

INSTALLATION, OPERATION, MAINTENANCE MANUAL



CRUZ[®]belt

CRUZbelt INDEX

Purpose	4
Equipment Warranty	5
Warning and Safety Instructions	6
Introduction	8
Receiving and Unpacking	8
Site Preparation.....	8
Floor Support Information.....	8
Floor Support Installation.....	9
Ceiling Hanger Installation.....	9
Ceiling Hanger Sway Bracing.....	9
Anchoring Ceiling Hangers.....	10
Conveyor Set-up.....	11
Electrical	12
Belt Tracking.....	14
Commissioning of Equipment	16
Preventive Maintenance	17
Maintenance Schedule.....	18
Troubleshooting – Belt.....	19
Troubleshooting – Gearmotor.....	21
Troubleshooting – Chain and Sprocket.....	23
Troubleshooting – Bearings.....	24
Replacement Parts	25
Mission.....	46

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 CRUZbelt 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 Business Partner or MHS Conveyor' Customer Support at 231-798-4547 or Fax 231-798-4146.

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.

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.

IMPORTANT

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 04/08/2009

WARNINGS AND SAFETY INSTRUCTION

MHS Conveyor CRUZbelt conveyor is shipped with safety equipment installed. This equipment includes guarding, warning labels, and pop-out rollers. All safety equipment must be in place before running any conveyor. Read and obey all warning labels. Any labels damaged during the life of the conveyor will be replaced free of charge.

Walking on or riding moving conveyor is prohibited. Lock out power before removing any guarding. **Loose clothing and long hair must be kept away from moving equipment.**

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

WARNING

This is a notice which, if not followed, could result in serious injury or death.

CAUTION

This is a notice which, if not followed, could result in damage to equipment.

NOTE

This is where you will be notified of helpful information.



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

INTRODUCTION

This manual provides information for installing, operating, and maintaining your MHS Conveyor CRUZbelt 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 CRUZbelt is considerably different than other belt conveyor. An understanding of this manual will help you take advantage of the many unique features of CRUZbelt.

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 squaring.
- 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.

RECEIVING AND UNPACKING

Check items received against the bill of lading or packing list. Inspect all equipment for damage. Claims for damaged equipment must be made against the carrier immediately.

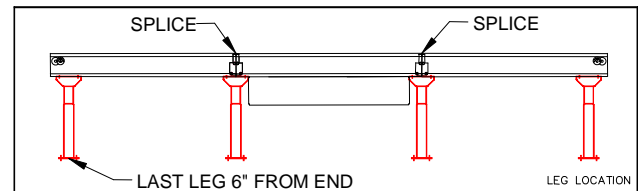
All units have an identification tag on them. Important information on the tag includes model description, item number, and tag number. The tag number matches the tag number on the layout drawing, if applicable.

SITE PREPARATION

1. Establish building baselines from the layout drawings.
2. Lay out centerline and end points of each unit using the building baselines.
3. Check the installation path for interferences.

FLOOR SUPPORT INFORMATION

All supports are intended to be used at a conveyor splice or the end of a unit. If a splice cannot be supported contact your MHS Conveyor distributor for other options. Support CRUZbelt at each end and at every splice as shown below.

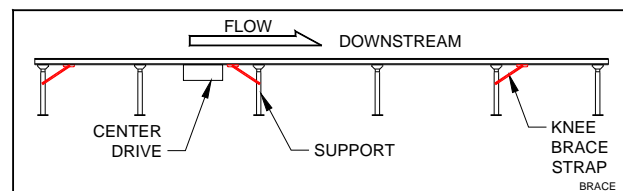


Leg elevations are shown on the elevation drawings. Leg elevation can also be set by subtracting 6-3/8" from the desired top of belt elevation.

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

WARNING

**Leg uprights must be vertical.
Adjust stand head to compensate for slope.**

FLOOR SUPPORT INSTALLATION

1. 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.

CEILING HANGER INSTALLATION

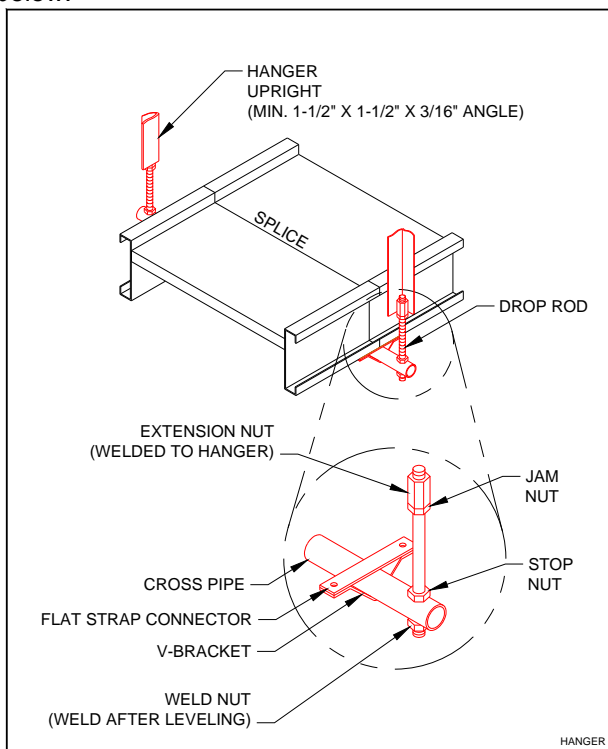
WARNING

Consult the building architect or structural engineer regarding ceiling loading and structural limitations of the building.

WARNING

Consult your distributor or a structural engineer to determine hanger and header steel sizes.

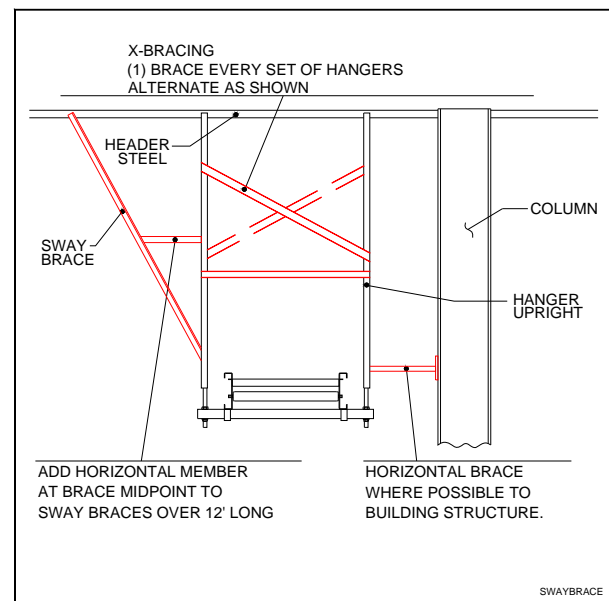
Install ceiling hangers at conveyor splices as shown below.



Cross pipes, v-brackets, flat strap connectors, 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.



NOTE

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.
- 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.

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 1/2" 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 1/2" diameter through bolt with backup plate or heavy washer. A 1/2" 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:

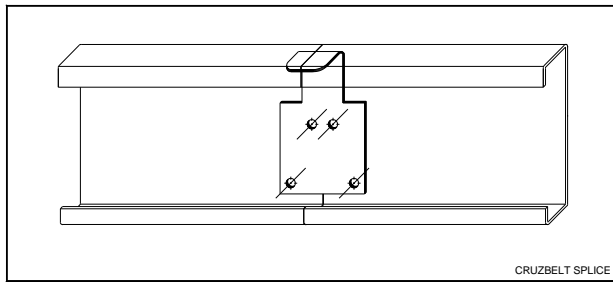
- Support equipment by drilling into the wall and inserting suitable bolt anchors.
- Use a 1/2" diameter through bolt with backing plate should the load or wall conditions warrant.

WARNING

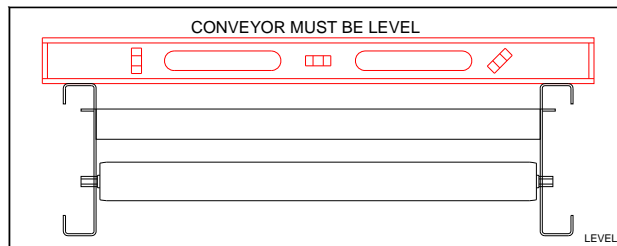
Consult a structural engineer to determine which anchoring method will support your load.

CONVEYOR SET UP

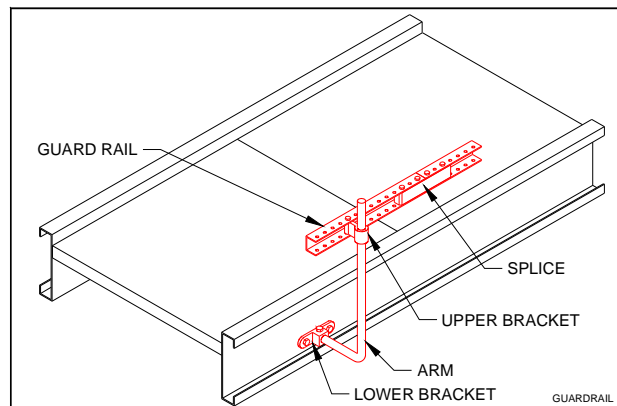
1. Place each bed in position per layout drawing.
2. Splice beds together as shown below:



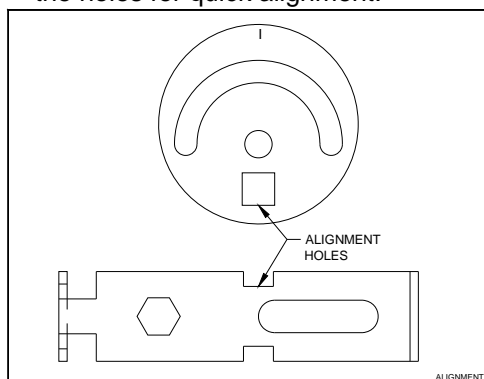
3. Set final elevation and level unit. Conveyor must be level side-to-side as shown:



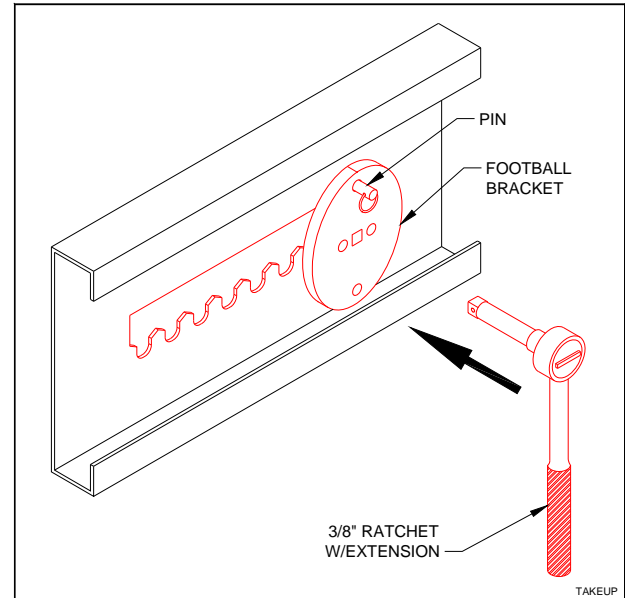
4. Tighten support bolts and anchor to floor.
5. Install any required guard rail as shown:



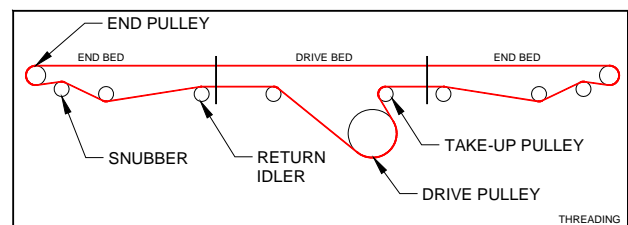
6. Square end pulleys and snubbers using alignment holes. Move cam or snubber bracket until the 3/8" square alignment hole is in line with the 3/8" square in the bed frame. A 3/8" key stock can be inserted into the holes for quick alignment.



7. Locate drive. Remove both black plastic drive shrouds and quick-release pins. Use a 3/8" ratchet extension in the square hole of one football bracket to roll the take-up as shown. (NOTE: no sockets are needed, just the 3/8" extension)



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



9. Pull belt ends together and insert lacing pin. A belt puller may be needed to draw the ends together.
10. 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. Belt should be just tight enough to drive the product.
11. Replace quick-release pins into both football brackets. One bracket may need to be aligned slightly to insert the pin. Replace drive shrouds.

CAUTION

Do not run the conveyor without replacing both quick release pins.

ELECTRICAL

WARNING

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.

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 the motor on a single direction conveyor runs the wrong direction, the leads must be switched to reverse rotation.

WARNING

Motor must be connected to the voltage listed on the name plate.

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.

NOTE

All controls equipment is covered by the original manufacturer's warranty.

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.
- Gasketed 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.

CONTROLS – SAFETY GUIDELINES

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

WARNING

All safety devices, including wiring of electrical safety devices, shall be arranged to operate in a "fail safe" manner. If power failure or failure of the device occurs a hazardous condition must not result.

START-UP WARNING HORN:

Ideally, all conveyors should be within sight of the conveyor start button. This allows the operator to verify no one will be in danger when the conveyor starts.

An audible warning device is required if all conveyor cannot be seen from the start button location. It could be a horn, buzzer, or bell unique to that conveyor for that location. It must be loud enough to be heard at any point of the conveyor being started. It should sound for five seconds after the start button is pushed, prior to the conveyor starting. Any auxiliary equipment such as vertical lifts, turntables, etc. must be included in the warning circuitry.

All conveyors that start and stop automatically should be marked with the appropriate labels. Adding a warning horn to conveyors that start unexpectedly is recommended.

START PUSHBUTTONS:

Start pushbuttons should be the flush type or guarded to prevent accidental activation. They should be provided with a legend plate defining which conveyors will be started.

STOP PUSHBUTTONS:

Stop pushbuttons should be the extended type so that any contact will result in activation. They should have a legend plate 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. Devices which are repeated on multiple control stations, such as emergency stops, should be located at the same relative location on each station. All operator controls shall be clearly marked or labeled to indicate the function controlled.

EMERGENCY STOPS:

All locations where an operator must work directly at the conveyor should be protected by an emergency stop. Operators should not have to leave their position to actuate the emergency stop.

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

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.

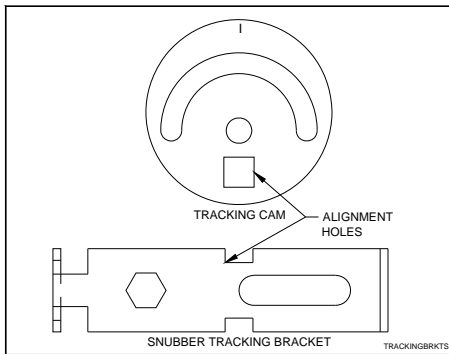
BELT TRACKING

WARNING

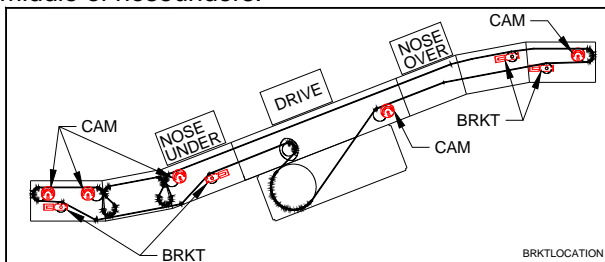
Only qualified personnel should be allowed to track the belt. Use caution since conveyor must be run during the tracking procedure.

ALL PULLEYS AND SNUBBERS MUST BE SQUARE and conveyor must be level prior to tracking the belt. Align the 3/8" square in the cam and snubber bracket 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.

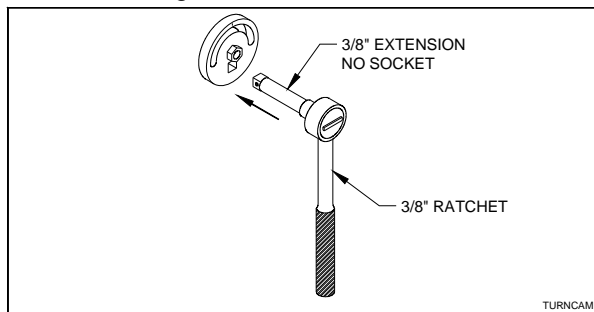
Belt tracking is accomplished using either the tracking cams or snubber tracking brackets.



Snubber tracking brackets are located near the end of the conveyor on the return belt snubber and near the middle of noseovers. Tracking cams are located on the end pulleys, the drive snubber, and near the middle of noseunders.

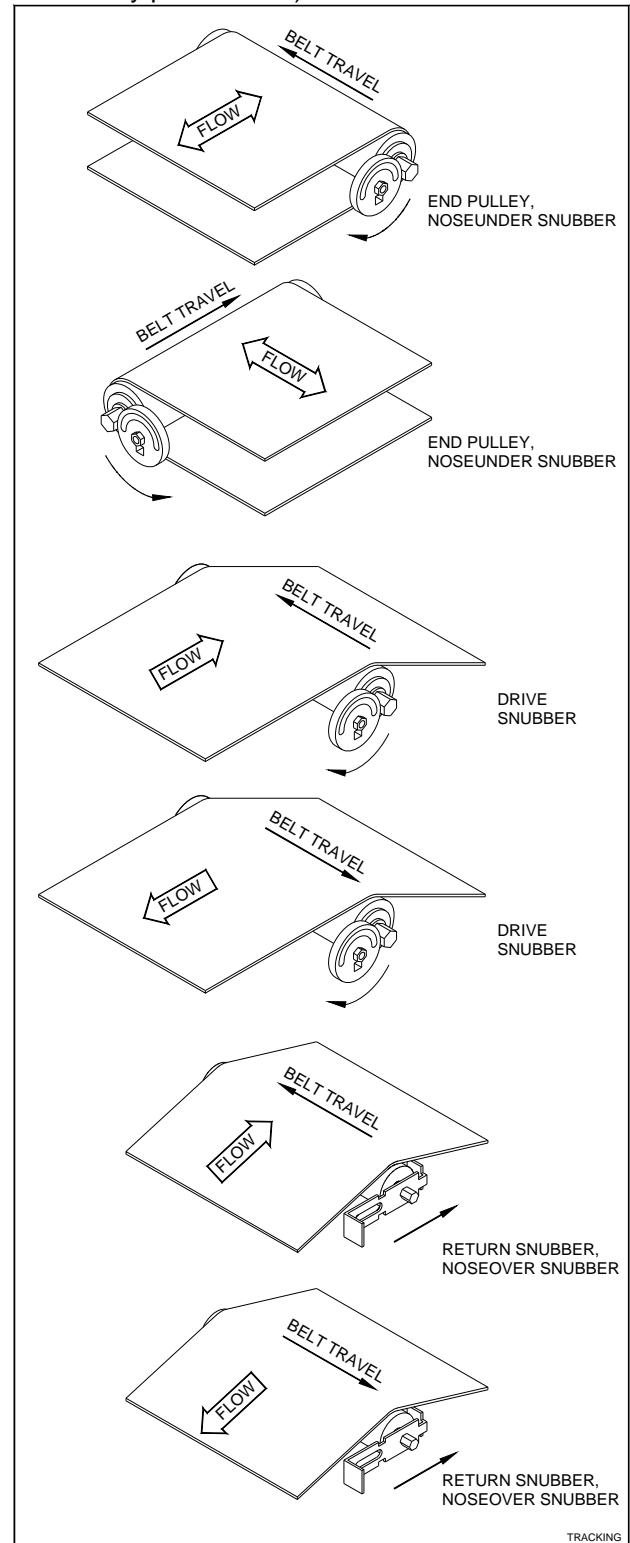


Turn the tracking cam with a 3/8" ratchet as shown:



Tracking scenarios:

(Note: "FLOW" refers to belt flow direction, not necessarily product flow)



NOTE

Belt moves toward the end of the pulley that it contacts first.

CRUZbelt is slightly different to track than other conveyor. 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.

CAUTION

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

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 only affect belt DOWNSTREAM of the device. 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 revolutions before continuing.

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.

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.
2. Visually inspect the installation. Is the conveyor straight? Is the conveyor reasonably level 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.

PREVENTIVE MAINTENANCE

GENERAL:

Preventive maintenance includes lubrication, adjustment of equipment, and replacing or repairing parts before failure.

All maintenance should be recorded in a log. This should show what was serviced and when. The log can then be used to trouble-shoot any systemic problems.

WARNING

Do not perform any maintenance until the conveyor power is locked out and cannot be turned on by any person other than the one performing the maintenance. If more than one person is working on the conveyor, each person must have a lock on the power. Any air lines in the work area should also be turned off.

Make sure personnel are clear of the conveyor before starting. All guards must be in place before starting.

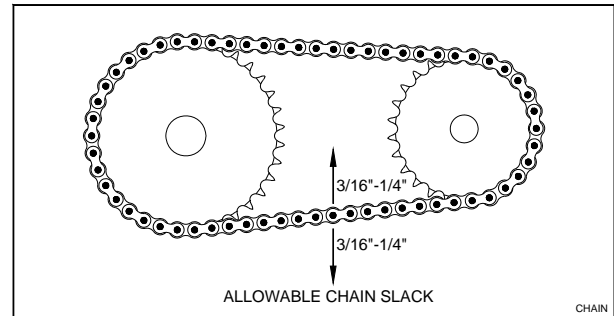
GEARMOTOR:

The drive unit should be checked monthly. Check the motor gear case for leaking seals. Check fluid level and fill with ISO VG220 mineral oil if necessary. Check breather on the gear case.

CHAINS AND SPROCKETS:

Chains and sprockets should be checked monthly. If either the sprockets or the chain are 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. 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 regreasable bearings. These bearings should be lubricated every six months.

MAINTENANCE SCHEDULE

Maintenance intervals will vary site by site. Establish short intervals at first, then lengthen if possible. The following is based on 8 hours per day, 5 days per week under normal conditions:

DAILY

- Listen for unusual noises
- Inspect conveyor for debris
- Check belting for build up or debris
- Verify all pulleys and rollers turn free
- Verify all guarding is in place
- Check for oil leakage
- Check for unusual vibration
- Check for loose bolts or parts

WEEKLY

- Inspect belt for proper tracking and tension
- Inspect belt lacing
- Inspect belt edges for fraying
- Inspect bearings and gear motor for excessive heat or noise
- Clean breather vent on gear motor
- Check operation of all electrical controls
- Inspect motor mounting bolts

MONTHLY

- Clean chains and sprockets. Lubricate with synthetic 30 weight oil.
- Check chain tension and alignment
- Clean belt with compressed air or stiff brush
- Check gear motor oil level
- Check pulley lagging for signs of wear

SEMI-YEARLY

- Clean belt and all surfaces with detergent and water
- Grease drive pulley and power take-off bearings.

YEARLY

- Inspect bolts for tightness
- Check for plumb and level.
- Touch up paint

TWO YEARS OR 10,000 HOURS

- Drain and fill gearmotor with ISO VG220 mineral based oil.

CAUTION

Verify all tools and foreign objects have been removed from conveyor. Check that all guards have been replaced and bolts have been retightened.

TROUBLESHOOTING GUIDE - BELT

	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 #36SP

TROUBLESHOOTING GUIDE - BELT

	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 section of this manual.
		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

TROUBLESHOOTING GUIDE – MOTOR/REDUCER

	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 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 be felt.
		Overloaded conveyor	Remove excess product. Address cause.
		Mis-threading belt path	Reroute belt path correctly

TROUBLESHOOTING GUIDE – MOTOR/REDUCER

	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
11.	Electrical shorts	Loose connection	Check all wire connections. Check fuses.

TROUBLESHOOTING GUIDE – CHAIN & SPROCKET

	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

TROUBLESHOOTING GUIDE – BEARINGS

	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
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

PARTS IDENTIFICATION

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

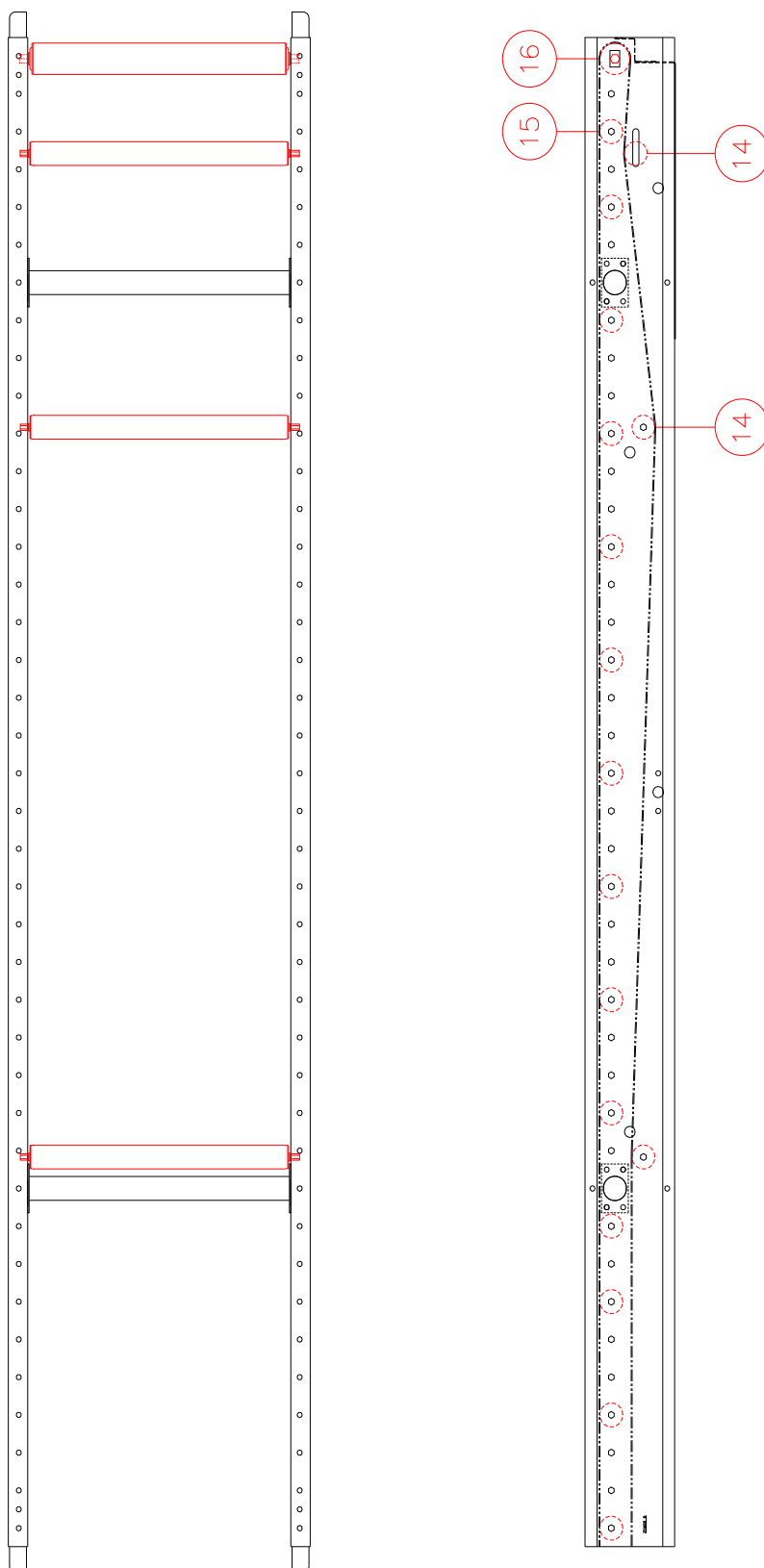
Parts which specifically pertain to CRUZbelt are included with illustrations.

A "Recommended Spare Parts List" is published for all conveyor orders of \$10,000 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 for maintenance.

If you are unable to locate this document (order under \$10,000 and not sent another may be obtained by contacting Customer Support at 231-798-4547 or Fax 231-798-4146.

To identify a part and its part number, refer to the assemblies and devices on the following pages. Determine the balloon number for the required part and reference the composite parts list.

REPLACEMENT PARTS

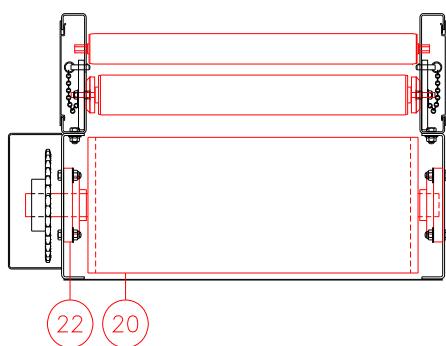
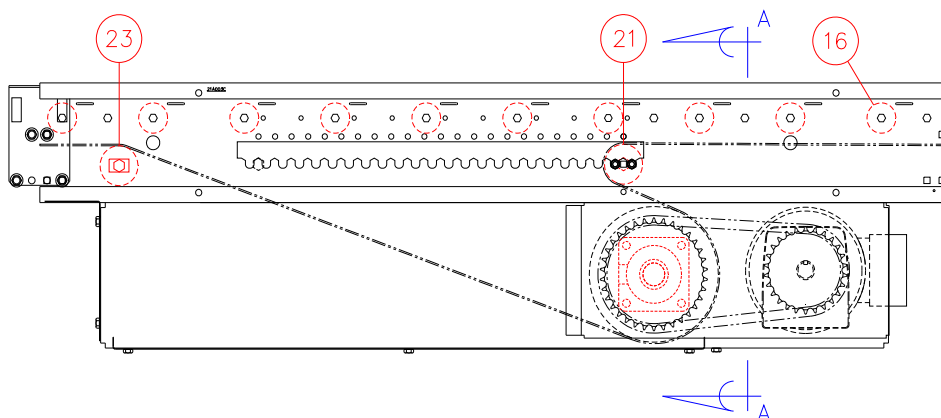
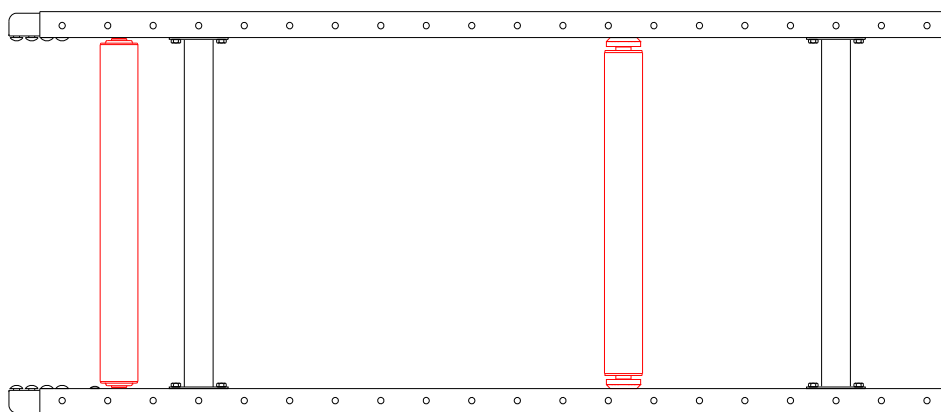


REPLACEMENT PARTS

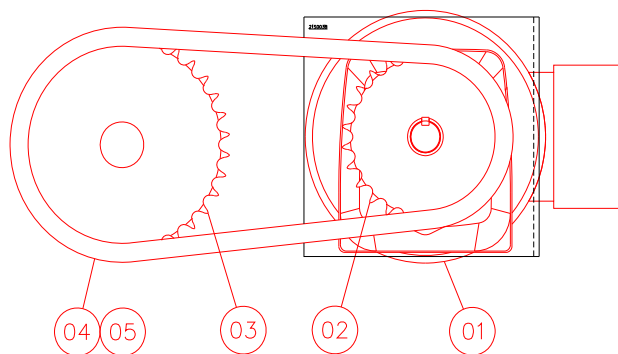
REPLACEMENT PART NUMBERS FOR CRUZBELT END BED							
BALLOON	DESCRIPTION	Width & Model					
		18 CZB	24 CZB	30 CZB	36 CZB	42 CZB	48 CZB
14	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING	60218009	60224009	60230009	60236009	60242009	60248009
15	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING	60218001	60224001	60230001	60236001	60242001	60248001
	1.9" DIA. GRAVITY ROLLER W/STANDARD BEARING						
16	2 1/2" DIA. ROLLER	E0009409	E0009410	E0009411	E0009412	E0009413	E0009414

Bed Reference Dwg. #21A001 D

REPLACEMENT PARTS



VIEW A-A



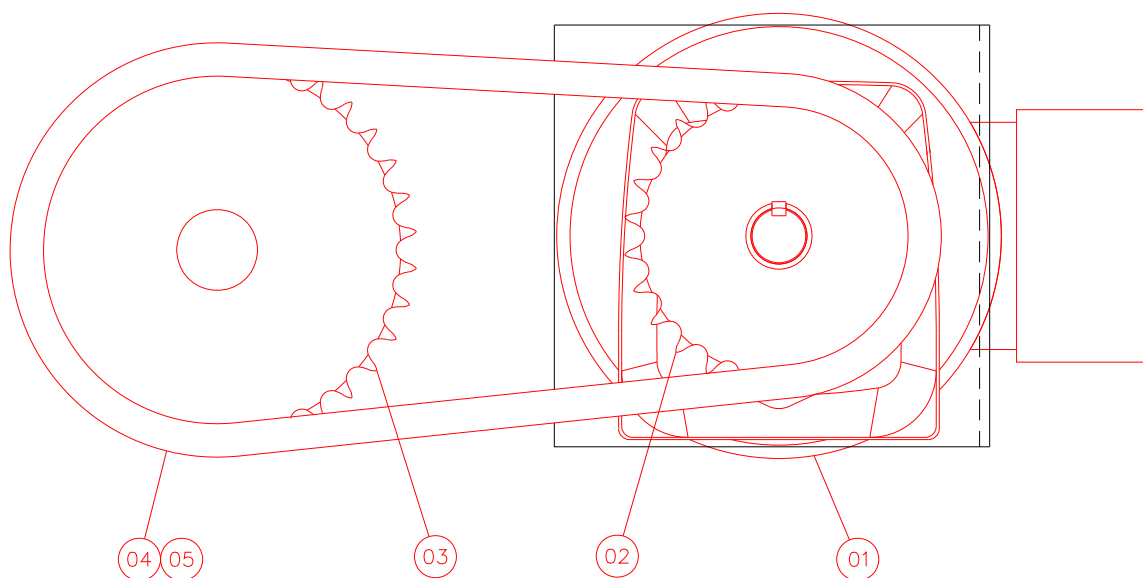
DRIVETRAIN

REPLACEMENT PARTS

REPLACEMENT PART NUMBERS FOR CRUZBELT CENTER DRIVE					
BALLOON	DESCRIPTION	Width & Item #			
		18 CZB	24 CZB	30 CZB	36 CZB
16	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING	60218009	60224009	60230009	60236009
	1.9" DIA. GRAVITY ROLLER W/STANDARD BEARING	60218001	60224001	60230001	60236001
20	8" PULLY WELDMENT	E0009507	E0009508	E0009509	E0009510
21	2 1/2" DIA. DRIVE TAKE UP ROLLER	E0009128	E0009129	E0009130	E0009131
22	1 7/16" DIA. FLG BEARING	90050211			
23	2 1/2" DIA. ROLLER	E0009409	E0009410	E0009411	E0009412

Bed Reference Dwg. #21A003 C

REPLACEMENT PARTS

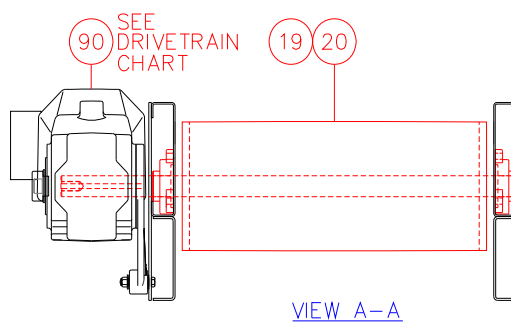
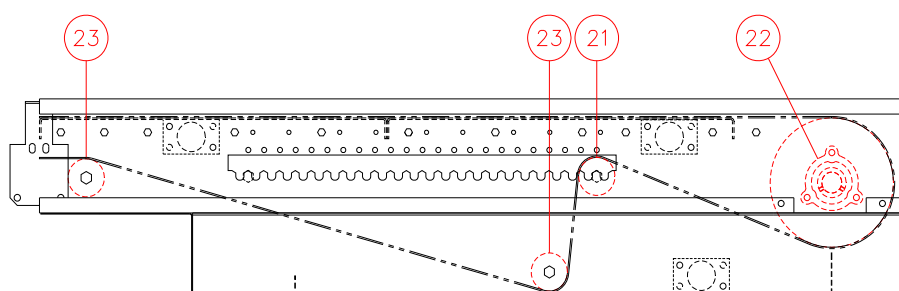
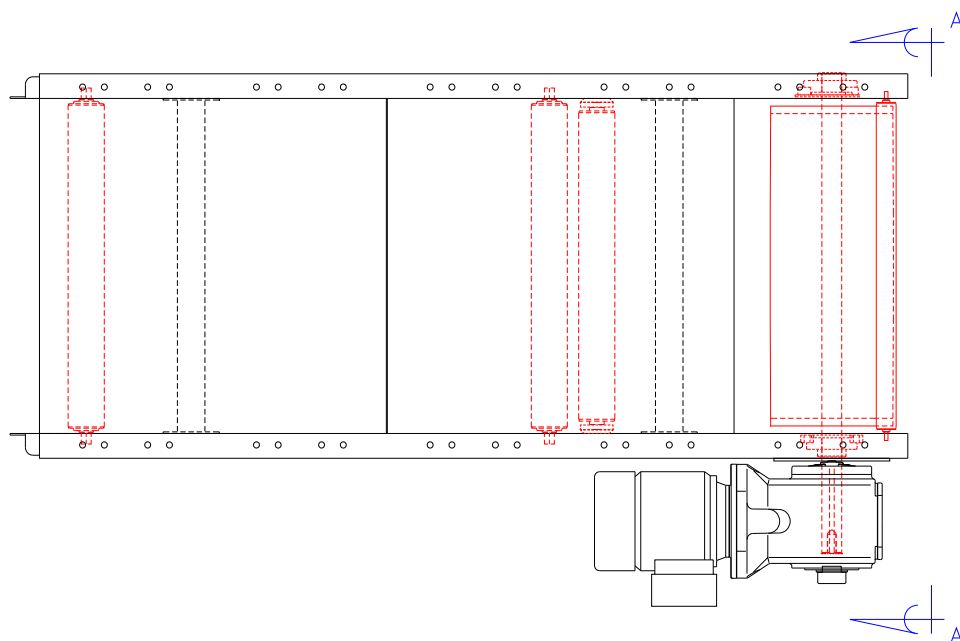


REPLACEMENT PARTS

REPLACEMENT PART NUMBERS FOR CRUZBELT CENTER DRIVE, DRIVE TRAIN								
FPM	HP	DRIVE TRAIN	OPTION	1	2	3	4	5
				GEAR MOTOR	DRIVE SPROCKET	DRIVEN SPROCKET	CHAIN	MASTER LINK
30	1/2	E0030811		E0031686	90800984	E0009564	90140032	90440107
		E0030832	BRAKE	E0031687				
45	3/4	E0030812		E0031688	90800575	90800600		
		E0030833	BRAKE	E0031689				
60	3/4	E0030813		E0031690	90800984	E0009564		
		E0030834	BRAKE	E0031691				
	1	E0030814		E0031692	90800985	90800600		
		E0030835	BRAKE	E0031693				
75	3/4	E0030815		E0031690	90800575	90800594		
		E0030836	BRAKE	E0031691				
	1	E0030816		E0031694	90800984	90800600		
		E0030837	BRAKE	E0031695				
	1 1/2	E0030817		E0031696	90800984	E0009564		
		E0030838	BRAKE	E0031697				
90	1	E0030818		E0031698	90800984	90800600		
		E0030839	BRAKE	E0031699				
	1 1/2	E0030819		E0031696	90800575	90800600		
		E0030840	BRAKE	E0031697				
105	1 1/2	E0030820		E0031700	E0009563	E0009564		
		E0030841	BRAKE	E0031701				
	2	E0030821		E0031702	E0031721	E0009564		
		E0030842	BRAKE	E0031703				
120	1 1/2	E0030822		E0031704	E0009563	90800594		
		E0030843	BRAKE	E0031705				
	2	E0030823		E0031702	E0031723	90800600		
		E0030844	BRAKE	E0031703				
135	1 1/2	E0030824		E0031706	E0031720	E0009564		
		E0030845	BRAKE	E0031707				
	2	E0030825		E0031708	90800575	90800594		
		E0030846	BRAKE	E0031709				
	3	E0030826		E0031710	E0031722	E0009564		
		E0030847	BRAKE	E0031711				
150	1 1/2	E0030827		E0031712	E0031720	90800600		
		E0030848	BRAKE	E0031713				
	2	E0030828		E0031708	E0009563	90800581		
		E0030849	BRAKE	E0031709				
	3	E0030829		E0031710	E0031723	90800600		
		E0030850	BRAKE	E0031711				
175	2	E0030830		E0031714	90800983	90800581		
		E0030851	BRAKE	E0031715				
180	3	E0030831		E0031716	E0031724	9081046	90140040	90440108
		E0030852	BRAKE	E0031717				

Drive-Train Reference Dwg #21S003 B

REPLACEMENT PARTS



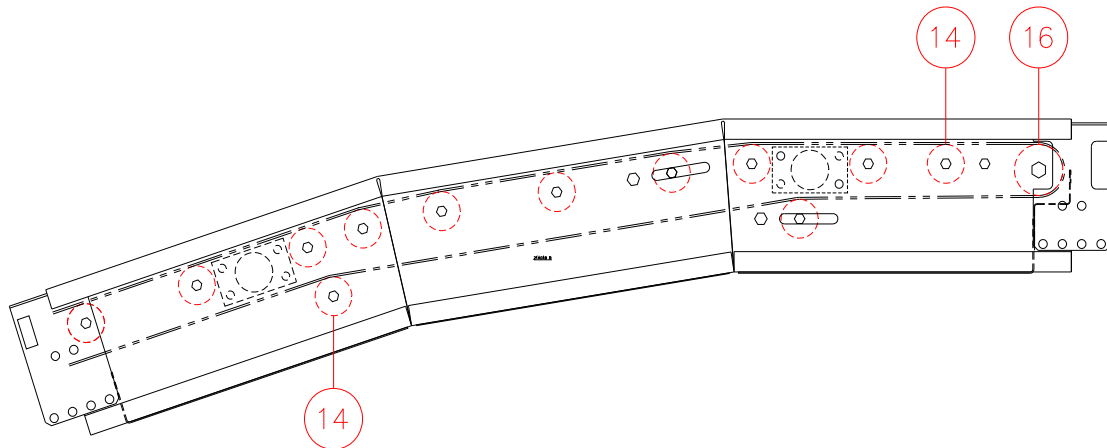
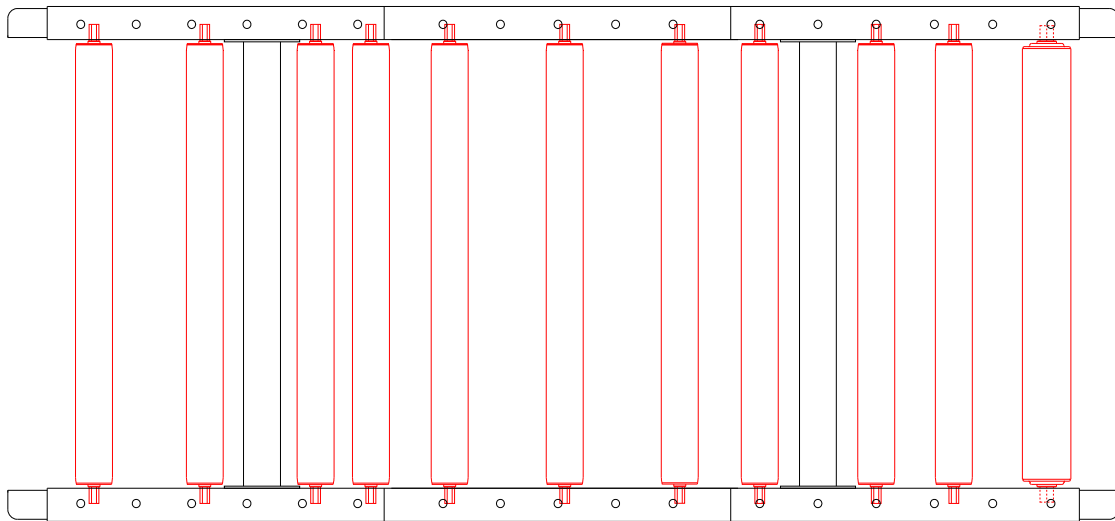
REPLACEMENT PARTS

REPLACEMENT PART NUMBERS FOR CRUZBELT END DRIVE							
BALLOON	DESCRIPTION	Width & Item #					
		18 CZB	24 CZB	30 CZB	36 CZB	42 CZB	48 CZB
20	8" PULLEY WELDMENT	E0009080	E0009081	E0009082	E0009083	E0009084	E0009085
21	2 1/2" DIA. DRIVE TAKE-UP ROLLER	E0009128	E0009129	E0009130	E0009131	E0009132	E0009133
22	3 BOLT FLANGE BEARING	E0002182					
23	2 1/2" DIA. ROLLER	E0009409	E0009410	E0009411	E0009412	E0009413	E0009415

Bed Reference Dwg. #21A006 A

REPLACEMENT PART NUMBERS FOR CRUZBELT END DRIVE, DRIVE TRAIN			
SPEED	HP	BELT PULL	DRIVE TRAIN
62	1	500	E0030055
71	1	450	E0030056
76	1	421	E0030057
87	1	367	E0030058
98	1	326	E0030059
109	1.5	440	E0030060
122	1.5	393	E0030061
140	2	457	E0030062
162	3	500	E0030063
187	3	500	E0030064
210	3	457	E0030065

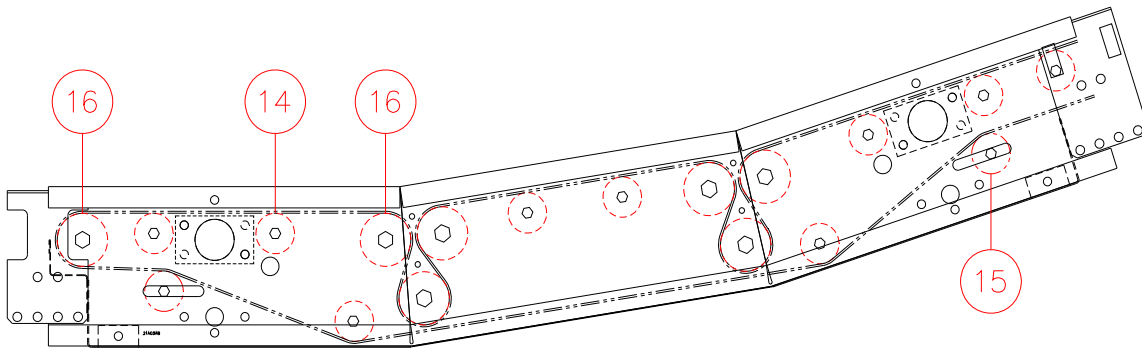
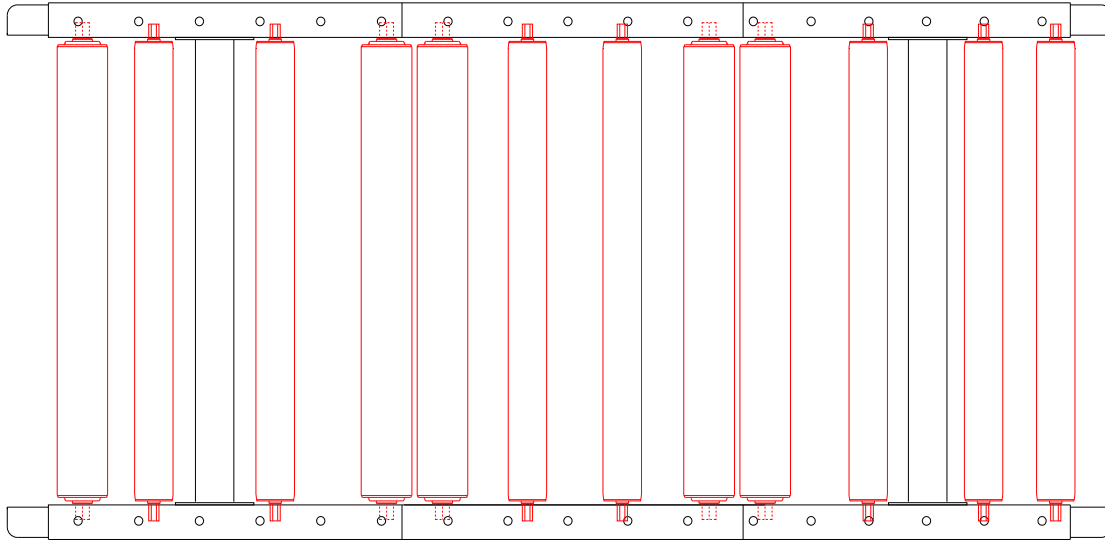
REPLACEMENT PARTS



REPLACEMENT PART NUMBERS FOR CRUZBELT NOSEOVER					
BALLOON	DESCRIPTION	Width & Item #			
		18 CZB	24 CZB	30 CZB	36 CZB
14	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING	60218009	60224009	60230009	60236009
16	2 1/2" DIA. ROLLER	E0009409	E0009410	E0009411	E0009412

Bed Reference Dwg. #21A018 B

REPLACEMENT PARTS

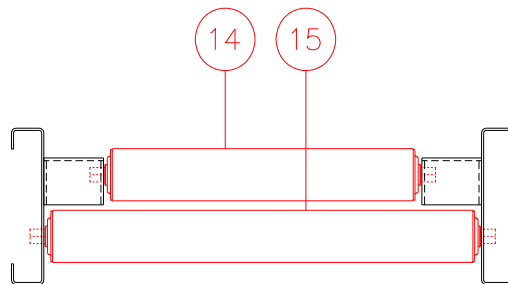
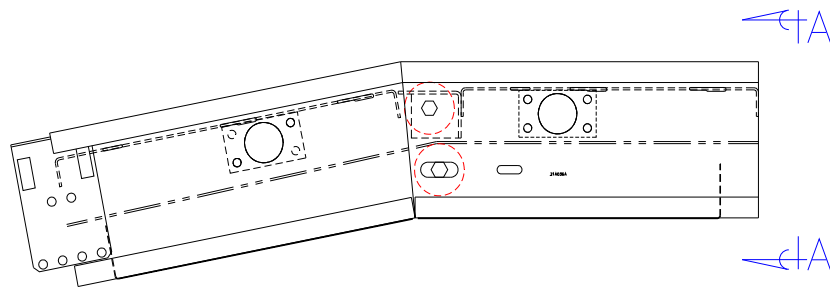
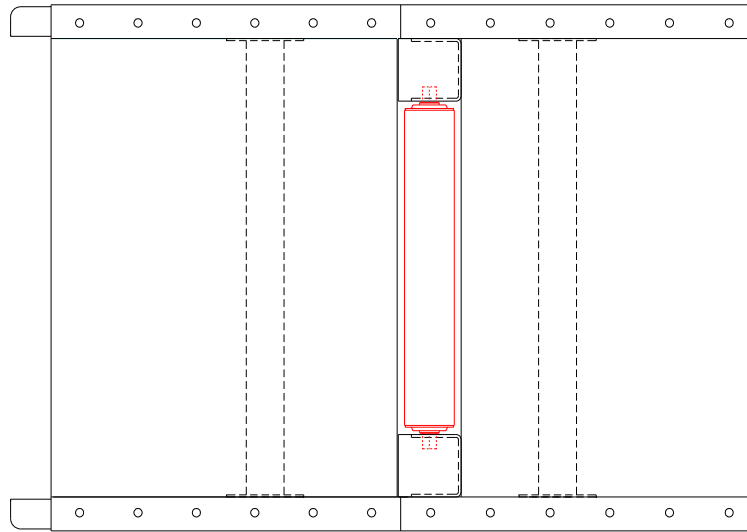


REPLACEMENT PART NUMBERS FOR CRUZBELT NOSEUNDER

BALLOON	DESCRIPTION	Width & Item #			
		18 CZB	24 CZB	30 CZB	36 CZB
14	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING	60218009	60224009	60230009	60236009
15	1.9" DIA. SNUBBER ROLLER W/PRECISION BEARING	E0009652	E0009653	E0009654	E0009655
16	2 1/2" DIA. ROLLER	E0009409	E0009410	E0009411	E0009412

Bed Reference Dwg. #21A030 B

REPLACEMENT PARTS

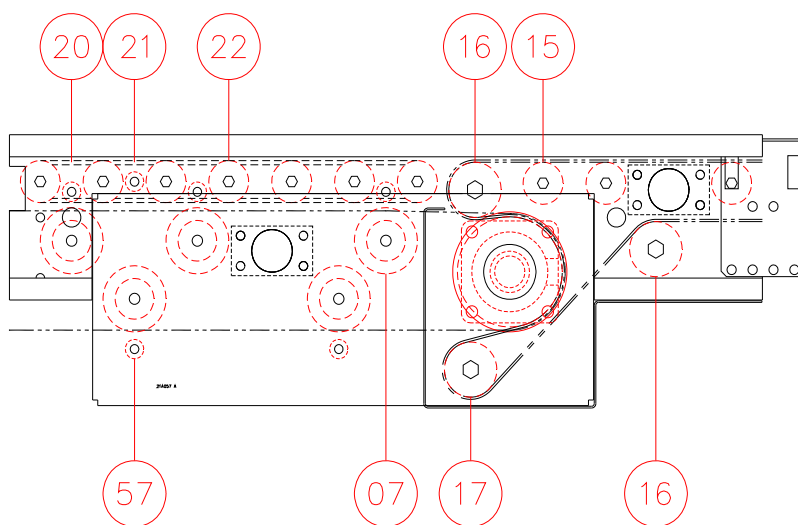
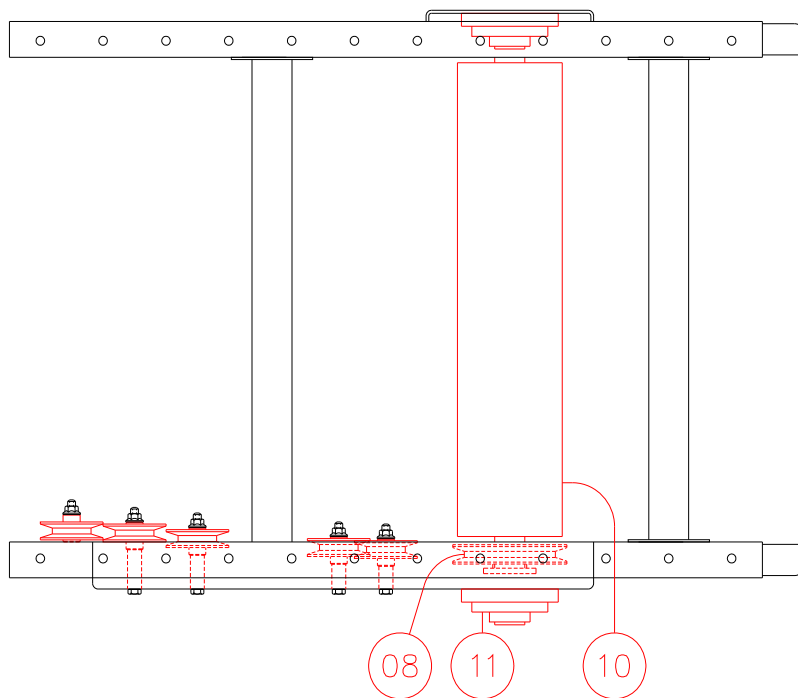


VIEW A-A

REPLACEMENT PART NUMBERS FOR CRUZBELT TRASH NOSEOVER							
BALLOON	DESCRIPTION	Width & Item #					
		18 CZB	24 CZB	30 CZB	36 CZB	42 CZB	48 CZB
14	2 1/2" DIA. ROLLER	E0009408	E0009409	E0009410	E0009411	E0009412	E0009413
15	2 1/2" DIA. ROLLER	E0009409	E0009410	E0009411	E0009412	E0009413	E0009414

Bed Reference Dwg. #21A036 A

REPLACEMENT PARTS

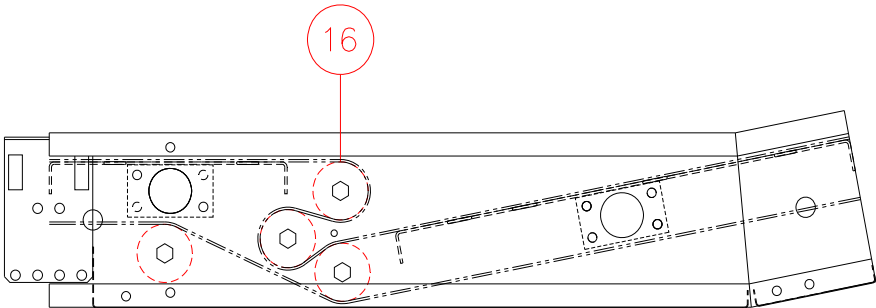
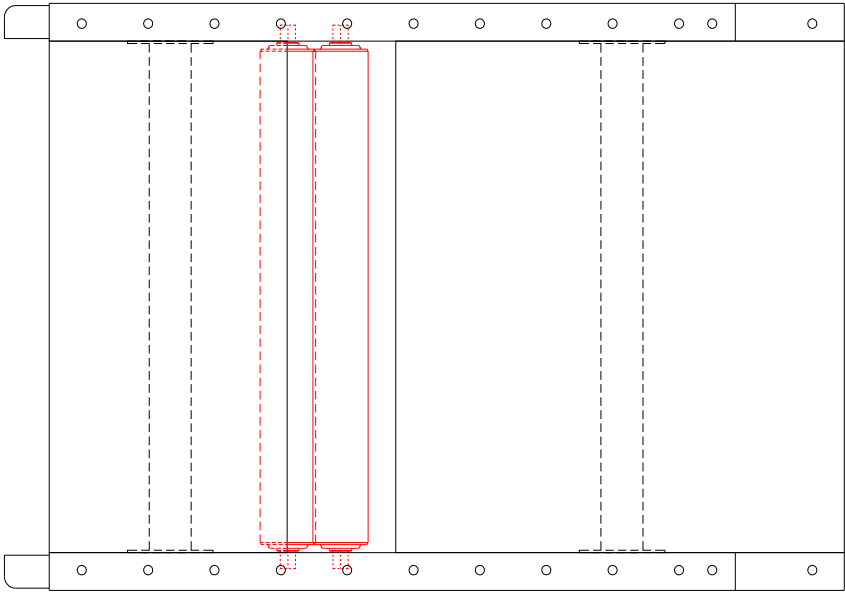


REPLACEMENT PARTS

REPLACEMENT PART NUMBERS FOR CRUZBELT PTO					
BALLOON	DESCRIPTION	Width & Item #			
		18 CZB	24 CZB	30 CZB	36 CZB
7	SHEAVE ASSEMBLY	E0009058			
8	V-BELT SHEAVE	E0009054			
	1-7/16" BORE BUSHING WITH KEY	90800710			
10	5 1/2" PULLY WELDMENT	E0032533	E0032534	E0032535	E0032536
11	1 7/16" DIA. FLG BEARING	90050211			
15	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING	60218009	60224009	60230009	60236009
	1.9" DIA. GRAVITY ROLLER W/STANDARD BEARING	60218001	60224001	60230001	60236001
16	2 1/2" DIA. ROLLER	E0009409	E0009410	E0009411	E0009412
17	2 1/2" DIA. ROLLER	E0032573	E0032574	E0032575	E0032576
20	O-RING 3/16" x 9 5/8"	90540003			
21	O-RING 3/16" x 9 15/16"	90530005			
22	1.9" DIA. GRAVITY ROLLER W/PRECISION BEARING	E0005252	E0005253	E0005254	E0005255
	1.9" DIA. GRAVITY ROLLER W/STANDARD BEARING	E0005256	E0005257	E0005258	E0005259
57	BEARING	90050111			

Bed Reference Dwg. #21A057 A

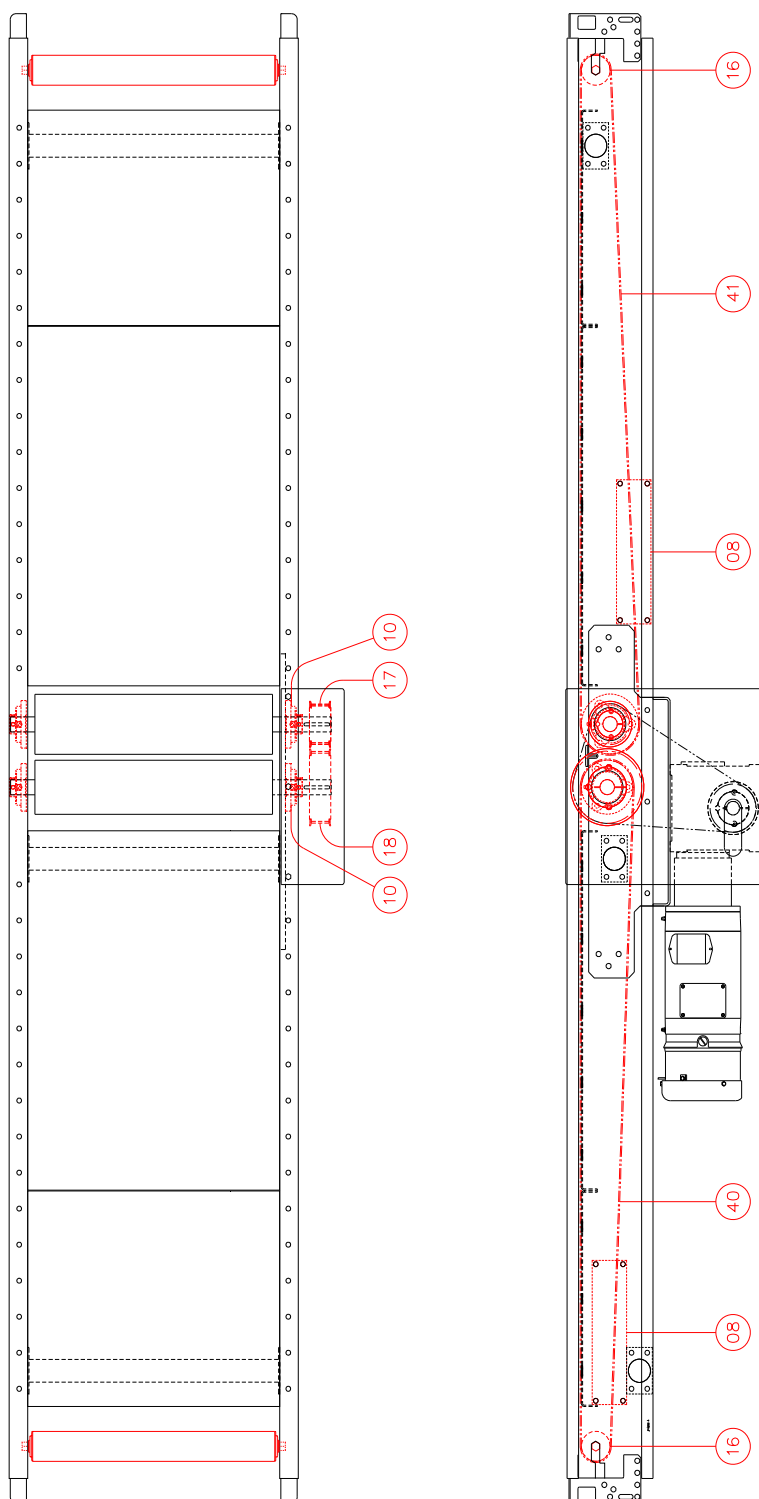
REPLACEMENT PARTS



REPLACEMENT PART NUMBERS FOR CRUZBELT DOUBLE SNUBBER							
BALLOON	DESCRIPTION	Width & Item #					
		18 CZB	24 CZB	30 CZB	36 CZB	42 CZB	48 CZB
15	2 1/2" DIA. ROLLER	E0009409	E0009410	E0009411	E0009412	E0009413	E0009414

Bed Reference Dwg. #21A065 A

REPLACEMENT PARTS

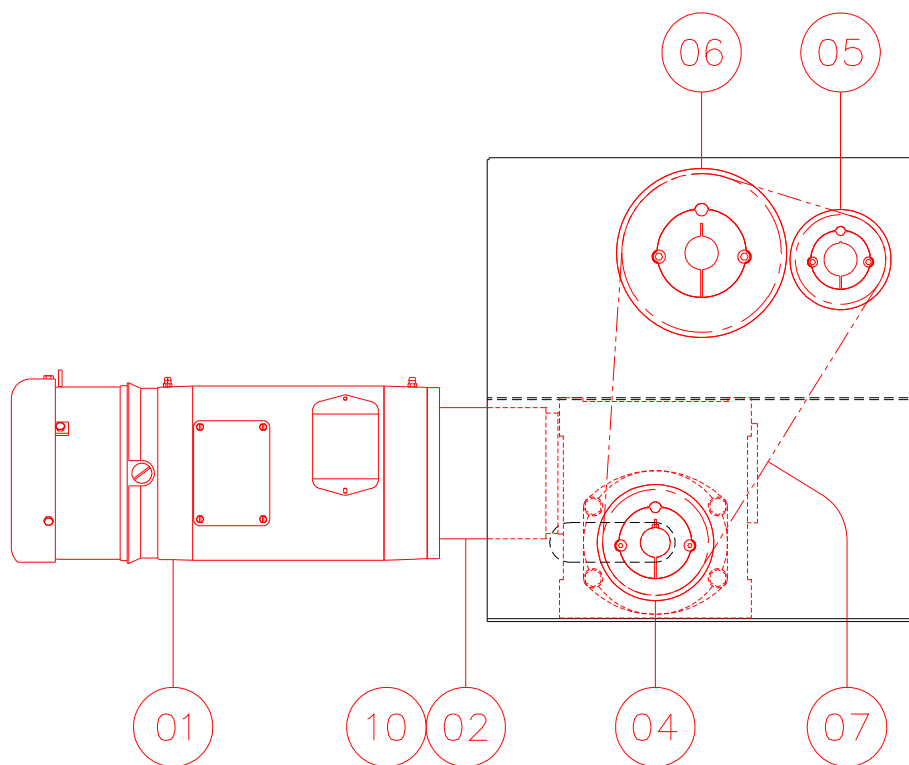


REPLACEMENT PARTS

REPLACEMENT PART NUMBERS FOR CRUZBELT INDUCTION BED					
BALLOON	DESCRIPTION	Width & Item #			
		18 CZB	24 CZB	30 CZB	36 CZB
8	UHMW BELT GUIDE	E0038278			
10	1 1/2" BORE FLANGE BEARING	E0034955			
16	2 1/2" DIA. ROLLER	E0009409	E0009410	E0009411	E0009412
17	4 1/2" DIA. TAPERLOCK ROLLER	E0038269	E0038270	E0038271	E0038272
18	4" DIA. TAPERLOCK ROLLER	E0038273	E0038274	E0038275	E0038276
40	RIBBED BELT	E0038333	E0038284	E0038285	E0038286
41	SMOOTH BELT	E0038334	E0038335	E0038336	E0038337

Bed Reference Dwg. #21A290 A

REPLACEMENT PARTS



REPLACEMENT PARTS

REPLACEMENT PART NUMBERS FOR CRUZBELT INDUCT, DRIVE TRAIN (2:1 REDUCTION DRIVE TRAINS)													
NOMINAL FPM	HP	OPTIONS	DRIVE TRAIN	1	2	4		5		6		7	10
				GEAR MOTOR	REDUCER	DRIVE PULLY	BUSHING	DRIVEN PULLY	BUSHING	DRIVEN PULLY	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 A

REPLACEMENT PARTS

REPLACEMENT PART NUMBERS FOR CRUZBELT INDUCT, DRIVE TRAIN (1.5:1 REDUCTION DRIVE TRAINS)													
NOMINAL FPM	HP	OPTIONS	DRIVE TRAIN	1	2	4		5		6		7	10
				GEAR MOTOR	REDUCER	DRIVE PULLY	BUSHING	DRIVEN PULLY	BUSHING	DRIVEN PULLY	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	E0038363								
			E0038313 460V	E0038329									
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	E0038363								
			E0038314 460V	E0038329									
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	E0038331								
			E0038315 460V	E0038329									
	3	VFD READY	E0038325 230/460	E0038357	E0038365								E003E361
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	E0038331								
			E0038319 460V	E0038329									
	3	VFD READY	E0038326 230/460	E0038357	E0038365								E0038361
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	E0038331								
			E0038317 460V	E0038329									
	3	VFD READY	E0038327 230/460	E0038357	E0038365								E0038361

Drive-Train Reference Dwg #21S009 A

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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