INSTALLATION, OPERATION, MAINTENANCE MANUAL

NBC™ V-Belt Modules

Straight and Curved

NBC V-BELTMODULES REVISION HISTORY

Revision Date	Chapter and Description	Initials
05/19/2023	Removed TGW System and replaced with MHS Conveyor	MD

INDEX

PURPOSE

It is the intent of MHS Conveyor (*previously known as TGW Systems)*, through this manual, to provide information that acts as a guide in the installation, operation and maintenance of MHS Conveyor NBC V-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 Business Partner or MHS Conveyor' Sales Support at mhs-conveyor.com

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 & SAFETY INSTRUCTIONS

Failure to follow the instructions and cautions throughout this book, 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

- **indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

CAUTION

- **indicates a situation which, if not avoided, could result in property damage.**

NOTE

This is where you will be notified of helpful information.

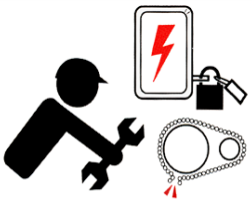
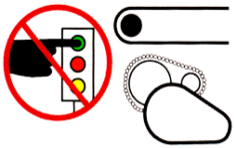
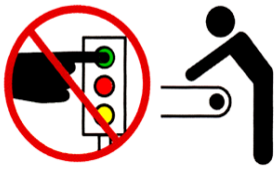
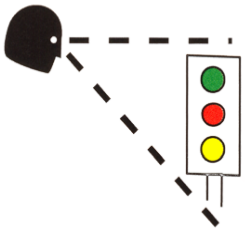
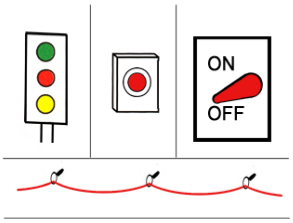
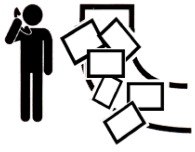
⚠ WARNING

- **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 the Customer Support Department.**
- **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 hair nets.**
- **Loose clothing, long hair and jewelry must be kept away from moving equipment.**
- **Maintain enough clearance on each side of all conveyor units for safe adjustment and maintenance of all components.**
- **Provide crossovers or gates at sufficient intervals where needed to eliminate the temptation for personnel to climb over or under any conveyor.**
- **Walking or riding on a moving conveyor must be prohibited.**
- **Before performing maintenance on the conveyor, make sure the start-up controls are locked out and cannot be turned on by any person other than the one performing the maintenance.**
- **If more than one crew member is working on the conveyor, EACH CREW MEMBER MUST HAVE A LOCK ON THE POWER LOCKOUT.**
- **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.**
- **Make sure all personnel are clear of all conveyor equipment before restarting the system.**

⚠ WARNING

- **Before servicing or performing any work in the motor control panel, disconnect and lock out the main incoming service. If only the panel disconnect is off, the incoming side will still be hot.**

Package Conveyors

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

POST IN PROMINENT AREA

INTRODUCTION TO STRAIGHT AND CURVED V-BELT MODULES

Concept

Driving V-belt modules from a NBC flat belt conveyor saves drives and their associated costs. The normal application for the V-belt modules, driven by a NBC flat belt conveyor, is a curve connected on one end of a NBC flat belt conveyor, then to a straight V-belt module, another curve, or another NBC flat belt conveyor.

Basics

The V-belt modules may connect to either end of the NBC flat belt conveyor. Any V-belt curve module can be connected to either end to turn in either direction in the system layout. Both the straight and curved modules are provided with zero-pressure zones.

The 90-degree curves have two zones of approximately 4’ length. The accumulating straight sections are offered with 30” zones. Straights less than 6’ long are offered only with 2” roller centers and sections 6’ and longer are offered with either 2” or 3” roller centers. The V-belt modules are only offered with zero-pressure accumulation with basic or progressive logic to match the release rate requirements.

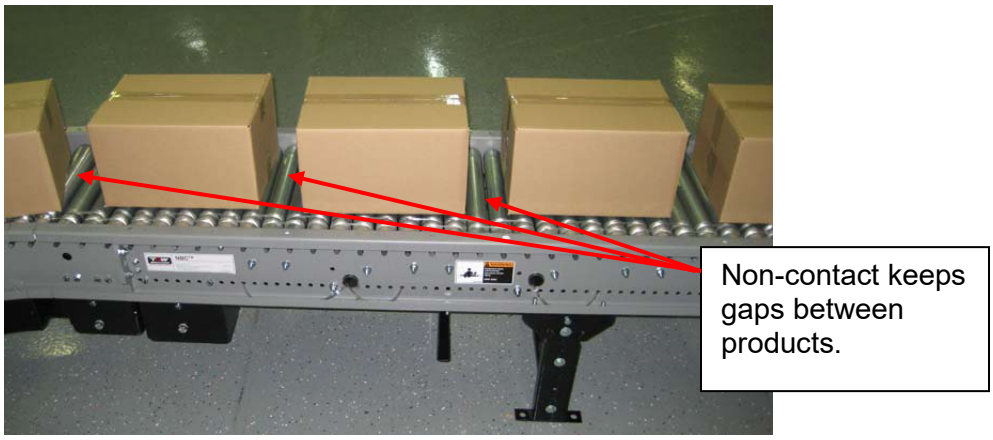
Up to four v-belt modules may be driven from each end of the NBC flat belt conveyor including curves and straights. Straights up to 6’ long do not require a take-up; straights 6’ to 12’ do require a built-in take-up. Straights 6’ and less utilize the take-up of a connecting curve on either end.

All V-belt modules ship complete with all internal logic connections and air piping run and connected. Any required connection V-belt will be tied next to where it must be installed along with the logic cable and air supply line.

Non-Contact Accumulation

Photo sensors and zone brakes are used for non-contact accumulation. The rollers are banded together in zones and a brake is installed in each zone. As the zone accumulates the brake engages, locking up the banded rollers in the zone. This prevents products from contacting the product in the next downstream zone. Pressure assemblies retract as the brakes are applied to stop product in each zone.

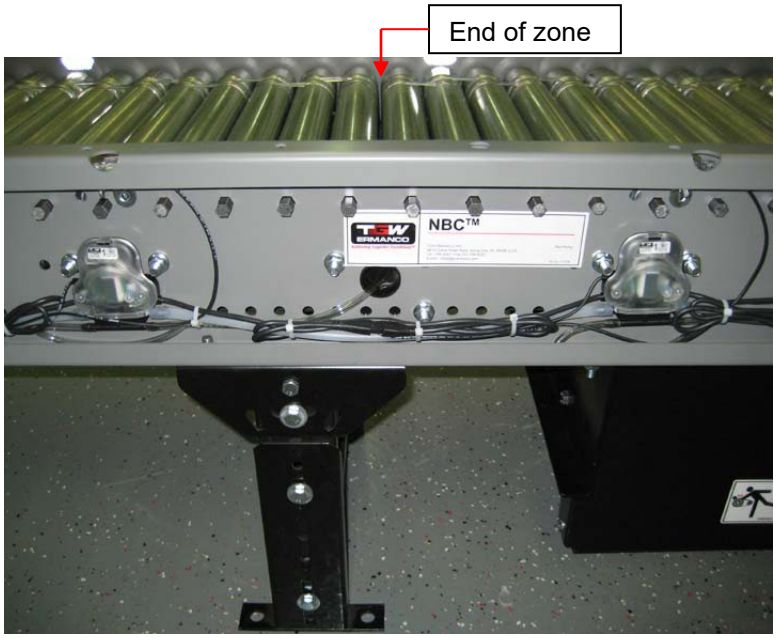
It is important for proper operation of non-contact accumulation that the conveyor zone is longer than the longest product. It should also be noted that if the shortest product is less than half the zone length, it is possible to accumulate two products in a zone. In addition, to prevent products from touching each other, the release mode used must be Basic. Progressive logic will compromise the product to zone integrity.



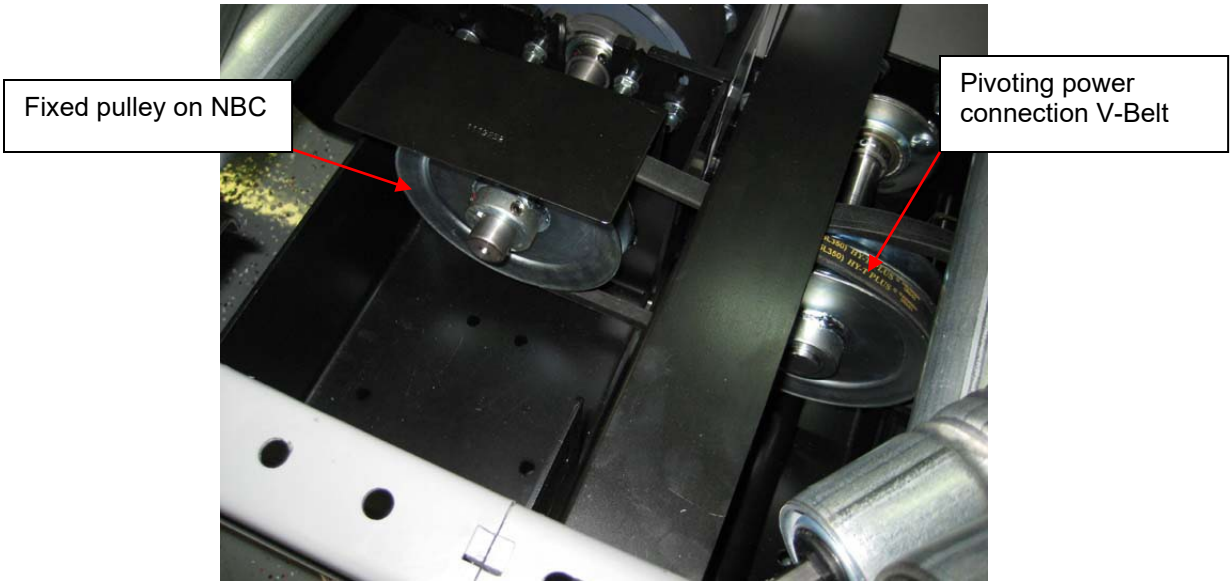
The gap, when accumulating, is the difference between the zone length and product length.

The 90° curve accumulates with two zones of 48 inches each.

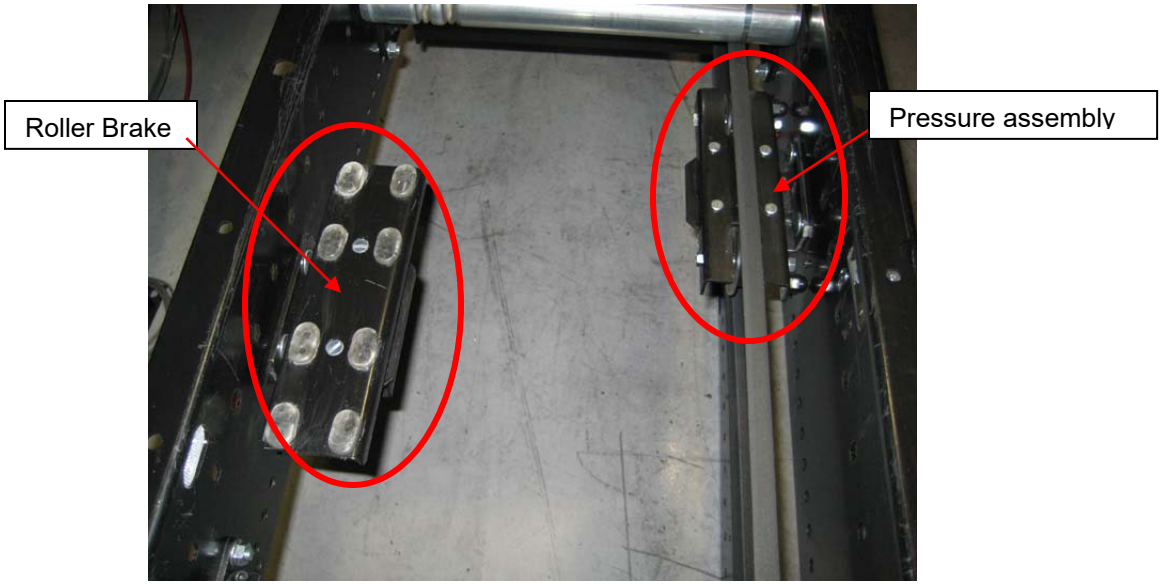
All rollers within each zone in straight V-Belt modules are slaved together for consistent roller drive capacity.



A belt is left off at each end of each zone to allow each zone independent operation. One logic module with sensor and reflector is mounted in each zone for accumulation control.



Pivoting power connection V-belt from NBC belt to V-Belt curve module.



A straight V-Belt module is shown with the V-Belt pressure assembly on the right and the roller brake on the left. When a signal is received to accumulate, the brake is raised against the rollers while the pressure assembly lowers the V-Belt away from the rollers.

Transportation

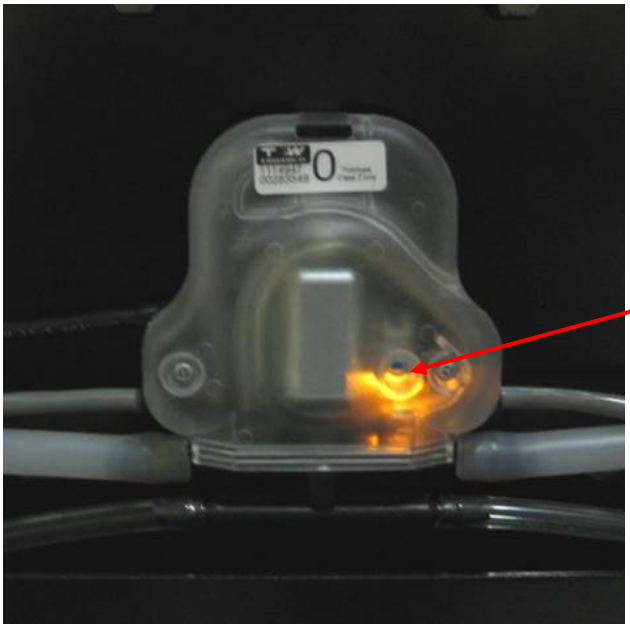
For transportation only of products, the pressure assembly is changed to a design which is fixed in the UP position. There are no roller brakes and all rollers are connected for the highest consistent drive.

BASIC AND PROGRESSIVE LOGIC

Every contact and non-contact NBC V-Belt accumulation conveyor is equipped with logic modules that can be switched from basic to progressive with a manually activated toggle switch. A green light indicates basic mode and an amber light progressive mode.

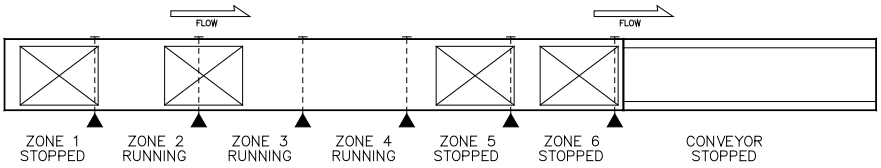
The manner in which basic and progressive logic modes change accumulation and release are explained in the following pages.

Green light indicates basic mode



Amber light indicates progressive mode

BASIC LOGIC



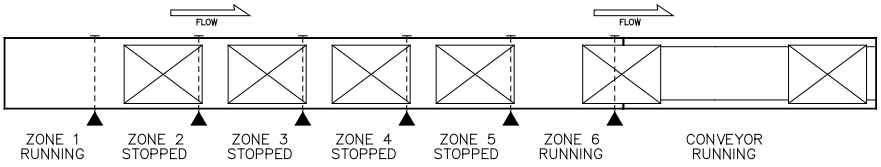
BASIC LOGIC OPERATION

Basic Logic functions such that when any two successive photoelectric sensors are blocked, the upstream zone is set to accumulate.

In the above example:

1. The discharge zone, Zone 6, is shown stopped, signifying that release from the zone is being inhibited and the Zone 6 sensor is blocked.
2. When the Zone 6 sensor AND the Zone 5 sensor is blocked Zone 5 will stop running.
3. Zone 4 and Zone 3 sensors are not blocked, and the zones are running.
4. Zone 2 sensor is blocked, but the zone is running because the Zone 3 sensor is NOT blocked.
5. Zone 1 is not driving because both Zone 1 AND Zone 2 sensors are blocked.

NOTE
(Basic Logic) Products being transported on accumulation conveyor are separated by a gap of one zone length upon release. This will reduce the transportation throughput capacity of the conveyor. The rate at which product is introduced onto an accumulation conveyor of this type must not exceed the transportation rate of the conveyor.



DISCHARGE FROM BASIC LOGIC

A release signal given to the Zone 6 Logic Assembly releases product from that zone. As released product clears the electronic sensor, the product stopped at the next upstream zone is driven forward.

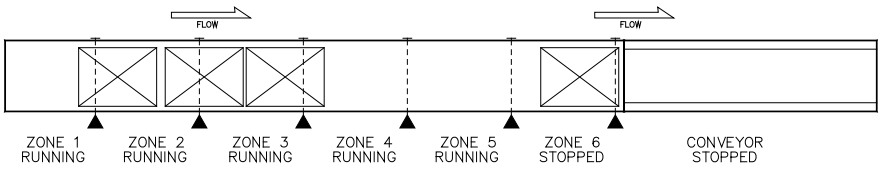
This will create a one-zone length gap between all released products, assuming conveyor speeds (accumulation conveyor and downstream conveyor) are identical.

NOTE
If the accumulation logic is set to Slug Release, all affected zones will run, resulting in the release of product with little or no gaps. This overrides the normal Basic Logic function.

PROGRESSIVE LOGIC

PROGRESSIVE LOGIC OPERATION

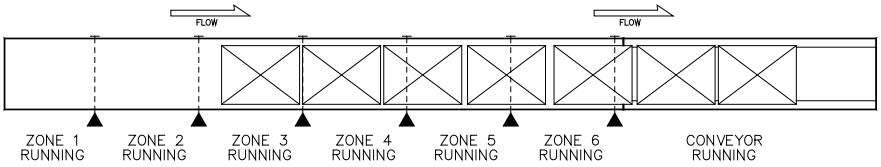
Progressive accumulation functions such that no zones are set to accumulate unless ALL the downstream electronic sensors are blocked, meaning that all downstream zones hold accumulated product.



In the above example, the discharge zone, Zone 6, is shown stopped which is the result of the release from the zone being inhibited (receiving conveyor is stopped) and the Zone 6 sensor being blocked.

Zone 5 sensor not being blocked results in all upstream zones, Zone 1 through Zone 5, running.

NOTE
(Progressive Logic) Products being transported on accumulation conveyor can remain tightly packed, without any gaps being created. The transportation throughput capacity of the conveyor is not reduced due to zoned accumulation.



DISCHARGE FROM PROGRESSIVE LOGIC

When the discharge zone, Zone 6, is provided a release signal, all upstream zones also release.

There is no gap between released products, assuming conveyor speeds (accumulation conveyor and downstream conveyor) are identical.

The Progressive Logic discharge functions the same as a Slug Release. Initiating the Slug Release will also result in all products releasing, regardless of zone conditions.

CAUTION

- **CRUZcontrol® Logic Assemblies are designed to be fail-safe. A loss of module power, a disconnected or severed cable, or a dirty or failed photoelectric sensor will all result in the stopping of a zone, initiating accumulation beginning from the affected zone.**
- **With Progressive Logic, failure of a Logic Assembly to function properly could possibly result in product accumulating with zones not stopping as required.**
- **While this should be unlikely due to the fail-safe nature of the Logic Assembly, the effects of such a failure should be considered. This type of failure could result in excessive line pressure, eventually causing product to push through the discharge zone of the conveyor. Jam detection sensors should be used as appropriate to minimize the effects of such a failure.**

APPLICATION – CRUZ®logic

Non-contact zero pressure zones

LOGIC MODULES AND RELEASE RATES

Your NBC conveyor comes with a field switchable logic module for every zone. All the logic modules are shipped in the basic mode. This will be indicated by a green light when the 24V power is activated.

Basic Release

In the basic release mode, all logic modules are set to basic. The release efficiency will generally be 40% to 50% depending on the conveyor speed and the type of release at the discharge of the unit. Release efficiency increases at lower speeds. An on/off cycling style of release will be more efficient than a one time “flush” type of release.

For non-contact accumulation, the conveyor should be operated in the basic mode to preserve the one product per zone integrity.

Progressive Release

The progressive release mode ignores the photo sensors and dumps all the zones at once, in the same way slug discharge operates.

Release efficiencies on progressive mode are in the 70% to 90% range depending on speed, type of release at the discharge unit, product length and zone length.

Progressive release will NOT maintain non-contact accumulation.

APPLICATION – NBC RELEASING ACCESSORIES

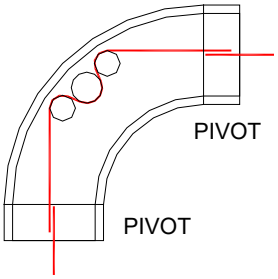
A signal to release or accumulate product is always required at the discharge end of an NBC V-Belt module accumulation conveyor.

Release function module at discharge end of
NBC V-Belt conveyor

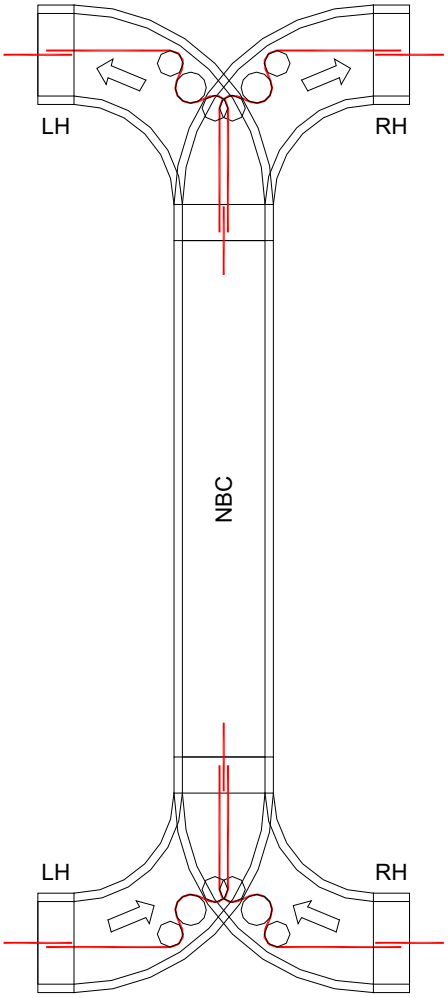
A signal to release or accumulate product

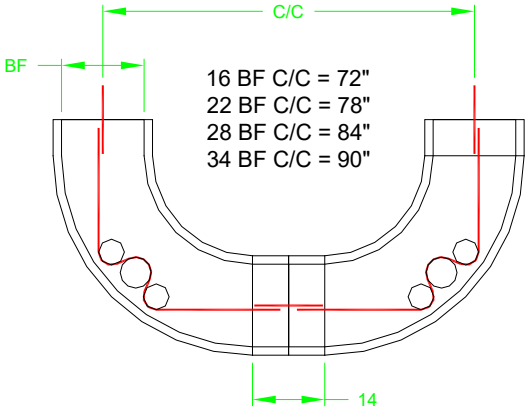
This is normally a 24V signal from the system PLC to the release function module of the NBC. Part numbers and complete wiring descriptions for release function modules are explained in the CRUZcontrol Installation, Operation and Maintenance Manual – item number 1118211.

V-BELT MODULE ARRANGEMENTS



CURVE,__BF NBC-90-_-CZ
(RH/LH)

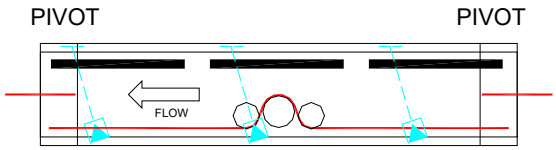




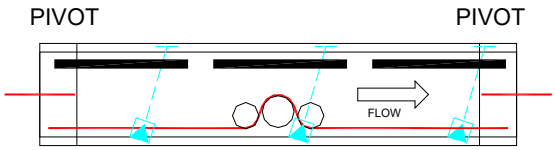
CURVE BETWEEN CENTERS

V-BELT MODULES (CURVES SHOWN)
MAY GO IN EITHER DIRECTION FROM
EITHER OR BOTH ENDS

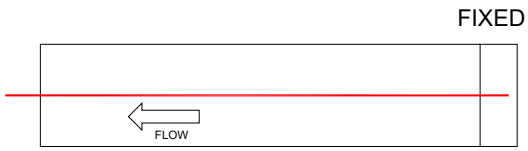
IOM–NBC028



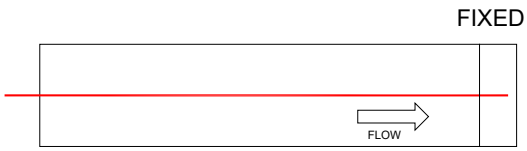
MIN 6' TO MAX 12' LENGTH
BED,__BF NBC-N__-CZV3-UT-__'__" LH
TAKE-UP BED



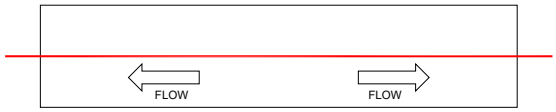
MIN 6' TO MAX 12' LENGTH
BED,__BF NBC-N__-CZV2-UT-__'__" RH
TAKE-UP BED



MIN 2' TO MAX 5'10" LENGTH
BED,__BF NBC-T-C6V2-PC-__'__" LH
CHARGE BED



MIN 2' TO MAX 5'10" LENGTH
BED,__BF NBC-T-C6V2-PD-__'__" RH
DISCHARGE BED



MIN 1'6" TO MAX 5'10" LENGTH
BED,__BF NBC-T-C6V2-PI-__'__" LH/RH
INTERMEDIATE BED

IOM–NBC029

RECEIVING & SITE PREPARATION

GENERAL

NBC zero-pressure conveyors 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 damaged or replace components must be made against the carrier immediately. While unloading, a check must be made against the Bill of Lading, or other packing lists provided, to confirm full receipt of listed items.

CAUTION

- **TAKE CARE 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, crossmember or any part of the equipment.**
- **Be sure the skid is free of other materials which may be on top of or against the side of the skid to be removed.**

PREPARATION OF SITE

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

Prior to starting 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.

PARTS INVENTORY AND IDENTIFICATION

Each subassembly is shipped completely assembled except typical loose parts. Drive assemblies are shipped mounted to the appropriate drive bed frame. Segregate the conveyor subassemblies by types for inventory and ease of locating during installation.

An identification label is attached to the inside of one side channel or on a crossmember, close to one end of each conveyor bed and on all drive packages. This label contains: job number, part number, order number, tag number (if specified), assembler's initials and date of manufacture. On 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. The illustrations in this manual and the part number stickers will assist you with your inventory.

Loose parts are boxed and shipped separately. You should have all conveyor sections and supports for a particular conveyor prior to installation. It is cost-effective to identify and procure any missing parts before they are needed for assembly. Small items like nuts and bolts are weigh-counted and packaged by size and type.

Identification label

INSTALLATION ARRANGEMENTS

FLOOR SUPPORTS

Install bolts used to attach the standhead to the frame so the nut is on the bottom. Standhead bolts should be left finger tight while the conveyor is being assembled and aligned.

Floor supports are ordered by nominal height range, which is the dimension from the floor to top of the support. Conveyor elevations are shown on the layout by top-of-roller elevations. This difference must be recognized when setting the support elevations. NBC CRUZ®channel conveyor is 6-5/16" from top-of-support to top-of-rollers with a 7-1/2" deep frame channel. The C6, rollers high channel to the bottom of the channel is also 6-5/16” from the top of rollers.

It is important that conveyor frames be installed level. Floor supports will accommodate normal irregularities in the floor surface. Adjustment for elevation in floor supports is accomplished with metal-on-metal bolt clamping force. To achieve the support's stated load rating, it is necessary to tighten the elevation adjustment bolts (3/8" diameter) to 23 ft/lbs of torque.

Supports should always be installed in the vertical position, and any variations due to conveyor pitch or floor slope will be compensated for in the pivoting standhead of the support.

ANCHORING

Anchoring in concrete floors is accomplished by drilling into the floor and inserting the suitable anchor bolt. The hole diameter and depth must be in accordance with the anchor bolt manufacturer's instructions.

Anchor intermediate floor supports with two anchor bolts, one through each support footplate using minimum 3/8" diameter anchor bolts. For floor supports over 5' high or when supporting drives, use 1/2" diameter anchor bolts.

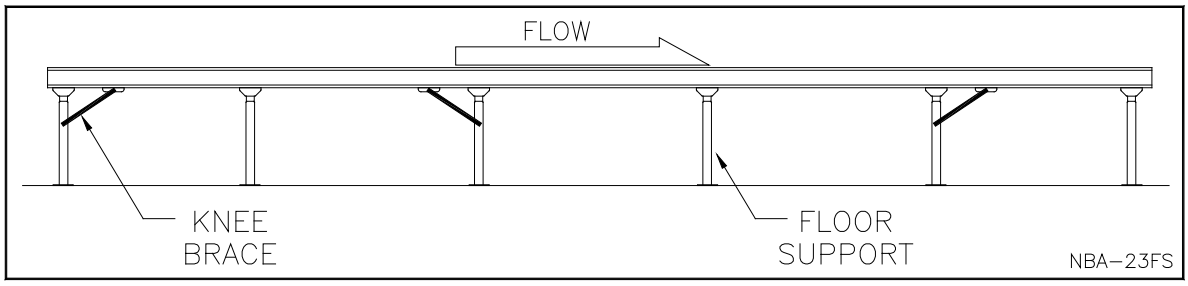
Stagger anchors from front hole on one side of the support, to rear hole on opposite side. Anchor bolts for equipment subject to impact loads should be a minimum of 1/2" diameter.

⚠ WARNING

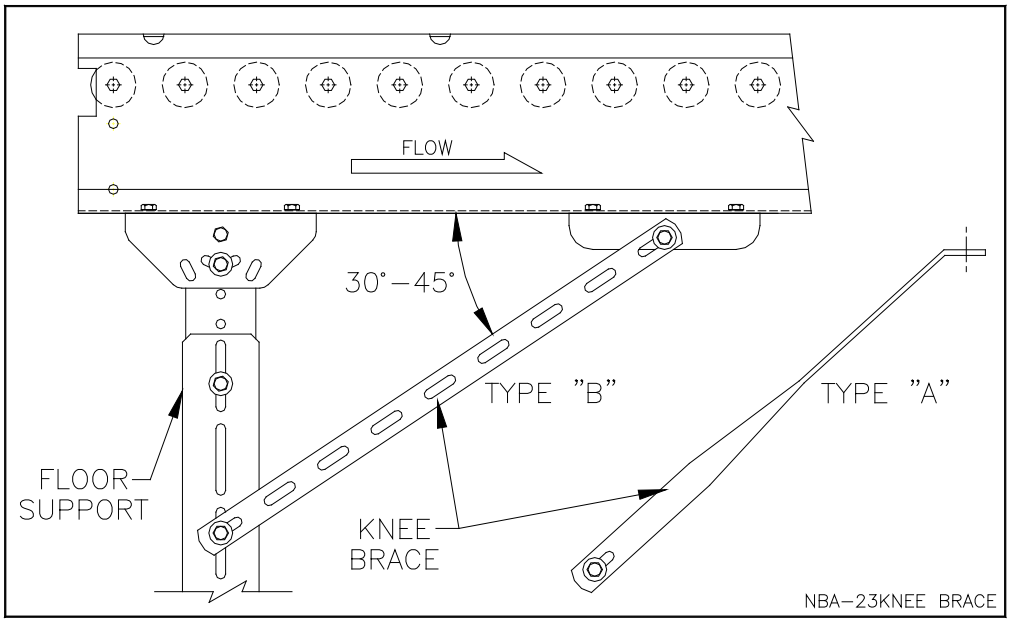
- **Place a bolt through the frame and support immediately with finger tight nut. This will prevent the frame from falling off the support, if bumped, and causing injury.**

KNEE BRACES

Stability along the conveyor length is achieved with knee braces. Braces resist stresses caused by direction of product flow, drives, stops and starts. Every support does not require bracing. Braces are used at the ends of straight runs and approximately every 30' in between. Braces should be located toward the discharge end (DOWNSTREAM) side putting them in tension. Starting the conveyor puts opposite stresses on the supports, which is resisted by installing a brace near the drive toward the receiving end (UPSTREAM).



For best results the angle between the knee brace and frame should not exceed 45 degrees, or be less than 30 degrees. On short supports where a small angle results, the knee brace may need to be shortened.



Type "C" braces (not shown) use two type "B" braces overlapped and bolted together for extended length when conveyor height is 48" or more.

ANCHORING CEILING HANGERS

Open Building Steel

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

1. Welding of auxiliary steel (stringers or headers) to building steel is prohibited.
2. Drilling and bolting to building steel is not recommended and will be done only with the customer's written permission.
3. 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 safely clamp between panel points.
4. 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

Accomplish anchoring by drilling into the concrete ceiling and inserting suitable anchor bolts. The hole diameter and depth must be in accordance with the lag bolt manufacturer's instructions.

Anchor each hanger with four bolts (two per upright) minimum size 1/2" diameter. Consult your distributor or structural engineer to determine your needs.

⚠ WARNING

- **Do not use explosive type anchors.**
- **For heavier concentrated loads like drives or points where movement or vibration can occur, use 5/8" diameter through bolts with backup plates.**
- **If this is not permissible or possible, then header steel must be installed using several anchor bolts to spread the load.**

Wood Joists/Beams

Hangers may be attached directly to the joists providing the load rating of the building will permit. Attach hangers to the vertical side of the joist in two places, one above the other, on each hanger upright. Anchoring is accomplished by drilling through the joist in the upper position and using a 1/2" diameter through bolt with a backup plate or heavy washer. A 1/2" diameter lag screw may be used in the lower position.

When a header is required to support the load, it must bridge across two or more joists. This header will be attached to each joist in the manner specified in paragraph above. Hanger uprights should then be bolted or welded securely to the headers.

NOTE

Consult a structural engineer to determine which method should be used for your load requirements.

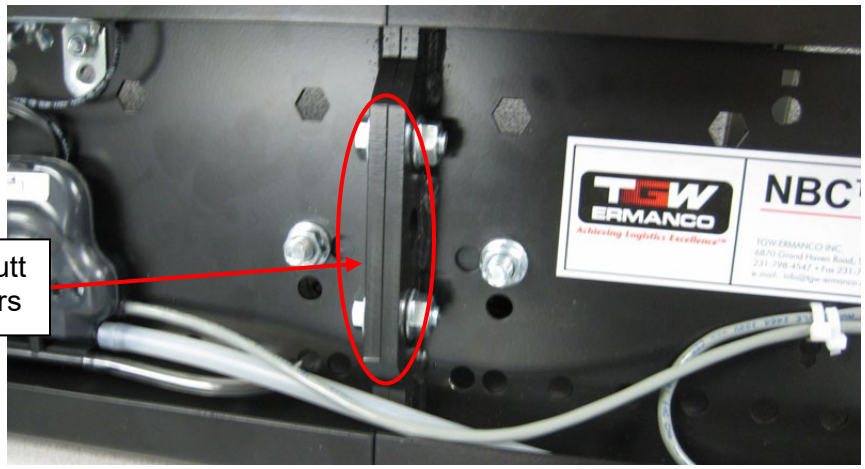
Concrete/Masonry Walls

Equipment may be supported from concrete walls through use of suitable bolts and anchors or by bolting through the wall if the condition of the wall or load dictates it. A 1/2" diameter through bolt should be used with a backing plate.

Ceiling-hung conveyor header steel should be installed well ahead of the conveyor frame installation to minimize congestion.

CONNECTORS

All NBC uses welded butt plate connectors. For either ceiling hanging or floor supporting, supports may be placed anywhere under the 12' bed section. **Do not extend support locations beyond 12' centers.**



SETTING LOGIC MODULES

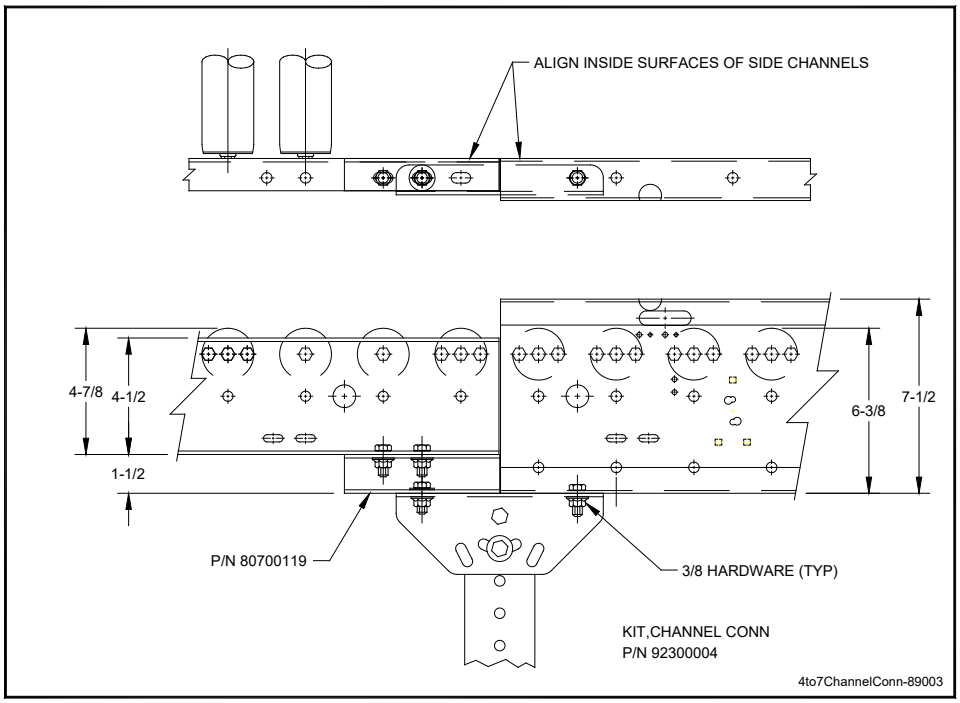
After mechanical and electrical installation is complete and there is air to the system, the logic modules may need to be reset.

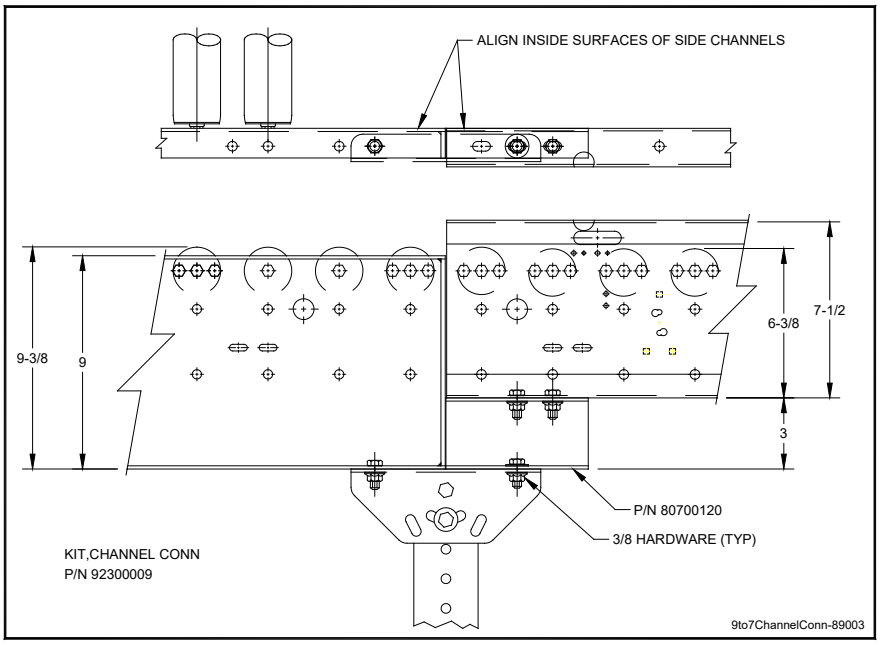
All logic modules are factory set in the basic mode indicated by the green light. This logic mode may be adequate for your conveyor system. However, if higher product throughput is required, some of the basic modules can be switched to progressive which is indicated by an amber light.

Never switch all the logic modules to progressive. For maximum product throughput, a pattern of 4 progressive modules and 1 basic module should be followed. **See INDEX heading "Basic and Progressive Logic" for additional explanation.**

Switching logic modes with paper clip

CRUZ®channel TO XenoROL® CHANNEL CONNECTIONS

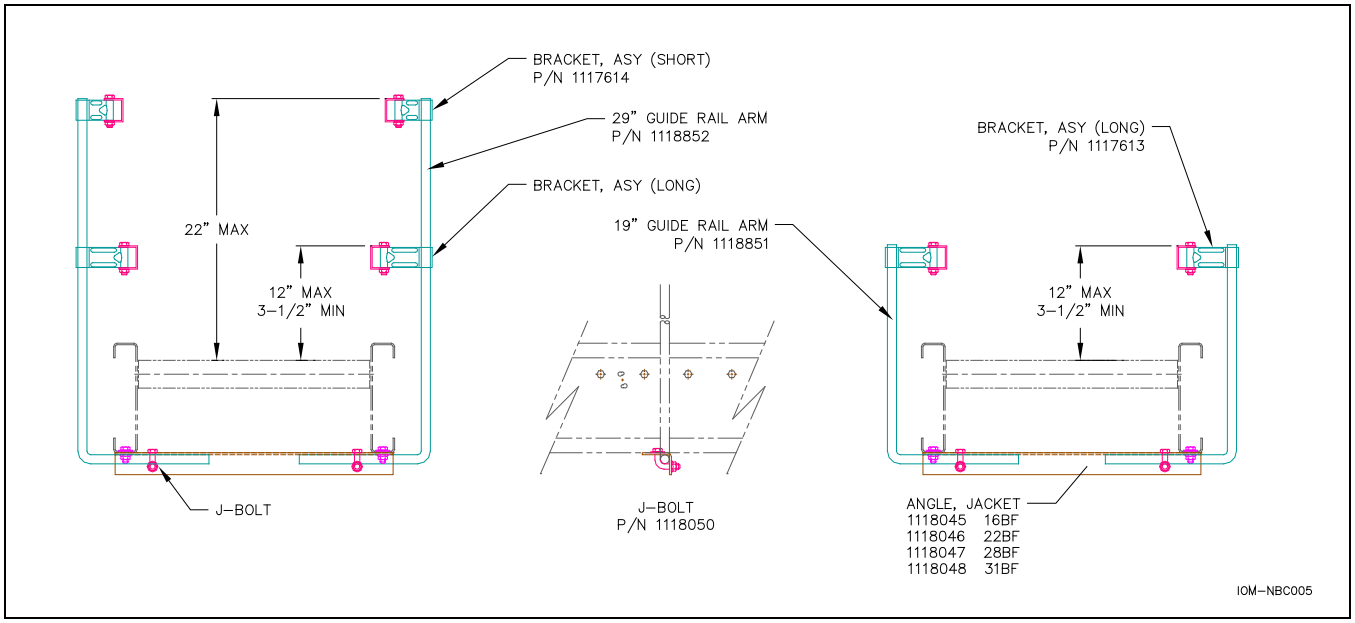




NOTE

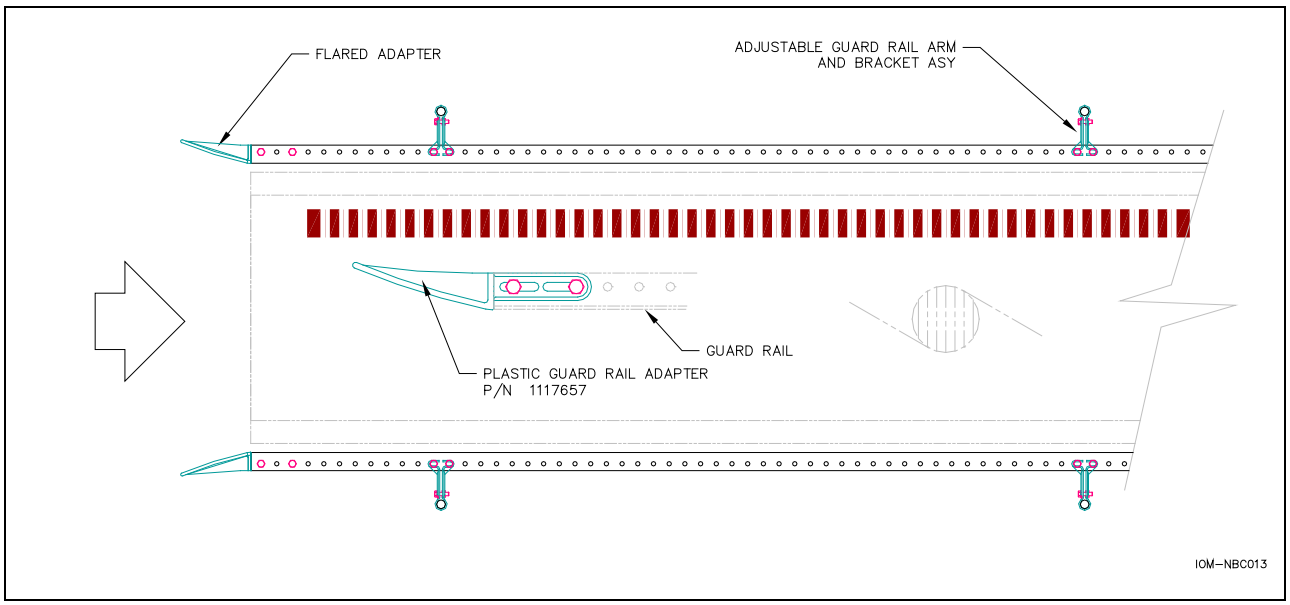
C6 Channel uses the exact same connections when mounted to XenoROL.

For all elevations requiring high guardrail, the NBC is designed to use adjustable guardrail. The configurations and associated part numbers are shown below.



Adjustable guard single high and double high

Flared lead-in section for adjustable channel guardrail.



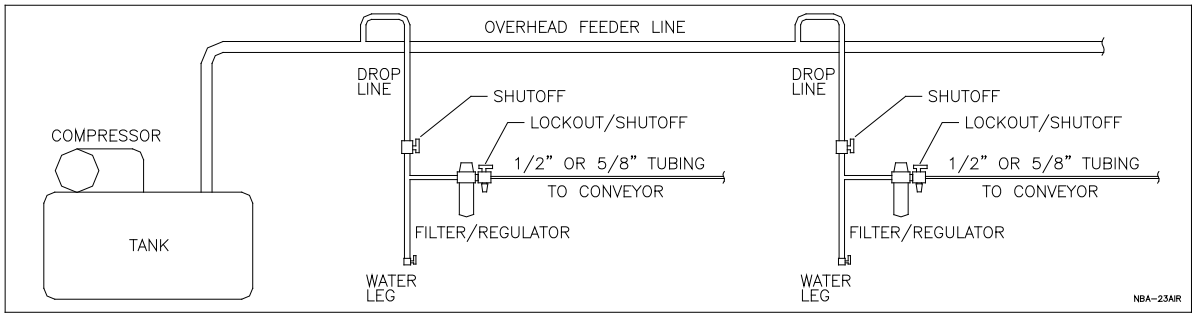
Use part #117657 at the entrance of all adjustable channel guardrail

CRUZ®channel TO C6 NOSE PIECE

A CRUZchannel to C6 nosepiece provides a smooth transition for products moving from rollers high conveyor to rollers low conveyor.

C6 to CRUZ nosepiece

AIR SUPPLY REQUIREMENTS



GENERAL

Every conveyor system is unique, with its own specific requirements. Therefore, the following is a general guide.

Main Feeder

Air velocity through the main feeder piping can be kept smooth with lower losses using large diameter pipe with minimum bends and restrictions. Standard weight black pipe or copper is suitable for plumbing the compressed air overhead to all points of use.

Air Drops

MHS Conveyor recommends using 3/4" pipe on air drops for high flow and low pressure loss. The drop is terminated with a drain at the bottom. A tee located prior to the drain branches off to the conveyor. This branch line must contain a lockout/shutoff. A shutoff must also be located in the drop before the branch tee. OSHA Rule 29, CFR1910.147 requires energy sources (air drops) be turned off and capable of being locked or labeled with a warning tag.

NOTE

The pneumatic system for NBC installations does not require lubrication. Lubrication may affect the valving operation and cause sluggish or erratic operation.

CAUTION

- **All air lines must be thoroughly blown out to clear all debris. The regulator must be set at 40 PSI after connecting air to NBC.**
- **If your air compressor uses synthetic oil, a coalescing filter plus a regular filter of 5 micron is required.**
- **Synthetic oils will shrink the seals in pneumatic devices and valving.**

LOW PRESSURE SWITCH

WARNING	
	• **An air pressure switch is required to be installed into the pneumatic circuit to detect a drop in air pressure below required levels. If pressure drops below approximately 20 PSI, the conveyor system should be programmed to shut-off based on the input from the pressure switch.**

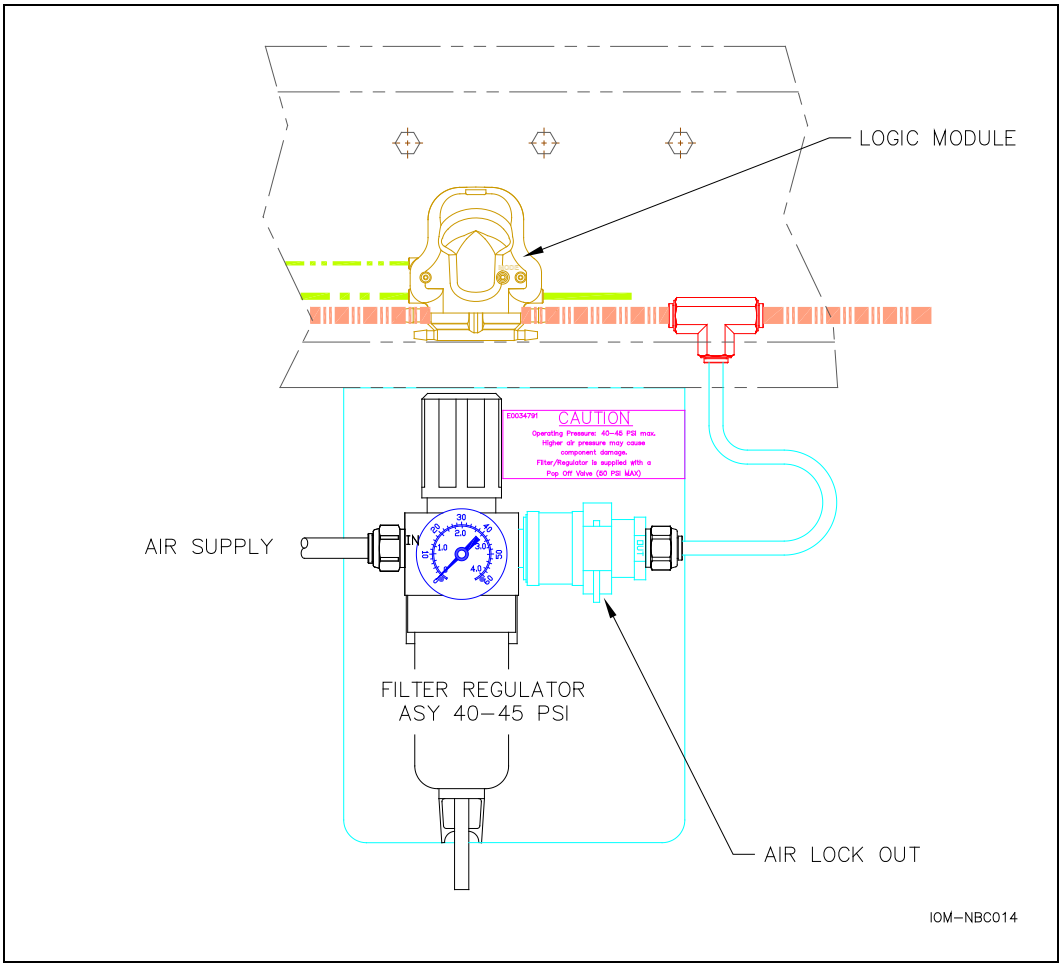
PNEUMATIC REQUIREMENTS

1. Regulator pressure set at 40 PSI
2. Maximum conveyor length each way from regulator is 100'. Locate regulator in center of conveyor for maximum length.
3. MHS Conveyor supplied low pressure regulator is required
4. Low pressure switch to be set at 20 PSI
5. In high humidity or low temperature, use air dryer
6. Use 5 micron filter
7. Lockout/shutoff valve to be provided by air system installer

Other:

8. Compressor HP = total CFM ÷ 3.55
9. Air tank size = approx. 1 gallon per CFM

The formulas to determine air consumption follows:
SCFM = .0012 x number of zones x releases per minute for noncontact accumulation double the SCFM from above

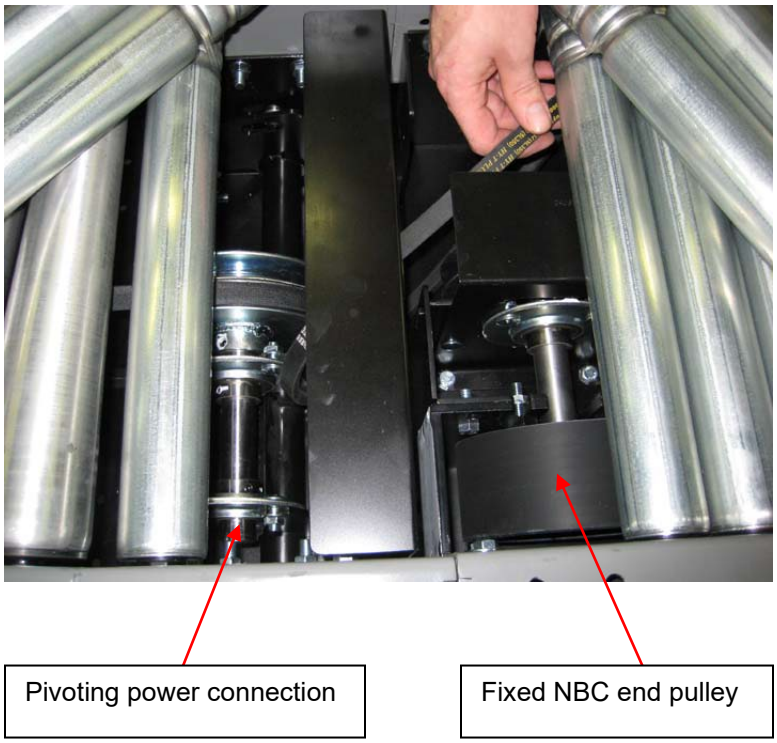

LOGIC MODULE
CAUTION
AIR SUPPLY
IN
FILTER REGULATOR
ASY 40–45 PSI
AIR LOCK OUT
IOM–NBC014

INSTALLING PIVOTING POWER CONNECTION JUMP BELT AND TENSIONING SYSTEM

Notes:

1. Locate the joints to be connected from the system layout drawing.
2. Any joint to be connected will have a jump V-Belt tied near the open pulleys.
3. The joint to be connected will have two open pulleys in alignment.
4. The pivot feature of the pivoting power connection allows all the connected modules to share the take-ups located in all curves and some longer (over 6') straight modules.
5. When connecting to an NBC flat belt conveyor, the air pressure does not need to be removed or the NBC flat belt take-up loosened since the connection pulley on the NBC flat belt is fixed.
6. All the main drive V-Belts in the modules are installed at the factory. Only the connection V-belts at the pivoting power connection need to be installed.

Step 1. From the system layout drawing, locate the joint to be connected. Remove enough rollers to get connection working space. Untie the jump belt located next to the joint where it is required.



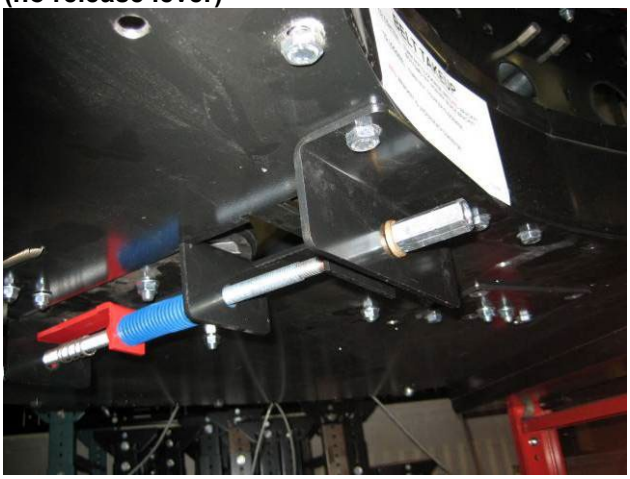
Step 2. Release tension using the belt take-up in the nearest curve or in a straight section, which contains a take-up. To release tension refer to the illustrations below. If the curve has an orange handle next to the spring/threaded rod assembly, hold it down while turning the nut on the end of the threaded rod counterclockwise. If no orange lever is present, the take-up has an automatic release so simply turn the nut counterclockwise to loosen belt.

NOTE

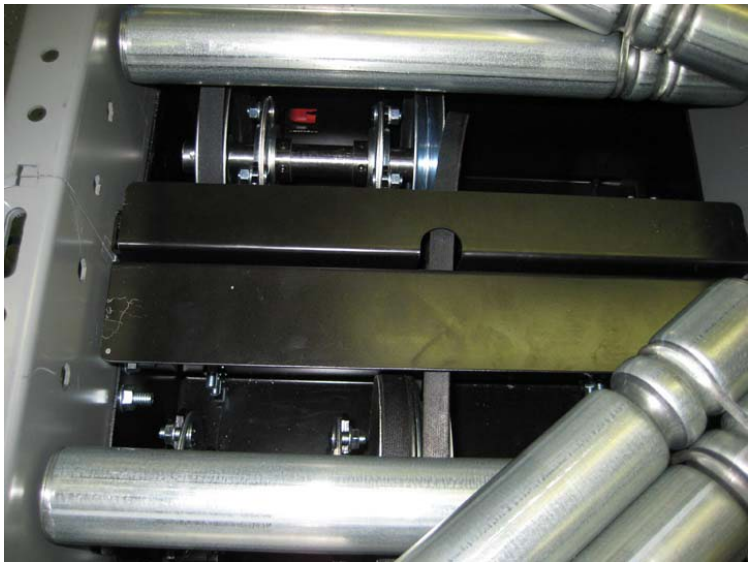
Take-up pulley will NOT move immediately. Turning the take-up nut releases spring tension first, then it moves the take-up pulley.

Generation 1 – Take-up with release lever shown

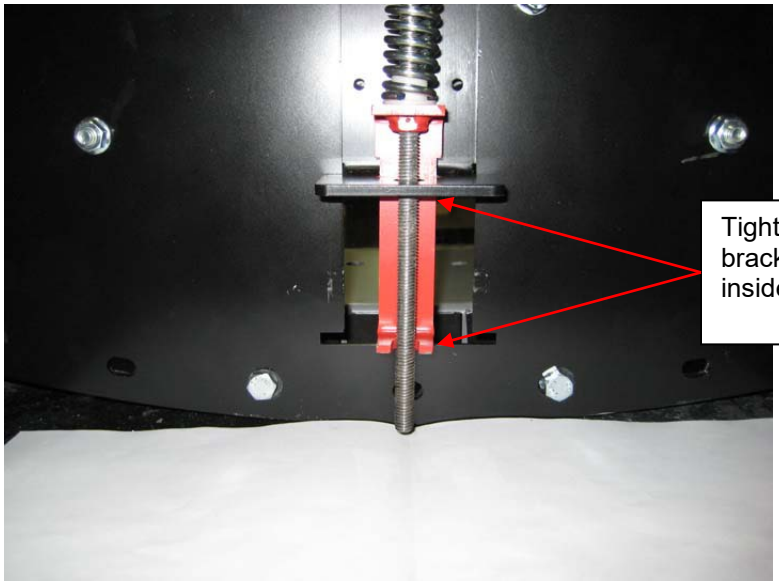
Generation 2 – Take-up with automatic release (no release lever)

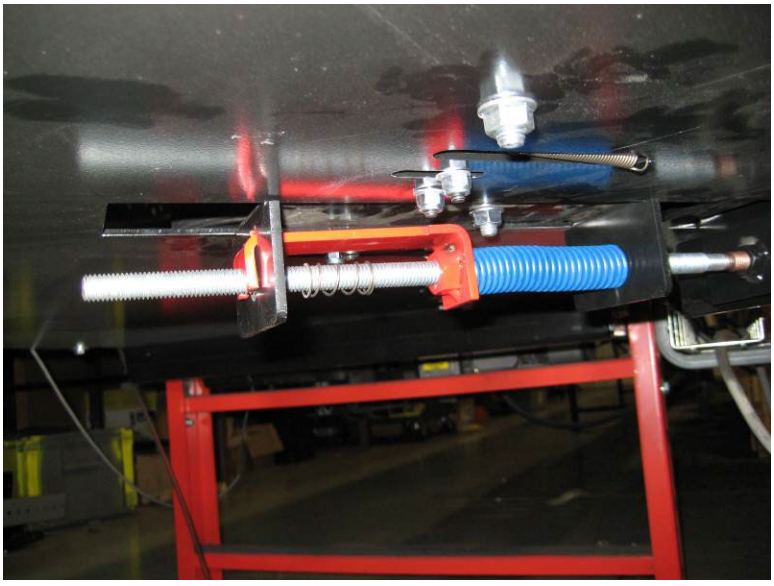


Step 3. Back off the spring tension until the pivoting power connection shaft and V-Belt pulley can swing far enough toward the section to be connected, to install the jump belt. Place belt over fixed pulley first (if present), then over the pivoting pulley.



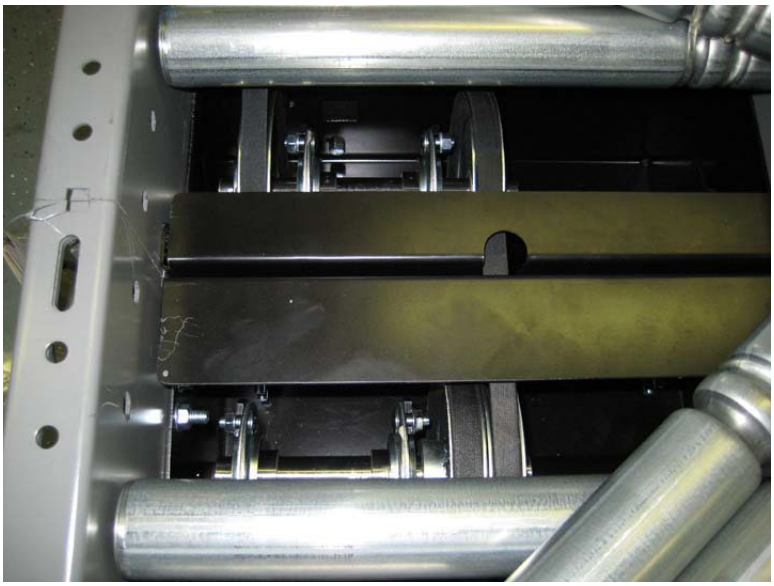
Step 4. After the connection belt is in place on both pulleys, the belt tension needs to be set. Turn the nut on the end of the threaded rod until the forked end of the red bracket contacts the black bracket which holds the rod. The red bracket is shown in the backed-off (loose) position for belt installation.





Red bracket in tight position.

Step 5. When the connection V-Belt is installed and properly tensioned, the rollers may be re-installed.



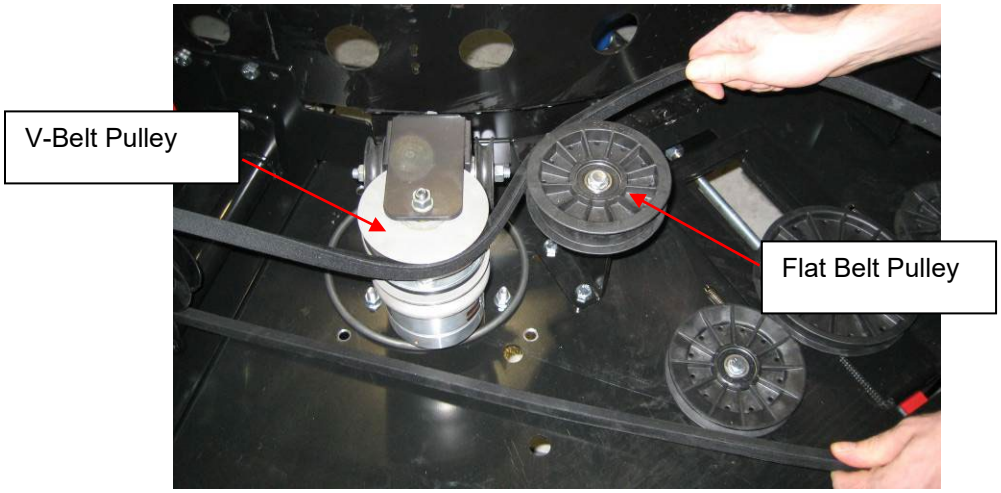
REPLACING MAIN DRIVE BELT, NBC CURVES

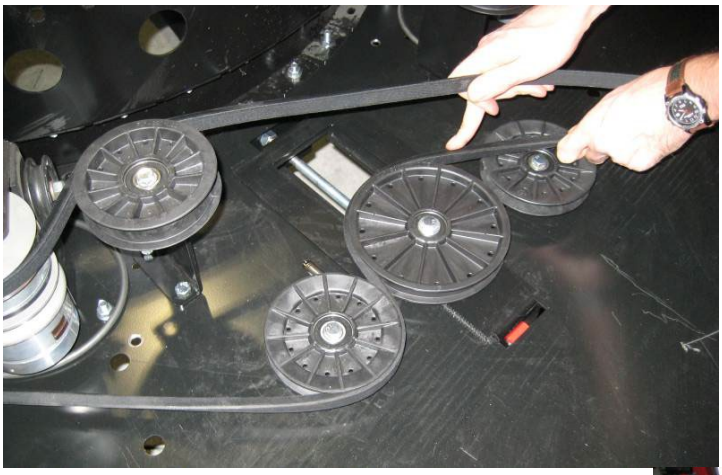
The main drive belt is shipped installed in all NBC V-belt modules. To change the main drive belt, follow the steps below.

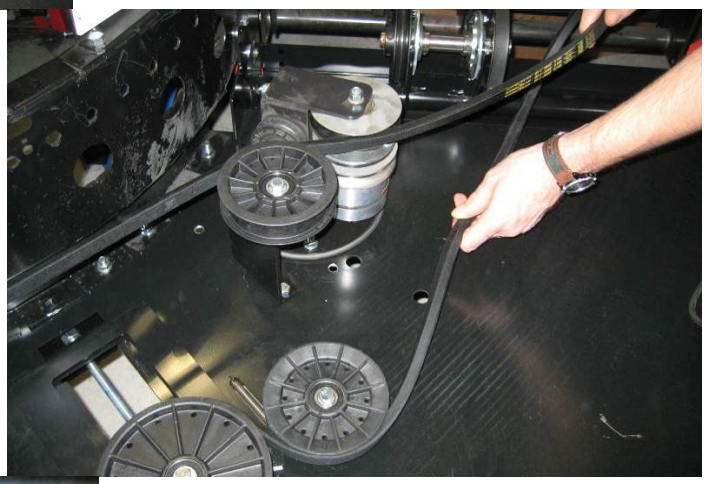
1. Turn off and lock out power to drive
2. Release belt tension (see “Tensioning system”)
3. Remove enough rollers to access internals. It is usually possible to leave Drive Pod rollers alone.
4. Remove old belt
5. Starting at one Pivoting Power Connection, seat belt in pulley. The V-belt pulleys receive the V side of the belt, and the flat face pulleys receive the back side of the belt.

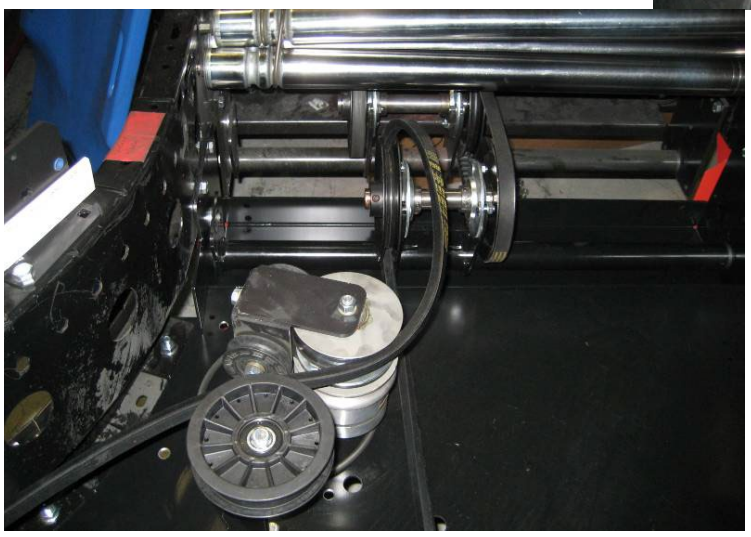
All rollers removed for clarity

6. Work your way around the curve, seating the belt in all the pulleys.





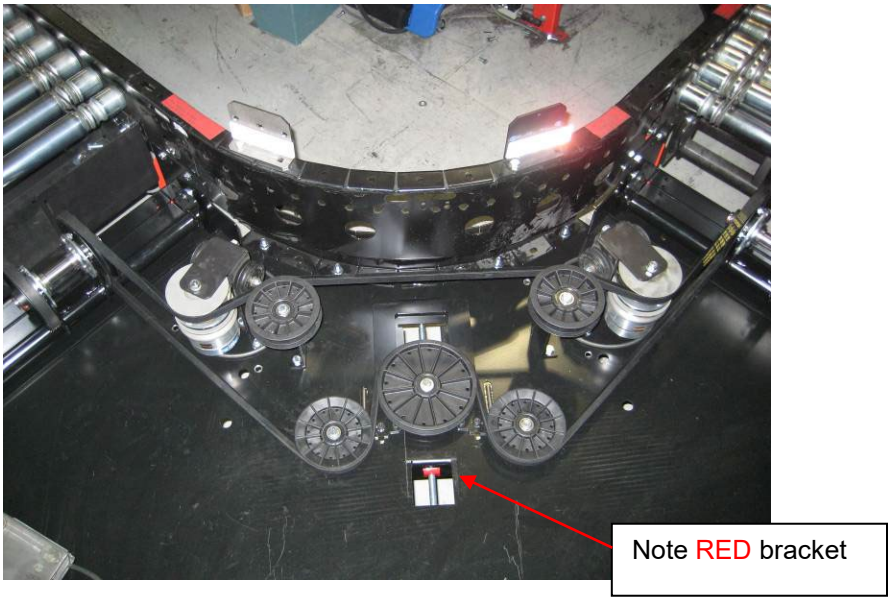




7. After belt is seated, retension module (see “Tensioning System”).
8. Replace rollers and o-rings.

NOTE
Two center rollers in the 90 degree curve are NOT tied together with o-rings.

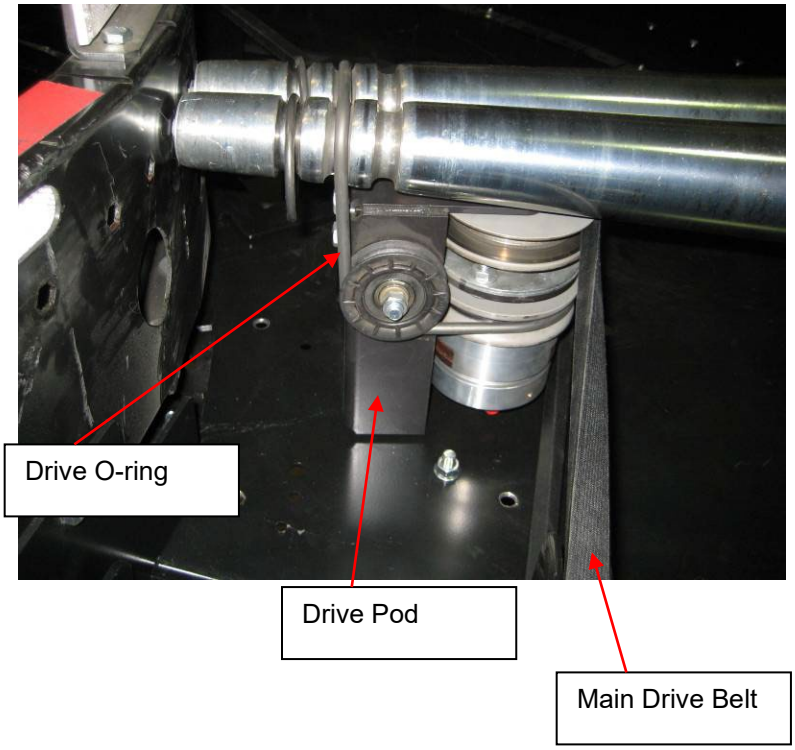
Finished and tensioned 90 degree belt path.



DRIVE O-RING REPLACEMENT

1. Turn off and lock out power.
2. Remove main drive belt tension (see “Tensioning System”).
3. Remove the four rollers over Drive Pod.
4. Replace Drive O-ring in Drive Pod. Replace the two rollers over Drive Pod.
5. Replace remaining rollers.
6. Retension main drive belt (see “Tensioning System”).

Finished Drive O-ring path.



MAINTENANCE SCHEDULE

Periodic maintenance intervals shown may vary with load, speed, hours of daily operation, ambient temperature, humidity, etc. Intervals can be established by fairly frequent maintenance at first; then lengthen the intervals as justified by observation of need based on history. The following is based on 5 days per week, 8 hours per day 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 ANY OIL LEAKAGE.

- Check any unusual noises or vibration.
- Check for loose bolts or parts.
- Check air filter bowls for accumulated water.
- Listen for air leaks.

WEEKLY

- Inspect drive belt tension
- Inspect bearings, gear reducers and motors for excessive noise or heat.
- Check operation of all electrical controls.
- Inspect motor mounting bolts.
- Check for proper PSI on air regulators.

⚠ WARNING

- **Prohibit riding on conveyor by anyone.**
- **Think before making any adjustments. It may prevent an injury. Remember, all moving components are potentially dangerous.**
- **Protect yourself from unexpected starts when working on a stopped unit by locking and tagging the control panel or disconnect switch that supplies power to the unit.**

MONTHLY

- Check air filters for cleanliness
- Check drive unit for leaking seals and oil level in gearcase (if applicable), unusual noises, vibration and stress cracks.

SEMI-YEARLY

- If dry sounding, lubricate unsealed bearings in rollers with light oil. Check free spin of rollers.
- Drain and flush gearcase after each 2,500 hours of normal operation or at least every 6 months (if applicable).
- Grease motor shaft bearings
- Inspect and clean motor control centers
- Grease regreaseable bearings
- Check black PVC belt welded splice for signs of early failure

YEARLY

- Inspect oil in gearboxes
- Inspect tightness of all nuts and bolts on units. Re-adjust and, if necessary, re-tighten.
- Check for plumb and level. Shims have been known to vibrate out from under supports in isolated incidents.
- Touch up paint that has been chipped. Unpainted surfaces will rust.
- Inspect for stress/fatigue cracks in frame and supports

BELT SPLICE INSPECTION

- Belt splice should be inspected every 2,000 hours.
- If belt splice is cracked or coming apart it should be scheduled as soon as possible for a new belt splice to replace the old belt splice.

NOTE

Never re-weld over old belt splice. This makes the belt splice weak and brittle.

CAUTION

- **Check to confirm tools and foreign objects have not been left on or inside the conveyor.**
- **Check to confirm all loosened parts have been retightened.**
- **Check to confirm all guards have been installed.**

REDUCERS/GEARMOTORS

- NBC drive units use gearmotors which are properly filled at the factory with sufficient lubrication for their mounting position.
- A synthetic lube (Mobilgear SHC630) is the standard lube supplied.
- Oil should be changed every 20,000 hours.

Disassembly/assembly procedure as follows

- Remove necessary guards to access maintenance areas
- Disconnect any electrical connection
- Remove reducer or gearmotor
- Perform required maintenance
- Reverse procedures for assembly
- Replace all guards

Regularly inspect all gearbox reducers to guarantee maximum performance.

- Tightness of bolts and screws
- No major oil leaks
- No excessive heating
- No unusual vibration or noise

⚠ WARNING

- **Do not perform maintenance on the conveyor until the startup controls are locked out and cannot be turned on 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.**

SOLENOID VALVES

In order to minimize downtime, it is normally not feasible to repair malfunctioning electrical or valve components while leaving the conveyor unusable. Spare components should be kept in stock for emergency replacement. If feasible, the part may be repaired later to replace maintenance stock. Items which cannot be readily repaired or are questionable should be replaced. Components under warranty should not be repaired except in an emergency.

⚠ WARNING

- **Before removing a valve or other pneumatic component, shut off and exhaust the entire pneumatic circuit and shut off and lockout electrical supply.**

SENSING SWITCHES

Sensing switches are of two types:

- retroreflective photoeye

- proximity switch

Adjust the retroreflective type as follows

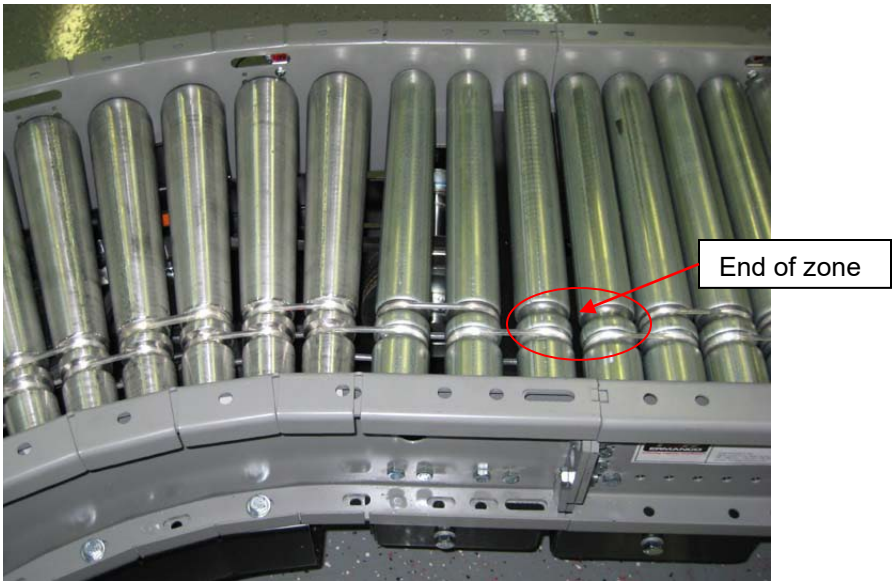
- Determine what sizes of target the photoeye must sense
- Adjust for the worst case, usually smallest item, by loosening photoeye mounting nut and aligning while making sure photoeye has unobstructed view of reflector.
- Move the target in and out of the field of detection to ensure that the photoeye energizes and de-energizes.

Adjust the proximity type as follows

- Loosen proximity switch mounting bolt and adjust sensing switch so that the product passes directly in front of the switch face, as close to the switch face as possible without making contact.
- Check that the proximity switch energizes and de-energizes as the product passes in front of the switch face
- Tighten the mounting bolt

V-BELT MAINTENANCE

All maintenance involving the V-Belts, V-Belt pulleys, pressure assemblies, roller brakes, clutches or bearings require some rollers to be removed from the frame. All V-belt modules have the rollers connected together into zones. This is done to equalize the roller drive capacity throughout the zone. The roller-to-roller connecting belts are under high tension and can be difficult to pull over the ends of the rollers.



All rollers are connected except the ends of zones.

For the removal of rollers:

- Do not remove any connecting belts except at the ends of the area being worked on. If possible, make one or both ends of the work area the end of the zone where there is no connecting belt.
- Push or pull the axles to remove one end of all rollers to be removed, resting them on the frame. Push the end of the axle from the end opposite the grooves or pull from the groove end of the roller, depending on which side is most accessible. Pulling the axle protects the frame from scratches, however it is generally easier to work from the side opposite the groove and push the axle.
- Remove the opposite end of each roller and roll them up to one side out of the way, leaving them connected.

For re-installing the rollers:

- Roll the rollers back out over the frame with the axles resting on the frame
- Reconnect any rollers where the connecting belt was removed before inserting the axles back into the frame.
- Insert all the axles on the grooved end first and then the opposite end by pushing opposite the grooves or pulling from the groove end.

Remove or insert all roller axles in work area on one end at a time.

Keep as many rollers connected as possible and roll them to one end of the work area – out of the way.

PARTS IDENTIFICATION

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

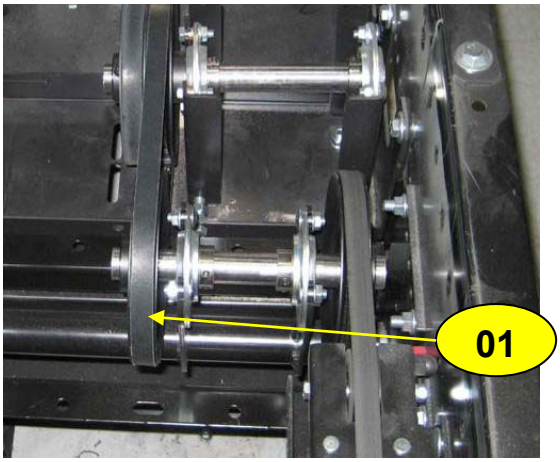
Parts which specifically pertain to NBC are included with illustrations.

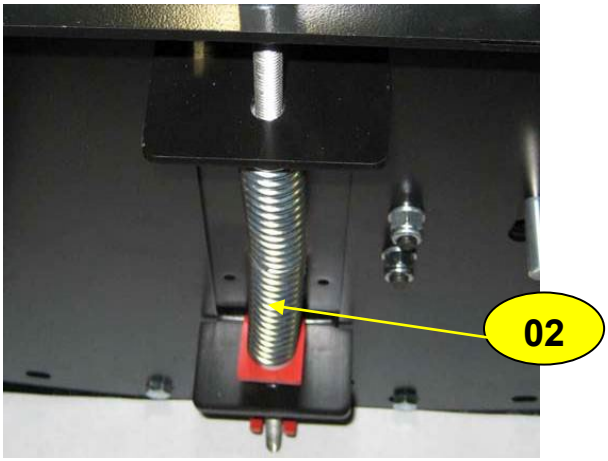
A "Recommended Spare Parts List" is published for all conveyor orders of $10,000 or more. This spare parts list is sent to the purchaser approximately (2) weeks after the order is received. It includes part numbers, description, pricing and recommended quantities to be kept for maintenance.

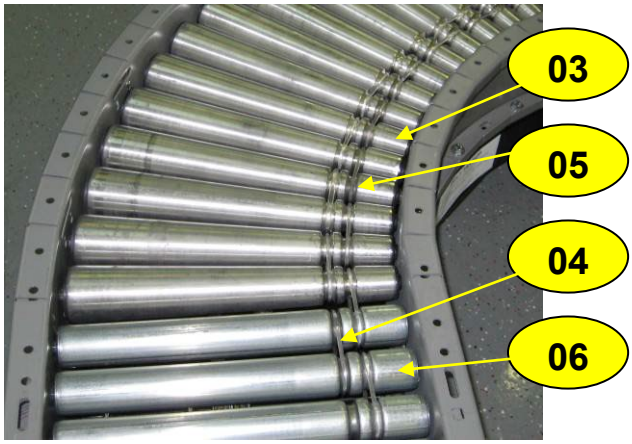
If you are unable to locate this document (or the order is under $10,000) another may be obtained by contacting Lifetime Services at 231-798-4547.

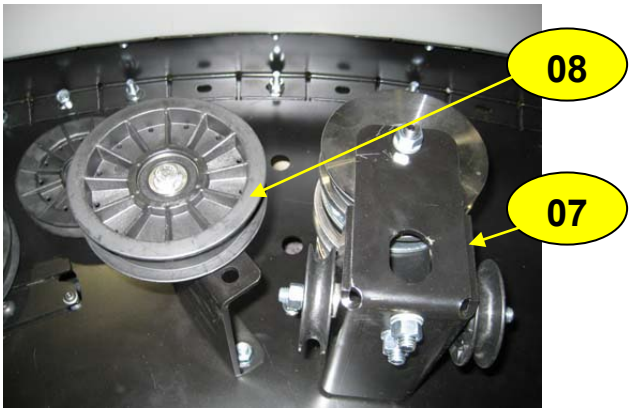
To identify a part and its part number, refer to the assemblies and devices on the following pages. Determine the balloon number for the required part and reference the composite parts list.

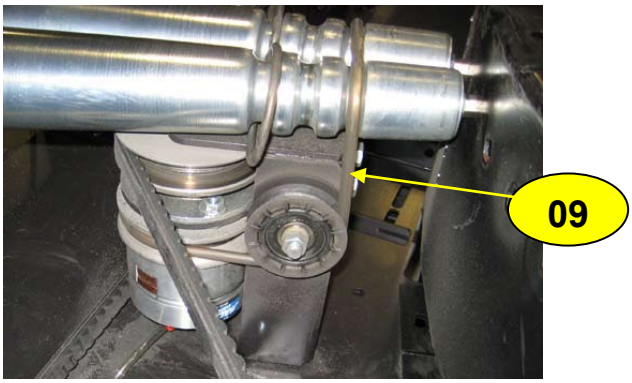
V-BELT MODULE PARTS

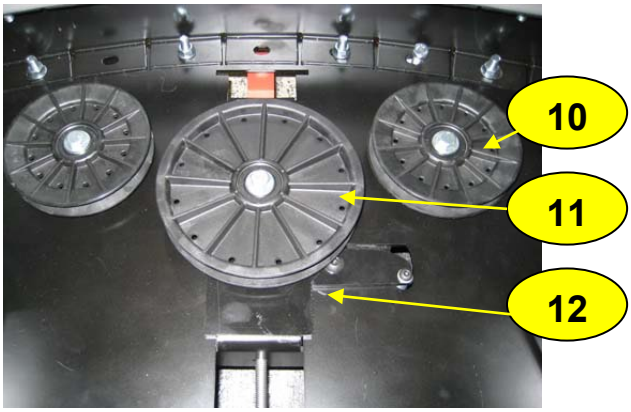


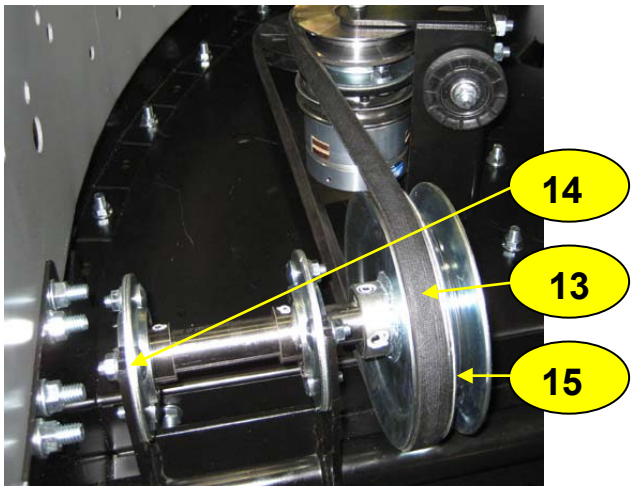








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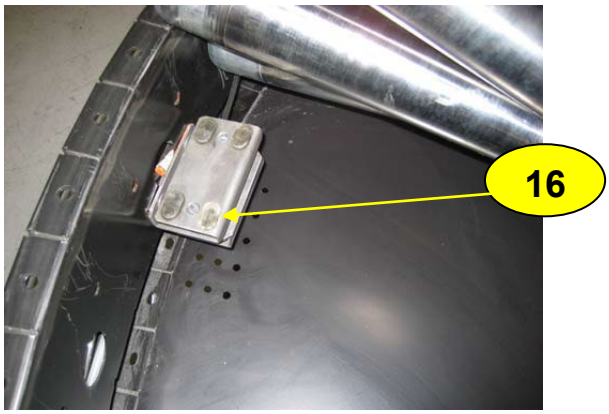
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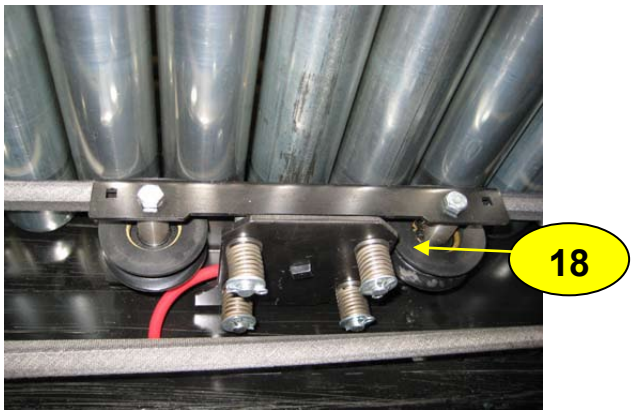
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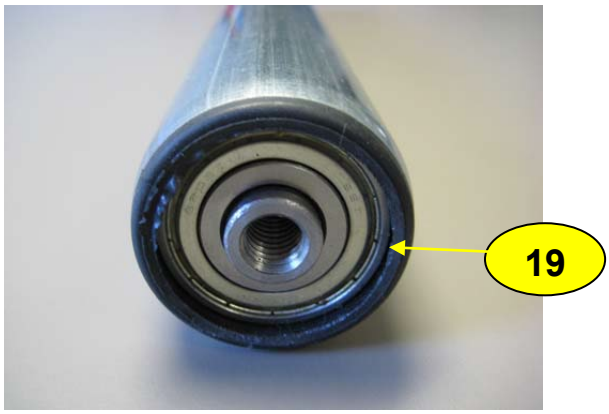
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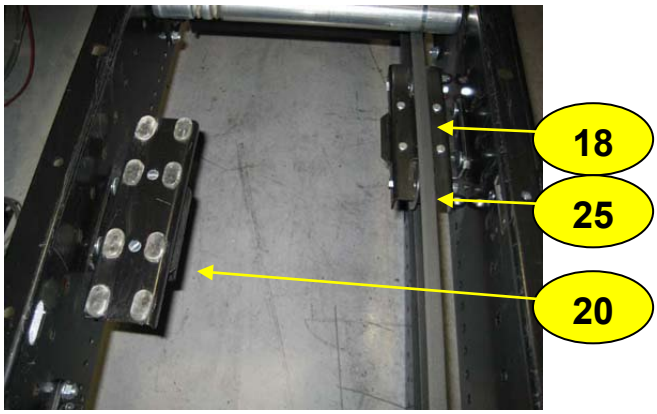
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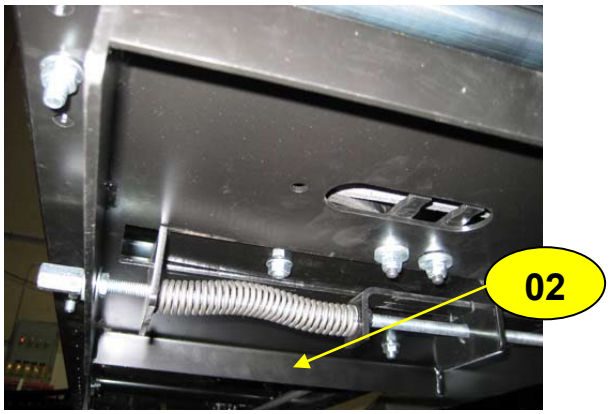
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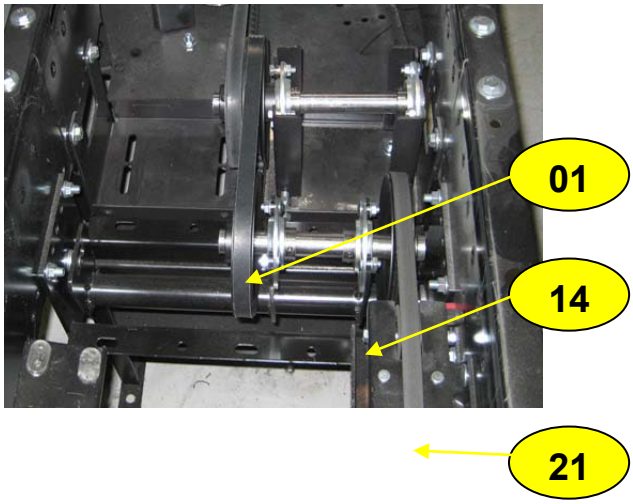
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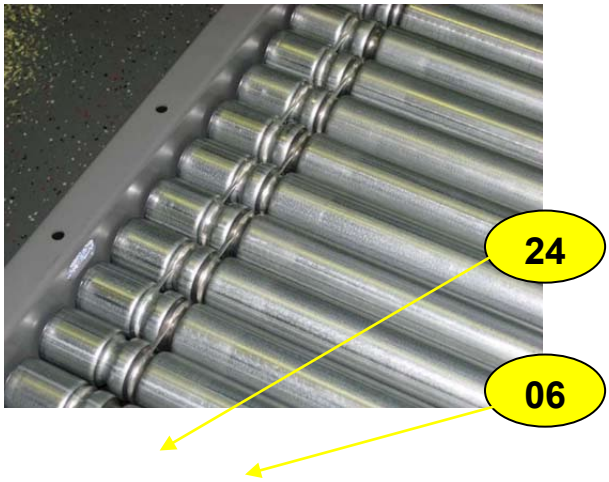
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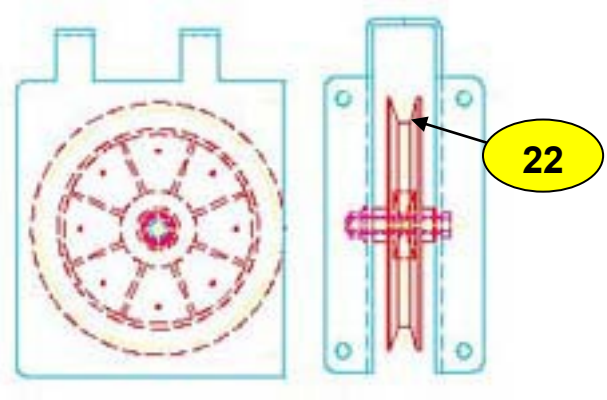
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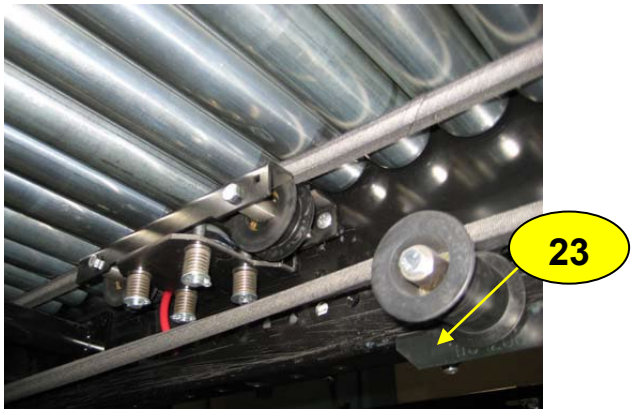
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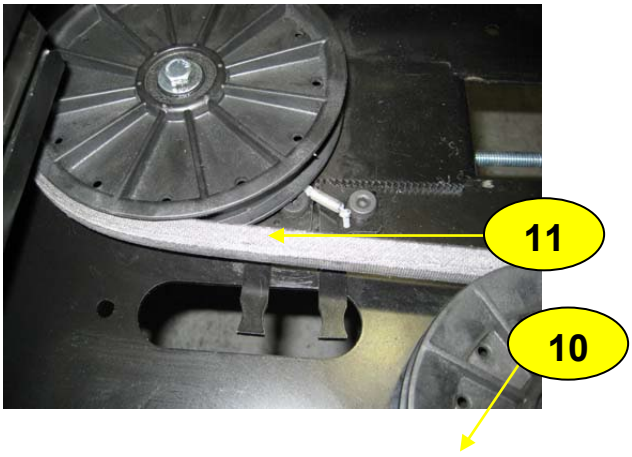
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REPLACEMENT PART NUMBERS FOR NBC V-BELT – CURVE AND STRAIGHT			
BALLOON NUMBER	**PART NUMBER**	**DESCRIPTION**	**USE FOR CURVE OR STRAIGHT**
01	1119237	Connection V-Belt 35” long	Curve and Straight
02	1118817	Compression spring 8” long Gen 1 w/release lever	Curve and Straight
02	1121193	Compression spring 6” long Gen 2 w/automatic release	Curve and Straight
03	1118856	Tapered Roller 16 BF	Curve
	1118848	Tapered Roller 22 BF	Curve
	1118860	Tapered Roller 28 BF	Curve
	1118861	Tapered Roller 34 BF	Curve
04	1119190	Oring straight to straight roller connection	Curve
05	1119191	Oring taper to taper roller connection	Curve
06	E0005252	Straight 1.9” roller 16 BF	Curve
	E0005253	Straight 1.9” roller 22 BF	Curve
	E0005254	Straight 1.9” roller 28 BF	Curve
	E0005255	Straight 1.9” roller 34 BF	Curve
	E0002412	16 BF	Straight
	E0002413	22 BF	Straight
	E0002414	28 BF	Straight
	E0006220	34 BF	Straight
07	1117896	Curve drive clutch pod	Curve
08	1119188	Flat idler pulley 4” dia.	Curve
09	1119195	Oring 5/16” x 21-1/2” clutch pod to rollers	Curve
10	1118819	Idler pulley 5” dia.	Curve and Straight
11	1118818	Flat idler pulley 6” dia.	Curve and Straight
12	1118829	Extension spring 1” long Gen 1 w/release lever	Curve and Straight
12	1120197	Extension spring 2” long Gen 2 w/automatic release	Curve and Straight
13	1119236	V-Belt main 90° curve drive B140	Curve
14	1105389	3-bolt flange bearing	Curve and Straight
15	1117761	V-pulley 6” dia. Steel	Curve and Straight
16	1118919	Curve brake assembly	Curve
17	1114948	Logic module, air to drive, V-Belt modules	Curve and Straight
18	1118975	As shown, Pressure Assy (Hose out left side)	Straight
	1119864	Pressure Assy Opp. shown (Hose out right side)	Straight
19		1.9” Dia. Roller with 5/8” dia. round axle tapped in ends.	Straight
	1120242	16 BF	Curve
	1120092	22 BF	Curve
	1120240	28 BF	Curve
	1119751	34 BF	Curve
	1122418	16 BF	Straight
	1122419	22 BF	Straight
	1122420	28 BF	Straight
	1122421	34 BF	Straight
20	1118933	Straight brake assembly	Straight
21	See bed tag or spare parts list for length	Main straight drive V-Belt	Straight
22	1119709	Fixed end pulley assy 6”	Straight
23	E0002212	Return V-Belt sheave assy	Straight
24		Oring straight to straight connection	
	90530005	3” roller centers	Straight
	E0005491	2” roller centers	Straight
25	1120257	Pressure assembly fixed in the UP position, no air required. For Transportation only.	Straight

MISSION

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

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