

INSTALLATION, OPERATION, MAINTENANCE MANUAL



CRUZ[®] belt

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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 CRUZ® belt 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 Conveyor Distributor or MHS Conveyor Lifetime Services at 231-798-4547 or Fax 231-798-4549. Visit MHS Conveyor at mhs-conveyor.com.

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 or before the equipment has forty-one hundred (4100) hours of running use, whichever period is shorter, 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 or ten thousand (10,000) hours of running use, whichever period is shorter, 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.

IMPORTANT

All equipment and components not manufactured by MHS Conveyor carry only such warranty as given by the manufacturer thereof, which warranty MHS Conveyor will assign or otherwise make available to Purchaser without recourse to MHS Conveyor, provided that such warranty is assignable or may be made available.

For service on motors, reduction units, electrical components, controls, air, or hydraulic cylinders, contact the local authorized sales and service representative of respective manufacturer. If none is available in your locality, contact the MHS Conveyor representative. MHS Conveyor will not be responsible for units that have been tampered with or disassembled by anyone other than the authorized representative of the respective manufacturer.

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 08/22/2011

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 Conveyor warranty on any failed components that result from these environment issues.

Conveyor Design and Safety Guidelines

A safety risk evaluation is required for all of our standard equipment. The safety risk evaluation considers every potential hazard on the conveyor, weighs the probability and the severity of the potential injury, and addresses methods of mitigation to make the risk of injury either low or negligible. We use the ANSI B11 TR3 standards for all of our risk evaluation.

In addition, all of our equipment is designed to comply with the following national and industry standards:

CEMA Safety Standards and Labels - (CEMA is the Conveyor Equipment Manufacturers Association)

ASME B20.1- Safety standard for Conveyors and Related Equipment

ASME B15.1 – Safety standard for Mechanical Power Transmission Apparatus

OSHA 1910.147 – The Control of Hazardous Energy

OSHA 1910.212 - General Requirements for all Machines

OSHA 1910.95 – Occupational Noise Exposure

ANSI 2535 – Safety Color Code

MHS Conveyor Safety Recommendation

For additional safety information: MHS Conveyor agrees to the following safety instruction or guidelines listed within this manual. This is not to conflict with your state or legal requirements.

MHS Conveyor Recommends for maintenance or repair purposes, to incorporate a lock out and tag procedure. To ensure all starting devices, prime movers (Pneumatic), or powered accessories are off before attempting to maintenance or repair.

The following procedures are designed to protect everyone involved with the conveyor against an unexpected restart. To include understanding of potential hazard of stored energy, which can exist after the power source is locked out.

For additional information, refer to the latest issue of ANSI Z244.1, American National Standard for Personnel Protection – Lockout/Tagout of Energy Sources– Minimum Safety Requirements.
<http://www.ansi.org/>

OSHA 29CRF Part 1910.147 *“Control of Hazardous Energy Sources (Lockout/Tagout)”*, which includes requirements for release of stored energy and OSHA Safety and Health Regulations for Construction 1926.555 Conveyors <https://www.osha.gov/>

ANSI Standards for Conveyors

It is essential for safe and efficient system operation that safety information and guidelines presented here are properly understood and implemented.

MHS Conveyor recognizes American National Standard Institute (ANSI) booklet entitled *Safety Standards for Conveyors and Related Equipment B20.1*. For more information go to: <http://webstore.ansi.org/default.aspx>

With any piece of industrial equipment, conditions exist that might cause injury to you or your co-workers. Because it is not possible to describe each potentially hazardous situation that might develop, you must be alert at all times for unsafe conditions. To avoid injury, use maximum possible care, common sense, and adhere to all safety standards.

Take special care while maintaining and inspecting electrical equipment and devices. All personnel working on or around the system should be aware of, and adhere to, all **CAUTION**, **DANGER**, and **WARNING** signs.

Labels or signs are posted to reduce the risk of injury to all personnel. Never assume that the signs and notices are applicable only to inexperienced personnel. Maintain signs in a legible condition. Contact your supervisor to post additional safety signs if you feel they are necessary. <http://www.ansi.org/>

ANSI Conveyor Safety Rules



Conveyor safety rules, as well as specific regulations and guidelines listed in this publication:

- DO NOT touch moving Conveyor parts.
- DO NOT walk, ride, or climb on the Conveyor.
- DO NOT operate the Conveyor with chain guards or other protective guards removed.
- Keep jewelry, clothing, hair, etc., away from the Conveyor.
- Know the location and function of all start/stop devices and keep those devices free from obstruction.
- Clear all personnel from the equipment before starting the Conveyor.
- DO NOT attempt to clear product jams while the Conveyor is running.
- Allow only trained and authorized personnel to maintain or repair Conveyor equipment.
- DO NOT load the Conveyor beyond specified design limits.
- DO NOT attempt to make repairs to the Conveyor while it is running.
- DO NOT modify equipment without checking with the manufacturer.
- DO NOT operate or perform maintenance on equipment when taking any type of drug, sedative, when under the influence of alcohol, or when over fatigued.
- Report any unsafe condition to your supervisor or maintenance staff.

Conveyor Equipment Manufacturers Association (CEMA)

The Conveyor Equipment Manufacturers Association (CEMA) provides safety information related to conveyor systems. There are Conveyor Safety Video and Conveyor Safety Poster produced by CEMA.



MHS Conveyor recommends these videos for training and education purposes as part of a safe working environment around conveyor equipment. The videos introduce awareness of operations, personnel, maintenance technicians, and management to safety hazards commonly associated with the automated material handling conveyor equipment.

The safety posters reviews important safety labels and are intended to be posted in public places as a day-to-day reinforcement of good safety practices. These posters can be downloaded from the CEMA Web Site at <http://cemanet.org/safety/posters.htm> or for more information for both the safety poster and the videos can be purchased from CEMA. Visit their web site – www.cemanet.org for additional information or contact them at:



Conveyor Equipment Manufacturers Association
6724 Lone Oak Blvd. Naples FL 34109
Phone (941) 514-3470

CEMA Safety Label Meanings

The word or words that designate a degree or level of hazard seriousness. The signal words for product safety signal are: DANGER, WARNING, and CAUTION.



- **DANGER** -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 extreme situations.
- **WARNING** – 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** – 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.

Warnings and Safety Instructions

Failure to follow the instructions and cautions throughout this manual, and warning labels 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:

 WARNING	
	<ul style="list-style-type: none">Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.
CAUTION	
<ul style="list-style-type: none">Indicates a situation, which, if not avoided, could result in property damage.	



WARNING



- 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 is prohibited.
- Before performing maintenance on the conveyor, make sure the start-up controls/power panels 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.

 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. 

Product: Unit Handling

Equipment: Motor Driven Live Roller Conveyors

To be placed along both sides of these conveyors since these conveyors provide surfaces and profiles attractive, but hazardous, for climbing, sitting, walking, or riding.



"A"

SPACE UP TO A MAXIMUM OF 20 FT.
CENTERS (BOTH SIDES)

Optional Label to be placed either on the side or top of rails when space available does not permit application of the larger label



"B"

SPACE UP TO A MAXIMUM OF 20 FT.
CENTERS (Sides or top surface of both rails)

To be placed along the sides of these conveyors to warn personnel that the conveyor can start automatically



"C"

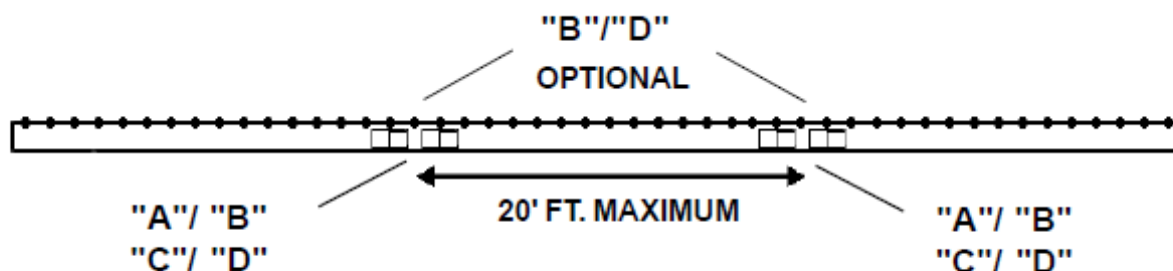
SPACE UP TO A MAXIMUM OF 20 FT.
CENTERS (BOTH SIDES)

Optional Label to be placed either on the side or top of rails when space available does not permit application of the larger label



"D"

SPACE UP TO A MAXIMUM OF 20 FT.
CENTERS (Sides or top surface of both rails)



NOTE: Due to the design of these conveyors, there may not be room on the side rails to place the larger labels. In that case, the smaller labels may be used. Optionally, they may also be placed on the top surface of both rails. The key is the space available and visibility by operators and maintainers.





Package Conveyors



 <p>Do Not Climb, Sit, Stand, Walk, Ride, or Touch the Conveyor at Any Time</p>	 <p>Do Not Perform Maintenance on Conveyor Until Electrical, Air, Hydraulic and Gravity Energy Sources Have Been Locked Out and Blocked</p>	 <p>Operate Equipment Only With All Approved Covers and Guards in Place</p>
 <p>Do Not Load a Stopped Conveyor or Overload a Running Conveyor</p>	 <p>Ensure That All Personnel Are Clear of Equipment Before Starting</p>	 <p>Allow Only Authorized Personnel To Operate or Maintain Material Handling Equipment</p>
 <p>Do Not Modify or Misuse Conveyor Controls</p>	 <p>Keep Clothing, Body Parts and Hair Away from Conveyors</p>	 <p>Remove Trash, Paperwork and Other Debris Only When Power is Locked Out</p>
 <p>Ensure That ALL Controls and Pull Cords are Visible and Accessible</p>	 <p>Know the Location and Function of All Stop and Start Controls</p>	 <p>Report All Unsafe Conditions</p>

POST IN PROMINENT AREA

Manual Structure

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

INSTALLATION, OPERATION, MAINTENANCE
MANUAL

TGW

PRODUCT NAME
IF PRODUCT HAS ADDITIONAL INFORMATION
Revision (MM/DD/YYYY)

ADD A PICTURE

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

TGW Systems Inc.

Mission
To meet or exceed all customer expectations by providing the highest quality products and services, on time, at exceptional value, in an environment which promotes safety and personal development.

TGW

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Regional sales offices and authorized Business Partners located throughout the United States and Canada.
Licensees and Business Partners in Europe, South America and Southeast Asia.

WARNING

Pay attention to the safety instructions!

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

Introduction

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.

Some features of interest:

- 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.

Definition of Terms

CRUZ®belt ABBREVIATIONS LISTING	
ADJ	ADJUSTABLE
ASY	ASSEMBLY
BRG	BEARING
BR*	BELT ON ROLLER
BF	BETWEEN FRAME
BLK	BLACK
BTM	BOTTOM
BRKT	BRACKET
BRK	BRAKE
WBB	Welded BUTT-BOLT CONNECTION
BUT	BUTTON
C	CENTER (2.25"C, 3"C, 4"C, 6"C)
CW	CLOCKWISE
CCW	COUNTER CLOCKWISE
CDR	CENTER DRIVE
C-C	CENTER TO CENTER
CH	CHANNEL
CLR	CLEAR
CLBRK	CLUTCH/BRAKE
CONN	CONNECTOR (Mechanical, Electrical, Pneumatic)
XM	CROSSMEMBER
CZB	CRUZ BELT
DP*	DEEP
DEG	DEGREE
DIA	DIAMETER
DBL	DOUBLE
DD	DOUBLE D ECK
DR	DRIVE, DRIVE BED
DURO	DUROMETER (Stone Scale "A" Elastomer Hardness)
DL	DUAL LANE
EA	EACH
EL	ELEVATION
EDR	END DRIVE
EURO	EURODRIVE
FPM	FEET PER MINUTE
FL	FLAT
FH	FLAT HEAD
FS	FLOOR SUPPORT
FT	FOOT/FEET
FLA	FULL LOAD AMPS
GALV	GALVANIZED
GA	GAUGE

CRUZ® belt ABBREVIATIONS LISTING	
GRD	GUARD
GR	GUARD RAIL
HDWE	HARDWARE
HD*	HEAD
HD*	HEAVY DUTY
HH, HHCS	HEX HEAD CAP SCREW
HP	HORSE POWER
HZ	HORIZONTAL TAKE-UP
IN	INCH
INDBLT	INDUCTION BELT
INT	INTERMEDIATE BED
ID	INSIDE DIAMETER
INT	INTERNAL
IT	ITEM
LCD	LACED
LH	LEFT HAND
LGTH	LENGTH
L/	LESS
LG	LONG
LM	LOGIC MODULE
LOW PRO	LOW PROFILE
LP	LOW PROFILE
MAX	MAXIMUM
MM	METRIC
MID	MIDDLE
MIN	MINIMUM
MOD	MODULE
MTR	MOTOR
MNT	MOUNT
MTG	MOUNTING
N	NORD GEARMOTORS
NPT	NATIONAL PIPE THREAD
NOML	NOMINAL
NO	NOSE UNDER
NU	NOSE OVER
OAL	OVER ALL LENGTH
OAW	OVER ALL WIDTH
PH*	PAN HEAD
PL	PLATE
PLTD	PLATING (Roller Description, previously FLCT)
PRT	PART
LBS	POUNDS
PWR	POWER
PRBG	PRECISION BEARING
PRS	PRESSURE
QS	QUICK SHIP PROGRAM
RAD	RADIUS

CRUZ® belt ABBREVIATIONS LISTING	
RPM	REVOLUTIONS PER MINUTE
RH	RIGHT HAND
R/LH	RIGHT HAND AND LEFT HAND
RLR	ROLLER OR ROLLERS
RC	ROLLER CHAIN
SKWLOC	SKWEEZELOCK
SB	SLIDER BED
SL	SLOTTED
SMTH	SMOOTH
SOC	SOCKET
SPCL	SPECIAL
SKT	SPROCKET
SQ	SQUARE
SS*	STAINLESS STEEL
STD	STANDARD
STK	STOCK
THD*	THREAD
TB	TIMING BELT
U- ARMS	
URO	URETHANE
V	VOLT
WLDMT	WELDMENT
W	WIDE
W/	WITH

*More than one meaning

Additional guidelines:

Put quantities in brackets with no spaces, **Ex: (2) CTD RLR**
(14) SPDP

Enter brakes length in inches instead of feet. **Ex: (1) 36" BRK-LH**
(2) 24" BRK-RH

When referencing LH or RH, enter just **-LH** or **-RH**, do not enter, 'on LH end'.

Ex: JC-RH

For a detailed lists of abbreviations and terms visit MHS Conveyor website at mhs-conveyor.com

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 comparison check must be made against the Bill of Lading, or other packing lists provided, to confirm full receipt of listed items.

CAUTION

- 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.

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 Retrieval) bar code
 - Scan bar code for IOM manual



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

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.



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 section 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, qualified in the mechanics of the equipment, and enforce safe working procedures for the protection of the crew, customer, and customer's property.

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 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.

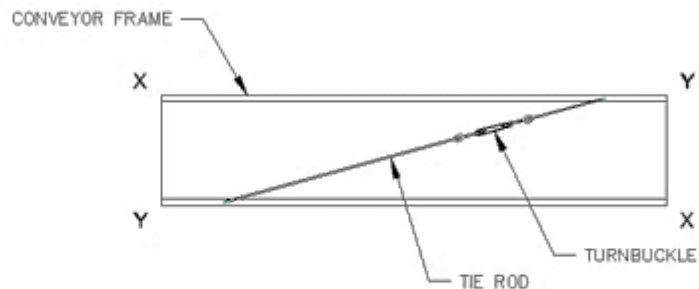
The conveyor sections are joined together with welded butt plate connectors. If a conveyor section is determined to be out of square, adjustment must be made before proceeding to the next section. Correct the squareness of the conveyor frame by installing a tie rod along the longest diagonal dimension 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

- An out of square conveyor section is a leading cause of belt mistracking.

LOOSEN SUPPORT AND CONNECTION HARDWARE BEFORE ATTEMPTING ANY ADJUSTMENT.



MEASURE DIAGONALLY ACROSS THE FOUR CORNERS.
 IF Y-Y DIMENSION IS GREATER THAN X-X, ASSEMBLY TIE ROD AS SHOWN.
 IF X-X DIMENSION IS GREATER THAN Y-Y, ASSEMBLY TIE ROD ACROSS THE OPPOSITE DIAGONALS.
 ADJUST TURNBUCKLE UNTIL DIAGONAL MEASUREMENTS ARE EQUAL IN LENGTH ($\pm 1/16$ ”).

IOM-NBC031

Squaring conveyor Kit# 1134766

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.

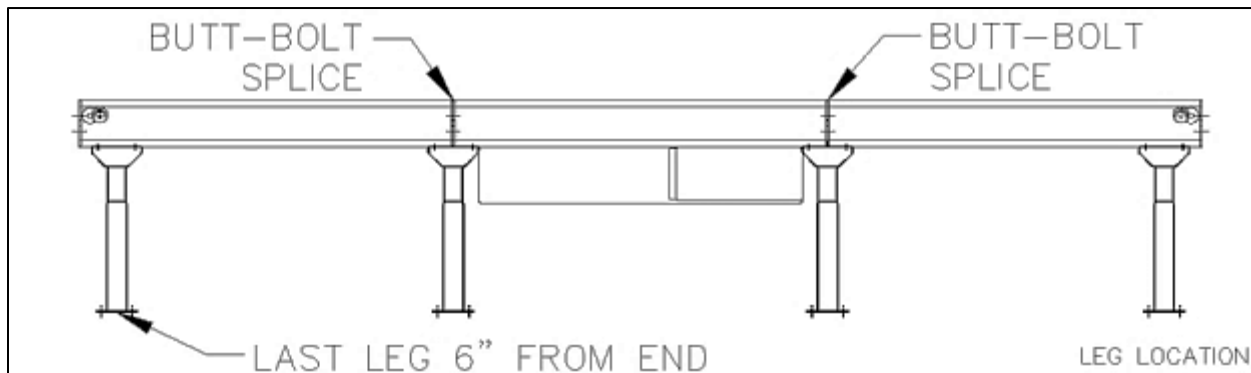
You must know:

- 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.

Floor Support Information

1. 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.
2. Attach supports to both sides of drive.
3. On intermediate and end beds, attach one support on the end furthest from the drive.

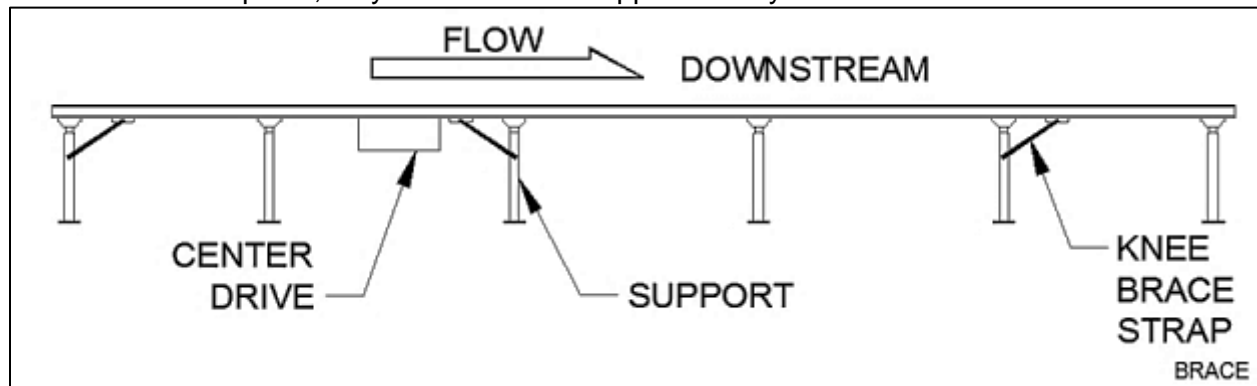


Leg elevations are shown on the elevation drawings. Leg elevation can also be set by subtracting 6-3/8" from the desired top of belt elevation.

NOTE

Top of Belt – 6 3/8" = Top of Support

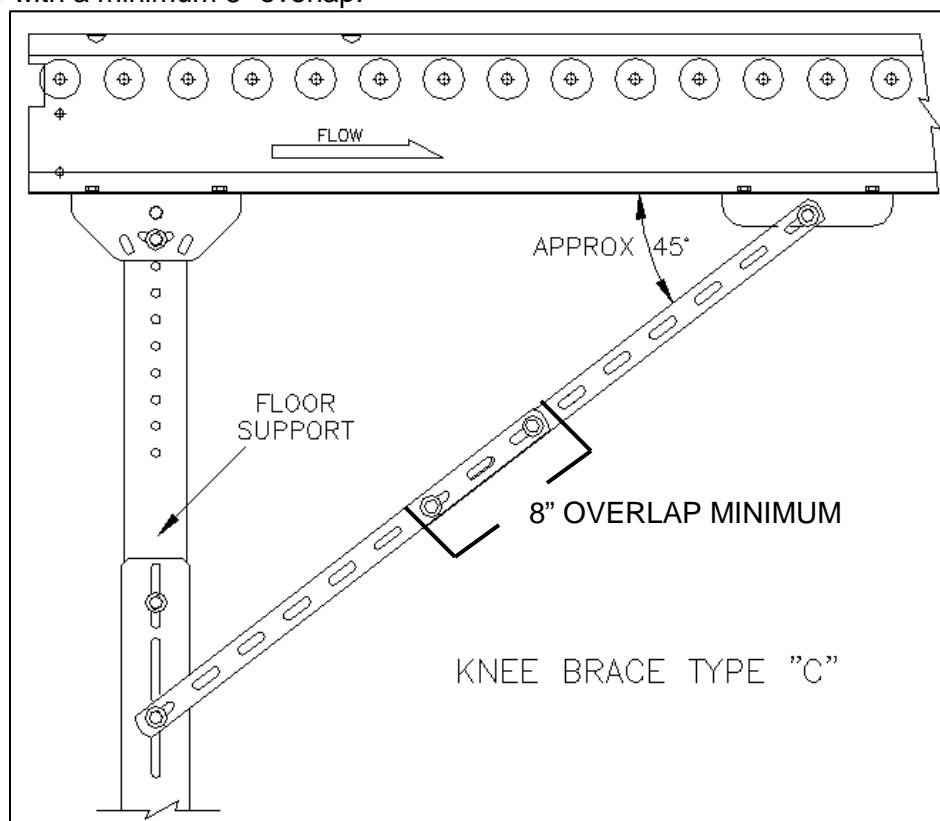
If knee braces are required, they are installed on approximately 30' centers as shown below.



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.

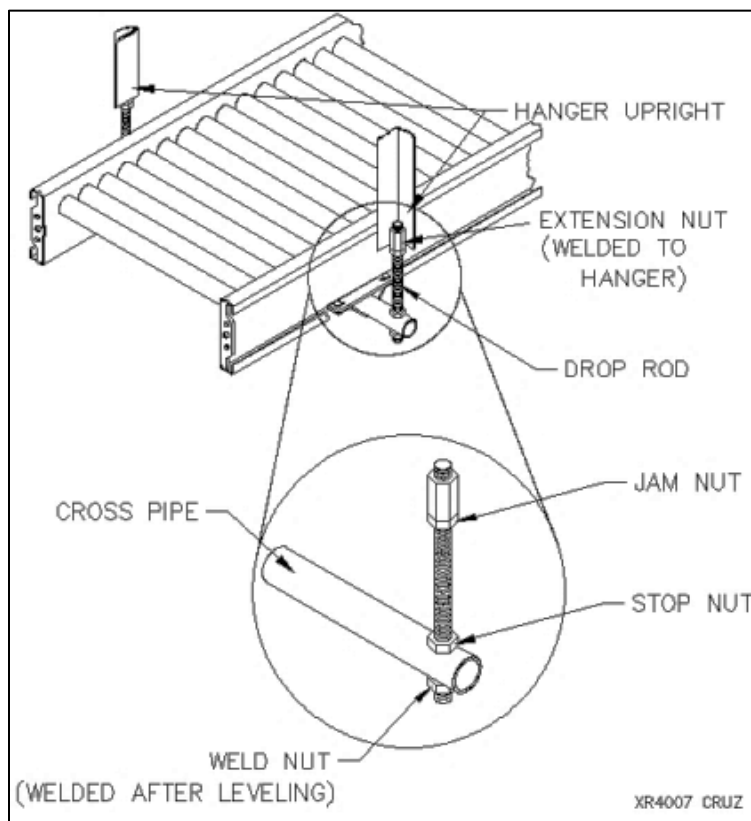


Ceiling Hanger Installation

 WARNING	
	<ul style="list-style-type: none">• Consult the building architect or structural engineer regarding ceiling loading and structural limitations of the building.

 WARNING	
	<ul style="list-style-type: none">• Consult your distributor or a structural engineer to determine hanger and header steel sizes.

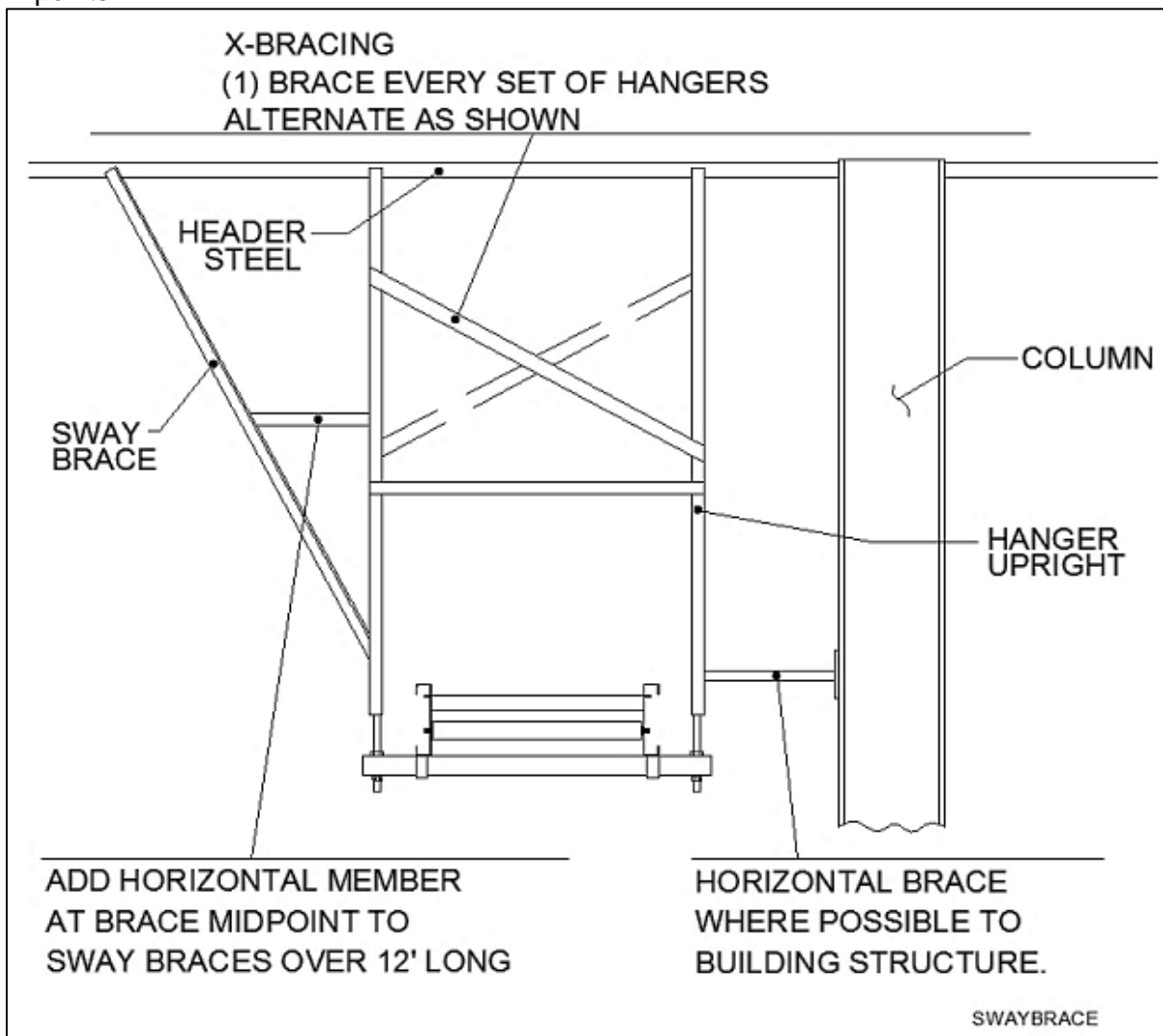
Install ceiling hangers as close to conveyor splices as possible, no further than 6' from a joint and no further than 12' apart.



Cross pipes, v-brackets, and related hardware are provided standard. Drop rods and hardware are optional.

Ceiling Hanger Sway Bracing

- Sway bracing should be a minimum of 1-1/2" x 1-1/2" x 3/16" angle.
- Secure sway bracing to the hanger upright near the conveyor and extend upward at an angle between 30 and 45 degrees.
- Brace horizontally to building structure where possible.
- Hanger uprights over 12'-0" long must have a horizontal bridge as shown.
- Sway bracing should be installed on every third hanger or 30'-0", whichever is less.
- Install X-bracing as shown if bracing cannot be installed outside uprights.
- Additional bracing should be used before and after curves, at drives, and at product divert points.



CAUTION

- Check for product clearance before adding X-bracing.

Anchoring Ceiling Hangers

Open building steel:

The following references are from the American Institute for Steel Construction manual (AISC).

- Welding of auxiliary steel (stringers or headers) to building steel is prohibited.
- Drilling and bolting to building steel is not recommended and will be done only with the customer's written permission and certified engineer.
- Clamping of stringers or headers to building trusses will normally be done only at panel points. Specific customer permission and load calculations by a qualified engineer are necessary to clamp between panel points.
- Headers when used for short spans, such as between roof purlins, will be securely clamped to building steel. Stringers when used between headers may be welded or bolted to the headers directly or with suitable angle clips upon approval from certified engineer.

Concrete ceilings:



- Anchor by drilling into concrete ceiling and inserting suitable bolt anchors.
- Follow bolt manufacturer's recommendations for hole diameter and depth.
- Anchor each hanger with four bolts (two per upright) minimum ½" diameter.
- Heavier loads like drives or areas of vibration require 5/8" diameter through bolts with backup plates or multiple anchor bolts.

Wood joists/beams:

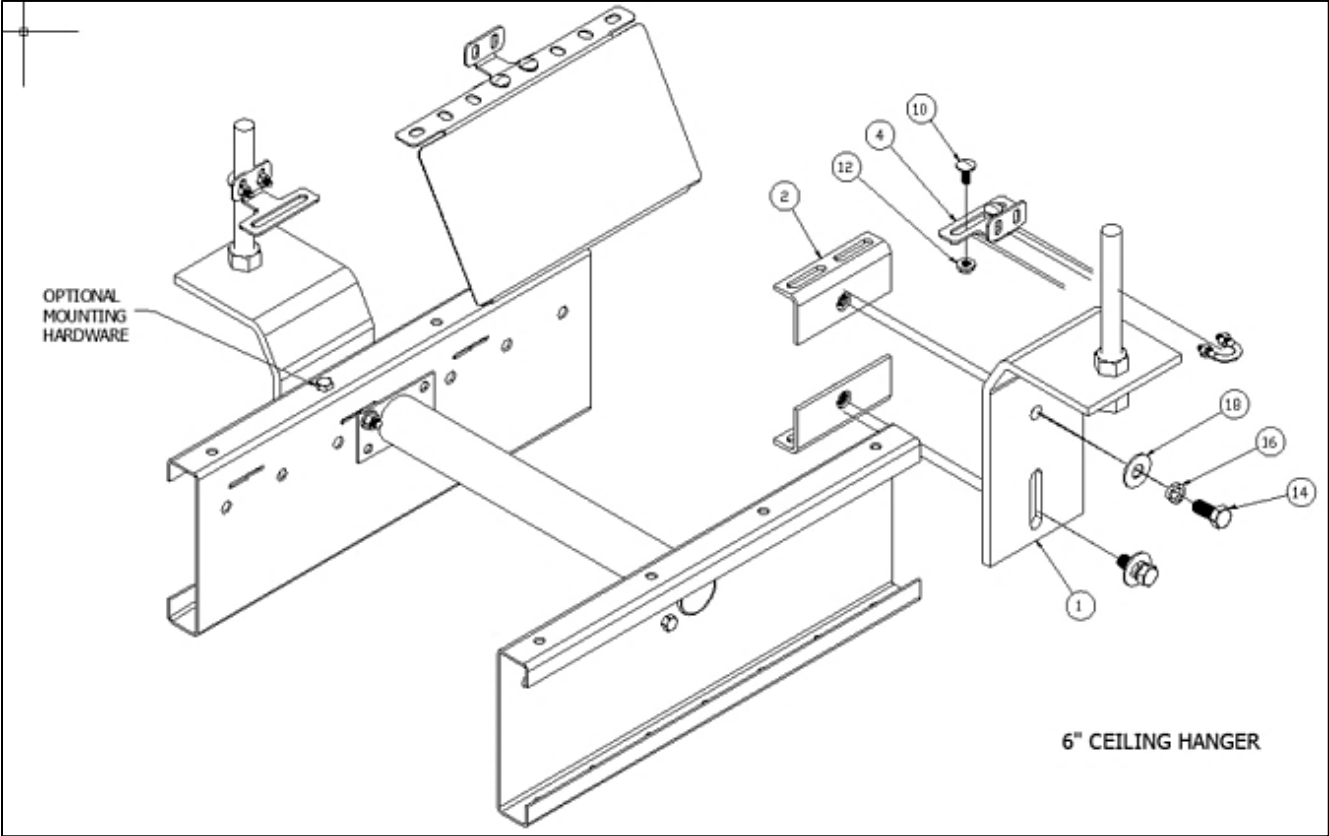
- Hangers may be attached directly to the joists providing the load rating of the building will permit. Attach each hanger to the vertical side of the joist in two places, one above the other. Drill through the joist in the upper position and secure with a ½" diameter through bolt with backup plate or heavy washer. A ½" diameter lag bolt may be used in the lower position.
- When a header is required to support the load, it must bridge across two or more joists. Attach as described above. Hanger uprights may then be secured to the header.

Concrete or masonry walls:

- Support equipment by drilling into the wall and inserting suitable bolt anchors.
- Use a ½" diameter through bolt with backing plate should the load or wall conditions warrant.

 WARNING	
	<ul style="list-style-type: none"> • Consult a structural engineer to determine which anchoring method will support your load. • All attachments to building must be approved by owner as well as certified engineer.

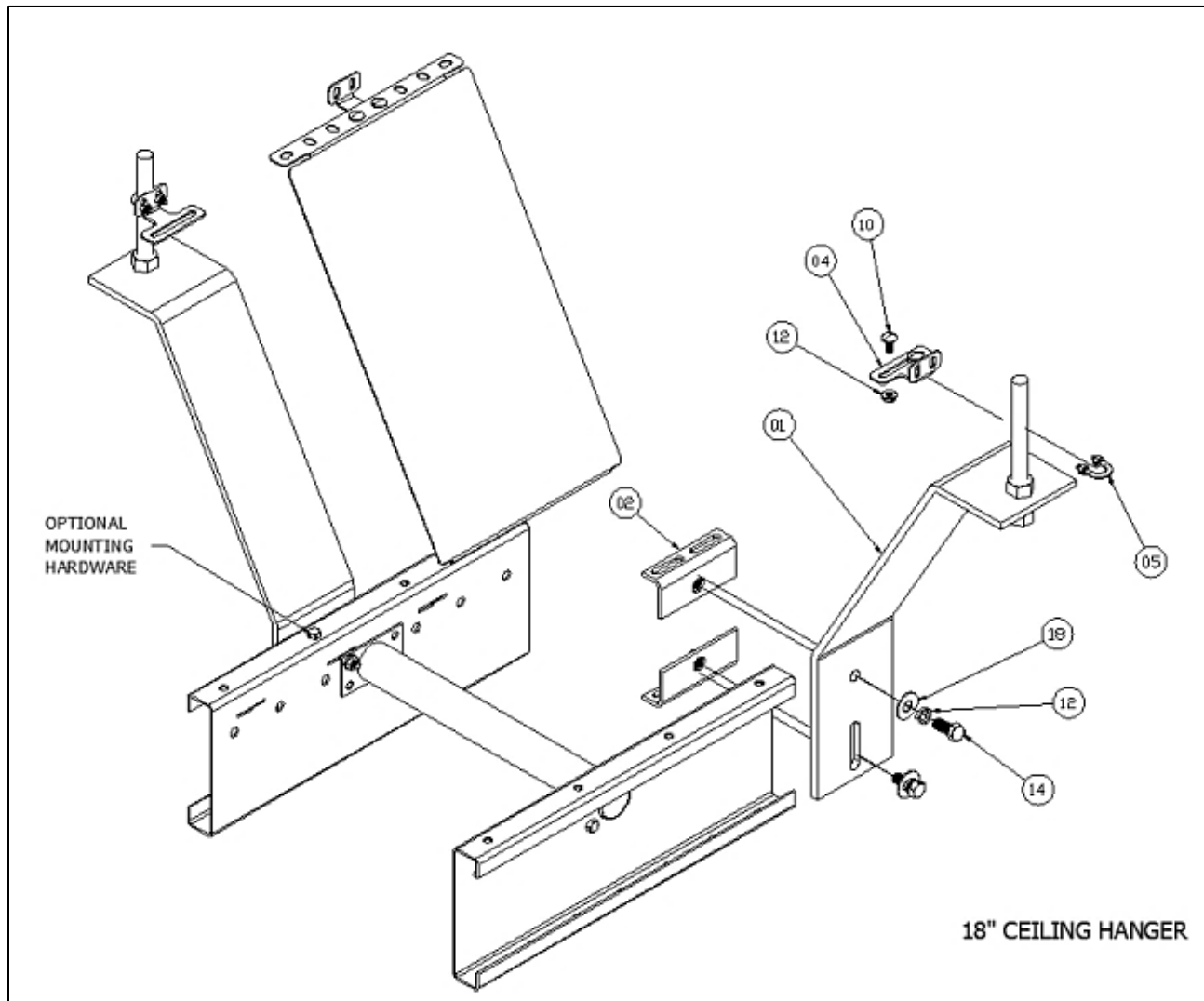
Empty Carton Conveyors 6" Guard Rail Kit



Dwg #	21A597B	KIT, HANGER CEILING CZB TRASH 6" FLARED LOW PROFILE PIPELESS	1158968
Balloon	Qty	Description	Part #
	1	MANUAL, PAGE DWG 21A597	1158970
1	2	BRKT, PIPELESS HANGER 3/8" X 5" X 10"	1158203
2	4	WLDMT, ANGLE CLIP 7GA FOR PIPELESS CEILING HANGER	1158204
4	2	BRKT, 18" FLARED GR SUPPORT	1147772
5	2	U-BOLT, 1/4-20 X 3/4" X 1-1/4" LONG WITH TWO NUTS	E0002981
10	2	SCREW, 5/16-18 X 3/4" BUTT HD BUTT SOC C/S W/FLANGE	95000065
12	2	NUT, 5/16-18 SERRATED FLANGE HEX	95200060
14	4	SCREW, 1/2-13 X 1-3/4" HH PLATED	95000103
16	4	WASHER, 1/2 FLAT USS 1-3/8" OD .086-.132" THK	95300011
18	8	WASHER, 1/2 LOCK ZP	95300012

Ref Dwg 6" CEILING HANGER

Empty Carton Conveyors 18" Guard Rail Kit



Dwg #	21A596B	KIT, HANGER CEILING CZB TRASH 18" FLARED LOW PROFILE PIPELESS	1158967
Balloon	Qty	Description	Part #
	1	MANUAL, PAGE DWG 21A596	1158969
1	2	BRKT, PIPELESS HANGER 3/8" X 5" X 22"	1158202
2	4	WLDMT, ANGLE CLIP 7GA FOR PIPELESS CEILING HANGER	1158204
4	2	BRKT, 18" FLARED GR SUPPORT	1147772
5	2	U-BOLT, 1/4-20 X 3/4" X 1-1/4" LONG WITH TWO NUTS	E0002981
10	2	SCREW, 5/16-18 X 3/4" BUTTON HEAD SOCKET C/S W/FLANGE	95000065
12	2	NUT, 5/16-18 SERRATED FLANGE HEX	95200060
14	4	SCREW, 1/2-13 X 1-3/4" HH PLATED	95000103
16	4	WASHER, 1/2 FLAT USS 1-3/8" OD X .086-.132" THK	95300011
18	8	WASHER, 1/2 LOCK ZP	95300012

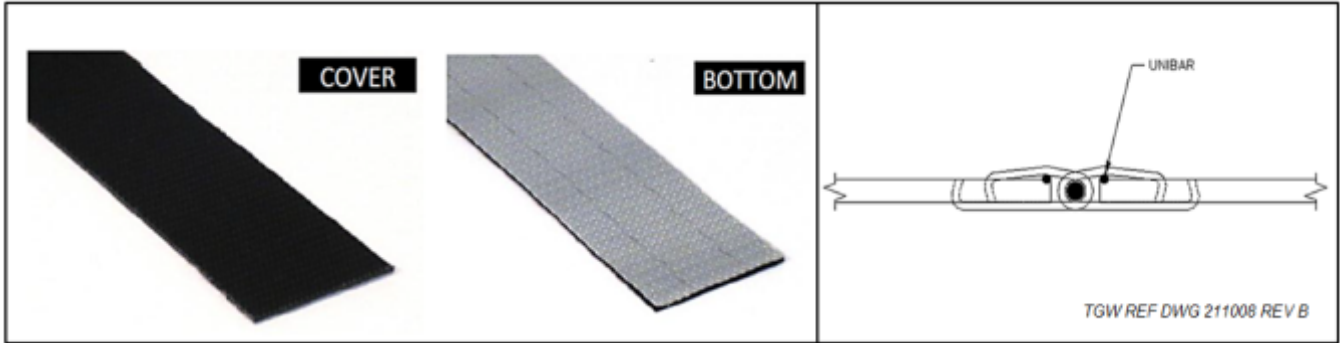
Ref Dwg 18" CEILING HANGER

Belt Material

BELT MATERIAL (General)	BELT WIDTH	BELT LENGTH	TEMPERATURE RANGE	STRENGTH	ACCEPTABLE STRETCH	LACING	LACING PIN
BELT,CZB _-9/16" X _- _- _- _- _- _- EWX (21I008) SPARKS MONO FLEX BU 200 E POLYURETHANE IMPREGNATION (ANTI-STATIC QUIET WEAVE)	BF - 7/16" ± 1/16" (72" MAX WIDTH)	OAL ± 1/4"	23 F TO 175 F	110 lbs / inch width	0.4 - 2.5% (MHS Conveyor) RECOMMENDED STRETCH 0.5%	CLIPPER UCM36SS12 (316 STAINLESS STEEL) (PN 1100706)	CLIPPER DSS065 (316 STAINLESS STEEL) (PN E0034789)
BELT,CZB _-9/16" X _- _- _- _- _- _- HOZ (21I006) SPARKS MONO FLEX BP 210 QW 2-PLY SMOOTH BLACK PVC (ANTI-STATIC QUIET WEAVE)							
BELT,CZB _-9/16" X _- _- _- _- _- _- INC (21I007) SPARKS MONO FLEX BP 290 QW 2-PLY RIBBED BLACK PVC (ANTI-STATIC QUIET WEAVE)							

BELT MATERIAL (Differences)	BELT THICKNESS	COVER MATERIAL	COVER HARDNESS	WEIGHT	COEFFICIENT OF FRICTION	
					STEEL	CARDBOARD
BELT,CZB _-9/16" X _- _- _- _- _- _- EWX (21I008) 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 (21I006) 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 (21I007) 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)

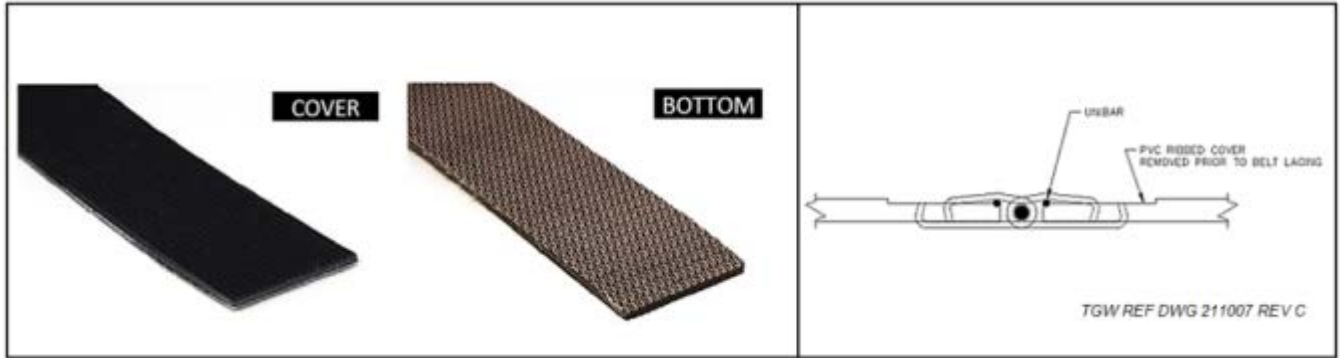
Mono Flex BU 200 (EWX)



Mono Flex BP 210 QW (HOZ)



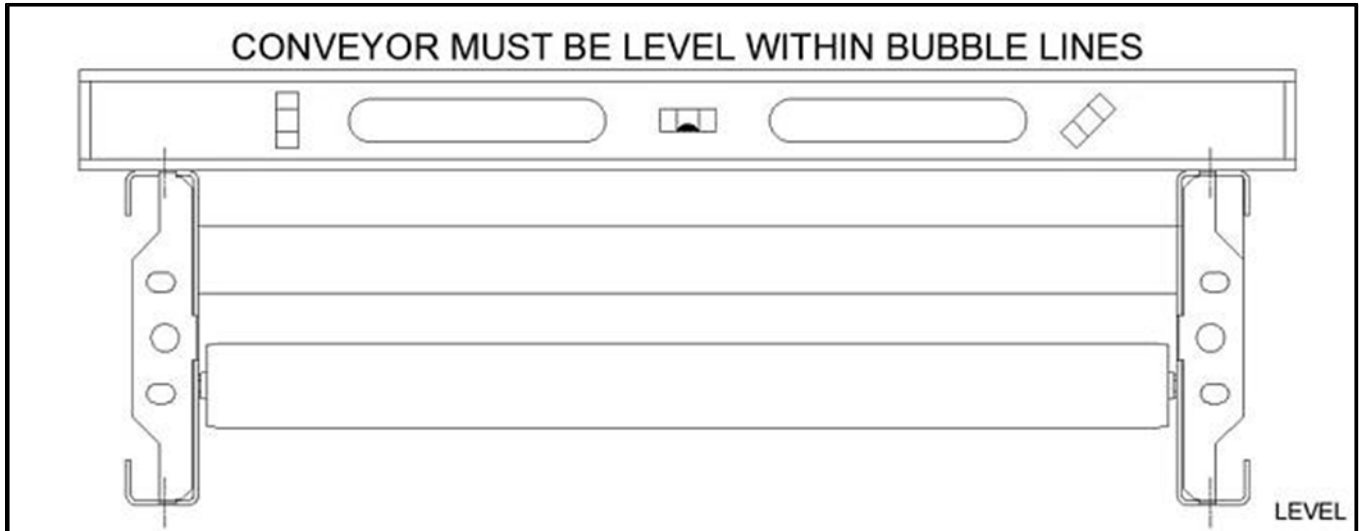
Mono Flex BP 290 QW (INC)

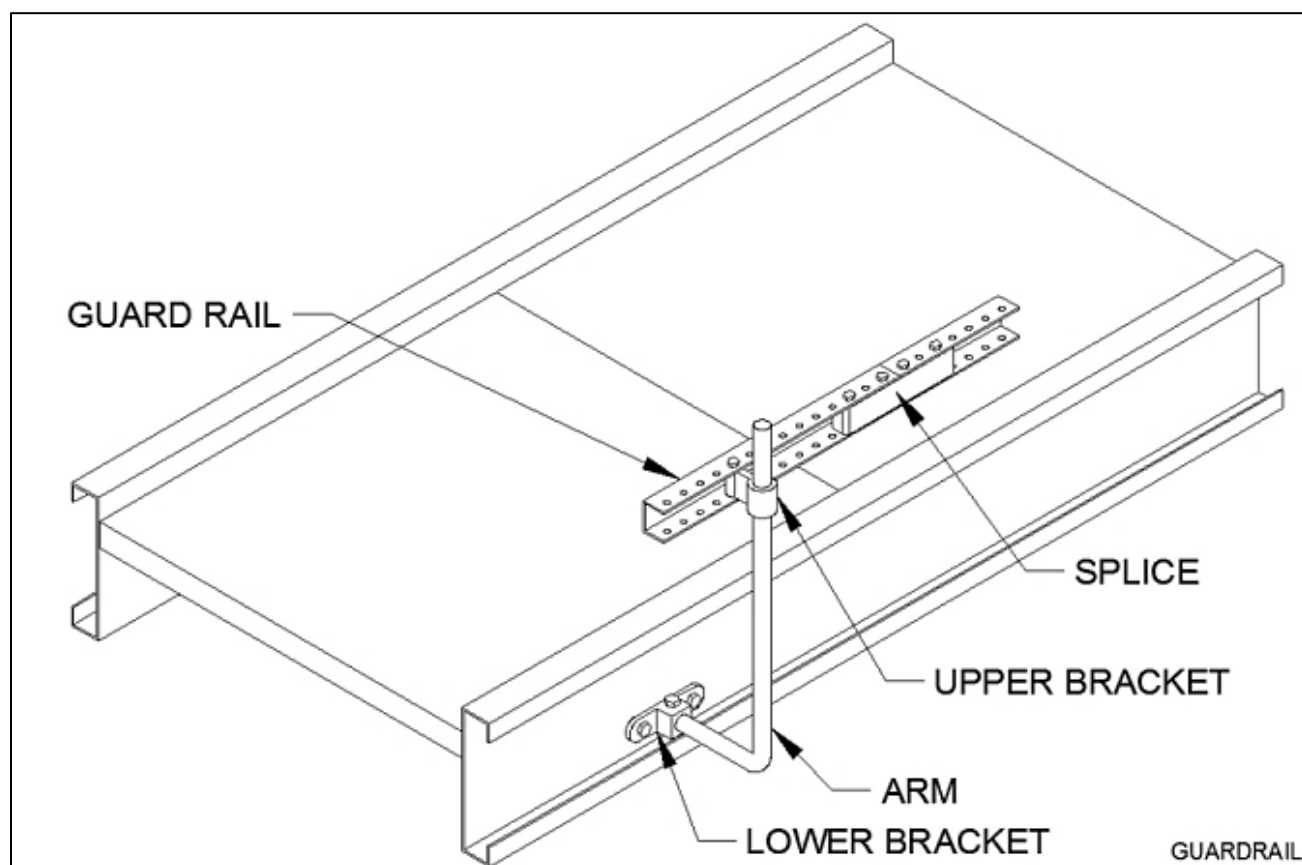


Conveyor Set Up

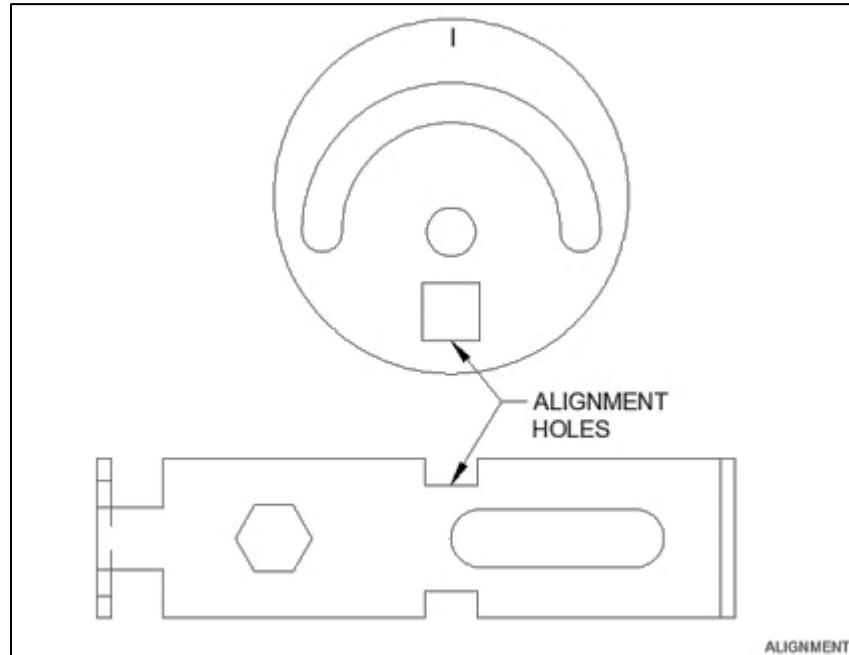
1. Place each bed in position per layout drawing.
2. Bolt bed butt connectors together.
3. Set final elevation and level unit. Conveyor must be level side-to-side and along conveyor length as shown below:
4. Tighten support bolts and anchor to floor.

Install any required guard rail as shown:

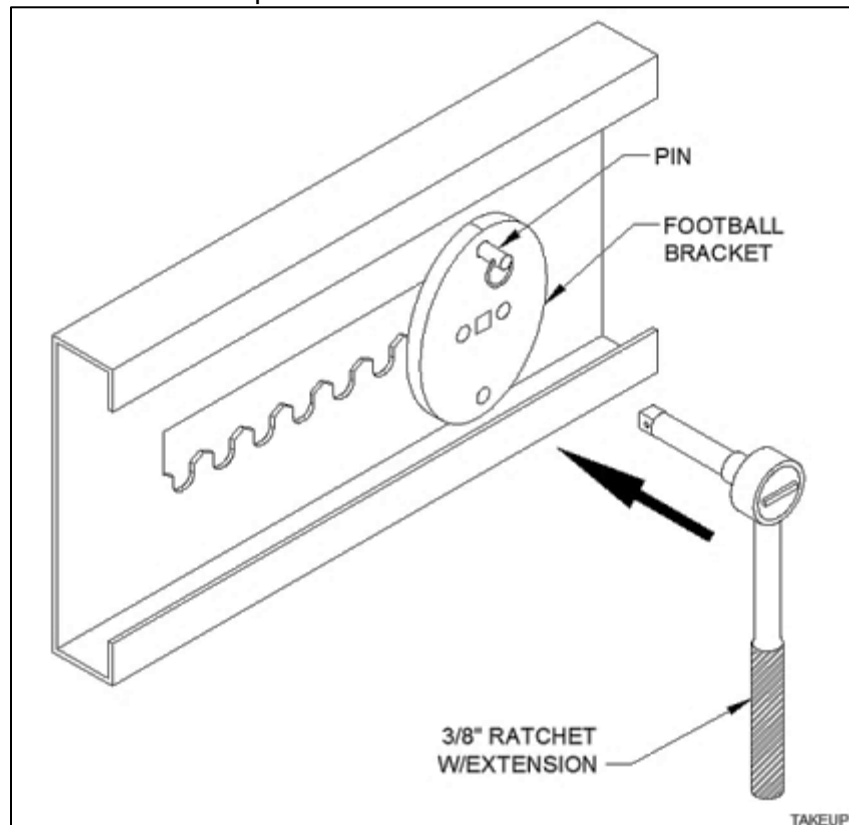




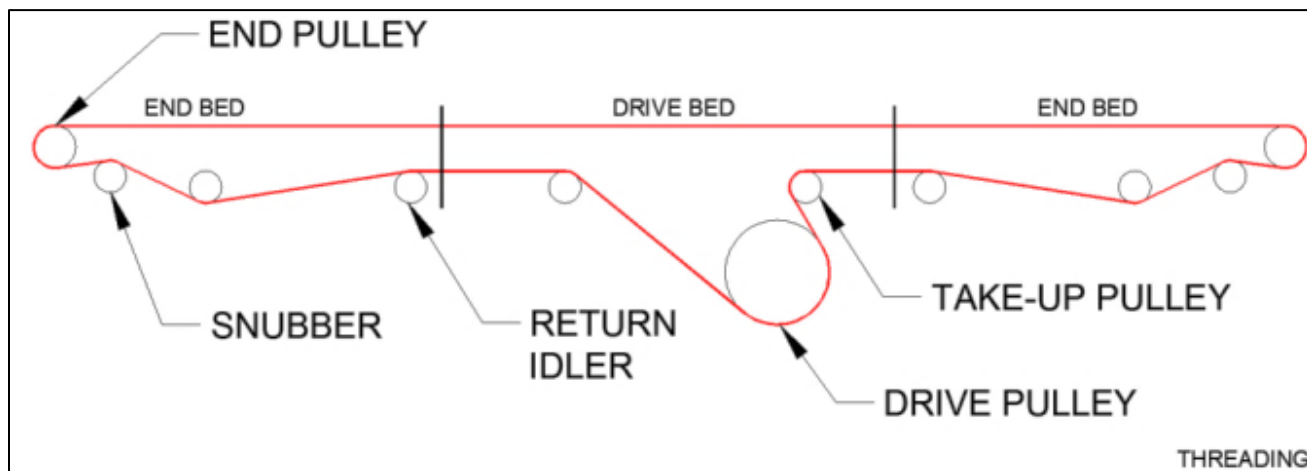
5. Square end pulleys and snubbers using alignment holes. Move cam or snubber bracket until the 3/8" square alignment hole is in line with the 3/8" square in the bed frame. A 3/8" key stock can be inserted into the holes for quick alignment.



6. 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.



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



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)

8. Pull belt ends together and insert lacing pin.
9. 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" on the ratchet or using two people with ratchets. Belt should be just tight enough to drive the product.
10. 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

- **Do not** run the conveyor without replacing both quick release pins.
- The CAM (football bracket) **must be vertical** on both sides.
- **Do not over tighten belt** as this causes excessive stress on the Drive Drum Shaft and associated bearings.
- **Excessive belt tension** will cause premature failure of the take-up assembly.

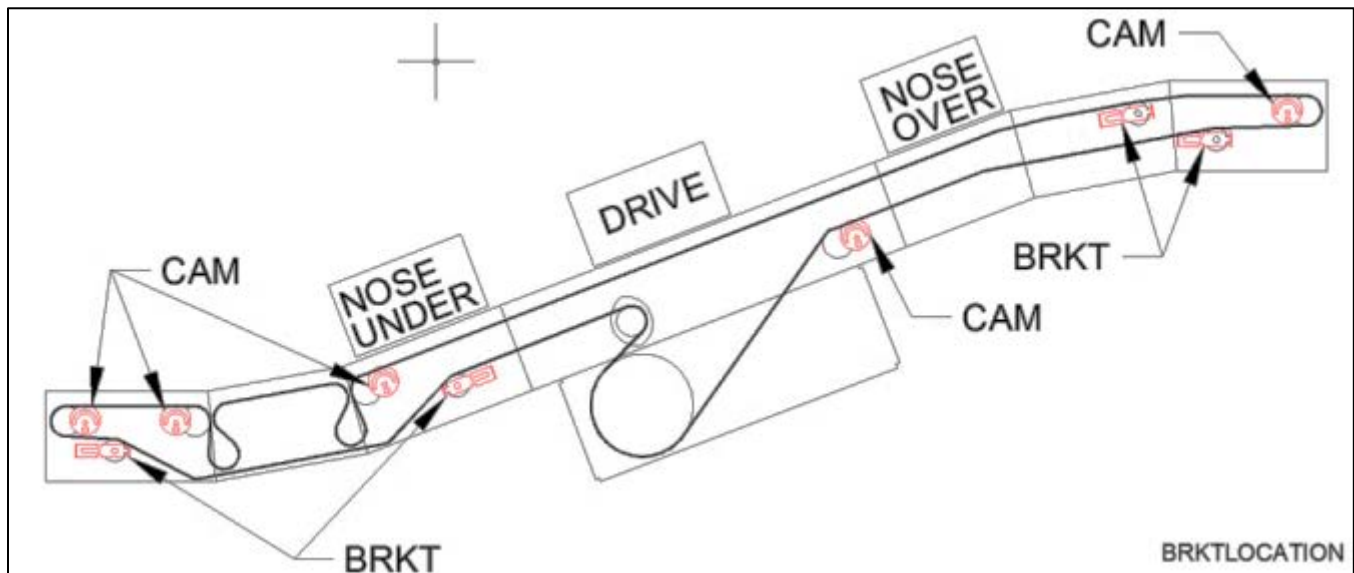
Belt Tracking

 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.

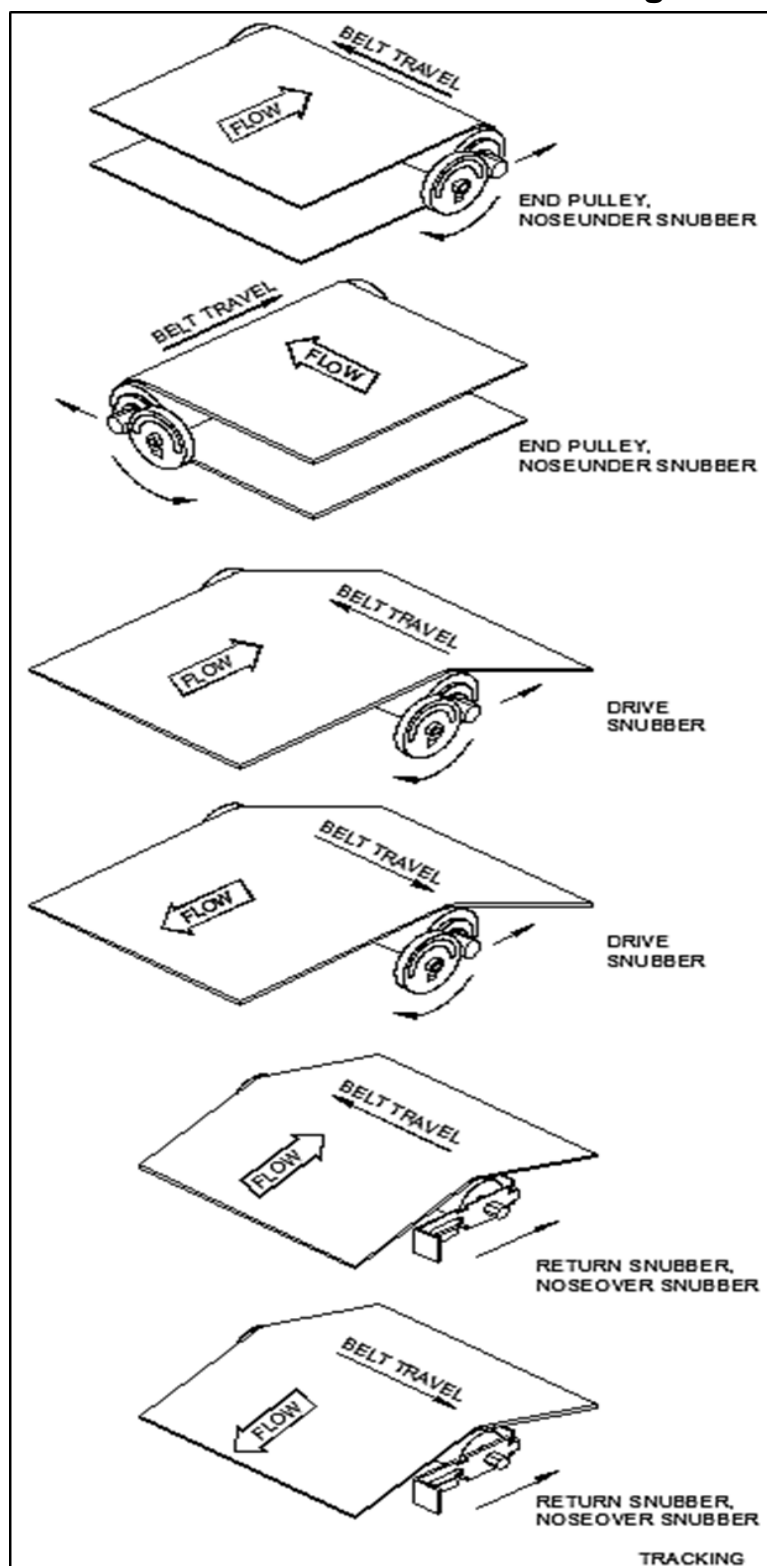
ALL PULLEYS AND SNUBBERS MUST BE SQUARE and conveyor must be level prior to tracking the belt. Align the 3/8" square in the cams and snubber brackets with the corresponding square in the bed frame. (See "Conveyor Set-up" section). Conveyor must be wired to run the correct direction. Belt should be tensioned 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 noseunders. Snubber tracking brackets are located near the ends of the conveyor on the return belt snubber/carrier rollers and near the middle of noseovers.



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

- Belt must not be allowed to contact the side frame near an end pulley or a snubber roller.



Some 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

- 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.



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.

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.)

1. Follow the belt path through the entire conveyor. Ensure lacing is straight and fastened correctly.
2. Visually inspect the installation. Is the conveyor straight? Is the conveyor level within bubble lines from side to side? From end to end?
3. Check guard rail clearance to product.
4. Eliminate all catch points.
5. Check conveyor elevations.
6. All bolts and set screws tight.
7. Check product clearance to overhead structures.
8. Simulate all operational functions with actual product.
9. All guards in place with proper clearance.
10. All OSHA required guards in place on walkways, catwalks, ladder-ways, floor openings, etc.
11. All labels and warning signs in proper place, unobstructed.

Mechanical Dynamic Checkout

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

1. Turn the motor ON. With the belt moving make sure each belt has proper tension.
2. Check the belt tracking.

Conveyor Controls - Safety Guidelines

The following are basic conveyor controls safety guidelines for common controls equipment.

START-UP WARNING HORN - Conveyors being started and cannot be seen from the start pushbutton location, an audible warning device is required. It could be a horn, buzzer, or bell. It must be loud enough to be heard at any point on the conveyor being started. It should sound for the duration of five seconds after the start pushbutton is pushed, prior to the conveyor starting. Any auxiliary equipment such as vertical lifts, turntables, etc. must be included in the warning circuitry.

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

STOP PUSHBUTTON - Stop pushbutton should be the extended type such that any contact with it is sufficient to stop the conveyor. They should have a legend plate defining which conveyors will be stopped.

EMERGENCY STOPS - All locations where high voltage motors are used and an operator is working must be protected by an emergency stop.

Emergency stop devices should also protect high pedestrian areas where high voltage motors are used. Actuating an emergency stop must dropout the start circuit and all electrical power, requiring restarting the system using the start pushbutton provided.

All locations where low voltage motors are used (under 50 volts) and an operator is working all require an emergency stop circuit. This requirement also applies to high pedestrian areas.

Preventive Maintenance

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.



Periodic maintenance 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.
- Listen for air leaks.



Weekly

- Check for proper PSI on air regulators.
- Check air filter bowls for accumulated water.

 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.

Air Systems

The best preventive maintenance for any air operated device is clean air. Dirty air will make pneumatic devices sticky, and they will not operate properly. To ensure the continued performance of filters, monitor filter / regulator bowl drain every week. To manually drain the bowl, push the push button at the bottom of the bowl. Let all accumulated liquid drain until you hear air escaping.

 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.

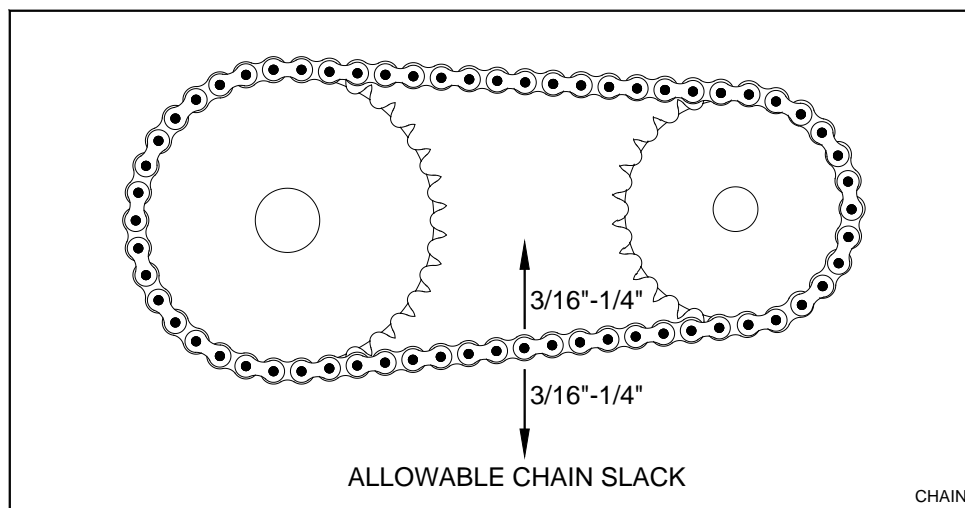
Gearmotor

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:



Belt Drive Tension Measurement

- There are three known measurements that need to be set in the Sonic Meter to correctly measure belt tension. These measurements are:
 - Weight of the belt in grams per meter of belt length.
 - Width of the belt in millimeters.
 - Belt Span between timing belt sprockets measured in millimeters.
- MHS Conveyor has standardized on using “Poly-Chain”, 8 mm tooth pitch, 36 mm wide synchronous timing belts in all American domestic conveyor / sorter equipment.
- The weight of this style synchronous timing belt is 4.7 grams / meter.
- The belt width is 36 millimeters.
- The Belt Span between timing belt sprockets is fairly dependent on the pulley belt combination used.
- The correct tension can be either measured in Pounds of Tension or Frequency measured in Hertz
- After setting the correct parameters in the Sonic Meter hold the sensing probe a few millimeters above or below the belt 36 mm wide face. Tap the belt to generate a vibration and read the measurement on the Sonic Meter.

Rollers

Inspect rollers periodically for debris build-up.

Belts

Belts normally need very little care. Clean monthly with compressed air or a stiff brush. Clean bi-annually with water and detergent.

CAUTION

- Do not use petroleum-based products to clean the belt.

Regreasable Bearings

The drive unit and power take-off have re-greasable bearings. 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.

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

Belt Troubleshooting Guide Continued

	Problem Belt	Possible Cause	Remedy
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
		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,
		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
9.	Excessive belt stretching	Tension too great	Reduce belt tension by take-up adjustment

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. Check control circuit voltage
		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. Check chain tension.
		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
		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
		Overloaded conveyor	Remove excess product. Address cause.
		Mistthreading belt path	Reroute belt path correctly

Gearmotor Troubleshooting Guide Continued

	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
		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 facility.
		Key between motor and reducer missing	Replace key
11.	Electrical shorts	Loose connection	Check all wire connections. Check fuses.

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-
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"
		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

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

Replacement Parts Identification

This section is used to identify parts that may require replacement during the life of the conveyor.

Parts that specifically pertain to CRUZbelt are included with illustrations.

A "Recommended Spare Parts List" is published for all conveyor orders of \$20,000 or more. 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 or Fax 231-798-4549.

Spare Parts Priority Level Explanations

Level #1

Failure of a priority level #1 spare part ("A" level part) may cause major distribution 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 majority of these parts are purchased from MHS Conveyor vendors and carry their own warranties through those 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.

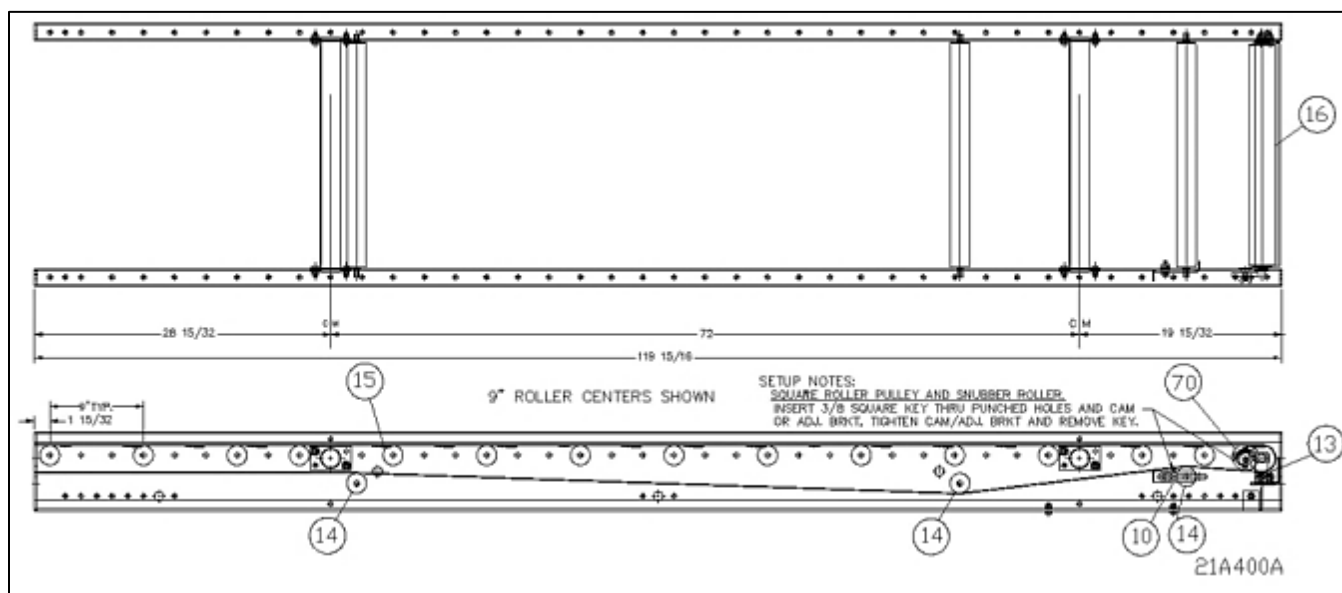
Priority level 2 spare parts include roller chain, sprockets, belt pulleys, rollers, air cylinders, and other related parts whose failure should not stop a conveyor system suddenly. These parts tend to wear out gradually and are not known to fail suddenly.

Level #3

Priority level #3 part ("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.

CRUZbelt End Beds

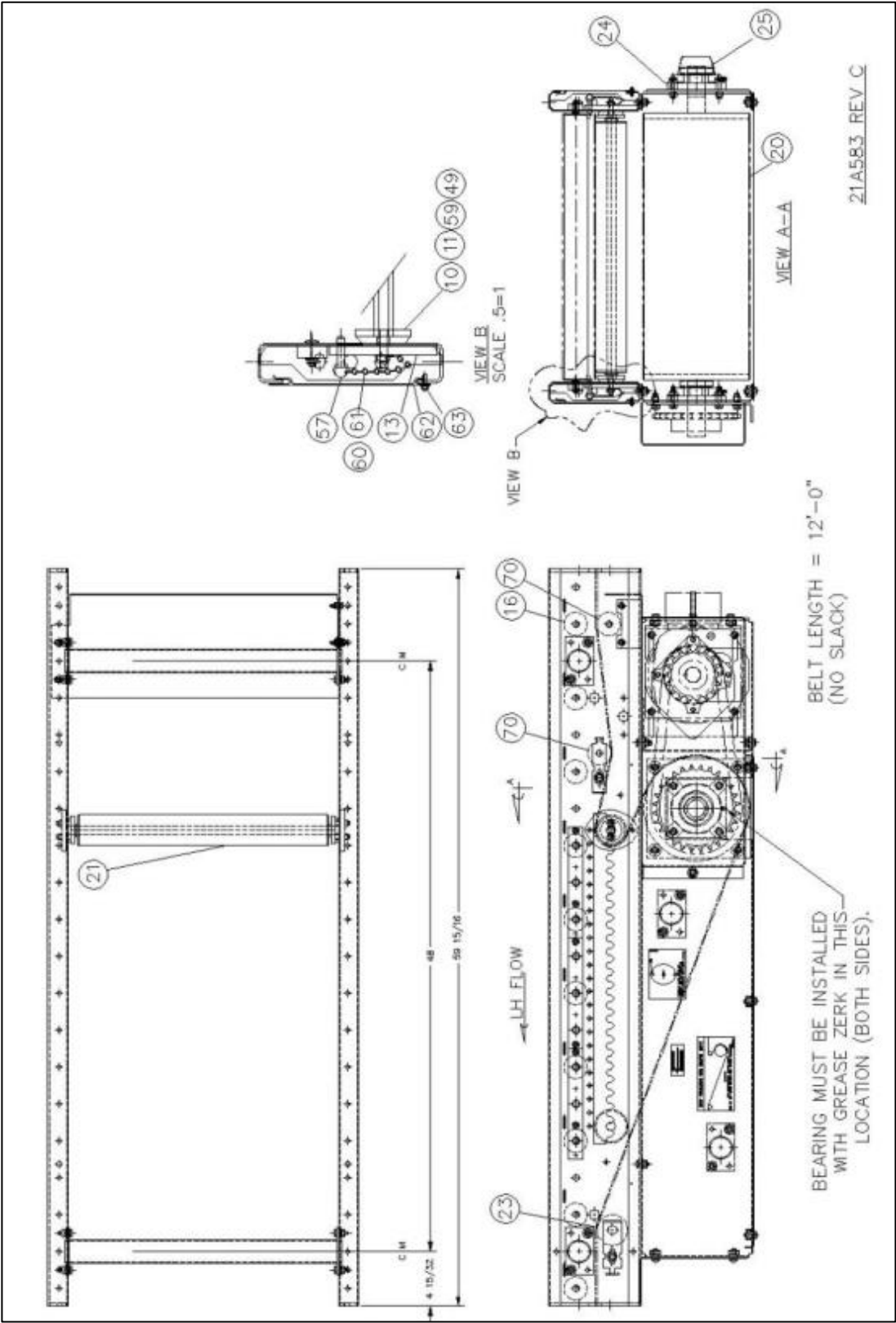


REPLACEMENT PARTS FOR CRUZBELT END BEDS

BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
10	SNUBBER ADJUSTING BRACKET	E0009408			
13	FINGER GUARD __ CZB	E0034991	E0034992	E0034993	E0040394
14	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING	60218009	60224009	60230009	60236009
15	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING				
16	2 1/2" DIA. ROLLER WALL THICKNESS W/1/4"	E0040390	E0040391	E0040392	E0040393
70	ADJUSTING CAM ASSEMBLY	E0038393			

Bed Reference Dwg. #21A400A

CRUZbelt Center Drives

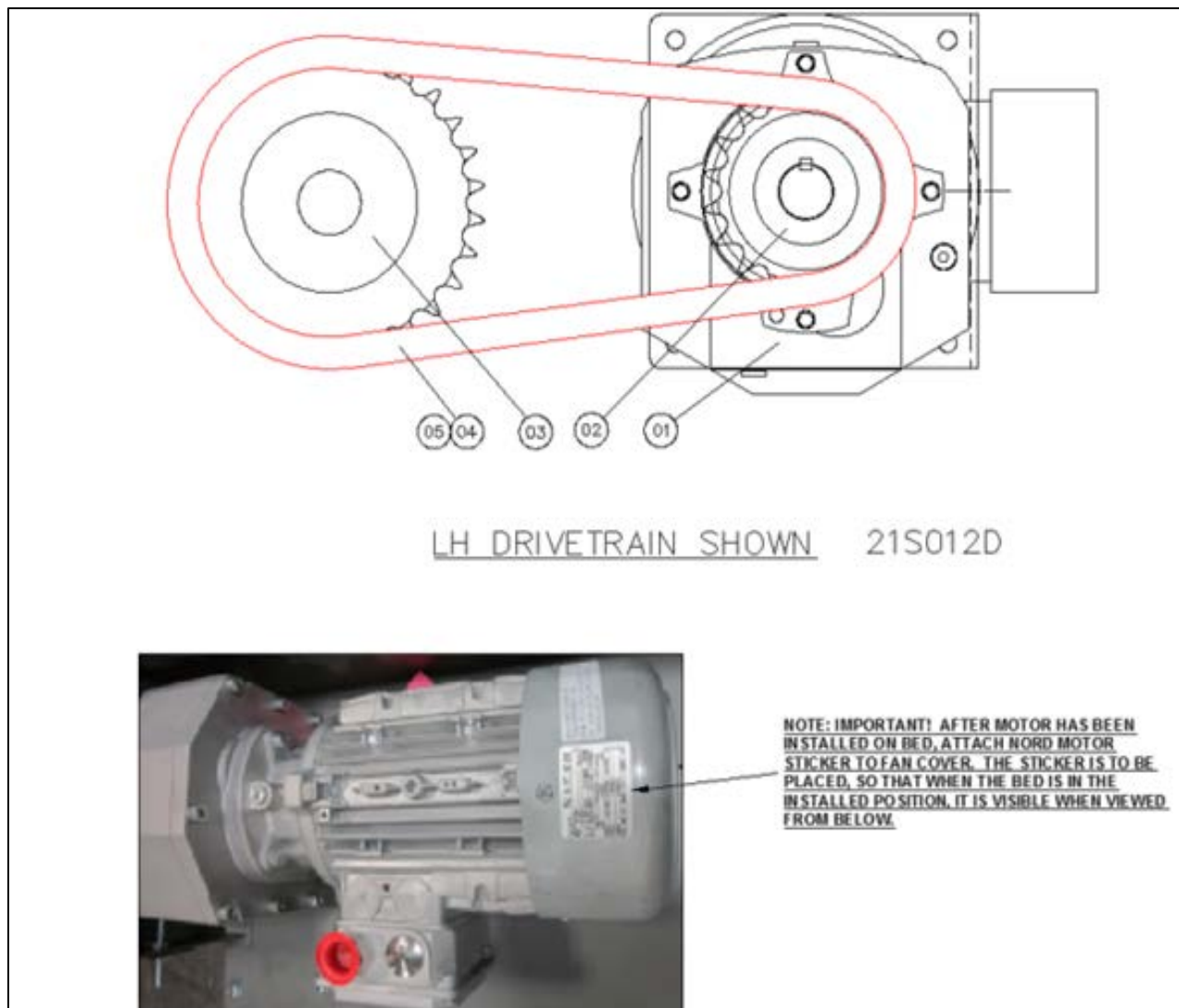


CRUZbelt Center Drives

REPLACEMENT PARTS FOR CRUZBELT CENTER DRIVES					
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
10	GUIDE DISC CZB CAM T/U	E0009126			
11	PL, CAM WLDMT INNER CZB DR	E0009100			
13	PL, CZB T/U FOOTBALL	E0009127			
49	NUT 5/16-18 ELASTIC-LOCK	95200074			
57	PIN, QUICK RELEASE 5/16 X .8	E0009146			
59	BUSHING, 5/16 X 1/2 X 3/8L BRONZE	E0009148			
60	LANYARD, SASH CHAIN 6"	E0009101			
61	WASHER, LOBED .335ID	E0009102			
62	SHROUD, CZB CDR GUARD	E0009122			
63	SCREW, #8-18 X 1/2" SELF DRILL	E0002572			
16	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING	60218009	60224009	60230009	60236009
20	8" PULLEY WELDMENT	1158680	1158681	1158682	1158683
21	2 1/2" DIA. DRIVE TAKE UP ROLLER	E0040400	E0040401	E0040402	E0040403
23	ROLLER, SNUB __ BF 11/16" HEX AXLE	18218001	18224001	18230001	18236001
24	4-BOLT BRG X 1-7/16" CONCENTRIC CLAMP COLLAR	1114091			
25	BEARING END SAFETY CAP	1114092			
70	ROLLER, __ CZB 1.9 SNUBBER PRBG	E0009652	E0009653	E0009654	E0009655

Bed Reference Dwg. #21A583C

NOTE: # 16 above is not used with slider pan conveyors

Drive Train

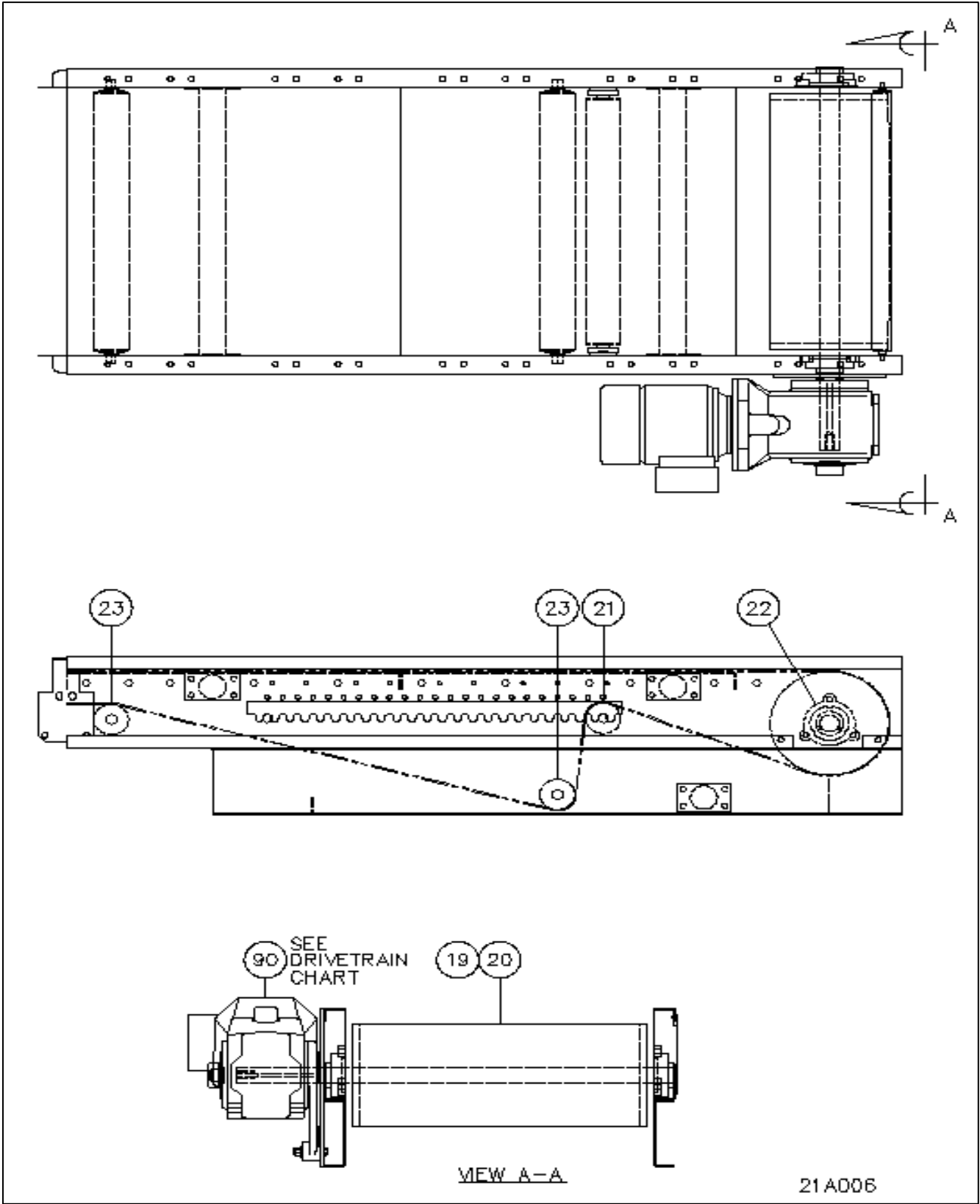
RH & LH Center Drive - Drive-Trains

REPLACEMENT PARTS FOR CRUZBELT RH & LH CENTER DRIVE								DRIVE TRAINS		
Balloon #					1	1	2	3	4	5
FPM	HP	RH DRIVE TRAIN	LH DRIVE TRAIN	OPTION	RH GEAR MOTOR	LH GEAR MOTOR	DRIVE SPROCKET	DRIVEN SPROCKET	CHAIN	MASTER LINK
30	1/2	1135388	1135384		1135076	1135071	1118303 15T 1" Bore	1118285 28T 1-7/16" Bore	90140032 PEER # 60 ROLLER CHAIN	90440107 PEER # 60 MASTER LINK
		1135389	1135387	BRAKE	1135078	1135074				
45	3/4	1135392	1135390		1135083	1135081	11182777 16T 1" Bore			
		1135393	1135391	BRAKE	1135084	1135082				
60	3/4	1135396	1135394		1135091	1135087	1118298 17T 1" Bore			
		1135397	1135395	BRAKE	1135092	1135090				
	1	1135401	1135398		1135095	1135093	1118303 15T 1" Bore			
		1135402	1135400	BRAKE	1135096	1135094				
75	3/4	1135406	1135404		1135099	1135097	1118298 17T 1" Bore			
		1135407	1135405	BRAKE	1135100	1135098				
	1	1135411	1135408		1135103	1135101	1118303 15T 1" Bore			
		1135412	1135410	BRAKE	1135104	1135102				
	1 1/2	1135416	1135413		1135107	1135105	1118352 16T 1-1/4" Bore			
		1135417	1135415	BRAKE	1135106	1135106				
90	1	1135420	1135418		1135113	1135111	11182777 16T 1" Bore			
		1135421	1135419	BRAKE	1135114	1135112				
	1 1/2	1135424	1135422		1135117	1135115				
		1135425	1135423	BRAKE	1135118	1135116				
105	1 1/2	1135442	1135440		1135121	1135119	1118264 27T 1-7/16" Bore			
		1135443	1135441	BRAKE	1135120	1135120				
	2	1135446	1135444		1135126	1135123	1118352 16T 1-1/4" Bore			
		1135447	1135445	BRAKE	1135125	1135125				
120	1 1/2	1135450	1135448		1135130	1135128	1118298 17T 1" Bore	1118285 28T 1-7/16" Bore		
		1135451	1135449	BRAKE	1135131	1135129				
	2	1135454	1135452		1135135	1135132	1118325 18T 1-1/4" Bore			
		1135455	1135453	BRAKE	1135136	1135133				
135	1 1/2	1135458	1135456		1135139	1135137	1118298 17T 1" Bore			
		1135459	1135457	BRAKE	1135140	1135138				
	2	1135462	1135460		1135143	1135141	1118303 15T 1" Bore			
		1135463	1135461	BRAKE	1135144	1135142				
	3	1135466	1135464		1135152	1135148	1118352 16T 1-1/4" Bore			
		1135467	1135465	BRAKE	1135153	1135150				
150	1 1/2	1135470	1135468		1135156	1135154	11182777 16 T 1" Bore	1118264 27T 1-7/16" Bore		
		1135471	1135469	BRAKE	1135457	1135155				
	2	1135474	1135472		1135143	1135141	1118352 16T 1-1/4" Bore			
		1135475	1135473	BRAKE	1135144	1135142				
	3	1135478	1135476		1135160	1135158	1118352 16T 1-1/4" Bore			
		1135479	1135477	BRAKE	1135161	1135159				
175	2	1135489	1135487		1135164	1135162	11182777 16T 1" Bore	1118273 26T 1-7/16" Bore		
		1135490	1135488	BRAKE	1135165	1135163				
180	3	1135493	1135491		1135168	1135166	1118352 16T 1-1/4" Bore			
		1135494	1135492	BRAKE	1135169	1135167				
210	2	1160550	1160548		1160529	1160527	11182777 16 T 1" Bore	1118264 27T 1-7/16" Bore		
		1160551	1160549	BRAKE	1160530	1160529				
	5	1160554	1160552		1160533	1160531	1118352 16T 1-1/4" Bore			
		1160555	1160553	BRAKE	1160534	1160533				
240	2	1160558	1160556		1160537	1160535	11182777 16 T 1" Bore	1118273 26T 1-7/16" Bore		
		1160559	1160557	BRAKE	1160538	1160537				
	5	1160562	1160560		1160541	1160539	1118352 16T 1-1/4" Bore			
		1160563	1160561	BRAKE	1160542	1160541				

Drive-Train Reference Dwg # 21S012

Drive-Train Reference Dwg # 21S012 D

End Drive

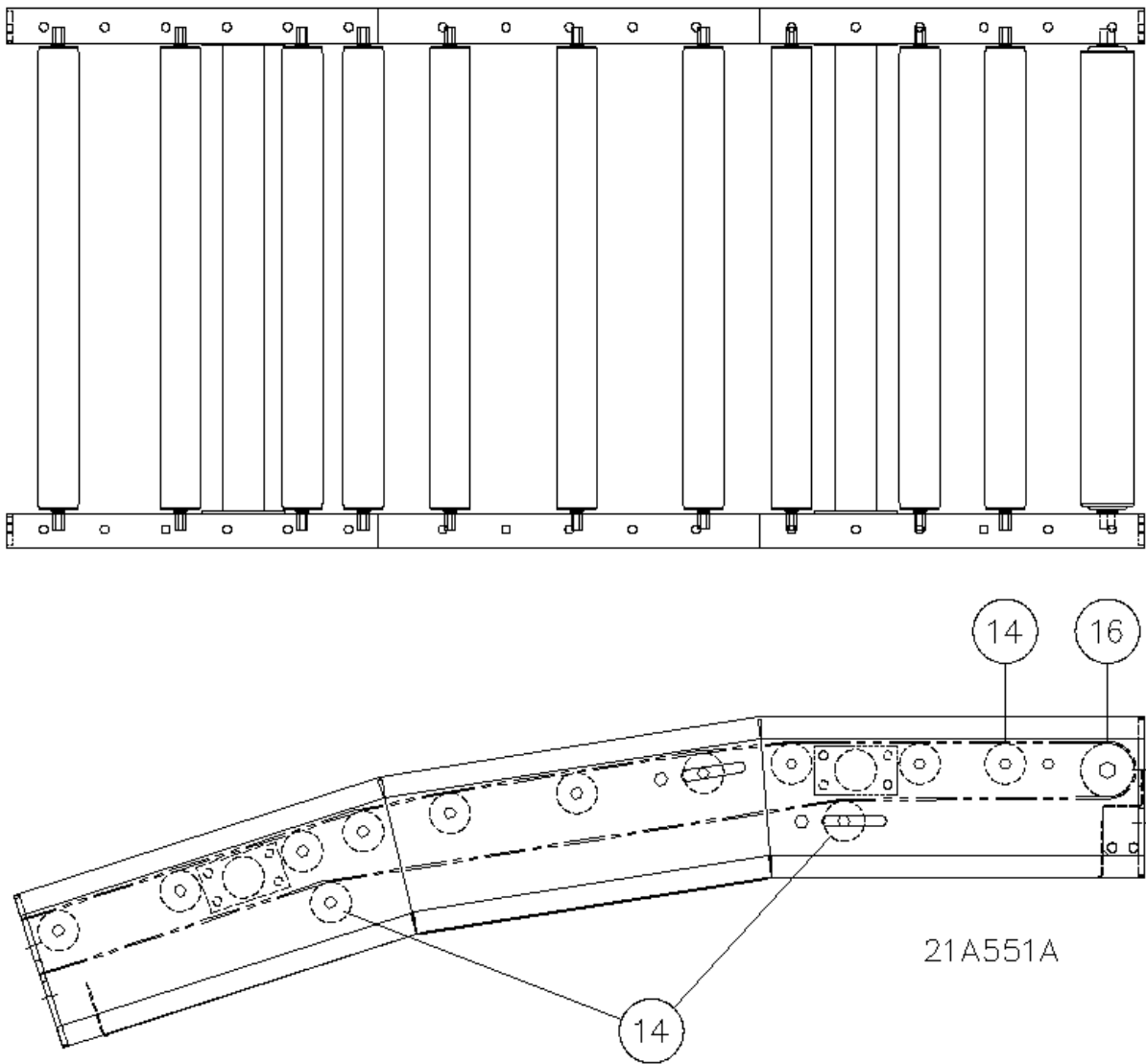


End Drive & Drive Train Replacement Parts

REPLACEMENT PARTS FOR CRUZBELT END DRIVE							
BALLOON	DESCRIPTION	Widths & Part #s					
		16" BF	22" BF	28" BF	34" BF	40" BF	46" BF
20	8" DIA PULLEY WELDMENT	E0009080	E0009081	E0009082	E0009083	E0009084	E0009085
21	2 1/2" DIA 1/4" WALL DRIVE TAKE-UP ROLLER	E0040400	E0040401	E0040402	E0040403	E0040404	E0040405
22	3-BOLT FLANGE BEARING	1115245					
23	2 1/2" DIA 1/4" WALL ROLLER	E0040390	E0040391	E0040392	E0040393	E0040394	E0040395
Bed Reference Dwg. #21A540A							

DRIVE TRAIN ITEM #s				
DRIVE TRAIN ITEM #s / GEARMOTOR PART #s FOR CRUZBELT END DRIVES				
SPEED	HP	BELT PULL	RH DRIVE TRAIN	LH DRIVE TRAIN
62	1	500	E0030055	E0030066
			E0009134	E0033844
76	1	421	E0030057	-----
			E0009136	-----
87	1	367	E0030058	E0030069
			E0040299	E0040300
98	1.5		E0030059	E0030070
			1152460	1155644
109	1.5	440	E0030060	E0030071
			1108875	1108876
122	1.5	393	E0030061	E0030072
			1108877	1108878
210	3	457	E0030065	E0030076
			1131352	1131353
Dwg # 21A006D, 90				

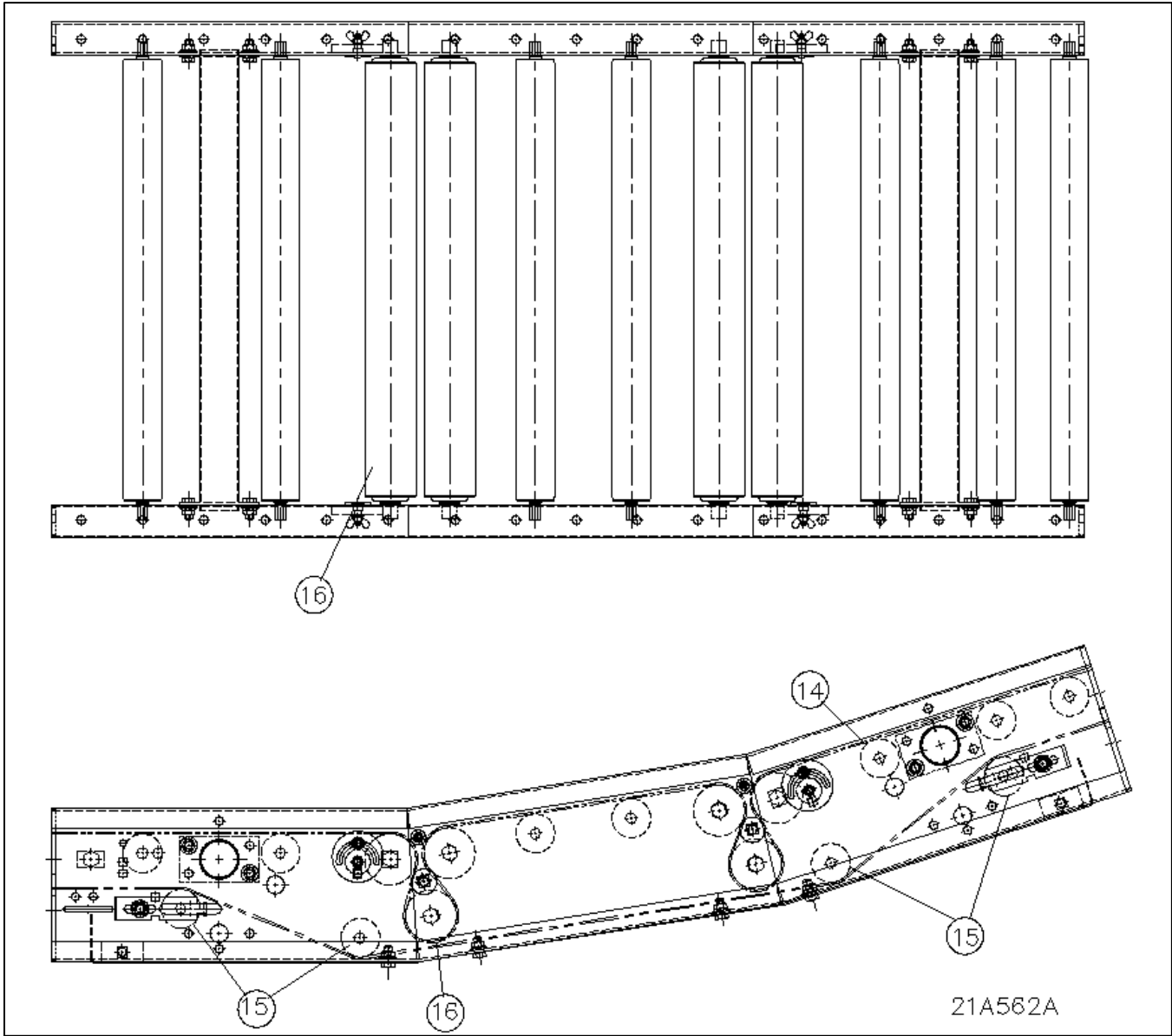
Noseover



REPLACEMENT PART FOR CRUZBELT NOSEOVER

BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
14	1.9" DIA. GRAVITY ROLLER PRBG	60218009	60224009	60230009	60236009
16	2 1/2" DIA. ROLLER	E0040390	E0040391	E0040392	E0040393
Note: #14 above is not used with slider pan conveyors					
<i>Bed Reference Dwg. #21A551A</i>					

Noseunder



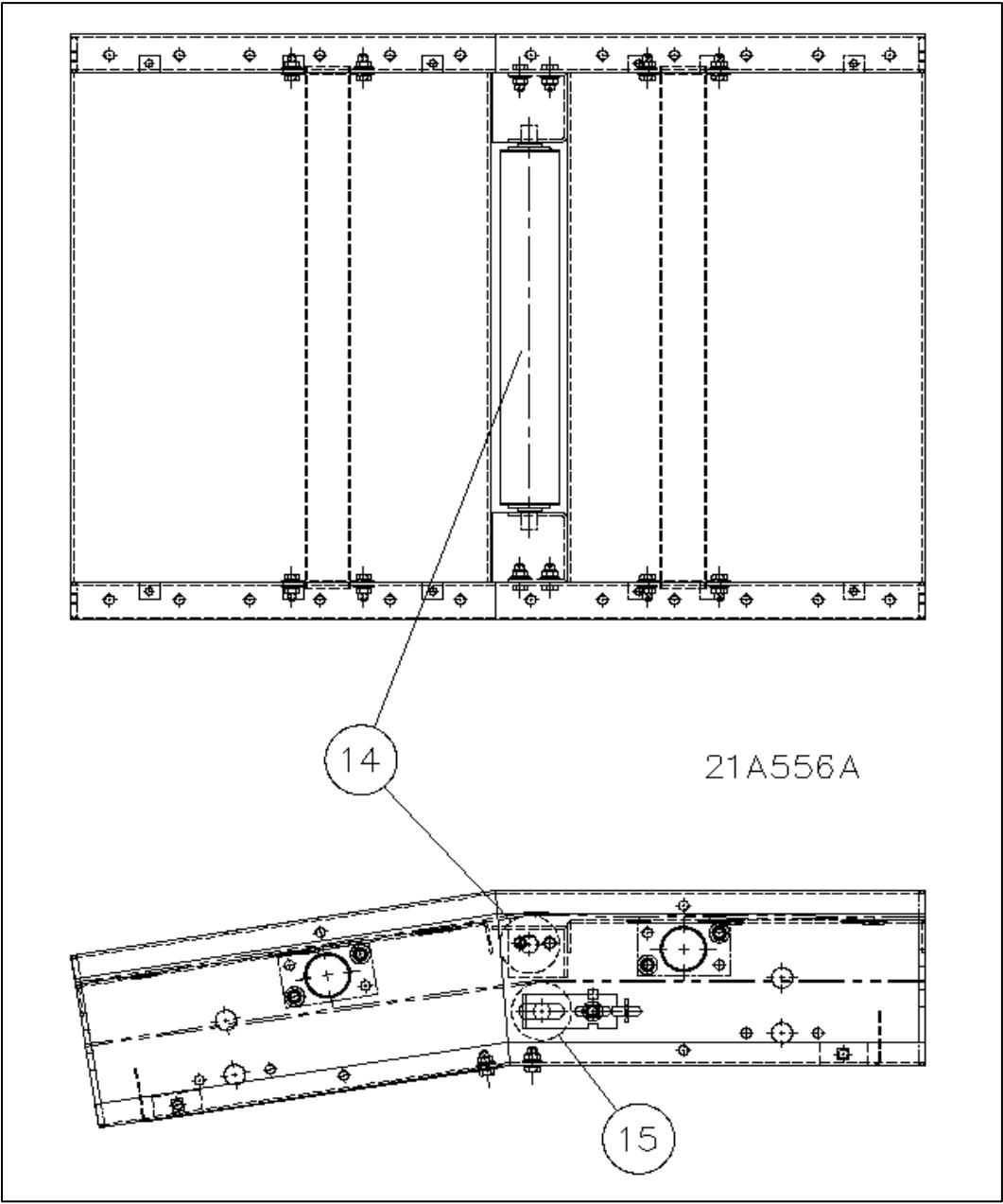
REPLACEMENTS FOR CRUZBELT NOSEUNDER

BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
14	1.9" DIA. GRAVITY ROLLER PRBG	60218009	60224009	60230009	60236009
15	1.9" DIA. SNUBBER ROLLER PRBG	E0009652	E0009653	E0009654	E0009655
16	2 1/2" DIA. ROLLER	E0040390	E0040391	E0040392	E0040393

Note: #14 above is not used with slider pan conveyors

Bed Reference Dwg. #21A562A

Empty Carton Conveyors – Noseover

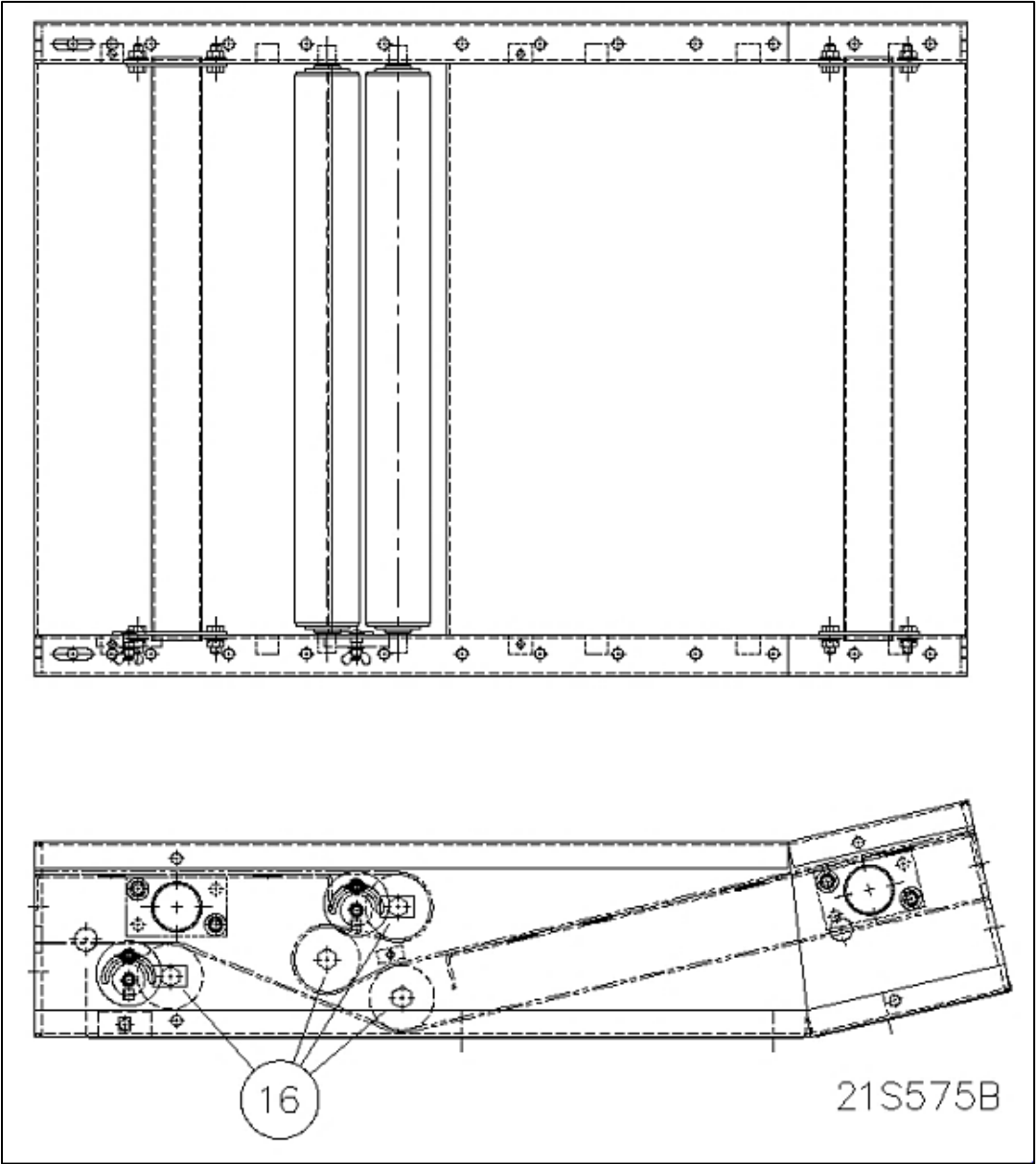


REPLACEMENT PARTS FOR CRUZBELT EMPTY CARTON NOSEOVER

BALLOON	DESCRIPTION	Widths & Part #s				
		22" BF	28" BF	34" BF	40" BF	46" BF
14	2 1/2" DIA. ROLLER	E0040390	E0040391	E0040392	E0040393	E0040394
15	2 1/2" DIA. ROLLER	E0040391	E0040392	E0040393	E0040394	E0040395

Bed Reference Dwg. #21A556A

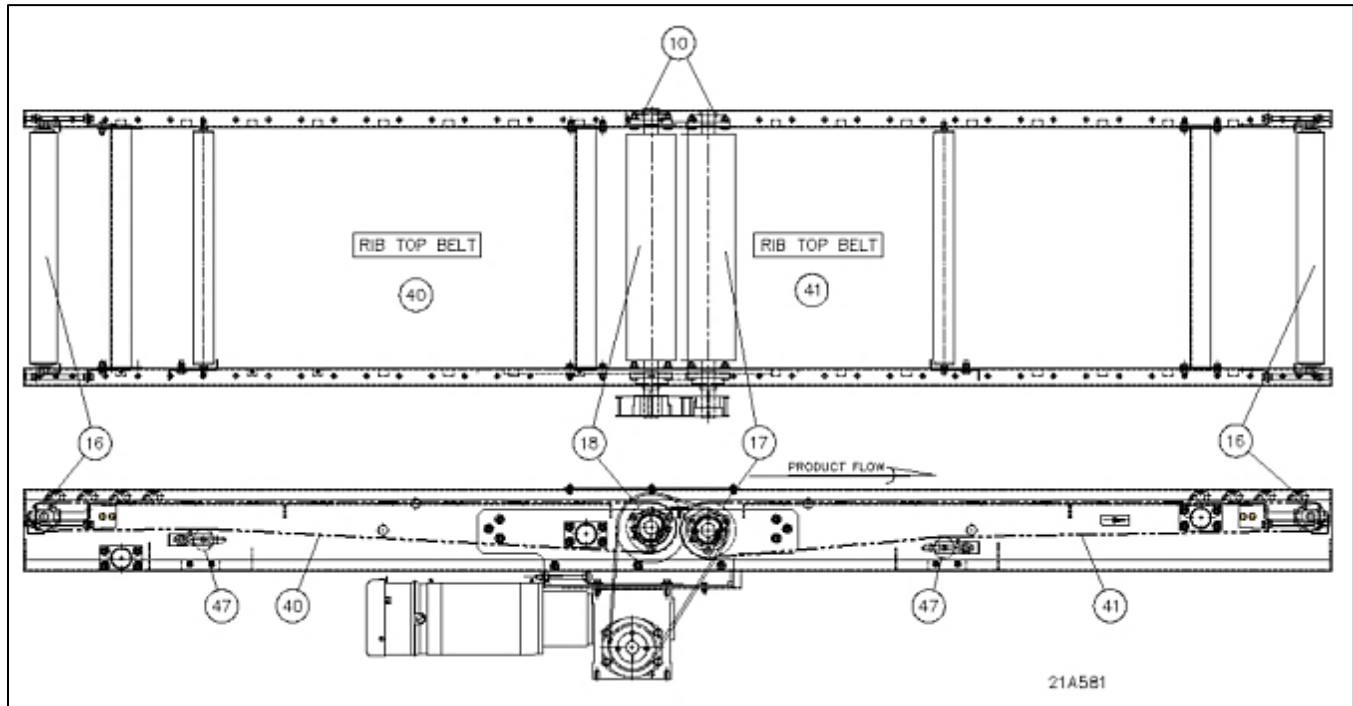
Empty Carton Conveyor – Double Snubber



REPLACEMENT PARTS FOR CRUZBELT DOUBLE SNUBBER							
BALLOON	DESCRIPTION	Widths & Part #s					
		16" BF	22" BF	28" BF	34" BF	40" BF	46" BF
16	2 1/2" DIA. ROLLER	E0040390	E0040391	E0040392	E0040393	E0040394	E0040395
Bed Reference Dwg. #21A575B							

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Induction Bed

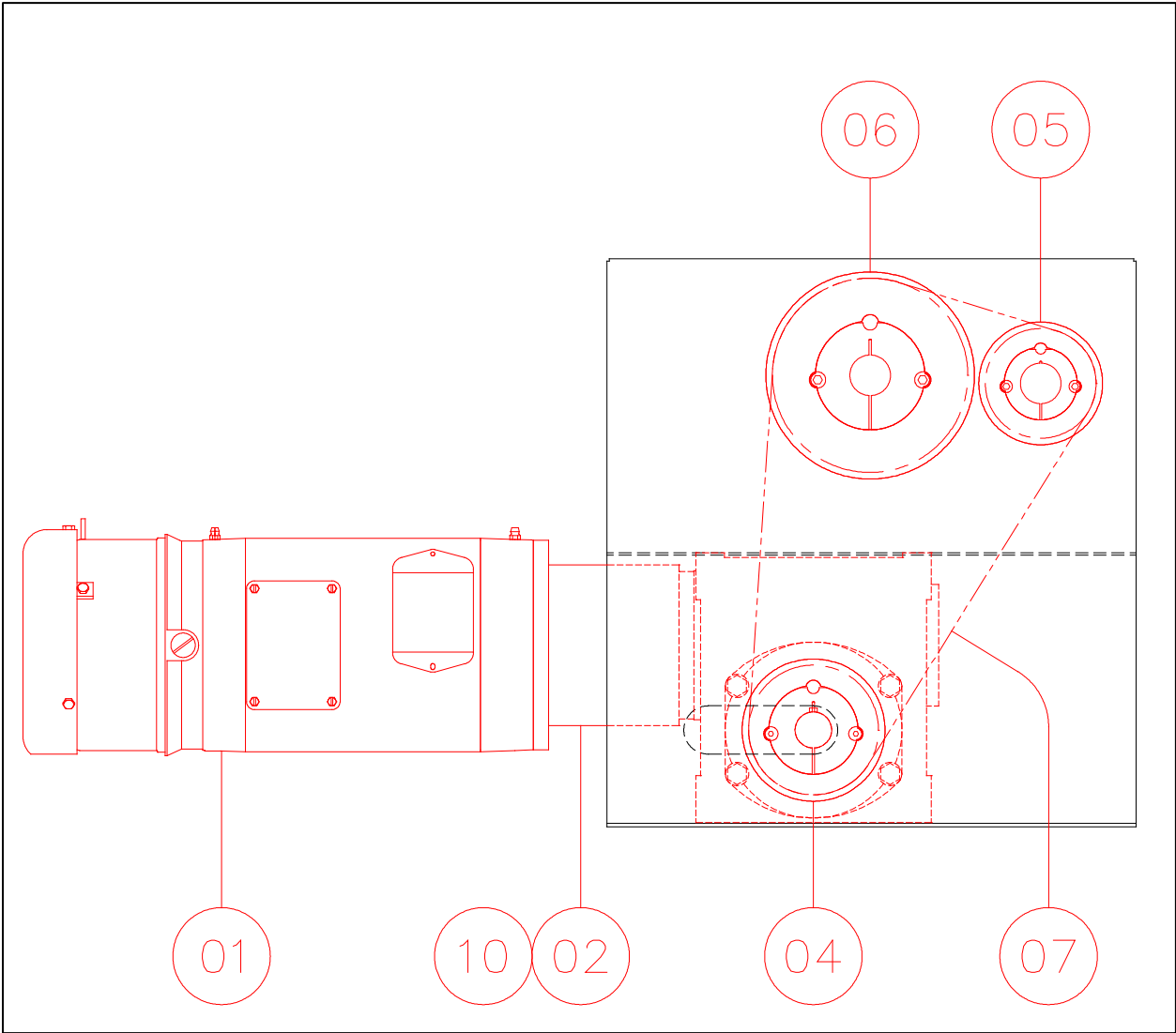


REPLACEMENT PARTS FOR CRUZBELT INDUCTION BEDS

BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
8	UHMW BELT GUIDE (Older Units) Ref Dwg # 21A209A-I	E0038278			
10	3-BOLT FLANGE CLAMP COLLAR STYLE 1-1/4" BORE DODGE BEARING	1107696			
16	2 1/2" DIA. 1/4" WALL PULLEY	E0040390	E0040391	E0040392	E0040393
17	4 1/2" DIA. TAPERLOCK URO LAGGED PULLEY	E0038269	E0038270	E0038271	E0038272
18	4" DIA. TAPERLOCK SBR LAGGED PULLEY	E0038273	E0038274	E0038275	E0038276
40	RIBBED BELT (BP290 QW) (INCL)	E0038333	E0038284	E0034981	E0034983
41	RIBBED BELT (BP290 QW) (INCL)	E0038333	E0038284	E0034981	E0034983
41	SMOOTH BELT (BP210 QW) (HORZ) Ref Dwg # 21A209A-I	E0038334	E0038285	E0034982	E0034984

Bed Reference Dwg. #21A581B

Induction Bed Drive-Train



Induction Bed 2:1 Reduction Drive-Train

REPLACEMENT PARTS FOR CRUZBELT INDUCT , DRIVE TRAIN (2:1 REDUCTION DRIVE TRAINS)													
			Balloon#	1	2	4		5		6		7	10
NOMINAL FPM	HP	OPTIONS	DRIVE TRAIN	GEAR MOTOR	REDUCER	DRIVE PULLEY	BUSHING	DRIVEN PULLEY	BUSHING	DRIVEN PULLEY	BUSHING	BELT	HYTREL SPYDER
45/90	1	BRAKE	E0038335 208/230V	E0038381	E0038363	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
			E0038294 460V	E0038356									
	2		E0038345 208/230V	E0038358	E0038363								
			E0038304 460V	E0038329									
60/120	1	BRAKE	E0038336 208/230V	E0038381	E0038363	E0038328 45-TOOTH	E0038372	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
			E0038295 460V	E0038356									
	2		E0038346 208/230V	E0038358	E0038363								
			E0038305 460V	E0038329									
75/150	1	BRAKE	E0038337 208/230V	E0038381	E0038331	E0038310 34-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
			E0038296 460V	E0038356									
	2		E0038347 208/230V	E0038358	E0038331								
			E0038306 460V	E0038329									
	3	VFD READY	E0038320 230/460	E0038357	E0038365								E0038361
100/200	1	BRAKE	E0038338 208/230V	E0038381	E0038331	E0038328 45-TOOTH	E0038372	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
			E0038297 460V	E0038356									
	2		E0038348 208/230V	E0038358	E0038331								
			E0038307 460V	E0038329									
	3	VFD READY	E0038321 230/460	E0038357	E0038365								E0038361
120/240	1	BRAKE	E0038339 208/230V	E0038381	E0038331	E0038333 36-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038309 60-TOOTH	E0038311	E0034960	E0038360
			E0038298 460V	E0038356									
	2		E0038349 208/230V	E0038358	E0038331								
			E0038308 460V	E0038329									
	3	VFD READY	E0038322 230/460	E0038357	E0038365								E0038361

Drive-Train Reference Dwg #21S009

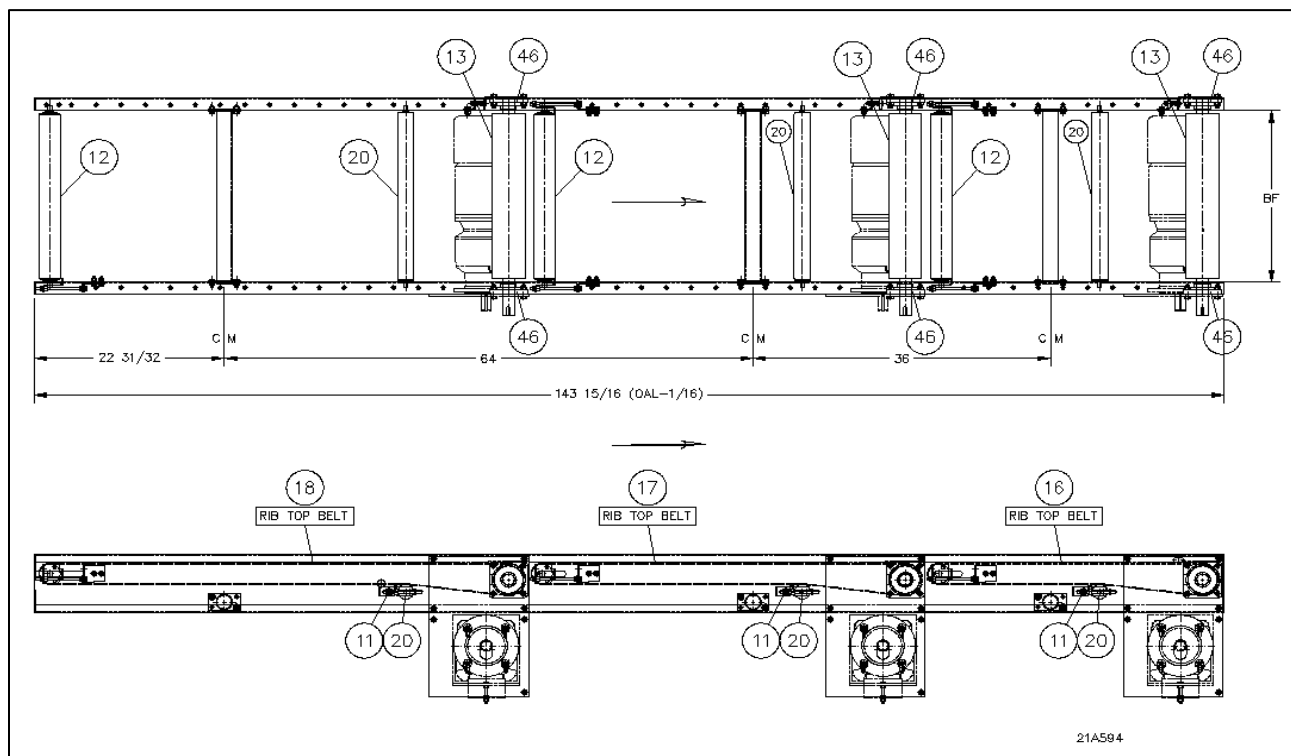
Drive-Train Reference Dwg #21S009 A

Induction Bed 1.5:1 Reduction Drive-Train

REPLACEMENT PARTS FOR CRUZBELT INDUCT, DRIVE TRAIN (1.5:1 REDUCTION DRIVE TRAINS)													
			Balloon#	1	2	4		5		6		7	10
NOMINAL FPM	HP	OPTIONS	DRIVE TRAIN	GEAR MOTOR	REDUCER	DRIVE PULLEY	BUSHING	DRIVEN PULLEY	BUSHING	DRIVEN PULLEY	BUSHING	BELT	HYTREL SPYDER
60/90	1	BRAKE	E0038340 208/230V	E0038381	E0038363	E0034695 38-TOOTH	90800943	E0034695 38-TOOTH	90800948	E0033835 50-TOOTH	E0034696	E0034960	E0038360
			E0038299 460V	E0038356									
	2		E0038350 208/230V	E0038358									
80/120	1	BRAKE	E0038341 208/230V	E0038381	E0038363	E0038328 45-TOOTH	E0038372	E0038310 34-TOOTH	90800948	E0038328 45-TOOTH	E0034696	E0034960	E0038360
			E0038300 460V	E0038356									
	2		E0038351 208/230V	E0038358									
100/150	1	BRAKE	E0038342 208/230V	E0038381	E0038331	E0034695 38-TOOTH	90800943	E0034695 38-TOOTH	90800948	E0033835 50-TOOTH	E0034696	E0034960	E0038360
			E0038301 460V	E0038356									
	2		E0038352 208/230V	E0038358									
133/200	1	BRAKE	E0038343 208/230V	E0038381	E0038331	E0038328 45-TOOTH	90800943	E0038310 34-TOOTH	90800948	E0038328 45-TOOTH	E0034696	E0034960	E0038360
			E0038202 460V	E0038356									
	2		E0038353 208/230V	E0038358									
160/240	1	BRAKE	E0038344 208/230V	E0038381	E0038331	E0034695 38-TOOTH	90800943	E0033833 36-TOOTH	90800948	E0033834 48-TOOTH	E0034696	E0034960	E0038360
			E0038303 460V	E0038356									
	2		E0038354 208/230V	E0038358									
	3	VFD READY	E0038327 230/460	E0038357	E0038365	E0034695 38-TOOTH	90800943	E0033833 36-TOOTH	90800948	E0033834 48-TOOTH	E0034696	E0034960	E0038360
			E0038325 230/460	E0038357									
	3	VFD READY	E0038325 230/460	E0038357									

Drive-Train Reference Dwg #21S009 A

CRUZ 4 Triple Induction Beds

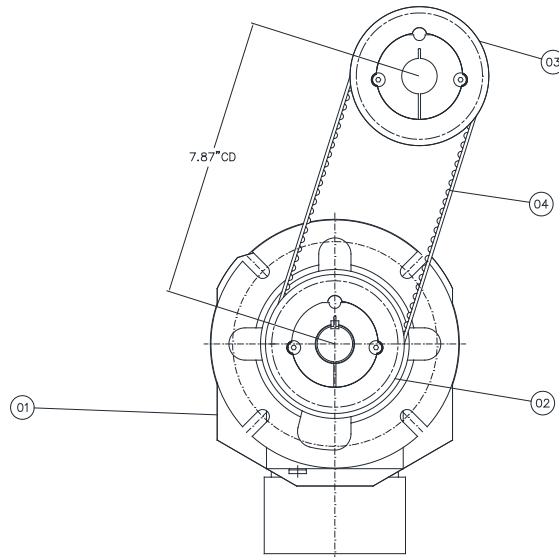


CRUZ 4 Triple Induction Beds

REPLACEMENT PARTS FOR CRUZBELT TRIPLE INDUCTION BEDS					
ASSEMBLY ITEM NUMBERS		1159861	1159862	1159863	1159864
BALLOON	DESCRIPTION	Widths & Part #s			
		16" BF	22" BF	28" BF	34" BF
11	BRKT,CZB SNUBBER ADJ.	E0009408			
12	2 1/2" DIA. 1/4" WALL ROLLER	E0040390	E0040391	E0040392	E0040393
13	PULLEY,WLDMT 3.5" __ CZB	1102801	1102802	1102803	1102804
16	ENDLESS RIBBED BELT __ CZB __-9/16" X 6'-1.75" BP290	1155992	1155993	1155994	1155995
17	ENDLESS RIBBED BELT __ CZB __-9/16" X 8'-1.75" BP290	1159910	1159911	1159910	1159910
18	ENDLESS RIBBED BELT __ CZB __-9/16" X 10'-1" BP290	1160518	1102807	1160518	1160518
20	ROLLER, __ " GRAV 1.9 PLTD PRBG	60224009	60224009	60224009	60224009
46	4-BOLT FLANGE 1-7/16" BORE PEER BEARING W/HDW	1115247			
Bed Reference Dwg. #21A594A					

CRUZ 4 Induction Drive-Train

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



$$\text{FPM} = \text{RPM} \times \frac{\text{DR SPKT}}{\text{DRVN SPKT}} \times \frac{4 \times 3.1416}{12}$$

$$\text{BELT PULL} = \frac{33000 \times .95 \times .97 \times \text{HP}}{\text{FPM}}$$

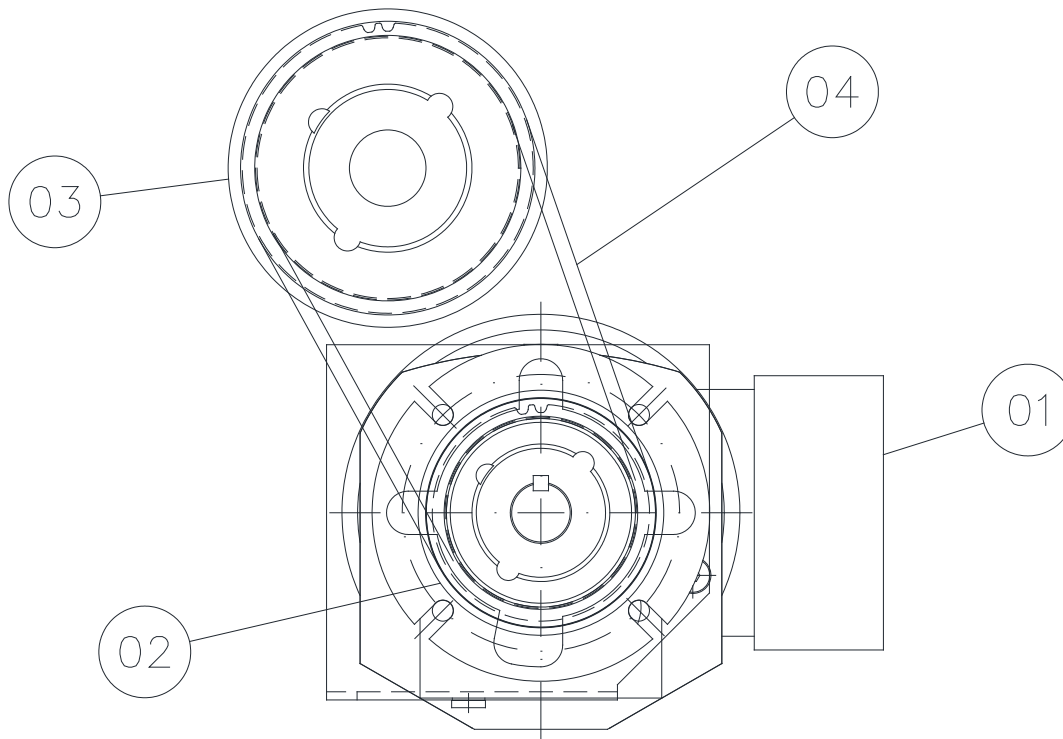
NOTE: ALL NORD GEARMOTORS USE "VL" BEARING OPTION (IE- SK372Z-VL-90S/4)

CRUZ4 Induction Drive-Train

REPLACEMENT PARTS FOR CZB 4 INDUCT RH DRIVE-TRAINS									
NOMINAL FPM	HP	DRIVE TRAIN	1		2	2	3	3	4
		WITH ENCODER	GEAR MOTOR	REDUCER RPM	DRIVE SPROCKET	DRIVE BUSHING	DRIVE SPROCKET	DRIVEN BUSHING	BELT
330	2	1152576	1152124	317	E0034781	E0034696	E0034781	E0034696	1131521
					8MX-40S-36	2012 1-1/4" B	8MX-40S-36	2012 1-1/4" B	8MGT-720-36
410	2	1152577	1152125	393	E0034781	E0034696	E0034781	E0034696	1131521
					8MX-40S-36	2012 1-1/4" B	8MX-40S-36	2012 1-1/4" B	8MGT-720-36

Drive-Train Reference Dwg # 21S016 & 17 B

CRUZ 4 CDR Drive-Train



LH DRIVETRAIN SHOWN

GEARMOTOR INFORMATION

MOUNTING POSITION: M1

MOUNTING STYLE: FLANGE "F" (140MM)

HEAVY DUTY OUTPUT BEARING OPTION: 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

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

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

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.

21S013D

CRUZ 4 CDR Drive-Trains

REPLACEMENT PART NUMBERS FOR CZB4-CDR TIMING BELT BED 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	0.75	1157019	1139657		1160243	1139569	D0603454	90800942 1610 1" Bore	1139655 8MX-45S-21	E0034696 2012 1-1/4" Bore	D0503822 8MGT-720- 31 GT2	
		1157029	1139670	BRAKE	1139641	1139641	8MX-38S-21					
105	0.75	1157020	1139658			1139570	1139652					90800919 2012 1" Bore
		1157030	1139671	BRAKE		1139642	8MX-39S-21					
120	1.0	1157021	1139659			1139571	1139653 8MX-41S-21					
		1157031	1139672	BRAKE	1162105	1139643						
135	1.0	1157022	1139660			1139572		D0503820 8MX-40S-21				
		1157032	1139673	BRAKE		1139644						
150	1.5	1157023	1139661			1139573	90800919 2012 1" Bore					
		1157033	1139674	BRAKE		1139646						
180	1.5	1157024	1139662		1160997	1139574			1139654 8MX-42S-21			
		1157034	1139675	BRAKE	1159520	1139647						
210	2	1157025	1139663			1139653	1139653 8MX-41S-21	1139655 8MX-45S-21				
		1157035	1139676	BRAKE		1139648						
240	2	1157026	1139664		1158336	1139576						
		1157036	1139677	BRAKE		1139649						
280	3	1157027	1139667		1157337	1139577	1139652		90800942			
		1157037	1139678	BRAKE		1139650	8MX-39S-21		1610 1" Bore			
300	3	1157028	1139668			1139578	D0503820		90800919			
		1157038	1139679	BRAKE		1139651	8MX-40S-21		2012 1" Bore			
Drive-Train Reference Dwg #21S013 D												

Drive-Train Reference Dwg #21S013 D

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IOM Revision / History

Initials	Approved by	Rev. Date	Page	Comment
SK,MD,TB	Tom Brower	8/11/15	All	Review general instruction and update Belt material, lacing, terms and spare parts level.
MD	Tom Brower	11/1/2015	All	Logo Update

MHS Conveyor Information

Mission

To meet or exceed all customer expectations by providing the highest quality products and services, on time, at exceptional value, in an environment which promotes safety and personal development.



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