

# Installation and Maintenance Manual

Model: BRBDC

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Rev. B



a TOYOTA ADVANCED LOGISTICS company

## Contributions

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## Revisions

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11/2/2021	B	Branding and style updates	Andrew Jones
1/10/2022	Review B	MKT final draft	Mark Fishback

## Term and Acronym Definition List

<b>TERM/ACRONYM</b>	<b>DEFINITION</b>
<b>BRBDC</b>	Belted Roller Bed Direct Current; DC roller conveyor format driven by brushless DC servo motor.
<b>Carton or Case</b>	Term for conveyable items generally contained in cardboard boxes.
<b>CB</b>	Carriage bolt.
<b>DC</b>	Direct current.
<b>Discharge</b>	The point where cartons, cases, or totes exit a conveyor or similar unit used in a material handling system.
<b>Guide Rail</b>	Mechanism used to maintain the desired position of conveyable cartons, cases, or totes on their respective conveying surface.
<b>Idler Roller</b>	Cylindrically-shaped material handling component that is unpowered and used to support a belt.
<b>Infeed</b>	The point where cartons, cases, or totes enter a conveyor or similar unit used in a material handling system.
<b>Live</b>	A zone of conveyor runs "live" when it runs whenever energized. It is for this reason that live zones of conveyor do not have or need any photoeyes or reflectors.
<b>LOTO</b>	Lockout Tagout.
<b>Mark Number</b>	A numeric or alphanumeric term used to uniquely identify a conveyor bed or collection of beds (of similar model type) within a material handling system.
<b>Match</b>	A mark made on mating conveyor assemblies to assist in identifying orientation and placement within a system.
<b>OAW</b>	Overall width of any given conveyor bed.
<b>OSHA</b>	Occupational Safety and Health Administration
<b>Poly-V</b>	A band or roller hub format with longitudinal ribs used for power transmission in DC conveyor applications.
<b>Roller</b>	Powered or unpowered cylindrically-shaped material handling component used for mechanical power transmission, a conveying surface, and/or support for a belted conveying surface.
<b>Side Cover</b>	A PVC cover used to conceal and protect electrical components and wiring from foreign debris and moving obstacles.
<b>Side Frame</b>	Structural member used to support rotating components needed for conveyor beds.
<b>TOR</b>	Top of roller; this refers to the elevation of the conveying surface with respect to the floor on which the conveyor is sitting.
<b>Track</b>	To adjust the position of conveyor components in such a way that encourages proper belt alignment on a system.
<b>Tracking Bands</b>	Thin plastic bands installed on head or secondary drive roller to help keep DC format conveyor belts tracked.
<b>Wiz Nut</b>	A serrated flange nut used to cut into the surface of the component it is tightened against.

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Reference Documents

MANUFACTURER	MANUAL
<b>Bastian Solutions</b>	Bastian Solutions Conveyor: Side Cover and Guiderail Installation Manual
<b>Bastian Solutions</b>	Bastian Solutions Conveyor: Support Installation Manual
<b>Bastian Solutions</b>	Bastian Solutions Conveyor: Teknic Motor Service Bulletin
<b>Teknic, Inc.</b>	MCVC-3441D Manual

## **1 Introduction**

Thank you for choosing Bastian Solutions conveyor. The following manual serves as a guide for installation, part replacement, and general maintenance for your material handling equipment. It is important to read the manual and follow any instructions as it provides important safety information for personnel and will maximize the longevity of the conveyor.

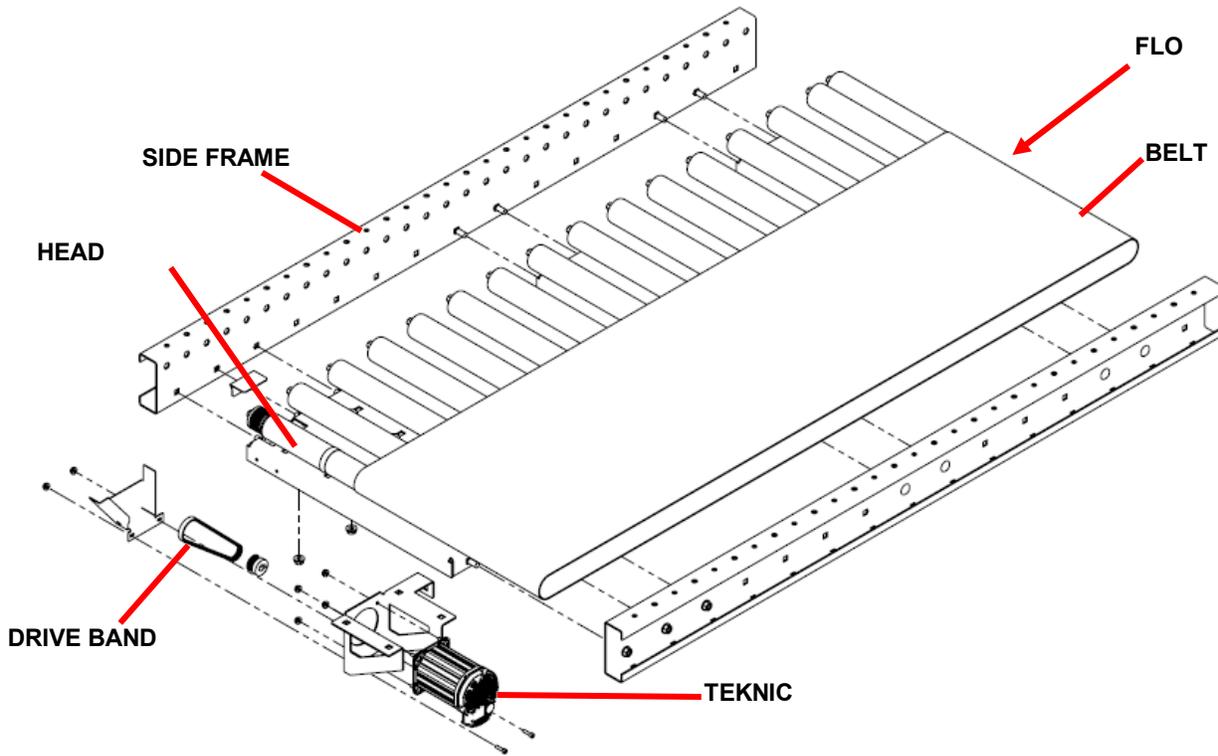
The information contained in this manual applies only to the products described. Uses, activities, or processes related to installing or maintaining the equipment that are not explicitly described in this manual are considered out of scope. Please contact Bastian Solutions for any questions or support that is not clearly addressed in this document. Bastian Solutions is not responsible for misuse of the equipment described in this manual or misuse of information in this manual. If you have any questions, contact Bastian Solutions Customer Service at [ConveyorSupport@bastiansolutions.com](mailto:ConveyorSupport@bastiansolutions.com).

## **2 OSHA and Safety**

Bastian Solutions is not responsible for ensuring that conveyors used in a system abide by OSHA standards. Safety is of primary importance to our company, but as a product distributor we ask that system integrators and end users conform with all applicable OSHA standards. We encourage that all warnings in this manual are followed to avoid unnecessary risk.

### 3 Model: BRBDC

The Belted Roller Bed DC Conveyor (BRBDC) utilizes a belt that is driven by a DC motor to convey product. The BRBDC conveyor is designed with a single head roller that pulls the belt in the direction of flow while non-powered idler rollers support the belt throughout the length of the bed section. The head roller is “live” meaning that it runs continuously whenever the Teknic motor is energized. The model shown in Figure 1 serves as a reference to become familiar with the components and terminology used in this manual. These terms will be used throughout the manual and are common among many of the other Bastian Solutions’ conveyor product lines.



*Figure 1: Exploded View of BRBDC*

The model in Figure 1 is a BRBDC bed section. The BRBDC section has 4” roller centers and has (1) zone. The zone is made up of carrying rollers, (1) Teknic motor and (1) head roller. The head roller is connected to the Teknic motor by a Poly-V band while the carrying rollers are only in contact with the belt. The conveyor runs continuously whenever energized.

## 4 Receiving

Upon delivery of any Bastian Solutions conveyor, please review and check the following:

- The quantity of items received against the Bill of Lading.
- Complete a visual inspection of equipment to determine any damage that may have occurred during shipping. If damage is present, document with pictures.
- Review Mark Number information and layout locations. More information can be found in subsection 4.1.

If there are any missing or damaged components contact your Bastian Solutions' conveyor representative with as much detail as possible. If you are unsure of your Bastian Solutions' conveyor representative, please contact Bastian Solutions Customer Service at [ConveyorSupport@bastianolutions.com](mailto:ConveyorSupport@bastianolutions.com).

### 4.1 Mark Numbers

A mark number is a specific number given to a piece of equipment. A mark number is usually made up of a single product line (RZPDC, RLVDC, BZPDC, etc.) but can contain many bed section lengths. They can range from two inches to hundreds of feet. The mark number is used to help identify where the piece of equipment will go within the system layout.

Every bed section of conveyor will have (2) stickers. One sticker on the infeed end of the bed, and one sticker on the discharge end of the bed. Each sticker will contain the following information:

- Project Number and Name
- Model Type
- Mark Number
- Match
- Piece
- Flow

Figure 2 shows stickers that would appear on an RZPDC that has two bed sections.



*Figure 2: Mark Number Stickers*

The Match field on the stickers is used to indicate if two bed sections are to be spliced to one another. As shown in Figure 2 the stickers where the two beds splice together both contain "Match: 1".

The piece field defines the bed section number within the mark. The flow refers to the direction of product flow along the conveyor system.

### 4.2 Skid Contents

Skids will contain varying combinations of conveyor sections, support structures, accessories, and pertinent hardware. For protection of product integrity during shipping, accessories and supports may be delivered on separate but labeled skids.

### 4.3 Skid Documentation

All shipments will contain a Bill of Lading for the delivery company, a skid label, and a skid manifest. Skid labels have the contents of each shipped item located on the skid. Figure 3 shows a sample of a skid label. These stickers are placed on the surface of each skid.

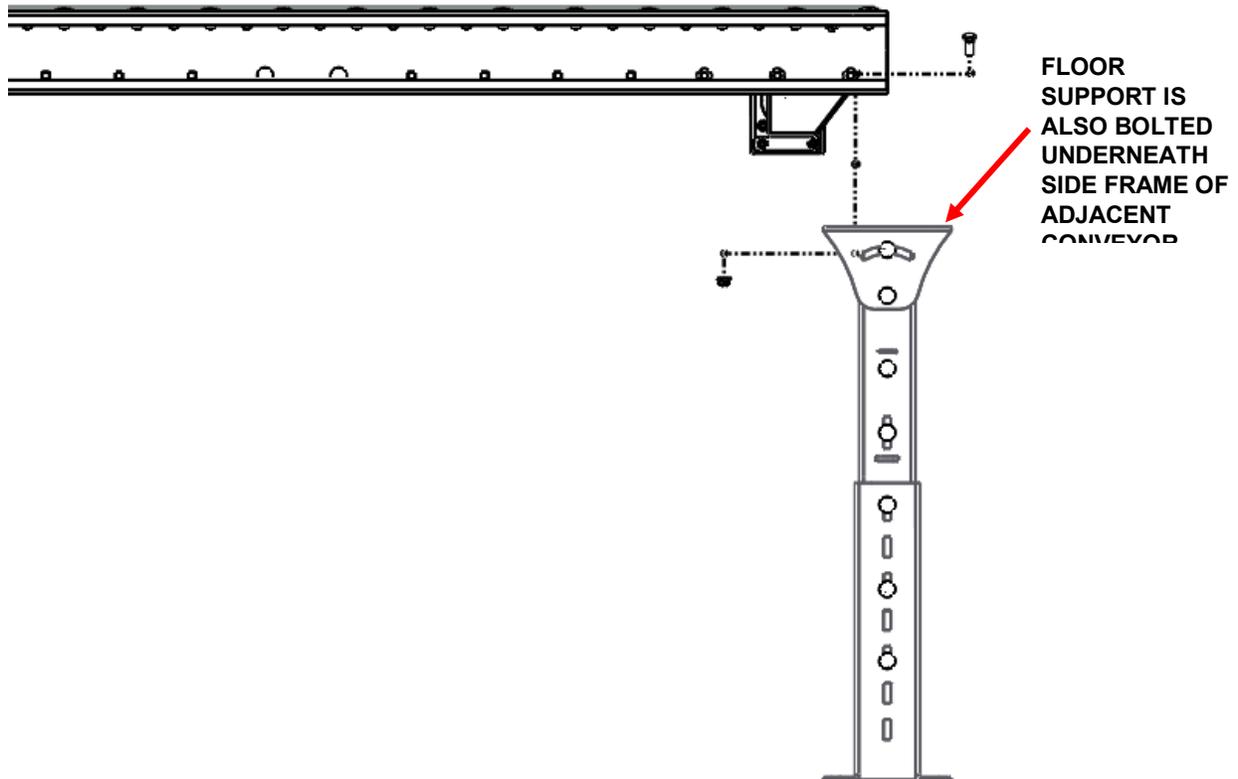


Figure 3: Skid Sticker

## 5 Installation

The installation supervisor should have elevation and layout prints with detailed information regarding the placement of conveyor sections and support structures. This information is not the responsibility of Bastian Solutions to provide unless otherwise specified.

1. Clear the workspace around the portion of the layout selected for installation.
2. Measure out from a constrained origin to start placement of supports. It is recommended that snap chalk lines are used, or other methods of keeping a consistent line.
3. Use elevation layouts to determine the conveyor's top of conveying surface.
4. Place the support type that the layout designates. Each support type has a corresponding mark sticker.
5. Check the flow direction on the mark stickers to ensure that conveyors are mounted properly.
6. Place the conveyor onto the support structure and fasten it securely using the 3/8"-16 carriage bolts and wiz nuts provided as shown in Figure 4 (floor support shown as an example support structure). The recommended torque specification is 31ft-lbs.



*Figure 4: Fastening BRBDC to Floor Support*

7. Attach any guiderail or miscellaneous accessories. For information on guiderail installation, please reference the “Bastian Solutions Conveyor: Side Cover and Guiderail Installation Manual”
8. Check that the height of the infeed and discharge ends are correct per the system layout.
9. Secure the supports to the floor (or other permanent fixture).



**Lockout/Tagout** procedures should be implemented before performing any maintenance.

## **6 Maintenance and Operation**

The longevity and proper functionality of Bastian Solutions conveyor is based upon standard operating practices and general maintenance of equipment. Setting up a regular maintenance schedule will help to ensure that products comply with the equipment’s warranty. **Lockout/Tagout** procedures should be implemented before performing any maintenance.

### **6.1 Safety During Operation**

The list below explains a series of recommended precautions that should be taken when personnel are near the equipment. This list is not intended to be the only precautions taken, but it serves as a guide of important steps to follow.

- Only fully trained employees should operate or perform maintenance on conveyor. Proper training should include the detailed description of fail-safes, stopping devices, or other emergency regulations put in place.
- WARNING stickers should be replaced if worn or damaged.
- All personnel in the area should be alerted prior to starting any conveyor at all times. This process may vary depending on the conditions and layout of the site, but it should use audible and visual cues and all personnel should be made aware of the protocol.
- Operators should inspect the conveyor for damage, foreign objects, and verify all personnel is clear of the equipment prior to engaging drive.
- Ensure that all areas are clear of objects prior to loading and unloading.
- No personnel should ever ride, climb, step, sit on, or otherwise put body weight on the conveyor. Doing so puts both personnel and equipment at risk.
- Maintenance should be performed at regular intervals to assure the safety of operators and the longest life of components. Should a component break during operation or prior to operation, then lockout/tagout instructions should be performed immediately to prevent exposure to hazards.

### **6.2 Maintenance Schedule**

To prolong the life of the material handling equipment and reduce the risk of potential safety hazards, it is vital that a preventative maintenance program be set in place and followed. The following instructions will help identify key areas requiring maintenance.

### 6.2.1 Mechanical Service

- An auditory inspection of the equipment should be performed to identify any unusual noise that may indicate that there is a problem with the equipment.
- Check all nuts and bolts to ensure fastener connections remain tight.
- The drive band should be inspected for excessive wear, stretching or slip and replaced as necessary.
- The recommended interval for maintenance is at least once every 6 months.

### 6.2.2 Electrical Service

For issues with the drive motor, please refer to the “Bastian Solutions Conveyor: Teknic Motor Service Bulletin” or the Teknic MCVC-3441D manual

- All Bastian Solutions’ conveyor DC products operate at either 24V or 48V, nominally.



When performing electrical work on Bastian Solutions conveyor, ensure adherence to all applicable OSHA standards.

- If experiencing any other electrical problems with Bastian Solutions DC conveyor, contact Bastian Solutions Customer Service at [ConveyorSupport@bastiansolutions.com](mailto:ConveyorSupport@bastiansolutions.com).

### 6.2.3 Replacing Idler Rollers



Belt does not need to be removed to replace idler rollers.

1. Follow the lockout/tagout procedure in place to ensure safety.
2. Remove the side cover from the intended work area.
3. Locate roller needing replacement and apply pressure on one end of the hex shaft with a small diameter punch or similar tool until the shaft clears the frame. Be careful NOT to apply a side load to the hex shaft. (Refer to Figure 5)

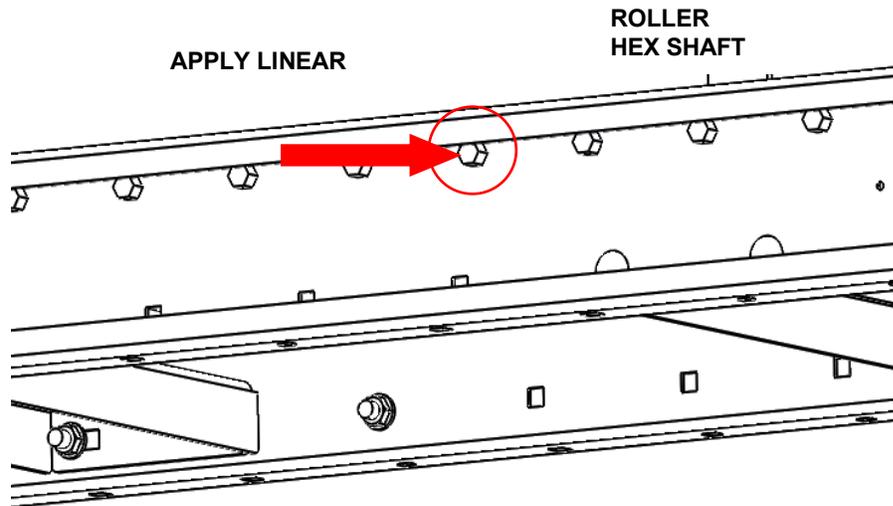


Figure 5: Roller Removal

4. Provide upward force on the roller body until the hex is sitting above the side frame. Refer to Figure 6 (belt hidden for visibility). A putty knife or other flat surface tool is recommended to be placed between the hex shaft and the inside of the frame. This will help protect the paint on the side frame.

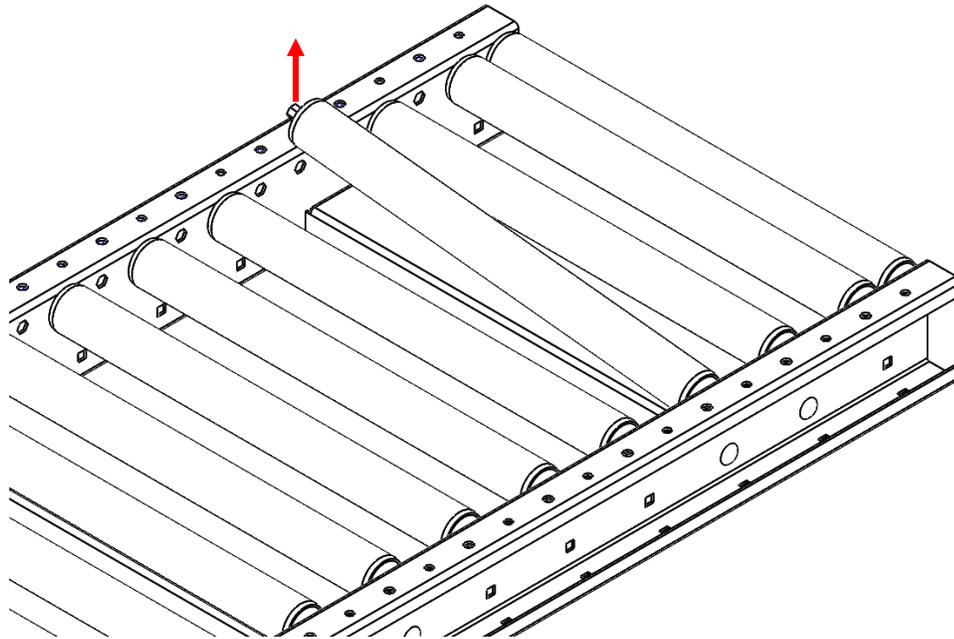


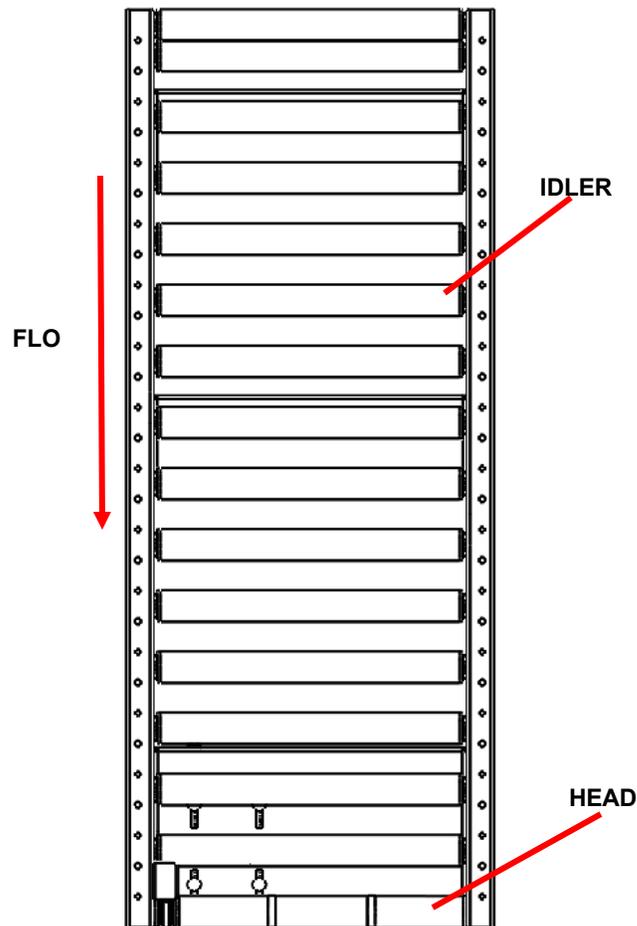
Figure 6: Removing Roller from Side Frame, Belt Hidden for Visibility

5. Remove the hex shaft from the opposite hex hole and slide out from underneath the belt.
6. Slide replacement roller underneath the belt and guide the hex shaft into hole in one of the side frames.

7. After the hex shaft is in the hex hole, the opposite side shaft can be inserted into the appropriate hex hole. Use a putty knife or other flat surface tool to guide the hex shaft into the opposite hex hole.



Ensure that the rollers maintain 4" roller spacing and are perpendicular to the side frame as shown in Figure 7.



*Figure 7: Top View of BRBDC, Belt Hidden for Visibility*

8. Replace side cover.

### 6.2.4 Replacing Head Roller

1. Follow the lockout/tagout procedure in place to ensure safety.
2. Relax the drive belt tension by loosening (4) bolts and the tensioner bolt as shown in Figure 8.

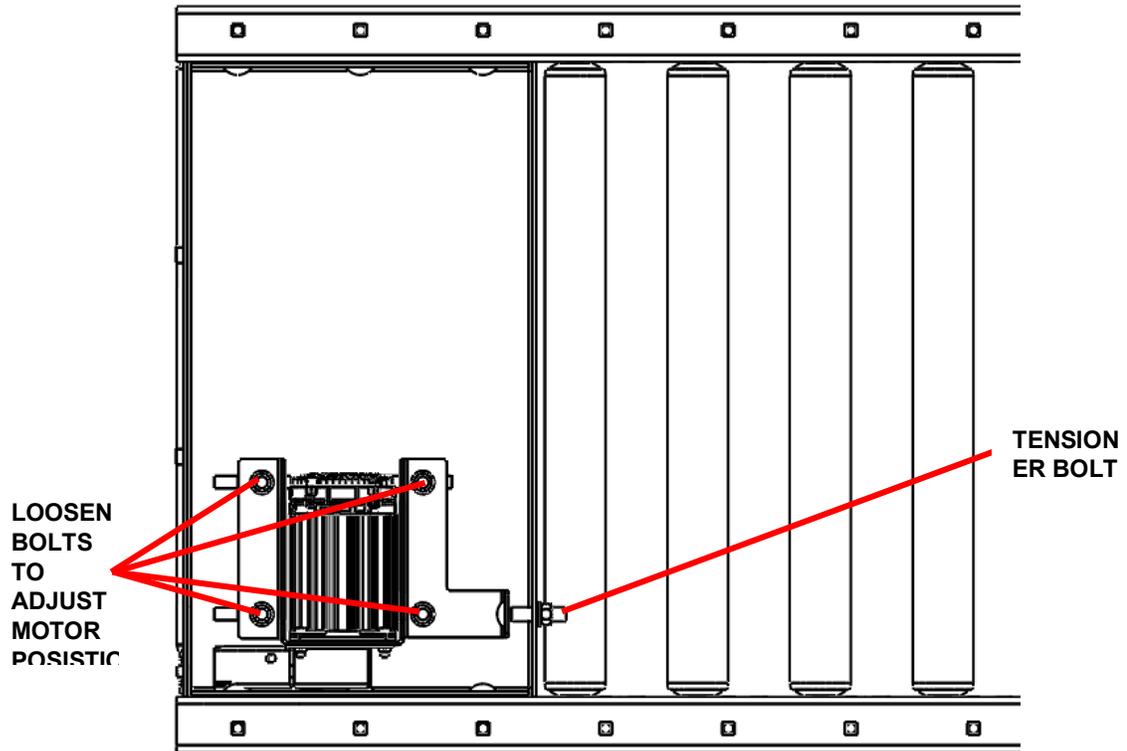


Figure 8: Underside View of BRBDC

3. Once drive belt tension has been relaxed, the head roller can be removed by following 6.2.3 steps 2-5.



Remove the shaft opposite the Poly-V band first when removing head roller.

4. Install the replacement head roller by sliding it underneath the belt and inserting the hub of the head roller through the Poly-V band first.
5. Guide the hex shaft nearest the Poly-V band into the appropriate hole of the side frame.
6. After the hex shaft is in the hex hole, insert the opposite shaft into the appropriate hex hole. Use a putty knife or other flat surface tool to guide the hex shaft into the opposite hex hole.



There will be a large amount of tension in the belt when installing replacement head roller. Use the rollers length as leverage against the belt tension to install hex shaft into side frame.

7. Tension the drive band by tightening the tensioner bolt as shown in Figure 8 and torquing the mounting bolts to 31ft-lbs. Band should be tensioned enough so that it does not slip during operation.

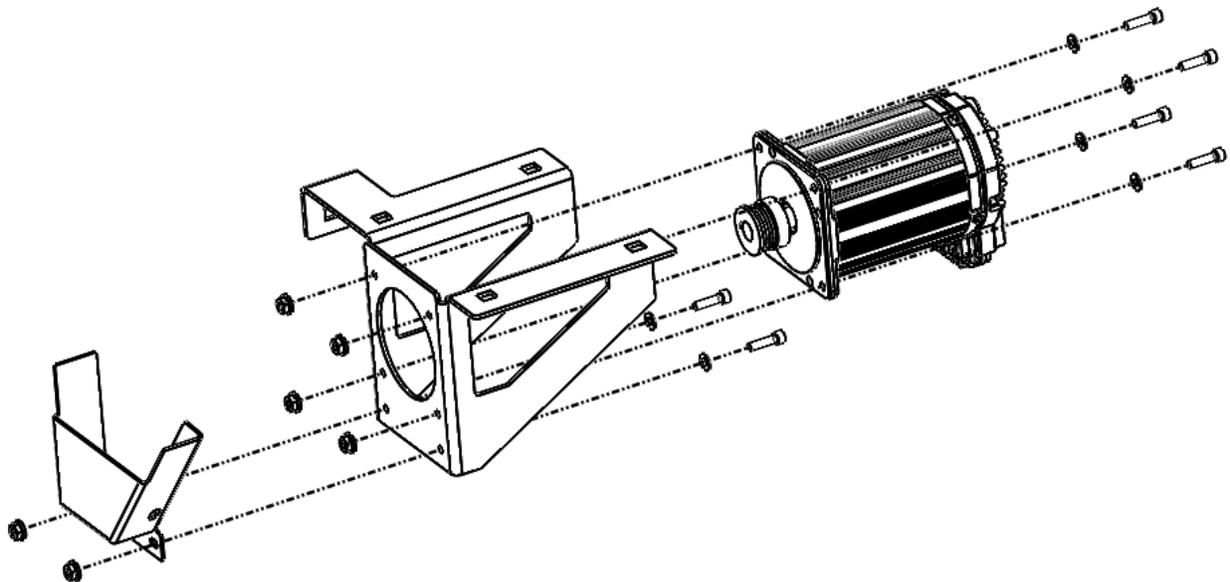
### 6.2.5 Replacing Motor

2. Relax band tension by first loosening (4) bolts and then the tensioner bolt as shown in Figure 8.
3. Remove drive band guard and motor from motor bracket by removing (6) bolts as shown in Figure 9.



**NOTE**

Remove loose drive band from motor pulley before removing motor from bracket.



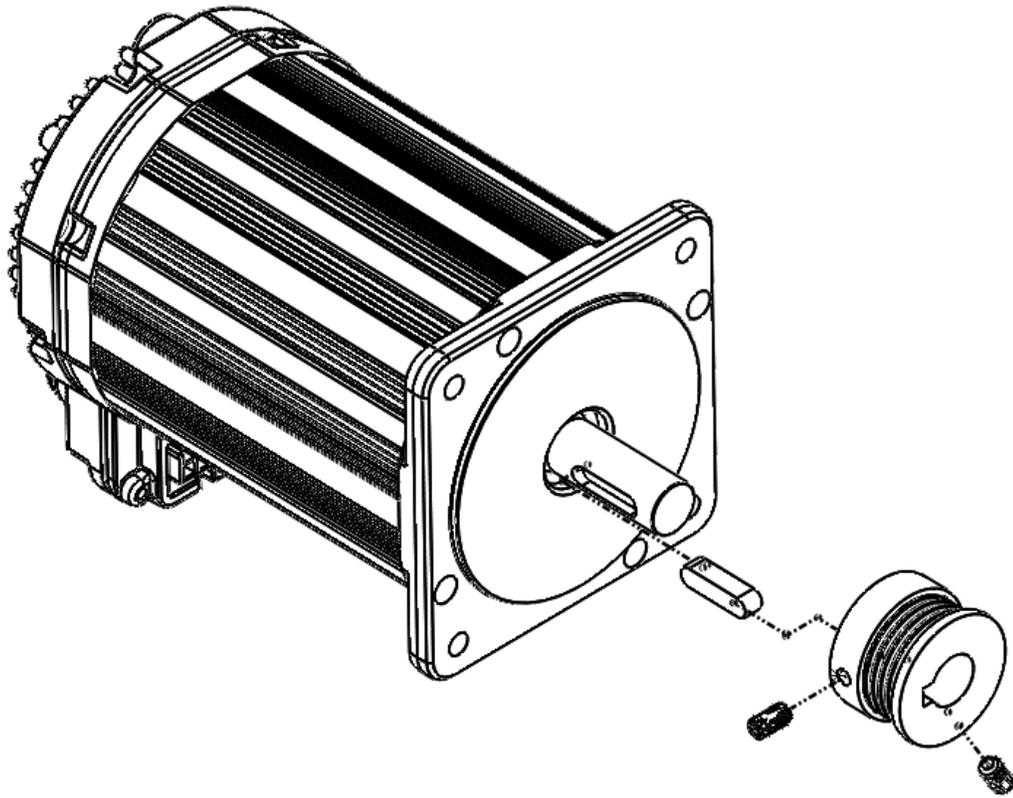
*Figure 9: Exploded View of Motor Mounting Assembly*

4. Remove the motor pulley by loosening the set screws as shown in Figure 10.



**NOTE**

Shaft is keyed. Be careful not to lose key during disassembly.



*Figure 10: Exploded View of Motor and Pulley Assembly*

5. Install pulley to replacement motor as shown in Figure 10. Torque set screws to 80 in-lbs.
6. Install replacement motor and drive band guard to bracket as shown in Figure 9. Torque bolts to 80 in-lbs.



Route Poly-V band around motor pulley before installing band guard. Ensure that Poly-V band rests within grooves of motor pulley.

7. Tension drive band by tightening tensioner bolt (refer to Figure 8) until band is taut.
8. Fasten motor bracket to BRBDC bed spacer by torqueing (4) bolts within slots to 31ft-lbs as shown in Figure 8.

## 6.2.6 Replacing Drive Band

1. Follow the lockout/tagout procedure in place to ensure safety.
2. Relax band tension by first loosening (4) bolts and then the tensioner bolt as shown in Figure 8.
3. Remove band guard by removing (2) bolts as shown in Figure 11.

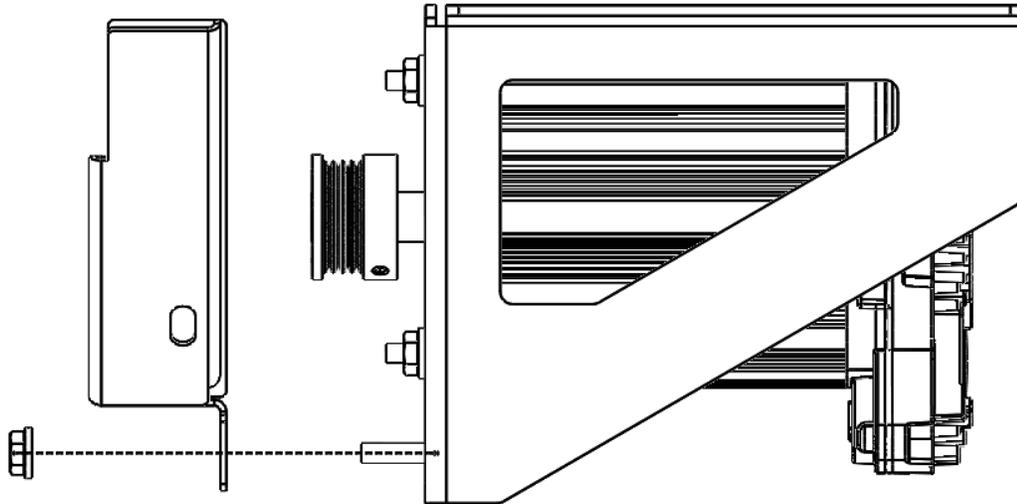


Figure 11: Band Guard Assembly

4. Remove relaxed band from motor pulley.
5. Remove head roller by following 6.2.3 steps 2-5.



Remove the shaft opposite the Poly-V band first when removing head roller.

6. Slide off drive band from head roller.
7. Slide replacement drive band onto the hub side of head roller



Ensure that Poly-V band rests within grooves on the hub of the head roller.

8. Install head roller back into place by following 6.2.4 steps 5-6.
9. Route Poly-V band around motor pulley.



Ensure that Poly-V band rests within grooves of motor pulley.

10. Install band guard onto motor bracket as shown in Figure 11. Torque bolts to 80 in-lbs.
11. Tension drive band by adjusting tensioner bolt (refer to Figure 8) until band is taut.

12. Fasten motor bracket to BRBDC bed spacer by torquing (4) bolts within slots to 31ft-lbs as shown in Figure 8.
13. Replace side covers.

Tracking the belt on a BRBDC only requires adjusting the heights of the floor supports to be level.



Refer to the “Bastian Solutions Conveyor: Support Installation Manual” for more information on adjusting floor supports.

The belt on a BRBDC should be biased towards one side of the conveyor as shown in Figure 12.

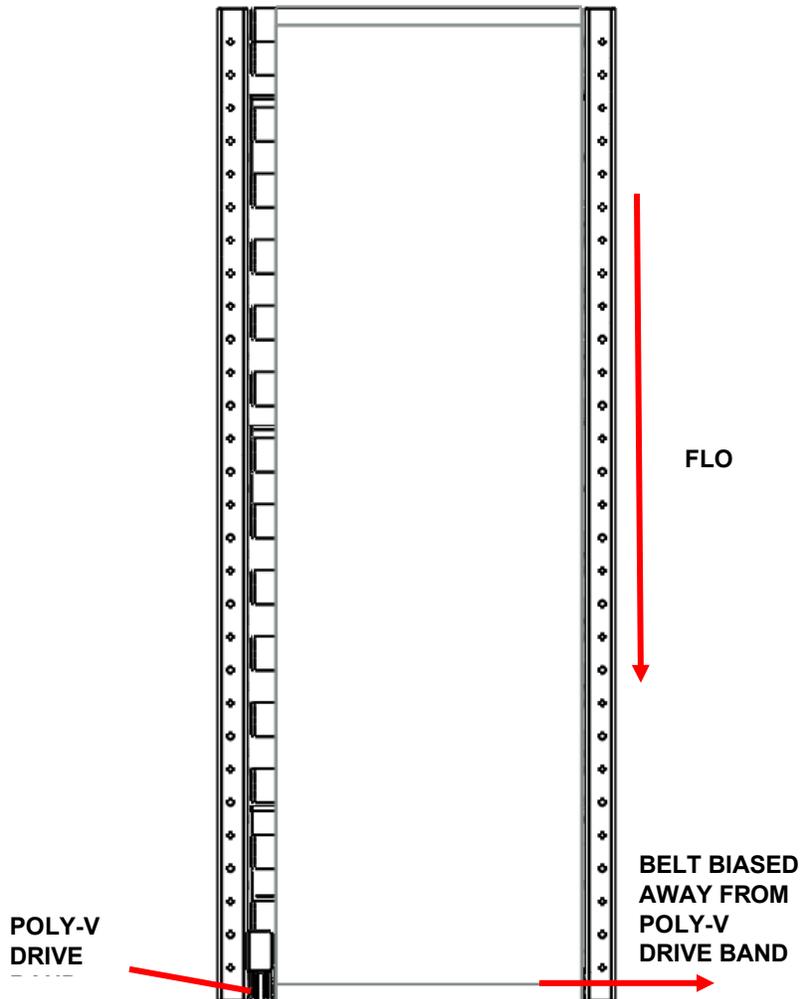


Figure 12: Top View of BRBDC

### 6.2.8 Tracking Drive Band

Drive band should be tracked to prevent excessive wear and extend the life of the band. Drive band guard does not have to be removed to track band.

2. Apply a liner force to the side of the band while simultaneously turning the head roller.
3. Repeat until the drive band is only in contact with the head roller and motor pulley when turned.

## 7 Troubleshooting and Repair

For issues with the drive motor, please refer to the “Bastian Solutions Conveyor: Teknic Motor Service Bulletin” or the Teknic MCV-3441D manual.

*Table 1: Troubleshooting BRBDC*

<b>ERROR</b>	<b>CAUSE</b>	<b>ACTION</b>
<b>Belt is not tracking properly</b>	Floor support height is not level	Refer to 6.2.7.
<b>Poly-V drive band rubs on finger guard</b>	Drive band is misaligned	Track drive band as described in 6.2.8.
<b>Band/Belt dust in drive band guard.</b>	Belt not tracked properly	Refer to 6.2.7.
	Drive band not tracked properly	Track drive band as described in 6.2.8.
<b>Roller has difficulty turning or not turning at all</b>	Idler roller needs replacement	Replace idler roller as described in 6.2.3.
	Head roller needs replacement	Replace head roller as described in 6.2.4.

## 8 Standard Spare Parts

Table 2: BRBDC Standard Spare Parts Table

REF. NO.	DESCRIPTION	COMMON CONFIGURATIONS
1	DRIVE BAND	POLY-V, 4 RIBS
2	IDLER ROLLERS	NO-GROOVE
3	HEAD ROLLER	POLY-V
4	TRACKING BAND	N/A
5	BELT	WVT, MULTIPLE LENGTHS, MULTIPLE WIDTHS
6	MOTOR	TEKNIC, MCV-3441D

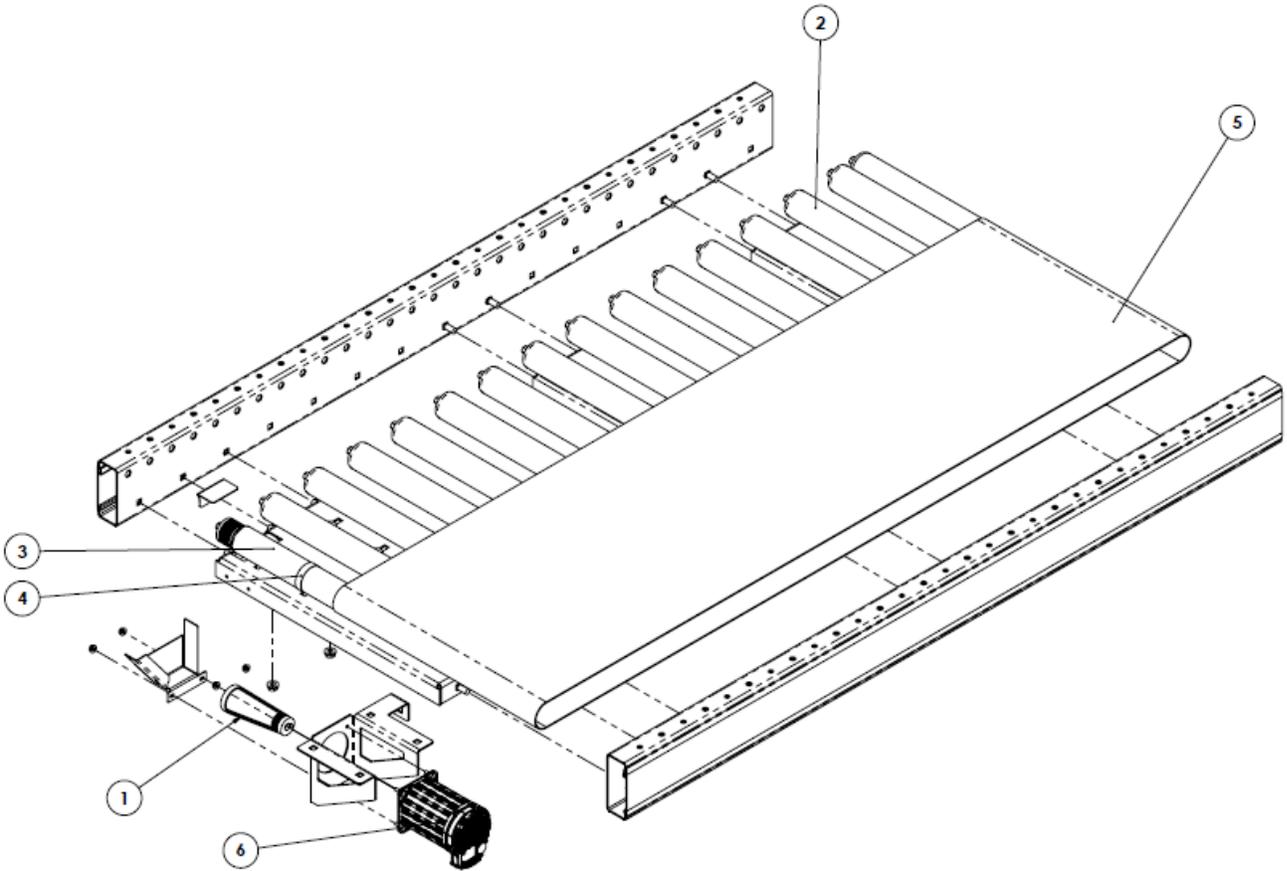


Figure 13: BRBDC Spare Parts Exploded View

Bastian Solutions Conveyor Installation and Maintenance Manual

Model: Bastian Solutions BRBDC Conveyor

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