INSTALLATION, OPERATION, MAINTENANCE MANUAL

MHS CONVEYOR

NBS®BR IOM

Narrow Belt Sorter – Low Friction Bearing Rail

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Chapter 1: IOM INTRODUCTION

IOM Purpose

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

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

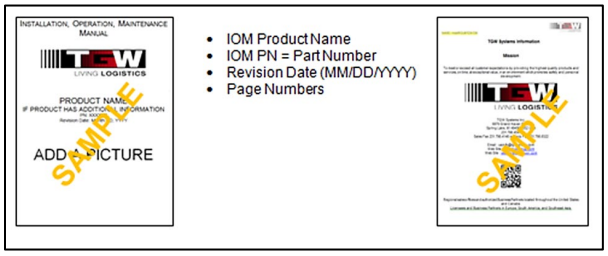
This service manual is intended for use by personnel who are knowledgeable of installation and safe working practices on conveyor systems.

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

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

Manual Structure

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



⚠ WARNING

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

Chapter 2: MHS Conveyor POLICIES

MHS Conveyor Equipment Warranty

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

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

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

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

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

Rev 03/01/2019

MHS Conveyor Environment Standards

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

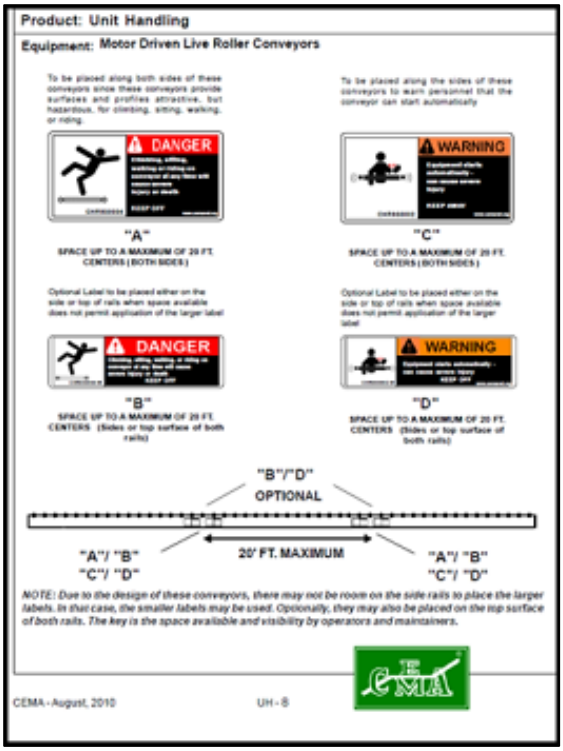
When installing conveyor on a new construction site, be sure that the concrete is properly cured before setting conveyor on it. In addition, if conveyors are stored in the proximity of curing concrete, proper ventilation must be used to direct the curing agent fumes away from the conveyor.

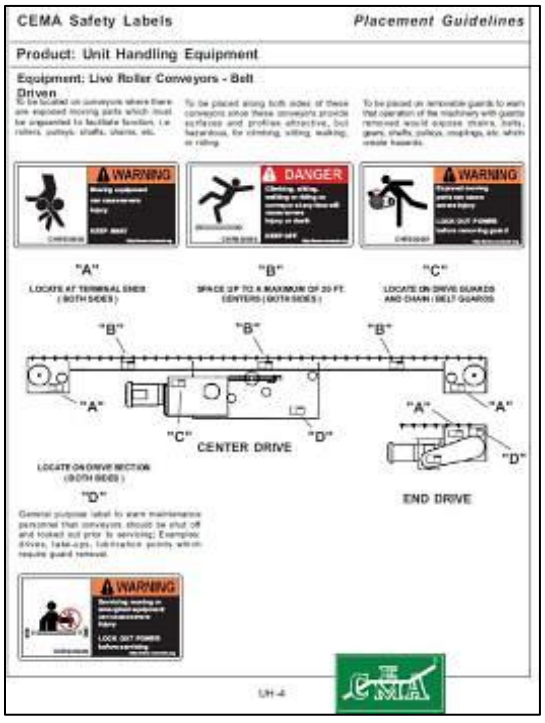
Failure to comply with these guidelines will void the MHS Conveyor warranty on any failed components that result from these environment issues.

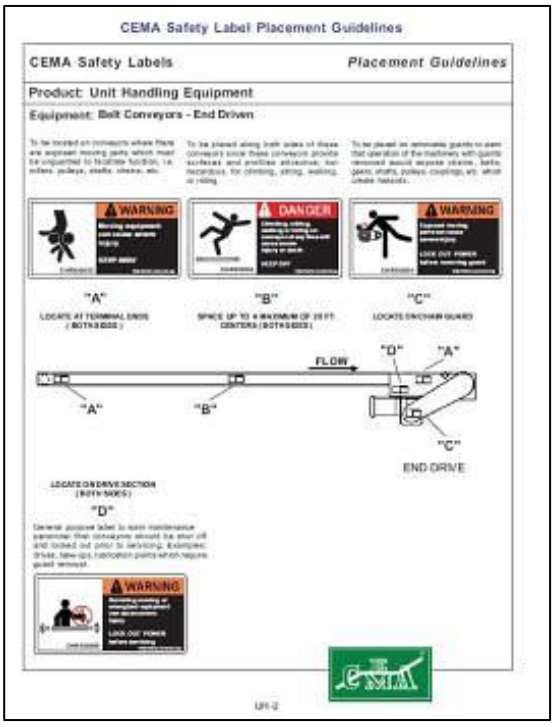
03/01/2019

2.1.1: CEMA Unit Handling Standard

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







2.2: WARNINGS AND SAFETY INSTRUCTIONS

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

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

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

DANGER

- Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING

- Indicates potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION

- Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

2.3: SAFETY WARNINGS

WARNING

- After maintenance, REPLACE guards immediately.
- Keep ALL warning labels clean and clear of any obstructions.
- Never remove, deface, or paint over WARNING or CAUTION labels. Any damaged label will be replaced by MHS Conveyor at no cost by contacting Lifetime Services.
- It is very important to instruct personnel in proper conveyor use including the location and function of all controls.
- Special emphasis must be given to emergency stop procedures.
- It is important to establish work procedures and access areas which do not require any part of a person to be under the conveyor.
- It should be required that long hair is covered by caps or hairnets.
- Loose clothing, long hair, and jewelry must be kept away from moving equipment.
- Maintain enough clearance on each side of all conveyor units for safe adjustment and maintenance of all components.
- Provide crossovers or gates at sufficient intervals where needed to eliminate the temptation for personnel to climb over or under any conveyor.
- Walking or riding on a moving conveyor must be prohibited.
- Before performing maintenance on the conveyor, make sure the start-up controls are locked out and cannot be turned on by any person other than the one performing the maintenance.
- If more than, one crewmember is working on the conveyor, EACH CREW MEMBER MUST HAVE A LOCK ON THE POWER LOCKOUT.
- All pneumatic devices must be de-energized and air removed to prevent accidental cycling of the device while performing general maintenance.
- Make sure all personnel are clear of all conveyor equipment before restarting the system.
- Before restarting a conveyor which has been stopped because of an emergency, an inspection of the conveyor must be made and the cause of the stoppage determined. The starting device must be locked out before any attempt is made to correct the cause of stoppage.

⚠ WARNING

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

2.4: MHS Conveyor CONTROLS SAFETY GUIDELINES

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

Start-up Warning Horn

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

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

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

Start Pushbuttons

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

Stop Pushbuttons

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

Operator Controls

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

Emergency Stops

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

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

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

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

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

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

Controls Logic

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

Safety Switches

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

Special Devices

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

Rev 03/01/2019

Chapter 3: NBS INTRODUCTION

NBS Concept

The MHS Conveyor NBS Narrow Belt Sorter technology was developed to provide an economic alternative to other sortation devices, as well as providing sorting options that were not easily available.

This technology is similar to sorters that use wide flat load carrying belts and pop-up wheels to divert product but has eliminated many of the high cost / maintenance features associated with these sorters.

Limitations on availability of bi-directional diverts, long divert lane center-line distances, as well as the high costs associated with the skilled labor required to install these wide belts have been addressed with this technology.

Features and Benefits

Features and benefits common to the NBS 30, NBS 90 low friction rail technologies include:

- Product is continuously carried on multiple narrow belts for smooth bump-free conveying and excellent tracking accuracy.
- Narrow belts slide on low friction roller bearing guides, resulting in reduced noise and virtually eliminating tracking problems.
- Multiple narrow belts are progressively guided through the sorter to minimize belt tracking issues
- Narrow belts run flat and straight through NBS modules without snubbing or back-wrapping resulting in reduced horsepower requirements.
- Simple user-friendly design allows ease of installation and maintenance.
- Compact modular design of modules allows closer divert/transfer lane center distances.
- Modularity and universal mounting of modules allows easy repositioning or reconfiguration in the field.
- Gravity take-away or spurs may be used in many applications to lower initial costs.
- NBS technology costs less than conventional full width belt sorters in material as well as installation costs.

3.1: NBS 30 AND NBS 30 WAVE™

- Simple 30 degree diverter design means less maintenance and higher uptime.
- Diverters use proven true vertical lift for reliability, consistency, and low cost 3 rows and 5 rows only.
- High friction, diverter wheels with precision bearings for positive quiet sorting
- Conveyor Action allows for close product centers and higher through put rates.

3.2: NBS WAVE 200

- Rates to 200 CPM with 18" long product and maximum 6” gap at 425 FPM.
- Snubber roller has ABEC-1 precision bearings.
- Does **NOT** change product orientation when using a 30° spur take away conveyor.
- Maximum speed 425 FPM.
- Operating air pressure is 40 PSI with a maximum of 45 PSI
- Gap between products from the original 12” down to 6” recommended, with a tolerance of (± 3”).
- Products should be edge aligned to cover the first spur side divert wheels or approximately 1”off the spur edge, and should contact the inside first wheel. (See above edge aligned drawing). Contact Engineering Support for application specific solutions.
- Distance between diverts utilized TGdraW for accurate layout or contact MHS Conveyor Applications Engineering.

3.3: NBS-90 & NBS90-SL

- Separate drive within the transfer module allows a space saving single or bidirectional unit NBS90 is driven with a MOVIMOT motor. NBS-SL is driven off the return side of the belt.
- Coated rollers allow positive product acceleration and transfer rate
- Pickup of product “on the fly” allows maximized sort rate

Definition of Terms

KEY WORD	ABBREVIATION	DESCRIPTION
ALUMINUM RAIL	AR	Original NBS UHMW belt guide holders
AIRBAG		Inflatable lifting device used in NBS30
BEARING	BRG	Low friction rotating or sliding device
BEAR RAIL	BR	NBS-BR belt guides composed of small ball bearings between steel side rails
BELT	BLT	Flexible load carrying surface or O-ring
BETWEEN-FRAME	BF	The distance between conveyor side frames
BRACKET	BRKT	Attachment between a main and another part
CHANNEL	CH	Structural side member of conveyor equipment
CONNECTOR	CONN	Holds two parts together (Mechanical or Electrical)
CONSTRUCTION ORDER	CO _ _ _ _ _	Item number of modified standard
CROSSMEMBER	XM	Holds channels apart
DIVERTER		NBS30 module
DRIVE	DR	Power unit at the discharge end of NBS sorter
ELEVATION	EL	Top-of belt height above base surface
ENCODER		Electrical distance counter used to track package location along the sorter length
END PULLEY	E-PULL	4” or 5" diameter roller at charge end of NBS sorter
EXTRUSION		Aluminum base that holds UHMW belt strips (See ALUMINUM RAIL)
FEET PER MINUTE	FPM	Speed sorter belts are traveling
FILTER / REGULATOR		Combination air pressure air filter / regulator
FLOOR STAND	FS	Name for conveyor bed support
FLOW CONTROL		Needle valve used to control airflow
GEARMOTOR	GEARMTR	One piece gear-reducer motor assembly
GUARD RAIL	GR	Angle or channel used to keep product on NBS
GUARD	GRD	Any part used to protect area for safety reasons
IDLER	IDL	Un-driven pulley used as a tensioning device
ITEM NUMBER	IT #	MHS Conveyor part identification number
KEY		Square locking device used on rotating shafts
KIT		Group of several parts with a single item number
LACED	LCD	The condition of a correctly installed lacing
LACING		Type or method of joining belts together (splice)
LIFT FRAME		The lifting structure of a NBS90 transfer
LIFT TABLE		Assembly that guides the NBS30 wheels upward
LOCKNUT		Self-locking fastener that resists vibration
LOCTITE		A thread-locking adhesive that resists vibration
LOOSE PARTS	LP	Individual parts that must be installed in the field

KEY WORD	ABBREVIATION	DESCRIPTION
MODULE	MOD	A self-contained mechanical assembly
MOUNT	MNT	Part used to hold another, similar to a bracket
MOUNTING	MTG	Location and fasteners to attach a mount
MOTOR	MTR	Rotational power source usually using electricity
MUFFLER		Device used to reduce the noise of exhausted air
NATIONAL PIPE THREAD	NPT	Standard identifier for USA tapered pipe sizes
ORDER NUMBER	11 _ _ _ _ _	Original factory order / tracking number
O-RING		Polyurethane cord belts of differing lengths
PHOTOEYE	PE	Optical sensing device used for product control
PLATE	PL	Flat piece of metal usually bolted on for strength
PROGRAMMABLE LOGIC CONTROLLER	PLC	Self-contained programmable control unit that can control several input and output devices
PULLEY		Roller described by diameter and body length
REFLECTOR	RF	Target used to reflect a light back to a photo eye
REGULATOR	REG	Air device that reduces pressure to usable level
ROLLER		Described by axle size and BF dimension
SCANNER		A device that recognizes products by bar codes
SCHEMATIC		Line drawing of a electrical or pneumatic circuit
SEAL		Sealing device on a rotating shaft or cylinder rod
SHAFT		Round steel rod described by diameter and length
SHEAVE		A grooved disc that guides a V-belt or O-ring
SHIM		Thin piece of metal, used to fill up a space
SKATEWHEEL	SKW	2” diameter X 5/8” wide X ¼” axle hole roller
SOCKET	SOC	Hex shaped hole in an Allen screw
SOLENOID	SOL	An electrically operated multi-position air valve
SPACER		Thick washer or tube that a fastener passes thru
SPLICE		Area where similar materials are joined together
SPRING	SPR	Coiled wire device used for un-powered return
SPROCKET	SPKT	Wheel with shaped teeth that engage roller chain
SPUR		Transition bed between a diverter and exit lane
STANDHEAD		Pivoting bracket that attaches support to the bed
STARTER		Electrical relay that energizes the drive motor
TAG		Number that identifies unit in system lay-out
TAKEUP		Assembly used to remove slack from a belt / belts
TEE		A part with three connections locations
TENSIONER		A pneumatic, spring, or static take-up device
TRANSFER	TRNS	NBS90 and NBS-SP module

KEY WORD	ABBREVIATION	DESCRIPTION
ULTRA HIGH MOLECULAR WEIGHT	UHMW	Industry standard term for the hard milky white Polyethylene used in wear strip applications
VALVE		An air shut-off or switching device
VENT		Small hole in gearbox to allow air expansion
WEARSTRIP		Low-friction material used to reduce rubbing wear
WELDMENT	WLDMT	Any part that requires welding in its manufacture
VFD	VFD	Variable Frequency Drive for motor speed control

3.4: PRODUCT DESCRIPTIONS

Narrow Belt Sorter
NBS
Takeup Bed

TYPE	MODEL	WIDTH	BED TYPE	BELT RAIL STYLE	LENGTH	TAKEUP TYPE
BED	NBS	18W	TAKEUP	BR	5'0"	AIR OP

EXAMPLE: BED,NBS-18W-TAKEUP-BR
5'0"-AIR OP

PRODUCT DESCRIPTION: Bed, NBS Conveyor,18" Wide, Takeup Bed, BR (Bearing Rail) Belt Rail
5'0" Overall Length, Air Operated Takeup

Narrow Belt Sorter
NBS
Drive Bed

TYPE	MODEL	WIDTH	BED TYPE	DRIVE DRUM	DRIVE TYPE	BELT RAIL STYLE	DRIVE SIDE	LENGTH	TAKEUP TYPE
BED	NBS	25W	D	8"STD	EDR	BR	RH	5'0"	W/AIR TAKEUP

EXAMPLE: BED,NBS-25W-D-8"STD-EDR-BR-RH
5'0"-W/AIR TAKEUP

PRODUCT DESCRIPTION: Bed, NBS Conveyor, 25" Wide, Drive Bed, 8" Drum for Standard Drive (vs. LP for Low Profile Drive), End Drive, BR (Bearing Rail) Belt Rail, Right Hand Drive Side
5'0" Overall Length, With Air Operated Takeup (vs. L/AIR TAKEUP - Less Air Takeup)

Narrow Belt Sorter
NBS
Drive Train

TYPE	MODEL	DRIVE DRUM	MOTOR POWER	VELOCITY	DRIVE TRAIN	DRIVE SIDE
DR-TRAIN	NBS	8"LP	2.00HP	120FPM	DIRECT	RH

EXAMPLE: DR-TRAIN,NBS-8"LP-2.00HP
120FPM-DIRECT-RH

PRODUCT DESCRIPTION: Drive Train, NBS Conveyor, 8" Drum for Low Profile Drive, 2.00 Horsepower
120 Feet Per Minute, Direct Drive, Right Hand Drive Side

For the most current list of **"Product Description"** and **"Terms and Abbreviations"** Log into mhs-conveyor.com and select Support/Engineering Support Documents.

Chapter 4: NBS Receiving and Site Preparation

Receiving

MHS Conveyor NBS Narrow Belt Sorters are shipped in subassemblies. These subassemblies are packaged to guard against damage in shipment, when handled properly.

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

CAUTION

- **TAKE CAUTION DURING THE REMOVAL OF EQUIPMENT FROM THE CARRIER**. Remove small items and boxes first. Pull and lift only on the skid, not on the frame, cross member or any part of the conveyor equipment.

Preparation of Site

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

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

4.1: PARTS INVENTORY & IDENTIFICATION

Each subassembly is shipped completely assembled except the bed joint splice plate/nuts which are shipped with other loose parts. Identify and separate the sorter subassemblies by type or tag number, for inventory and ease of locating during installation.

An identification label is attached to the inside of one side channel or on a cross member, close to one end of each conveyor bed.

Labels may contain the following information:

Item number

- Item number
- Description
- Job Number
- Mfg. Number
- Date of manufacture
- Tag number (if specified)
- Assembler's clock number
- QR (Quick Response) Label
  - Scan Code For IOM Manual

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

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

On special devices, it is located on a convenient flat surface that is not offensive to the appearance of the equipment but is still accessible for viewing.

These numbers can be cross-referenced against the packing list.

Loose parts are boxed and shipped separately.

You should have all conveyor sections and supports for a particular conveyor prior to installation.

It is cost-effective to identify and procure any missing parts before they are needed for assembly.

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

⚠ WARNING

- The Installation Supervisor must be experienced with conveyor, qualified in the mechanics of the equipment, and enforce safe working procedures for the protection of the crew, customer, and customer's property.

WARNING	
	• Before restarting a conveyor which has been stopped because of an emergency, an inspection of the conveyor must be made and the cause of the stoppage determined. The starting device must be locked out before any attempt is made to correct the cause of stoppage.

Chapter 5: NBS Application & Installation Details

- NBS Selection Guidelines
- Use NBS when:
- Medium to high speed sortation is required
- Product may be same size and weight, or mixed
- Product weight: 1-75 lbs., 1500 lbs. total load
- Product size: 6" x 9" Min -- 28" x 28" Max
- Ambient temperature is +33° to 120°F

5.1: Application Rules & Guidelines

Matching conveyor rates before and after NBS sortation are vital to proper application decisions.

The take-away lanes from NBS can be either Skatewheel / gravity (used as a deceleration area), or powered conveyor, run at a speed which can receive products as fast as they are released from the NBS.

- The maximum divert rate for a NBS 30 is 100 CPM (18" X 18" cases moving at 300 feet per minute); NBS 30 WAVE is 200 CPM at 425 FPM; NBS 90 is 65 CPM single-direction, 55 CPM bi-directional.
- When feeding NBS sortation, use a split metering belt to singulate individual products with a minimum gap of 18". For NBS 30 WAVE, minimum gap is 6″.
- For NBS 30 and NBS 30 WAVE, align all products along the “Spur” side of the NBS sorter.
- The maximum length of an NBS sortation conveyor is 45' when using the 5' Drive Bed.
- The maximum length of an NBS sortation conveyor is 200' when using a 6' Drive Bed.
- The minimum length of an NBS sortation conveyor is 11'-6". (5' Drive Bed, 1'-6" End Pulley & 5' Divert Bed)
- All units require 1/2” gap before and after the unit for maintenance access to the end covers.
- Maximum speed for NBS is 425 FPM.
- A VFD is required for all NBS sortation conveyors for speeds at 200 FPM and above.
- All product conveying on an NBS sortation conveyor cannot sag below the surface of the belts.
- The Gearmotors used for NBS drives are all VFD (variable frequency drive) rated.

CAUTION

- The use of a VFD (Variable Frequency Drive) is required for NBS drive motor control. Ignoring this point will void the belt and motor manufacturer’s warranty.

WARNING	
	• NBS 90 Transfer motors must be controlled to run on demand ONLY! Motors running continuously will cause component failure.

Elevation (Top-Of-Belt, TOB)

The minimum TOB to floor elevation at the discharge end of an NBS sortation line is 25". This elevation includes 23-1/2" for the drive unit at the discharge end, and 1-1/2" (minimum) for the NBS Low Elevation Support (LES) used on the drive unit. The length of the drive is based on the overall conveyor length: up to 45’ is a 5′ drive bed, and over 45′ is a 6′ drive bed. Extra room alongside the drive should be provided to allow maintenance personnel access to either side of the drive unit.

Divert Locations

- The leading edge of the first divert module must be a minimum 28" from the charge end of the sorter.
- The trailing edge of the last divert module must be a minimum 70" (5’ DR bed) or 80” (6’ DR bed) from the discharge end.
- The leading edge of a 30° spur mounts 5-1/2" ahead (upstream) of the center line of the second row of wheels on a NBS 30 divert. (Reference drawing)
- The location of a divert lane is centered or slightly downstream of the centerline of the transfer rollers in a NBS 90.
- Set spur height to be level with the 3rd or 3rd thru last row of wheels on the sorter/divert approximately 3/8" above the belts, reference drawing.
- One NBS 90 transfer with rollers up to 45" in length can transfer to two or four separate lanes.
- A single-direction transfer to two lanes one side is called a "Dual Transfer"
- A bi-direction transfer to two lanes each side is called a "Quad Transfer"

Available Drive Selections

- 2 HP @ 120, 150, 180 FPM
- 2 HP @ 200, 220, 250, 300 FPM
- 3 HP @ 180, 200, 220, 250, 300 FPM
- 5 HP @ 250, 300 FPM
- 7.5 HP @ 300, 325, 375, 425 FPM

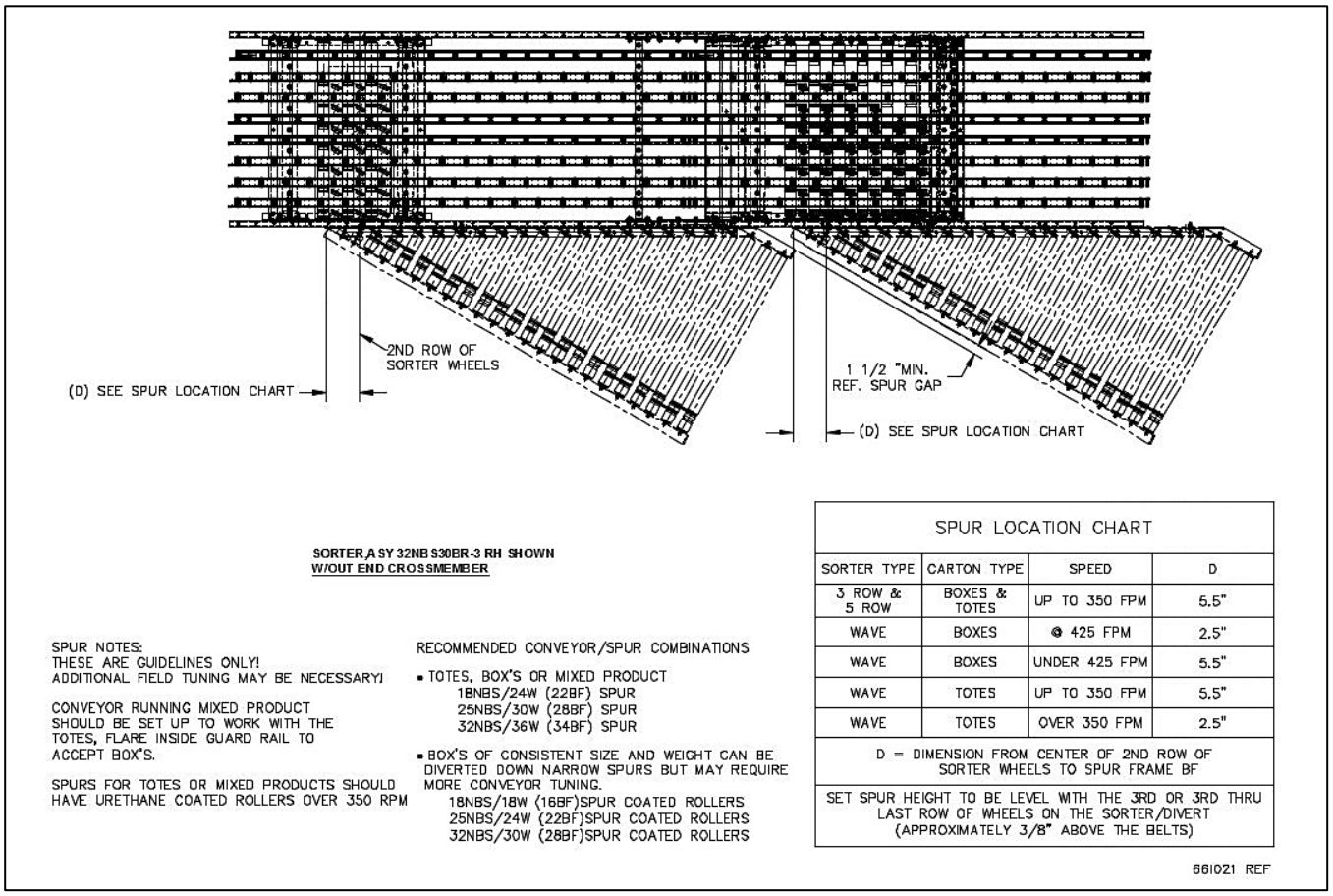
Sorter Nominal Widths (Number of belts)

- 18" with 4 Belts on 3-1/2" Centers
- 25" with 6 Belts on 3-1/2" Centers
- 32" with 8 Belts on 3-1/2" Centers

5.1.1: Spur Location (Both NBS 30 and Wave Divert)

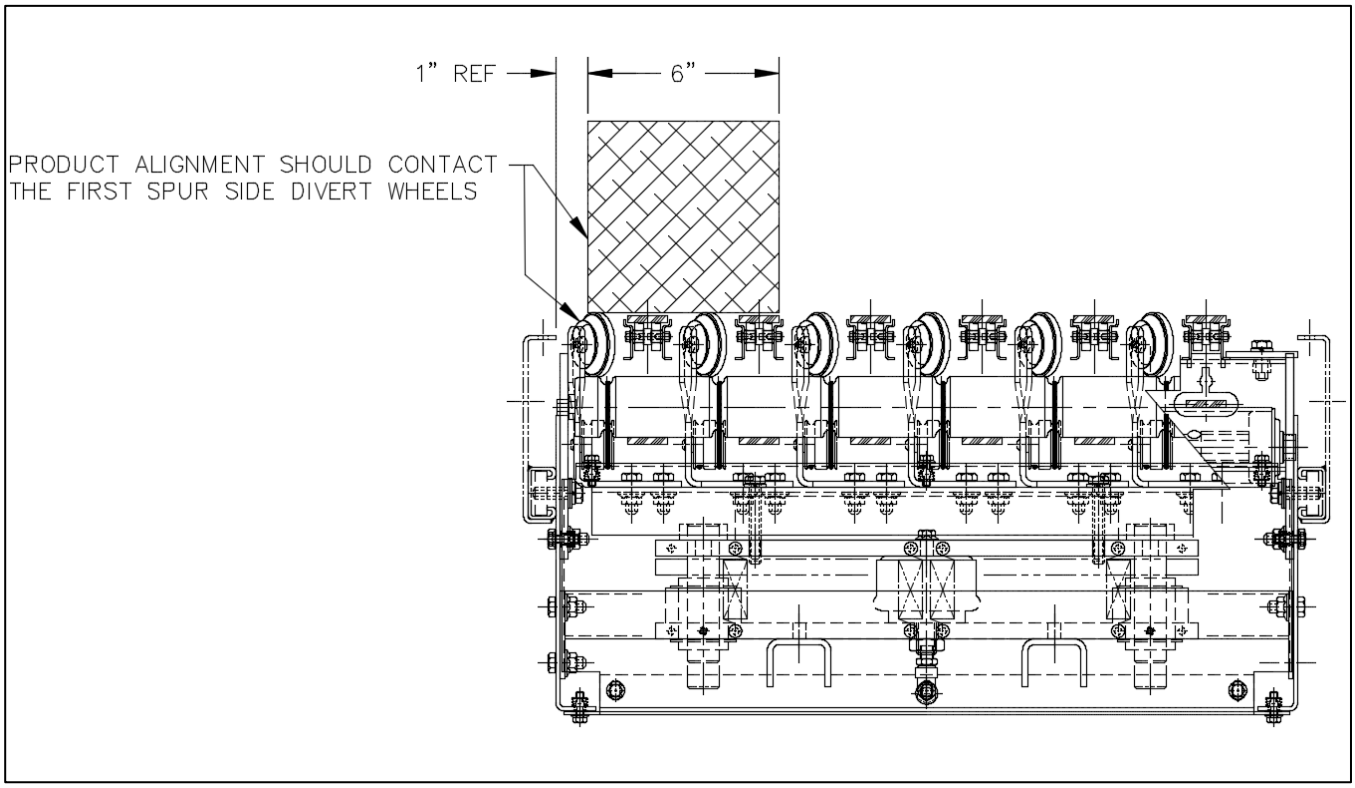
Note:

Spur frame is bolted directly to NBS Sorter / Divert Bed frame side channel.



5.2: PRODUCT ALIGNMENT

Products should be edge aligned to cover the first spur side divert wheels or approximately 1” off the spur edge, and should contact the inside first wheel.



Shown is 6” box approximately 1” off edge aligned on an NBS30

Correct alignment – product contacts the first spur side divert wheels.

Wrong alignment - missed contact with the first spur side divert wheels.

Chapter 6: NBS Installation Details

General Procedures

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

Dimensional Reference Points

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

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

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

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

⚠ WARNING

- The Installation Supervisor must be experienced with conveyor and qualified in the mechanics of the equipment and enforce safe working procedures for the protection of the crew, customer, and customer's property.

⚠ WARNING

- Before restarting a conveyor which has been stopped because of an emergency, an inspection of the conveyor must be made and the cause of the stoppage determined. The starting device must be locked out before any attempt is made to correct the cause of stoppage.

6.1: General Electrical Requirements

⚠ WARNING

- All electrical controls must be installed, wired, and connected by a licensed electrician only.
- 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 electrical voltage of the motor will be stamped on the metal nameplate. This voltage should be checked to see that it matches your available voltage. Many motors, both single phase and three phase, are dual voltage. Consult the wiring diagram on the motor for the proper connections. If a three-phase motor on a single direction conveyor runs the wrong direction, two of the three leads must be switched to reverse rotation.

⚠ WARNING

- Do not connect the motor to any other voltage than stamped on its metal nameplate.

Consult the wiring diagram on the inside cover of the starter and push-button station for the proper electrical connections.

Three-phase drives require transformers to reduce the push-button 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 control equipment is covered by the original manufacturer's equipment warranty.

WARNING	
	• All safety devices, including wiring of electrical safety devices, shall be arranged to operate in a “fail safe” manner. That is, if power failure or failure of the device itself would occur, a hazardous condition must not result.

NEMA type 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 dust and dirt.

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 and oil, and drippings of noncorrosive liquids suitable for use in industrial environments.

NEMA 13 - Indoor use: Provides protection against dust, dirt, sprayed oil and noncorrosive liquids.

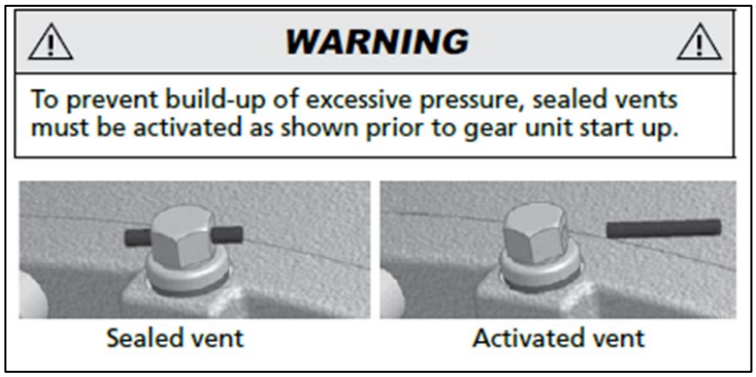
6.2: Gear Motor Activation

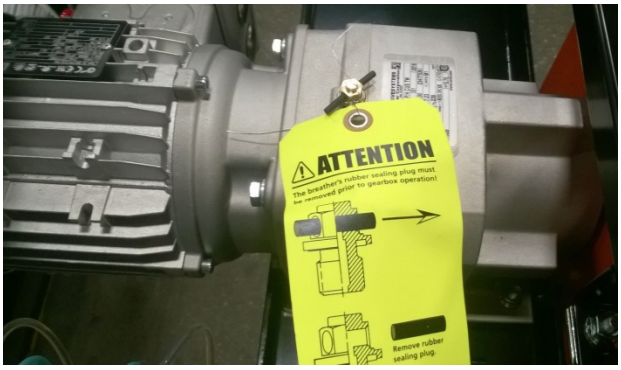
PRIOR to systems activation - Please inspect the gear unit for a vent and if applicable to the product remove the rubber sealing plug to activate. The vent is designed to allow excessive pressure to escape. Each gear unit should have a yellow instruction tag as shown below. The tag can be removed after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

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

⚠ WARNING	
	• In order for the gear motor to release pressure, the vent must be activated by removing the rubber sealing plug PRIOR to gear unit start up.

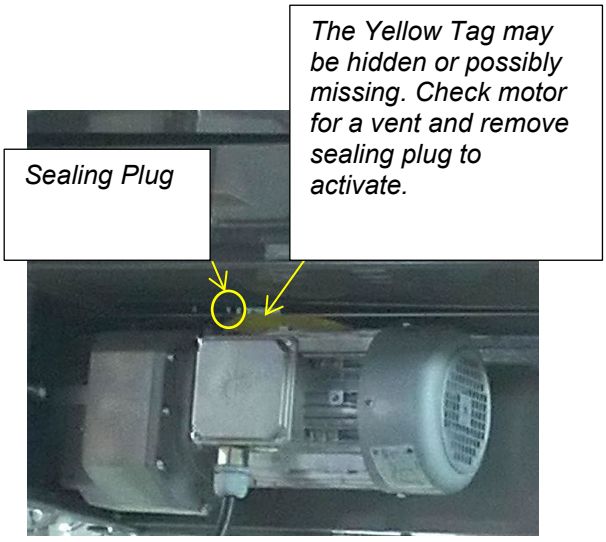
Please check you gear unit for a vent and if applicable to your product, remove the sealing plug to activate. “https://www5.nord.com” Operation Manual for Gear Units (B1000).

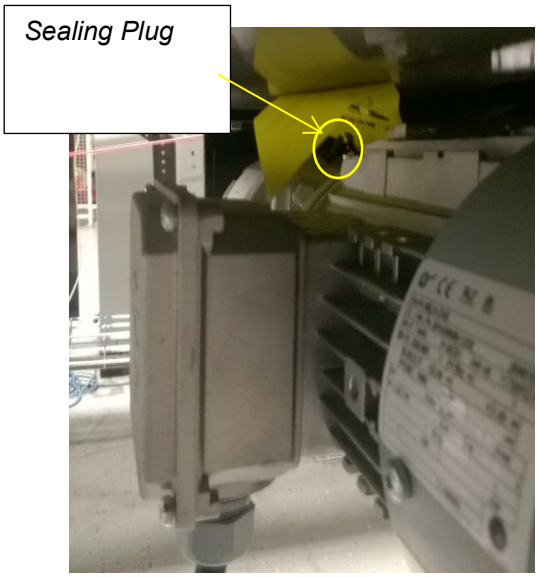


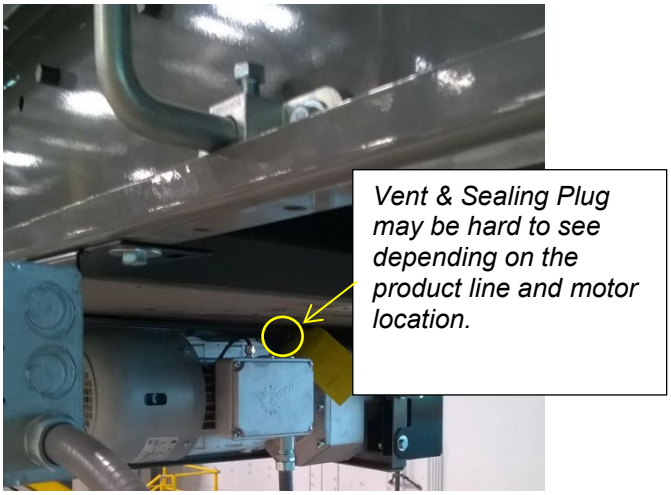


Note: Yellow tags may be tucked out of sight. Please inspect all motors for a vent and remove sealing plug, if present, to activate.

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







6.3: ELEVATIONS

All top-of-belt (TOB) heights should be installed in accordance with the elevations shown on the drawings. In addition, all sortation devices must be level across both the frame width and length. Leveling of the frames is best done using a rotating laser level along the length of the conveyor and a builder's level across the width.

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

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

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

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

Component Orientation

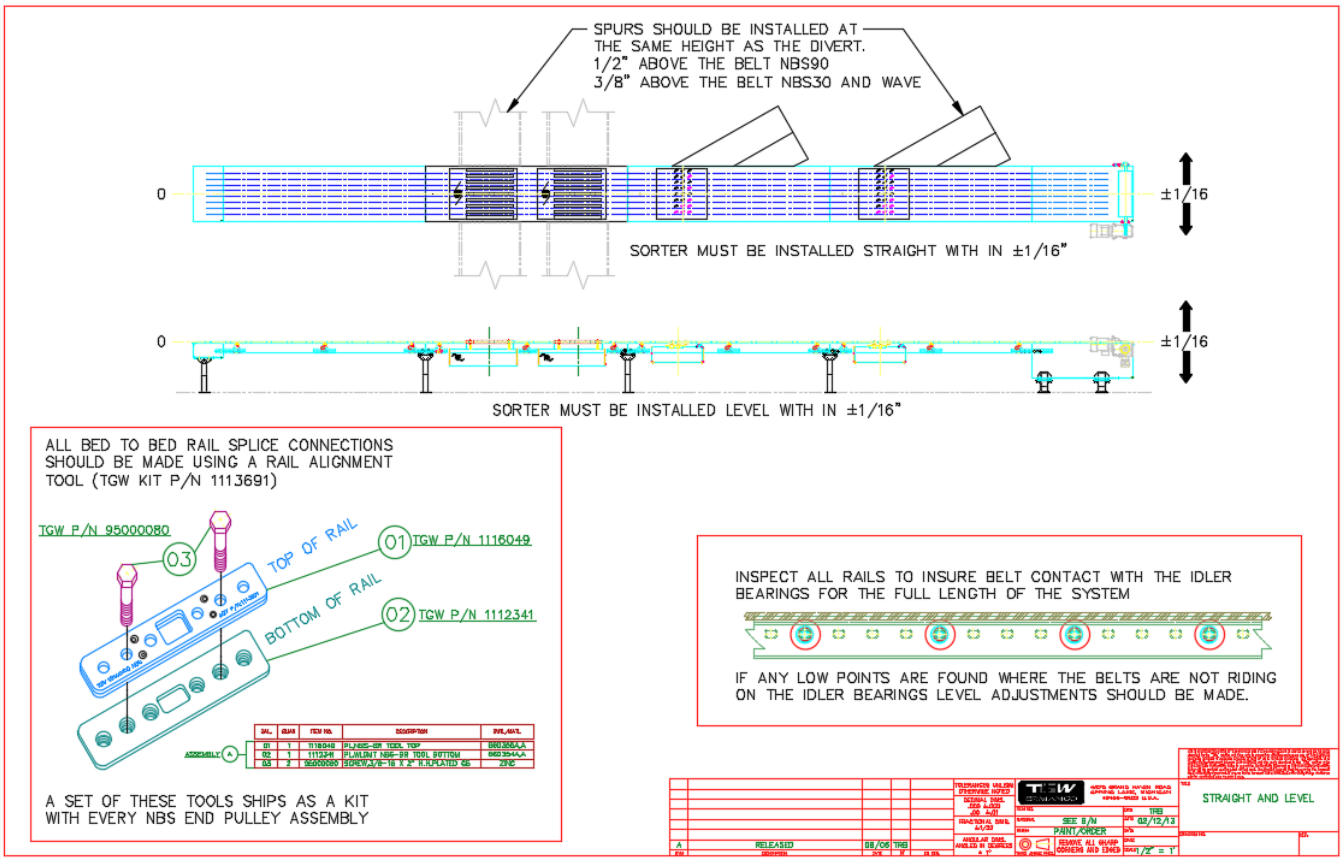
Using your conveyor system layout drawing and the numbers on the I.D. tags on each component, position and orients the conveyor sections. You must know:

- The direction of product flow
- The elevation height
- The drive is positioned at the discharge end
- The end pulley is positioned at the charge end

IMPORTANT!

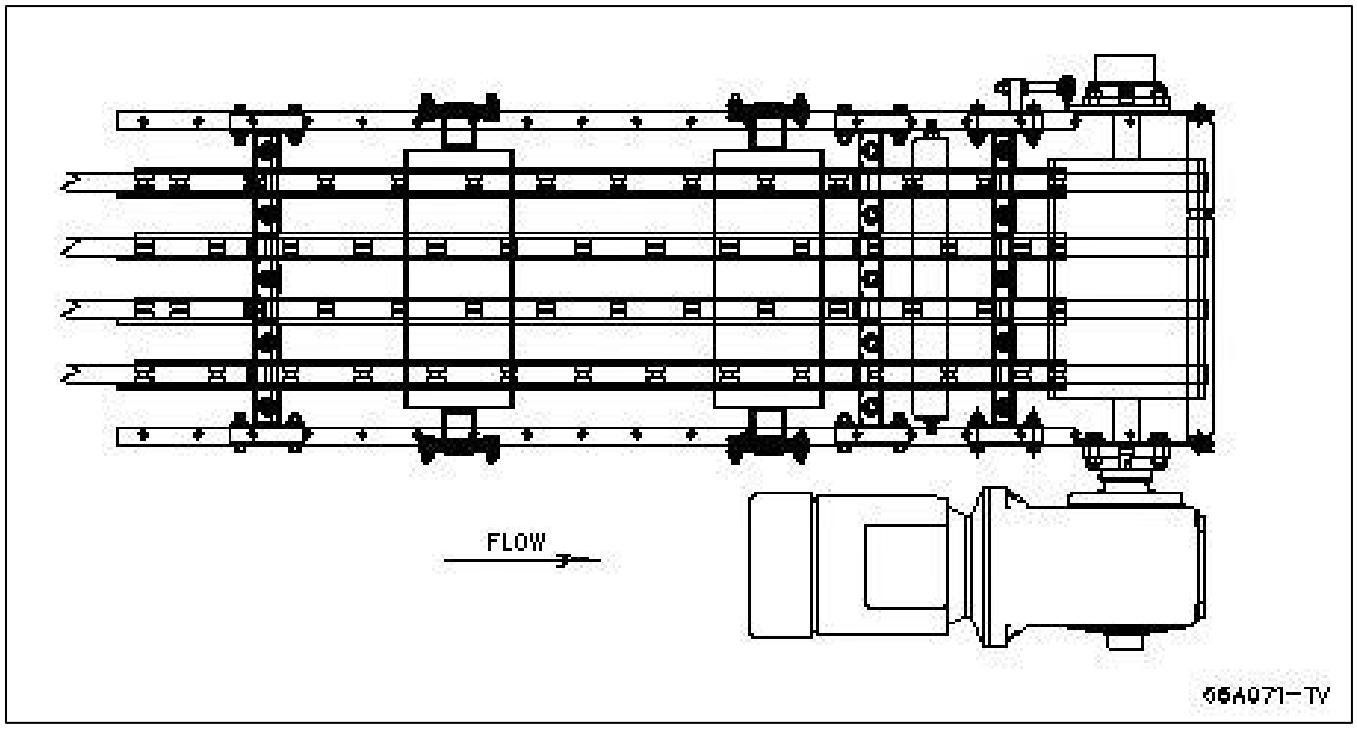
Do not make alterations to the equipment without consulting with user's representative and MHS Conveyor. Unauthorized modifications to the equipment may impair its function, create a hazardous condition, affect its useful life, and/or void the warranty.

6.3.1: Straight and Level



Sorters must be installed straight and level.

Discharge end product flow



Discharge end drive bed with product flow

6.4: Supporting Arrangement

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-belt elevations. The difference between top of belt (TOB) and top of support is 7-5/8". This dimension must be subtracted from the TOB height to set support height.

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 stand-head of the support.

6.5: Supports & Connections

Roll Formed (RF) supports replace all existing MHS Conveyor floor supports.

For details on Supports & Connections see Support & Connections IOM (#1200485) at https://mhs-conveyor.com/support/iom-manuals/supports-and-connections

6.6: 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 at a 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" in diameter.

⚠ WARNING

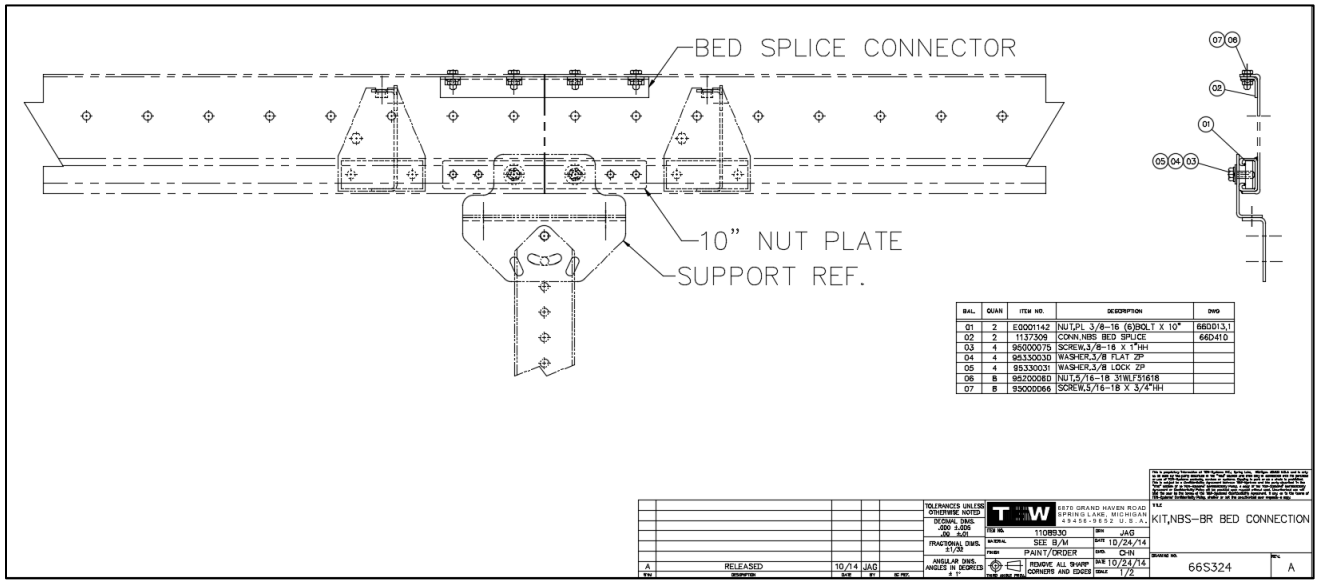
- Place a bolt through the frame and support immediately with finger tight nut. This will prevent the frame from falling off the support, if bumped, and causing injury.

6.7: BED/SUPPORT CONNECTORS

NBS can **ONLY** be supported at bed joints. Install the sortation conveyor (drive bed thru end pulley) on supports. Leave approximately 1/16″ gap between low friction rail joints. The conveyor must be level and straight. Adjoining beds are connected using 3/8″ thick by 10″ nut plate, 3/16″ thick by 10″ clamping plate and 3/8″ hardware. These parts are shipped with other loose parts. Insert 10″ nut plate halfway into the formed channel end of each bed.

Mount standhead support with two 3/8-16 x 1″ hex head bolts with flat and lock washers. After that mount 10″ clamp plate to channel ends with four 3/8-16 x 1″ hex head bolts with nut, flat and lock washers (see picture below). It can be seen that a crossmember could be moved into the recessed area of the standhead support bracket if needed.

Maintaining the rigidity and flatness of the conveying surface is the end result of proper support installation.



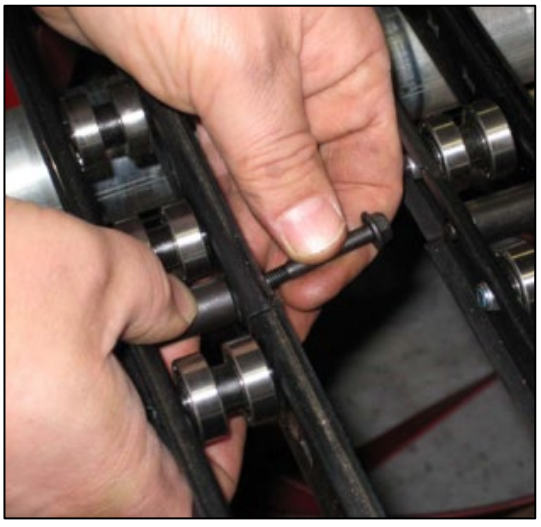
Low Friction Rail Overlapping Splice Connection Kit#1108930

6.8: INSTALL LOW FRICTION RAIL CONNECTORS

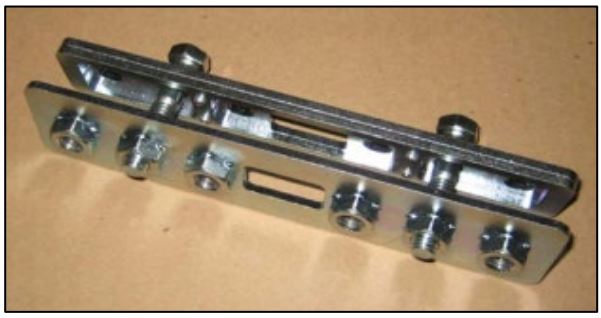
Install low friction rail connectors at all rail joints. Each low friction rail connection consists of a M5 hex head bolt, a M5 nylon locking nut, and a ½″ dia. connecting spacer. These parts are bagged with the quantity required for each bed, and shipped with other loose parts.

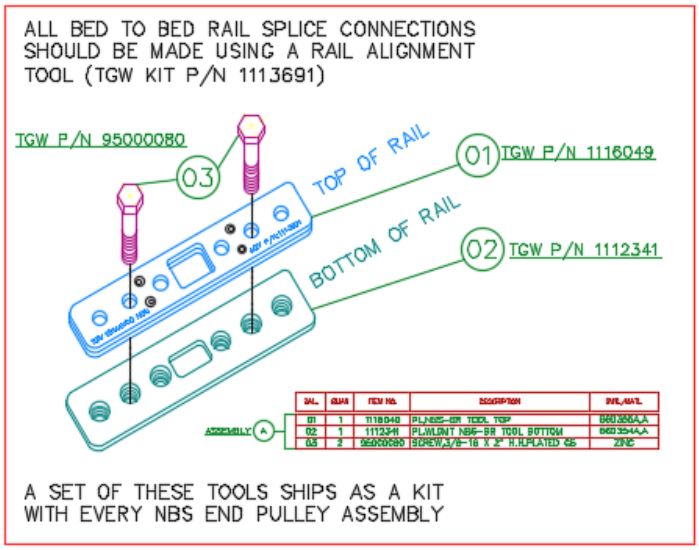
6.9: RAILING ALIGNMENT PROCEDURE

Install rail connector by placing the connector between the offset rails at the joint. Slide mounting screw thru rails and spacer and place nut on the other end. Do not tighten connector hardware at this time.



Installation of the connecting spacers requires an alignment tool (MHS Conveyor Kit part no.1113691). The tool is used to ensure a smooth straight transition from bed to bed with each job and should be shipped with the loose parts for the end pulley assembly.

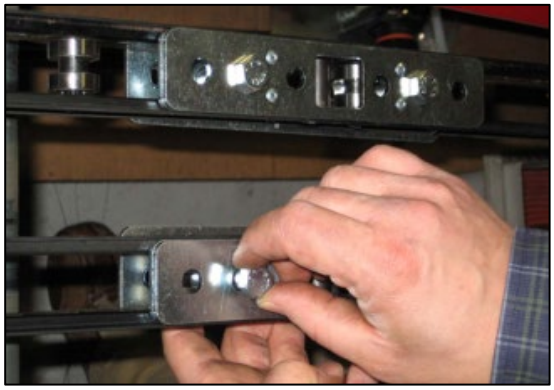


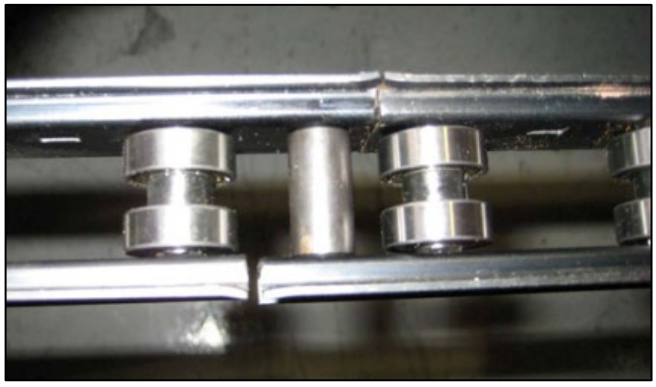


Place top plate of rail alignment tool between guide covering bearings at the joint. Slide the bottom nut plate under the low friction rail with the nuts facing down. Thread (2) 3/8-16 x 2″ hex head screws thru top plate and into the bottom nut plate and snug hardware to clamp plates to rail.

CAUTION

- **Do not over tighten** clamp plates to the rails as this may crush and permanently damage the rails.





The rail assemblies are built with a 1″ offset and are mounted flush to the charge end of the bed. The offset extends beyond the discharge end of the bed allowing an overlap with the up stream bed. There should be approximately a 1/16″ gap between the low friction rails at the joints. Tighten M5 hardware for rail connector. After connector hardware is snug, remove alignment tool and repeat process for each rail joint.

The low friction rail belt guides are installed at the factory with clamping plates which hold them down to the top surface of their mounting crossmembers. These crossmembers have a built in locating feature for ensuring the correct placement of the across the width of the conveyor.

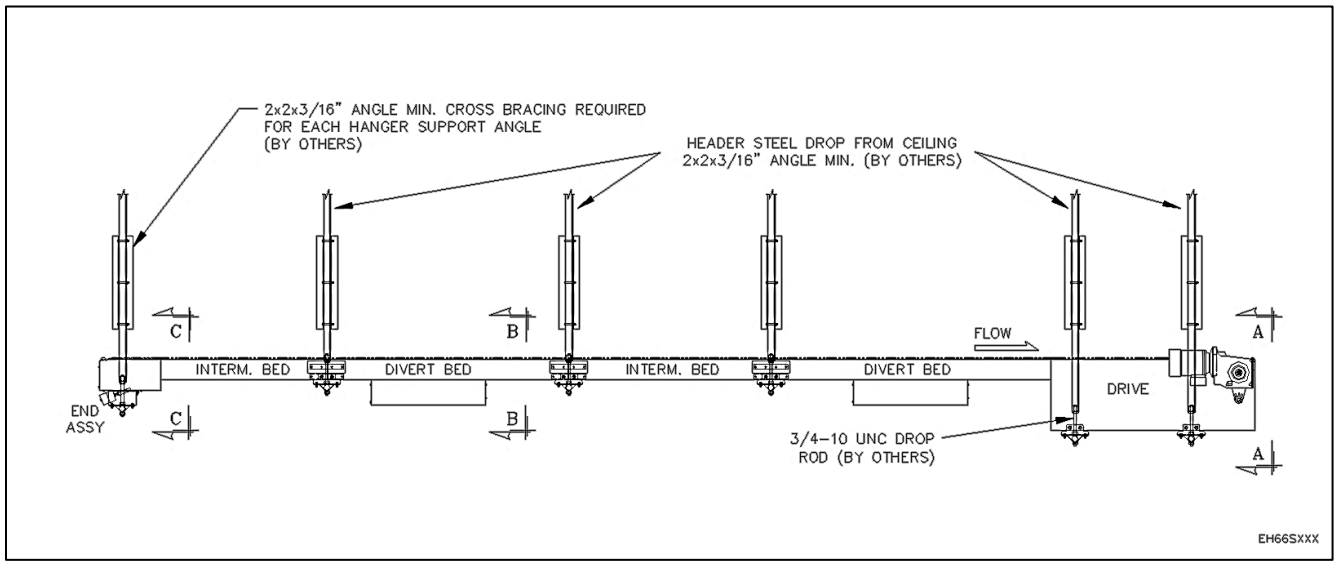
The rail assemblies are built with a 1″ offset and are mounted flush to the charge end of the bed. The offset extends beyond the discharge end of the bed allowing an overlap with the up stream bed. There should be approximately a 1/16″ gap between the low friction rails at the joints.

A splice kit consisting of spacers and M5 hardware is provided with each bed and it is used to connect the rails at the overlap. A 9/16″ socket wrench, 8mm socket wrench, and an 8mm box wrench are recommended for this installation.

6.10: CEILING SUPPORTED NBS CONVEYORS

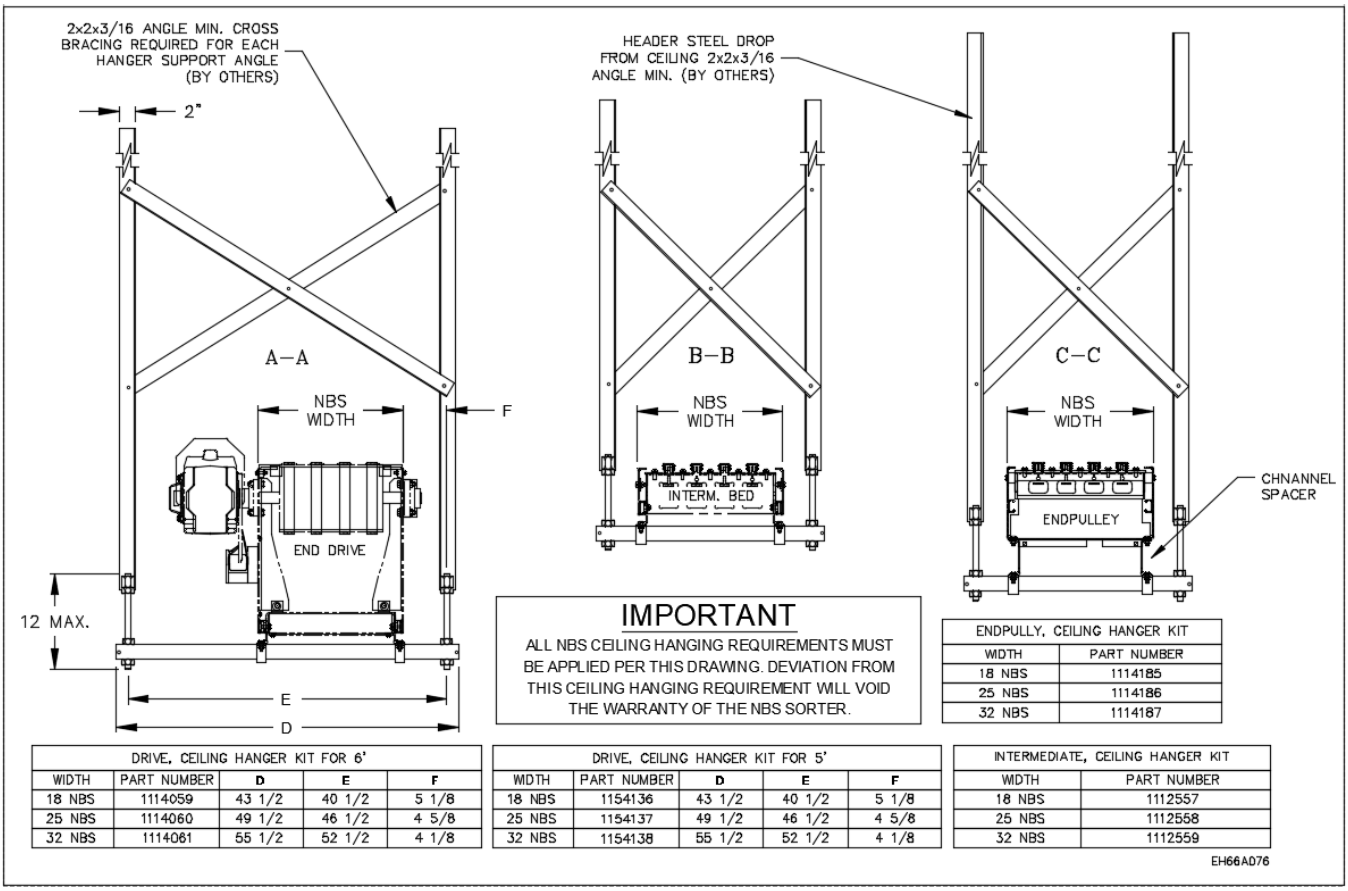
The NBS conveyor is designed to ALWAYS be supported at the bed joints. For ceiling hanging applications, an NBS ceiling hanger kit MUST be used at the bed joints as shown in the diagrams below. The end pulley and drive beds show connection locations for the specific ceiling hanger kit designed for those locations. Along with the ceiling hangers, cross bracing is required for all hangers. This ceiling hanging method provides the lateral conveyor rigidity.

Deviation from this ceiling hanging requirement will void the warranty of the NBS sorter.



CAUTION

- Deviation from this ceiling hanging requirement will void the warranty of the NBS sorter.



IMPORTANT

ALL NBS CEILING HANGING REQUIREMENTS MUST BE APPLIED PER THIS DRAWING. DEVIATION FROM THIS CEILING HANGING REQUIREMENT WILL VOID THE WARRANTY OF THE NBS SORTER.

ENDPULLY, CEILING HANGER KIT

WIDTH	PART NUMBER
18 NBS	1114185
25 NBS	1114186
32 NBS	1114187

DRIVE, CEILING HANGER KIT FOR 6'

WIDTH	PART NUMBER	D	E	F
18 NBS	1114059	43 1/2	40 1/2	5 1/8
25 NBS	1114060	49 1/2	46 1/2	4 5/8
32 NBS	1114061	55 1/2	52 1/2	4 1/8

DRIVE, CEILING HANGER KIT FOR 5'

WIDTH	PART NUMBER	D	E	F
18 NBS	1154136	43 1/2	40 1/2	5 1/8
25 NBS	1154137	49 1/2	46 1/2	4 5/8
32 NBS	1154138	55 1/2	52 1/2	4 1/8

INTERMEDIATE, CEILING HANGER KIT

WIDTH	PART NUMBER
18 NBS	1112557
25 NBS	1112558
32 NBS	1112559

EH66AD76

Ceiling hanger diagrams are a guide to establish a final support design.

Consult structural engineer for actual application.

⚠ WARNING

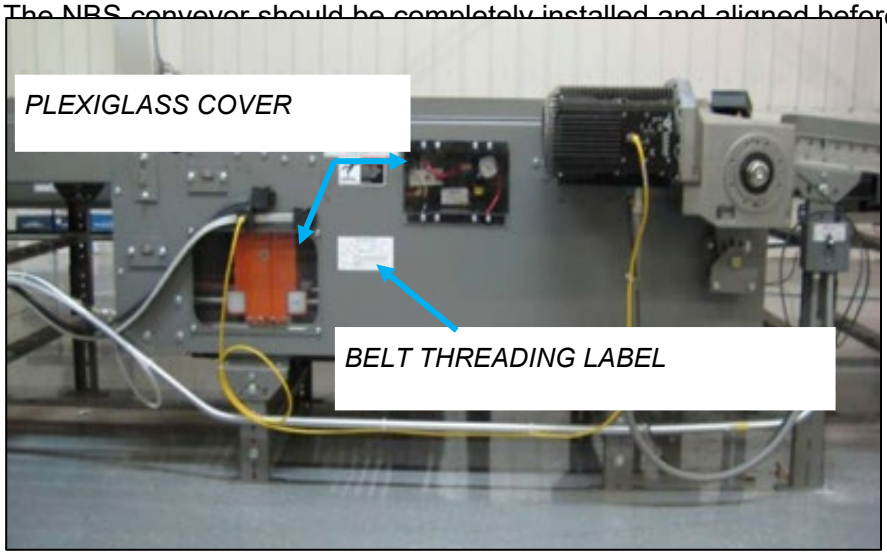
- Consult structural engineer for actual application.

6.11: NBS Belt Installation

Pre-Installation

Belts, as shipped from MHS Conveyor, are cut to length with lacing installed. Rolls of belting should be stored laying on the edge on a pallet. Never leave a belt where it may absorb moisture. Remove any tight shipping banding immediately upon arrival. Lacing pins are taped inside the lacing on each belt.

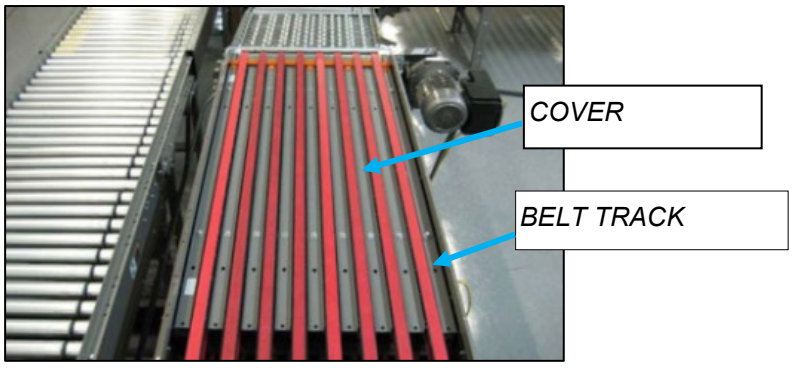
The NBS conveyor should be completely installed and aligned before belt installation.



Remove the plexiglass side covers from the sides of the drive frame, exposing the take-up pulleys. Switch the take-up air switch to the un-tensioned position, raising the take-up pulleys on the 5′ drive bed and retracting the take-up pulleys on the 6′ drive bed to the minimum take-up position. Replace all covers and guards.

Then remove the covers between the belt tracks so that the belt guides are exposed. Do the same for each NBS 30 diverter.

Remove the O-rings from the O-ring driven gap roller.

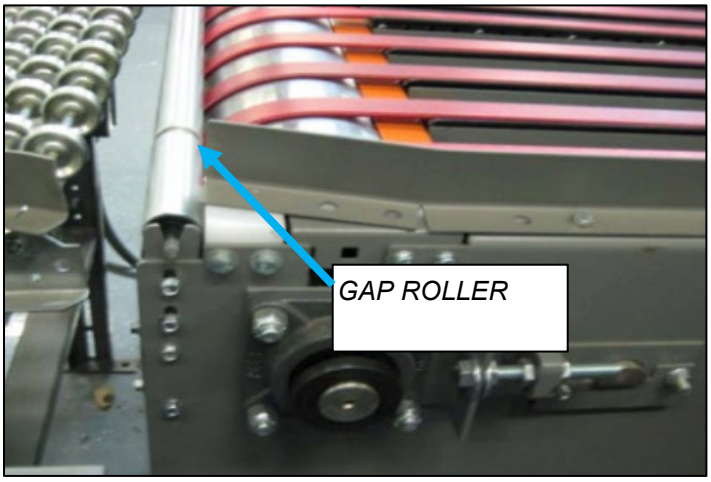


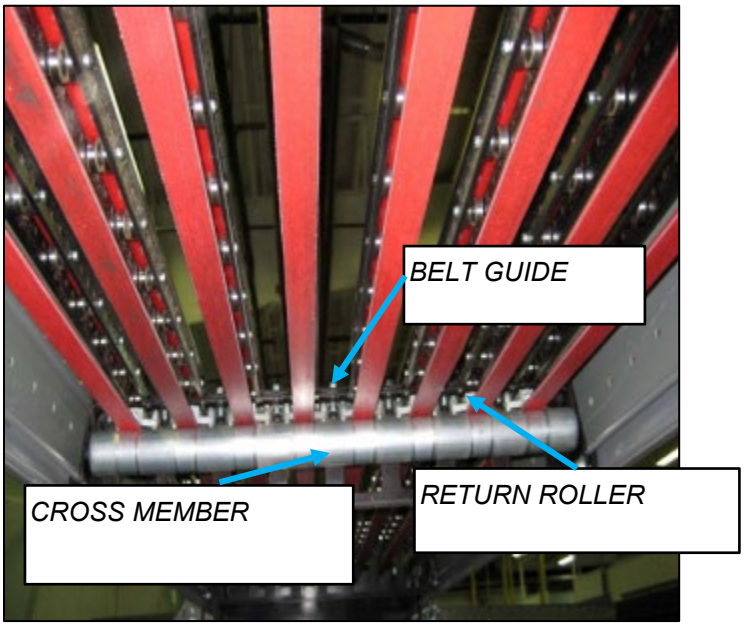
6.11.1: Belt Threading Instructions

Because NBS uses multiple narrow belts of long length, it will be most efficient to have two people working together during the threading process.

The belting must be uncoiled and laid out flat on the sorter, with the smooth red urethane surface down contacting the bearing assemblies on the rails. The belts must not be allowed to twist along their length as they are installed.

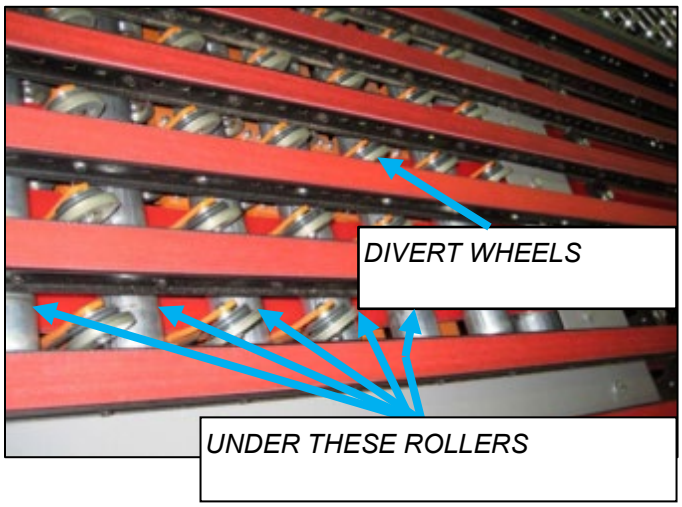
Start at the charge end (farthest from the drive) and feed all of the belts through together at the same time. Start the belts down between the gap roller and the end pulley. Guide the belts under the 5" diameter end pulley and up and over the 2.5" diameter snub roller, before passing through the crossmember mounted belt guides.

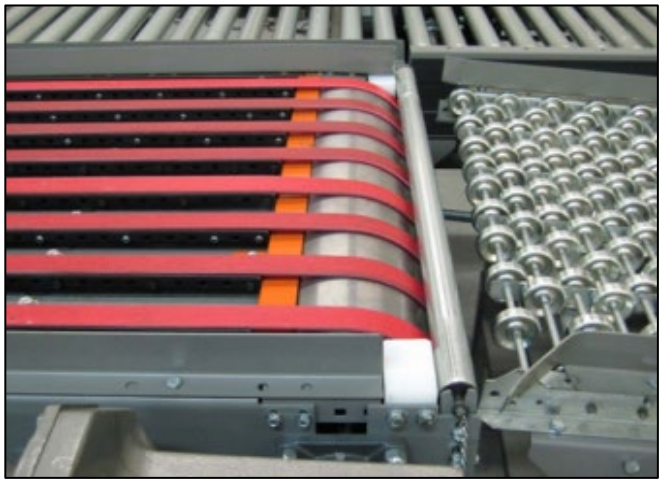




All belts must pass over return rollers positioned not more than 9′ apart to minimize belt sag and through holes in crossmembers.

NBS 30 diverts use the moving narrow belts to drive the pop-up divert wheels. The narrow belts must pass over the first 2.5″ dia. roller in the diverter, under the next three, five or six rollers, depending on the number of rows in the diverter, which power the divert wheels over the last 2.5″ dia. roller and then between the belt guides, as they exit the diverter.



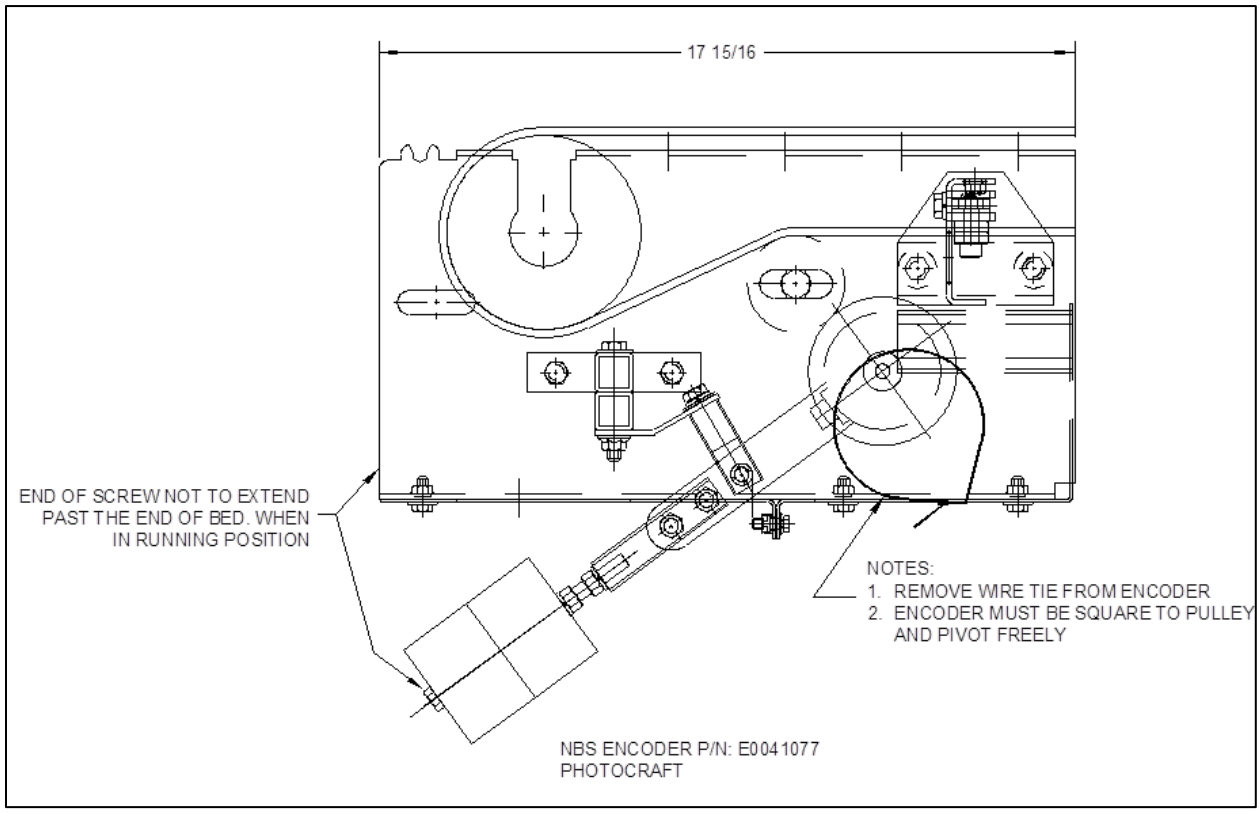


NBS 90 transfer rollers fit up between the narrow belts.

Thread the belts through the drive unit using the diagram on the side of the unit as a guide. The red urethane surface of the belt should be down contacting the drive pulley and bearings in the rails.

Mesh the loops of the lacing on one end of the belt with the loops on the other, so the sides of the belt are even, and install the lacing pin.

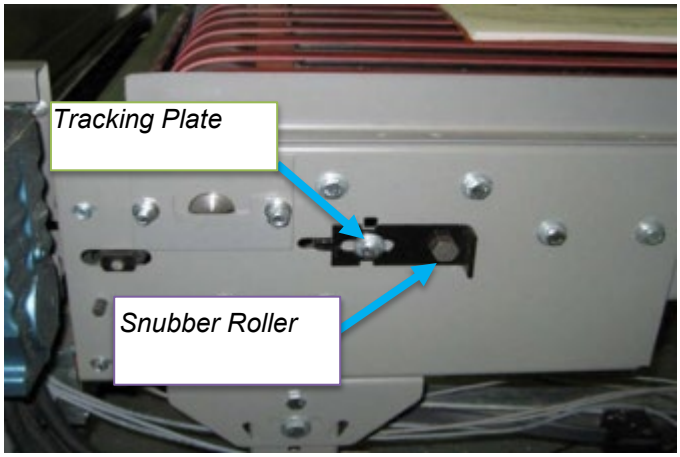
NBS Encoder Assembly at Charge End of Sorter

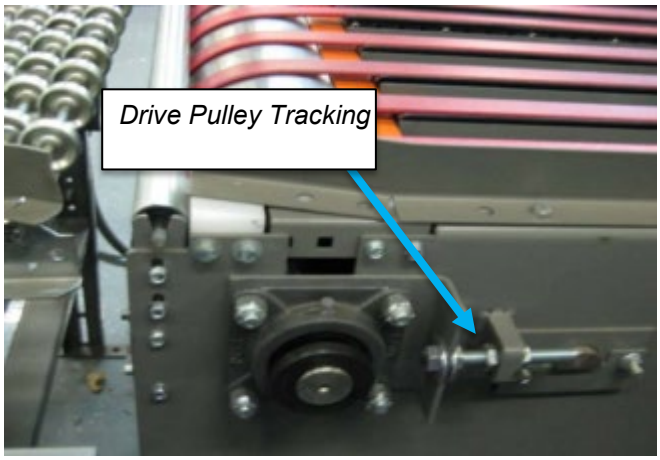


6.11.2: Belt Tracking

Prior to belt tracking, all guards, plates, and bottom pans must be re-installed. With the guards in place, switch the take-up air switch to the tensioned position, moving the take-up pulleys to tension the belts. At this time you can "bump" the motor to be sure rotation is correct, the belts are running smoothly and maintaining their position.

Most NBS conveyors do not require belt tracking. However, each conveyor should be checked at the charge and discharge ends to be sure the belts are floating in a neutral position not crowding the sides of the low friction rail guide tracks.



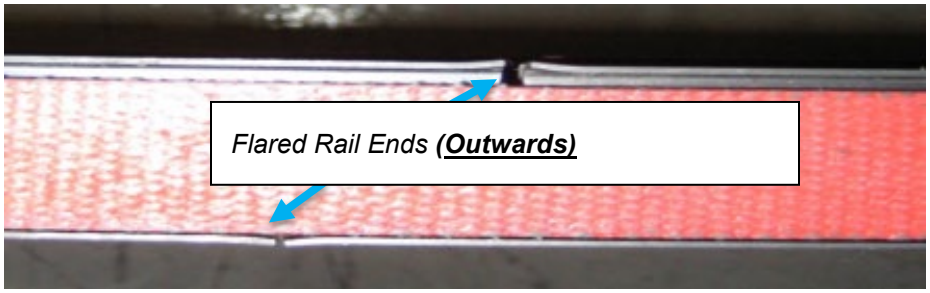


If the belts are out of their grooves or riding hard to one side adjustment can be made on the driven pulley jackscrew after loosening the four bolts holding the drive pulley 1-7/16″ bearing at the discharge end. The snubber roller in the end pulley assembly is used to track the belts at the charge end.

After running for a few hours inspect rail joints for belt wear at these points. All beds come from the factory with the ends of the rails pre-flared, but if belt dust occurs at the joints, additional flaring the rails outwards may be necessary.

To do this simply clamp pliers to the guide portion of the rail on the end and twist outward away from the belt. A slight amount of flare is all that should be necessary to prevent belt wear at the joints.

Once the belt is tracking properly verify that all of the bottom pans, guards and access covers on the drive bed, end pulley, and all diverts have been reinstalled.



6.11.3: Belt Specifications and Lacing

Belting:

Endurethane 150 2-ply

Width: 1-1/4" +0/-1/16"

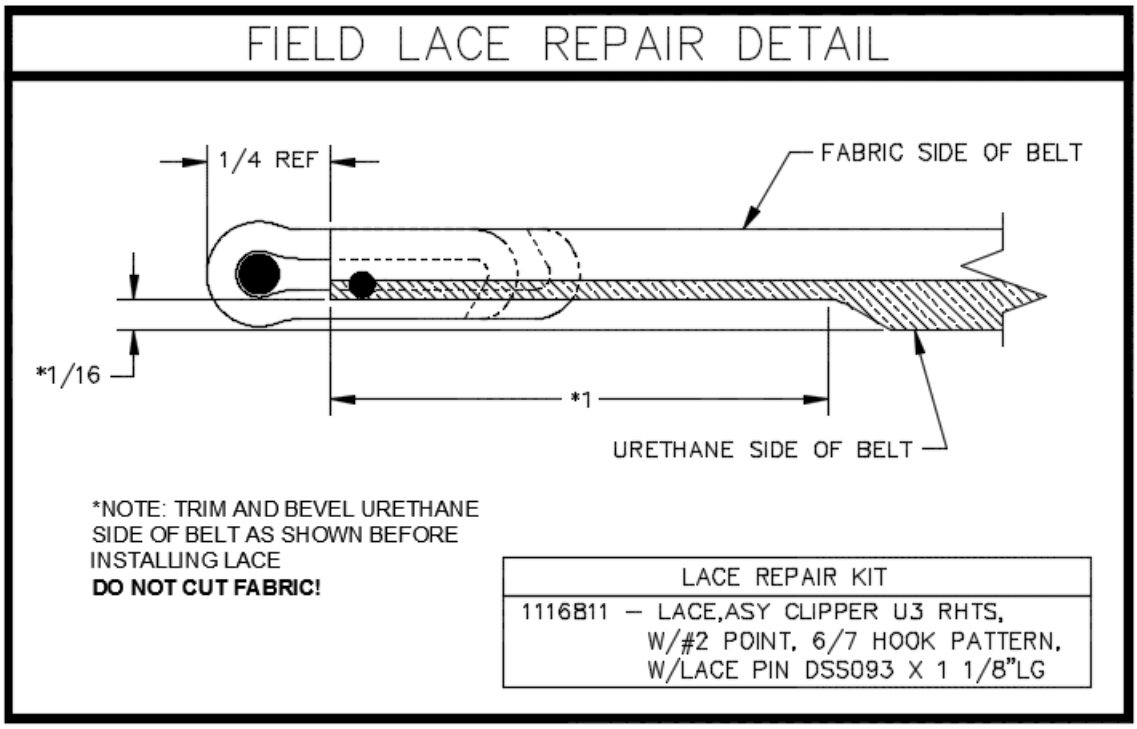
Thickness: .203" +/- .015 with a hidden lace

Lace: Clipper U3RTS w/#2 point

Lacing pin: DSS093 (Dura Stainless Steel) x 1-1/8" +/- 1/32" long .093 “WHITE DURA PIN COATING” .048 304 stainless steel core

CAUTION
• Only use the specified lacing and pin. Any substitution will result in premature belt failure.

For field repair, lacing can be done without hidden lace without damage to the unit. Belts without hidden lace may make additional noise as the lace passes thru snubbed areas. See diagram below. Belts must have six (6) hooks on one side and seven (7) hooks on the other for maximum strength.



6.11.4: Belt Lacing Information

NBS LACING KIT	PN 1116811		FACE PLATE	#2 - #4 Face Plate
TYPE	**Part #**	**Qty Per**	**Units**	**DESCRIPTION**
Item	1116801	1	EA	LACE,CLIPPER U3 RHTS W/ #2 POINT 6-HOOK PATTERN
Item	1116802	1	EA	LACE,CLIPPER U3 RHTS W/ #2 POINT 7-HOOK PATTERN
Item	1116810	1	EA	PIN,LACE .093" Dia X 1-1/8" LONG (.093" Dia Dura-Stainless)

Belt Replacement Lengths

Replacement belts may be ordered by the original part number marked on the belt or belt length. The item belt length can be determined by the following information.

- The 5' drive bed requires, 10'-8" (128")
- The 6’ drive bed requires, 16’0” (192”)
- The 18" end pulley bed, 3'-0" (36")
- NBS 30 diverters require, 3/8" each
- NBS 30 WAVE diverters require, 3/8" each
- NBS 90 SL transfers require, 3/8" each
- Auxiliary take-up requires, 1'4" (16")
- All other beds require 2 times their length.

Nominal Widths (Number of Belts)

- 18" with 4 Belts on 3-1/2" Centers
- 25" with 6 Belts on 3-1/2" Centers
- 32" with 8 Belts on 3-1/2" Centers

6.12: NBS Pneumatic General Guidelines

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 (NBS30-3R, NBS30-5R, and NBS90, and NBS90-SL)

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.

Air Drops (NBS30 WAVE, and NBS30 Aligner)

The NBS WAVE and aligner require higher air capacity than the NBS30 or NBS90 divert. As six rows of divert wheels must fire within a fraction of a second, the “burst” air capacity must be adequate or sluggish and inconsistent divert action will result. MHS Conveyor recommends the following minimum air plumbing for the WAVE divert and aligner.

A 1″ air drop and ¾″ black pipe or copper header for every 5 WAVE diverts. 3/8″ polyethylene tubing and be plumbed to each divert from the ¾″ header provided the length doesn’t exceed 5′. Do not plumb more than one divert with 3/8″ poly tube.

A 1″ air drop and ¾″ black pipe or copper header for each pre-aligner. 3/8″ polyethylene tubing can be run from the ¾″ header to each solenoid bank on the pre-aligner. The length of the poly tube must not exceed 5′.

MHS Conveyor can provide a standard ¾″ filter regulator for each drop. The part number is 1103388.

NOTE: The NBS pneumatic system does not require lubrication. Lubrication may affect valve action and cause sluggish or erratic operation.

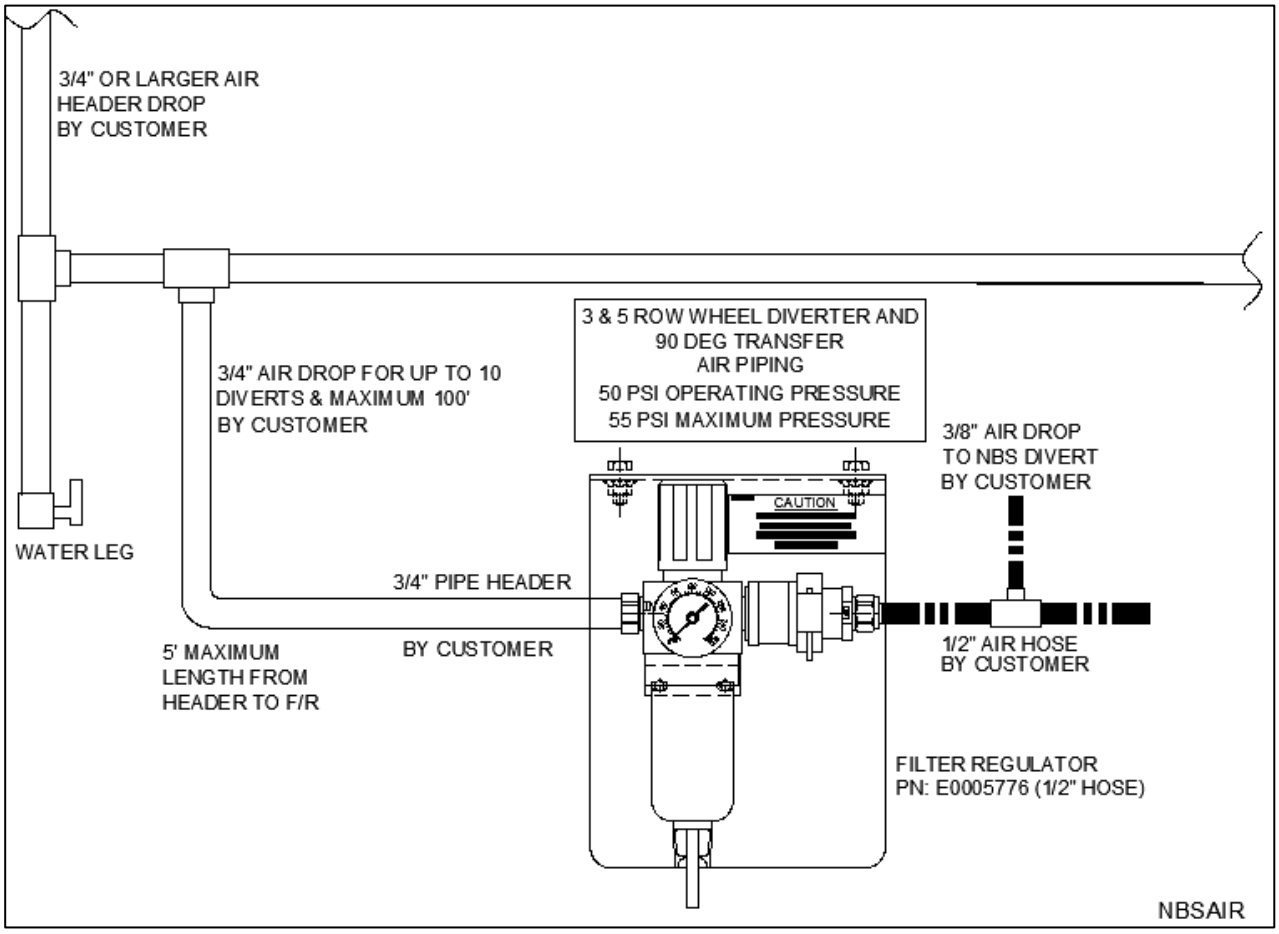
IMPORTANT! If your air compressor uses synthetic oil, a coalescing filter plus a regular filter of 5 micron is required. Synthetic oils will shrink the seals in pneumatic devices and valves.

CAUTION
• All airlines must be thoroughly blown out (of all debris) and the regulator must be set as required before connecting air to the NBS.

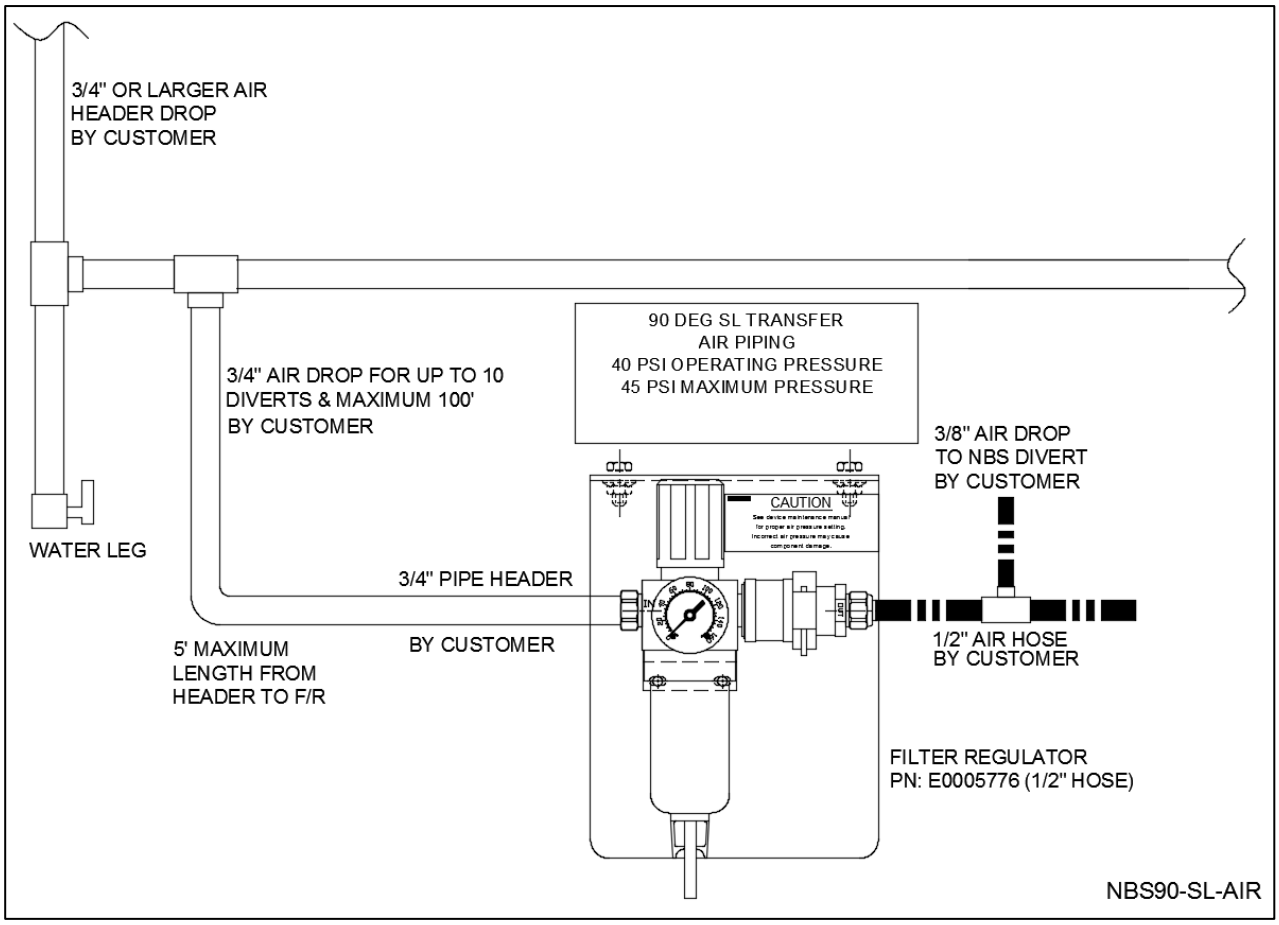
CAUTION

- NBS 30 WAVE™ diverters must not be operated above 55 PSI. Exceeding this may damage unit.

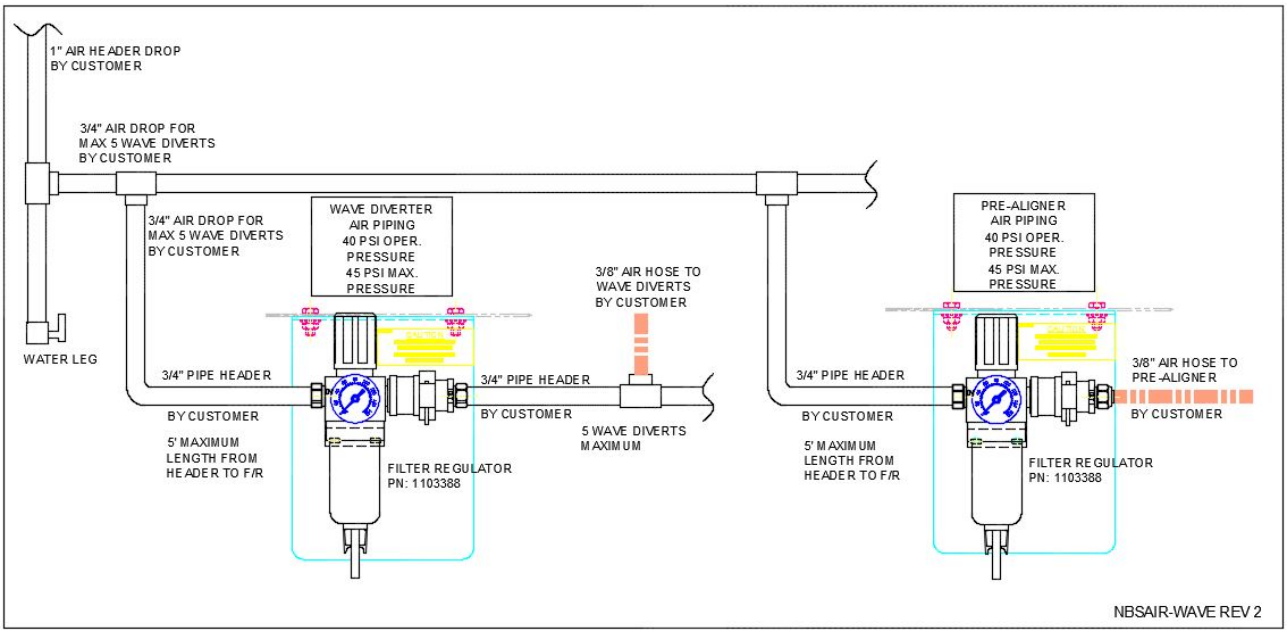
Air Supply Requirements NBS30-3R, NBS30-5R, NBS90



Air Supply Requirements NBS90-SL



Air Supply Requirements NBS30 WAVE, NBS30 ALIGNER



Pneumatic Pressure Requirements

- Maximum conveyor length each way from regulator is 80'.
- Locate regulator in center of conveyor, if possible, for maximum efficiency.
- Overhead feeder line pressure to be 100 PSI minimum.
- Low pressure switch should be set at 10 PSI below the operating air pressure for the specific device noted below.
- In high humidity or low temperature, use air dryer.
- Use 5 micron filter.
- Lockout/shutoff valve to be provided by air system installer.

Regulators pressure set to unit requirements:

- 5’ drive with air take-up 50-55 PSI
- 6’ drive with air take-up 80-85 PSI (Requires separate shop air drop)
- 30º 3 row /5 row sorter 50-55 PSI
- 30º WAVE sorter/aligner 40-45 PSI
- 90º transfer 50-55 PSI
- 90° SL transfer 40-45 PSI

Pneumatic Volume Formulas

NBS 30 3-Row Diverters are actuated by a single air bag.

The air consumption per divert is calculated by:

- .018CF (cubic feet) X CPM (cycles per min.) = SCFM (Standard Cubic Feet / Minute)

NBS 30 5-Row Diverters are actuated by two air bags.

The air consumption per divert is calculated by:

- .036CF (cubic feet) X CPM (cycles per min.) = SCFM (Standard Cubic Feet / Minute)

NBS 30 WAVE diverts are actuated by six air cylinders.

The air consumption per divert is calculated by:

- .039CF (cubic feet) X CPM (cycles per min.) = SCFM (Standard Cubic Feet / Minute)

NBS 90 transfers are actuated by a single air cylinder.

The air consumption per divert is calculated by:

- .062CF (cubic feet) X CPM (cycles per min.) = SCFM (Standard Cubic Feet / Minute

NBS90-SL transfer slave are

The air consumption per divert is calculated by:

- .061CF (cubic feet) X CPM (cycles per min.) = SCFM (Standard Cubic Feet / Minute)

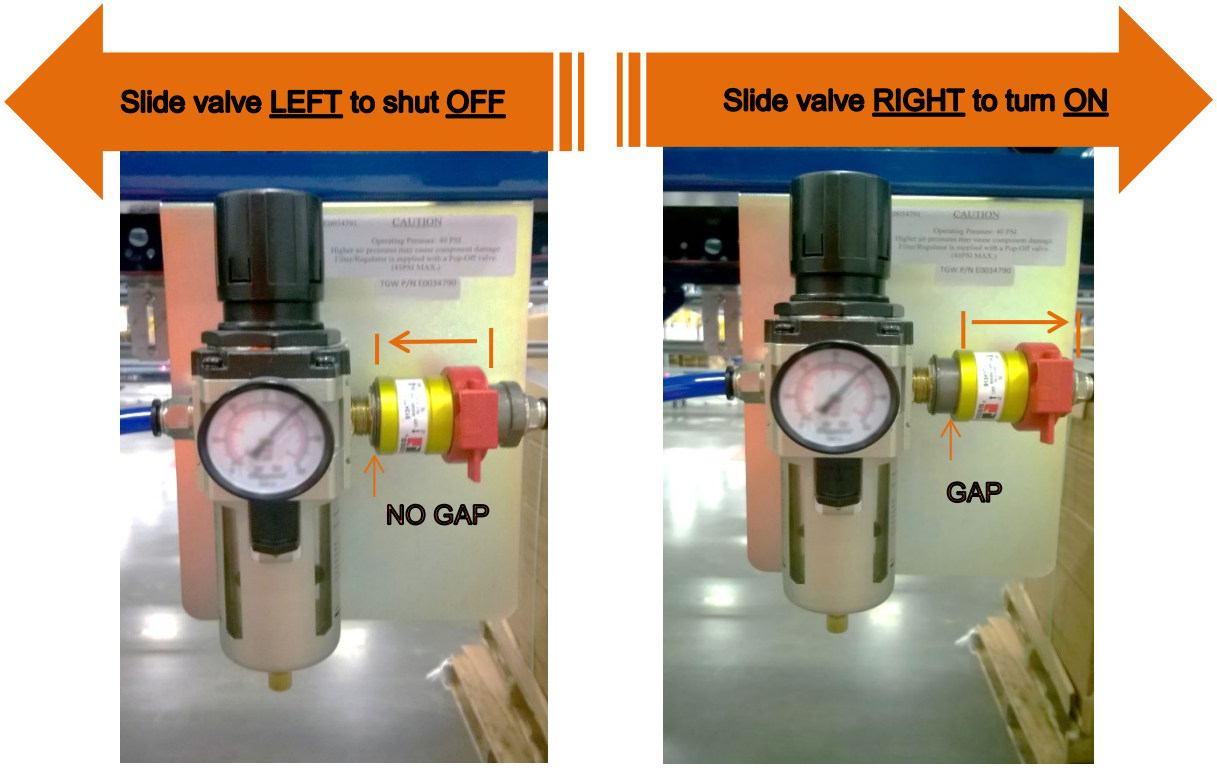
NBS 30 aligners are actuated by twelve (12) air cylinders.

The air consumption per divert is calculated by:

- .077CF (cubic feet) x CPM (cycles per min.) = SCFM (Standard Cubic Feet / Minute)

Adding together the air requirements of all diverts and transfers connected to one regulator will give total air flow requirements for that NBS air system.

6.12.1: Air Regulator Lock Out Valve On and Off Position



Note:

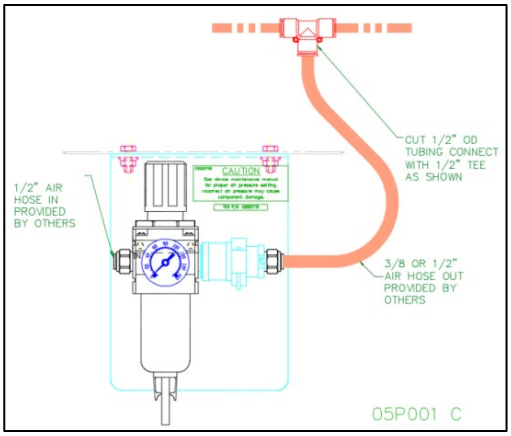
The air regulator valve label details the on and off positions.

For air pressure regulations please see detailed instruction in this manual.

⚠ WARNING	
⚠	• Do not remove and install sleeve valve to infeed side of regulator. Back feeding through the regulator will cause damage and void the warranty.

6.12.2: Air Line Connections

Source Air Connection



Ideally, the regulator should be centrally located along the sorter and should not be more than 80' from the furthest diverter/transfer.

Attach the filter/regulator assembly to the bottom flange of the side frame using the mounting bracket supplied with the kit.

The source airline that distributes air to the diverters/transfers should be ½″ hose that is rated to handle a pulsating 60 PSI line pressure. MHS Conveyor part number available for this purpose is

- 89000572 TUBING, URETHANE ½″ OD.

Cut into the supply line along the sorter bed at each diverter/transfer location and install the source airline tee fitting P/N:

- 89000640 UNION, TEE 1/2".

Connect the source airline between this fitting and the diverter/transfer with P/Ns:

- E0038781 REDUCER, PLUG-IN ½″-3/8″ and
- 89000585 TUBING, POLYETHYLENE 3/8″ OD, CLR.

CAUTION

Do not use a lubricator. When replacing filter/regulator bowl, lightly lubricate seal with mineral oil. Do not use synthetic oils such as esters or silicones. DO NOT get oil inside filter/regulator bowl.

Low Pressure Air Switch

The installation of an air pressure switch in the NBS air supply circuit, to detect a drop in air pressure below required levels, is recommended.

If pressure drops below approximately Low pressure switch should be set at 10 PSI below the operating air pressure for the specific device noted below, the conveyor system should shut off.

It is recommended that this air switch be located either at the furthest end of the source airline away from the regulator or at the pneumatic belt take-up located in or near the drive bed at the discharge end of the sorter.

CAUTION

- The function of the low pressure air switch is to protect the drive pulley and the NBS narrow belts from being damaged from slipping under load in the event of an air pressure disruption. Loss of air pressure may also cause diverter / transfer jams.

Solenoids

For the sake of simplicity, only two different solenoids are used to actuate either NBS 30 diverters or NBS 90 transfers, and that difference is in control voltage only.

The NBS 30 WAVE™ diverter is actuated by a 6-station valve bank, and is only offered in 24VDC.

The NBS 30 diverters, NBS 90 transfers, and NBS 90 transfers use spring return, 4-way solenoids with a DIN electrical connector, mounted on the outside, opposite the discharge direction of the diverter/transfer.

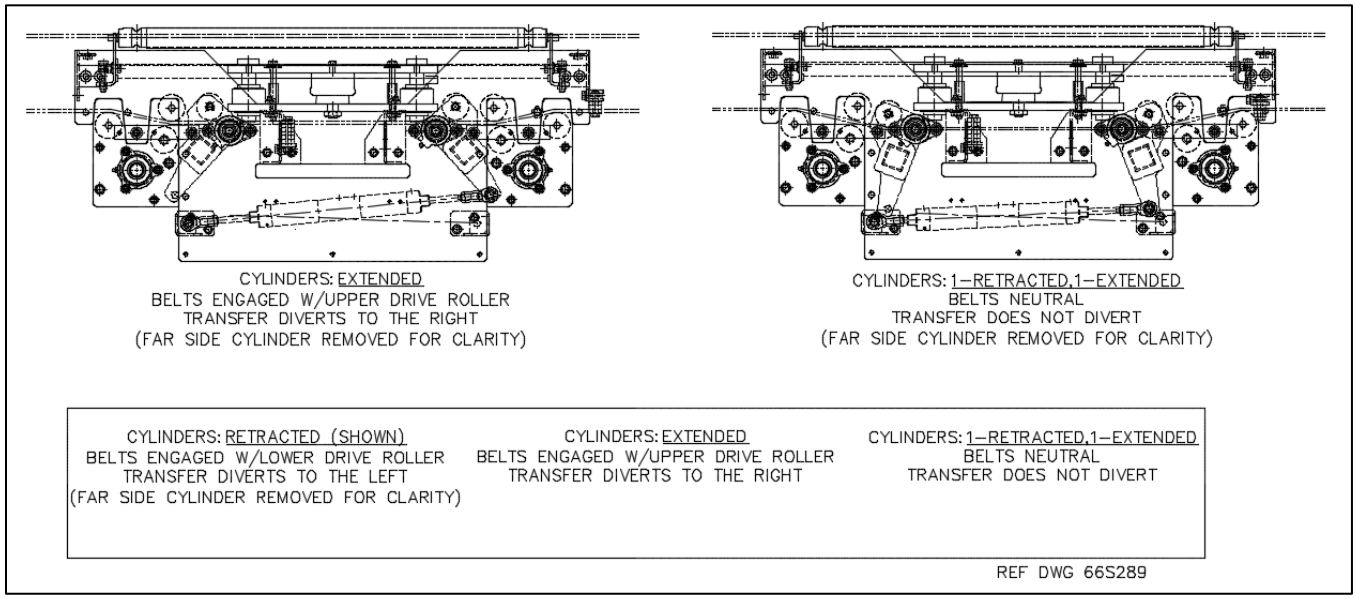
The location of the 4-way solenoids for the NBS 90-SL transfers are fixed, the mounting does not change due to the direction of the diverter/transfer.

The lift mechanism of the NBS 30 and NBS 90-SL is spring returned and the 4-way solenoid is plumbed as a 2-way solenoid using three ports and plugging the “B” & “EB” ports.

The lift mechanism of the NBS 90 is powered in both directions and has combination needle-valve / exhaust mufflers installed in ports “EA” & “EB” that are used to adjust actuation speeds.

Solenoids in all models are plumbed such that the diverter/transfer is normally in the down position and rises on solenoid activation.

Two additional solenoids control the transfer direction of the NBS 90-SL. Actuating solenoid “A” operates the transfer to the left, while solenoid “B” operates the transfer to the right. Only one solenoid should be activated at a time.



The MHS Conveyor part numbers for replacement solenoids are:

- E0038769 VALVE,SMC 4-WAY 24VDC DIN CONN
- E0038770 VALVE,SMC 4-WAY 110VAC DIN CONN
- 1112930 VALVE,4-WAY 24VDC MANIFOLD MT (FOR NBS 30 WAVE DIVERT)

Field Installation Wave Diverter

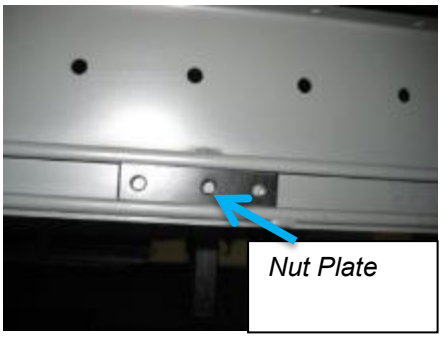
This instruction sheet is intended as a supplement to the Installation, Operation, and Maintenance Manual for the narrow belt sorter.

All of the precautions, warnings, and safety instructions are applicable to this supplement. Obtain a copy of the IOM Manual for your sorter while performing the below described installation. Refer to the IOM Manual for instructions on disconnecting power to the NBS before beginning any work.

Initial Preparation

Before attempting to install your new Wave Diverter there are a few details that must be taken care of:

The area under the bed where the Wave Diverter will be installed must be clear. This includes any conduit runs, wires, and air lines that may interfere with the ability to raise the Wave Diverter into place.



The bed that will be accepting the Wave Diverter must have hardware installed. Check to see that there are at least four (4) nut plates (two (2) on each side) installed in the channels on the inside of the bed side channels.

If the bed does not have the appropriate nut plates, the beds must be separated and nut plate (MHS Conveyor part number E0001143) can be installed.

The sorter belts must be separated at the lacings before installation of the Wave Diverter. Position the lacing under the bed, beside where the Wave Diverter will be positioned, prior to separating the belts. Refer to the appropriate section of the NBS Installation, Operation, and Maintenance Manual for instructions.

CAUTION
• Only use the specified lacing and pin. Any substitution will result in premature belt failure.

Move the Wave Diverter near the bed where it will be installed. The Wave Diverter must be supported so it can be moved under the bed and lifted into place.

Some suggested methods are:

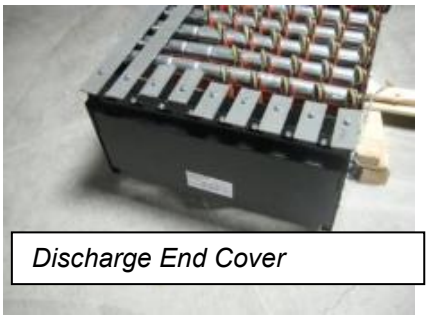
hydraulic floor jacks at each corner, two floor jacks with a pair of supporting 4x4's running the width of the Wave Diverter, or a forklift, provided the forks are long enough to support both sides of the Wave Diverter. The method used will depend on the width of the Wave Diverter and how high it has to be lifted.

Wave Diverter supported on lift truck forks

NOTE: Avoid pinching wires or hoses when positioning or moving wave diverter.

Remove the charge end and discharge end covers.

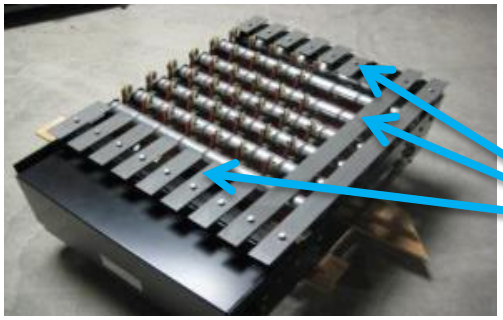
Charge End Cover



Discharge End Cover

Remove the top cover plates. Set aside for later reinstallation.

NOTE: Although it is not necessary, removing the outside bearing rails will facilitate the installation.

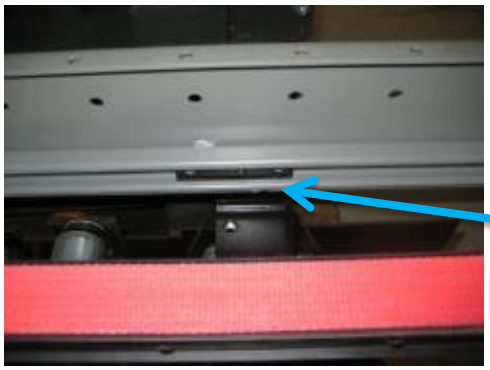


Top Cover Plates

6.13: WAVE DIVERTER INSTALLATION

Place Wave Diverter on the supports to be used to lift it into place.

Move Wave Diverter into position under NBS bed.



Position nut plates in approximate location in channel.

Nut Plate approximately aligned with mounting holes in Wave Diverter

Raise Wave Diverter into desired location until mounting holes align with nut plates.

Insert eight (8) 3/8-16 x 1 hex head bolts, lock washer, and washer through the Wave Diverter crossmember into the nut plate. **DO NOT TIGHTEN**.

Move the Wave diverter to its final position, and then tighten the mounting screws.

Reinstall bearing rail, if removed.

Install the Long Top Cover Plates (finger guards) where there are no wheels.

Install the 7 5/8” long cover plates at the charge end of the sorter. The longer side goes toward the Wave Diverter.

Install the 5 3/8” long top plates at the discharge end of the Wave Diverter. The longer side goes away from the Wave Diverter

View showing all Cover Plates installed.

Thread the belts through the Wave Diverter and reconnect ends. Refer to NBS Installation of the belts in the Operation, and Maintenance Manual for instructions.

Reinstall charge end and discharge end covers.

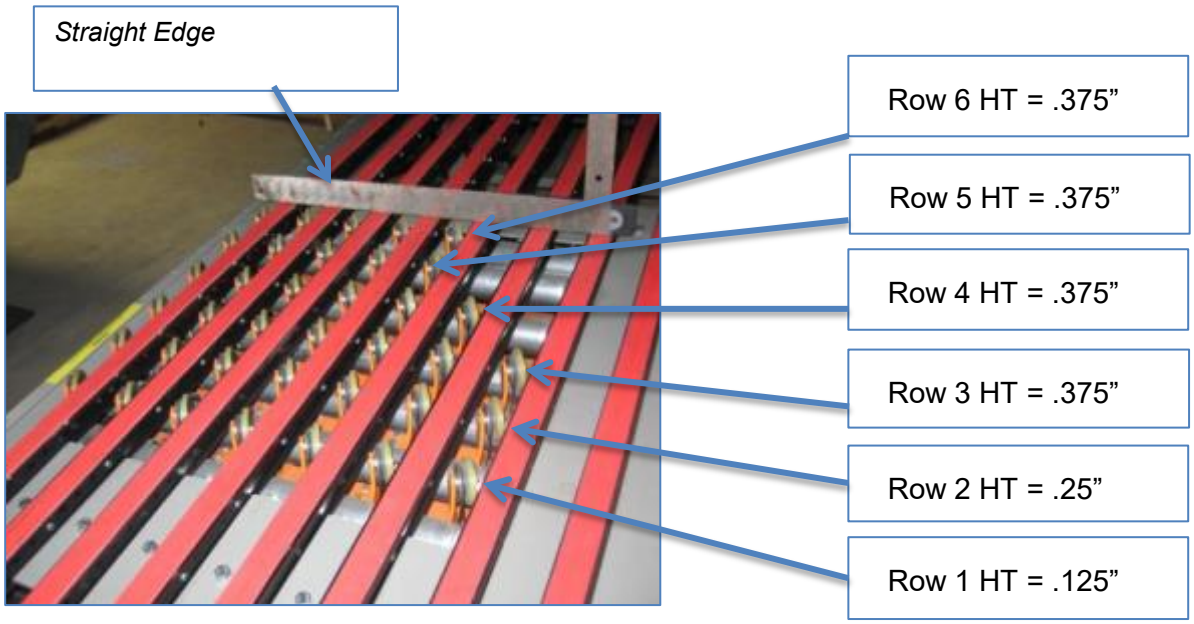
Establish control and air connections.

Test roller height as follows:

Place a straight edge long enough to bridge at least two belts across the belts near the wheels. Slide the straight edge over the wheels, making sure the wheels do not touch the straight edge.

Apply air pressure to raise the wheels. Check the wheel height above the belt as shown below.

Test and commission as outlined in the NBS Installation, Operation, and Maintenance Manual.



6.14: COMMISSIONING OF EQUIPMENT

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 closely 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.)

The belt tension air pressure must be set to the correct pressure setting. Air pressure higher than required can cause belt failure.

Listen for air leaks after air pressure is turned on.

Check the plumbing of the solenoids.

Follow the belt path through the entire conveyor. The belt must be threaded through the drive per the diagram, all of the belts must be captured between crossmember mounted belt guide assemblies, and no belt should be threaded under a crossmember (belt path labels are attached at each diverter location from the factory). Label on the side of the sorter.

Visually inspect the installation. Is the conveyor straight? Is the conveyor level from side to side? From end-to-end? Are the bed joints straight?

Check guard rail clearance to product.

Eliminate all catch points.

Check conveyor elevations.

All bolts and set screws tight.

Check product clearance to overhead structures.

Simulate all operational functions with actual product.

All guards in place with proper clearance.

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

All labels and warning signs in proper place, unobstructed.

Set all needle valve mufflers to the same settings (4-5 turns out).

Mechanical Dynamic Checkout

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

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

Actuate each diverter solenoid manually.

Check the belt tracking.

⚠ WARNING	
	• NBS 90 Transfer motors must be controlled to run on demand ONLY! Motors running continuously will cause component failure.

Chapter 7: NBS MAINTENANCE

7.1: GENERAL PREVENTIVE MAINTENANCE

The key to ensuring the expected return on investment is to protect against premature failure with a well-planned program of preventive maintenance.

Preventive maintenance programs examine what may fail and then formulate action plans which will prevent failure or downtime. This kind of maintenance includes lubrication and replacement or repair of parts before failure but after expected life has been attained.

Preventive maintenance will save expensive downtime and wasted energy. It will increase the life of components. Along with preventive maintenance, there should be a record-keeping system. You must know what problems you have had in the past and when different components were serviced.

A visual and audible inspection should be taken every day. You can see if oil is leaking, pulley worn; or you can hear a faulty bearing, or any other noise that might indicate a problem. When something major goes wrong with some component, records should be kept to see if a pattern to the problem occurs.

All personnel working in close proximity to the conveyor should inform maintenance or their supervisor of any unusual 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.
- Make sure personnel are clear of all conveyor equipment before restarting the system.

Gearmotor

The drive unit should be checked monthly. Check the Gearmotor for leaking seals. Check the gear case for proper oil level and add the approved oil for your particular unit. Check for overheating, vibrations, and dirt buildup.

Each Nord Gearmotor is supplied from the factory with the correct grade and quantity of synthetic lubricant for the specified mounting position. Under special circumstances such as high or low ambient temperatures, optional oils should be used.

Pulley and Timing Belts

Pulley and timing belts should be checked annually. Look for correct alignment. In time, set screws may loosen and allow the pulleys to become misaligned. Use a straight edge held parallel to both pulleys to check alignment. Shift one of the pulleys if the straight edge shows it is necessary.

⚠ WARNING	
	• REPLACE ANY GUARD REMOVED in order to adjust, check or lubricate components. Guards are furnished and installed to prevent personal injury during operation; maintain them on the unit.

⚠ WARNING	
	• Do not use gasoline or kerosene for cleaning. Use nonflammable solvent only.

Rollers

All rollers used in NBS equipment have precision, sealed lubed for life bearings and do not require maintenance. Periodically removing the rollers has an added benefit of distributing the wear on the bearing inner race by rotating the axle to a new position. If a defective roller bearing is found, replace the roller.

Do not allow tape, banding, shrink-wrap, etc. to build up on roller or pulleys. This can cause rollers to jam and the belt to miss-align in the track. If this is a common occurrence due to the product packaging, clean up on a regular schedule.

⚠ WARNING	
	• Use a blunt object to remove rollers from frame. A screwdriver or similar pointed object could slip and cause injury.

Air System

The best preventive maintenance for any air operated device is clean air. Always be alert for air leaks anywhere in the system and correct promptly. Check all airline filter bowls weekly for accumulated water and drain if necessary. Check for proper PSI settings on air regulators.

CAUTION

- Maintenance Schedule 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.

⚠ 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.

Motor Controls

Inspection (Semi-Yearly)

⚠ WARNING
• Before servicing or performing any work in the motor control panel, disconnect and lockout the main incoming service. If only the panel disconnect is off, the incoming side will still be hot.

Excessive overheating is indicated by discoloration of components. Most often, these symptoms are a sign of loose connections. If left uncorrected, this can eventually cause arcing between components, leading to destruction of the controls. It is normal to find the interior of the control cabinet very warm when it is first opened.

The condition of contacts must be checked on all contactors and starters that show signs of overheating. Make sure that they are free of dust and are not excessively pitted or burned. When badly burned or worn, the contacts must be replaced.

In the course of inspecting contact condition, spring pressure should be checked. As contact surface wears down, spring pressure can be lost because of the overheating. Contact spring resiliency can usually be detected by fingertip pressure.

Check for faulty door gaskets especially when there are excessive deposits of foreign materials. Particular attention should be given to conductive deposits because they can cause flashovers and premature component failure when allowed to collect to any great extent. Either reposition or replace defective gaskets and clean the control cabinet.

CAUTION
• Avoid touching components until they have had time to cool. Some may still be hot.

Check all overload settings on motor controls. Check for loose wiring and tighten as required.

Cleaning

When cleaning a control cabinet, it is best to use a vacuum cleaner rather than compressed air. A vacuum cleaner removes rather than redistributes dust and dirt. Compressed air can damage and displace relay contacts and springs.

7.2: MAINTENANCE SCHEDULE

Periodic maintenance intervals shown may vary with load, speed, hours of daily operation, ambient temperature, humidity, etc. Maintenance intervals can be established after fairly frequent maintenance. First, lengthen the intervals as justified by observation, and re-adjust 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 for any oil leakage.
- Check for any unusual noises or vibration.
- Check for loose bolts or parts.
- Check air filter bowls for accumulated water.
- Listen for air leaks.

Weekly

- Inspect bearings and motors for excessive noise or heat.
- Clean breather cap on Gearmotor (if used).
- 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 gear case (if applicable), unusual noises, vibration and stress cracks.

Semi-Yearly

- Inspect and clean motor control centers.
- Grease re-greasable bearings. *Recommend NLGI #2 lithium complex grease.*

Yearly

- Inspect tightness of all nuts and bolts on units. Re-adjust and, if necessary, retighten.
- 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.

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.

7.3: NBS TROUBLESHOOTING GUIDE

#	Problem	Possible Cause	Remedy
1.	Belts rolling out of guide tracks	Conveyor not installed straight	Straighten conveyor
		Conveyor not installed level	Inspect conveyor to insure there are not low/high spots at the divert points. Re-level conveyor as necessary
		Air pressure for the belt take-up is set too low	Set air pressure to the proper PSI. Reference IOM manual
		Divert is not rising up to proper height	Verify air pressure setting.
		Divert is not rising up to proper height	Verify the number of diverts per air drop. Consult IOM Manual to verify that number of diverts per air drop does not exceed MHS Conveyor recommendations.
		Divert spur isn't set to the proper height	Inspect and adjust height of divert spur as needed.
		Rail joints are not aligned/installed properly	Loosen rail splice hardware and use the rail alignment tool to adjust the alignment of the rail(s) accordingly. Reference IOM Manual for additional assistance.
		Verify wave commander program is matched to the conveyor speed	Set VFD for the motor to proper speed. Contact MHS Conveyor for additional assistance if needed.
		Vertibelt speed is incorrect	Verify speed of vertibelt, and make corrections to VFD as necessary. Refer to IOM Manual for additional assistance.
		Divert is not staying in the up (transfer) position long enough	Inspect and verify timing of divert, adjust accordingly to ensure product is fully off transfer before lowering unit.
2.	Divert Tub engaging at wrong time	PLC programming	Inspect timing of logic with encoder to ensure data is correct.
		Solenoid wired incorrectly	Inspect wiring, and adjust accordingly.
		Clogged solenoid	Inspect solenoid valve to ensure no water is present

#	Problem	Possible Cause	Remedy
3.	Belt Failure	Routing of belt within drive train	Inspect belt routing to ensure proper installation. Refer to IOM Manual for additional information.
		Belting rails not aligned properly	Check rail alignment at joints to ensure proper alignment. Refer to IOM Manual for additional information.
		Incorrect belt tension	Inspect air pressure within belt take-up to ensure proper setting
4.	Product not diverting correctly	Discharge conveyor unit not in proper location	Based upon product being handled on NBS discharge conveyor location is variable; refer to IOM Manual for further assistance.
		Height of discharge conveyor not correct	Inspect discharge conveyor, and adjust accordingly.
5.	Loud humming noise	Belts installed incorrectly	Inspect belt installing to ensure proper side is making contact with the rail.
6.	Wheels not turning within divert tub	Belt not routed correctly	Inspect belt routing and adjust accordingly. Refer to IOM Manual for detailed information.

7.4: Repair Procedures

⚠ 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 areas.
- Make sure personnel are clear of all conveyor equipment before restarting the system. Do not use gasoline or kerosene for cleaning. Use nonflammable solvent only.

Gearmotors

NBS drive units use Gearmotors which are properly filled at the factory with sufficient lubrication for their mounting position. A synthetic lube is the standard lube supplied in all MHS Conveyor Gearmotors (Mobilgear SHC630).

Disassembly/assembly procedure as follows:

- Remove necessary guards to access maintenance areas.
- Disconnect any electrical connection.
- Remove Gearmotor.
- Perform required maintenance.
- Reverse procedures for assembly.
- After all fasteners are tight, double check chain tension and sprocket alignment.
- Replace all guards.

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.

7.5: SENSING SWITCHES

Sensing switches are of two types:

- Photoeye retro reflective
- Proximity switch

Photoeye

Adjust the photoeye retro reflective 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.

Proximity switch

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.

7.6: NBS Maintenance Checklist

End Pulley Assembly

- Examine end pulley assembly. Remove any residue clinging to end pulley, and end pulley snubber.
- Check to see if belt is tracked correctly through crossmember belt guide assemblies.
- Remove any residue or built up of fibers between low friction rails at joints.

Intermediate Bed Assembly

- Remove any residue or built up of fibers between low friction rails at joints.
- Remove any residue or built up on carrier rollers.

Drive Assembly

- Remove any residue built up on drive pulley.
- Check to see if belt is tracked correctly through crossmember belt guide assemblies.
- Examine belt guide carrier rollers. Remove any residue built up on rollers.
- Examine individual take up wheels for wear. Clean off any build up on wheels.
- Examine take up snubber pulleys. Clean off any residue built up on pulleys.

Divert Assembly (NBS30)

- Replace missing or excessively worn divert wheels.
- Remove any residue or fiber that has built up in drive groove of diverter wheels and idlers.
- Check to see if all O-rings for driving divert wheels are in place. Replace all missing or worn O-rings.
  - **Note:** There are two O-rings used to drive each divert wheel. One clear colored O-ring which transmits power from drive roller to lower idler, and one black colored O-ring which transmits power from lower idler to divert wheel).
- Check to see if belt is tracked correctly through crossmember belt guide assemblies.
- Examine divert snubbers, and drive rollers for residue build up. Clean off any residue.
- Check to see that all wheel brackets are tight. Replace any missing hardware, and tighten any loose hardware.

Transfer Module (NBS90)

- Remove any residue or build up on transfer rollers.
- Check tension of both timing belts. (SEW-MOVIMOT drive and jump belt). Reference section Using the Gates 505C or 507C Sonic Meter.
- Check height of transfer rollers above the belt top surface. Check the plane passing over the transfer rollers for level and parallelism to belt surfaces. Reference NBS 90 Transfer Roller Adjustment Procedure.

Encoder

- Remove any residue or buildup on encoder wheels under the charge end pulley snubber roller.

7.7: NBS 90 Transfer Roller Adjustment Procedure

NBS 90 transfers are assembled as a stand-alone unit that is inserted into an NBS bed section. The height of the roller is set by the use of a setting gauge, and adjustment is performed at each of the four corners of the unit on the assembly bench.

When the unit is inserted into the bed and secured into place, the roller heights are within our assembly tolerance of +/- 1/32″. Depending upon the speed of the sorter, weight of the product, and condition of the transferred product's bottom surface, slight adjustments of the transfer rollers' heights may be necessary to effectively transfer these products.

Adjustment in the field is performed by the following steps:

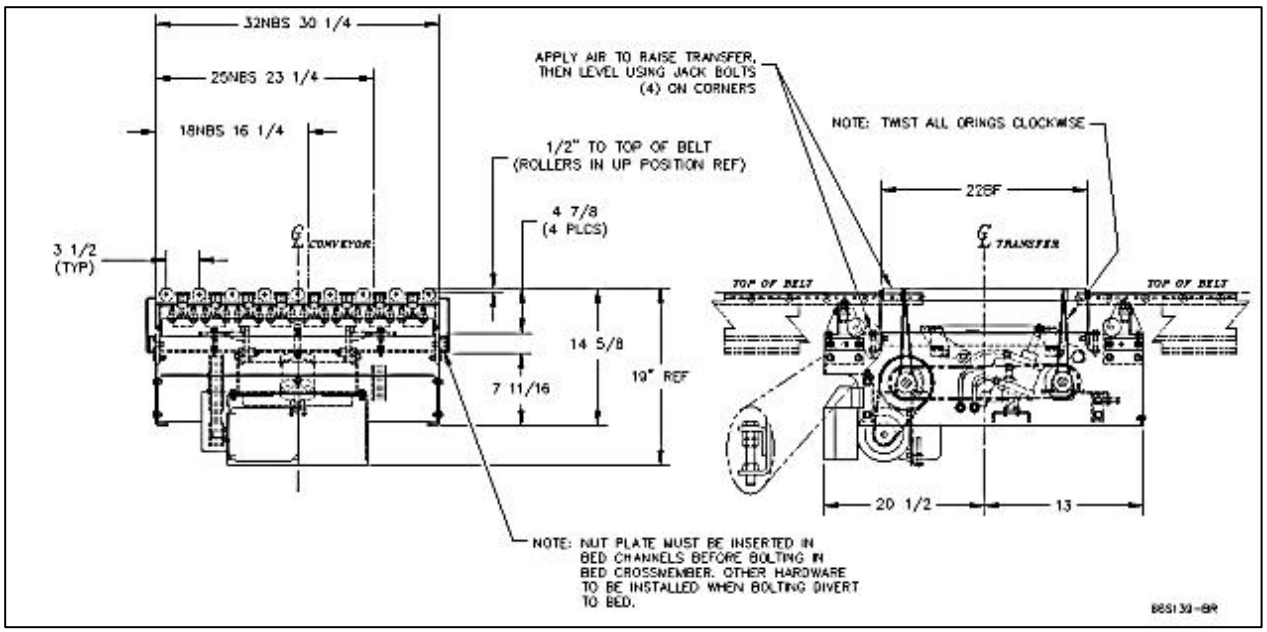
Determine which corners need height adjustments. This can be determined by placing a straight edge across the sorter belts and measuring the distance from the bottom of the straight edge to the top-of-roller at each transfer corner. If the transfer rollers can be forced into their up position, the straight edge can be placed on the roller surfaces and the measurements can be made down to the belt surfaces. (The roller mounting forks are usually in their full up adjusted position, and lowering the roller height is usually the easiest way to adjust.)

Remove the two flat orange end guards from both ends of the transfer (this will allow access to the four adjustment locations).

The roller mounting forks have ¾′ long slots in their faces and are clamped between the jack bolt angle and the longitudinal crossmember that separates the two forks.

Loosen the two hex head cap screws in the corner that is being adjusted as well as the jam nuts on the jack screw. Use the jack screw jam nut that moves the fork in the direction necessary. Repeat this procedure on each corner that needs adjustment.

When transfer roller are all parallel to the sorter belt surfaces, tighten all fasteners and replace the guards.



7.8: USING THE GATES 505C OR 507C SONIC METER

Timing Belt Tension Measurement

There are three known measurements that need to be set in the Sonic Meter to correctly measure belt tension. These measurements are:

- Weight of the belt in grams per meter of belt length.
- Width of the belt in millimeters.
- Belt Span between timing belt sprockets measured in millimeters.

MHS Conveyor has standardized on using “HPR”, 8 mm tooth pitch, 30 mm wide synchronous timing belts in all American domestic conveyor / sorter equipment.

The weight of this style synchronous timing belt is 5.8 grams / meter.

The belt width is 30 millimeters.

The Belt Span between timing belt sprockets is fairly standard for the different equipment types using these synchronous timing belts.

NBS90 Transfers use two synchronous timing belts in each different transfer.

The SEW-MOVIMOT drive belt (P/N 90050600 BELT, TMG HPR 600-8M-30) is always the same Belt Span distance (137 millimeters).

The correct tension can be either measured in Pounds of Tension: 20 – 30 lbs. or Frequency measured in Hertz: 110 – 130 Hertz

There are only two other timing belts used in NBS90 transfers and their use is determined by the length of the transfer rollers (either 24 inch long or 30 inch long).

Part number 90051120 BELT, TMG HPR 1120-8M-30 is used in 24″ long transfers. (424 mm Belt Span)

The correct tension can be either measured in Pounds of Tension: 30 – 50 lbs. or Frequency measured in Hertz: 40 – 57 Hertz

Part number 90051440 BELT, TMG HPR 1440-8M-30 is used in 30″ long transfers. (576 mm Belt Span).

The correct tension can be either measured in Pounds of Tension: 30 – 50 lbs. or Frequency measured in Hertz: 33 – 42 Hertz

After setting the correct parameters in the Sonic Meter hold the sensing probe a few millimeters above or below the belt 30 mm wide face. Tap the belt to generate a vibration and read the measurement on the Sonic Meter.

Chapter 8: NBS Recommended Replacement Parts

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

8.1: Spare Parts Priority Level Explanations

Level #1

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

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

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

Level #2

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

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

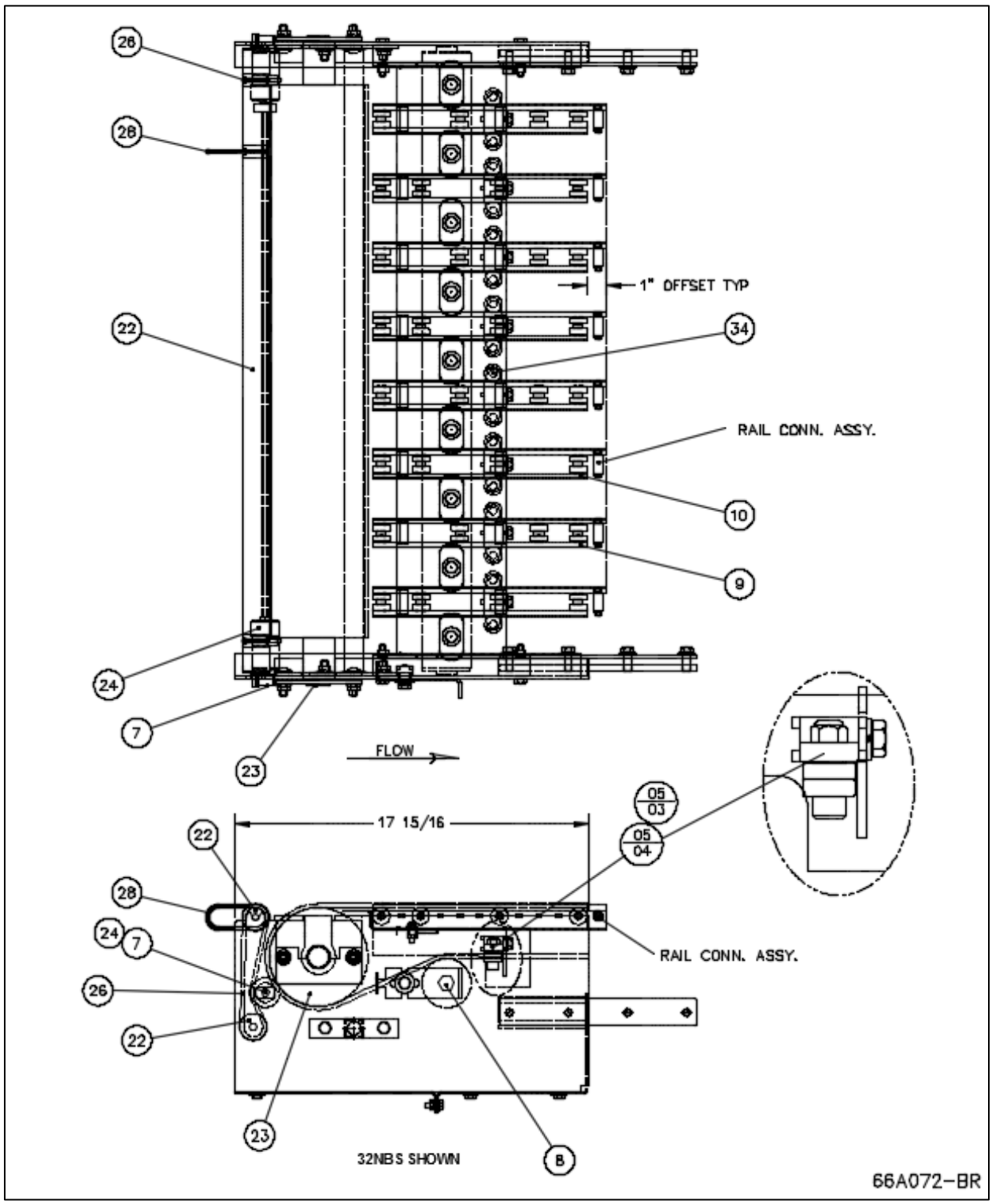
Priority level 2 spare parts include roller chain, sprockets, belt pulleys, rollers, air cylinders, and other related parts whose failure should not stop a conveyor system suddenly. These parts tend to wear out gradually and are not know to fail suddenly.

Level #3

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

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

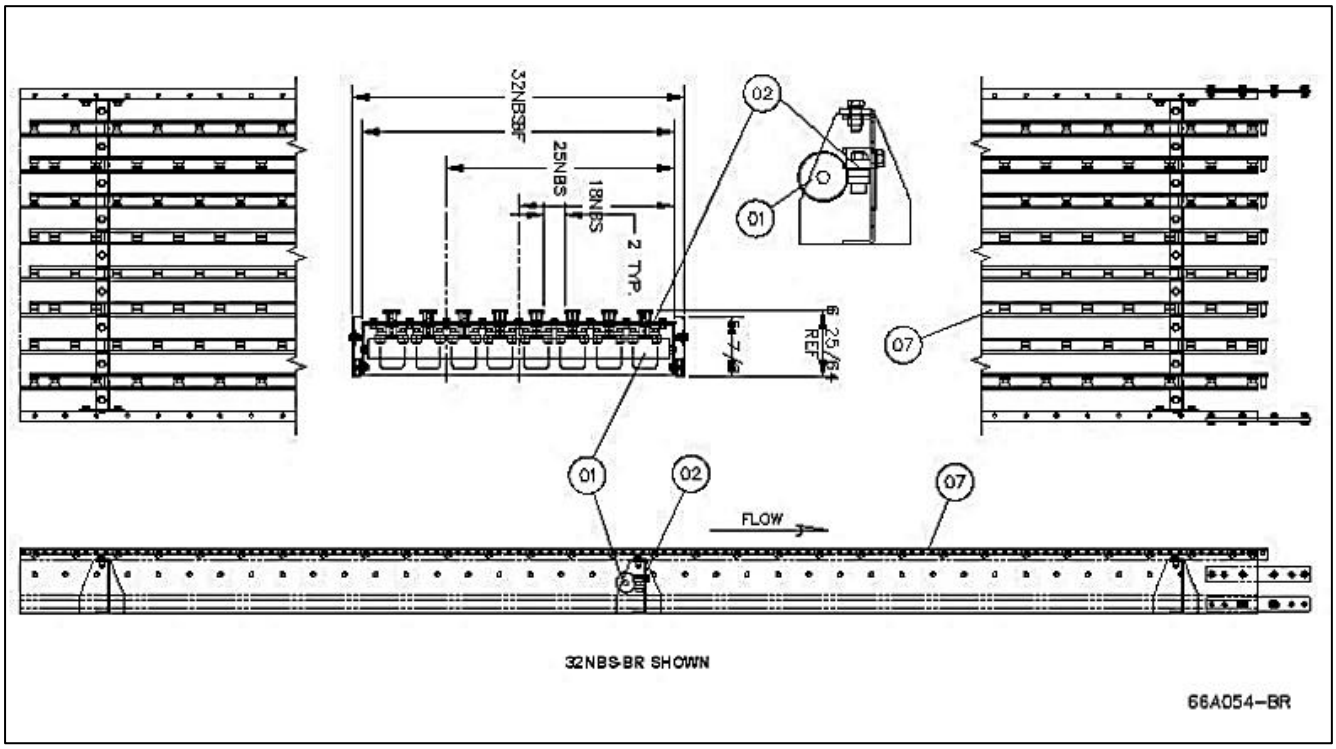
8.2: NBS-BR End Pulley



8.2.1: Replacement Parts – NBS-BR End Pulley

NBS, BR 5' END PULLEY WIDTHS				
		WIDTH & ITEM #		
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
7	ROLLER, SLIDE 11/32HEX NBS-SP	E0002716	E0002716	E0002716
8	PULLEY, _ _NBS 2.5 DIA	E0040908	E0040909	E0040910
9	RAIL,ASY-A NBS-BR 1' EP	1108855	1108855	1108855
10	RAIL,ASY-B NBS-BR 1' EP	1108856	1108856	1108856
22	ROLLER, SLV __NBS ENDPULLEY	E0041070	E0041071	E0041072
23	**PULLEY, _ _NBS 5"DIA C-FF 1-3/16**	**E0040823**	**E0040824**	**E0040825**
23/0001	PULLEY, __NBS 5"DIA C-FF 1-3/16	E0040820	E0040821	E0040822
23/0002	SHAFT, 1-3/16 X 19 18NBS 4"EP ,	E0003150	E0003151	E0003152
23/0003	COLLAR, ECCENTRIC LOCK 1-3/16"B	90140052	90140052	90140052
24	**ROLLER, IDLER _ _NBS END PULLEY**	**E0041073**	**E0041074**	**E0041075**
26	ORING, 83A 3/16 X 12-1/2"	90530019	90530019	90530019
28	ORING, 83A 5/32 X 6-1/4" ST TRANS	E0001299	E0001299	E0001299
05/03	**GUIDE, ASY NBS BLT XM MTD**	**E0039089**	**E0039089**	**E0039089**
05/04	BRG, R6 ZZ C3	90050111	90050111	90050111
				Dwg # 66A072E

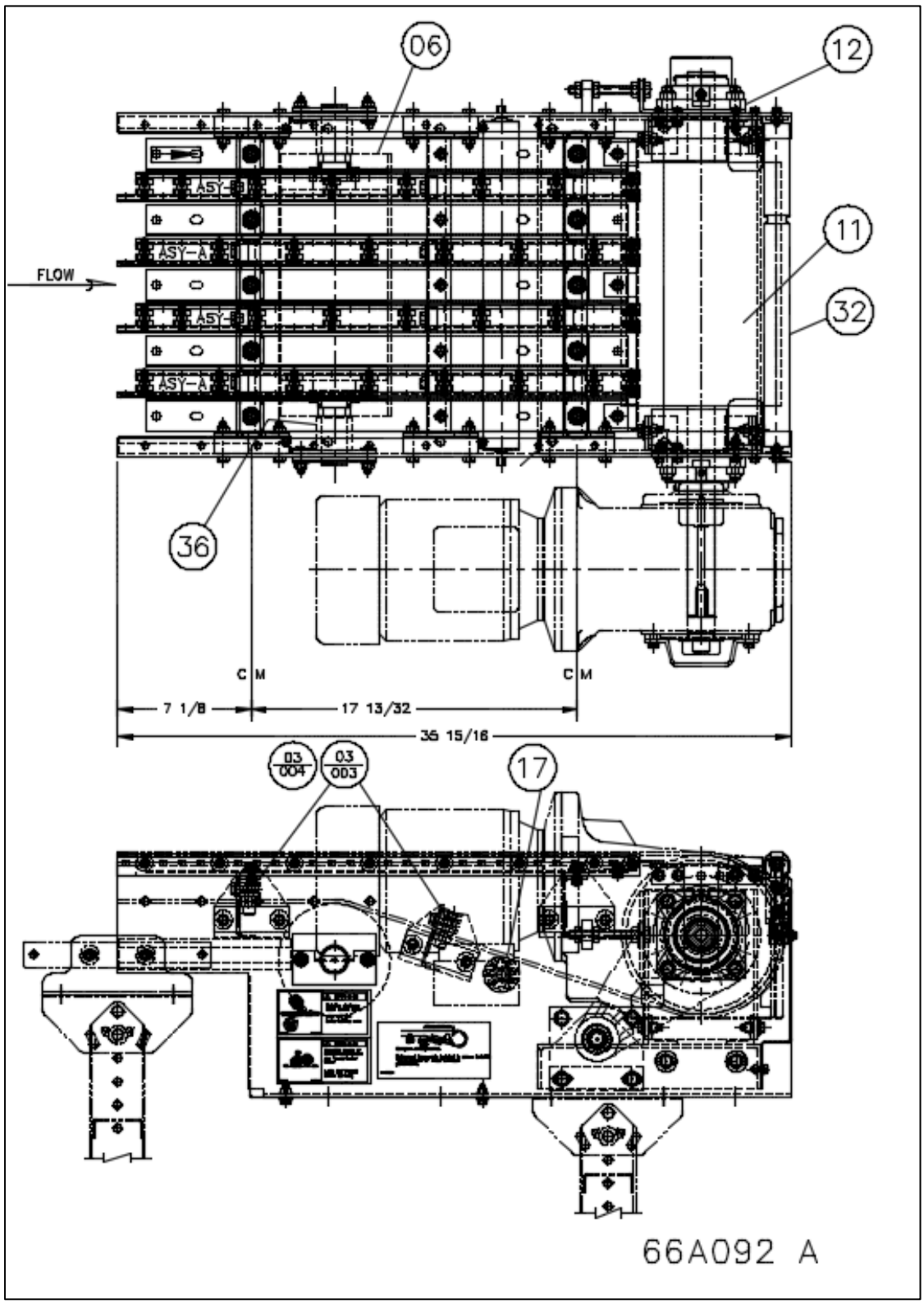
8.3: NBS-BR INTERMEDIATE BED



8.3.1: Replacement Parts – NBS-BR Intermediate Bed

NBS, BR INTERMEDIATE BED WIDTHS				
		WIDTH & ITEM #		
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
01	ROLLER,RET NBS 1.9" DIA PRBG	E0001155	E0001156	E0001157
02	**BLOCK,ASY BELT GUIDE**	**E0039089**		
02/002	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111		
07	RAIL,ASY-A NBS-BR 10'	1102050		
				Dwg # 66A054B-BR

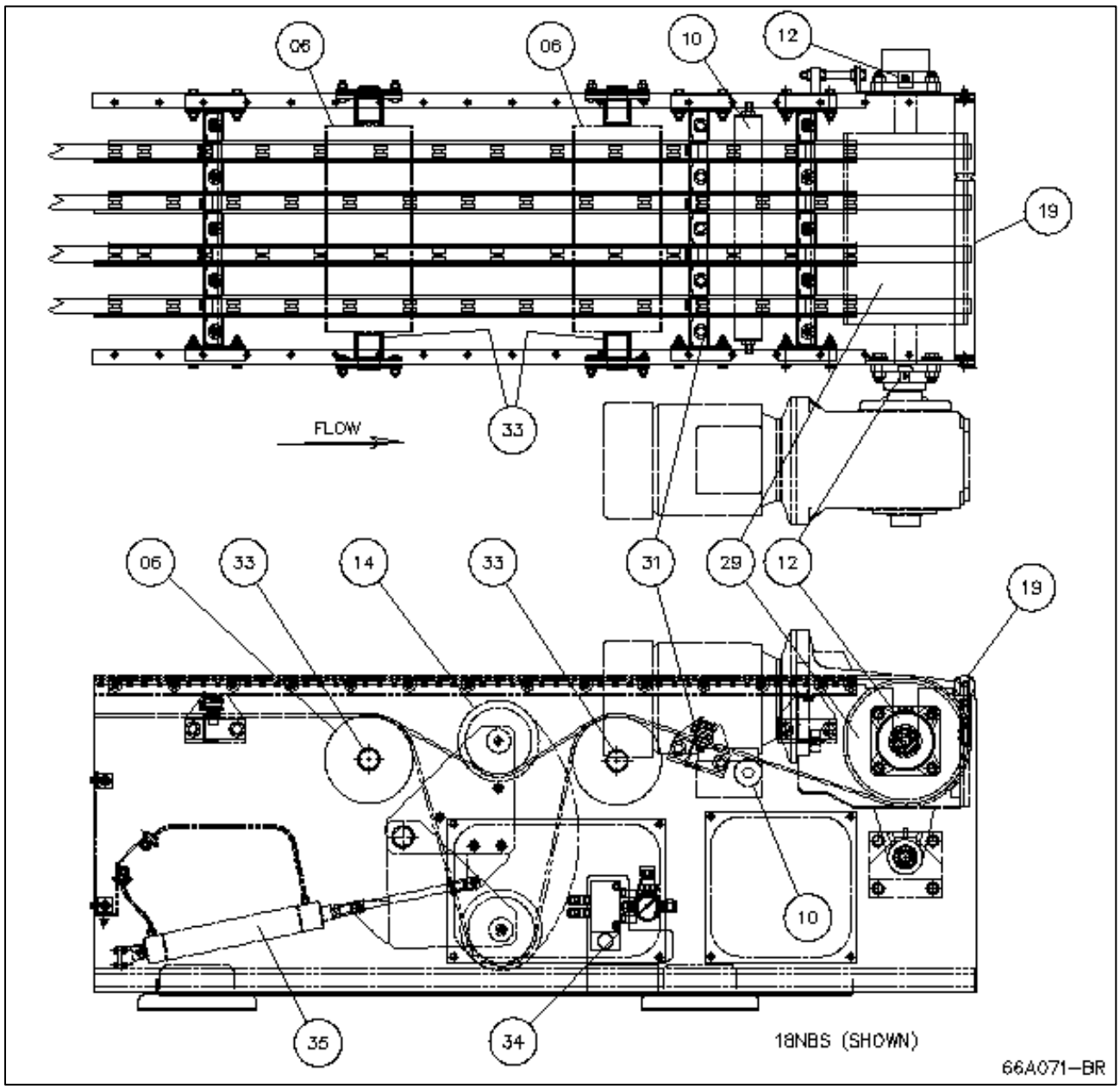
8.4: NBS-BR Drive 3′ Bed RH Shown



8.4.1: Replacement Parts – NBS-BR Drive 3' Bed RH Shown

NBS, BR 3' DRIVE BED WIDTHS				
Note: Less Independent Belt Take-up		**WIDTH & ITEM #**		
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
03/03	**GUIDE, ASY NBS BLT XM MTD**	**E0039089**		
03/04	BRG, R6 ZZ C3	90050111		
06	**PULLEY,ASY 6" DIA _ _ NBS C-FF**	**E0001274**	**E0001275**	**E0001276**
06/001	PULLEY, _ _ NBS 6" DIA C-FF 1-7/16" BORE W/BRGS	E0001271	E0001272	E0001273
06/002	SHAFT,1-7/16" DIA X _ _ -1/4 _ _ NBS	E0001265	E0001266	E0001267
06/003	COLLAR,ECCENTRIC LOCK 1-7/16" BORE W/HDW	1132149		
17	ROLLER, _ _ NBS DR 1.9" DIA PLTD PRBG	1115002	1115167	1115168
11	PULLEY,8" DIA DIRECT _ _ NBS	1108334	1108335	1108336
12	BRG,FLG 4-BOLT X 1-7/16" BORE CLAMP	1114091		
32	ROLLER,GAP _ _ NBS	E0001337	E0001340	E0001343
36	SPACER, 6" PULLEY STOP 1-1/2" PVC	E0001295		
				Ref Dwg 66A092 REV A

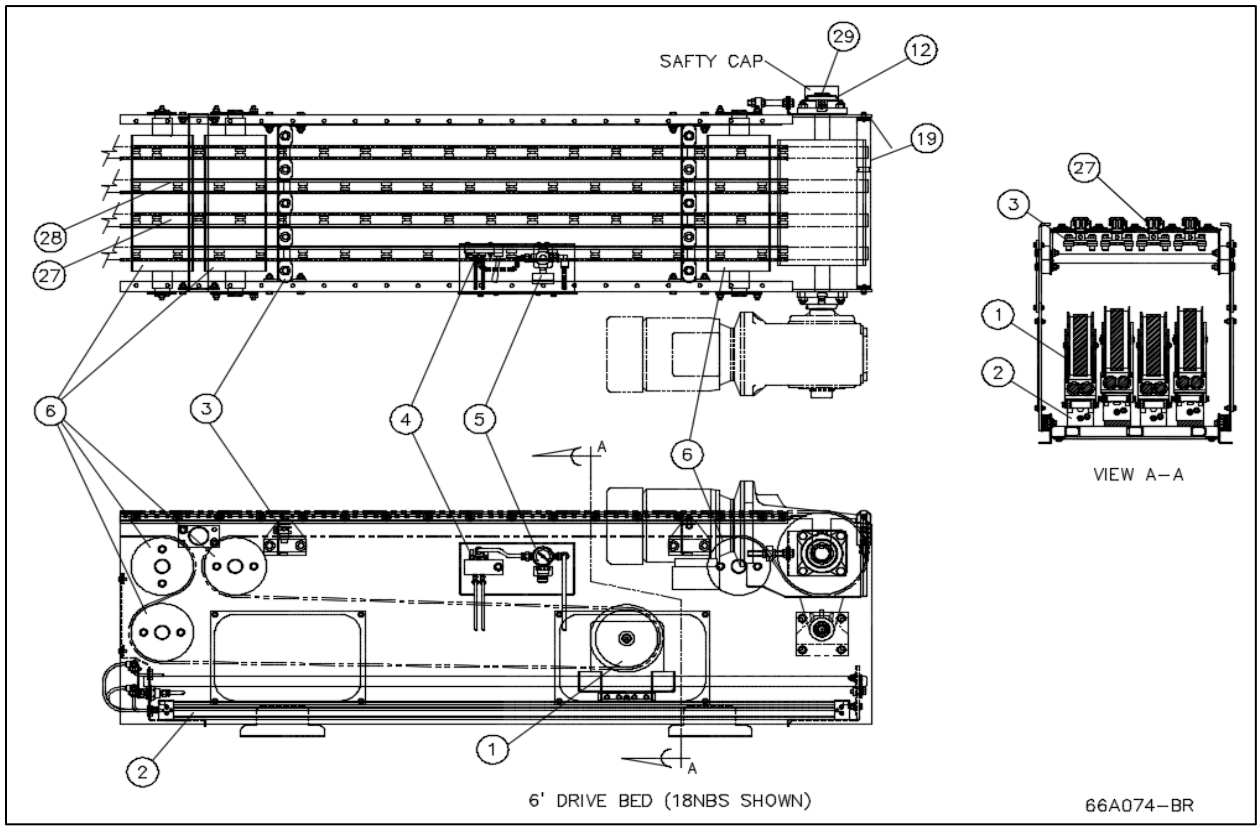
8.5: NBS-BR Drive 5′ Bed RH Shown



8.5.1: Replacement Parts – NBS-BR Drive 5' Bed RH & LH

NBS, BR 5' DRIVE BED WIDTHS				
		WIDTH & ITEM #		
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
06	**PULLEY,ASY 6" DIA _ _NBS C-FF**	**E0001274**	**E0001275**	**E0001276**
06/001	PULLEY, _ _ NBS 6" DIA C-FF 1-7/16" BORE W/BRGS	E0001271	E0001272	E0001273
06/002	SHAFT,1-7/16" DIA X _ _ -1/4 _ _ NBS	E0001265	E0001266	E0001267
06/003	COLLAR,ECCENTRIC LOCK 1-7/16" BORE W/HDW	1132149	1132149	1132149
10	ROLLER, _ _ NBS DR 1.9" DIA PLTD PRBG	1115002	1115167	1115168
12	BRG,FLG 4-BOLT CONCENTRIC CLAMP COLLAR	1114091	1114091	1114091
14	WHEEL,ASSEMBLY NBS	E0001560	E0001560	E0001560
19	ROLLER,GAP _ _NBS	E0001337	E0001340	E0001343
29	PULLEY,8.5" DIA DIRECT DR __NBS	1108334	1108335	1108336
29/001	SHAFT, _ _ NBS PULLEY X _ _ -1/8" (Replacement)	E0034909	E0034910	E0034911
31	**BLOCK,ASY BELT GUIDE**	**E0039089**	**E0039089**	**E0039089**
31/002	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111	90050111	90050111
33	SPACER,6" PULLEY STOP 1-1/2" ID PVC X 1-3/4" LONG	E0001295	E0001295	E0001295
34	**AIR,REGULATOR ASY NBS RH TAKEUP**	**E0004377**	**E0004377**	**E0004377**
34	AIR,REGULATOR ASY NBS LH TAKEUP	1115891	1115891	1115891
34/001	REGULATOR,SCHRADER 15R213FB	89000132	89000132	89000132
34/002	GAUGE,SCHRADER P781642	89000133	89000133	89000133
34/003	VALVE,5/2 HAND LEVER/DETENT	E0002697	E0002697	E0002697
35	CYL,AIR 1-3/4" BORE X 8" STROKE	E0004275	E0004275	E0004275
				Dwg # 66A071D-BR

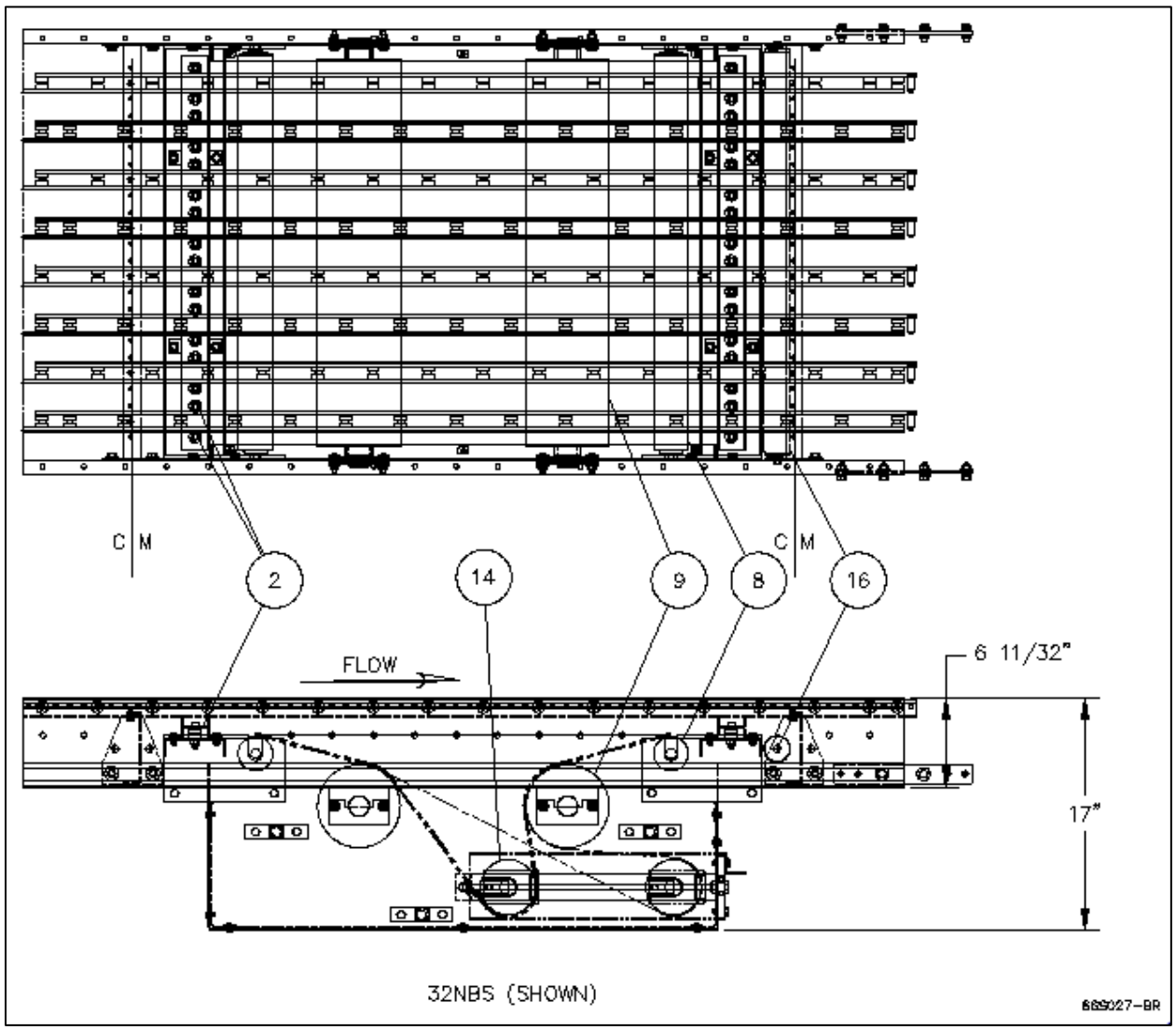
NBS-BR Drive 6′ Bed RH Shown



8.5.2: Replacement Parts – NBS-BR Drive 6' Bed RH & LH

6' DRIVE BED WIDTHS				
		WIDTH & ITEM #		
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
01	PULLEY,ASY 6" DIA W/FLANGE	E0002214	E0002214	E0002214
02	CYL,AIR RODLESS W/1-MALE PUSH LOCK CONN	1107699	1107699	1107699
03	**BLOCK,ASY BELT GUIDE**	**E0039089**	**E0039089**	**E0039089**
03/002	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111	90050111	90050111
04	AIR,VALVE 4-WAY HAND LEVER	1115797	1115797	1115797
05	AIR,REGULATOR ASY NBS TAKE-UP W/2 ELBOW FITTINGS 1/4NPT - 3/8" OD TUBE	1107897	1107897	1107897
06	**PULLEY,ASY 6" DIA _ _NBS C-FF**	**E0001274**	**E0001275**	**E0001276**
06/001	PULLEY, _ _ NBS 6" DIA C-FF 1-7/16" BORE W/BRGS	E0001271	E0001272	E0001273
06/002	SHAFT,1-7/16" DIA X _ _ -1/4 _ _ NBS	E0001265	E0001266	E0001267
06/003	COLLAR,ECCENTRIC LOCK 1-7/16" BORE W/HDW	1132149	1132149	1132149
19	ROLLER GAP_ _NBS	E0001337	E0001340	E0001343
12	BRG,FLG 4-BOLT CONCENTRIC CLAMP COLLAR	1114091	1114091	1114091
27	RAIL,ASY-A NBS-BR 6' DR	1108241	1108241	1108241
28	RAIL,ASY-A NBS-BR 6' DR	1108242	1108242	1108242
29	PULLEY,8.5" DIA DIRECT DR __NBS	1108334	1108335	1108336
29/001	SHAFT, _ _ NBS PULLEY X _ _ -1/8" (Replacement)	E0034909	E0034910	E0034911
				Dwg # 66A074-BR

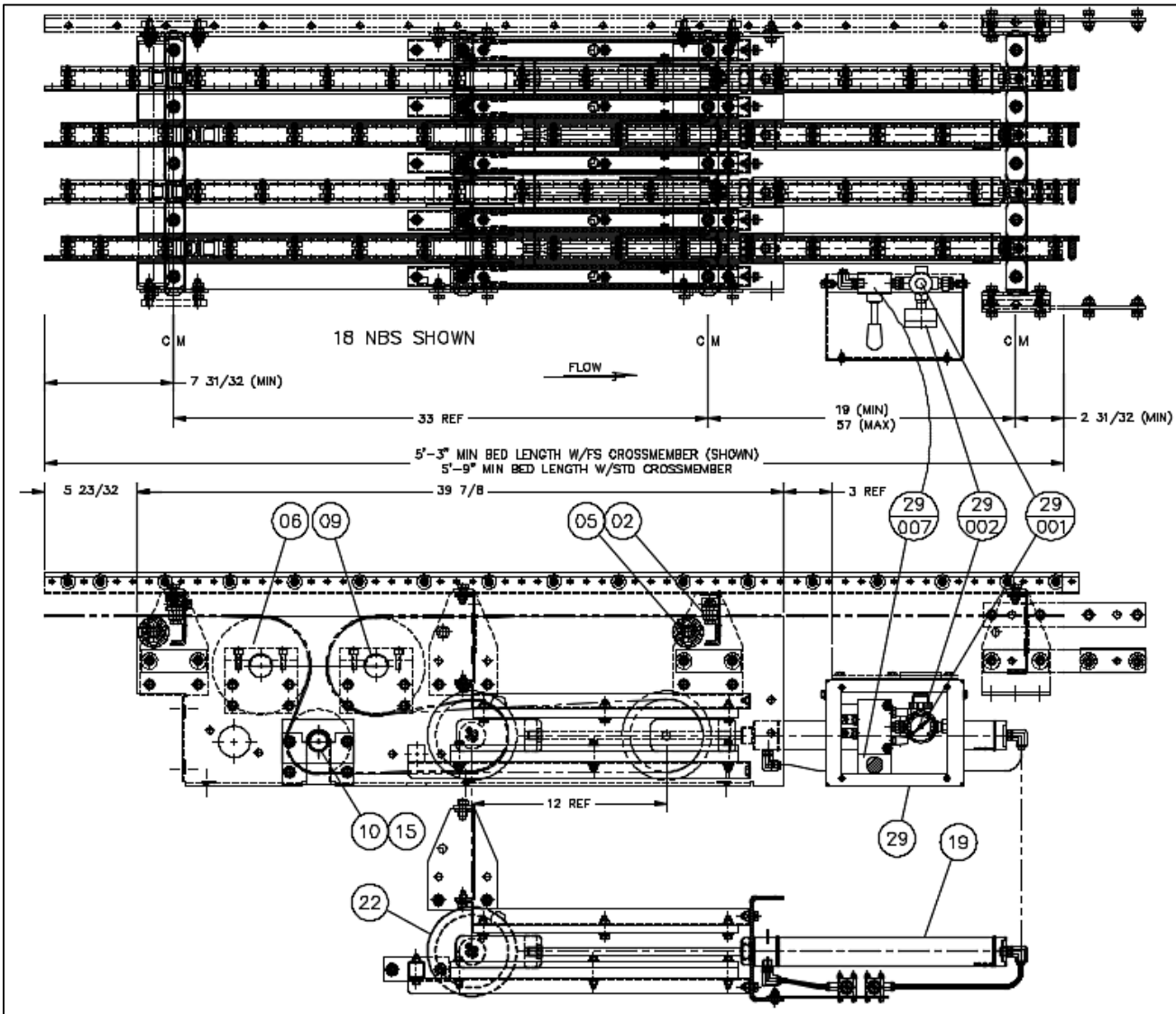
8.6: NBS-BR Manual Auxiliary Take-Up



8.6.1: Replacement Parts – NBS-BR Manual Auxiliary Take-Up

NBS, BR MANUAL AUXILIATY 19" TAKE-UP			
ASY,AUXILIARY TAKE-UP _ _ NBS-BR TAKE-UP 19"		**WIDTH & ITEM #**	
BALLOON	**DESCRIPTION**	**18"**	**25"**
02	GUIDE, NBS T-UP WHEEL/BLT ASY	E0002688	E0002689
02/001	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111	90050111
08	ROLLER,SNUBBER _ _NBS30 ABEC1 (_ _ - 15/32" BF)	E0002691	E0002692
09	**PULLEY,ASY 6" DIA _ _ NBS C-FF AUXILIARY TAKE-UP**	**E0001648**	**E0001649**
09/001	PULLEY, _ _ NBS 6" DIA C-FF 1-7/16" BORE	E0001272	E0001273
09/002	SHAFT,1-7/16" DIA X _ _ -13/16" 18NBS LP TAKE-UP	E0001635	E0001653
09/003	COLLAR,ECCENTRIC LOCK 1-7/16" BORE	1132149	1132149
09/004	SPACER,6" PULLEY STOP 9/32" PVC	E0001657	E0001657
14	**PULLEY,ASY 4" DIA _ _ NBS C-FF LP AUXILIARY TAKEUP**	**E0001651**	**E0001652**
14/001	PULLEY, _ _ NBS 6" DIA C-FF 1-7/16" BORE	E0001281	E0001282
14/002	SHAFT,1-7/16" DIA X _ _ -13/16" 18NBS LP TAKE-UP	E0001655	E0001656
14/003	COLLAR,ECCENTRIC LOCK 1-3/16" BORE	1132124	1132124
14/004	SPACER,4" PULLEY STOP 11/16" PVC AUXILIARY TAKE-UP	E0001658	E0001658
16	ROLLER,RET _ _ NBS 1.9" DIA PRBG	E0001156	E0001157
			REF: Dwg # 10D0577401A

8.7: NBS-BR Low Profile Air Auxiliary Take-Up



NBS	ASSEMBLY P/N	BF	OAW BED	OAW TAKE-UP
18NBS	1133099	16 1/4	18 17/64	21 13/32
25NBS	1133100	23 1/4	25 17/64	28 13/32
32NBS	1133101	30 1/4	32 17/64	35 13/32

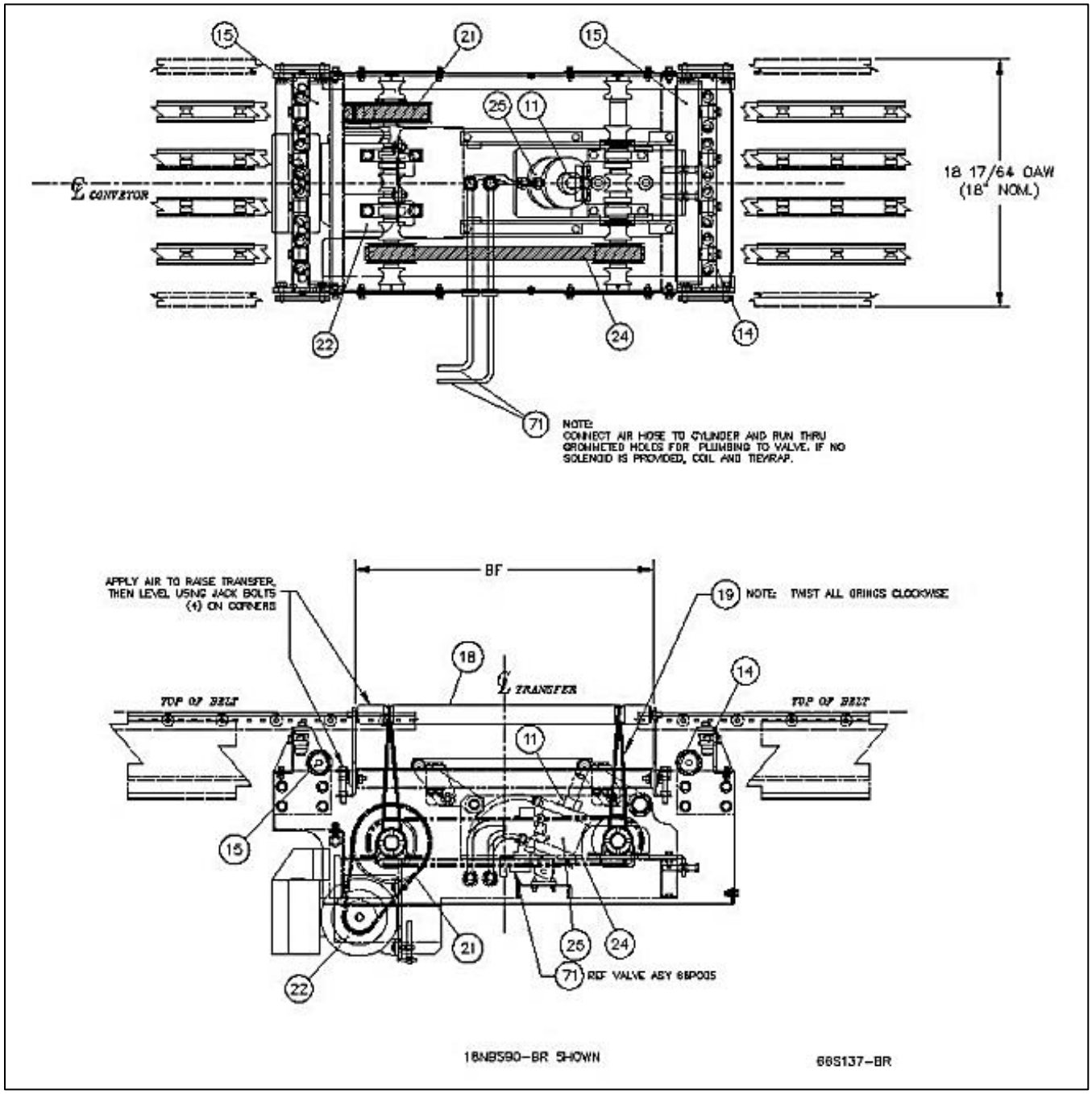
BELT LENGTH REQUIRED = (2 X BED OAL) + 39"

Dwg # 66S262A

8.7.1: Replacement Parts – NBS-BR Low Profile Air Auxiliary Take-Up

NBS, LP AIR AUXILIARY TAKE-UP WIDTHS				
TAKEUP,LP AUX AIR _ _ NBS- BR		WIDTH & ITEM #		
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
02	**CROSSMEMBER,ASY 18NBS-BR W/BELT GUIDE**	**1132993**	**1132994**	**1132995**
02/001	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111	90050111	90050111
05	ROLLER,SNUBBER _ _NBS30 ABEC1 (_ _ - 15/32" BF)	E0002690	E0002691	E0002692
06	**PULLEY,ASY 6" DIA _ _ NBS C-FF**	**1133015**	**1133016**	**1133017**
06/001	PULLEY, _ _ NBS 6" DIA C-FF 1-7/16" BORE	E0002171	E0002172	E0002173
06/002	SHAFT,1-7/16" DIA X _ _ -13/16" 18NBS LP TAKE-UP	1133009	1133010	1133011
06/003	COLLAR,ECCENTRIC LOCK 1-7/16" BORE	1132149	1132149	1132149
06/004	SPACER,6" PULLEY STOP 9/32" PVC	1133020	1133020	1133020
10	**PULLEY,ASY 4" DIA _ _ NBS C-FF LP AUXILIARY TAKEUP**	**1133021**	**1133022**	**1133023**
10/001	PULLEY, _ _ NBS 6" DIA C-FF 1-7/16" BORE	E0001280	E0001281	E0001282
10/002	SHAFT,1-7/16" DIA X _ _ -13/16" 18NBS LP TAKE-UP	1133012	1133013	1133014
10/003	COLLAR,ECCENTRIC LOCK 1-3/16" BORE	1132124	1132124	1132124
10/004	SPACER,4" PULLEY STOP 11/16" PVC AUXILIARY TAKE-UP	E0001658	E0001658	E0001658
19	CYL,AIR CLIPPARD SDR-28-12 1-3/4" BORE X 12" STROKE	1133082	1133082	1133082
22	WHEEL,ASY 5-1/2" OD NBS TAKEUP GLASS FILLED NYLON	E0001560	E0001560	E0001560
29	**AIR,REGULATOR ASY NBS LOW PRO AIR AUX TAKEUP**	**1133044**	**1133044**	**1133044**
29/001	REGULATOR,SCHRADER 15R213FB	89000132	89000132	89000132
29/002	GAUGE,SCHRADER P781642	89000133	89000133	89000133
29/007	VALVE,5/2 HAND LEVER/DETENT	E0002697	E0002697	E0002697
				REF: Dwg # 66S262D-BR

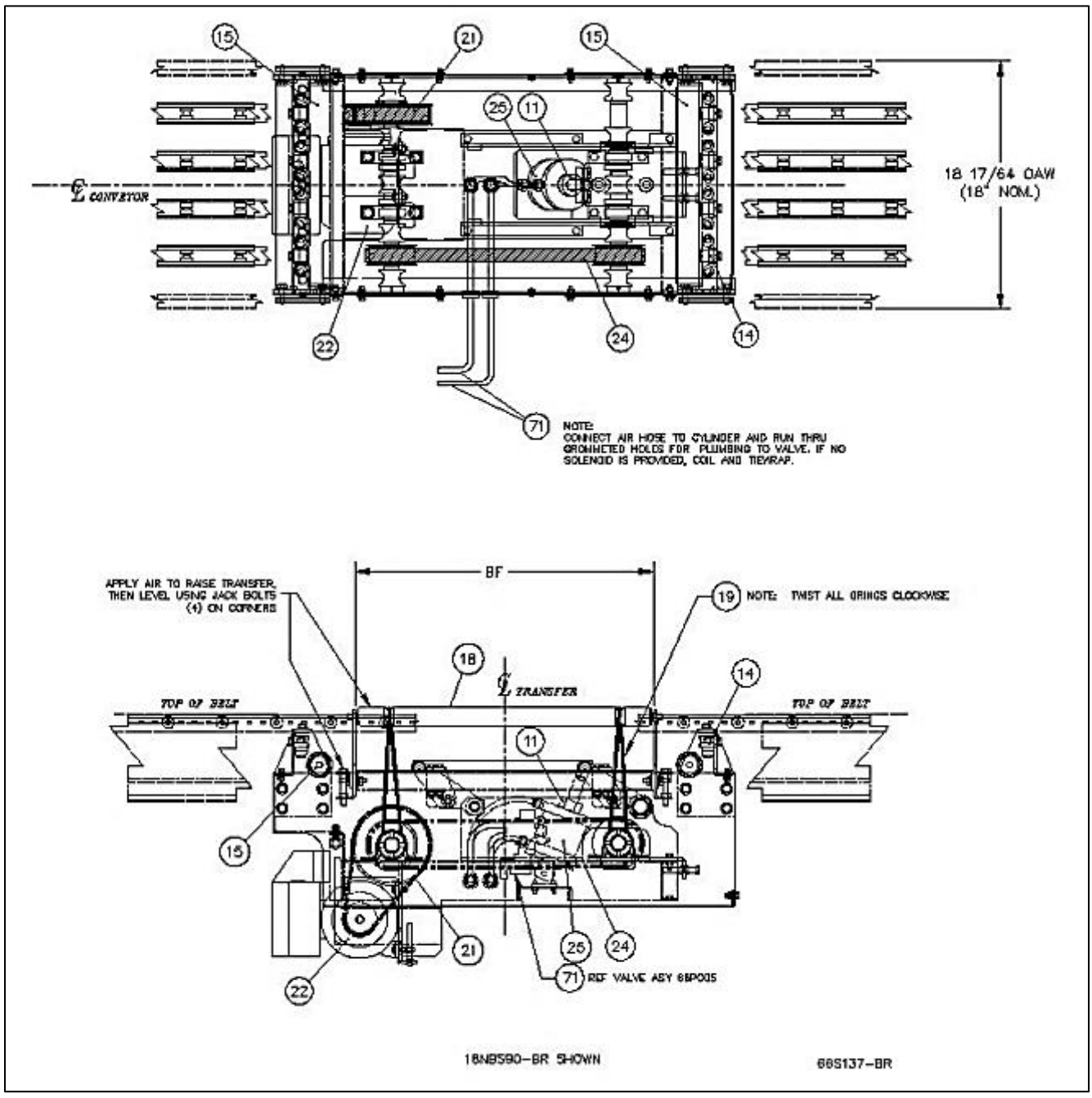
8.8: NBS 90-BR 24 TRANSFER



8.8.1: Replacement Parts – NBS90-BR-24 Transfer

NBS90, BR-24 TRANSFER WIDTHS										
With & Without MOVIMOT 24VDC Power Supply										
	Width	NBS __	BR-	BF-	SOL	MOTOR	XM			
WITH MOVIMOT POWER SUPPLY	TRANS,_ _	NBS90-	BR-	24-	110VAC	/230VAC	XM	1127039	1127051	1127059
	TRANS,_ _	NBS90-	BR-	24-	110VAC	/460VAC	XM	1127045	1127049	1127057
WITHOUT MOVIMOT POWER SUPPLY	TRANS,_ _	NBS90-	BR-	24-	24VDC	/230VAC	XM	1127038	1127050	1127058
	TRANS,_ _	NBS90-	BR-	24-	24VDC	/460VAC	XM	1127044	1127048	1127056
BALLOON	**DESCRIPTION**							**18"**	**25"**	**32"**
11	BUMPER,URETHANE 3/4" THICK 90A							E001867	E001867	E001867
14	**BLOCK,ASY BELT GUIDE**							**E0039089**	**E0039089**	**E0039089**
14/001	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)							90050111	90050111	90050111
15	ROLLER,RETURN __NBS90 (used with XM only)							E0043031	1100991	1100992
18	ROLLER,NBS-24 URETHANE (YELLOW)							1125911	1125911	1125911
19	ORING,83A NBS 7/32" DIA X 19-7/16" LONG							E001530	E001530	E001530
21	BELT,TMG HPR 600-8M-30H							90050600	90050600	90050600
22	MTR,EURODRIVE MOVIMOT.5HP 460VAC w/PW SY							E0001401	E0001401	E0001401
22	MTR,EURODRIVE MOVIMOT.5HP 230VAC w/PW SY							E0001402	E0001402	E0001402
22	MTR,EURODRIVE MOVIMOT.5HP 460VAC wo/PW SY							E0001403	E0001403	E0001403
22	MTR,EURODRIVE MOVIMOT.5HP 230VAC wo/PW SY							E0001404	E0001404	E0001404
24	BELT,TMG HPR 1120-8M-30H							90051120	90051120	90051120
25	CYL,AIR BORE 2.5" X STROKE 2.5"							E0001594	E0001594	E0001594
71	VALVE,SMC 4WAY 24VDC DIN CONN							E0038769	E0038769	E0038769
71	VALVE,SMC 4WAY 110VAC DIN CONN							E0038770	E0038770	E0038770
Dwg # 66S137E-BR										

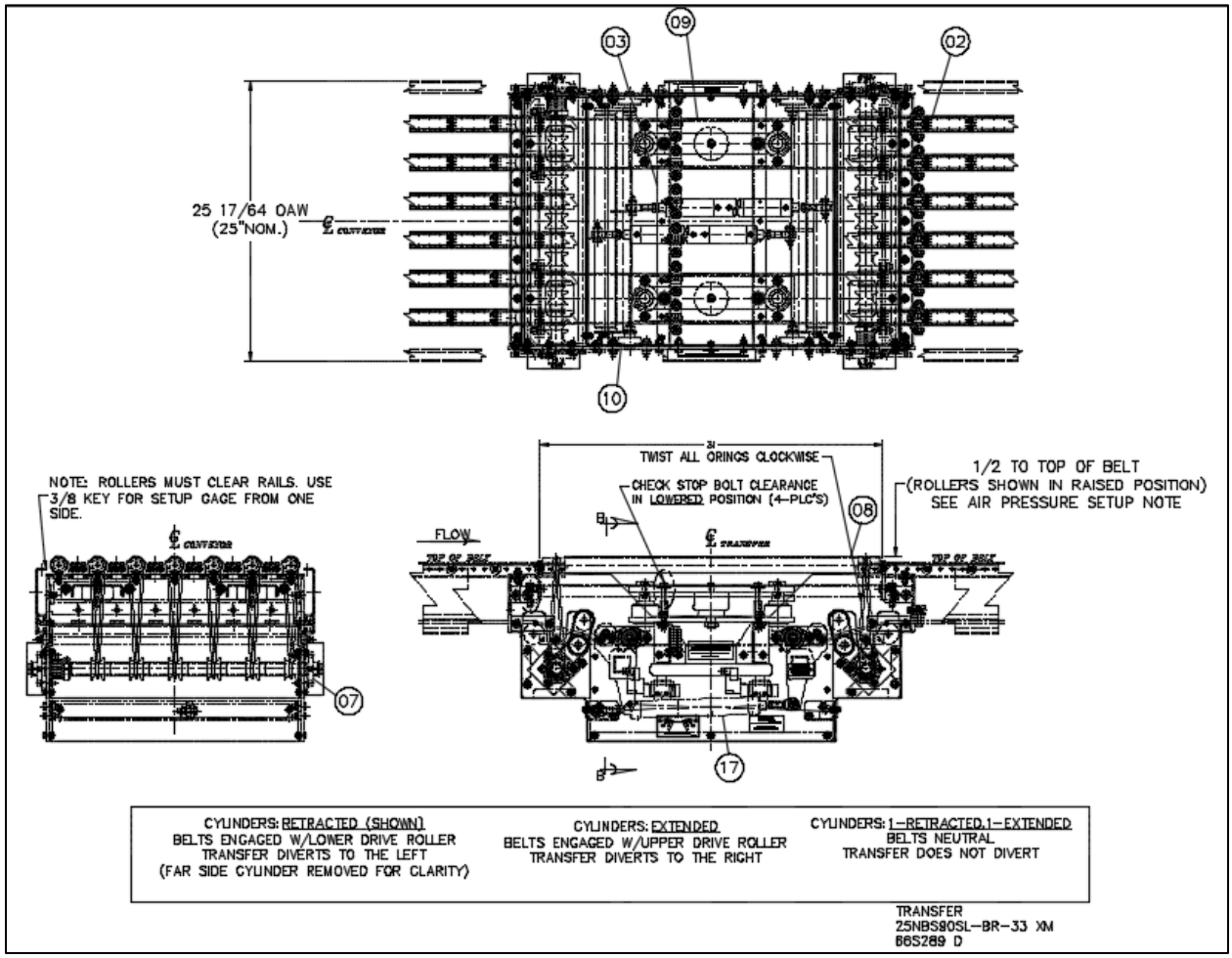
8.9: NBS 90-BR 30 TRANSFER



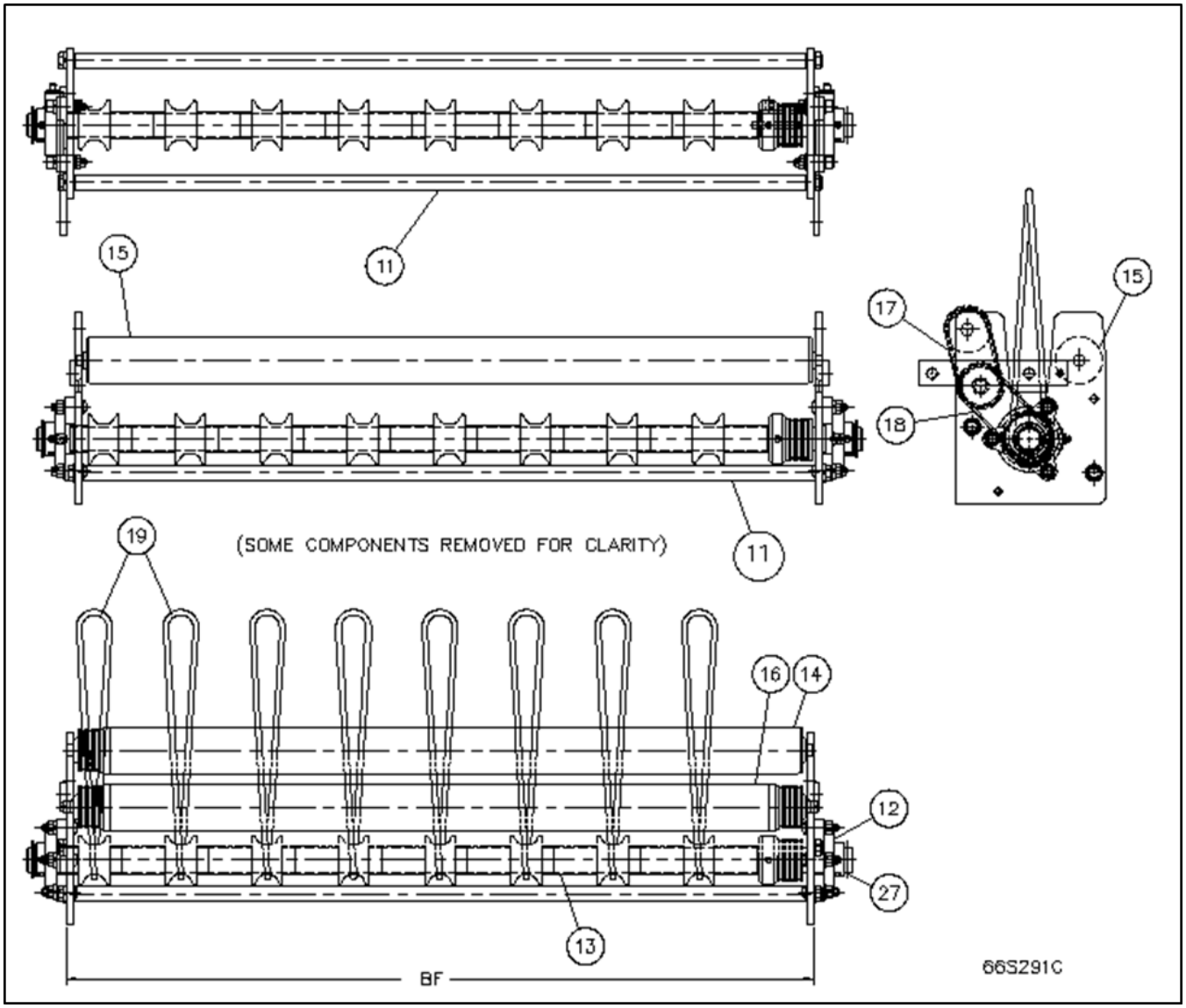
8.9.1: Replacement Parts – NBS90-BR-30 Transfer

NBS90, BR-30 TRANSFER WIDTHS									
With & Without MOVIMOT 24VDC Power Supply									
	Width	**NBS __**	**BR-**	**BF-**	**SOL**	**MOTOR**			
WITH MOVIMOT POWER SUPPLY	**TRANS,_ _**	**NBS90-**	**BR-**	**30-**	**110VAC**	**/230VAC**	**1127043**	**1127055**	**1127063**
	TRANS,_ _	**NBS90-**	**BR-**	**30-**	**110VAC**	**/460VAC**	**1127041**	**1127053**	**1127061**
WITHOUT MOVIMOT POWER SUPPLY	**TRANS,_ _**	**NBS90-**	**BR-**	**30-**	**24VDC**	**/230VAC**	**1127042**	**1127054**	**1127062**
	TRANS,_ _	**NBS90-**	**BR-**	**30-**	**24VDC**	**/460VAC**	**1127040**	**1127052**	**1127060**
BALLOON	**DESCRIPTION**						**18"**	**25"**	**32"**
11	BUMPER,URETHANE 3/4"THK 90A						E001867	E001867	E001867
14	**BLOCK,ASY BELT GUIDE**						**E0039089**	**E0039089**	**E0039089**
14/001	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)						90050111	90050111	90050111
15	ROLLER,RETURN __NBS90 (used with XM only)						E0043031	1100991	1100992
18	ROLLER,NBS-30 URETHANE (YELLOW)						1125912	1125912	1125912
19	ORING,83A NBS 7/32" DIA X 19-7/16" LONG						E001530	E001530	E001530
21	BELT,TMG HPR 600-8M-30H						90050600	90050600	90050600
22	MTR,EURODRIVE MOVIMOT.5HP 460VAC w/PW SY						E0001401	E0001401	E0001401
22	MTR,EURODRIVE MOVIMOT.5HP 230VAC w/PW SY						E0001402	E0001402	E0001402
22	MTR,EURODRIVE MOVIMOT.5HP 460VAC wo/PW SY						E0001403	E0001403	E0001403
22	MTR,EURODRIVE MOVIMOT.5HP 230VAC wo/PW SY						E0001404	E0001404	E0001404
24	BELT,TMG HPR 1440-8M-30H						90051440	90051440	90051440
25	CYL,AIR BORE 2.5" X STROKE 2.5"						E0001594	E0001594	E0001594
71	VALVE,SMC 4WAY 24VDC DIN CONN						E0038769	E0038769	E0038769
71	VALVE,SMC 4WAY 110VAC DIN CONN						E0038770	E0038770	E0038770
Dwg # 66S137E-BR									

8.10: NBS90-BR SL 33 TRANSFER



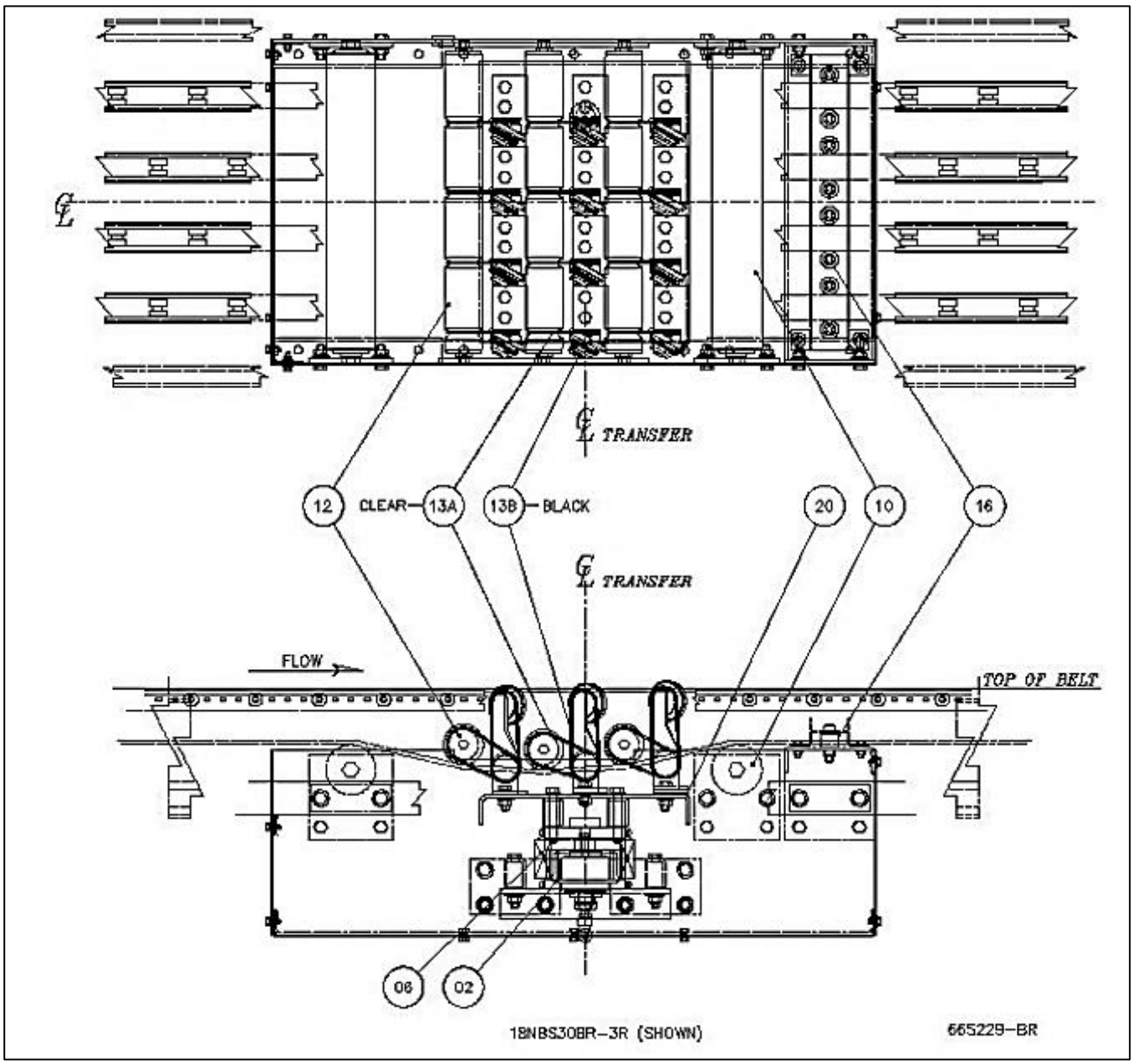
8.10.1: NBS90-BR SL 33 Transfer



8.10.2: Replacement Parts – NBS 90-BR-SL 33 Transfer Power Take Off

NBS90, SL-BR-33 TRANSFER WIDTHS				
		66S288A	66S289B	66S290B
TRANSFER,_ _ NBS90SL-BR-33 24VDC SOL ORANGE ROLLERS		**1158868**	**1158870**	**1158872**
TRANSFER,_ _ NBS90SL-BR-33 110VAC SOL ORANGE ROLLERS		**1158869**	**1158871**	**1158873**
TRANSFER,_ _ NBS90SL-BR-33 24VDC SOL YELLOW ROLLERS		**1162495**	**1162497**	**1162499**
TRANSFER,_ _ NBS90SL-BR-33 110VAC SOL YELLOW ROLLERS		**1162496**	**1162498**	**1162500**
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
02	BRG,RADIAL #6802ZZC3SRI2	E0031808	E0031808	E0031808
08	ROLLER,NBS90SL-33 85 DURO **ORANGE URETHANE**	1152174	1152174	1152174
08	ROLLER,NBS90SL-33 65 DURO **YELLOW URETHANE**	1146585	1146585	1146585
09	AIRBAG	90000025	90000025	90000025
11	CROSSMEMBER SPANNER NBS90SL	1157926	1157927	1157928
12	BRG FLG 3-BOLT X 1" BORE CAST W/HDWR	1127821	1127821	1127821
13	L/S TRANFER PTO NBS90SL	1154134	1154133	1154132
14	ROLLER PTO _ _ NBS90SL POLY-V 1.9 SGL SLV	1154130	1154129	1154128
15	ROLLER PTO _ _ NBS90SL 1.9	1154194	1154191	1131857
16	ROLLER PTO _ _ NBS90SL POLY-V 1.9 SGL SLV	1154163	1154164	1154165
17	BELT POLY-V 8 RIB 2.36" CTR (UPPER)	1152170	1152170	1152170
18	BELT POLY-V 8 RIB 2.36" CTR (LOWER)	1152171	1152171	1152171
19	ORING 83A NBS 7/32 X 19-7/16	E0001530	E0001530	E0001530
27	RING,RETAINING EXTERNAL 1" e-style	1130700	1130700	1130700
				Ref Dwg# 66S289 & 66S291

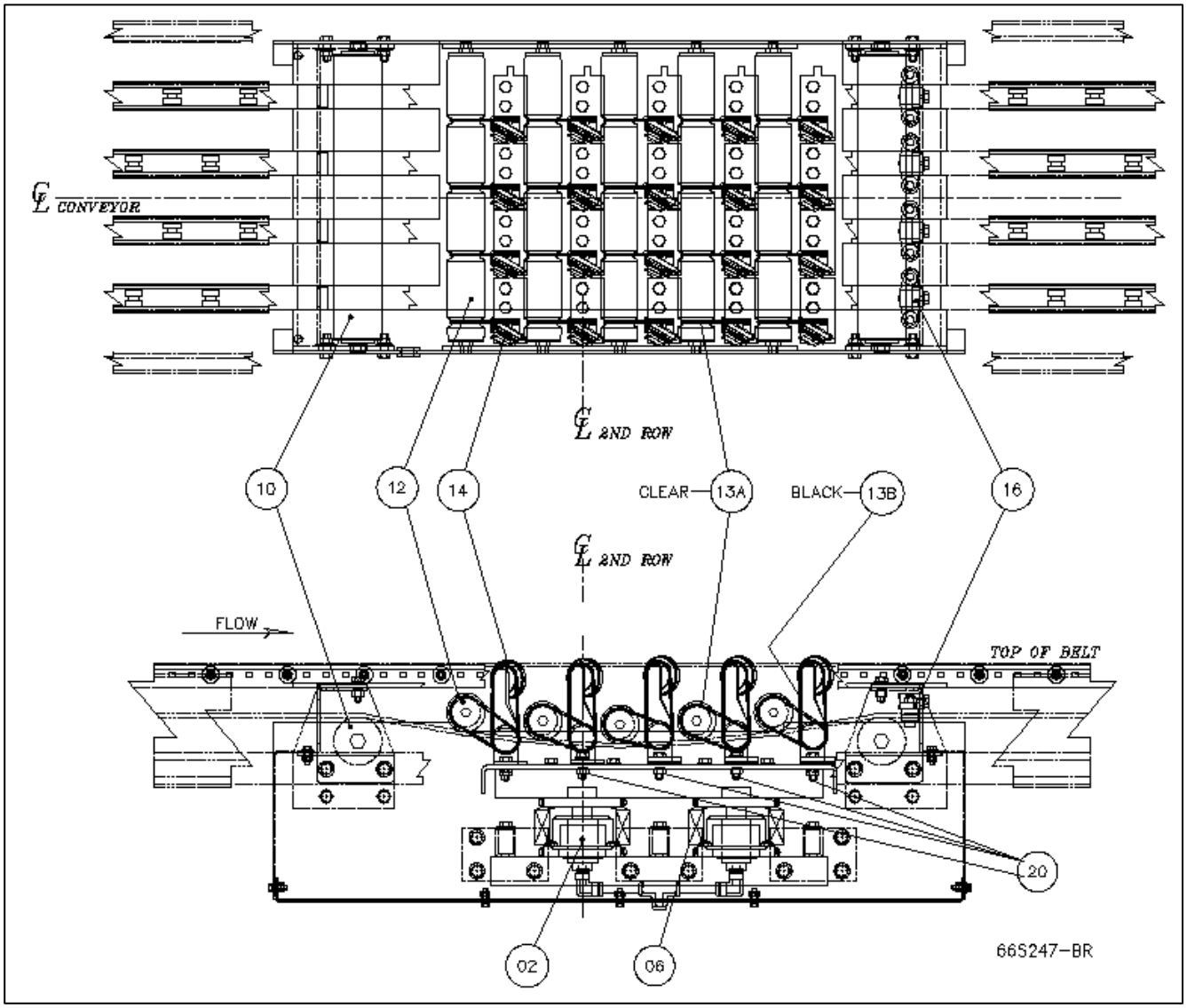
8.11: NBS30-BR 3-Row Sorter Assembly



8.11.1: Replacement Parts – NBS30-BR 3-Row Sorter

NBS30, BR-3R SORTER WIDTHS				
SORTER,ASY _ _ NBS30BR-3R RH 24V		**1114950**	**1114921**	**1112451**
SORTER,ASY _ _ NBS30BR-3R RH 110V		**1114951**	**1114922**	**1112452**
SORTER,ASY _ _ NBS30BR-3R LH 24V		**1114923**	**1112466**	**1112444**
SORTER,ASY _ _ NBS30BR-3R LH 110V		**1114924**	**1112467**	**1112445**
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
	VALVE,SMC 4WAY 24VDC DIN CONN	E0038769	E0038769	E0038769
	VALVE,SMC 4WAY 110VAC DIN CONN	E0038770	E0038770	E0038770
02	AIRBAG	90000025	90000025	90000025
06	SPRING,EXT 3/4" OD X 2" LG .075" WIRE	90800623	90800623	90800623
10	ROLLER,SNUBBER _ _NBS30	E0002690	E0002691	E0002692
12	ROLLER,_ _NBS30 PRBG WHL SORTER	E0002693	E0002694	E0002695
13A	ORING,83A 1/8" X 8" CLEAR	E0001238	E0001238	E0001238
13B	ORING,83A 1/8" X 9-1/4" BLACK	E0001239	E0001239	E0001239
16	**BLOCK,ASY BELT GUIDE**	**E0039089**	**E0039089**	**E0039089**
16/001	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111	90050111	90050111
20	SHIM,WHL BRK NBS30	E0001232	E0001232	E0001232
				Dwg #66S229B-BR

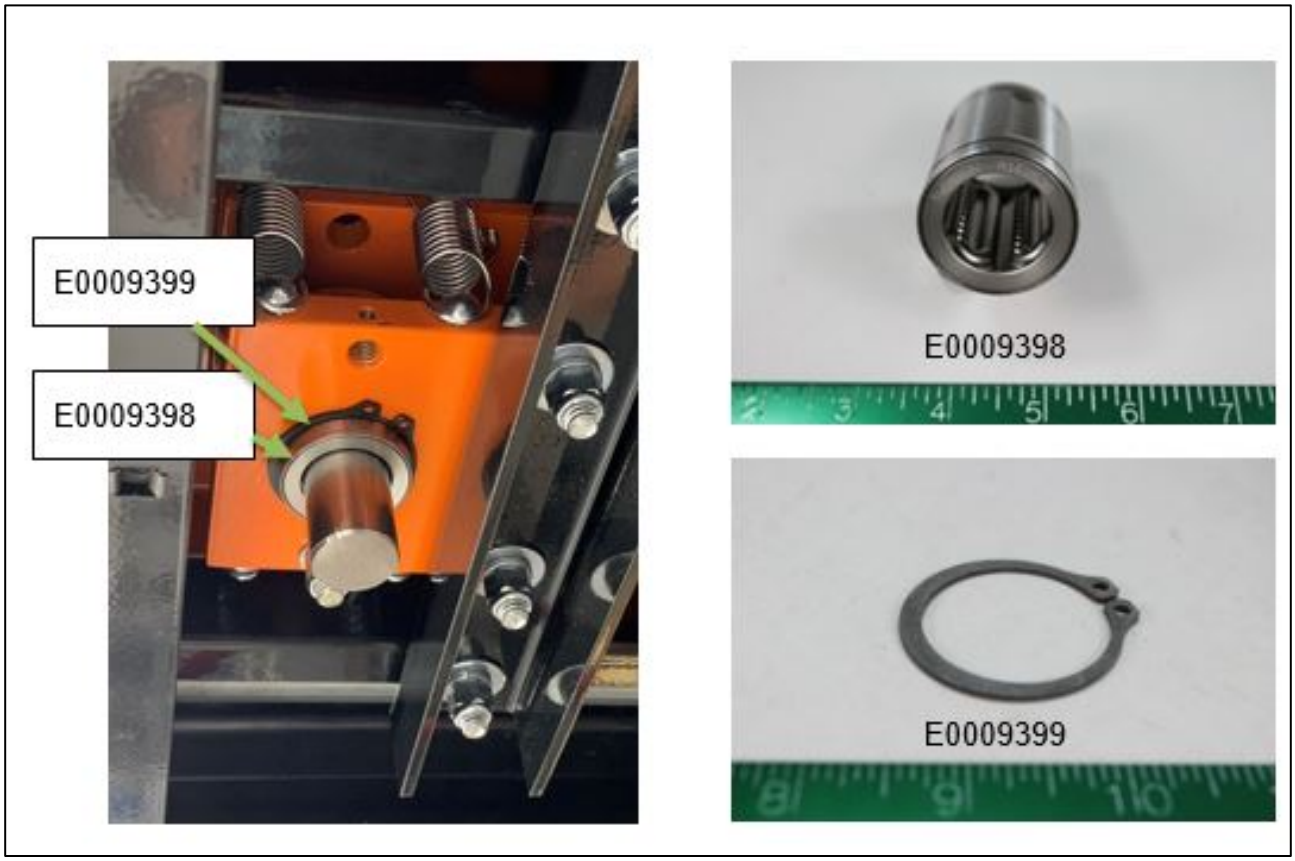
8.12: NBS30-BR 5-Row Sorter Assembly



8.12.1: Replacement Parts – NBS30-BR 5-Row Sorter

NBS30, BR-5R SORTER WIDTHS				
SORTER,ASY __NBS30BR-5R RH 24V		**1115141**	**1115145**	**1115149**
SORTER,ASY __NBS30BR-5R RH 110V		**1115142**	**1115146**	**1115150**
SORTER,ASY __NBS30BR-5R LH 24V		**1115139**	**1115143**	**1115147**
SORTER,ASY __NBS30BR-5R LH 110V		**1115140**	**1115144**	**1115148**
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
	VALVE,SMC 4WAY 24VDC DIN CONN	E0038769	E0038769	E0038769
	VALVE,SMC 4WAY 110VAC DIN CONN	E0038770	E0038770	E0038770
02	AIRBAG	90000025	90000025	90000025
06	SPRING,EXT 3/4" OD X 2" LG .075" WIRE	90800623	90800623	90800623
10	ROLLER,SNUBBER __NBS30	E0002690	E0002691	E0002692
13A	ORING,83A 1/8" X 8" CLEAR	E0001238	E0001238	E0001238
13B	ORING,83A 1/8" X 9-1/4" BLACK	E0001239	E0001239	E0001239
16	**BLOCK,ASY BELT GUIDE**	**E0039089**	**E0039089**	**E0039089**
16/001	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111	90050111	90050111
20	SHIM,WHL BRK NBS30	E0001232	E0001232	E0001232
				Dwg # 66S247D-BR

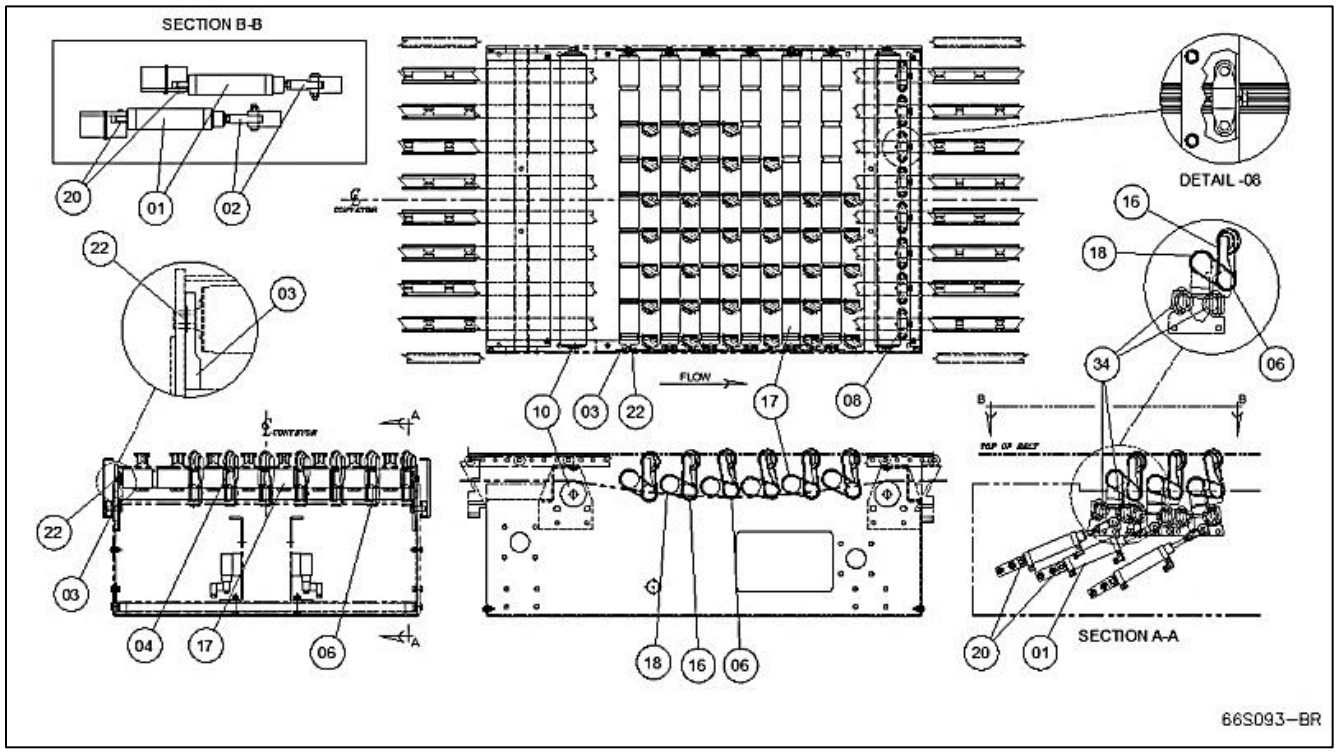
8.13: NBS30 Lift Table Wheel Sorter Optional Spare parts



8.13.1: NBS 30 Optional Replacement Parts – Lift Table Wheel Sorter

Optional Replacement Part Numbers Lift Table Wheel Sorter	
ITEM #	**DESCRIPTION**
E0009398	BRG,BUSHING THOMSON A-162536
E0009399	RING,GRIP THOMSON W 1000
	Dwg# 66S003

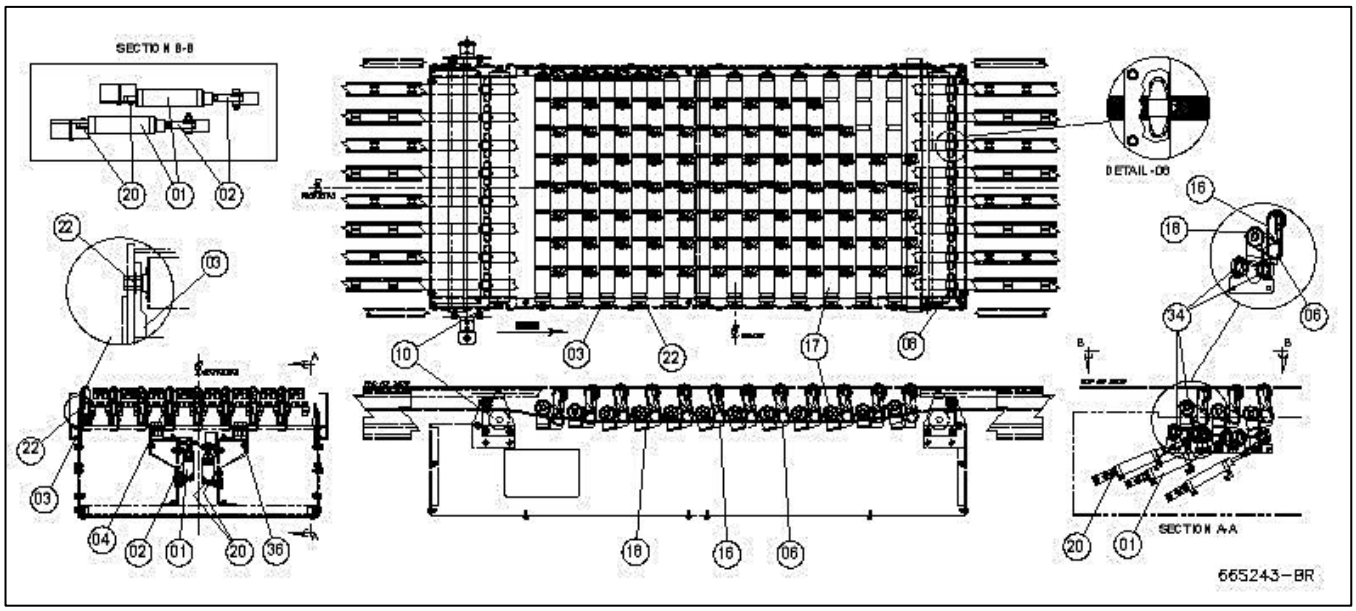
8.14: NBS 30 WAVE™ SORTER ASSEMBLY



8.14.1: Replacement Parts – NBS30-BR WAVE™ Sorter

NBS30, BR SORTER ASY, RH/LH 6 ROW DIVERT				
		WIDTH & ITEM #		
BALLOON	**DESCRIPTION**	**18"**	**25"**	**32"**
----	SORTER ASY__NBS30W6R-BR LH WAVE	1107197	1107394	1107398
----	SORTER ASY__NBS30W6R-BR RH WAVE	1107193	1107385	1107389
----	VALVE,ASY NBS30W 6-STATION 24V	1112928	1112928	1112928
----	VALVE,4-WAY 24V (REPLACEMENT) (SINGLE VALVE FOR REPLACEMENT ONLY)	1112930	1112930	1112930
01	CYL,AIR 1-1/8" BORE X 2" STROKE	E0033930	E0033930	E0033930
02	ROD,END SPHRCL 3/8" ID X 3/8" ROD	1106764	1106764	1106764
03	**PL,ASY PIVOT BLOCK NBS30W**	**E0033897**	**E0033897**	**E0033897**
03/001	BRG,RADIAL #6802ZZC3SRI2	E0031808	E0031808	E0031808
04	WHEEL,ASY NBS30 (MOLDED TIRE) ALUMINUM	1158076	1158076	1158076
06	WHEEL,ASY IDLER NBS30 ALUMINUM	1158077	1158077	1158077
08	**BLOCK,ASY BELT GUIDE NBS XM MTD**	**E0039089**	**E0039089**	**E0039089**
08/001	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111	90050111	90050111
10	ROLLER,SNUBBER__NBS30	E0002690	E0002691	E0002692
16	ORING,83A 1/8 X 9-1/4" BLACK	E0001239	E0001239	E0001239
17	ROLLER,__NBS30 PRBG WHL SORTER	E0031810	E0031811	E0031812
18	ORING,83A 1/8 X 8" CLEAR	E0001238	E0001238	E0001238
20	WASHER,DELRIN .750 OD X .385 ID	1101423	1101423	1101423
22	WASHER,DELRIN 1.500 OD X .506 ID	E0033910	E0033910	E0033910
34	BUMPER,RADIAL	E0033912	E0033912	E0033912
				Dwg # 66S200E-BR

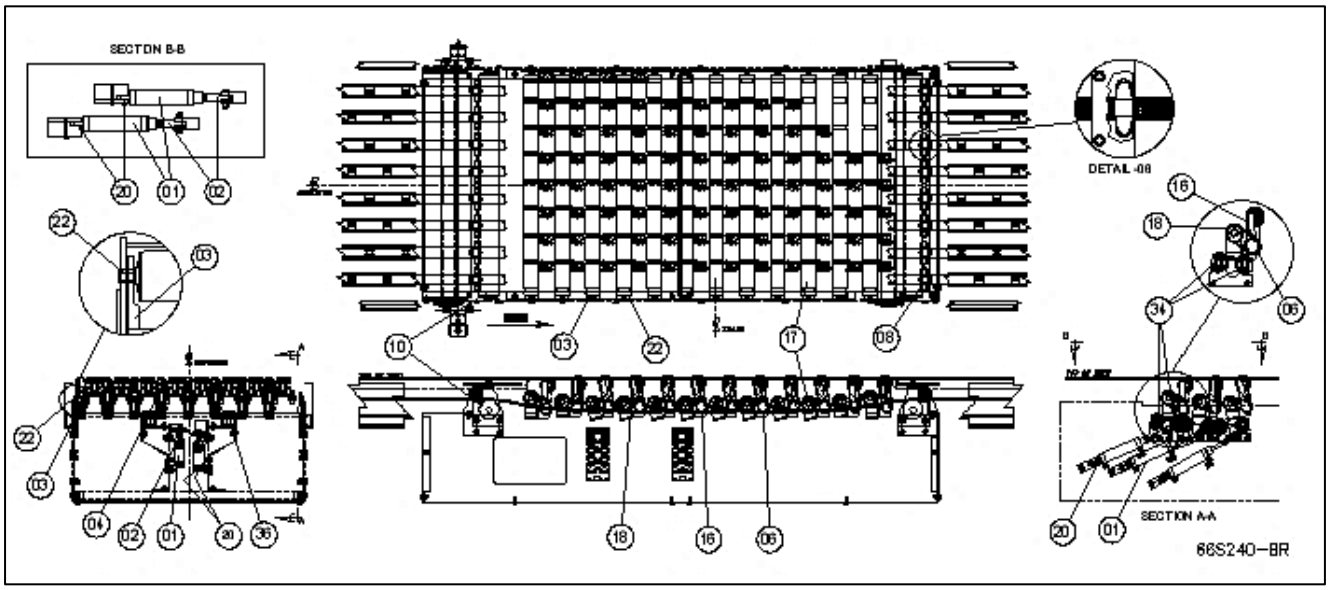
8.15: NBS30-BR 12-ROW ALIGNER ASSEMBLY



8.15.1: Replacement Parts – NBS30-BR 12-Row Aligner

NBS30, 12R-BR ROW ALIGNER WIDTHS			
		WIDTH & ITEM #	
BALLOON	**DESCRIPTION**	**25"**	**32"**
----	MANIFOLD,ASY NBS30-12R 4-STATION 24V	1109704	1109704
----	VALVE,4-WAY 24V (REPLACEMENT) (SINGLE VALVE FOR REPLACEMENT ONLY)	E0038769	E0038769
----	MANIFOLD,ASY NBS30-12R 4-STATION 110V	1109705	1109705
----	VALVE,4-WAY 110V (REPLACEMENT) (SINGLE VALVE FOR REPLACEMENT ONLY)	E0038770	E0038770
01	CYL,AIR 1-1/8" BORE X 2" STROKE	E0033930	E0033930
02	ROD,END SPHERICAL 3/8" ID X 3/8" ROD	1106764	1106764
03	**PL,ASY PIVOT BLOCK NBS30W**	**E0033897**	**E0033897**
03/001	BRG,RADIAL #6802ZZC3SRI2	E0031808	E0031808
04	WHEEL,ASY NBS30 (MOLDED TIRE) ALUMINUM	1158076	1158076
06	WHEEL,ASY IDLER NBS30 ALUMINUM	1158077	1158077
08	**BLOCK,ASY BELT GUIDE NBS XM MTD**	**E0039089**	**E0039089**
08/001	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111	90050111
10	ROLLER,SNUBBER__NBS30	E0002691	E0002692
16	ORING,83A 1/8 X 9-1/4" BLACK	E0001239	E0001239
17	ROLLER,__NBS30 PRBG WHL SORTER	1101771	1101772
18	ORING,83A 1/8 X 8" CLEAR	E0001238	E0001238
20	WASHER,DELRIN .750 OD X .385 ID	1101423	1101423
22	WASHER,DELRIN 1.500 OD X .506 ID	E0033910	E0033910
34	BUMPER,RADIAL	E0033912	E0033912
36	BEARING,ROLLER 1/2 ID	1101780	1101780
			Ref Dwg 66S243-BR

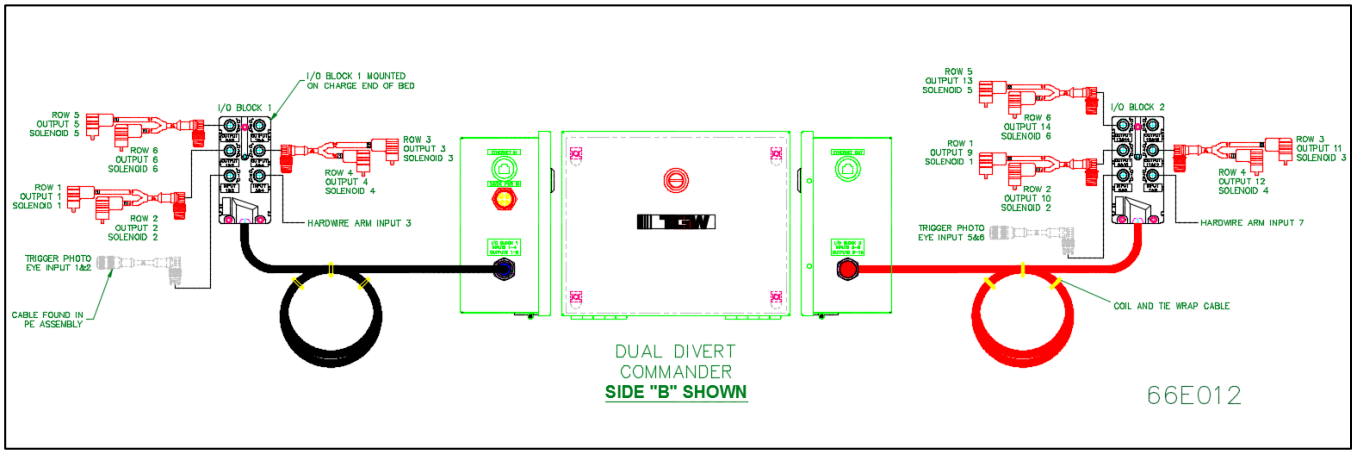
8.16: NBS30-BR WAVE™ ALIGNER ASSEMBLY



8.16.1: Replacement Parts – NBS30-BR WAVE™ Aligner

NBS30, WP-BR 12 ROW ALIGNER WIDTHS					
		PROXIMITY PHOTOEYE		RETROREFLECT & PROX PHOTOEYES	
		25"	32"	25"	32"
BALLOON	DESCRIPTION	PE	PE	BE	BE
----	SORTER ASY___NBS30WP RH Flat Cable	1102331	1102335	1102330	1102334
----	SORTER ASY___NBS30WP LH Flat Cable	1101786	1101820	1101785	1101819
----	SORTER ASY___NBS30WP RH Round Cable	1102333	1102337	1102332	1102336
----	SORTER ASY___NBS30WP LH Round Cable	1101788	1101822	1101787	1101821
----	VALVE,ASY NBS30WP 12-STATION 24V	1112929	1112929	1112929	1112929
----	VALVE,4-WAY 24V (REPLACEMENT) (SINGLE VALVE FOR REPLACEMENT ONLY)	1112930	1112930	1112930	1112930
01	CYL,AIR 1-1/8" BORE X 2" STROKE	E0033930	E0033930	E0033930	E0033930
02	ROD,END SPHERICAL 3/8" ID X 3/8" ROD	1106764	1106764	1106764	1106764
03	PL,ASY PIVOT BLOCK NBS30W	E0033897	E0033897	E0033897	E0033897
03/001	BRG,RADIAL #6802ZZC3SRI2	E0031808	E0031808	E0031808	E0031808
04	WHEEL,ASY NBS30 (MOLDED TIRE) ALUMINUM	1158076	1158076	1158076	1158076
06	WHEEL,ASY IDLER NBS30 ALUMINUM	1158077	1158077	1158077	1158077
08	BLOCK,ASY BELT GUIDE NBS XM MTD	E0039089	E0039089	E0039089	E0039089
08/001	BRG,7/8" OD X 9/32" WIDE (R6 ZZ C3)	90050111	90050111	90050111	90050111
10	ROLLER,SNUBBER___NBS30	E0002691	E0002692	E0002691	E0002692
16	ORING,83A 1/8 X 9-1/4" BLACK	E0001239	E0001239	E0001239	E0001239
17	ROLLER,___NBS30 PRBG WHL SORTER	1101771	1101772	1101771	1101772
18	ORING,83A 1/8 X 8" CLEAR	E0001238	E0001238	E0001238	E0001238
20	WASHER,DELRIN .750 OD X .385 ID	1101423	1101423	1101423	1101423
22	WASHER,DELRIN 1.500 OD X .506 ID	E0033910	E0033910	E0033910	E0033910
34	BUMPER,RADIAL	E0033912	E0033912	E0033912	E0033912
36	BEARING,ROLLER 1/2 ID	1101780	1101780	1101780	1101780
					Dwg # 66S093-BR

8.17: WAVE CONTROL NBS-30 DUAL ETHERNET



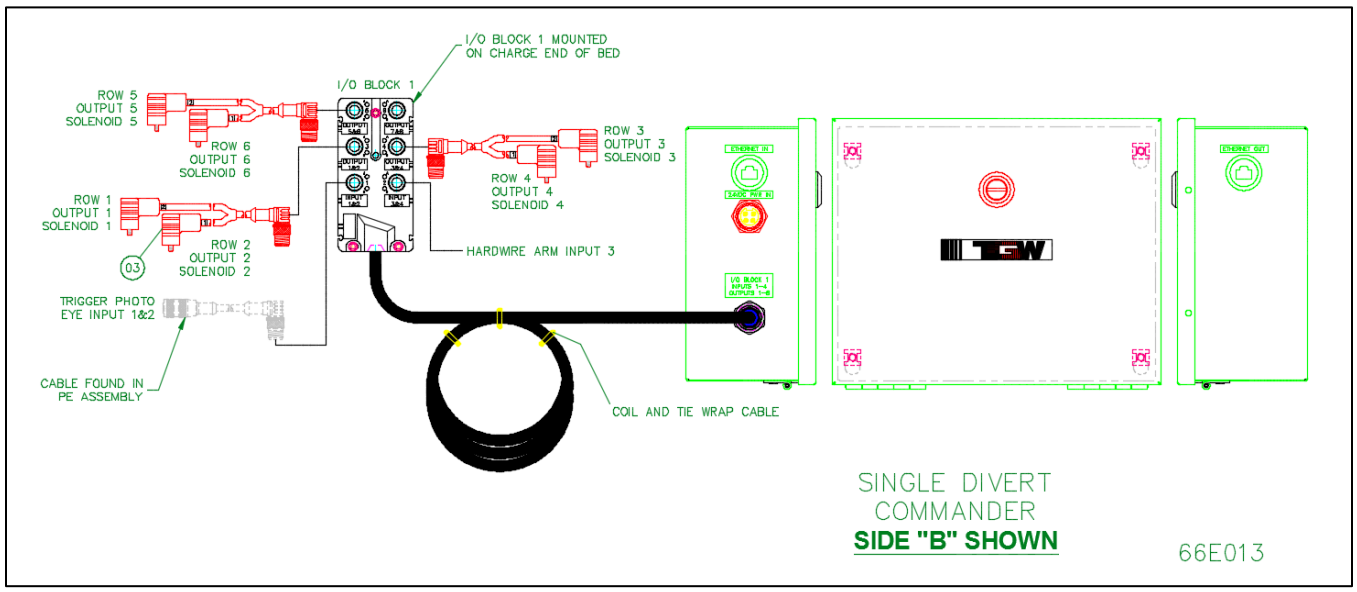
8.17.1: Replacement Parts – Wave Control Dual Ethernet

Replacement Part Numbers for Wave Control Dual Ethernet	
ITEM #	**DESCRIPTION**
1182136	WAVE CNTL, NBS-DUAL ETHERNET
	Dwg# 66E012A

8.17.2: Replacement Parts – Photoeye

Replacement Part Numbers for Photo Eye	
ITEM #	**DESCRIPTION**
1182138	PB, NBS-WAVE-RETRO-ETHERNET
1182139	PB, NBS-WAVE-PROX-ETHERNET

8.18: WAVE CONTROL NBS-30 SINGLE ETHERNET



8.18.1: Replacement Parts – Wave Control Single Ethernet

Replacement Part Numbers for Wave Control Single Ethernet	
ITEM #	**DESCRIPTION**
1182137	WAVE CNTL, NBS-SINGLE ETHERNET
	Dwg# 66E013A

8.18.2: Replacement Parts – Photoeye

Replacement Part Numbers for Photo Eye	
ITEM #	**DESCRIPTION**
1182138	PB, NBS-WAVE-RETRO-ETHERNET
1182139	PB, NBS-WAVE-PROX-ETHERNET

NBS REVISION HISTORY

Revision Date	Chapter/Description	Initials
4/21/2021	**Spur Location (Both NBS 30 and Wave Divert)** Added - **Note: Spur frame is bolted directly to NBS Sorter / Divert Bed frame side channel.**	DG
7/6/2021	Added optional spare parts for Wheel Sorter Lift Table	AB CN

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