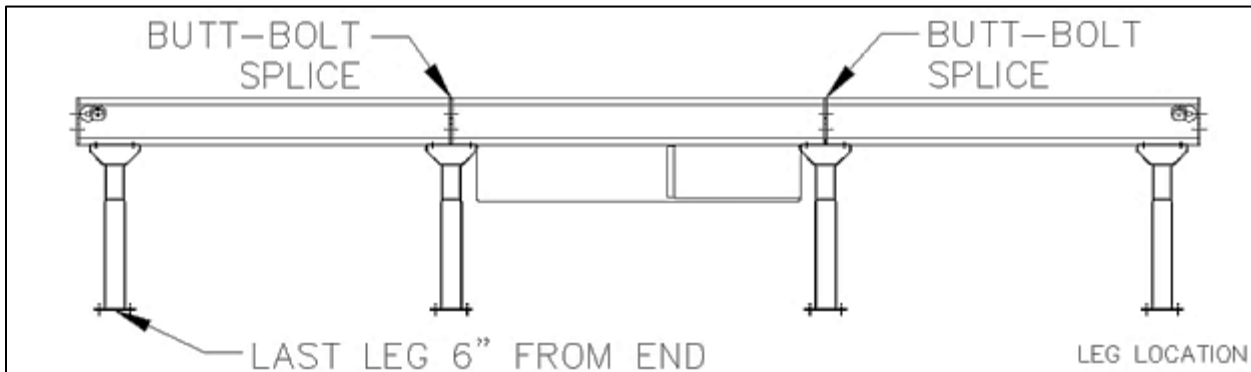
5.8 SUPPORT ARRANGEMENTS

Floor Support Information

All supports are intended to be used at a conveyor seam or joint at the end of a unit. All CRUZbelt beds now have butt-bolt connections to allow supporting off center of a bed joint if necessary. Support CRUZbelt at each end and at every splice as shown below. Set all supports for unit to proper height.

Attach supports to both sides of drive.

On intermediate and end beds, attach one support on the end furthest from the drive.

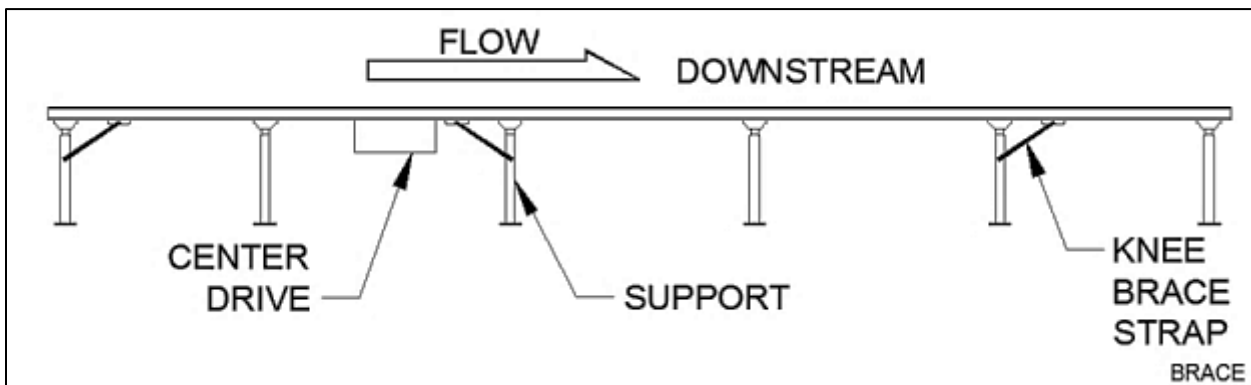


Leg elevations are shown on the elevation drawings. Leg elevation can also be set by subtracting 6-3/8" from the desired top of belt elevation.

NOTE:

Top of Belt - 6 3/8" = Top of Support

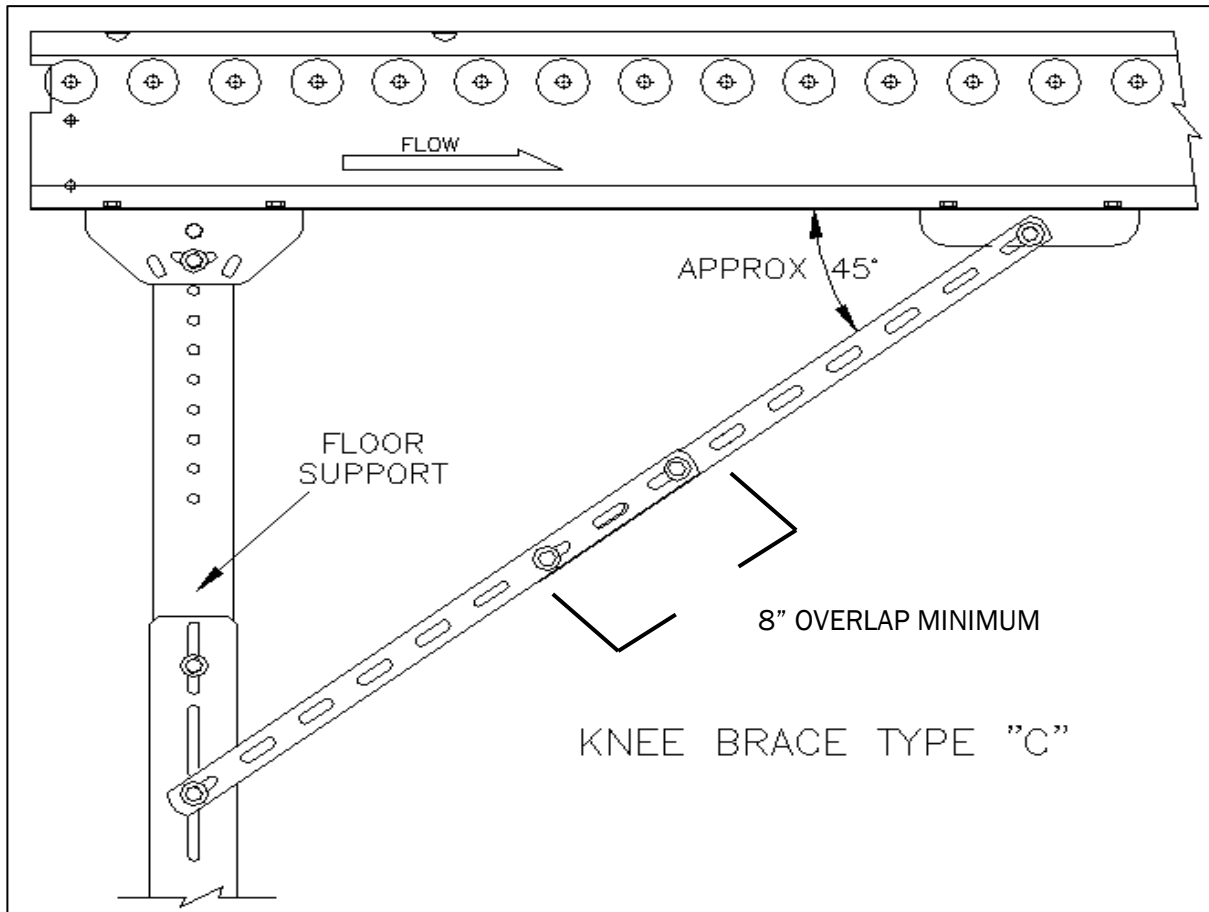
If knee braces are required, they are installed on approximately 30' centers as shown below.



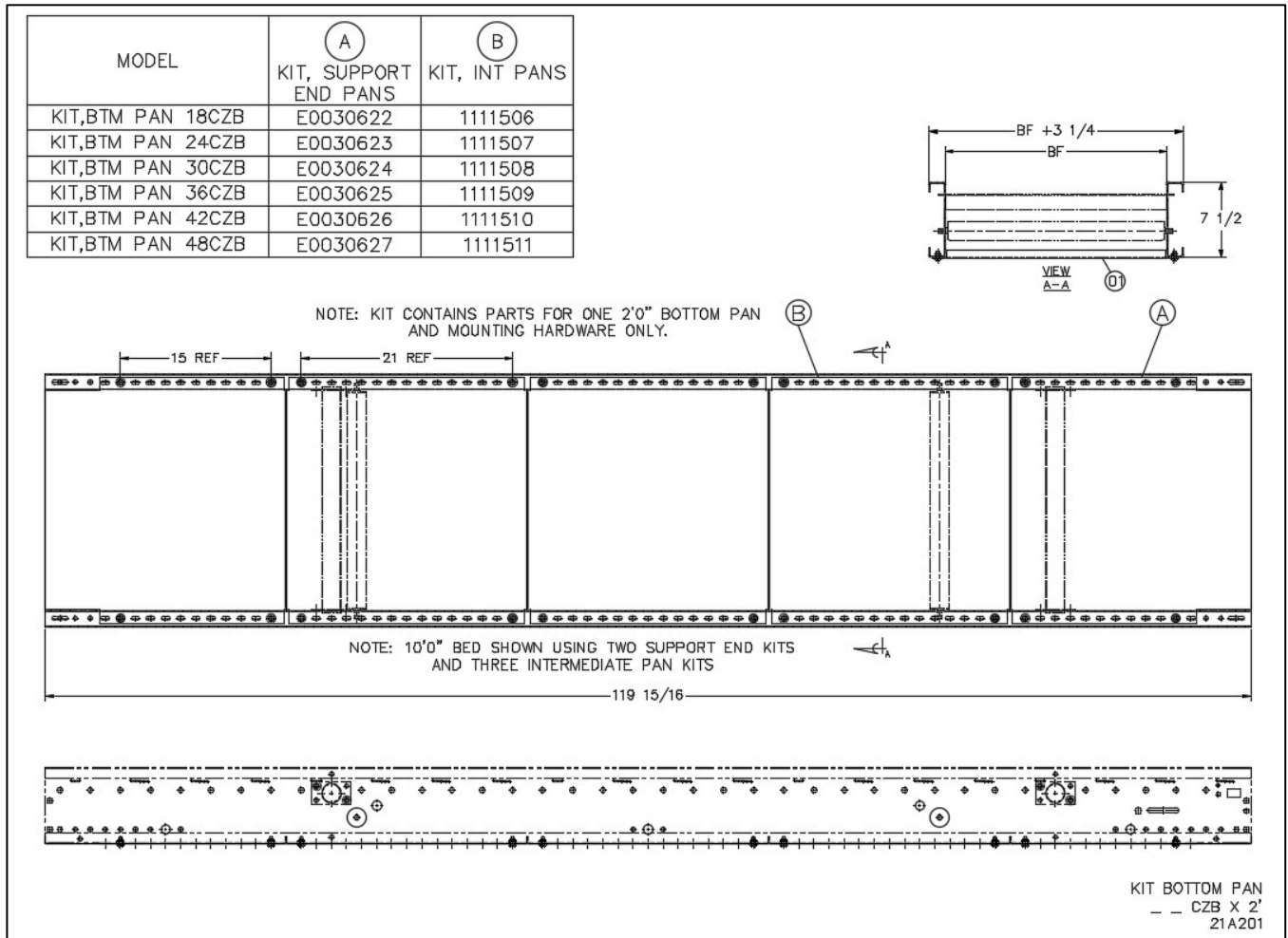
Note brace direction. Near a drive, the brace should be on the upstream side of the support. Elsewhere the brace should be downstream of the support. For maximum effect, the angle between the brace and the side frame must be between 30 and 45 degrees.

 WARNING	
	<ul style="list-style-type: none">• Leg uprights must be vertical. Adjust stand head to compensate for slope.

Supports over 48" high use a double knee brace (Type "C"). To make a double knee brace, bolt two straps together with a minimum 8" overlap.



5.9 BOTTOM PANS



Bottom pans are safety covers that provide operator protection from running belts and debris, and are highly recommended up to 8' from the floor.

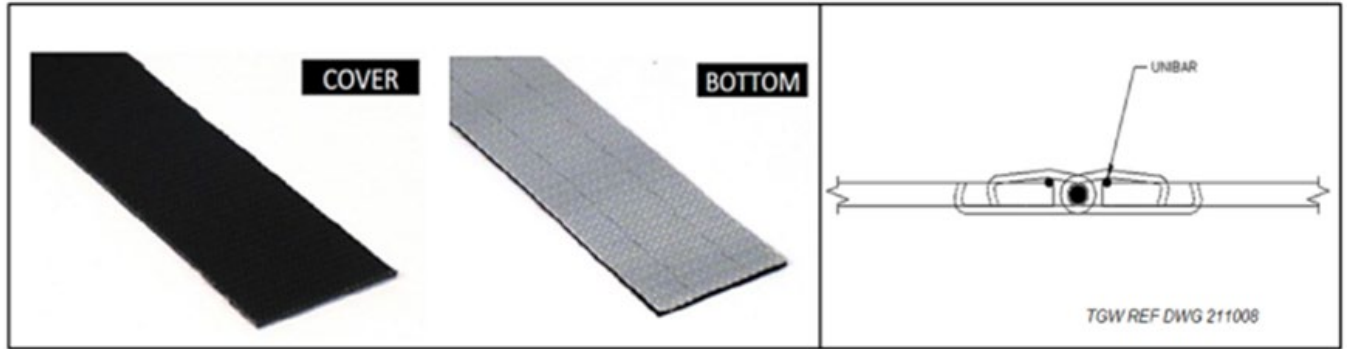
Bottom pan kits include; (1) 2'0" bottom pan and mounting hardware.

5.10 BELT MATERIAL

BELT MATERIAL (General)	BELT WIDTH	BELT LENGTH	TEMPERATURE RANGE	STRENGTH	ACCEPTABLE STRETCH	LACING	LACING PIN
BELT,CZB ___-9/16" X ___-___-___" EWX (211008) SPARKS MONO FLEX BU 200 E POLYURETHANE IMPREGNATION (ANTI-STATIC QUIET WEAVE)	BF - 7/16" +/- 1/16" (72" MAX WIDTH)	OAL ± 1/2" (MEASURE BELT END TO BELT END NOT INCLUDING FASTENERS OR LACING)	-20°F TO 180°F	110 lbs / inch width	45 LBS @ 1% STRETCH	CLIPPER UCM36SP (316 STAINLESS STEEL) (PN 1100706)	CLIPPER DSS065 (316 STAINLESS STEEL) (PN E0034789)
BELT,CZB ___-9/16" X ___-___-___" HOZ (211006) SPARKS MONO FLEX BP 210 QW 2-PLY SMOOTH BLACK PVC (ANTI-STATIC QUIET WEAVE)			23°F TO 175°F		0.4 - 2.5% (MHS RECOMMENDED STRETCH 0.5%)		
BELT,CZB ___-9/16" X ___-___-___" INC (211007) SPARKS MONO FLEX BP 290 QW 2-PLY RIBBED BLACK PVC (ANTI-STATIC QUIET WEAVE)			0.4 - 2.5% (MHS RECOMMENDED STRETCH 0.5%)				

BELT MATERIAL (Differences)	BELT THICKNESS	COVER MATERIAL	COVER HARDNESS	WEIGHT	COEFICENT OF FRICTION	
					STEEL	CARDBOARD
BELT,CZB ___-9/16" X ___-___-___" EWX (211008) SPARKS MONO FLEX BU 200 E POLYURETHANE IMPREGNATION (ANTI-STATIC QUIET WEAVE)	.075" +/- .015 (RANGE .060" - .090")	Polyurethane Impregnation	NA	0.35 lbs / SQUARE FOOT	0.20 (BOTTOM WHITE SURFACE)	0.23 - .28 PVC/PU (TOP COVER)
BELT,CZB ___-9/16" X ___-___-___" HOZ (211006) SPARKS MONO FLEX BP 210 QW 2-PLY SMOOTH BLACK PVC (ANTI-STATIC QUIET WEAVE)	.079" +/- .015 (RANGE .064" - .094")	PVC	78 DUROMETER SHORE "A"	0.50 lbs / SQUARE FOOT	0.22 (BOTTOM SURFACE)	0.37 PVC (TOP COVER)
BELT,CZB ___-9/16" X ___-___-___" INC (211007) SPARKS MONO FLEX BP 290 QW 2-PLY RIBBED BLACK PVC (ANTI-STATIC QUIET WEAVE)	.102" +/- .015 (RANGE .087" - .117")	PVC	45 DUROMETER SHORE "A"	0.72 lbs / SQUARE FOOT	0.22 (BOTTOM SURFACE)	0.95 PVC (TOP COVER)

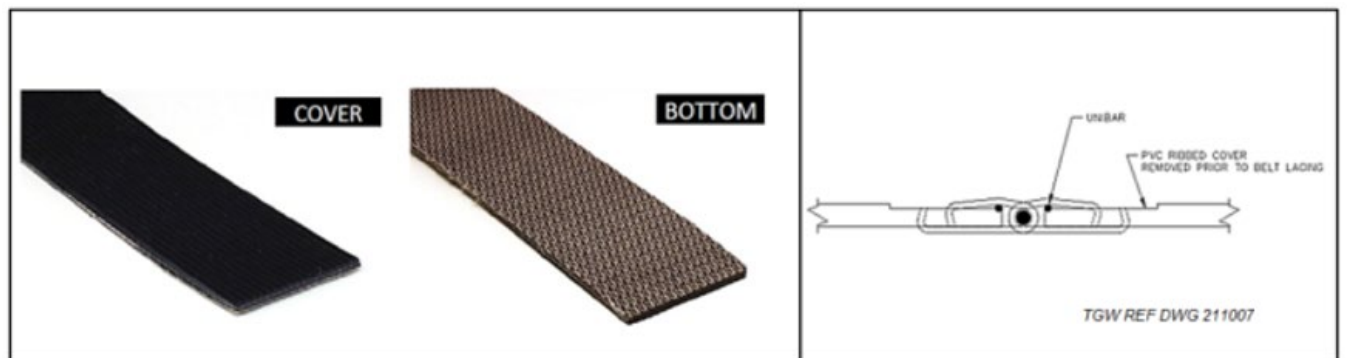
Mono Flex BU 200 (EWX)



Mono Flex BP 210 QW (HOZ)



Mono Flex BP 290 QW (INC)



5.11 CONVEYOR SET UP

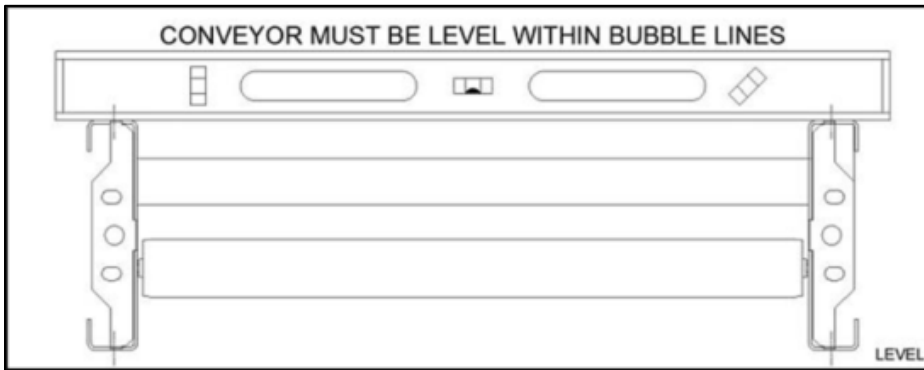
Place each bed in position per layout drawing.

Bolt bed butt connectors together.

Set final elevation and level unit. Conveyor must be level side-to-side and along conveyor length as shown below:

Tighten support bolts and anchor to floor.

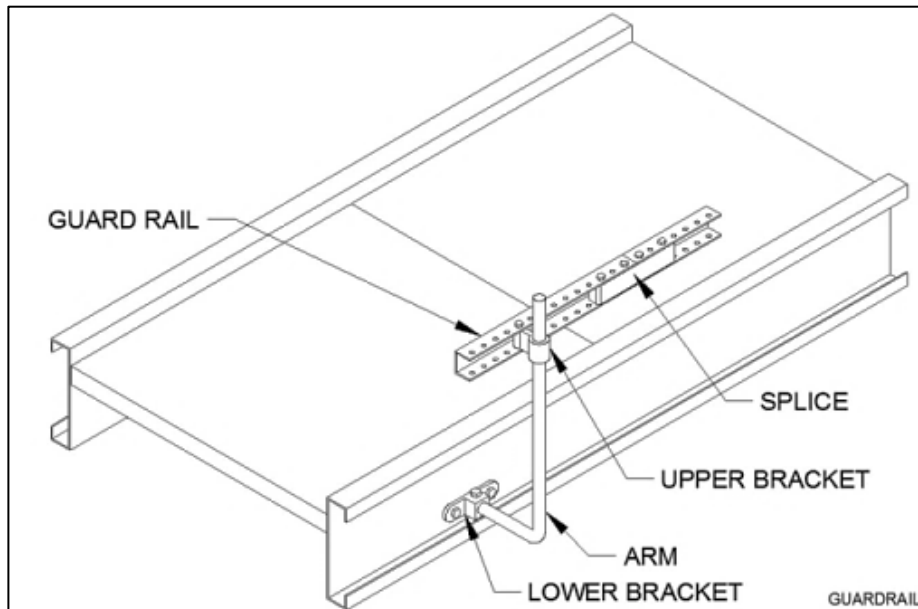
Install any required guard rail as shown:



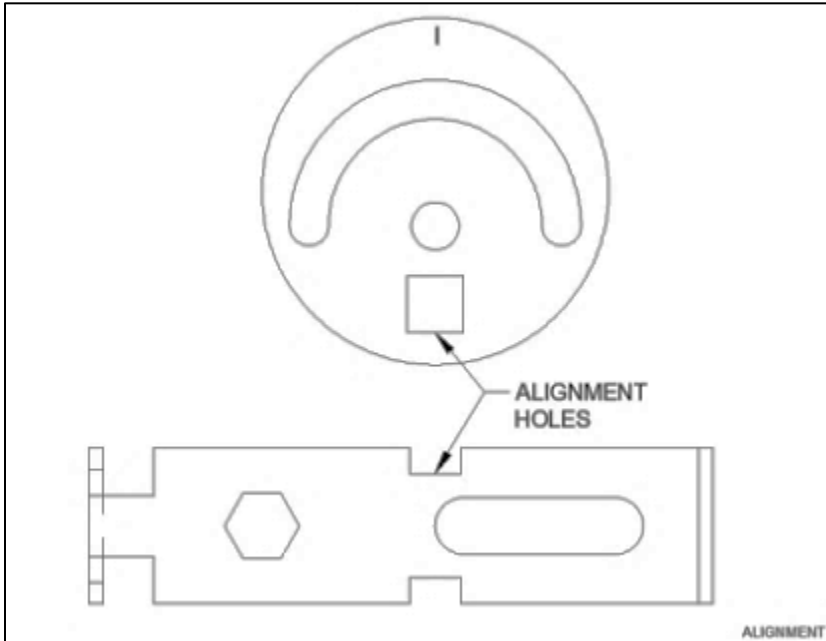
Conveyor must be level

5.12 GUARDRAIL ASSEMBLY

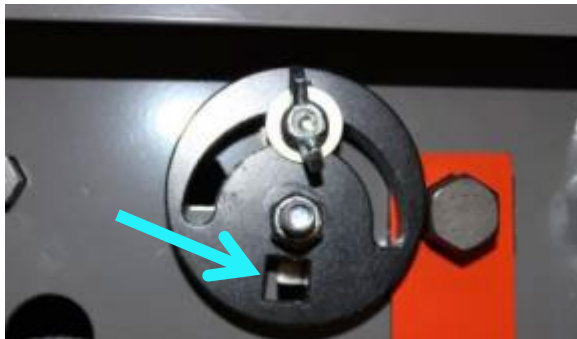
Square end pulleys and snubbers using alignment holes. Move cam or snubber bracket until the 3/8" square alignment hole is in line with the 3/8" square in the bed frame. A 3/8" key stock can be inserted into the holes for quick alignment.



5.13 BELT ALIGNMENT



Hole Alignment



Move CAM over to align square holes. (Mid-point Location)

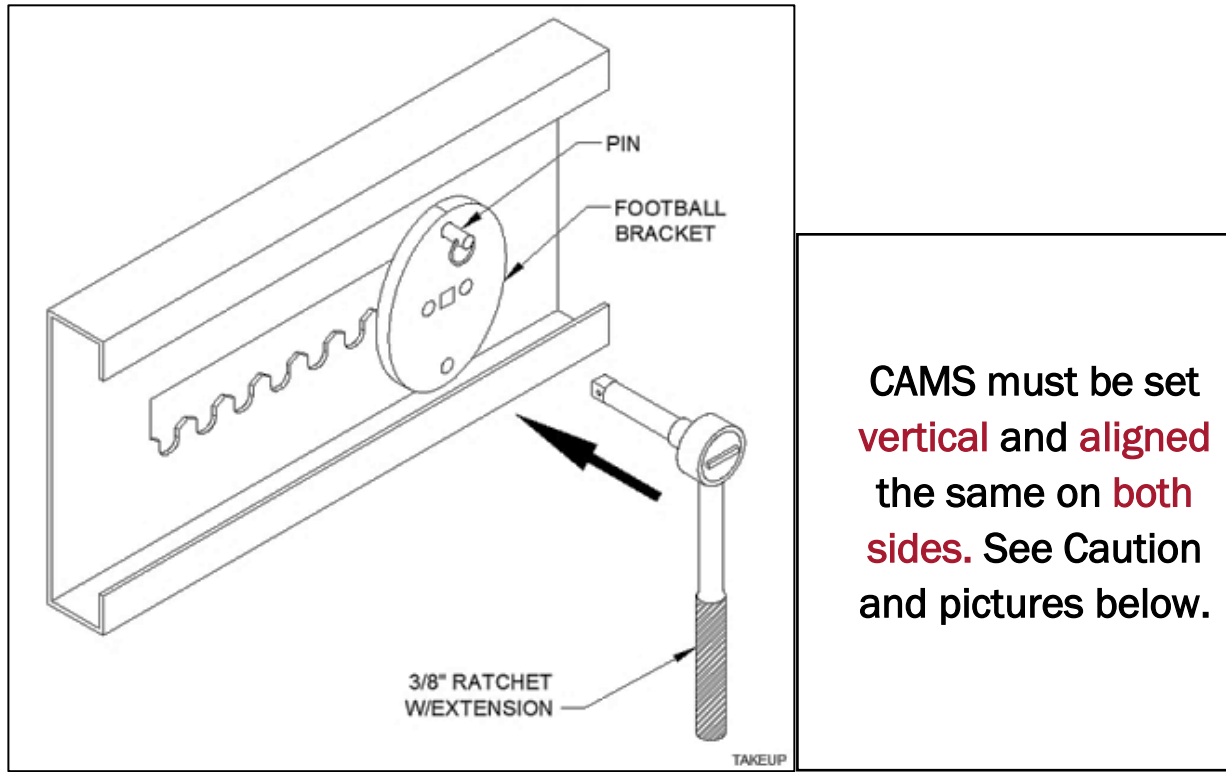


Slide snubber bracket over to align square holes. (Mid-point Location)

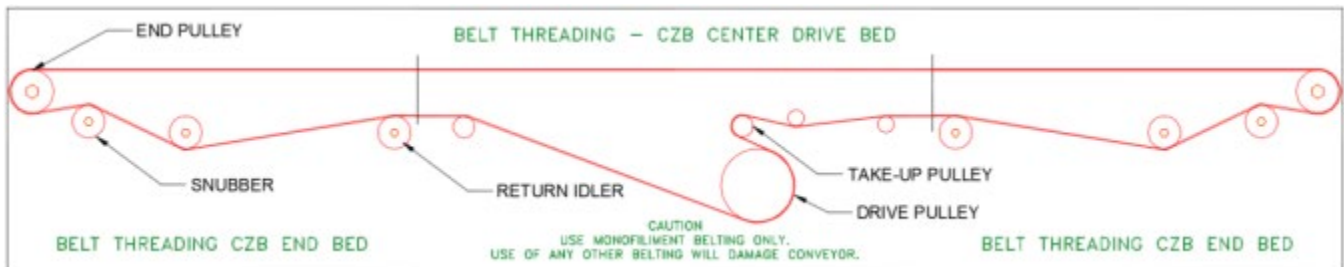
Locate drive. Remove both black plastic translucent shrouds and quick-release pins. Use a 3/8" ratchet with extension in the square hole of one football bracket to roll the take-up as shown. Make sure the belt is not rubbing on the side channels.

To view CRUZbelt Take-up and Tracking video visit: mhs-conveyor.com

5.14 CRUZBELT W/CAM TAKE-UP



Thread belt through conveyor. Labels on drive beds show specific threading. A general belt path is shown below.



5.15 STANDARD CRUZBELT LACING

CRUZbelt LACING INFORMATION	
LACING:	CLIPPER: UCM36SS12 316 STAINLESS STEEL (INSTALL LACE ON BELT WITH .065 DIA LACE PIN THRU HOOKS (P/N 1100706))
LACING PIN	CLIPPER: DSS065 316 STAINLESS STEEL WIRE CORE IN A .065 WHITE DURAPIN COATING (P/N E0034789)

Pull belt ends together and insert lacing pin.

Tension belt by rolling a football bracket away from the motor. A standard 3/8” drive ratchet will provide correct belt tension with ease. **DO NOT** over tension the belt by using a “cheater bar”, “long handled bar” or “breaker bar” on the ratchet bar or using two people with ratchets. Belt should be just tight enough to drive the product.

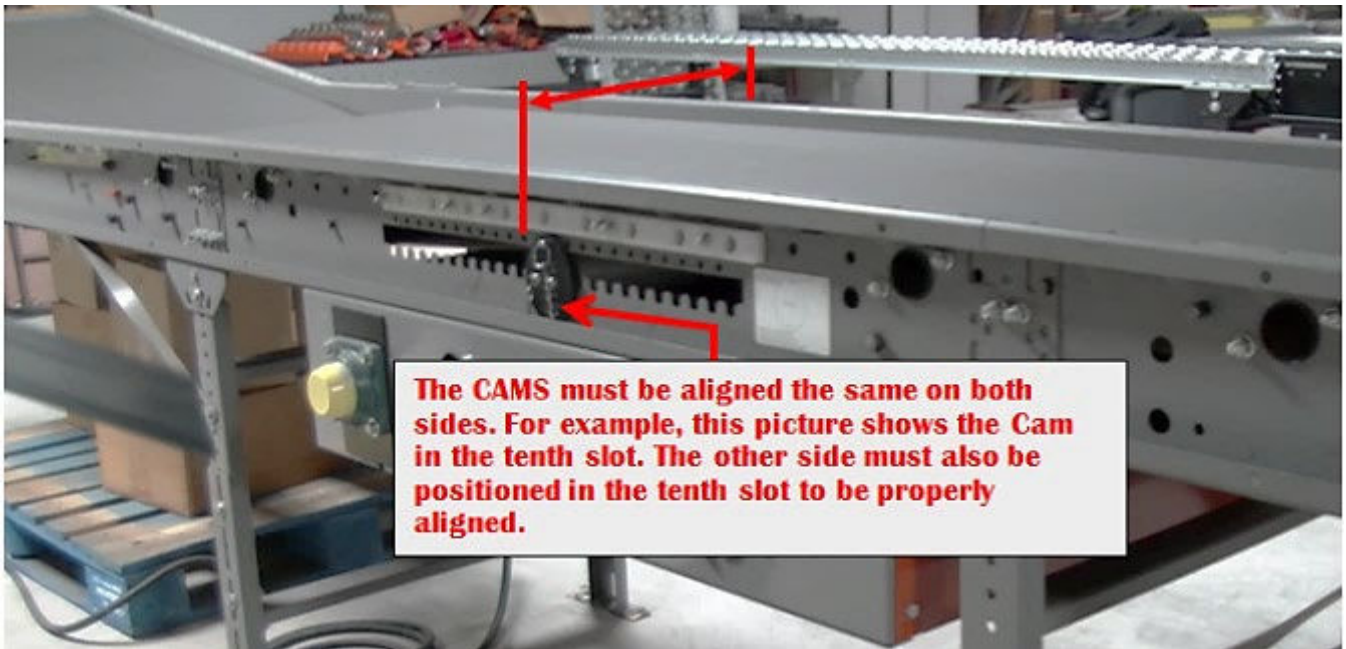
To prevent possible damage to the roller bearing, when tightening the CAM (football bracket) DO NOT use more than 15ft lbs. of torque.

Replace quick-release pins into both football brackets as shown on bed label. One football bracket may need to be separately aligned slightly to insert the pin. Replace drive shrouds.

CAUTION
<ul style="list-style-type: none">• Do not run the conveyor without replacing both quick release pins.• The CAM (football bracket) must be vertical on both sides and the Cam must be aligned in the same vertical hole position on both sides. The Cam this must not be offset from each other. (See pictures below)• Do not over tighten belt as this causes excessive stress on the Drive Drum Shaft and associated bearings. DO NOT use more than 15ft lbs. of torque on the Cam (football bracket).• Excessive belt tension will cause premature failure of the take-up assembly.

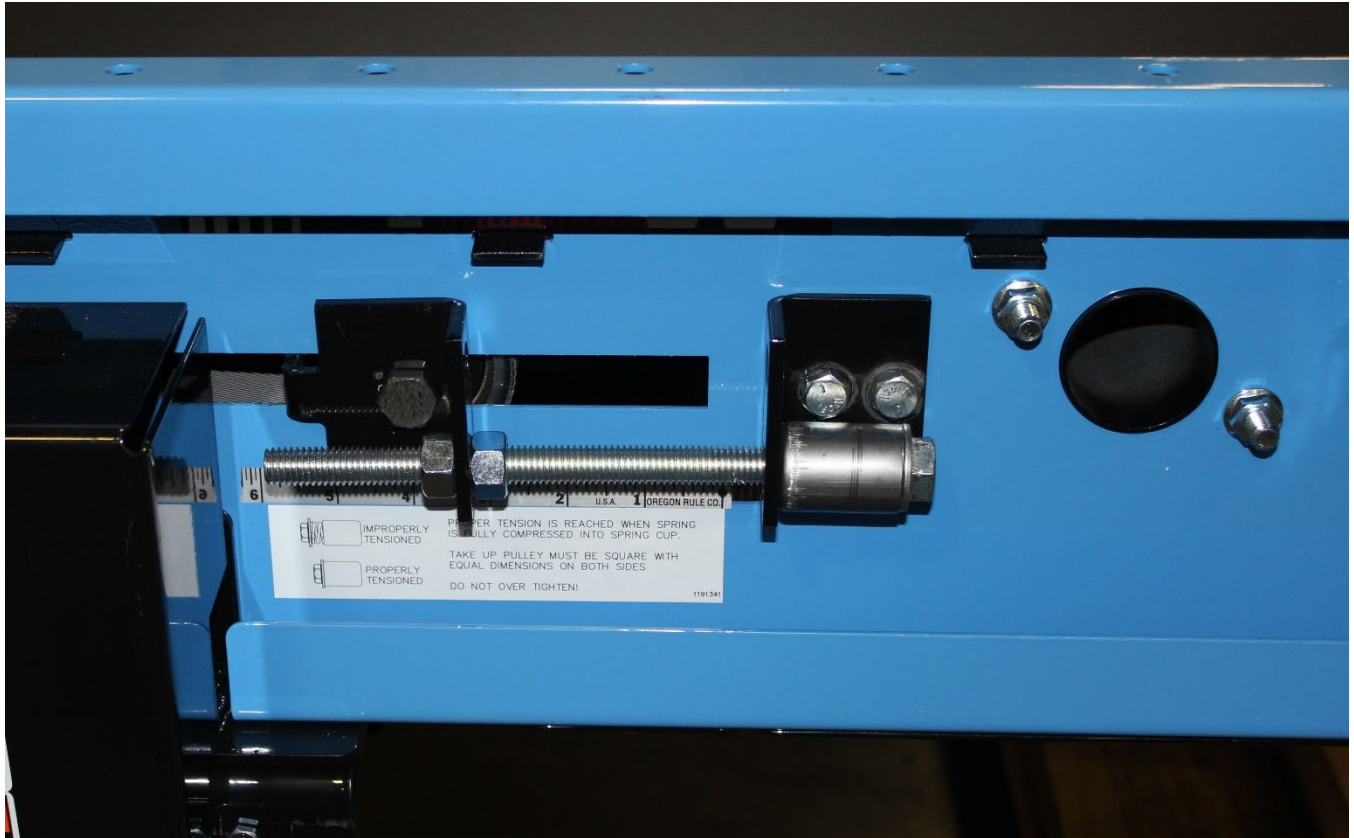


The Cams must be vertical on each side.



The Cams must be aligned the same on both sides.

5.16 CRUZBELT 4 WITH SPRING TAKE-UP



Proper tension has been reached when spring is fully compressed into spring cup.

Take-up pulley must be square the equal dimensions on both sides.

Do not over tighten.



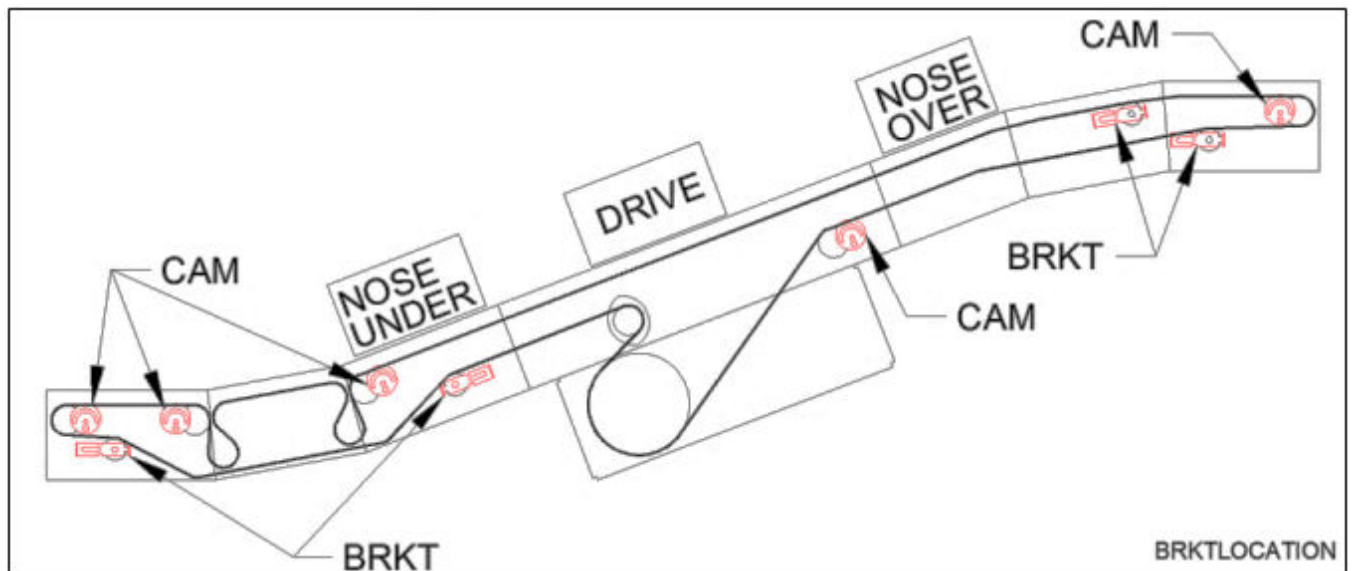
5.17 BELT TRACKING

WARNING	
	<ul style="list-style-type: none"> • Only qualified personnel should be allowed to track the belt. • Use caution since conveyor must be run during the tracking procedure.

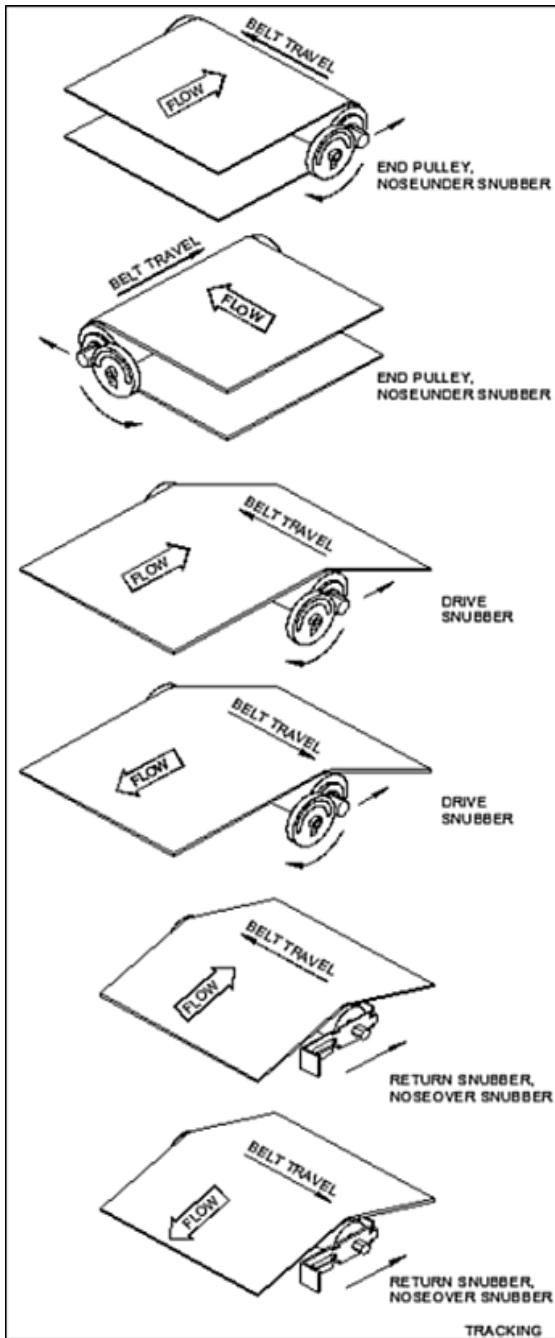
ALL PULLEYS AND SNUBBERS MUST BE SQUARE, and conveyor must be level prior to tracking the belt. Align the 3/8" square in the cams and snubber brackets with the corresponding square in the bed frame. (See "Conveyor Set-up" section). Conveyor must be wired to run the correct direction. Belt should be tensioned tight enough to drive the heaviest product.

Belt tracking is accomplished by moving the snubber (belt return roller) tracking brackets (fine adjustments) first from their squared positions. The use of the tracking cams is a coarse adjustment that should only be used if necessary.

Tracking cams are located on the end pulleys, the drive snubbers, and near the middle of Noseunder. Snubber tracking brackets are located near the ends of the conveyor on the return belt snubber/carrier rollers and near the middle of Noseovers.



5.17.1 Tracking scenarios



NOTE: Flow refers to belt surface flow direction not necessarily product flow.

NOTE: Belt moves towards the end of the pulley that it contacts first.

CRUZbelt is slightly different to track than other conveyors. Since the belt is only 7/16" narrower than the between frame dimension, some belt contact with the side frame is expected. However, the belt **must not be** allowed to contact the frame near any end pulley or snubber roller.

CAUTION
<ul style="list-style-type: none">• Belt must not be allowed to contact the side frame near an end pulley or a snubber roller.

5.17.2 Basic tracking information:

The belt moves TOWARD the end of a pulley it contacts first.

Use snubber tracking brackets before using tracking cams. End pulley tracking is used as a last resort.

Tracking brackets and cams affect belt movement on the next device DOWNSTREAM from the adjusted pulley. Find the nearest bracket or cam upstream from the problem area and adjust as shown.

Adjust bracket or cam slightly and watch belt for several belt revolutions before continuing to ensure the belt location is stabilized.

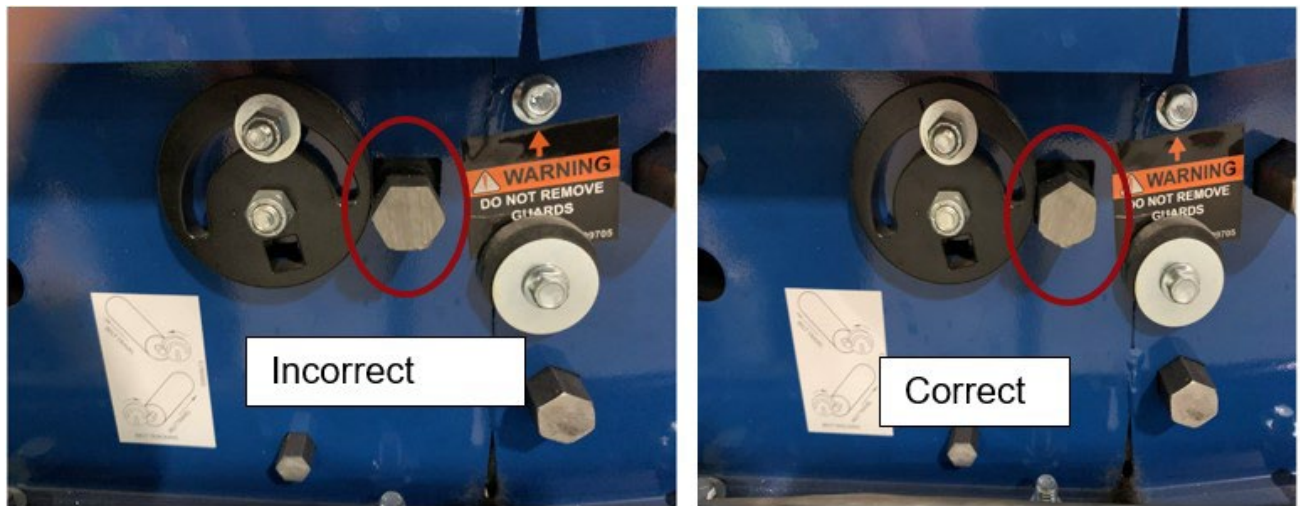
CAUTION
<ul style="list-style-type: none">• CRUZbelt conveyor must be used with mono-filament belting. Use of any other belting will damage conveyor. Consult your MHS Conveyor distributor for belt specifications.

5.17.3 CRUZbelt Noseunder Hex Axle Position

CAUTION
<ul style="list-style-type: none">• CRUZbelt Noseunder - Hex Axle Position must be set with points up and flat side against the tracking cam.



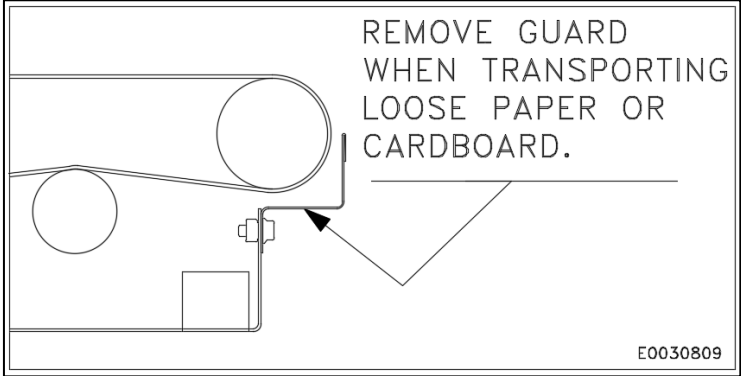
Note:

CZB Noseunder Hex Axle Position must be set with points up and flat side against the tracking cam. See pictures below.



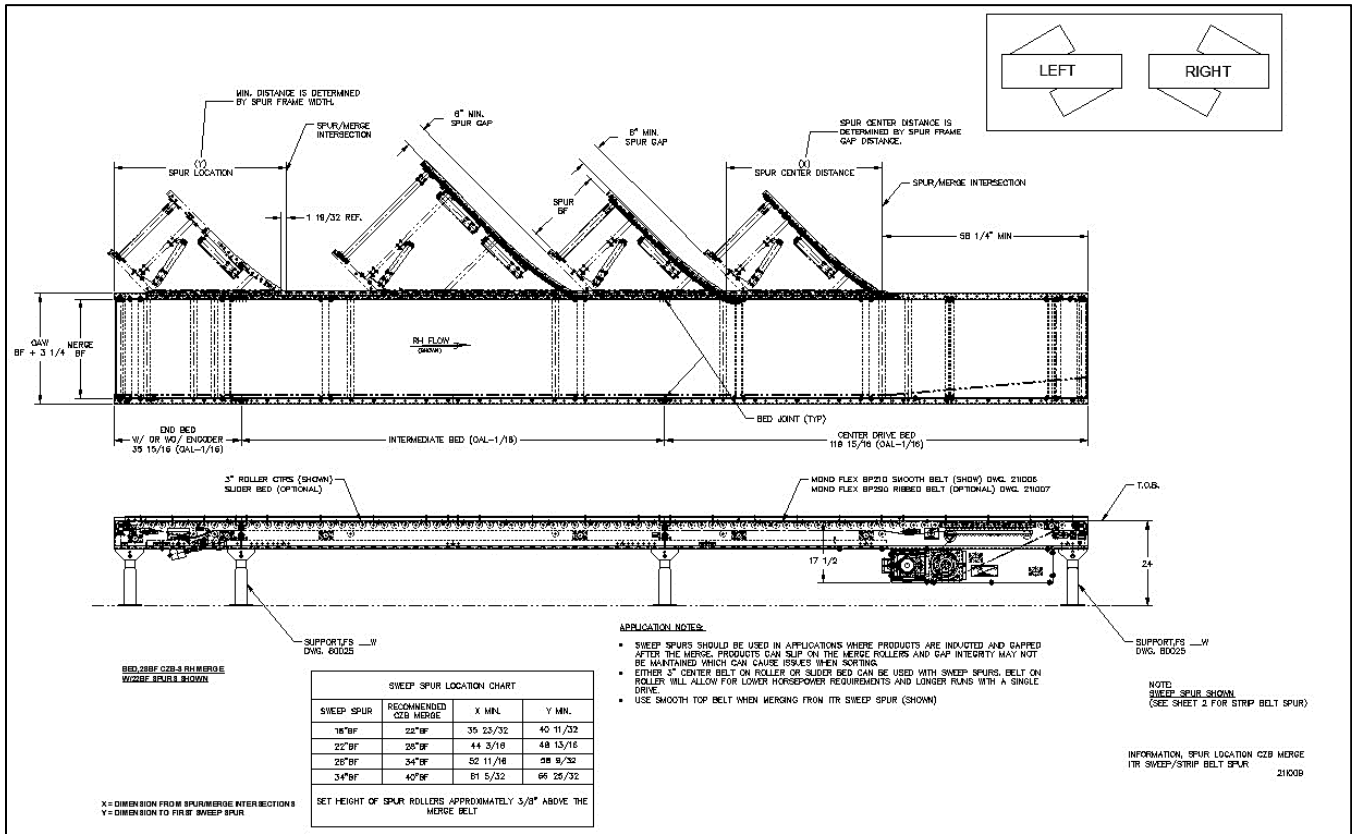
5.17.4 Empty Carton Conveyor (ECC) End Guard(s)

CRUZbelt Empty Carton Conveyor must have the end guard(s) removed when transporting loose paper or cardboard, otherwise debris can catch in the guard and interfere with proper conveyor operation. **Remove guard when transporting loose paper or cardboard.**

 WARNING	
	<ul style="list-style-type: none">When installing CRUZbelt Empty Carton Conveyor please read label on the end guard for removal. <div style="border: 1px solid black; padding: 5px;"><p>REMOVE GUARD WHEN TRANSPORTING LOOSE PAPER OR CARDBOARD.</p><p style="text-align: right;">E0030809</p></div>



7 CRUZBELT MERGE



Standard Equipment

Belt:

Smooth top belting is used when merging, which pulls the product downstream and maintains orientation. The belt is a black smooth top PVC with monofilament carcass, 100 lbs. per inch of width, tensile strength, clipper lacing.

NOTE: CRUZbelt require a monofilament belt. Installation of any other type of belt will damage the internal components of CRUZbelt and will immediately and permanently **VOID all MHS Conveyor warranties.**

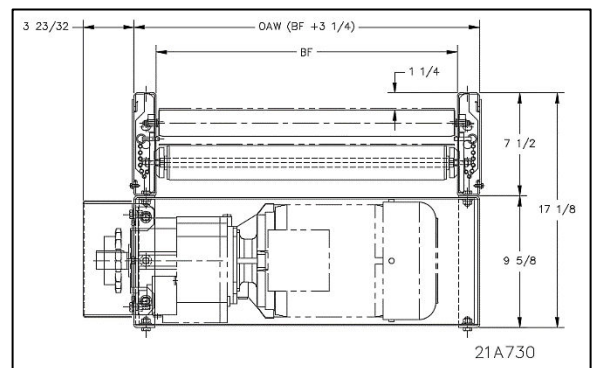
Application

Sweep Spurs should be used when purging out a line to a final downstream accumulator prior to induction. Sweep Spurs discharge products on to the CRUZbelt Merge at rates up to 200 CPM.

The Strip Belt Spur should be used when there is a requirement to set the destination at the strip belt merge discharge and track the product from the strip belt spur to the sortation diverts location.

CRUZbelt Merge Beds

CRUZBELT WIDTH INFORMATION				
Overall Width	19-1/4"	25-1/4"	31-1/4"	37-1/4"
Between Frames	16"BF	22"BF	28"BF	34"BF
Belt Width	15-9/16"	21-9/16"	27-9/16"	33-9/16"



CHARGE (END) BED:

Length: 3'-0"

Roller Centers: Slider and 3" RC. Comes with or without encoder.

INTERMEDIATE BED

Lengths: 2'.0" thru 10'.0" (1'.0" Increments)

Roller Centers: Slider and 3" RC

DRIVE / DISCHARGE BED

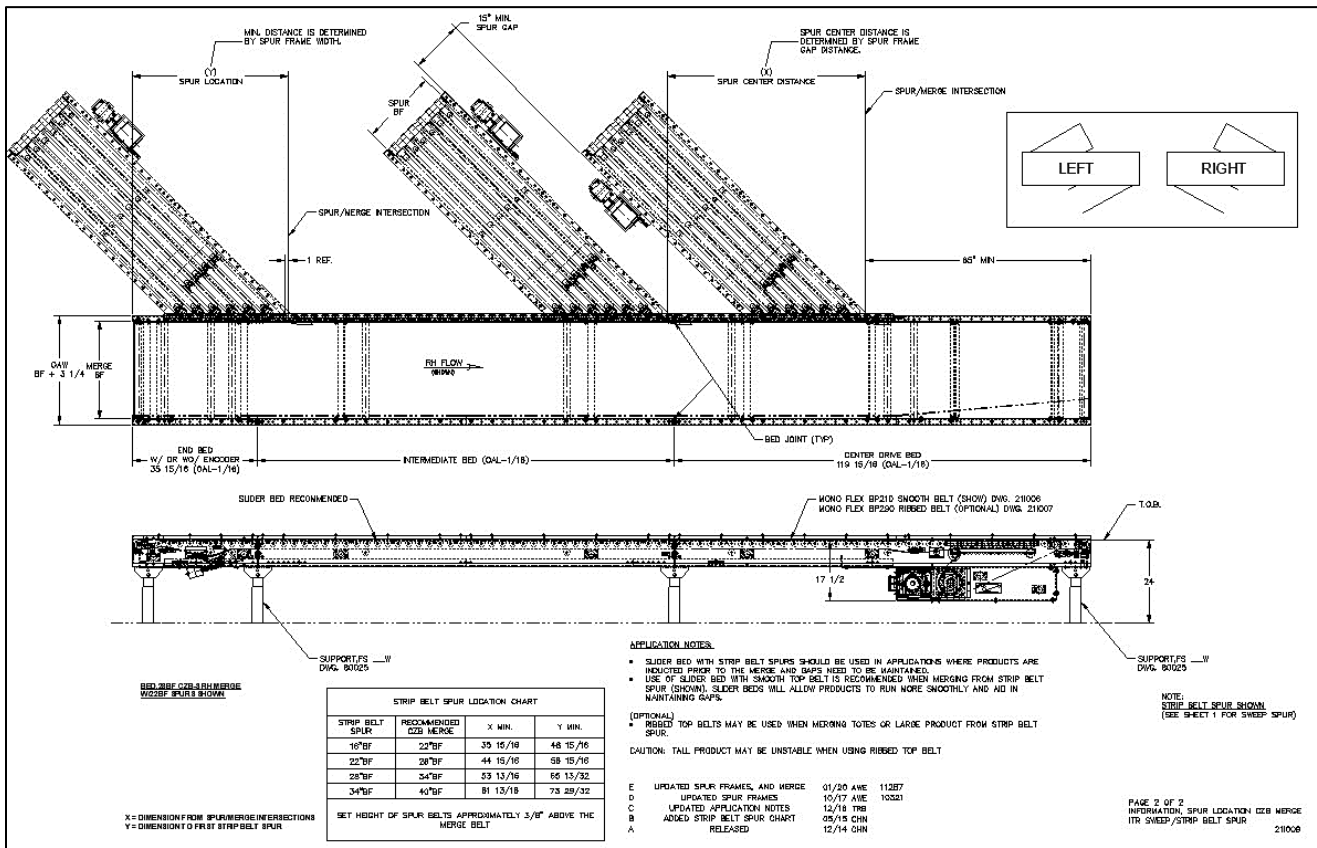
Length: 10'-0"

Roller Centers: Slider and 3" RC

DRIVE-TRAIN:

Use CRUZbelt center drive trains.

8 CRUZBELT & STRIP BELT SPUR



Standard Equipment

Belt:

Black rough top with clipper lacing.

Speed:

Speed 103 FPM to 350 FPM available.

The Strip Belt Spur should be used when there is a requirement to set the destination at the strip belt merge discharge and track the product from the strip belt spur to the sortation diverts location.

CRUZBELT WIDTH INFORMATION				
Overall Width	19-1/4"	25-1/4"	31-1/4"	37-1/4"
Between Frames	16"BF	22"BF	28"BF	34"BF
Belt Width	15-9/16"	21-9/16"	27-9/16"	33-9/16"

9 CRUZBELT COMMISSIONING OF EQUIPMENT

General

Commissioning of the equipment can best be defined as the final adjustments and test of the installed equipment required for its proper operation. The need for commissioning is inherent, since the individual components of equipment are brought together at the installation site to operate as a system.

Mechanical and electrical commissioning is most often carried out simultaneously. Commissioning must simulate the actual operation of the system as close as possible to demonstrate the ability to perform reliably at the specified rate in the prescribed operational sequence.

During the Commissioning Phase, it is necessary to load the equipment with product to be conveyed, which provides the means of detecting those areas requiring adjustment. Personnel will be required to support operational functions. This may serve as part of operator training and familiarity with the system. During the commissioning activity, special attention should be directed toward personnel safety. No unnecessary risks should be taken that would endanger the safety of any personnel. All personnel must familiarize themselves with all safety features of the system such as emergency stops and motor disconnects.

Mechanical Static Checkout

(No power to the conveyor.)

Follow the belt path through the entire conveyor. Ensure lacing is straight and fastened correctly.

Visually inspect the installation. Is the conveyor straight? Is the conveyor level within bubble lines from side to side? From end to end?

Check guard rail clearance to product.

Eliminate all catch points.

Check conveyor elevations.

All bolts and set screws tight.

Check product clearance to overhead structures.

Simulate all operational functions with actual product.

All guards in place with proper clearance.

All OSHA required guards in place on walkways, catwalks, ladder-ways, floor openings, etc.

All labels and warning signs in proper place, unobstructed.

Mechanical Dynamic Checkout

(Power to the conveyor, but no product on it.)

Turn the motor ON. With the belt moving make sure each belt has proper tension.

Check the belt tracking.

10 CRUZBELT PREVENTIVE MAINTENANCE & TROUBLESHOOTING

General PM

Preventive maintenance will save expensive downtime, wasted energy costs, and increase life of components. An accurate record keeping system will track component servicing history.

MHS Conveyor recommends periodic maintenance intervals. Inspection intervals may vary with load, speed, hours of operation, ambient temperature, humidity, etc. Intervals can be established by starting with a fairly frequent maintenance at first, and then lengthens the intervals as justified by observation of the need, based on history. The following schedule is based on 5 days per week, 8 hours per day operation under normal conditions.

Daily

- Listen to everything for unusual noises or vibration.
- Visually inspect to see that conveyor sections are clear and free of debris.
- Check to see that all safety guards are in place.
- Check for loose bolts or parts.

Weekly

- Check belt for wear and proper tension.
- Check belt tracking.
- Check belt lacing.

Monthly



- Inspect Gearmotor for leaking seals and the breather plug for dirt and debris.
- Inspect chain & sprocket, pulley, sheaves, and belts. See below for details.



Semi Annual

- Check the bearings for grease (Do not over grease). *Recommend NLGI #2 lithium complex grease.*
- Inspect pulleys and rollers for build-up of debris.

Annual

A complete inspection of conveyor equipment, parts, and proper operations to include safety tests. MHS Conveyor recommend inspecting for the following but not limited to:

 WARNING	
	<ul style="list-style-type: none"> • Prohibit walking or riding on conveyor by anyone. • Care should be taken when servicing any conveyor to prevent accidental injury. • All moving parts are potentially dangerous.

 WARNING	
	<ul style="list-style-type: none"> Do not perform maintenance on the conveyor until the start-up controls, including motor safety switches, are locked out and cannot be turned by any person other than the one performing the maintenance. If more than, one member of a crew is working on the conveyor, EACH CREW MEMBER MUST HAVE A LOCK ON THE POWER LOCK OUT. The air pressure must be turned off to the work area. All pneumatic devices must be de-energized to prevent accidental cycling of the device. Check the loosened parts have been retightened and all guards reinstalled. Make sure personnel are clear of all conveyor equipment before restarting the system.

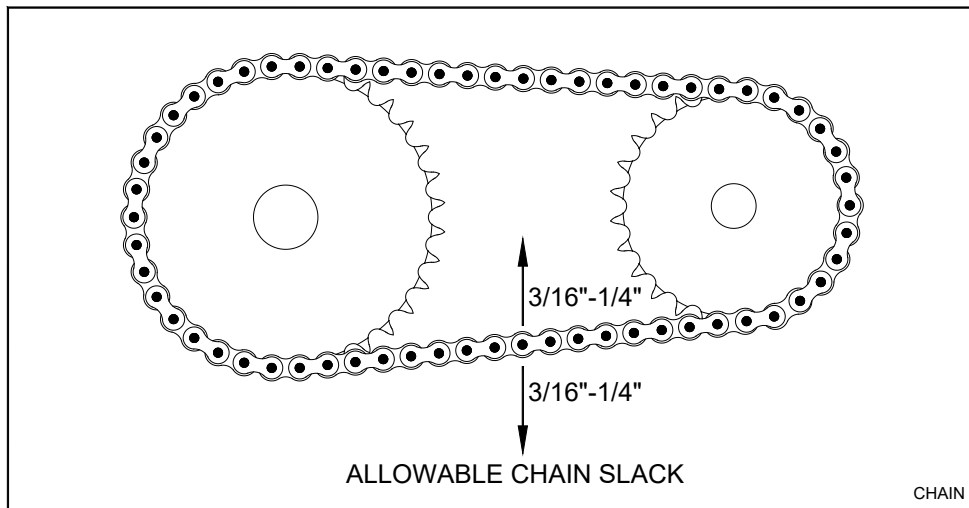
Gearmotor

The drive unit should be checked monthly. Check the motor gear case for leaking seals. Check breather on the gear case for dirt accumulation.

Chains and Sprockets

Chains and sprockets should be checked monthly. If either the sprockets or the chain is worn, both should be replaced. Sprockets must be checked for alignment with a straight edge. Clean the chain with a non-flammable solvent and lubricate with 30W synthetic oil. A brush is recommended for oil application.

Check chain tension after initial run-in and then monthly. Tension should be slightly slack, as shown:



Rollers

Inspect rollers periodically for debris build-up.

Belts

Belts normally need very little care. Clean monthly with compressed air or a stiff brush.



CAUTION
<ul style="list-style-type: none">• Do not use petroleum-based products to clean the belt.

Regreasable Bearings

The drive unit and power take-off have re-greasable bearings. *Recommend NGLI #2 lithium complex grease.* These bearings should be lubricated once during the first six months of operation. Over-greasing will pass grease through the bearing seals/shields and will draw dirt to the bearing. These bearing rotate at a relatively slow speed and should not use grease on a continuing basis.

Pulleys and Sheaves

During the first 30 days of operation, inspect the bushings and cap / setscrews for proper torque at least once a week, thereafter during periodic shutdowns.

 WARNING	
	<p>Pulleys and Sheaves</p> <ul style="list-style-type: none">• Do not use a worn hex wrench, as this may damage the setscrews.• Reference the bushing manufactures website for proper torque specifications and tightening procedures.

10.1 BELT TROUBLESHOOTING GUIDE

Problem Belt	Possible Cause	Remedy
1. Belt stopped or moving slower than normal, reducer output shaft is turning properly and all electrical components are operating normally.	Chain is loose and is skipping sprocket teeth	Tension chain. Check sprocket alignment, check for worn teeth.
	Belt has separated	Replace the entire belt or cut out damaged portion and add new piece with extra lacings.
	Bearings have failed	Locate and replace the bearings
	Belt slipping on drive pulley	See #2 below
	Belt lacing pulled out	See #3 below
	Improper belt tension	Re-tension take-up pulley
	Drive sprocket loose on shaft	Re-tighten sprocket and check for shaft wear
	Belt jammed due to obstruction	Check belt path and remove any obstruction
	Belt mistracked on return side	Reference Belt Tracking procedure.
2. Belt slipping on drive pulley	Take-up pulley not adjusted properly	Adjust take-up cam in small increments. Do not over-tighten.
	Drive pulley lagging or pulley side of belt is slippery	Replace pulley if lagging worn smooth. If slipping is caused by foreign substances in the lagging or bottom of belt, clean by scraping or wire brushing. Do not use solvents on belt or pulley lagging.
	New belt has stretched	Normal. Re-adjusted take-up.
	Seized end pulley or snubber roller bearings	Check and replace as required
	Load too heavy	Remove as required. Re-analyze needs.
	Belt threaded improperly	Check belt path per this manual
3. Belt lacing pulling out	Tension too high	Reduce belt tension at take-up pulley
	Obstruction	Remove obstruction
	Lacing worn out	Replace lacing with Clipper #UCM36SS12
4. Belt runs to one side	Rollers preceding and at trouble point are not square	Check alignment of pulleys and rollers. Adjust pulleys and rollers as required. See Belt Tracking section of this manual.

Problem Belt	Possible Cause	Remedy
	Build-up of foreign material on rollers and pulleys	Clean rollers and pulleys. Do not use solvents.
	Conveyor not level	Level conveyor bed
	Bowed belt	If belt is new, load tension may straighten it. Otherwise, replace.
	Pulley bearing set screws loose allowing pulleys to walk to one side	Loosen belt and reposition the pulley centered in the frame. Retighten the set screws and center the belt on the pulley.
	Worn bearings	Check and replace.
	Belt not joined securely at lacing	Re-cut belt ends square and re-lace.
	Off center loading	Correct loading conditions.
5. Rips at or near edge of belting	Obstruction	Remove obstruction
	Belt running against conveyor frame	See Belt Tracking section of this manual.
	Loose lacing	Check lacing for tightness and general condition. Check if belt is chamfered on corners.
6. Conveyor belt jerks during operation	Too much slack in drive chain which is jumping the sprocket	Adjust chain tension, check for worn sprockets.
	Chain climbing the sprocket	See "Chains & Sprockets" #8
7. Gouging of top cover	Obstruction	Locate and remove obstruction
	Damaged return idler or snubber pulley	Verify return idlers and snubber pulleys are spinning freely and have no material build-up.
8. Severe wear on drive pulley side of belting	Belt slipping on drive pulley	See #2 above
	Frozen or sticking rollers or pulleys	Replace bad pulleys or rollers
	Slider bed damage or misalignment	Check slider bed for smoothness and alignment at joints
9. Excessive belt stretching	Tension too great	Reduce belt tension by take-up adjustment

10.2 GEARMOTOR TROUBLESHOOTING GUIDE

	Problem - Motor/Reducer	Possible Cause	Remedy
1.	Motor will not start	No line voltage	Check emergency stops and reset. Check fuses and wiring for open circuit. Check thermal overload protection device. Check limit switches, starter and relays for faulty contacts or mechanical fault. Check voltage at source.
		Low line voltage	Check for low resistance short on line.
		Conveyor overloaded or jammed	Check for foreign material in chain and sprockets. Check for material between belt and pulleys. Check conveyor belt tension. Remove product overloading from conveyor and address cause.
		Burned out motor	Replace motor with spare and send defective motor to authorized repair station.
		Failure of electrical component	Check photoelectric control relay, timing modules and start/stop pushbuttons.
2.	Motor running excessively hot Note: Temperature up to 175° (hot to touch) is normal.	Drag on conveyor	Inspect entire conveyor for obstruction or falling bearings.
		Lack of reducer lubricant	Check oil level in gear case. Be sure breather plug is open (if used).
		Too much lubrication	Drain off excess.
		Frozen pulley or roller	Check all pulleys and bearings for free rotation. Replace if frozen or difficult to rotate.
		Wrong grade oil	Drain and refill with proper grade.
		Electrical	Check wiring and circuits. Take ampere reading and compare with motor rating on name plate.
		Key ramped up on the motor shaft, causing excessive bearing load.	Remove motor to reducer mounting belts. Pull motor back and reposition key, push motor back onto reducer. Binding or excessive resistance should not
		Overloaded conveyor	Remove excess product. Address cause.
Mistreading belt path	Reroute belt path correctly.		

	Problem - Motor/Reducer	Possible Cause	Remedy
3.	Reducer runs – drive pulley does not turn	Drive chain broken or disconnected	Replace chain or repair.
		Sprockets loose. Also, see “Bearings” #8, Chain & sprockets #2 and #6.	Check key and tighten set screws
4.	Reducer leaks oil	Defective oil seals on output shaft	Install new oil seals. Replace reducer with spare and send defective reducer to authorized repair facility.
		Oil level too high	Drain off excess.
		Loose bearing cover bolts	Tighten as required.
		Incorrect size	Check size and replace if necessary.
5.	Thermal protectors kicking out	Short in motor	See “Motor Will Not Start”.
		Excessive amps being pulled	Reset starter and check ampere draw. Check for conveyor overload.
6.	Starter overloads kicking out	Poor ventilation in control panel	Add vents or fan.
		Electrical	Check circuits and panel. Check heater size.
7.	Repeated stalling	Excessive product loads	Check if loads or rates have increased since purchase of conveyor.
		Motor wiring	Check motor wiring.
		Overload on motor	Check conveyor for obstruction causing drag or bearing failure. Check for excessive product load.
8.	Slow to start	Electrical	Check circuits and panel. Take ampere reading.
9.	Excessive noise or motor hums	Lack of lubrication	Check oil level in gear case.
		Damaged gears	Replace reducer.
		Loose mounting	Tighten bolts.
		Faulty bearing	Replace bearing.
10.	Motor will run but reducer does not turn	Worn gear in reducer	Replace reducer with spare and send defective reducer to authorized repair station.
		Key between motor and reducer missing	Replace key.

	Problem - Motor/Reducer	Possible Cause	Remedy
11.	Electrical shorts	Loose connection	Check all wire connections. Check fuses.

10.3 CHAIN & SPROCKET TROUBLESHOOTING GUIDE

	Problem - Chain & Sprocket	Possible Cause	Remedy
1.	Excessive slack	Normal wear	Expect rapid chain growth in first two weeks of operation. Check sprocket alignment and re-tension.
2.	Sprocket loose on shaft	Loose set screws	Realign sprockets with straight edge and tighten set screws. Check for worn components.
3.	Wear on tips of sprocket teeth	Chain elongated	Replace chain and sprockets
4.	Abnormal wear on chain or sprockets	Excessive chain tension	Align sprockets and reduce tension to 1/4" chain slack each way of center.
		Sprockets misaligned	Realign with straight edge across sprocket faces.
		Chain not adequately lubricated	Lubricate chain with approved lubricant, wipe away excess lubricant.
		Damaged sprocket or chain	Replace damaged component. Check alignment.
		Dirty chain	Clean thoroughly and use approved Lubricant.

10.4 BEARINGS TROUBLESHOOTING GUIDE

	Problem - Bearings	Possible Cause	Remedy
1.	Excessive vibration	Bearing brinnelled	Locate and replace
2.	Bearing runs excessively hot	No lubrication	Add approved lubricant
3.	Noise (intermittent)	Loose mounting bolts	Check security or mounting bolts
4.	Shaft rotation in bearing bore	Eccentric locking collar or hub loose	Tighten locking collar in the direction of shaft rotation and/or tighten set screws
5.	Noise (low pitch)	Bearing brinnelled	Replace
6.	Rough spots felt when rotated	Bearing worn	Replace
7.	Bearing squeals or thumps while running	Bearing has defect	Replace

	Problem - Bearings	Possible Cause	Remedy
8.	Pulley or roller does not turn	Bearing frozen	Replace bearing or complete roller
		Key sheared off in pulley hub	Check loading. Check shaft. Replace key.
		Set screws slipping on shaft	Tighten and check shaft

11 CRUZBELT REPLACEMENT PARTS IDENTIFICATION

This section is used to identify parts that may require replacement during the life of the conveyor. Parts, which specifically pertain to MHS Conveyor conveyors, are included with illustrations. A "Recommended Spare Parts List" is published for all conveyor orders of \$20,000. This spare parts list is sent to the purchaser approximately (2) weeks after the order is received. It includes part numbers, description, pricing and recommended quantities to be kept on hand for maintenance. If you are unable to locate this document, another may be obtained by contacting the MHS Conveyor Lifetime Services at 231-798-4547.

11.1 SPARE PARTS PRIORITY LEVEL EXPLANATIONS

Level #1

Failure of a priority level #1 spare part ("A" level part) may cause major disruption of system performance.

Priority level 1 spare parts must be on-hand, and available to be replaced in the event of a component failure that could shut down a critical function of a conveyor system.

Priority level 1 spare parts include motors, gear reducers, gearmotor, motorized rollers, air solenoid valves, and related components. The majorities of these parts are purchased from MHS Conveyor vendors and carry their own warranties through these vendors. For more warranty information, see MHS Conveyor Equipment Warranty.

Level #2

Failure of a priority level #2 spare parts ("B" level part) usually is gradual and should not cause a major system disruption.

Priority level 2 spare parts are parts required for smooth system operation and preventative or regular mechanical maintenance.

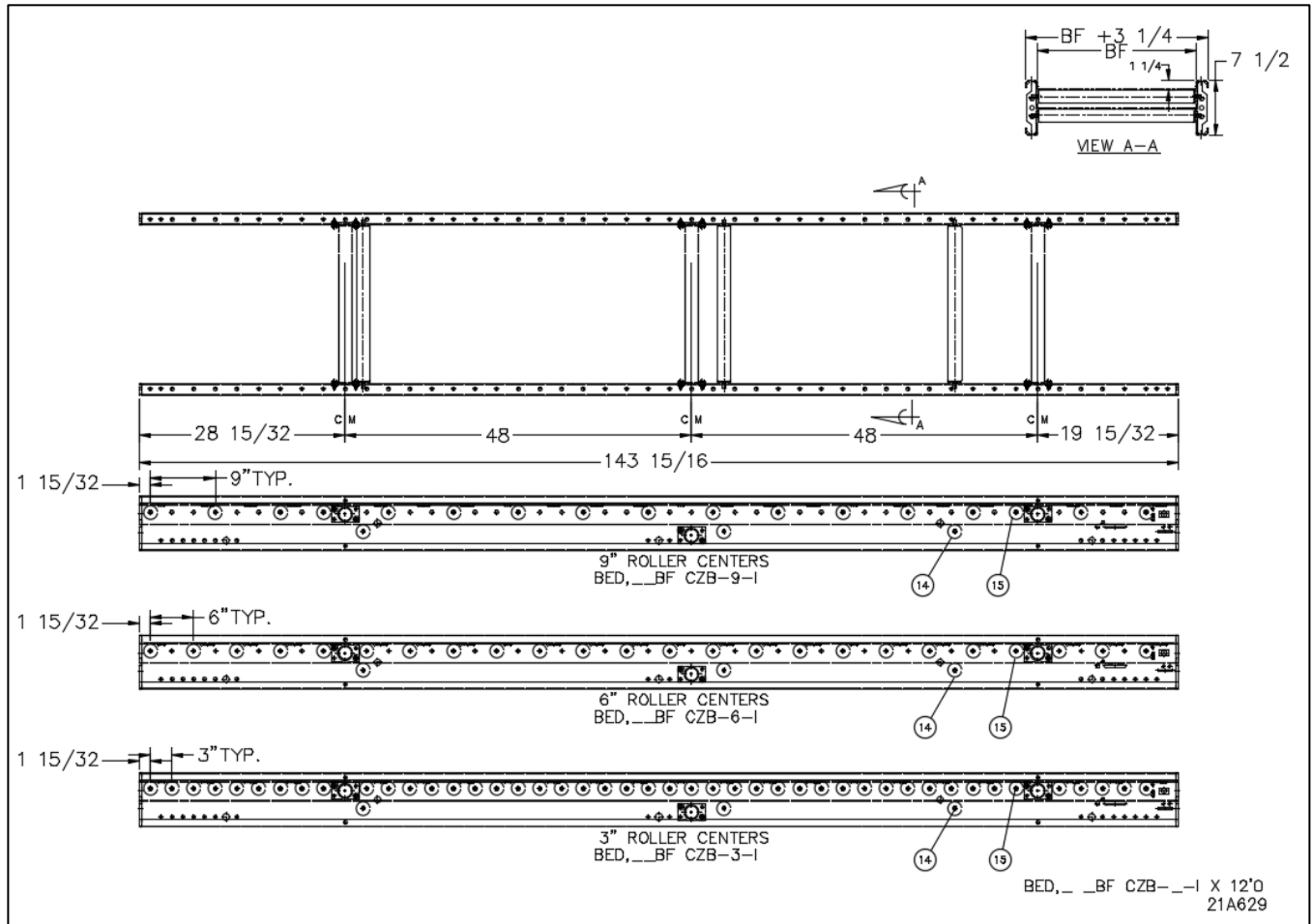
Priority level 2 spare parts include roller chain, sprockets, belt pulleys, rollers, air cylinders, and other related parts whose failure should not stop a conveyor system suddenly. These parts tend to wear out gradually and are not know to fail suddenly.

Level #3

Priority level #3 parts ("C" level part) rarely fails and are easily obtainable.

Priority level 3 spare parts are parts that rarely fail or maybe optionally used by the customer.

11.2 CRUZBELT INTERMEDIATE BED – BELT ON ROLLER

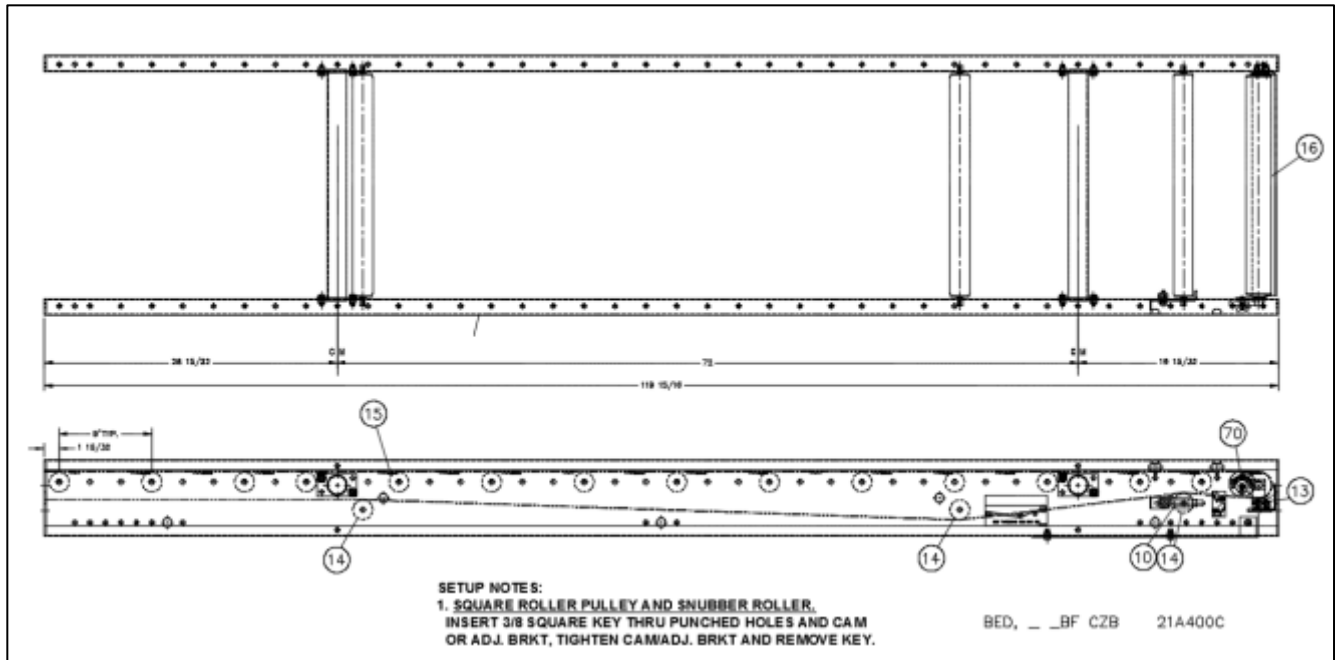


11.2.1 CRUZbelt Intermediate Bed

REPLACEMENT PARTS FOR CRUZBELT INTERMEDIATE BED					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
14	ROLLER, __CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655
15	ROLLER, __"GRAV 1.9 PLTD PRBG	60218009	60224009	60230009	60236009

Bed Reference Dwg. #21A629

11.3 CRUZBELT END BEDS - BELT ON ROLLER

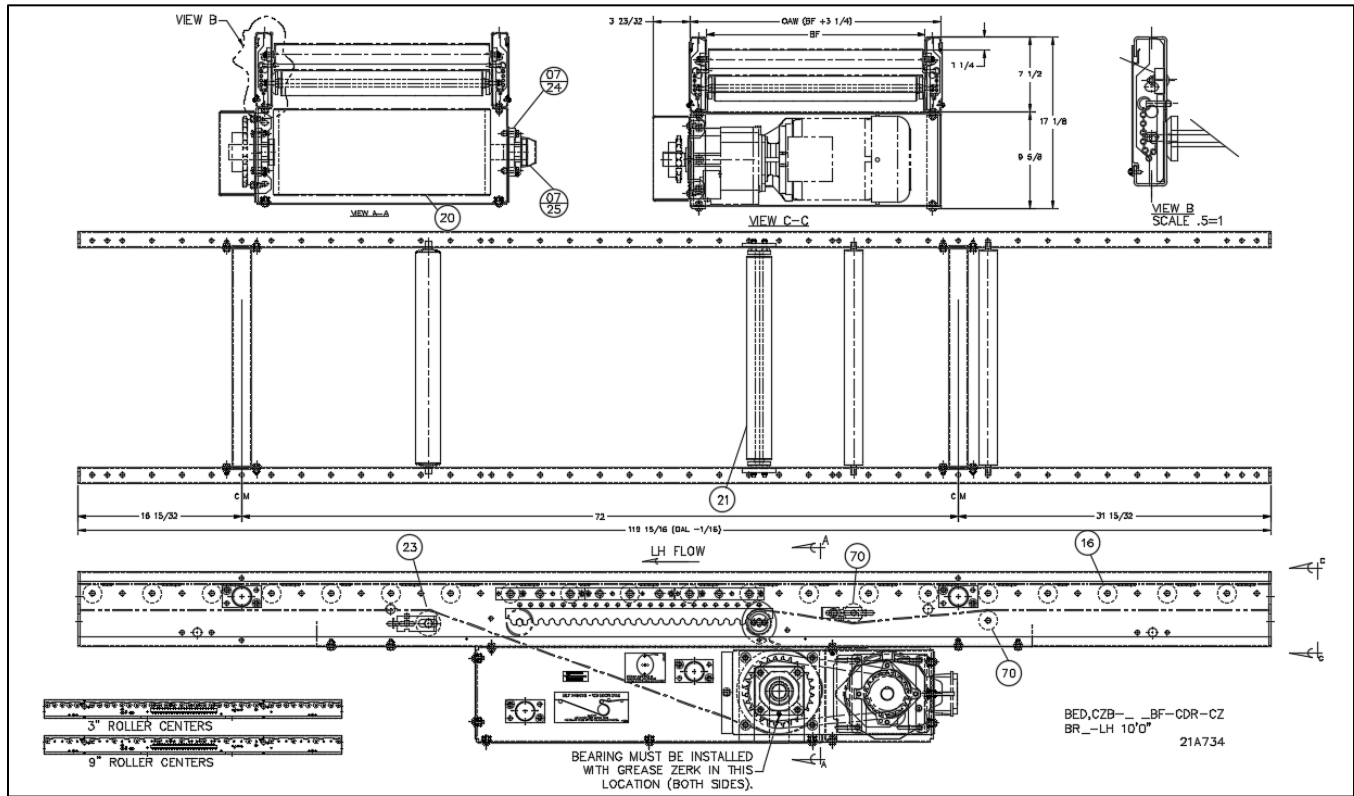


11.3.1 CRUZbelt End Beds

REPLACEMENT PARTS FOR CRUZBELT END BEDS					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
10	BRKT,CZB SNUBBER ADJ.	E0009408			
13	GUARD,FINGER __CZB (HANDED)	E0034991	E0034992	E0034993	E0034994
14	ROLLER, __CZB 1.9 SNUBBER	E0009652	E0009653	E0009654	E0009655
15	ROLLER, __" GRAV 1.9 PLTD PRBG	60218009	60224009	60230009	60236009
16	PULLEY, __CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393
70	CAM,ASY CZB	E0038393			

Bed Reference Dwg. #21A400C

11.4 CRUZBELT CENTER DRIVES - BELT ON ROLLER

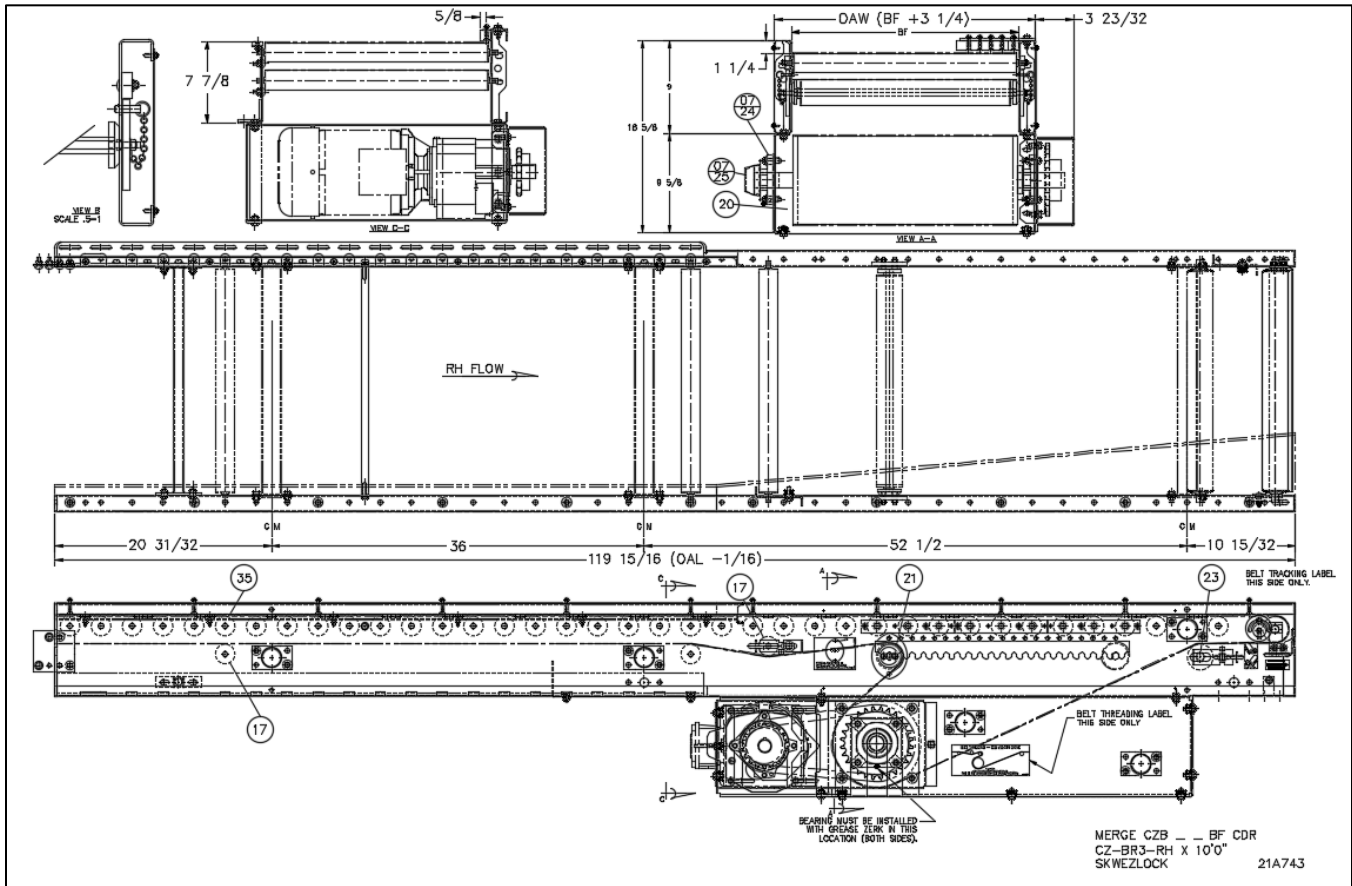


11.4.1 CRUZbelt Center Drives (BOR)

REPLACEMENT PARTS FOR CRUZbelt CENTER DRIVE BOR					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
07/24	BRG, FLG 4BOLT X 1-7/16" (CONCENTRIC CLAMP COLLAR,D-LOCK)	1114091			
07/25	BEARING END, SAFTY CAP	1114092			
16	ROLLER, __"GRAV 1.9 PLTD PRBG	60218009	60224009	60230009	60236009
20	PULLEY, WLDMT 8" __BF CZB CDR	1158680	1158681	1158682	1158683
21	PULLEY, __CZB DR 2.5 DIA 1/4W	E0040400	E0040401	E0040402	E0040403
23	ROLLER, SNUB __BF 11/16 AXLE	18218001	18224001	18230001	18236001
70	ROLLER, __CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655

Bed Reference Dwg. #21A734

11.5 CRUZBELT MERGE DRIVE BED

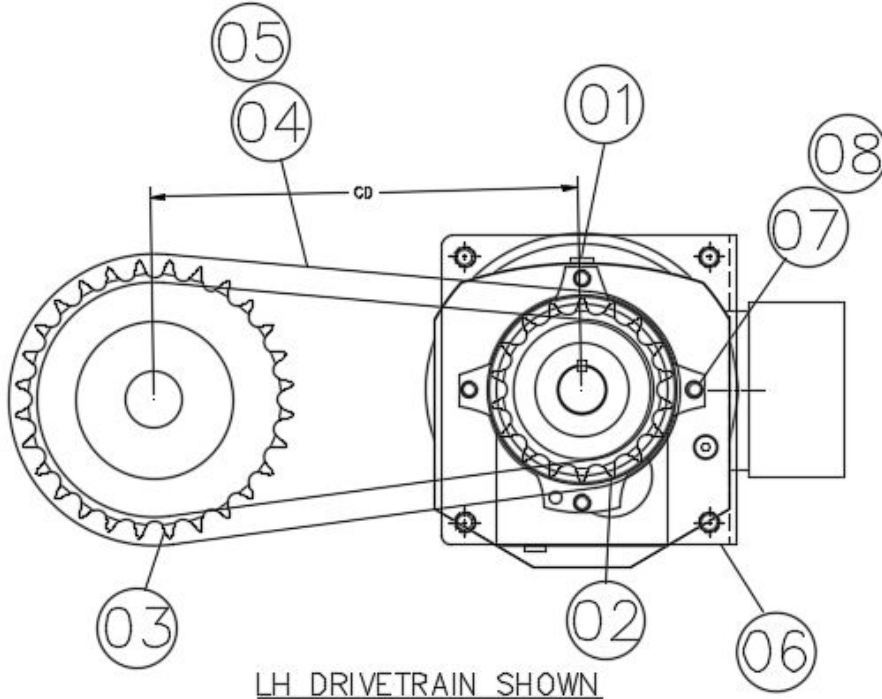


11.5.1 CRUZbelt Merge Drive

REPLACEMENT PARTS FOR CRUZBELT MERGE DRIVE					
BALLOON	DESCRIPTION	Widths & Part #s			
		22" BF	28" BF	34" BF	40" BF
07/24	PULLEY,_CZB 2.5 DIA 1/4	E0040391	E0040392	E0040393	E0040394
07/25	BEARING END, SAFTY CAP	1114092	1114092	1114092	1114092
17	ROLLER,_CZB 1.9 SNUBBER PRBG (CONCENTRIC CLAMP COLLAR,D-LOCK)	E0009653	E0009654	E0009655	E0009656
20	PULLEY,WLDMT 8" _BF CZB CDR	1158681	1158682	1158683	1161079
21	PULLEY,_CZB DR 2.5 DIA 1/4W	E0040401	E0040402	E0040403	E0040404
23	ROLLER,SNUB _BF 11/16AXLE	18224001	18230001	18236001	18242001
22	BRG, FLG 4BOLT X 1-7/16"	1114091	1114091	1114091	1114091
35	ROLLER,_ "GRAV 1.9 PLTD PRBG (W/PRECISION BREARING)	60224009	60230009	60236009	60242009

Bed Ref Dwg. #21A743

11.6 CRUZBELT DRIVE TRAIN



LH DRIVETRAIN SHOWN

NOTE: IMPORTANT! AFTER MOTOR HAS BEEN INSTALLED ON BED, ATTACH NORD MOTOR STICKER TO FAN COVER. THE STICKER IS TO BE PLACED, SO THAT WHEN THE BED IS IN THE INSTALLED POSITION, IT IS VISIBLE WHEN VIEWED FROM BELOW.

DRIVE TRAIN CZB 8CDR
21S012 REV

11.6.1 CRUZbelt RH & LH Center Drive Trains Chain Driven

REPLACEMENT PARTS FOR CRUZBELT RH & LH CENTER DRIVE TRAIN										DRIVE TRAINS	
Balloon #	1							2	3	4	5
FPM	HP	RH DR-TRAIN P/N	LH DR-TRAIN P/N	BRAKE OPTION	RH GEAR-MTR P/N	LH GEAR-MTR P/N	REDUCER SIZE IT 01	DRIVE SPROCKET	DRIVEN SPROCKET	CHAIN	MASTER LINK
60	1	1135401	1135398		1135095	1135093	SK373.1Z-VL-80 LP/4	1118303 H6015T 1"BORE	1118285 28T 1-7/16" BORE	90140032 PEER # 60 ROLLER CHAIN	90440107 PEER # 60 MASTER LINK
75	1.5	1135416	1135413		1135107	1135105	SK572.1Z-VL-90 SP/4	1118352 H6016T 1-1/4"BORE	1118264 27T 1-7/16" BORE		
120	2	1135454	1135452		1135135	1135132	SK572.1Z-VL-90 LP/4	1118352 H6016T 1-1/4"BORE	1118285 28T 1-7/16" BORE		
150	3	1135478	1135476		1135160	1135158	SK572.1Z-VL-100 LP/4	1118352 H6016T 1-1/4"BORE	1118273 26T 1-7/16" BORE		
180	3	1135493	1135491		1135168	1135166	SK572.1Z-VL-100 LP/4	1118352 H6016T 1-1/4"BORE	1118273 26T 1-7/16" BORE		
240	2	1160558	1160556		1160537	1160535	SK372.1Z-VL-90 LP/4	1118277 H6016T 1"BORE	1118273 26T 1-7/16" BORE		
	5	1160562	1160560		1160541	1160539	SK572.1Z-VL-112 MP/4	1118352 H6016T 1-1/4"BORE	1118285 28T 1-7/16" BORE		

Drive-Train Ref Dwg # 21S012

11.6.2 CRUZbelt Timing Belt

REPLACEMENT PARTS FOR CRUZBELT RH & LH TIMING BELT									
Balloon #	1							2	3
FPM	HP	RH DR-TRAIN P/N	LH DR-TRAIN P/N	BRAKE OPTION	RH GEAR-MTR P/N	LH GEAR-MTR P/N	REDUCER SIZE IT 01	DRIVE SPROCKET	DRIVEN SPROCKET
90	1 1/2	1135507	1135504		1135183	1135504	SK572.1Z-VL-90 SP4	E0033834 PULLEY,GATES POLY 8MX-48S-36	E0038985 PULLEY,GATES 8MX-63S-36
120	2	1135527	1135525		1135126	1135123	SK572.1Z-VL-90 LP4	E0038328 PULLEY,GATES POLY 8MX-45S-36	E0038985 PULLEY,GATES POLY 8MX-63S-36
150	3	1135545	1135543		1135310	1135307	SK573.1Z-VL-100 LP4	E0033834 PULLEY,GATES POLY 8MX-48S-36	E0038985 PULLEY,GATES 8MX-63S-36
180	3	1135570	1135568		1135152	1135148	SK572.1Z-VL-100 LP4	E0033835 PULLEY,GATES POLY 8MX-50S-36	E0038985 PULLEY,GATES 8MX-63S-36
300	2	1135612	1135610		1135372	1135369	SK572.1Z-VL-90 LP4	E0038988 PULLEY,GATES 8MX-56S-36	E0038309 PULLEY,GATES 8MX-60S-36
	5	1135622	1135620		1135378	1135374	SK572.1Z-VL-112 MP4	E0033835 PULLEY,GATES POLY 8MX-50S-36	E0038985 PULLEY,GATES 8MX-63S-36

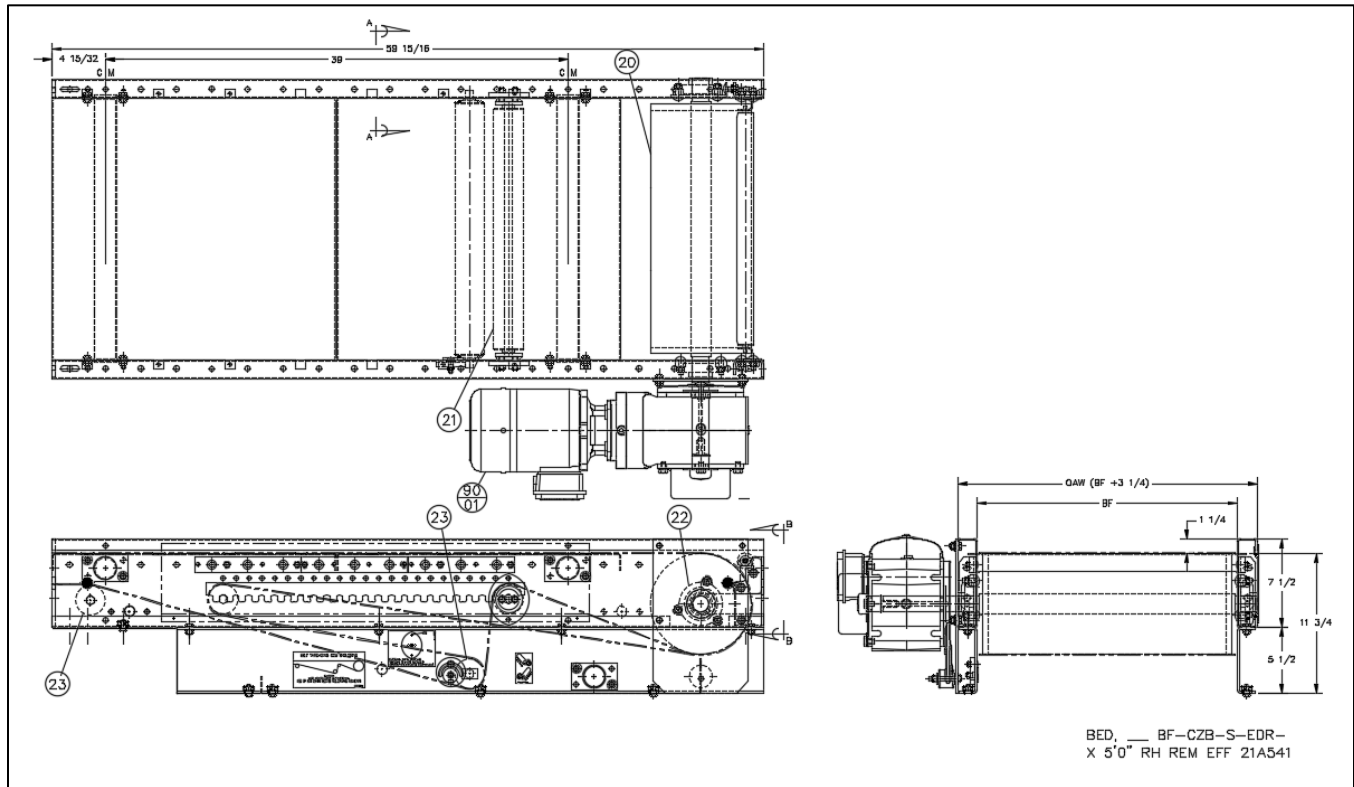
Drive-Train Ref Dwg # 21S012 H

11.6.3 CRUZbelt Mount plate

MOUNT PLATE FOR CONVERTING OLD STYLE GEARMOTOR MOUNT TO THE NEW NORD .1 NEW STYLE MOUNTING					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
6	PL,MTR CZB CDR SK57_1 W/ 3/8-16 PEM NUTS	1167735			
6	PL,MTR CZB CDR SK37_1, W/ 3/8-16 PEM NUTS	1186161			

Reference Dwg. #21S012H, 21D634, 21D672

11.7 CRUZBELT END DRIVE



11.7.1 CRUZbelt End Drive & Drive Train Replacement Parts

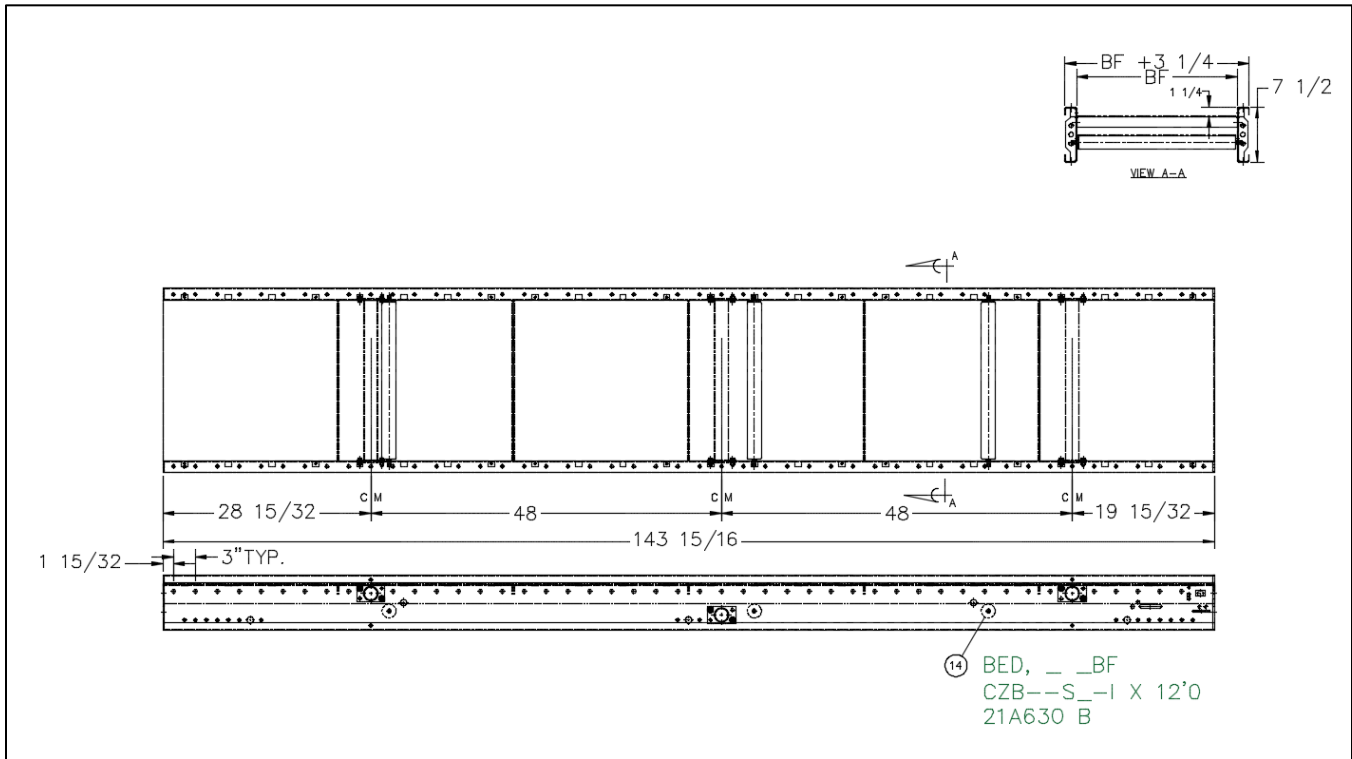
REPLACEMENT PARTS FOR CRUZBELT END DRIVE							
BALLOON	DESCRIPTION	Widths & Part #s					
		16" BF	22" BF	28" BF	34" BF	40" BF	46" BF
20	PULLEY,WLDMT __ CZB 8"EDR TAP	E0009080	E0009081	E0009082	E0009083	E0009084	E0009085
21	PULLEY, __ CZB DR 2.5 DIA 1/4W DRIVE TAKE-UP ROLLER	E0040400	E0040401	E0040402	E0040403	E0040404	E0040405
22	BRG,3BOLT FLG X 1-3/8" SST	1115245					
23	PULLEY, __ 4CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393	E0040394	E0040395

Bed Reference Dwg. #21A541

11.7.2 CRUZbelt Drive Train ITEM # Replacement Parts

DRIVE TRAIN ITEM #s DRIVE TRAIN ITEM #s / GEARMOTOR PART #s FOR CRUZBELT END DRIVES				
BALLOON			90	90
SPEED	HP	BELT PULL	RH DRIVE TRAIN	LH DRIVE TRAIN
75	1	404	1171281	1171294
90	1.5	469	1171282	1171295
105	1.5	418	1171283	1171296
120	1.5	380	1171284	1171297
135	2	455	1171285	1171298
150	2	414	1171286	1171299
210	3	444	1171287	1171300
Dwg # 21A541				

11.8 CRUZBELT INTERMEDIATE SLIDER BED

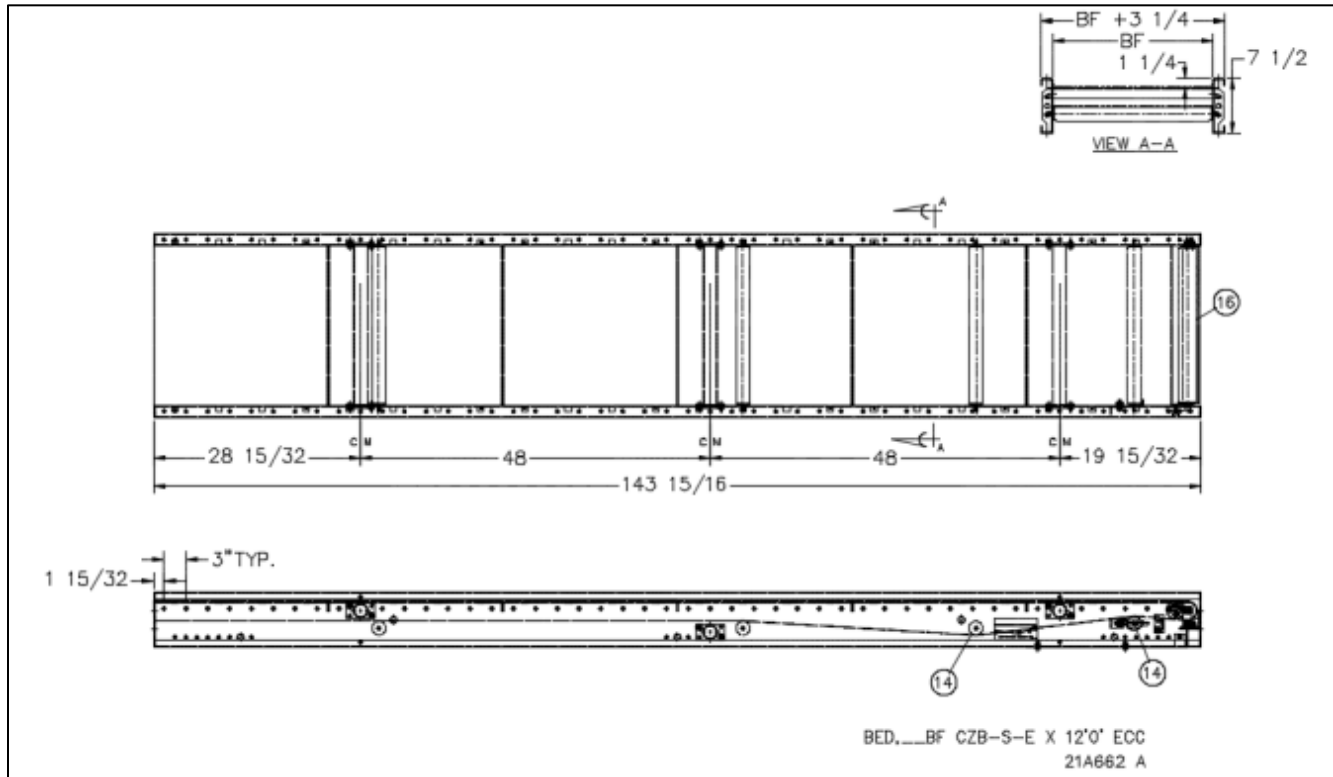


11.8.1 CRUZbelt Intermediate Slider Bed

REPLACEMENT PARTS FOR CRUZBELT INTERMEDIATE SLIDER BED							
		Widths & Part #s					
BALLOON	DESCRIPTION	16" BF	22" BF	28" BF	34" BF	40" BF	46" BF
14	ROLLER,_CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655	E0009656	E0009657

Bed Reference Dwg. #21A630

11.9 CRUZBELT SLIDER END BED

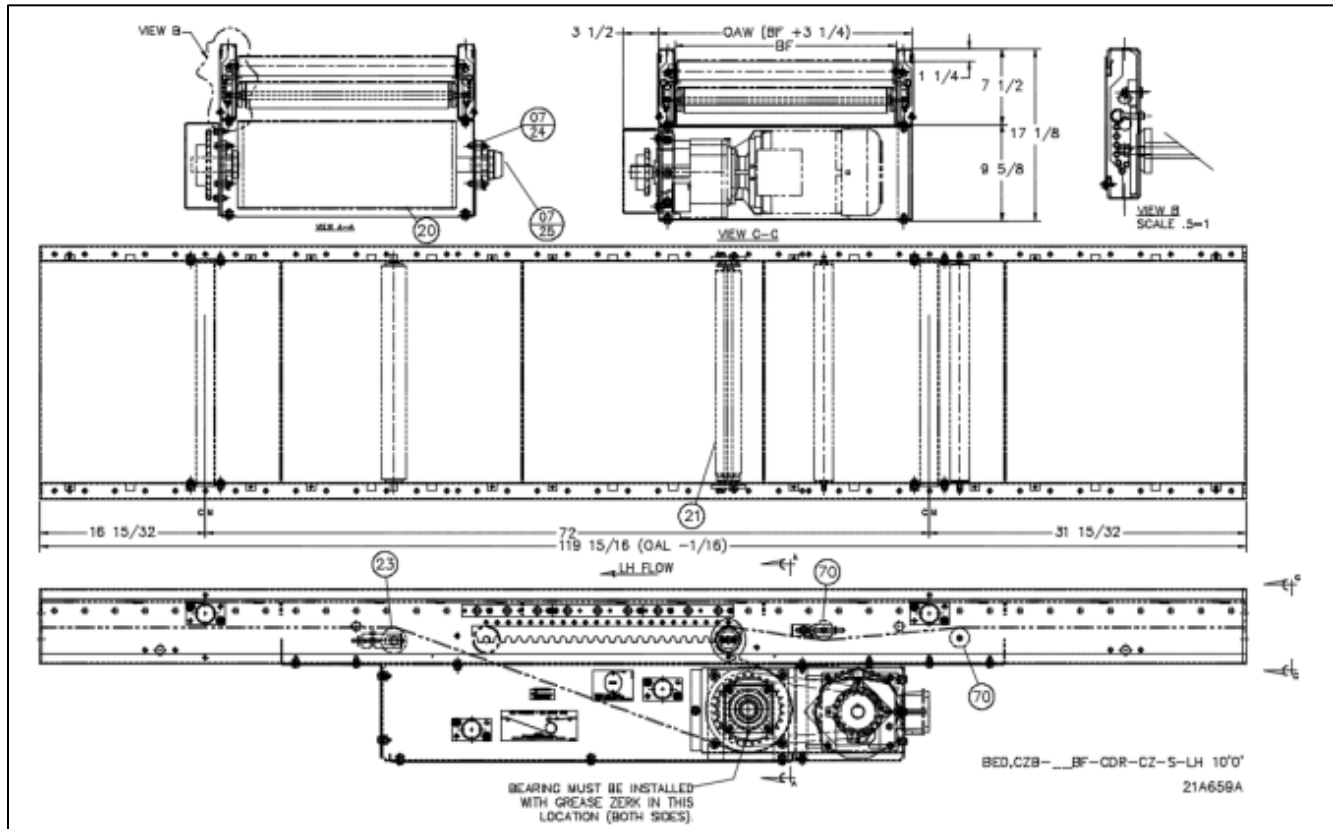


11.9.1 CRUZbelt Slider End Bed

REPLACEMENT PARTS FOR CRUZBELT SLIDER END BED							
		Widths & Part #s					
		Carton Tote Conveyor & Empty Carton				Empty Carton Only	
BALLOON	DESCRIPTION	16" BF	22" BF	28" BF	34" BF	40" BF	46" BF
14	ROLLER, __CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655	E0009656	E0009657
16	PULLEY, __CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393	E0040394	E0040395

Bed Reference Dwg. #21A662

11.10 CRUZBELT SLIDER CENTER DRIVE

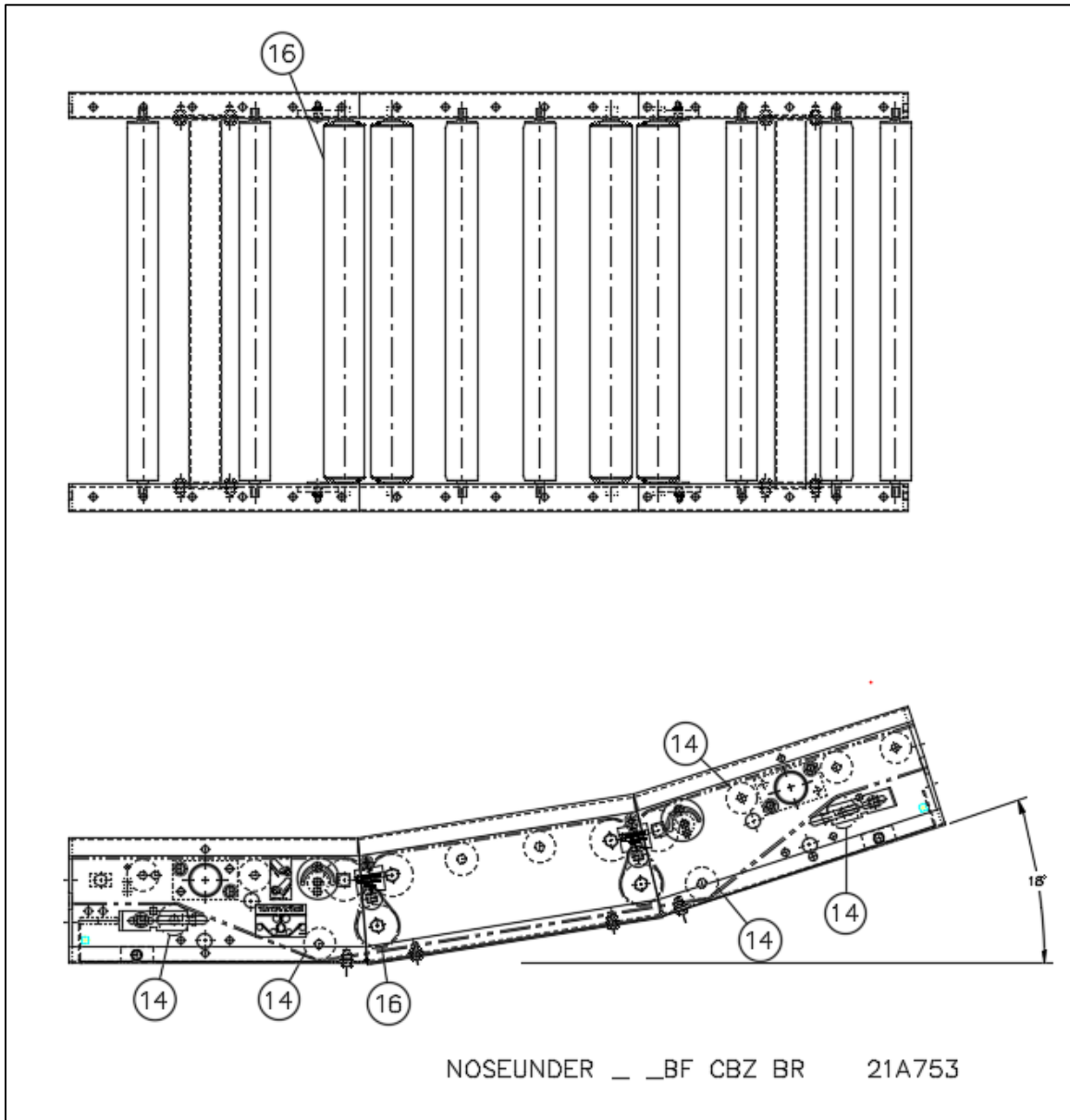


11.10.1 CRUZbelt Slider Center drive

REPLACEMENT PARTS FOR CRUZbelt SLIDER CENTER DRIVE							
		Widths & Part #s					
		Carton Tote Conveyor & Empty Carton				Empty Carton Only	
BALLOON	DESCRIPTION	16" BF	22" BF	28" BF	34" BF	40" BF	46" BF
07/24	BRG, FLG 4BOLT X 1-7/16"	1114091					
07/25	BEARING END SAFTYCAP	1114092					
20	PULLY, WLDMT 8" __BF CZB CDR	1158680	1158681	1158682	1158683	1161079	1161080
21	PULLY, __CZB DR 2.5 DIA 1/4W	E0040400	E0040401	E0040402	E0040403	E0040404	E0040405
23	ROLLER, SNUB __BF 11/16 AXLE	18218001	18224001	18230001	18236001	18242001	18248001
70	ROLLER, __CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655	E0009656	E0009657

Bed Reference Dwg. #21A659

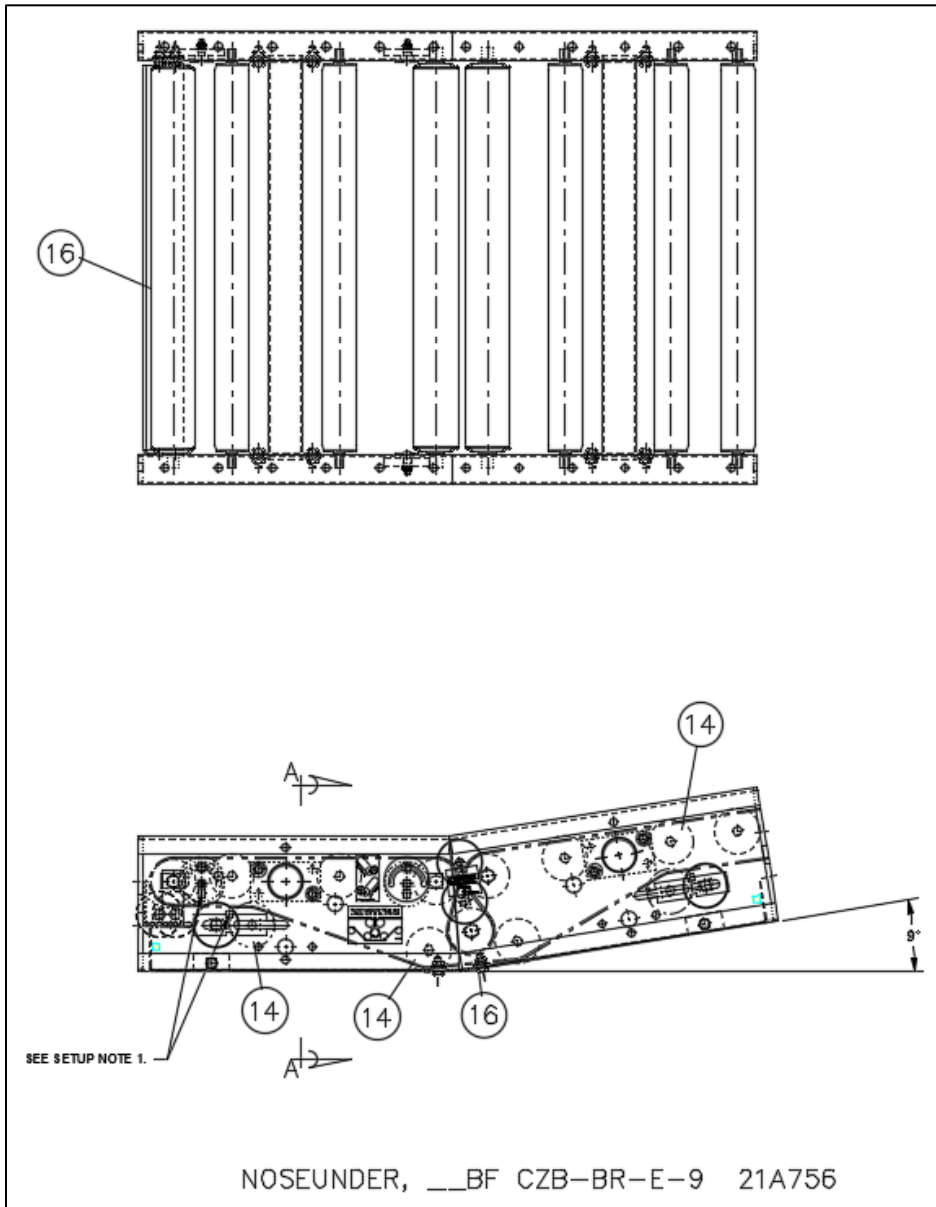
11.11 CRUZBELT INTERMEDIATE NOSEUNDER BED



11.11.1 CRUZbelt Noseunder

REPLACEMENTS FOR CRUZBELT NOSEUNDER					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
14	ROLLER, _ CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655
16	PULLEY, _ CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393
Note: #14 above is not used with slider pan conveyors					
Bed Reference Dwg. #21A753					

11.12 CRUZBELT NOSEUNDER END BED

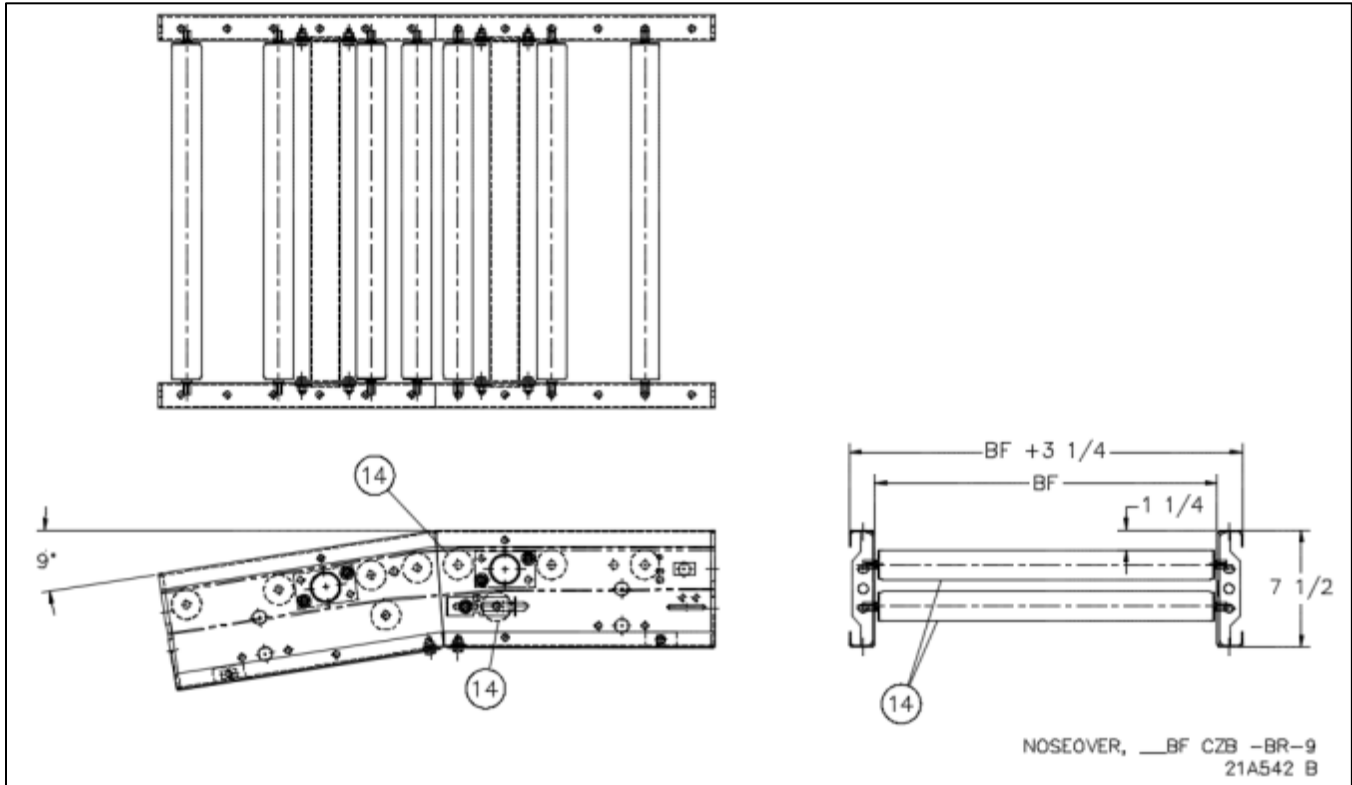


11.12.1 CRUZbelt Noseunder End Bed

REPLACEMENT PART FOR CRUZBELT NOSEUNDER END BED					
		Widths & Part #s			
BALLOON	DESCRIPTION	16" BF	22" BF	28" BF	34" BF
14	ROLLER,_ CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655
16	PULLEY,_ CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393

Bed Reference Dwg. #21A756

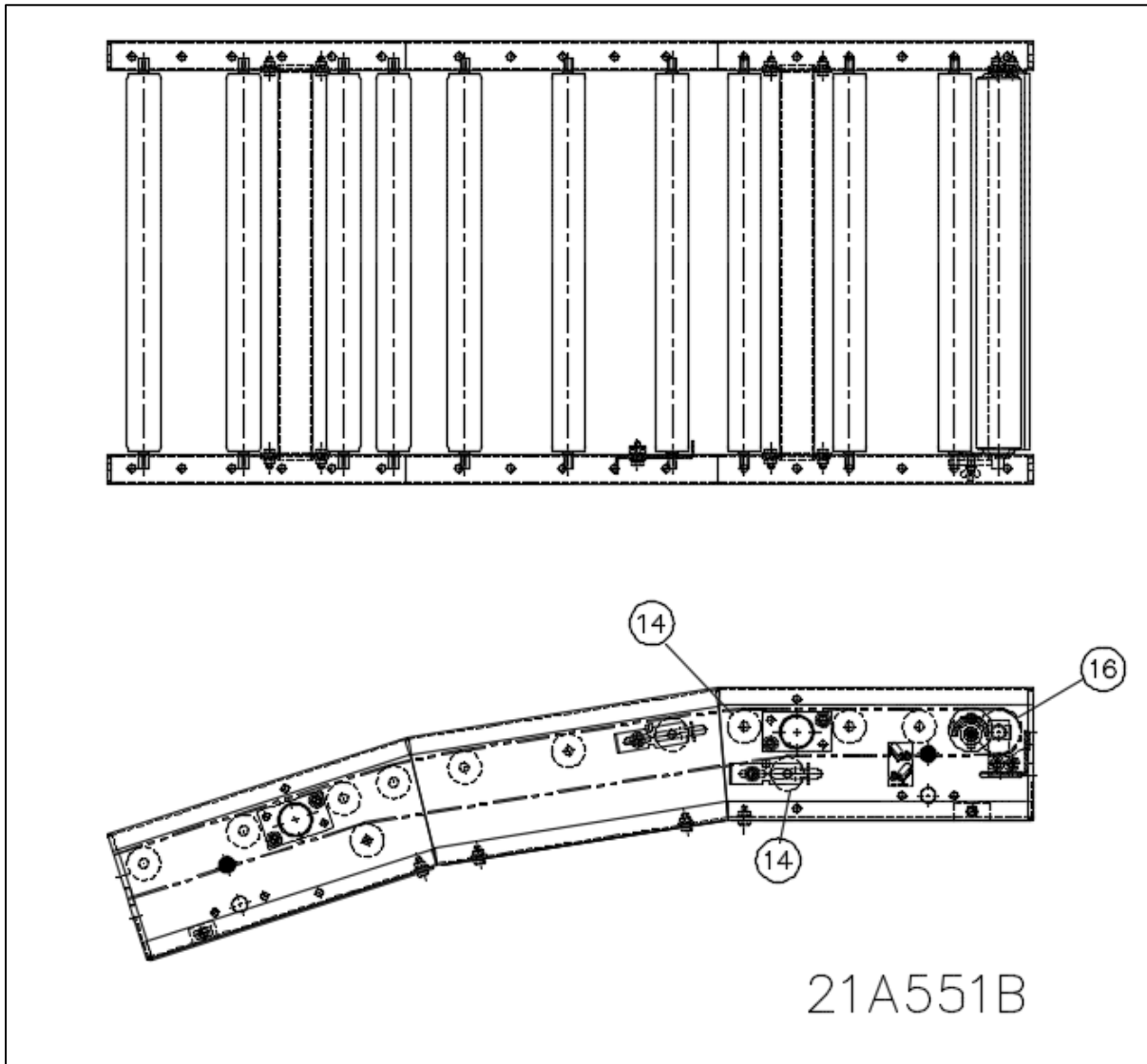
11.13 CRUZBELT INTERMEDIATE NOSEOVER BED



11.13.1 CRUZbelt Intermediate Noseover Bed

REPLACEMENT PARTS FOR CRUZBELT INTERMEDIATE NOSEOVER BED					
		Widths & Part #s			
BALLOON	DESCRIPTION	16" BF	22" BF	28" BF	34" BF
14	ROLLER, __CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655
Bed Reference Dwg. #21A542					

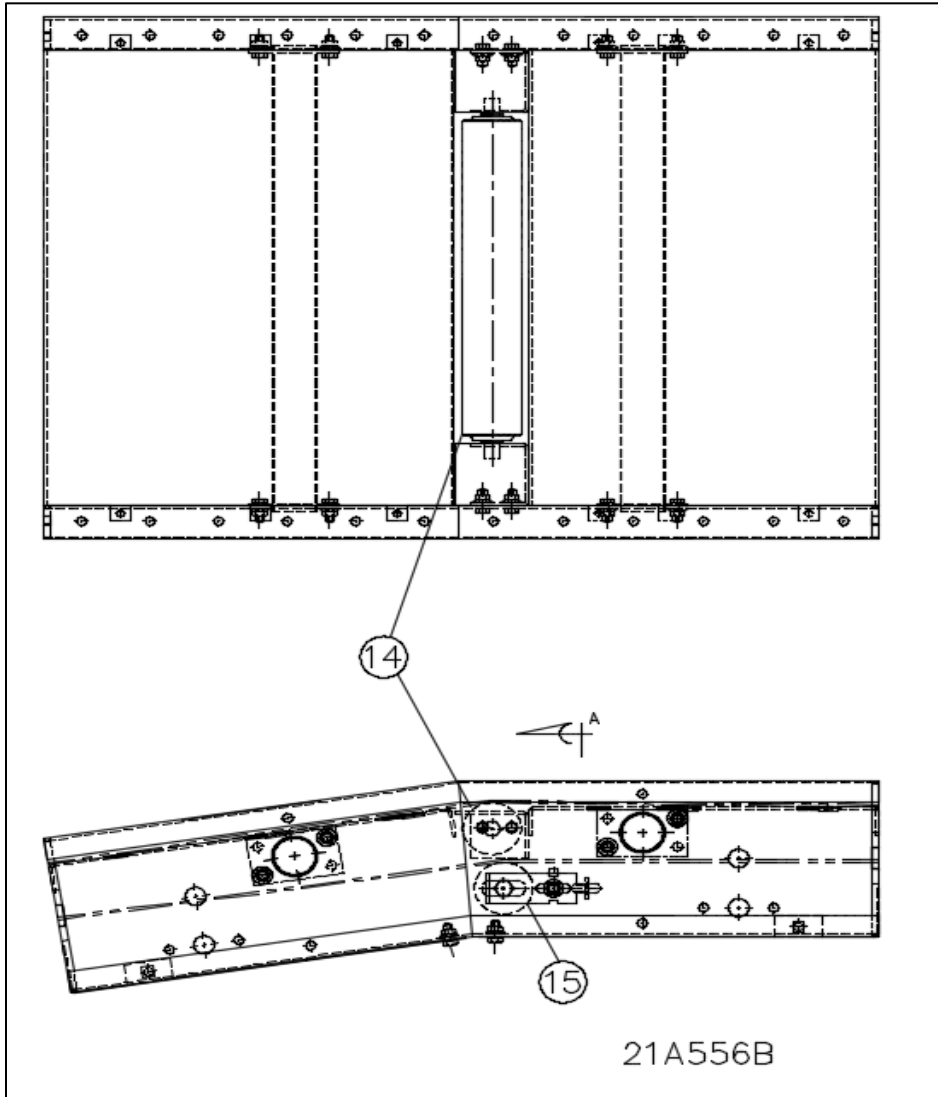
11.14 CRUZBELT NOSEOVER END BED



11.14.1 CRUZbelt Noseover End Bed

REPLACEMENT PART FOR CRUZBELT NOSEOVER END BED					
		Widths & Part #s			
BALLOON	DESCRIPTION	16" BF	22" BF	28" BF	34" BF
14	ROLLER,_ _CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655
16	PULLEY,_ _CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393
Bed Reference Dwg. #21A551					

11.15 CRUZBELT EMPTY CARTON SLIDER NOSEOVER

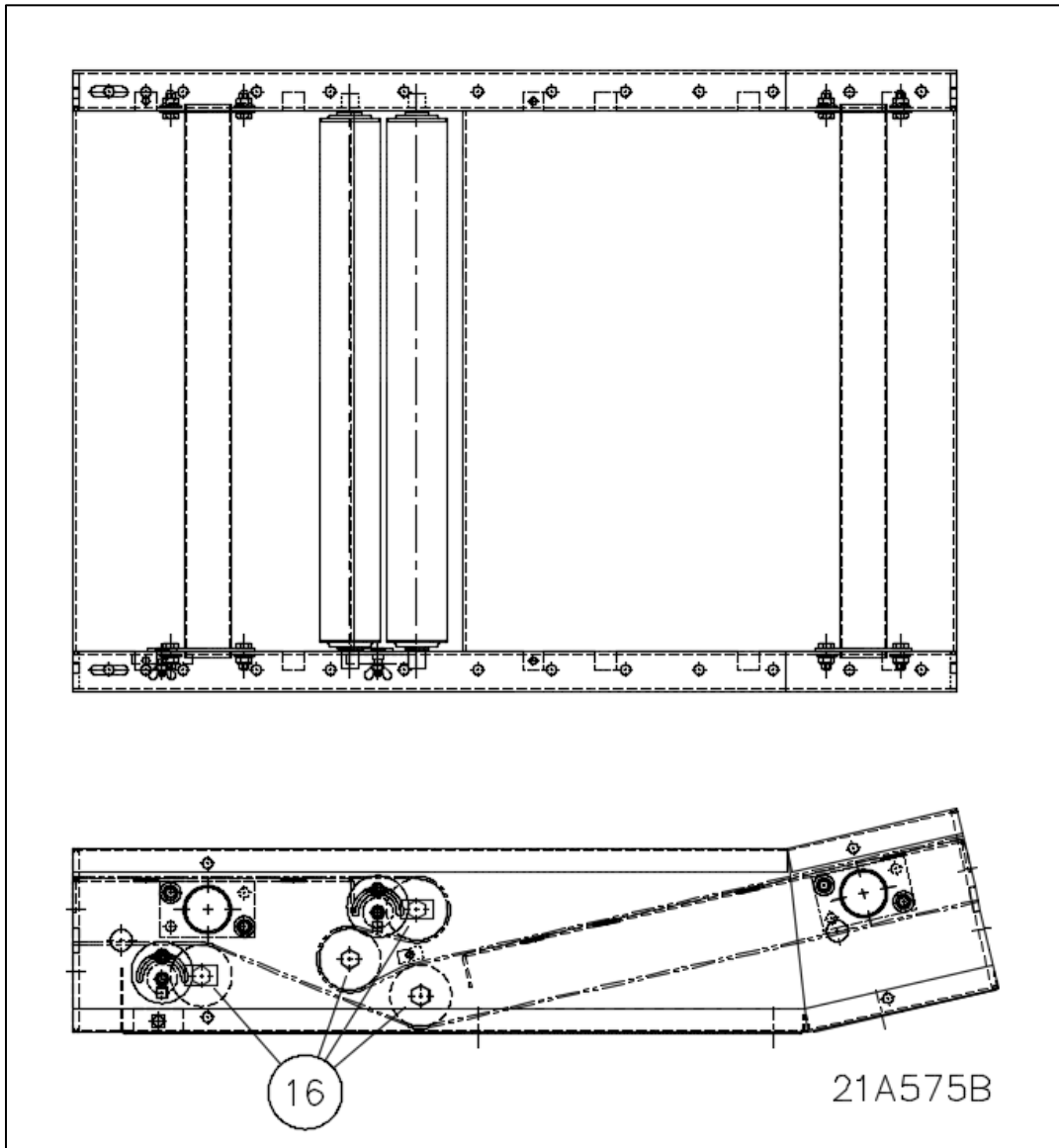


11.15.1 CRUZbelt Slider Noseover

REPLACEMENT PARTS FOR CRUZBELT SLIDER NOSEOVER							
BALLOON	DESCRIPTION	Widths & Part #s					
		16" BF	22" BF	28" BF	34" BF	40" BF	46" BF
14	PULLEY,_CZB 2.5 DIA 1/4W	1157669	E0040390	E0040391	E0040392	E0040393	E0040394
15	PULLEY,_CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393	E0040394	E0040395

Bed Reference Dwg. #21A556

11.16 CRUZBELT EMPTY CARTON CONVEYOR (SLIDER) DOUBLE SNUBBER

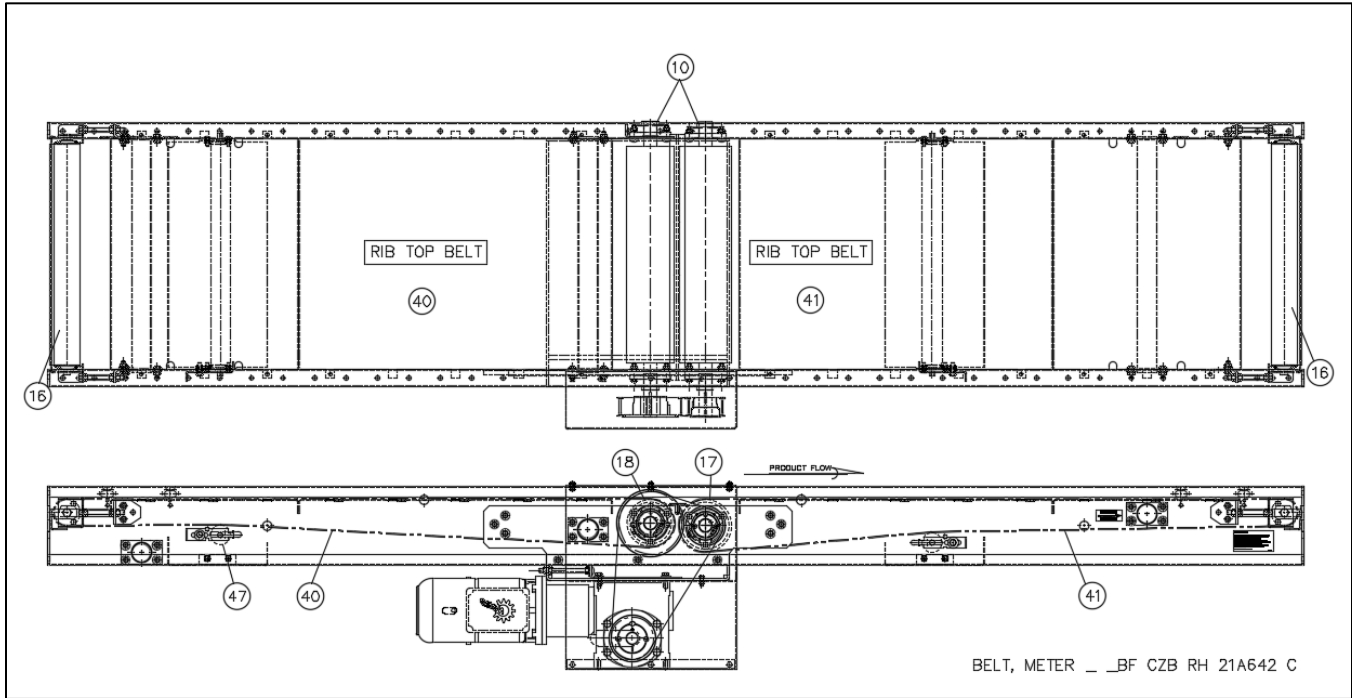


11.16.1 CRUZbelt Double Snubber (ECC Only)

REPLACEMENT PARTS FOR CRUZBELT DOUBLE SNUBBER (ECC Only)							
BALLOON	DESCRIPTION	Widths & Part #s					
		16" BF	22" BF	28" BF	34" BF	40" BF	46" BF
16	PULLEY,_CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393	E0040394	E0040395

Bed Reference Dwg. #21A575

11.17 CRUZBELT4 METER BED



11.17.1 CRUZbelt 4 Brake Meter Induction Beds

REPLACEMENT PARTS FOR CRUZbelt4 METER BEDS					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
10	BRG,FLG 3BOLT X 1-1/4" BORE DODGE	1107696			
16	PULLEY,_ CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393
17	PULLEY,TAPERLOCK __ CZB 4.5DIA, LAGGED, 80A URETHANE	E0038269	E0038270	E0038271	E0038272
18	PULLEY,TAPERLOCK __ CZB 4" DIA, LAGGED, 80A URETHANE	E0038273	E0038274	E0038275	E0038276
40 & 41	BELT,CZB 15-9/16X10'2"INC, BP290QW LACED W/CERT	1169943	1169944	1169945	1169946
47	ROLLER, __ CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655

Bed Reference Dwg. #21A642

11.18 CRUZBELT METER BED DRIVE-TRAIN

NOTE: NORD 1-HP 80LP/4 TW BREID MOTOR SHOWN.

NOTE: 3 HP DRIVE USES RISER BLOCK ON TOP OF REDUCER

NOTE: DRIVE BELT MUST BE DRAWN ON CORRECT P.D. OF SPROCKETS TO VERIFY LENGTH.

NOTE: DR-TRAINS WITH CYCLE RATES OF 0-10 ARE TYPICALLY USED IN BRAKE/METER BEDS. DRIVES WITH CYCLE RATES OVER 10 ARE USED IN INDUCTION BEDS.

*FOR BRAKE MOTORS, USE 460VAC BRAKE SUPPLY VOLTAGE THAT OUTPUTS 205VDC TO THE BRAKE COIL.

TERMINAL BOX LOCATIONS ON 1-HP BRAKE MOTORS:
 RH FLOW: TERMINAL BOX @ POSITION 1 W/CABLE ENTRY I (VIEW AA)
 LH FLOW: TERMINAL BOX @ POSITION 3 W/CABLE ENTRY I (VIEW BB)

**FOR 3-HP (3.2HP) INVERT DUTY DR-TRAINS, USE A STANDARD EFFICIENT S6-80% DUTY MOTOR TO ACHIEVE 0-90 CYCLES PER MINUTE (THE DUTY TYPE S6 IS DEFINED AS A SEQUENCE OF IDENTICAL DUTY CYCLES, EACH CYCLE CONSISTING OF A TIME OF OPERATION AT CONSTANT LOAD AND A TIME OF OPERATION AT NO-LOAD. THERE IS NO TIME DE-ENERGIZED AND AT REST.)

11.18.1 CRUZbelt Meter Bed 2:1 Reduction Drive-Train

REPLACEMENT PARTS FOR CRUZBELT METER, DRIVE TRAIN (2:1 REDUCTION DRIVE TRAINS) RIGHT HAND													
NOMINAL FPM	HP	OPTIONS	Balloon#										
			DRIVE TRAIN	1	2	DRIVE PULLEY	BUSHING	DRIVEN PULLEY	BUSHING	DRIVEN PULLEY	BUSHING	BELT	HYTREL SPYDER
45/90	1	BRAKE	1190163	1190117	E0038363	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
60/120	1	BRAKE	1190165	1190117	E0038363	E0038328 45-TOOTH	E0038372	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
75/150	1	BRAKE	1190167	1190117	E0038331	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
	3	VFD READY	1190187	1211648	E0038365	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038361
100/200	1	BRAKE	1190169	1190117	E0038331	E0038328 45-TOOTH	E0038372	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
	3	VFD READY	1190188	1211648	E0038365	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038361
120/240	1	BRAKE	1190170	1190117	E0038331	E0038333 36-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
	3	VFD READY	1190191	1211648	E0038368	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038361

Drive-Train Reference Dwg #21S009

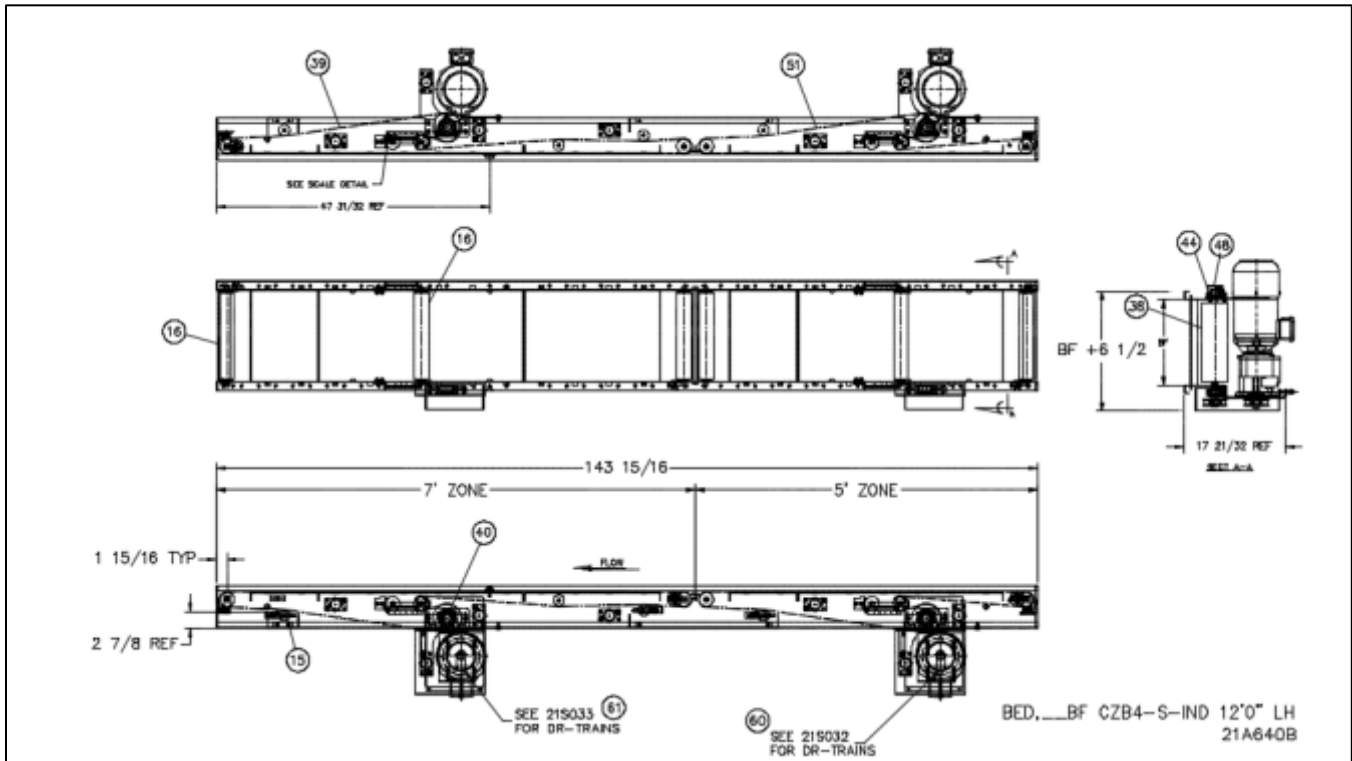
REPLACEMENT PARTS FOR CRUZBELT METER, DRIVE TRAIN (2:1 REDUCTION DRIVE TRAINS) LEFT HAND													
NOMINAL FPM	HP	OPTIONS	Balloon#										
			DRIVE TRAIN	1	2	DRIVE PULLEY	BUSHING	DRIVEN PULLEY	BUSHING	DRIVEN PULLEY	BUSHING	BELT	HYTREL SPYDER
45/90	1	BRAKE	1190177	1190114	E0038363	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
60/120	1	BRAKE	1190178	1190114	E0038363	E0038328 45-TOOTH	E0038372	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
75/150	1	BRAKE	1190179	1190114	E0038331	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
	3	VFD READY	1190195	1211648	E0038365	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038361
100/200	1	BRAKE	1190180	1190114	E0038331	E0038328 45-TOOTH	E0038372	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
	3	VFD READY	1190197	1211648	E0038365	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038361
120/240	1	BRAKE	1190181	1190114	E0038331	E0038333 36-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
	3	VFD READY	1190198	1211648	E0038368	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038361

Drive-Train Reference Dwg #21S009

11.18.2 CRUZbelt Meter Bed 1.5:1 Reduction Drive-Train

REPLACEMENT PARTS FOR CRUZBELT METER, DRIVE TRAIN (1.5:1 REDUCTION DRIVE TRAINS) RIGHT HAND													
NOMINAL FPM	HP	OPTIONS	DRIVE TRAIN	Balloon#		4		5		6		7	10
				1	2	DRIVE PULLY	BUSHING	DRIVEN PULLY	BUSHING	DRIVEN PULLY	BUSHING		
60/90	1	BRAKE	1190171	1190117	E0038363	E0034695 38-TOOTH	90800943	E0034695 38-TOOTH	90800948	E0033835 50-TOOTH	E0034696	E0034960	E0038360
80/120	1	BRAKE	1190172	1190117	E0038363	E0038328 45-TOOTH	E0038372	E0038310 34-TOOTH	90800948	E0038328 45-TOOTH	E0034696	E0034960	E0038360
100/150	1	BRAKE	1190173	1190117	E0038331	E0034695 38-TOOTH	90800943	E0034695 38-TOOTH	90800948	E0033835 50-TOOTH	E0034696	E0034960	E0038360
	3	VFD READY	1190192	1211648	E0038365								E003E361
133/200	1	BRAKE	1190174	1190117	E0038331	E0038328 45-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038328 45-TOOTH	E0034696	E0034960	E0038360
	3	VFD READY	1190193	1211648	E0038365								E0038361
160/240	1	BRAKE	1190175	1190117	E0038331	E0034695 38-TOOTH	90800943	E0033833 36-TOOTH	90800948	E0033834 48-TOOTH	E0034696	E0034960	E0038360
	3	VFD READY	1190194	1211648	E0038368								E0038361
Drive-Train Reference Dwg #21S009													
REPLACEMENT PARTS FOR CRUZBELT METER, DRIVE TRAIN (1.5:1 REDUCTION DRIVE TRAINS) LEFT HAND													
NOMINAL FPM	HP	OPTIONS	DRIVE TRAIN	Balloon#		4		5		6		7	10
				1	2	DRIVE PULLY	BUSHING	DRIVEN PULLY	BUSHING	DRIVEN PULLY	BUSHING		
60/90	1	BRAKE	1190182	1190114	E0038363	E0034695 38-TOOTH	90800943	E0034695 38-TOOTH	90800948	E0033835 50-TOOTH	E0034696	E0034960	E0038360
80/120	1	BRAKE	1190183	1190114	E0038363	E0038328 45-TOOTH	E0038372	E0038310 34-TOOTH	90800948	E0038328 45-TOOTH	E0034696	E0034960	E0038360
100/150	1	BRAKE	1190184	1190114	E0038331	E0034695 38-TOOTH	90800943	E0034695 38-TOOTH	90800948	E0033835 50-TOOTH	E0034696	E0034960	E0038360
	3	VFD READY	1190199	1211648	E0038365								E003E361
133/200	1	BRAKE	1190185	1190114	E0038331	E0038328 45-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038328 45-TOOTH	E0034696	E0034960	E0038360
	3	VFD READY	1190201	1211648	E0038365								E0038361
160/240	1	BRAKE	1190186	1190114	E0038331	E0034695 38-TOOTH	90800943	E0033833 36-TOOTH	90800948	E0033834 48-TOOTH	E0034696	E0034960	E0038360
	3	VFD READY	1190202	1211648	E0038368								E0038361
Drive-Train Reference Dwg #21S009													

11.19 CRUZBELT 4 METER BED - HIGH PERFORMANCE

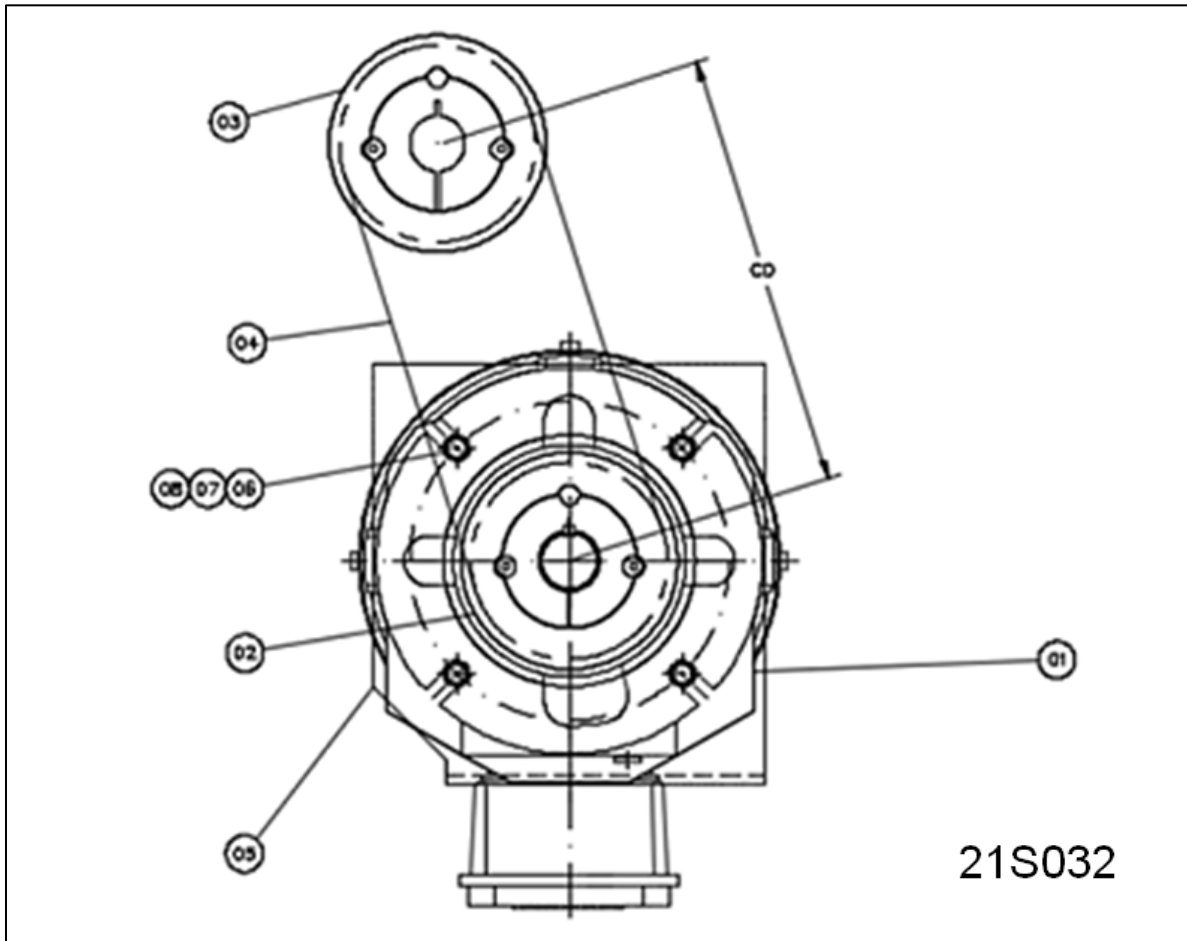


11.19.1 CRUZbelt 4 Single Meter Beds

REPLACEMENT PARTS FOR CRUZbelt 4 SINGLE METER BEDS					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
60	DR-TRAIN,CZB INDUCT 5HP 330FPM	1174022			
61	DR-TRAIN,CZB INDUCT 5HP 410FPM	1173903			
60 & 61 / 04	BELT,POLYCHAIN 8MGT-720-36	1131521			
15	ROLLER, _ CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655
16	PULLEY, _ CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393
38	PULLEY,WLDMT CZB4 CDR	1139425	1151294	1147330	1152563
39	BELT,CZB _ 9/16" X 16'-0" INC	1152570	1152571	1147341	1152572
40	BRG,PILLOW BLOCK 1 1/4" BORE	1139427			
44	BRG,FLG 3BOLT X 1-1/4"B DODGE	1107696			
---	BRG,FLG 3BOLT X 1-1/4" BORE	E0034955			
48	COVER,BRG END EC-206-X	1217663			
51	BELT,CZB _ 9/16" X 12'-0" INC	1143775	1152568	1147585	1152569

REF DWG#:21A640

11.20 CRUZBELT 4 METER DRIVE-TRAIN



NOTE: DRIVE NOT TO EXCEED 500 LBS. OF BELT PULL
 MAXIMUM SPROCKET SIZE DRIVE: 8MX-53S-36
 MAXIMUM SPROCKET SIZE DRIVEN: 8MX-42S-36

$$FPM = RPM \times \frac{DR\ SPKT}{DRVN\ SPKT} \times \frac{5 \times 3.1416}{12}$$

$$BELT\ PULL = \frac{33000 \times .98 \times .97 \times HP}{FPM}$$

NOTE: NOTE ALL GEARMOTORS USE "VL" BEARING OPTION (IE-SK372Z-VL-90SP/4)
 ALL GEARMOTORS USE "TW" THERMOSTAT OPTION (IE-SK372.1-VL-90SP/4 TW)

ASSUMPTIONS:

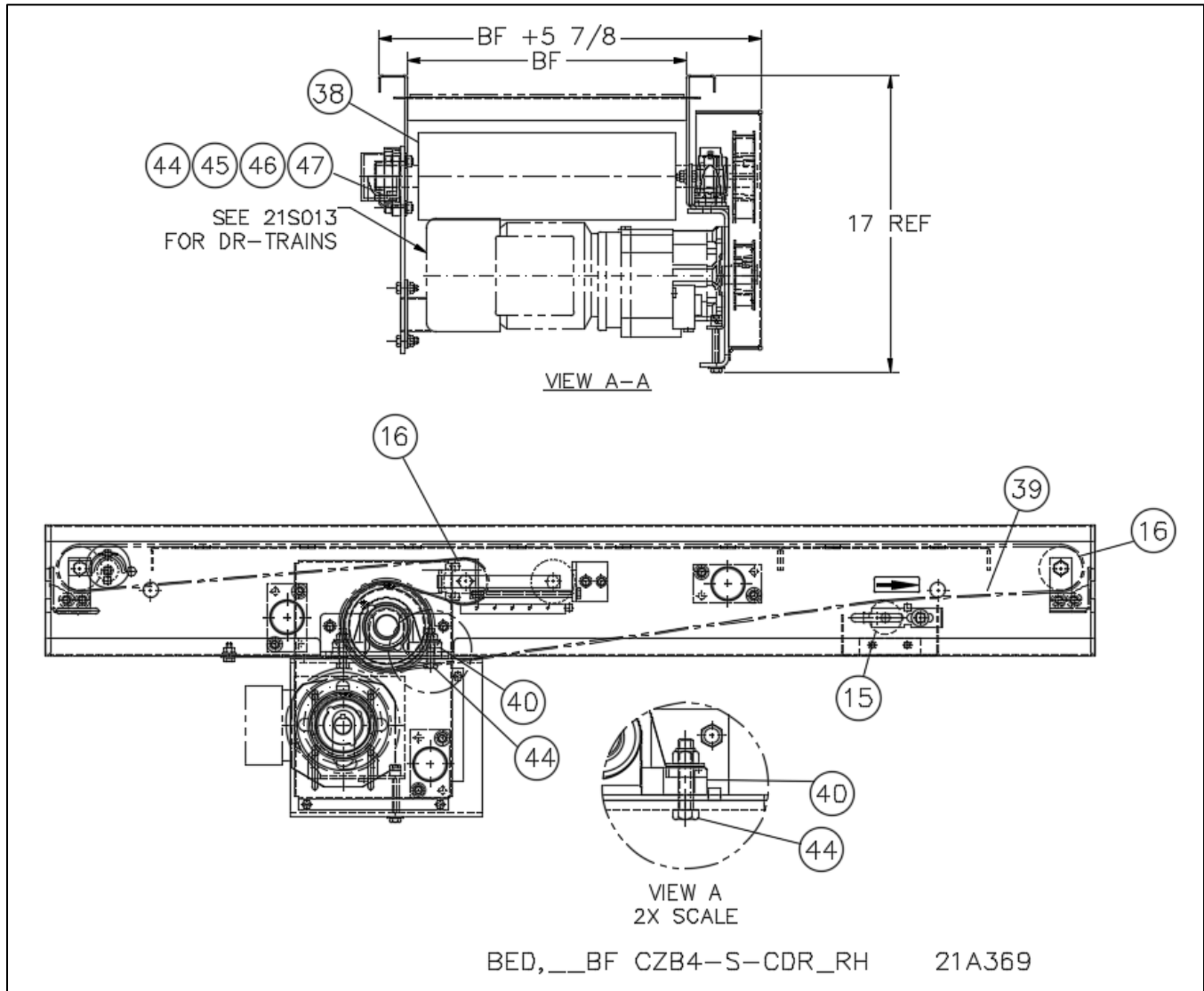
- GEARMOTOR EFFICIENCY = 97%
- SPROCKET EFFICIENCY = 95%
- LAGGED PULLEY = 5" DIA

11.20.1 CRUZbelt 4 Meter Drive-Train

REPLACEMENT PARTS FOR CZB 4 METER DRIVE-TRAINS										
NOMINAL FPM	HP	SIDE	DRIVE TRAIN	1		2	2	3	3	4
			WITH ENCODER	GEAR MOTOR	REDUCER RPM	DRIVE SPROCKET	DRIVE BUSHING	DRIVE SPROCKET	DRIVEN BUSHING	BELT
410	5	RH	1174023	1174022	416	E0038981 8MX-33S-36	90800948 1610 1-1/4B	E0038983 8MX-41S-36	E0034696 2012 1-1/4" B	1131521 8MGT-720-36
		LH	1174891							
330	5	RH	1173899	1173903	336					
		LH	1174890							

Drive-Train Reference Dwg # 21S032 & 21S033

11.21 CRUZBELT 4 CENTER DRIVE (CDR)

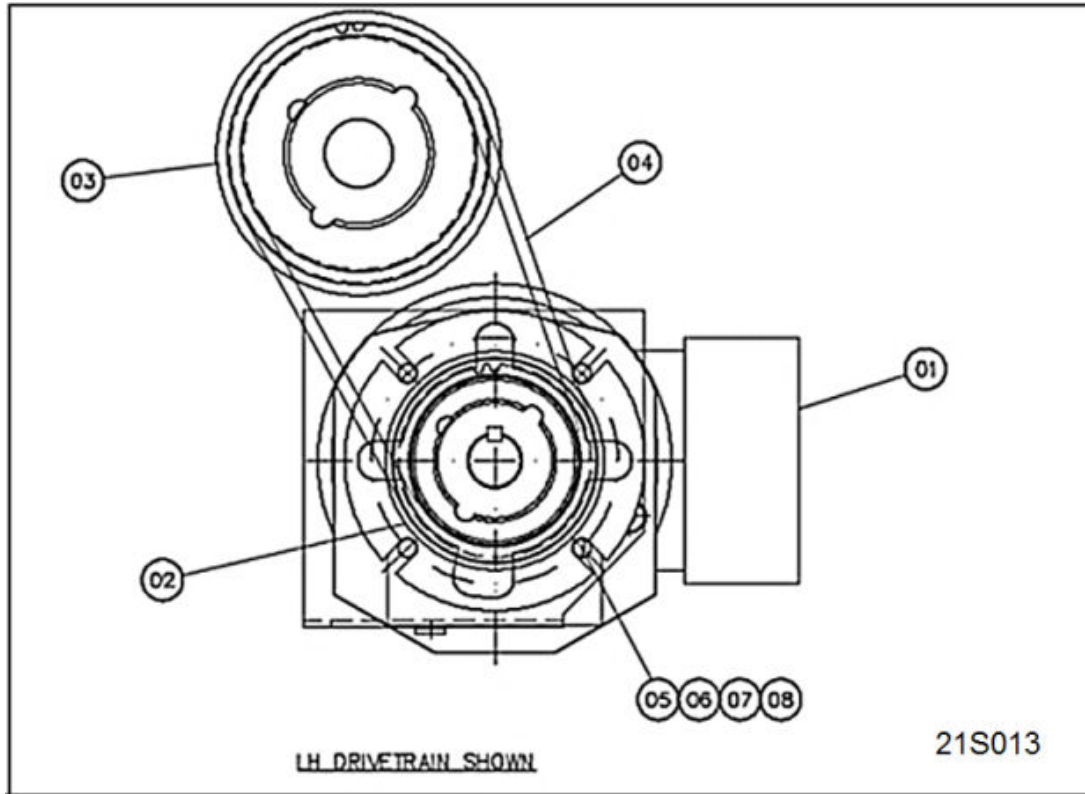


11.21.1 CRUZbelt 4 Center Drives

REPLACEMENT PARTS FOR CRUZBELT4 CENTER DRIVES					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
15	ROLLER,__CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655
16	PULLEY,__CZB 2.5 DIA 1/4W	E0040390	E0040391	E0040392	E0040393
38	PULLEY,WLDMT __BF CZB4 CDR URETHANE	1139425	1151294	1147330	1152563
39	BELT,CZB __-9/16" X __X__ INC BP290 QW LACED W/CERT	1170650	1170651	1170652	1170653
40	BRG,PILLOW BLOCK 1 1/4" BORE SQUEEZE LOCK	1139427			
44	BRG,FLG 3 BOLT X 1-1/4" BORE, CLAMP STYLE LF-DL-104S	1107696			

REF DWG#:21A369

11.22 CRUZBELT 4 CDR DRIVE-TRAIN



GEARMOTOR INFORMATION:

MOUNTING POSITION: M1

MOUNTING STYLE: FLANGE "F" (140MM)

HEAVY DUTY OUTPUT BEARING OPTIONAL: VL

NOTE: ALL GEARMOTORS USE "VL" BEARING OPTION (IE-SK372Z-VL-90S/4)

POSITION OF BRAKE HAND RELEASE LEVER: POSITION 1 W/TERMINAL BOX POSITION 1

POSITION 3 / W TERMINAL BOX POSITION 3

$$\text{BELT PULL} = \frac{33000 \times .98 \times .97 \times \text{HP}}{\text{FPM}}$$

$$\text{FPM} = \frac{\text{RPM} \times \text{DR SPKT}}{\text{DRVN SPKT}} \times \frac{5 \times 3.1416}{12}$$

ASSUMPTIONS:

GEARMOTOR EFFICIENCY = 97%

SPROCKET EFFICIENCY = 95%

LAGGED PULLEY = 5" DIA

MAXIMUM SPROCKET SIZE: 8MX-48S-21

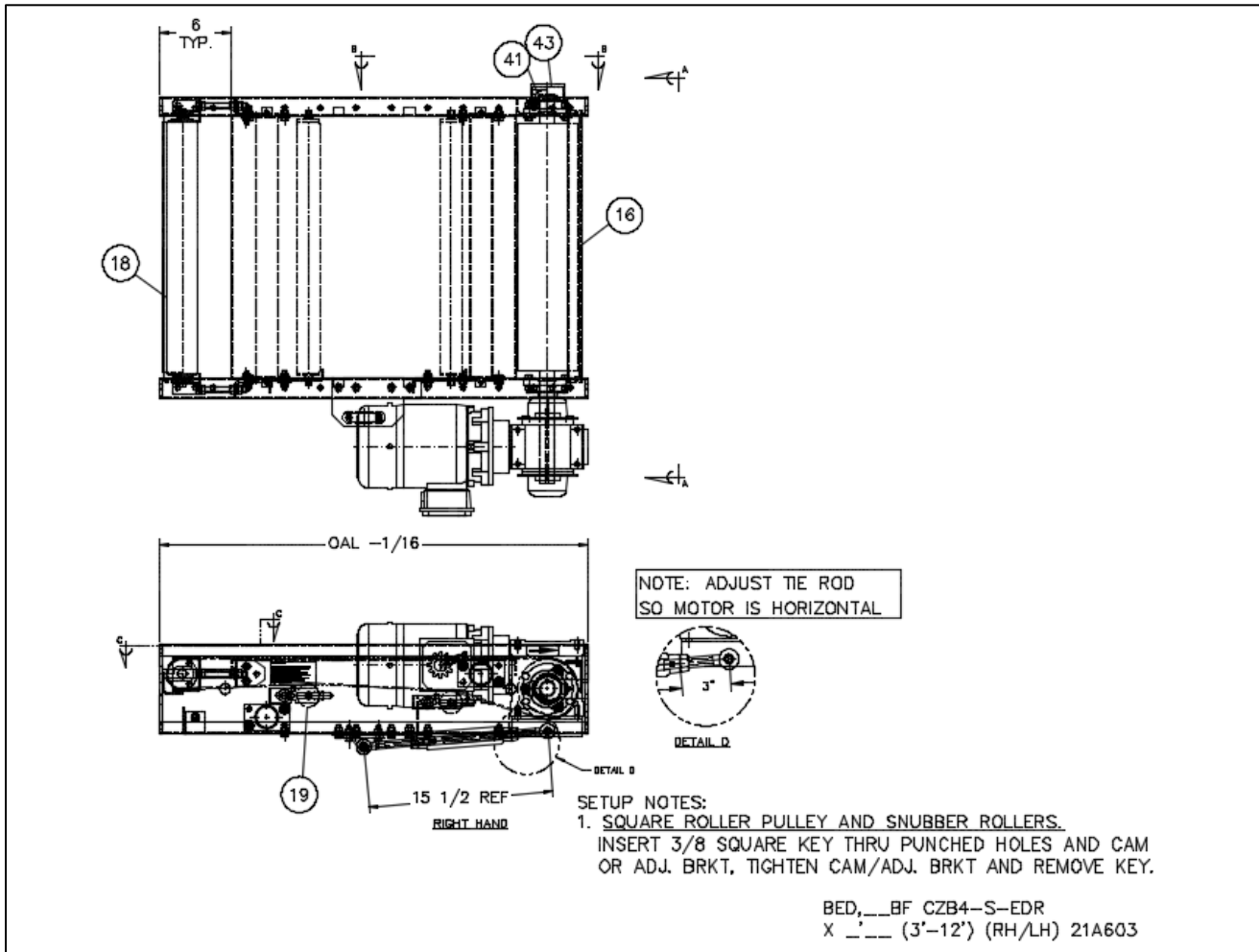
NOTE: DRIVE NOT TO EXCEED 250 LBS OF BELT PULL.

11.22.1 CRUZbelt 4 CDR Drive-Trains

REPLACEMENT PART NUMBERS FOR CZB4-CDR TIMING BELT & DRIVE TRAINS											
FPM	HP	RH DRIVE TRAIN	LH DRIVE TRAIN	BRAKE OPTION	1	1	2	2	3	3	4
					RH GEAR MOTOR	LH GEAR MOTOR	DRIVE PULLEY	DRIVE BUSHING	DRIVEN PULLEY	DRIVEN BUSHING	DRIVE BELT
90	1.0	1187126	1187119		1187135	1187130	D0603454 8MX-38S-21	90800942 1610 1" BORE			
120	1.0	1157021	1139659		1170436	1139571	1139653 8MX-41S-21	90800919 2012 1" BORE	1139655 8MX-45S-21	E0034696 2012 1-1/4" BORE	1198816 720-21 GT2
150	1.5	1157023	1139661		1157005	1139573					
180	1.5	1157024	1139662		1160997	1139574		1139654 8MX-42S-21			
300	3	1157028	1139668		1183473	1183473	D0503820 8MX-40S-21	90800919 2012 1" BORE	1139655 8MX-45S-21		
		1157038	1139679	BRAKE	1198713	1139651					

Drive-Train Reference Dwg #21S013

11.23 CRUZBELT 4 END DRIVE



11.23.1 CRUZbelt 4 Slider Bed End Drive & Drive Train

REPLACEMENT PARTS FOR CRUZbelt4 END DRIVE BED (RH & LH)						
BALLOON	DESCRIPTION	Bed Length	Widths & Part #s			
			16" BF	22" BF	28" BF	34" BF
16	PULLEY, WLDMT __CZB 4.5 DIA EDR	3'-12'	E0038892	E0038893	E0038894	E0038895
18	PULLEY, __CZB 2.5 DIA 1/4W		E0040390	E0040391	E0040392	E0040393
19	ROLLER, __CZB 1.9 SNUBBER PRBG		E0009652	E0009653	E0009654	E0009655
41	BRG, FLG 3 BOLT X 1-1/4" BORE DODGE		1107696			
43	COVER,BRG END EC-206-X (END CAP)		1217663			
	BELT,CZB _ 9 / 16 X 6'-1.5" INC	3'	1167782	1167783	1167784	1167785
	BELT,CZB _ 9 / 16 X 8'-1.4" INC	4'	1167786	1167787	1167788	1167789
	BELT,CZB _ 9 / 16 X 10'-1.3" INC	5'	1167790	1167791	1167792	1167793
	BELT,CZB _ 9 / 16 X 12'-1.2" INC	6'	1167794	1167795	1167796	1167797
	BELT,CZB _ 9 / 16 X 14'-1.1" INC	7'	1167798	1167799	1167800	1167801
	BELT,CZB _ 9 / 16 X 16'-0.9" INC	8'	1167802	1167803	1167804	1167805
	BELT,CZB _ 9 / 16 X 18'-0.8" INC	9'	1167806	1167807	1167808	1167809
	BELT,CZB _ 9 / 16 X 20'-0.7" INC	10'	1167810	1167811	1167812	1167813
	BELT,CZB _ 9 / 16 X 22'-0.6" INC	11'	1167814	1167815	1167816	1167817
	BELT,CZB _ 9 / 16 X 24'-0.5" INC	12'	1167818	1167819	1167820	1167821

REF DWG:21A603

11.23.2 CRUZbelt 4 Slider End Drive & Drive Train

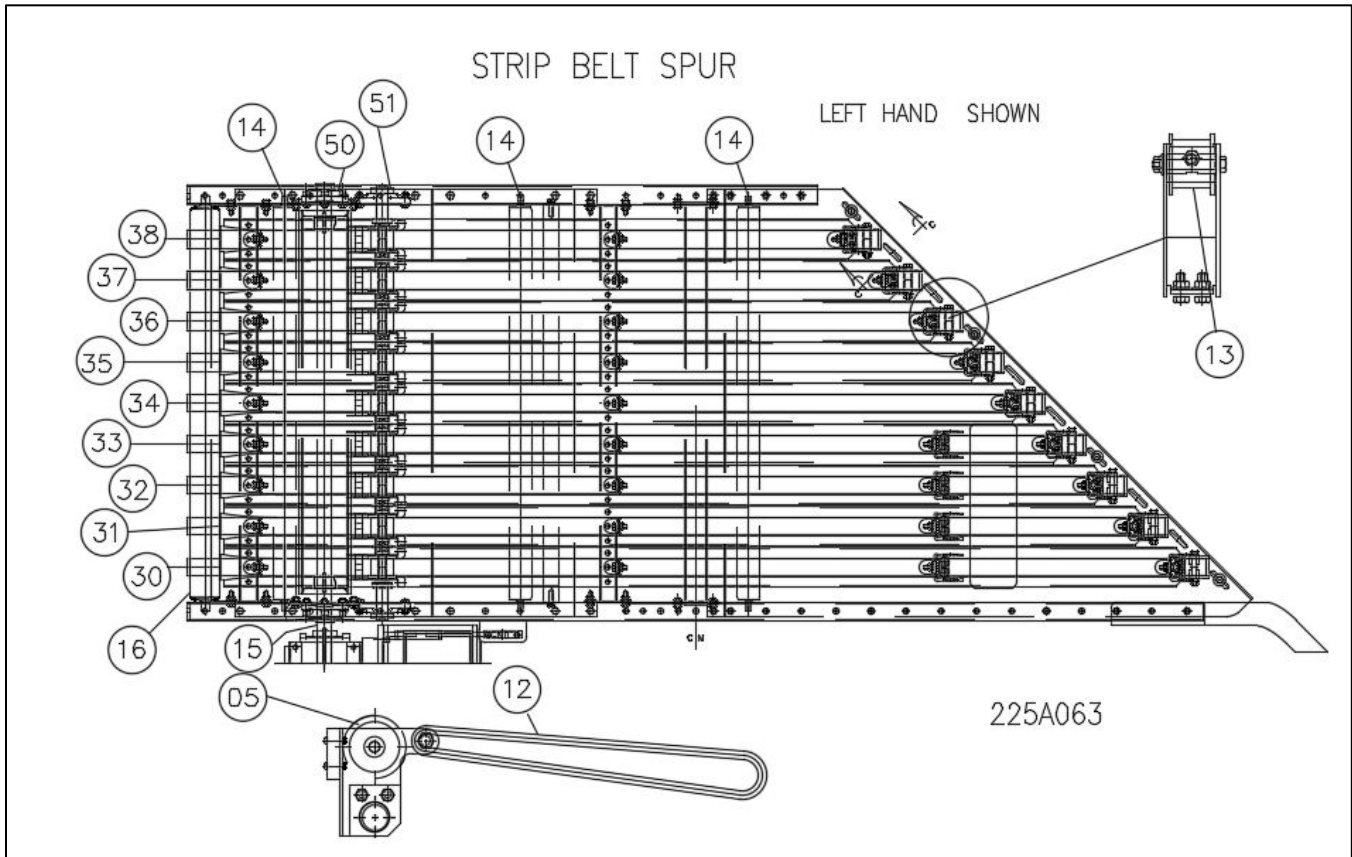
REPLACEMENT PART NUMBERS FOR CZB4-EDR DRIVE TRAIN ITEM #s								
DRIVE TRAIN ITEM #s / GEARMOTOR PART #s FOR CRUZBELT 4 END DRIVES								
BALLOON#		40	40	2	2	1	1	
FPM	SIDE	DRIVE TRAIN PN	BRAKE OPTION	MOTOR PN	MOTOR HP	REDUCER PN	RATIO / HP MTR FRAME	BELT PULL
*38	--	1192976	---	1192973	.5	E0038752	60:1, .5HP 56/20H	700
	LH	1192987	BRAKE	1192975	.5	E0038752	60:1, .5HP 56/20H	
	RH	1192983	BRAKE	1192974	.5	E0038752	60:1, .5HP 56/20H	
*45	--	1192977	---	1192973	.75	E0039000	50:1, .5HP 56/20H	583
	LH	1192990	BRAKE	1192353	.75	E0038419	40:1, .75HP 56/20H	
	RH	1192984	BRAKE	1192974	.75	E0039000	50:1, .5HP 56/20H	
*57	--	1192979	---	1190384	1	E0038491	40:1, .75HP 56/20H	466
	LH	1192991	BRAKE	1192353	1	E0038705	30:1, .75HP 56/20H	
	RH	1192985	BRAKE	1192352	1	E0038491	40:1, .75HP 56/20H	
*76	--	1192981	---	1190384	1	E0038705	30:1, .75HP 56/20H	350
	LH	1192989	BRAKE	1192975	1	E0039000	50:1, .5HP 56/20H	
	RH	1192986	BRAKE	1192352	1	E0038705	30:1, .75HP 56/20H	
91	--	1187672	---	1187037	1	E0038710	25:1, 1HP 140/20H	291
	LH	1190104	BRAKE	1190117				
	RH	1190098	BRAKE	1190114				
114	--	1187673	---	1187037	1	E0038707	20:1, 1HP 140/20H	233
	LH	1190105	BRAKE	1190117				
	RH	1190099		1190114				
127	--	1187674	---	1187037	1	E0038706	18:1, 1HP 140/20H	210
	LH	1190106	BRAKE	1190117				
	RH	1190100		1190114				
152	--	1187675	---	1187038	1.5	E0038711	15:1, 1.5HP 140/20H	261
	LH	1190107	BRAKE	1190119				
	RH	1190101		1190118				
180	--	1187678	---	1187039	1.5	E0038708	12.7:1, 1.5HP 140/20H	221
	LH	1190108	BRAKE	1190119				
	RH	1190102		1190118				
229	--	1187679	---	1187039	2	E0038709	10:1, 2HP 140/20H	233
	LH	1190109	BRAKE	1190121				
	RH	1190103		1190120				

REF DWG#: 21A603 & 21A592

* For normal; speeds of 38 thru 76 FPM, Use 0.50, 0.75-HP NORD STANDARD EFF. MOTORS.

On Brake motors, use 460VAC brake supply voltage that outputs 205VDC to the brake coil.

11.24 CRUZBELT STRIP BELT SPUR

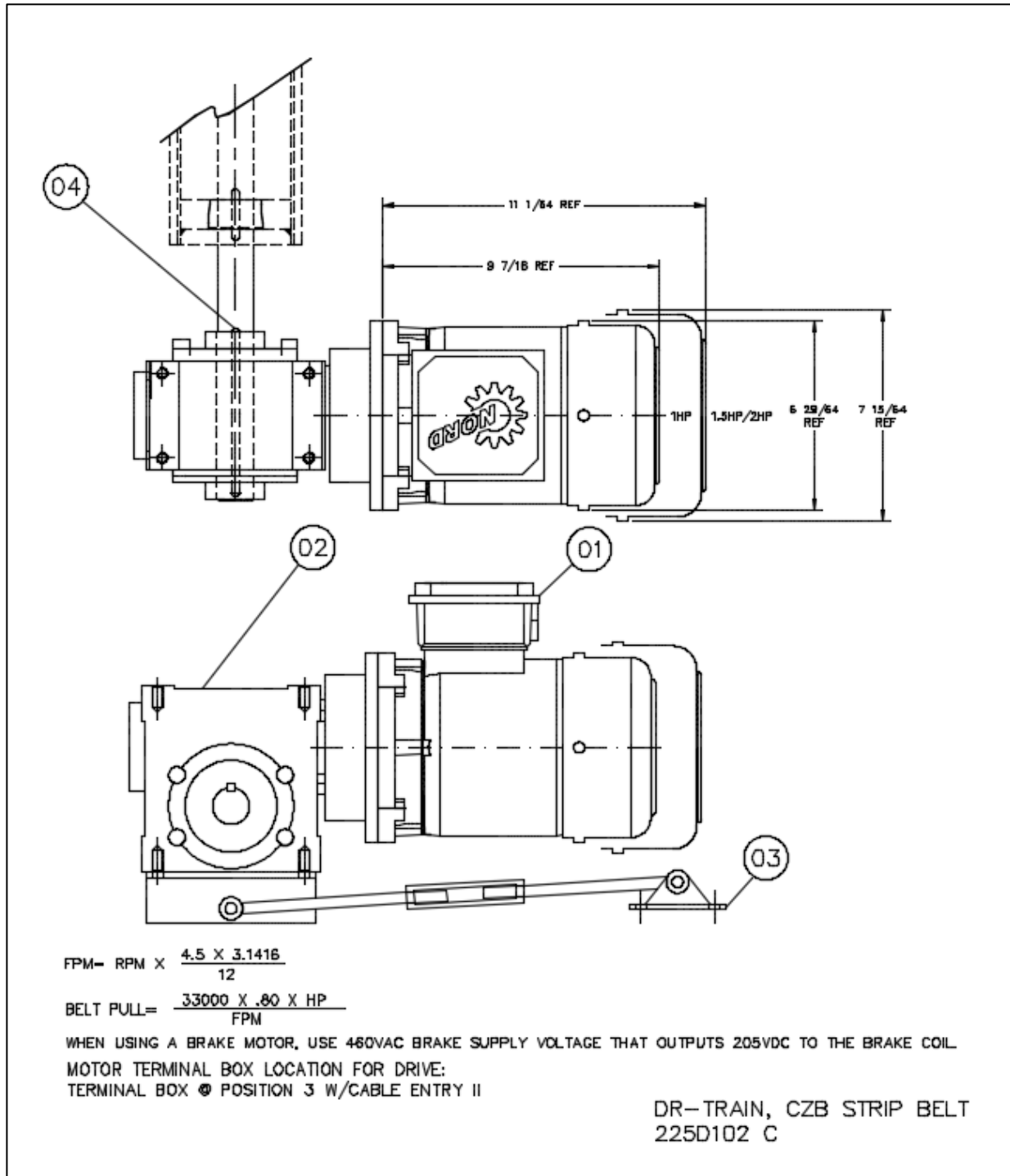


11.24.1 CRUZbelt Strip Belt Spur

REPLACEMENT PARTS CZB STRIP BELT SPUR					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
6	BRG, R6 ZZ C3	90050111			
5	SHEAVE,ASY FENNER #FA2501, INCLUDES (2)FENNER CB 0003, MTG ADAPTERS	E0007309			
10	BUSHING,BRONZE 3/8 X 5/8 X 3/4	E0033909			
12	ORING,83A 5/16 X 25"	1111445			
13	SHEAVE,ASY FLAT EFSON FA2501	E007309	E007309	E007309	E0033908
14	ROLLER,_ _CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655
15	PULLEY,TAPERLOCK _ _CZB 4"DIA	1126915	1126914	1111480	1120530
16	ROLLER,SNUB _ _BF 11/16AXLE	18218001	18224001	18230001	18236001
30	BELT,RGH TOP 1-1/2" W X 198" LACED	E0033899			
31	BELT,RGH TOP 1-1/2" W X 191" LACED	E0033900			
32	BELT,RGH TOP 1-1/2" W X 184" LACED	E0033901			
33	BELT,RGH TOP 1-1/2" W X 177" LACED	E0033902			
34	BELT,RGH TOP 1-1/2" W X 170" LACED	-----	E0033903		
35	BELT,RGH TOP 1-1/2" W X 163" LACED	-----	E0033904		
36	BELT,RGH TOP 1-1/2" W X 156" LACED	-----	-----	E0033905	
37	BELT,RGH TOP 1-1/2" W X 149" LACED	-----	-----	E0033906	
38	BELT,RGH TOP 1-1/2" W X 142" LACED	-----	-----	-----	E0033907
50	BRG,FLG 3BOLT X 1-1/4" BORE DODGE	1107696			
----	BRG,2BOLT FLG X 1" BORE BRG, LESS SET SCREWS,REF 1115244	90050202			

Bed Reference Dwg:225A047C

11.25 CRUZBELT SPUR DRIVE TRAIN



11.25.1 Strip Belt Spur Drive Train

REPLACEMENT PARTS CZB STRIP BELT SPUR DRIVE TRAIN							
		Balloon# 1	1		2		
NOMINAL FPM	DR-TRAIN P/N PRODUCT	MOTOR P/N	MOTOR HP	REDUCER P/N	REDUCER SIZE/RPM	ACTUAL FPM	BELT PULL
103	1190137	1187037	1	E0038707	20Q20H14 / 87	101.9	259
137	1190139	1187037	1	E0038711	20Q15H14 / 115	135.9	194
206	1190141	1187037	1	E0038709	20Q10H14 / 173	203.8	130
206	1190143	1187038	1.5	E0038709	20Q10H14 / 174	205	193
275	1190145	1187039	2	1156109	20Q07H14 / 247	291.2	181
410	1190155	1187039	2	1153140	20Q05H14 / 346	407.6	130

REF DWG#:225D102

CRUZBELT REVISION HISTORY

Revision Date	Chapter/Description	Initials
4/22/2021	Fixed Typo on a drawing number – No new revision issues	TE
09/24/2021	Update MHS Conveyor name, logo, and format	MD AB
02/28/2022	Correct the page header IOM title	MD
02/28/2022	Update part numbers list for dwg 21S013 & 21S012	DG / MD
12/09/2022	Add Pulley & Sheaves in maintenance section – no new revision issued.	TE

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ABOUT MHS CONVEYOR

About MHS Conveyor

MHS Conveyor, located in Norton Shores, Michigan, is a leading deliverer of “smart” material handling systems, technologies, products, and services, creating solutions for material flow applications. As a global supplier of conveyor systems and equipment since 1964, MHS Conveyor provides sorters, conveyors, and accessories to satisfy a broad spectrum of accumulation, transportation, and sortation applications.



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