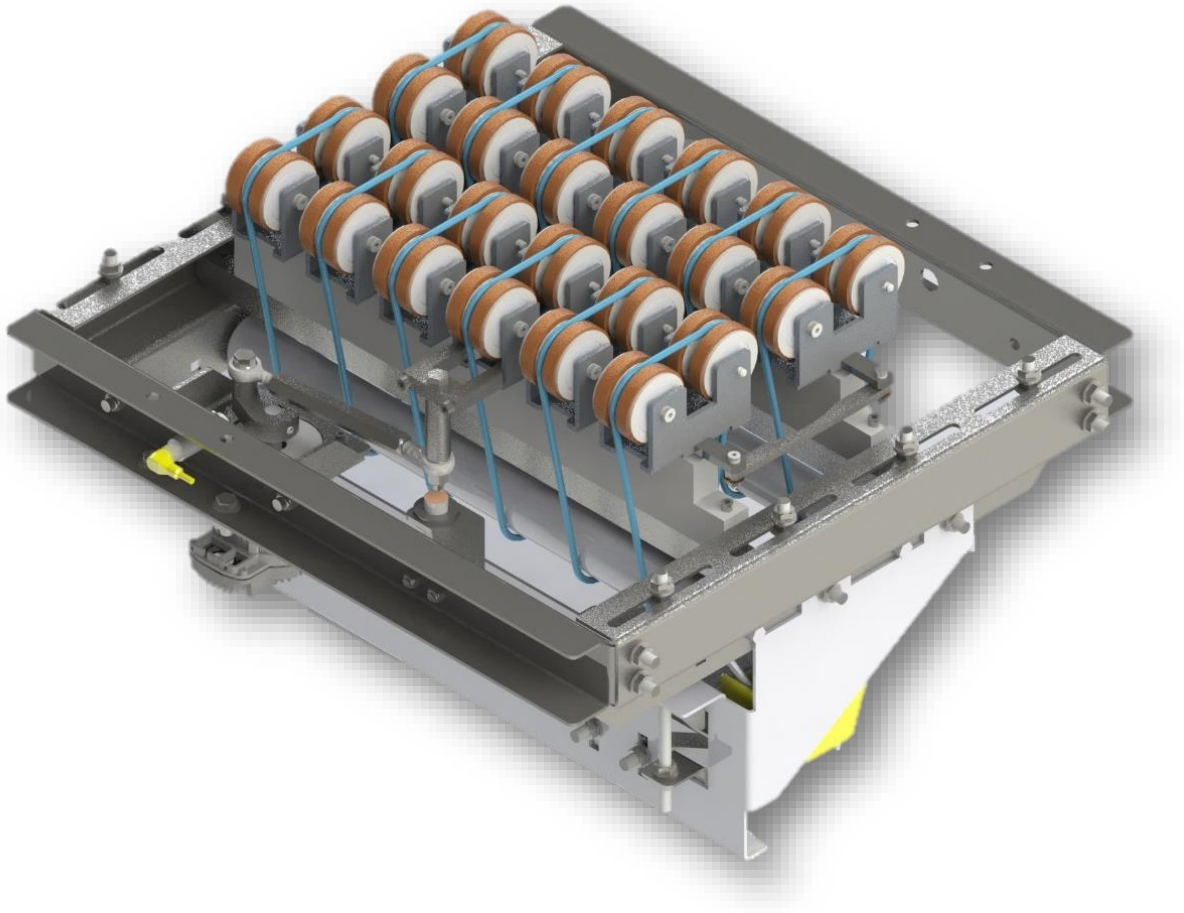

Installation and Maintenance Manual

Model: PWD

Effective August 2021

Rev.B

Bastian SOLUTIONS

a TOYOTA ADVANCED LOGISTICS company

Contributions

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Revision History

DATE	REVISION	REVISION DESCRIPTION	AUTHOR
10/17/2019	A1	Initial document creation	Rajarshi Choudhuri
08/30/2021	B	Figure 25 replaced with updated wiring diagram. Removed “ZiPline” from entire document.	Brad Paris

Term and Acronym Definitions

TERM/ACRONYM	DEFINITION
BF	Between frame; this refers to the distance between conveyor bed side frames.
BLVDC	Belted Live Direct Current; DC belted conveyor format powered by live MDRs.
BZPDC	Belted Zero Pressure Direct Current; DC belted conveyor format powered by MDRs with the intent to maintain zero pressure conditions.
Carton or Case	Term for conveyable items generally contained in cardboard boxes.
CB	Carriage bolt.
DC	Direct current.
Discharge	The point where cartons, cases, or totes exit a conveyor or similar unit used in a material handling system.
Divert	(noun) A conveyor unit used to change the direction of a carton, case, or tote in a controlled manner. (verb) To change the direction of a carton, case, or tote in a controlled manner.
Flange	A feature in sheet metal consisting of a face and bend connected to an existing face along a straight edge.
Guide Rail	Mechanism used to maintain the desired position of conveyable cartons, cases, or totes on their respective conveying surface.
Infeed	The point where cartons, cases, or totes enter a conveyor or similar unit used in a material handling system.
Live	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.
LOTO	Lockout Tagout.
Mark Number	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.
Match	A mark made on mating conveyor assemblies to assist in identifying orientation and placement within a system.
MSD	Master specification document; a document used to describe a product's intended capabilities, appearance, and interaction with users.
OAW	Overall width of any given conveyor bed.
O-Ring	A plastic ring with a circular cross section used for power transmission in DC conveyor applications.
OSHA	Occupational Safety and Health Administration.
Poly-V	A band or roller hub format with longitudinal ribs used for power transmission in DC conveyor applications.
PPE	Personal protective equipment.

Prox Sensor	A sensor able to detect the presence of nearby objects without any physical contact.
Pulley	Mechanical device used to change the direction of the belt in a conveyor system, to drive and/or tension the belt.
PWD	Pivot Wheel Divert; A modular DC sortation unit used to divert cartons, cases, or totes onto spurs.
RLVDC	Roller Live Direct Current; DC roller conveyor powered by live MDRs.
Roller	Powered or unpowered cylindrically-shaped material handling component used for mechanical power transmission, a conveying surface, and/or support for a belted conveying surface.
RZPDC	Roller Zero Pressure Direct Current; DC roller conveyor powered by MDRs with the intent to maintain zero pressure conditions.
Side Cover	A PVC cover used to conceal and protect electrical components and wiring from foreign debris and moving obstacles.
Side Frame	Structural member used to support rotating components needed for conveyor beds.
Skew	A format of DC conveyor where one end of all rollers is shifted one roller position to provide an angled conveying surface for left or right justification of cartons, cases, or totes.
Sorter	Any piece of conveyance equipment used to divert a series of cartons, cases, or totes simultaneously.
Splice Assembly	A five-component assembly-consisting of a plate (or formed plate), two bolts, and two nuts-that is used to secure a piece of guide rail to an adjacent piece of guide rail, or a side frame to an adjacent side frame. This is used to provide additional structural rigidity and ensure relative position of components is maintained.
Spur	A format of DC conveyor used to create linear transitions into intersecting lines of conveyor positioned at a non-perpendicular angle. Typically includes 30deg and 22deg configurations.
TOR	Top of roller; this refers to the elevation of the conveying surface with respect to the floor on which the conveyor is sitting.
Wiz Nut	A serrated flange nut used to cut into the surface of the component it is tightened against.
Zero Pressure	Condition where adjacent cartons, cases, or totes are not in contact with one another.
Zone	Any section of DC conveyor driven by a single MDR.

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Reference Documents

Manufacturer	Manual
Bastian Solutions	Bastian Solutions' Conveyor: Installation and Maintenance Manual: RLSDC
Bastian Solutions	Bastian Solutions' Conveyor: Installation and Maintenance Manual: RLVDC
Bastian Solutions	Bastian Solutions' Conveyor: Installation and Maintenance Manual: BLVDC
Bastian Solutions	Bastian Solutions' Conveyor: Teknic Motor Service Bulletin

1 Introduction

Thank you for choosing Bastian Solutions' Conveyor. The following manual will serve 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' Conveyor for any questions or support that is not clearly addressed in this document. Bastian Solutions' Conveyor 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' Conveyor Customer Service or Support at ConveyorSupport@BastianSolutions.com.

2 OSHA and Safety

Bastian Solutions' Conveyor 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: PWD

The Pivot Wheel Divert (PWD) is a wheel sortation device that utilizes 48V DC motors to divert product onto 30-degree spurs. The PWD is a cost-effective sortation solution that preserves product orientation while maintaining overall case flow rate of the system. Table 1 illustrates the offered configurations for the PWD. Figure 1 illustrates an iso-view of a 24" OAW, 2 row, left only divert PWD configuration.

Table 1: Offered PWD Configurations

Overall Width	Divert rows	Divert Configurations	Sale Configuration
18in	2	Left only/Right only	Standard Offering
24in	2	Left only/Right only	Standard Offering

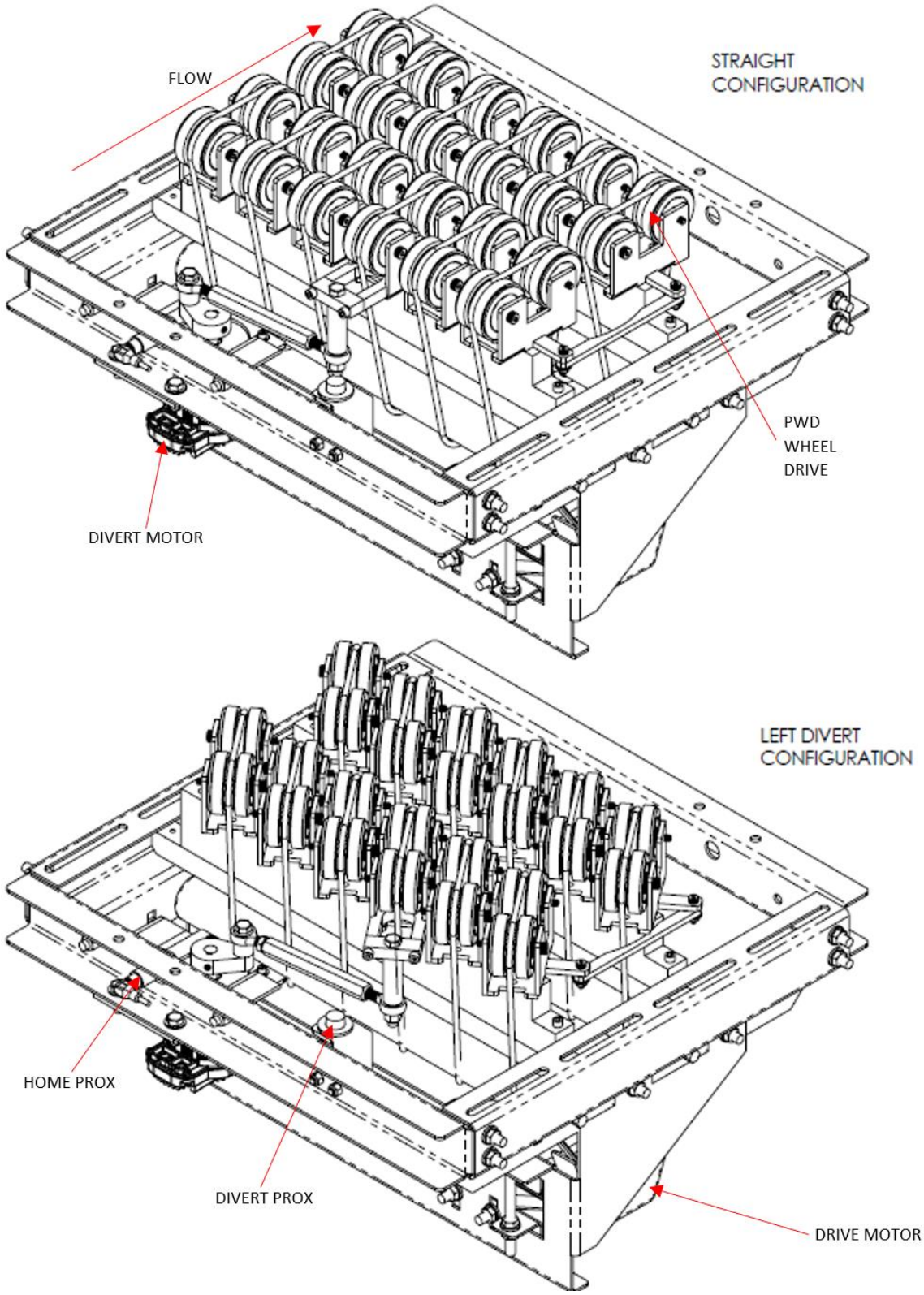


Figure 1: PWD, 24in OAW, 2 row, left divert

The model shown in Figure 1 serves as a reference to become familiar with the components and terminology used in this manual. The terminology used to describe the components will be used throughout the manual and are common amongst several Bastian Solutions' Conveyor product lines.

The model in Figure 1 shows a 24" OAW, 12" Zone L, 2 row, left divert PWD. The PWD fits in a 12" zone of a standard 3" roller spacing side frame. Adjacent zones of a PWD are typically RLVDC, BZPDC, RZPDC or BRBDC sections. The model in Figure 2 illustrates the placement of a PWD in a 3" RS RLVDC bed section with an adjacent spur.

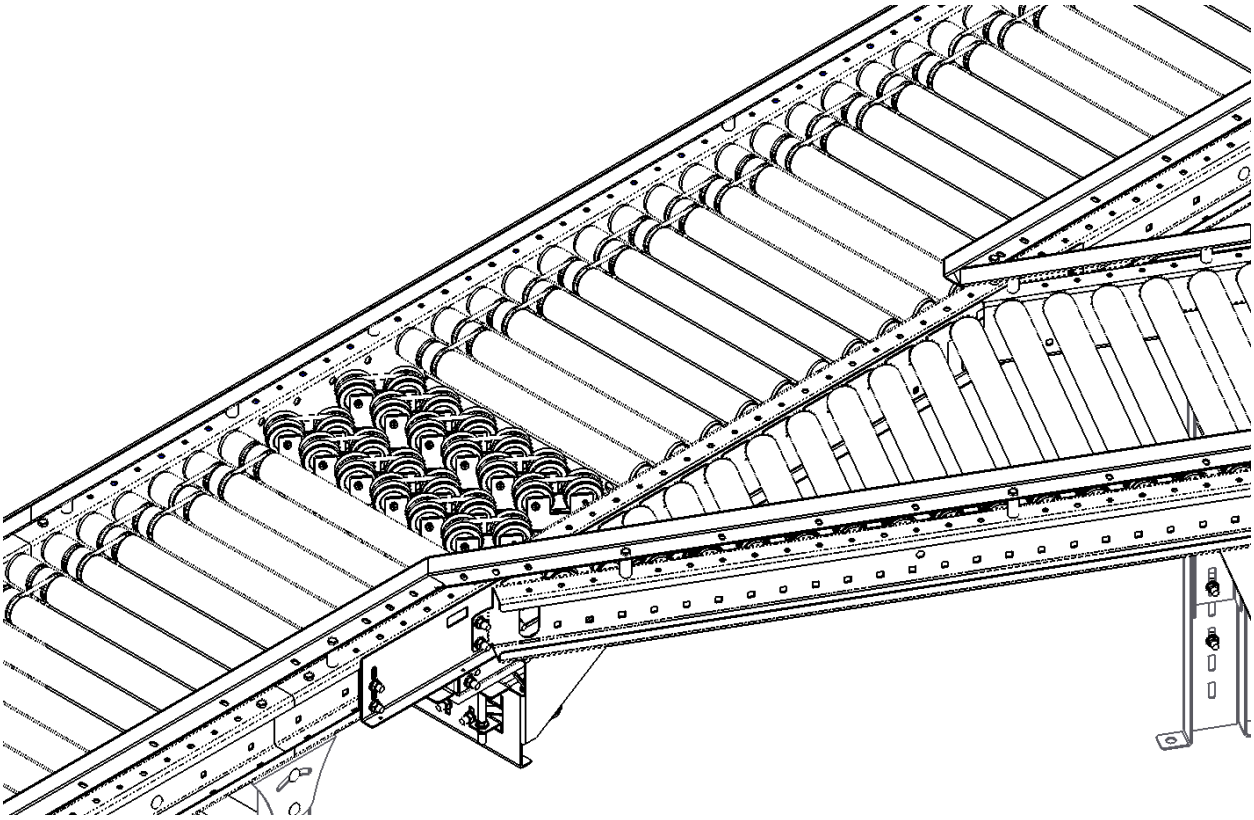


Figure 2: PWD placement in RLVDC section with right divert to spur

In Figure 2, the PWD is placed after a 12" zone of RLVDC. This placement is standard for all PWDs. The PWD can be positioned in other locations along the bed section. However, positioning the PWD in the non-standard location will result in additional cost adders due to adding additional zones in the bed section or adjacent bed sections to accommodate the placement of the PWD.

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.
- A visual inspection of equipment should be completed 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(Mark Numbers).

If there are any missing or damaged components, please contact your Bastian Solutions' Conveyor representative with as much detail as possible. If you are unsure of your Bastian Solutions' Conveyor representative, please contact Customer Service at ConveyorSupport@BastianSolutions.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. The mark number for a PWD is typically called out as a combination of the mark number of the bed section to which the PWD is installed into, followed by "-PWD". For example; "SHP1A10" is the mark number for the RLVDC section in which the PWD installs into and "SHP1A10-PWD" is the mark number of the PWD for that section. If there are multiple PWDs in a conveyor section, then each PWD will have a numerical suffix at the end of the PWD mark number. For example, "SHP1A10-PWD1" is the first PWD in the mark number, "SHP1A10-PWD2" is the second PWD in the mark number, etc.

Each PWD will have (2) stickers on the frame. One sticker on the infeed end of the PWD, and the other sticker on the discharge end of the PWD. Each sticker will contain the following information:

- Bastian Solutions' Project Number and Name
- Model Type
- Mark Number
- Match
- Piece
- Flow direction

Figure 3 illustrates the stickers marked on the PWD. Figure 4 illustrates the location of the stickers on the PWD.

Figure 3: PWD mark stickers

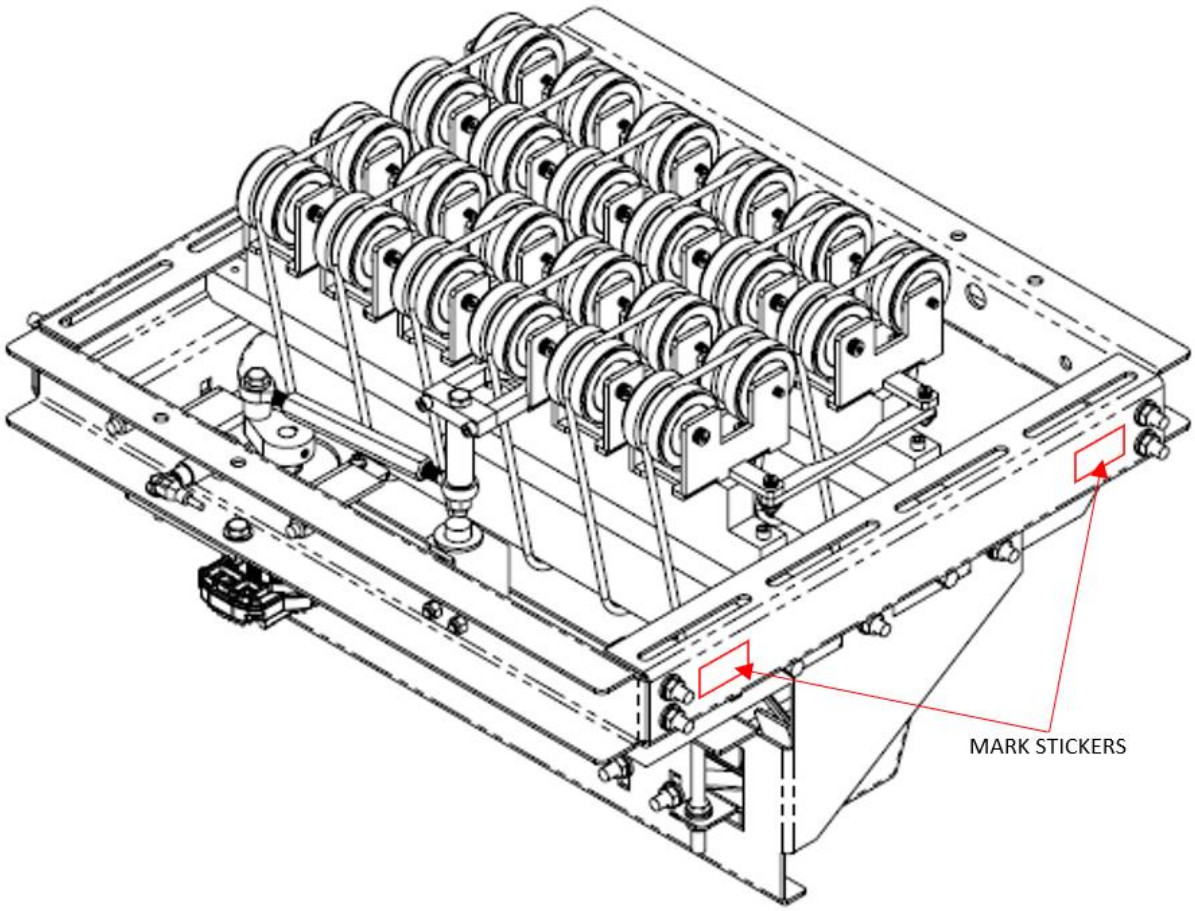


Figure 4: Location of mark stickers on the PWD

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 5 shows a sample of a skid label. These stickers are placed on the surface of each skid.

Figure 5: Skid Sticker

All PWDs are packaged on a skid with a box containing ship loose items. Each PWD on the skid will have its individual box containing ship loose items. Refer to Appendix 9.1 for a detailed list of ship loose items provided with each PWD.

Upon receiving the skid on site, please inspect for any visual damage of the equipment. If there are any damages, please contact your Bastian Solutions' Conveyor representative with images and details of the skid.

5 Installation

The installation supervisor on site should have the 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' Conveyor to provide unless otherwise specified.

The skid label contains pertinent information on the location of the PWD within the system based on the overall system drawing. The mark stickers contain information on orientation of the PWD and the location of the PWD with a given mark.

To verify the flow direction of the PWD, the divert motor and linkage is always biased towards upstream (infeed side) of the conveyor section. Figure 1 shows the flow direction and orientation of the PWD.

The minimum TOR (top of roller) height of the conveyor section needs to be greater than 16.5" for installation. In case of a PWD being installed for a smaller TOR value, please contact your Bastian Solutions' Conveyor representative for installation instructions.

For a conveyor section with a TOR height between 16.5" and 22", the general installation instructions for mounting the PWD are as follows:

1. Clear the workspace around the conveyor section onto which the PWD is installed. Ensure the PWD has been unpacked from the skid and oriented in the correct flow direction.
2. If the matching conveyor mark section is not installed by system layout, skip to step 5. If the matching conveyor mark section is already installed according to the system layout, then continue with step 3.
3. Disconnect all power and electrical communication to this conveyor section**. Bastian Solutions' Conveyor recommends using Lockout/Tagout (LOTO) procedures for this install.**
4. Position a forklift or lift table under the conveyor section. Un-fasten the conveyor section from the floor supports. Ensure that the conveyor section is stable and lift the conveyor section and put aside. **If the conveyor section is not stable during the lifting operation, this could cause potential injury to personnel.**
5. Install the PWD directly onto the conveyor section. Figure 6 illustrates the mounting holes for the conveyor section. The mounting hardware for the PWD will be in the box containing ship loose items.
6. The mounting hardware for the PWD is (8) 3/8"-16 carriage bolts and serrated flange nuts. The torque requirement is 31 ft-lbs.
7. Place the conveyor section on the floor supports and mount the section according to the system layout.
8. If conveyor section was initially removed from the system layout (step 3 and step 4), reconnect all electrical power and communication to this conveyor section and validate functionality of all zones around the PWD.

For a conveyor section with a TOR height greater than 22", the general installation instructions for mounting the PWD are as follows:

1. Clear the workspace around the conveyor section onto which the PWD is installed. Ensure the PWD has been unpacked from the skid and oriented in the correct flow direction.
2. Place the PWD under the conveyor section to which it is installed to.

3. Lift the PWD up to the gap in the conveyor section. The square holes on the bottom of the conveyor side frame will line up with the slots on the top of the PWD frame. The head of the carriage bolt sits inside the PWD frame with the wiz nut inside the channel of the conveyor side frame. Figure 6 illustrates an exploded view to mount a PWD to the conveyor section.
4. The mounting hardware for the PWD is (8) 3/8”-16 carriage bolts and serrated flange nuts. The torque requirement is 31 ft-lbs.
5. The slots on the PWD frame allow for adjustment of the PWD wheel position in the conveyor section.

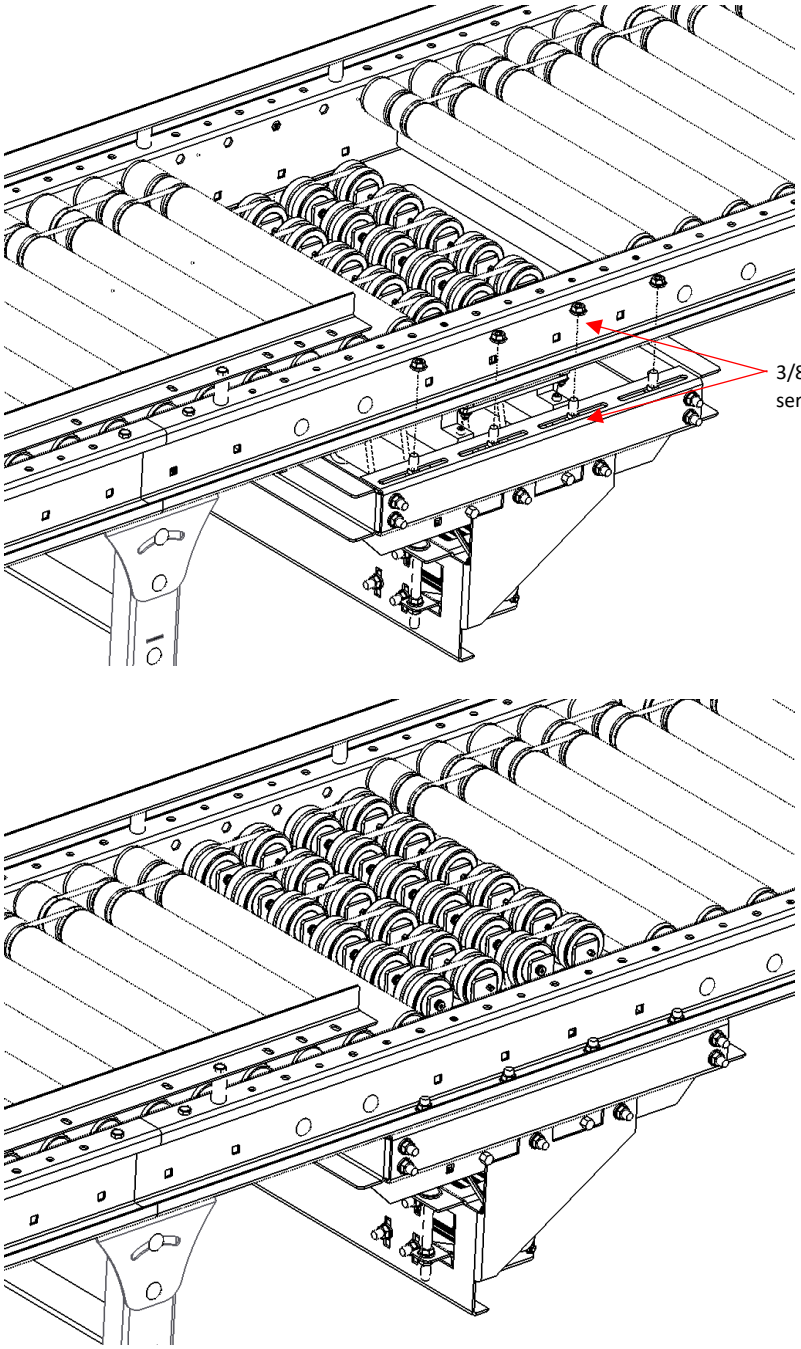


Figure 6: Exploded view of PWD installation

NOTE

In case of the PWD divert linkage colliding with the bed spacer, move the bed spacer by one-hole location away from the PWD frame. This should address any interference issues with the divert linkage on the PWD.

Once the PWD has been installed to the mating conveyor frame, the spur is installed to the conveyor section to which the PWD has been installed to. Figure 7 and Figure 8 illustrate the dimensions for installing a spur to the conveyor section with a PWD in different views. Installation instructions for a conveyor spur section can be found in the **Installation & Maintenance Manual: RLSDC.**

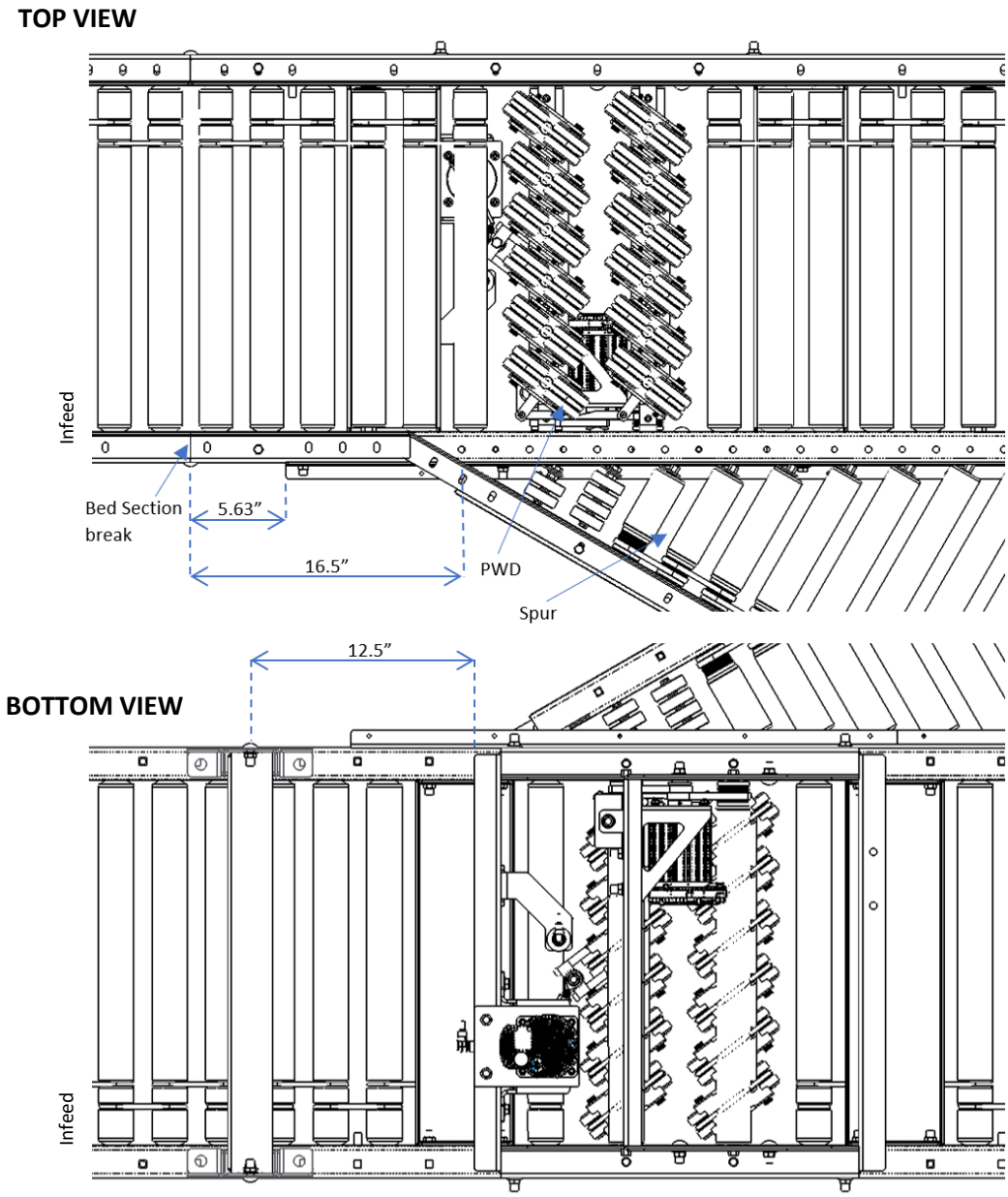


Figure 7: PWD and divert spur location - Top and Bottom view

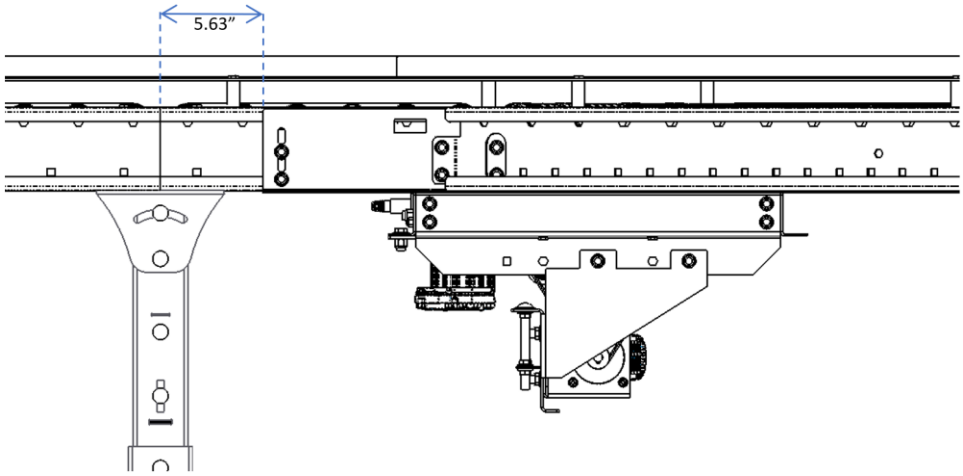


Figure 8: PWD and divert spur section - Side view

If the mating conveyor is not purchased from Bastian Solutions’ conveyor;

1. The PWD mounting mechanism is most likely a custom solution that would be outlined in an approval drawing. Consult your Bastian Solutions’ Conveyor representative for further details and instructions.
2. The spur begins at one roller position before the PWD. Refer to the top view of the divert and spur location in Figure 7.

The outlined spur locations to the mating conveyor are guidelines recommended by Bastian Solutions’ Conveyor. The outlined dimensions can vary based on application and system throughput. Bastian Solutions’ Conveyor recommends adjusting the PWD and spur locations as needed for the system application.

After mounting the PWD, the cables for the proximity sensors, the communication cables for the motors, and the power cables for the motor can be installed on the PWD. The cables are provided in the box containing ship loose items. The contents of the ship loose items provided are referenced in appendix 9.1. The wiring diagram for the PWD is in appendix 9.3.

Ensure the proximity sensors are connected to the logic terminal prior to providing power to the divert motor because the divert motor has a soft homing sequence on startup that utilizes the homing proximity sensor. Failure to do this step may cause damage to the divert linkage mechanism.

On startup of the PWD, the homing sequence will result in one full rotation of the divert motor. Motor and linkage tuning are further described in section 6 (Maintenance and Operation).

6 Maintenance and Operation

6.1 TOR adjustment

The TOR or Top of Roller adjustment for the PWD is not recommended as it increases the tension in the drive bands of the diverter wheels, which can cause torque issues with the drive or divert motor depending on the product loading, product geometry, divert timing, and divert speed.

In the absolute case where increasing the TOR is a must, please be aware that this procedure will require partial disassembly of the PWD. The TOR adjustment can be made with the PWD attached to the conveyor frame, or as a stand-alone unit, separated from the conveyor section. The steps are as follows:

1. Make sure the power to the drive and the divert motors are switched off. **Bastian Solutions' Conveyor recommends using Lockout/Tagout (LOTO) procedures for this operation.**
2. Pull the bands off the divert wheels. **Please be careful in doing this step as the band tension is fairly high and is characterized as a pinch point.**
3. **Do not use any form of hook or small rod to pull the band as this will cause necking on the band, which reduces the elastic tension of the band, and will require replacement of the bands.**
4. Once all the bands have been removed from the divert wheels, loosen the mounting bar screws under the PWD.
5. Insert provided spacers between the frame and the bottom of the mounting bar. Each spacer increases the height of the diverter wheels by 1/8".
6. Once the desired height has been reached, re-tighten the fasteners that hold down the mounting bar.
7. Re-engage the bands onto the diverter wheel assembly. Ensure that the band is centered on the groove and can freely rotate without any catch points in the assembly.

6.2 Divert linkage adjustment

The PWD divert linkage is tuned and checked for quality assurance prior to shipment from the Bastian Solutions' Conveyor facility. Over its operating life, there can be change in divert linkage length which could cause issues with the motion of divert. In this case, an adjustment of the divert linkage length needs to be made.

PWD's are ordered as a left divert OR a right divert ONLY. These divert directions are not interchangeable. If you require a left divert, but ordered a right divert, please contact your Bastian Solutions' Conveyor representative.

The divert linkage is an adjustable arm. This arm consists of a female threaded hex shaft and two ball joints on each end. Adjusting the length of the divert arm changes the divert characteristics. The dimensions for the left divert linkage is illustrated with Figure 9 and the dimensions of the right divert linkage is illustrated with Figure 10.

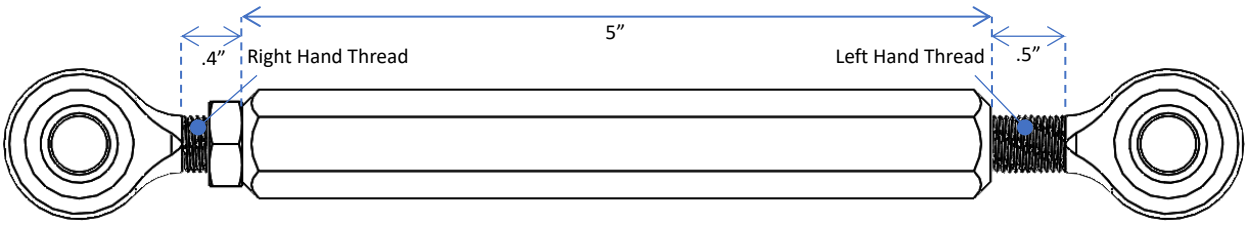


Figure 9: PWD Left divert linkage

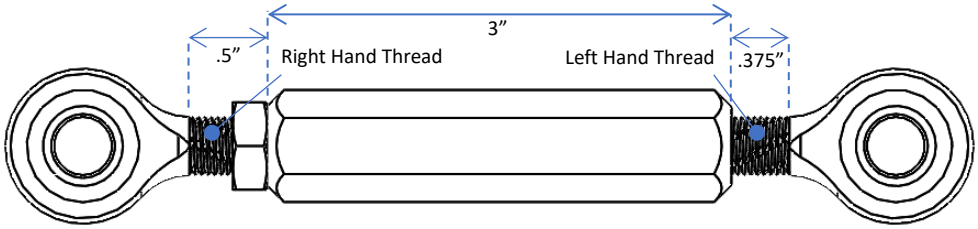


Figure 10: PWD Right divert linkage

On divert, the crank arm on the motor should be in line with the linkage. This allows for the mechanical lockout of the linkage and removes the torque load on the divert motor. Figure 11 illustrates the home position and divert position of a right hand divert. Figure 12 illustrates the home position and divert position of a left hand divert.

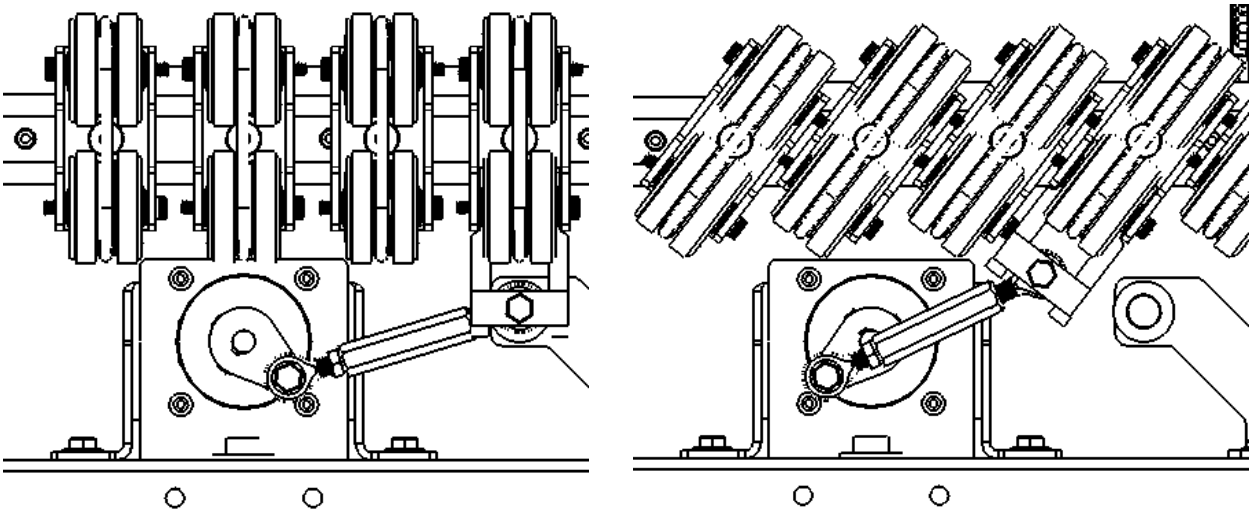


Figure 11: PWD Right divert linkage mechanism - Straight and divert configuration

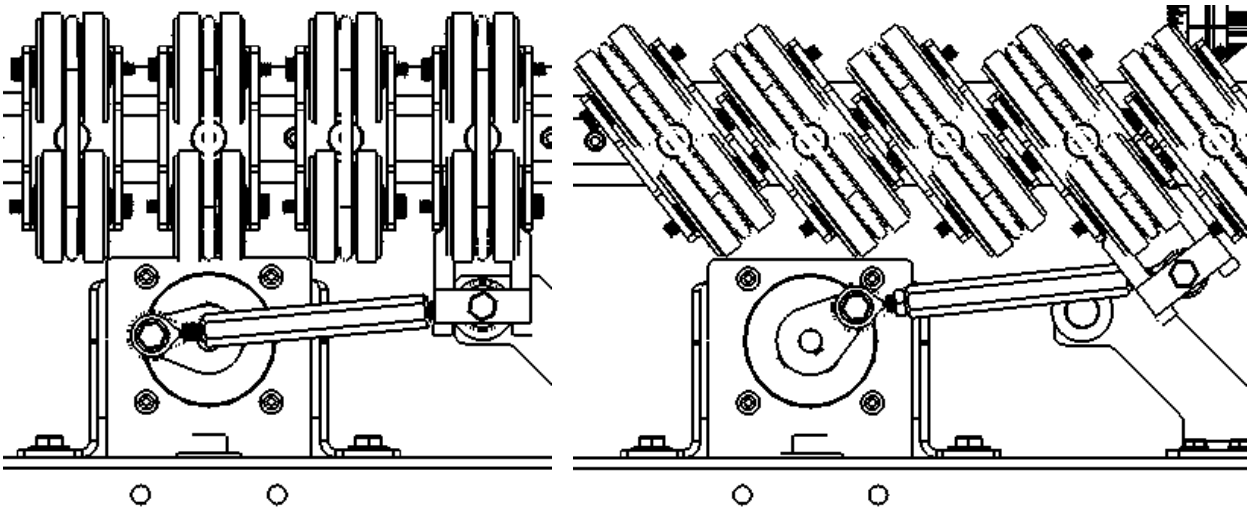


Figure 12: PWD Left divert linkage mechanism - Straight and divert configuration

6.3 Drive motor replacement

The following steps detail the drive motor replacement for the Bastian Solutions' Conveyor PWD.

1. Disconnect all power and electrical communication to this conveyor section**. Bastian Solutions' Conveyor recommends using Lockout/Tagout (LOTO) procedures for this maintenance operation.**
2. The PWD drive motor is located at the bottom of the PWD with its axis of rotation parallel to the rollers. Figure 13 illustrates the location and mounting of the PWD drive motor.

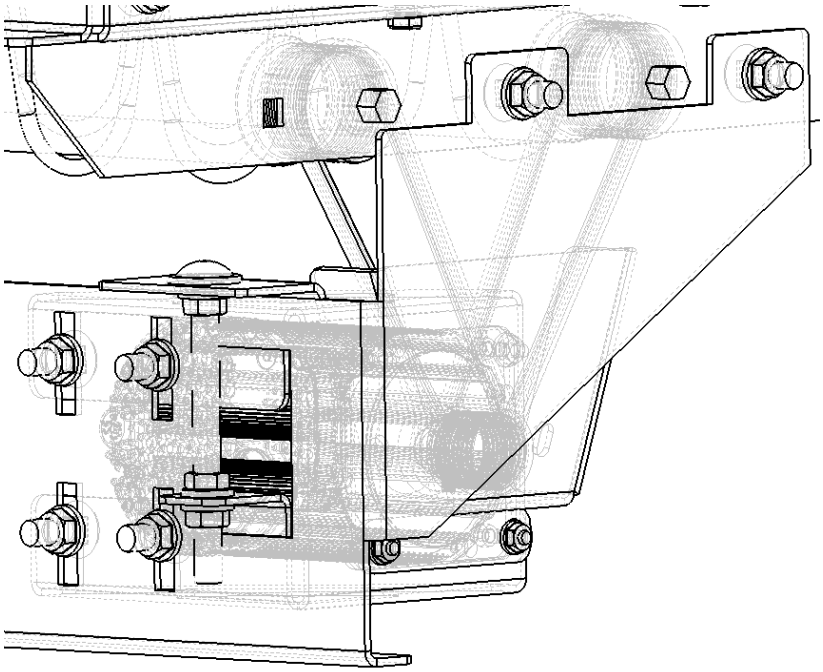


Figure 13: PWD drive motor

3. Remove the (4) 3/8” carriage bolt and serrated flange nuts attached on the back of the drive motor mount. Refer to Figure 14 for the motor mount locations. Loosen the motor take up hardware and then loosen the motor mount hardware. Proceed to adjust the motor tension take up until there is no tension on the Poly-V bands. Undo the mounting hardware and remove the take up bolt to slip out the motor mount sub assembly. The torque requirement for the 3/8” carriage bolt and serrated flange nuts is 31 ft-lbs.

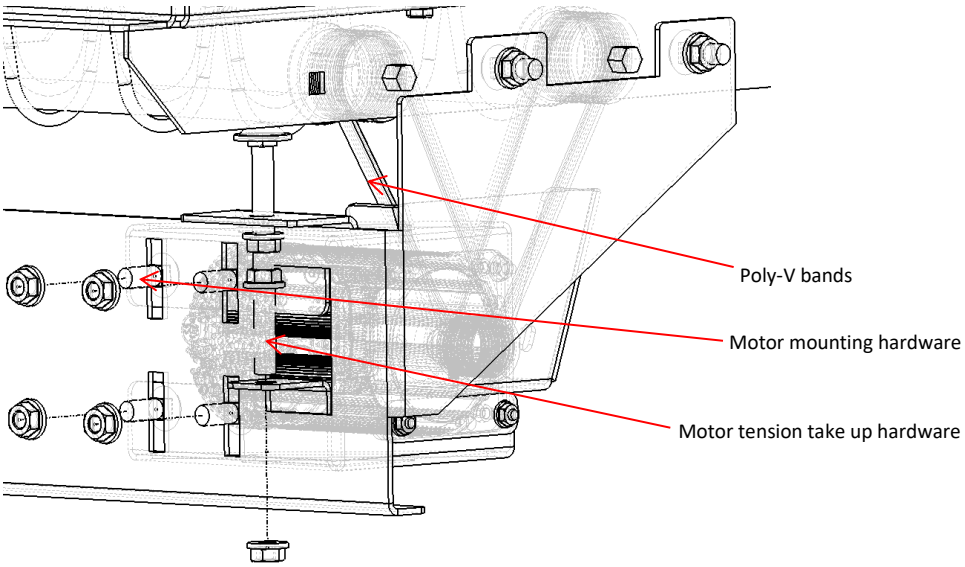


Figure 14: Exploded view - PWD drive motor mount

4. Remove the belt guard from the front of the motor. Refer to Figure 15 for the belt guard mounting location. The belt guard and the motor mount share the same mounting hardware. Please ensure that there is no tension on the Poly-V bands when executing this step.

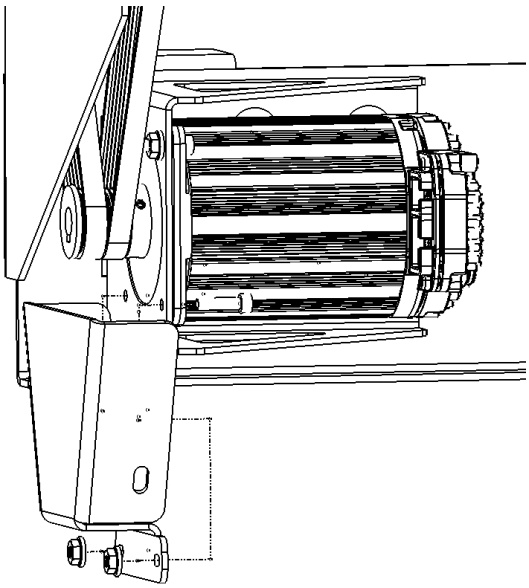


Figure 15: Belt Guarding on PWD drive motor

5. Remove the motor mount subassembly from the PWD. Remove the (4) #10-32 shoulder head cap screws and serrated flange nuts that connects the motor to the mount. Refer to Figure 16 for the mounting hardware locations. The torque requirement for #10-32 shoulder head cap screws is 80 in-lbs.

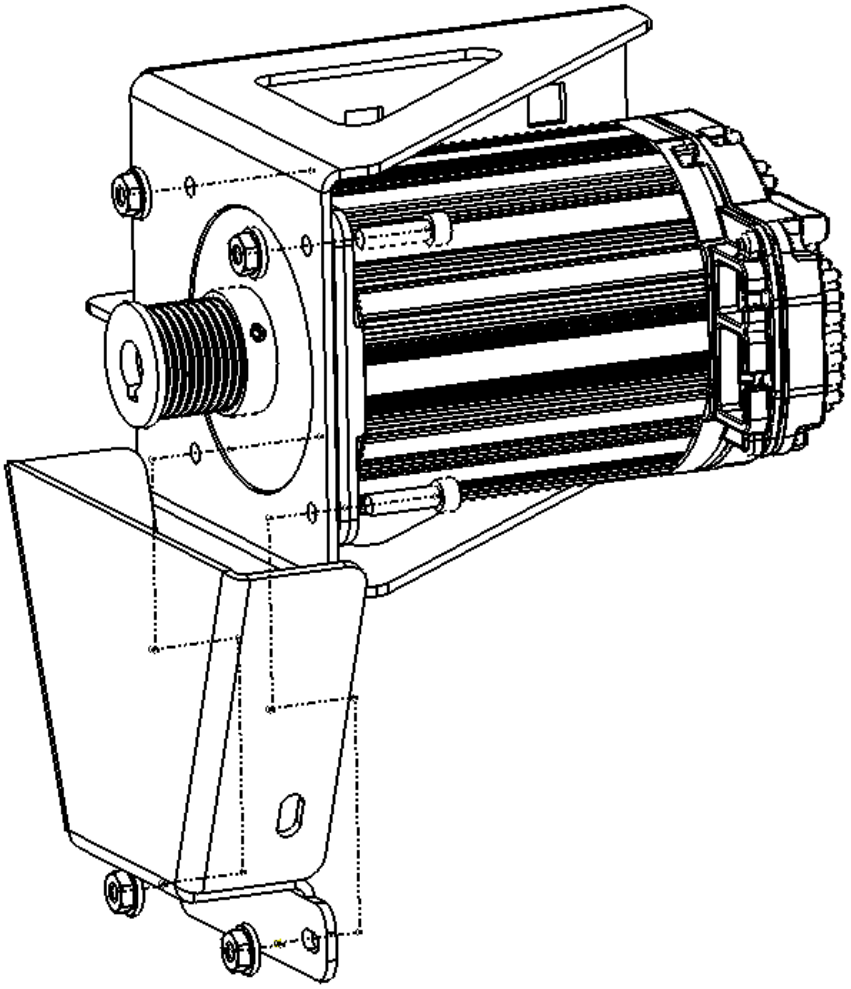


Figure 16: PWD drive motor mount

6. Replace the motor pulley from the old drive motor to the new drive motor. The pulley has a machine key and (2) #10-32 cup point set screws that attach it to the drive motor shaft. The torque requirement for #10-32 set screws is 80 in-lbs.
7. Follow the steps in reverse to mount the new drive motor to the PWD.
8. Ensure that the Poly-V bands are correctly positioned and do not rub against each other or against the pulley.
9. Tension the Poly-V bands. Do not over-tension the bands as this can reduce the Poly-V band life on the PWD. A quick check to ensure that the Poly-V bands are not over-tensioned is to check the tab on the motor mount which is connected to the tension take up. If the tab is deforming on tension, the Poly-V bands are over tensioned.

6.4 Drive band (Poly-V) replacement

The following steps detail the drive bands (Poly-V) replacement on a Bastian Solutions' Conveyer PWD.

1. Disconnect all power and electrical communication to this conveyor section**. Bastian Solutions' Conveyor recommends using Lockout/Tagout (LOTO) procedures for this maintenance operation.**
2. Remove the O-ring bands from the PWD wheels. The O-ring bands can be removed by pulling up form between the PWD wheels and rolling the band of the side of the wheels (Figure 17). P**lease be careful in doing this step as the band tension is fairly high and is characterized as a pinch point.**

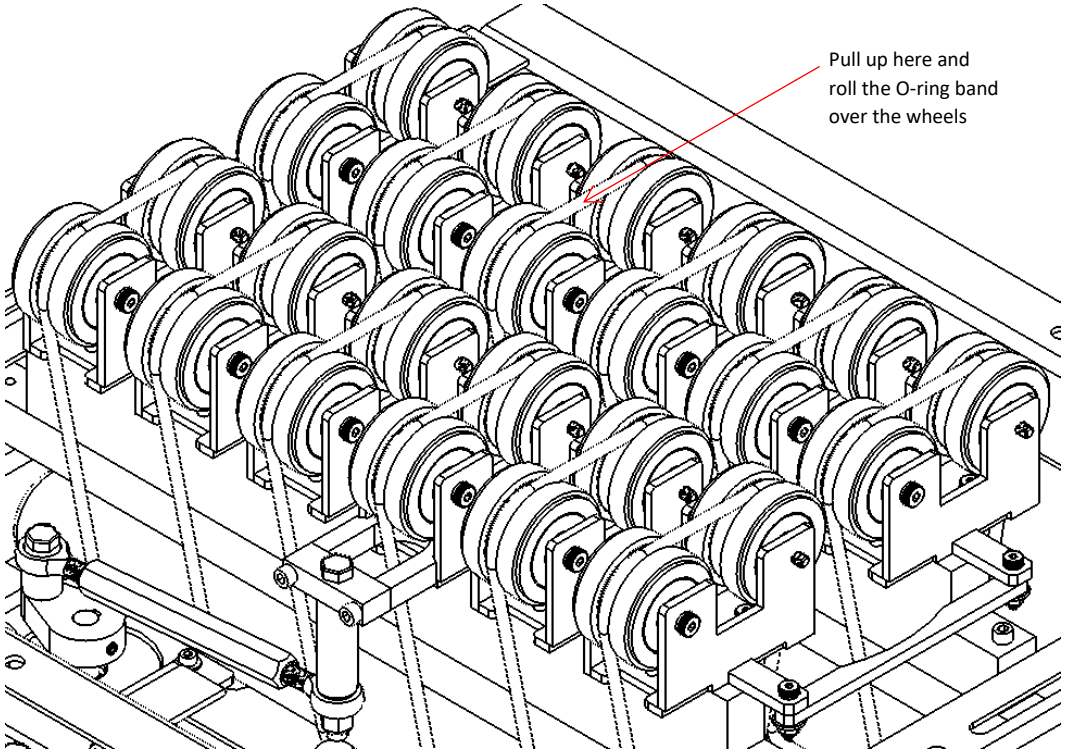


Figure 17: PWD O-ring band

3. Follow steps 1-4 in section 6.3.
4. Remove the Poly-V bands from the pulley on the drive motor.
5. Remove the idler rollers from the frame. The idler rollers have spring loaded hex shafts. To remove a roller, apply pressure to the end of the hex shaft on the Poly-V hub side using a small diameter punch or similar tool until the hex has moved enough to clear the frame.
6. Pull the roller down to remove and replace the Poly-V band. Repeat this step for both idler rollers. Re-install the roller back to the frame by pushing in the hex into the roller and snapping it into place.
7. Reinstall the Poly-V bands on to the PWD wheels.
8. Follow steps 1-4 from section 6.3 in reverse order to re-install the drive motor subassembly with the new Poly-V bands.

9. Ensure that the Poly-V bands are properly positioned on the rollers and the pulley.
10. Tension the Poly-V bands. Do not over-tension the bands as this can reduce the Poly-V band life on the PWD. A quick check to ensure that the Poly-V bands are not over-tensioned is to check the tab on the motor mount which is connected to the tension take up. If the tab is deforming on tension, the Poly-V bands are over tensioned.

6.5 Divert Motor replacement

The following steps detail the divert motor replacement on a Bastian Solutions' Conveyor PWD.

1. Disconnect all power and electrical communication to this conveyor section**. Bastian Solutions' Conveyor recommends using Lockout/Tagout (LOTO) procedures for this maintenance operation.**
2. The PWD divert motor is located at the upstream side of the PWD with its axis of rotation perpendicular to the rollers. Figure 18 illustrates the location and mounting of the PWD divert motor.

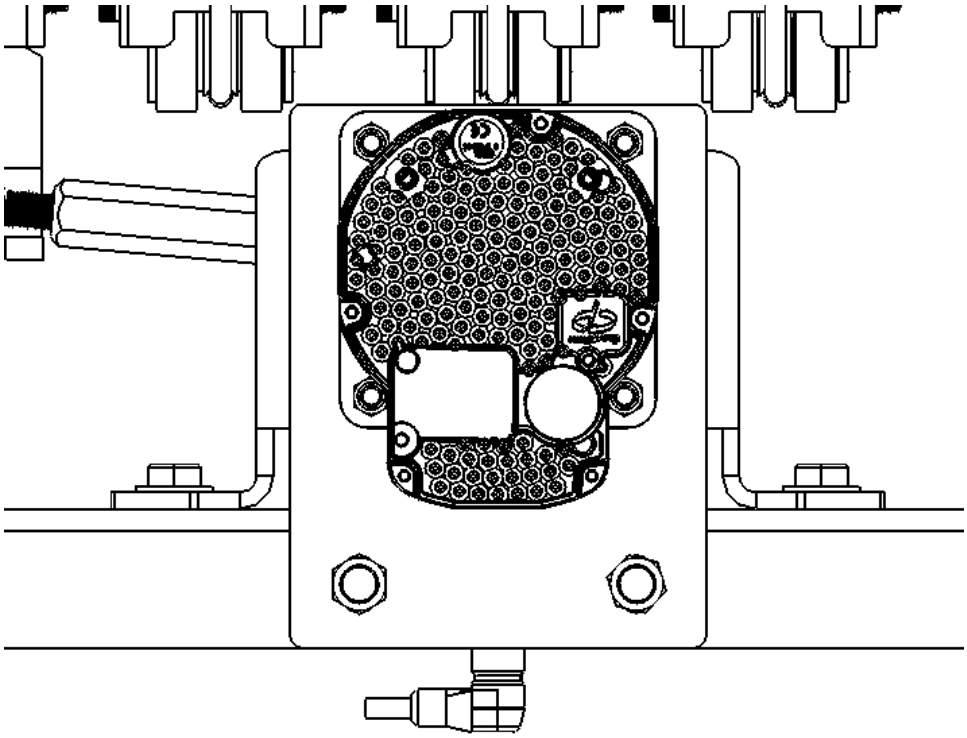


Figure 18: PWD divert motor mounting location and hardware

3. Remove the 3/8" hex head cap screw the connects the crank arm on the PWD divert motor to the divert linkage arm. Refer to Figure 19 for the location of the bolt.

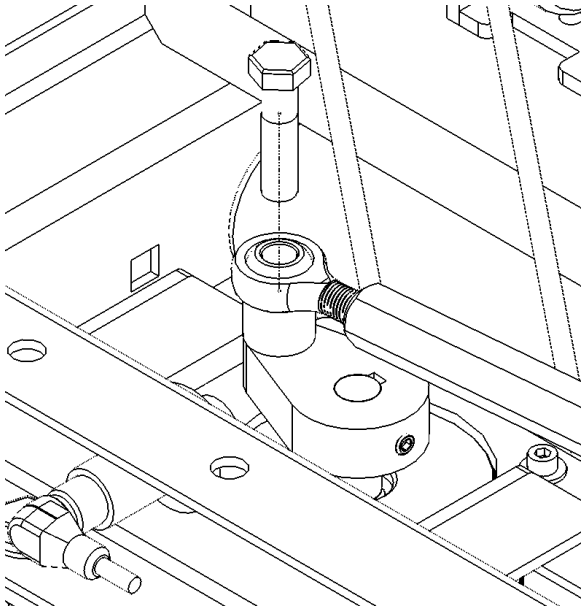


Figure 19: Connection between Divert linkage and Divert motor

4. Remove the divert motor mount sub assembly from the frame. The divert motor mount is connected to the frame via (4) 3/8" hex head cap screws and nylock nuts. Refer to Figure 20 that illustrates the mounting hardware and location. The torque requirement for 3/8" hex head cap screws and nylock nuts is 31 ft-lbs.

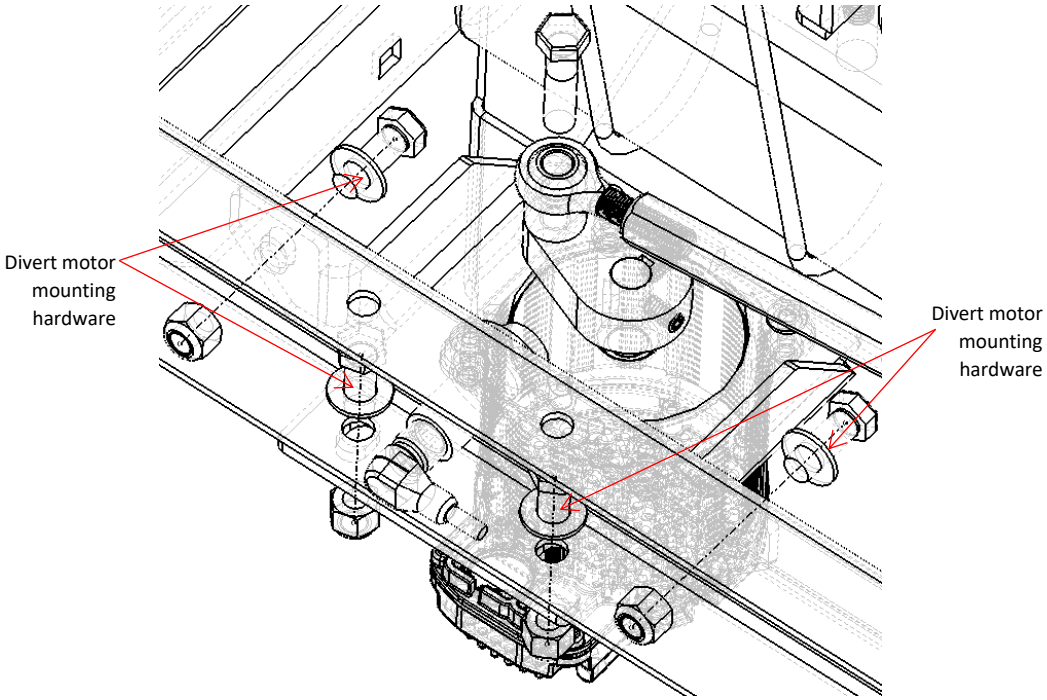


Figure 20: PWD divert motor mounting locations

5. Remove the hardware that connects the divert motor to the motor mount. The motor is connected to the divert motor mount via (4) #10-32 shoulder head cap screws. Refer to Figure

21 for the location of hardware that connects the divert motor to the motor mount. The torque requirement for #10-32 shoulder head cap screws and nylock nuts is 80 in-lbs.

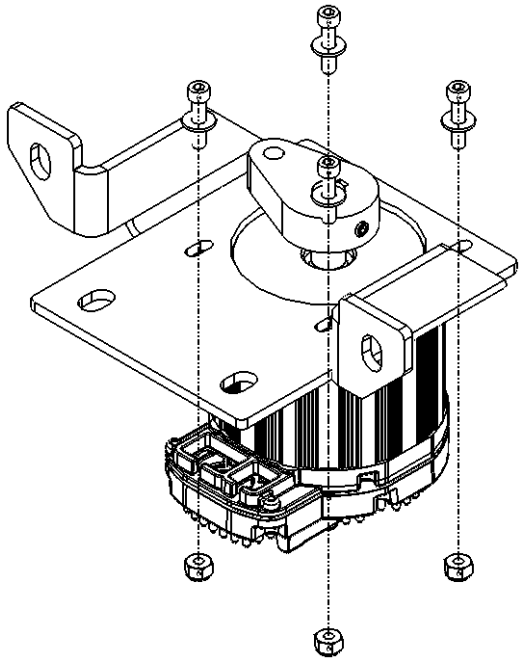


Figure 21: PWD divert motor mounting connections

6. Remove the crank arm from the motor mount shaft. A machine key and (2) #10-32 cup point set screws connect the motor shaft to the crank arm. The torque requirement for #10-32 set screws is 80 in-lbs.
7. Install the crank arm to the new divert motor and follow the disassembly steps in reverse to connect the new PWD divert motor.

6.6 PWD wheel drive band (O-ring) replacement

The following steps detail the PWD wheel drive band (O-ring) replacement for Bastian Solutions' Conveyor PWD. The frequency of band replacement is dependent on the system design.

1. Make sure the power to the drive and the divert motors are switched off. **Bastian Solutions' Conveyor recommends using Lockout/Tagout (LOTO) procedures for this operation.**
2. Cut the existing O-ring bands off the PWD.
3. Follow steps 3 and 4 from section 6.3. To summarize; Loosen the serrated flange nuts that hold the belt tension for the vertical take up of the drive motor. Loosen the four serrated flange nuts on the motor mount. Do not remove the serrated flange nuts from the carriage bolts for ease of reassembly. Remove the belt guard on the drive motor section. This is done by removing the fastener attachment on the bottom of the motor mount. Please ensure that there is no belt tension on the drive motor when this step is carried out.
4. Follow steps 4, 5 and 6 from section 6.4. To summarize; Remove the Poly-V belts from the motor hub that's attached on the drive motor. Remove the rollers. The rollers have spring loaded hex shafts for easy removal.

5. Remove the (2) 1/4”-20 shoulder head cap screws that attaches the divert linkage to the PWD wheel. Refer to Figure 22 that illustrates the hardware that needs to be removed. The torque requirement for 1/4”-20 shoulder head cap screws is 101 in-lbs.

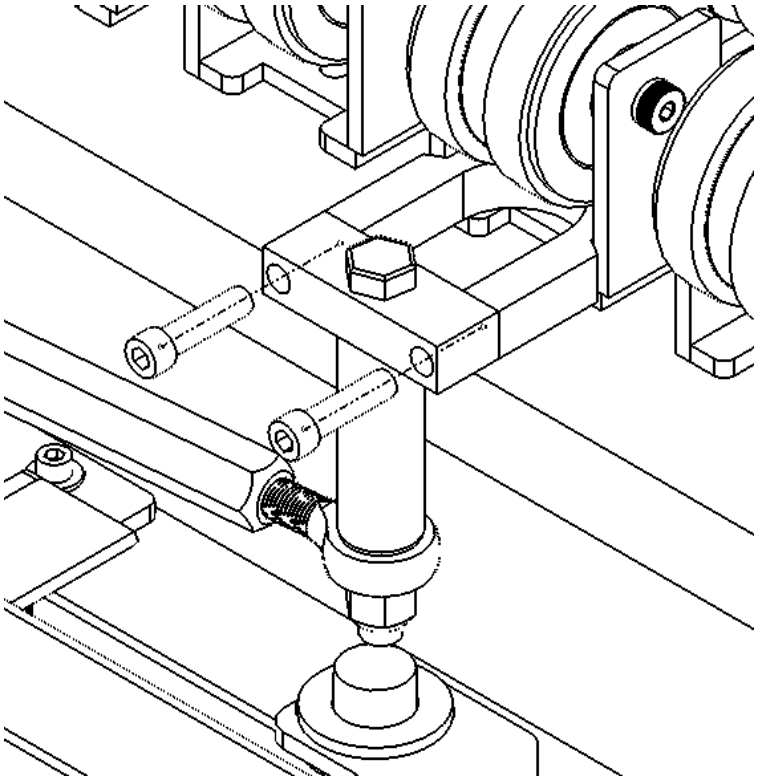


Figure 22: PWD divert linkage to PWD wheel attachment

6. Loosen the mounting bar screws on the both side of the PWD. **Loosen the (4) 3/8” serrated flange nuts on the left side of the frame and remove the (2) 1/4”-20 hex head mounting screws on the left side ONLY.** Refer to Figure 23 that illustrates the location of the mounting bar screws under the PWD frame. The torque requirements for the 3/8” carriage bolts and serrated flange nuts is 31 ft-lbs. The torque requirements for the 1/4”-20 hex head cap screws are 101 in-lbs.

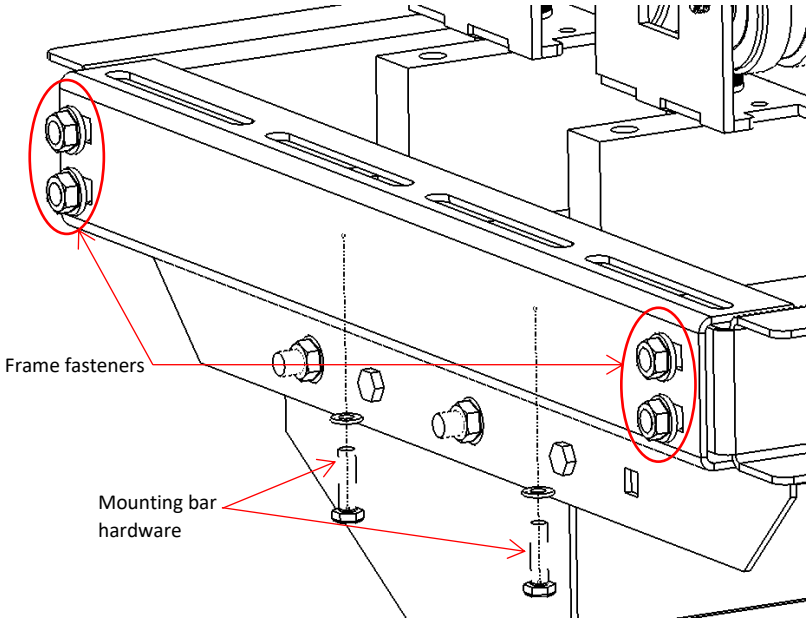


Figure 23: Mounting bar screws and serrated flange nuts on left side of PWD frame

7. Align the mounting bars at an angle so the new O-ring bands can be installed. Put six new bands through each mounting bar. Refer to Figure 24 that illustrates the position of the mounting bars to install new O-ring bands.

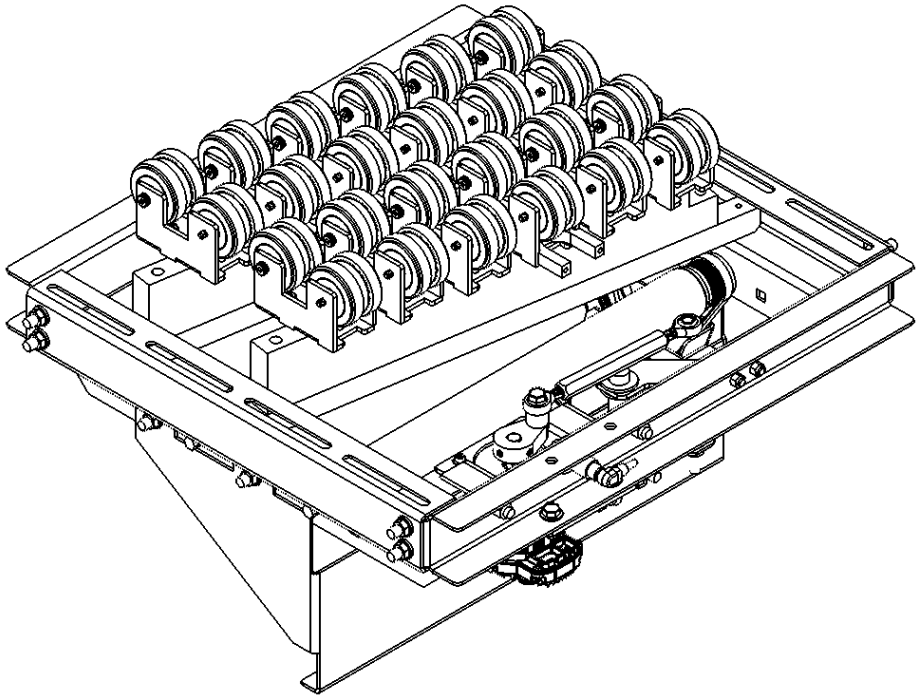


Figure 24: Mounting bars angled for installing O-rings

Based on the product conveyed; if the drive bands are a regular wear item, double the quantity of bands on each row. The second set of bands on each row will sit in between the divert wheel assemblies and can be easily mounted on the next maintenance cycle, effectively skipping steps 1-9.

8. Move the mounting bars to the original position and re-attach the mounting screws for the mounting bars. Tighten the serrated flange nuts on the frame.
9. Pass the rollers through the bands and attach to the hex holes. Ensure that the Poly-V bands are in the correct location on the Poly-V hub of the roller.
10. Re-engage the Poly-V bands with the drive motor and install the drive motor. Ensure that the belts are properly tensioned to allow for a better drive response and effective timing on the diverting section.
11. Re-engage the bands onto the diverter wheel assembly. Ensure that the band is centered on the groove and can freely rotate without any catch points in the assembly. If there are extra bands, ensure that they are placed in the notch between the side frame and the mounting bar. **Please be careful in doing this step as the band tension is fairly high and is characterized as a pinch point.**

6.7 Motor tuning tips

The PWD uses ClearPath-MC Teknic motors for both drive and divert movements. The motors are tuned at the Bastian Solutions' Conveyor facility for the specified design speed and divert direction. In the case of torque load problems on drive and divert motor, please refer to section 7 (Troubleshooting and Repair) of this manual.

If it has been established that there is an issue with the integration of the PWD with the controls system, the ClearPath interface provides diagnostic tools to identify issues with the PWD. The ClearPath interface has an inbuilt scope which allows for measuring torque, velocity error and position error while the system is running.

Further details on the ClearPath interface can be referenced in Bastian Solutions' Conveyor: Teknic Motor Service Bulletin.

7 Troubleshooting and Repair

Several issues that may arise with Bastian Solutions' Conveyor can be corrected with minimal field repairs. Bastian Solutions' encourages using the following troubleshooting techniques shown in Table 2 before contacting your Bastian Solutions' Conveyor representative. The troubleshooting techniques provided are the same operations followed by our field service engineers. To swiftly address any issues on site, Bastian Solutions' Conveyor asks that any issues that arise with the equipment be recorded in a log, with the mark number, description of the issue, and steps that were taken to resolve the issue.

Table 2: Troubleshooting guide

ERROR	CAUSE	ACTION
PWD flow and divert direction is incorrect	PWD is installed backwards.	Check flow direction on mark stickers and verify that divert motor is biased upstream.
	Drive motor direction is reversed.	Check control system parameter to reverse drive flow direction.
On straight or divert configuration, the PWD idler wheels are not oriented correctly	The divert linkage is not adjusted properly.	Follow section 6.2 to adjust the linkage.
		Re-run the homing sequence for the PWD. Cycle power on PWD.
	Loose fastener in the linkage mechanism.	Check fasteners under each idler wheel bracket, divert mechanism and row bracket.
PWD does not effectively divert product	PWD wheels are too low with reference to the TOR of the frame.	Remove PWD from the conveyor section. Shim the UHMW uprights and reinstall the PWD to the conveyor section.
	Timing issue with divert signal.	Check controls logic on timing for the divert signal.
Product does not convey smoothly over PWD	PWD idler wheels are too high with reference to the TOR of the frame.	Add shims to the mounting points of the PWD to the conveyor.
PWD drive motor stops working after a short period of operation	The drive motor in unable to provide the necessary amount of torque.	Check if the drive motor is connected to the correct power supply (48VDC).
		Check if the Poly-V rollers and/or the idler wheels have an obstruction or bad bearing.
		Contact your Bastian Solutions' Conveyor Representative.
	The tension of the O-rings on divert is very high.	Check if the drive motor is connected to the correct power supply (48VDC).
		Contact your Bastian Solutions' Conveyor representative.
PWD divert motor is constantly diverting	The home and divert proximity sensors are not connected.	Check home and divert proximity sensor connections to the control system and cycle power to execute the homing sequence.
	The communication signal to the divert motor is not registered.	Check the communication cable connection to the divert motor.

For issues not covered on the troubleshooting guide, Bastian Solutions' Conveyor recommends using the Equipment issue form located on the Bastian Intranet to quickly report issues. Bastian Solutions' Conveyor recommends completely filling out all the fields provided on the form and attaching any viable media to illustrate the issue at hand.

8 Spare Parts

Table 3 refers to general spare parts for a PWD. Please refer to appendix 0 for general arrangements for spare parts. The general arrangements have specific views for left divert and right divert configuration.

Table 3: General spare lists for PWD

Part Number	Qty.	Units	Description
A003BR-10012	14	EA	FLANGED BRONZE BEARING, 1/4" ID, 0.38in OD, 0.25in L, 0.47in FLANGE OD, 0.06in FLANGE THK, BRONZE
A003BR-10007	12	EA	THRUST BEARING, 1/2" ID, 0.94in OD, 0.25in THICK, STEEL BALL
A001BA-10032	12	EA	ORING, 0.216in OD, 21.07in L, BLACK, HEHT, SOFTENED
A003BR-10013	14	EA	THRUST BEARING, 1/4" ID, 0.63iN OD, 0.06in THK, BRONZE
A013TM-10004	1	EA	DC SERVO MOTOR, TEKNIC MCVC-3421S
A003EB-10001	1	EA	BALL JOINT, 3/8"-24 RH MALE THD, 1.25in THD LENGTH, 0.38in ID, 2.44in L
A003EB-10002	1	EA	BALL JOINT, 3/8"-24 LH MALE THD, 1.25in THD LENGTH, 0.38in ID, 2.44in L
A001RL-10047	2	EA	ROLLER, 1.9in OD, POLYV, 7/16" HEX, 20.5in BF, ABEC-1
A002EC-10065	2	EA	M12 CONNECTOR, RIGHT ANGLE
A002SE-10030	2	EA	PROX, M18 X 1 FLUSH MOUNT TO 3 PIN M12 CONNECTOR, 60mm L, 8mm SENSING RANGE, PNP, NORAMALLY OPEN, 2 LOCK NUTS
A013TM-10006	1	EA	DC SERVO MOTOR, TEKNIC MCVC-3441P
A001CP-10044	1	EA	V PULLEY, J PROFILE X 9. MACHINED
A001BA-10009	2	EA	POLYV, 4 RIBS, 435mm L
A002CA-10085	2	EA	CLEARPATH I/O CABLE, 10', 22GA, 2X4 MINI-FIT TO FLYING LEADS
A002CA-10086	2	EA	CLEARPATH POWER CABLE, 10', 16GA, 2X2 MINI-FIT TO FLYING LEADS
Z075PA-10001	24	EA	ASM, PIVOT DRIVE WHEEL

9 Appendix

9.1 Ship loose items

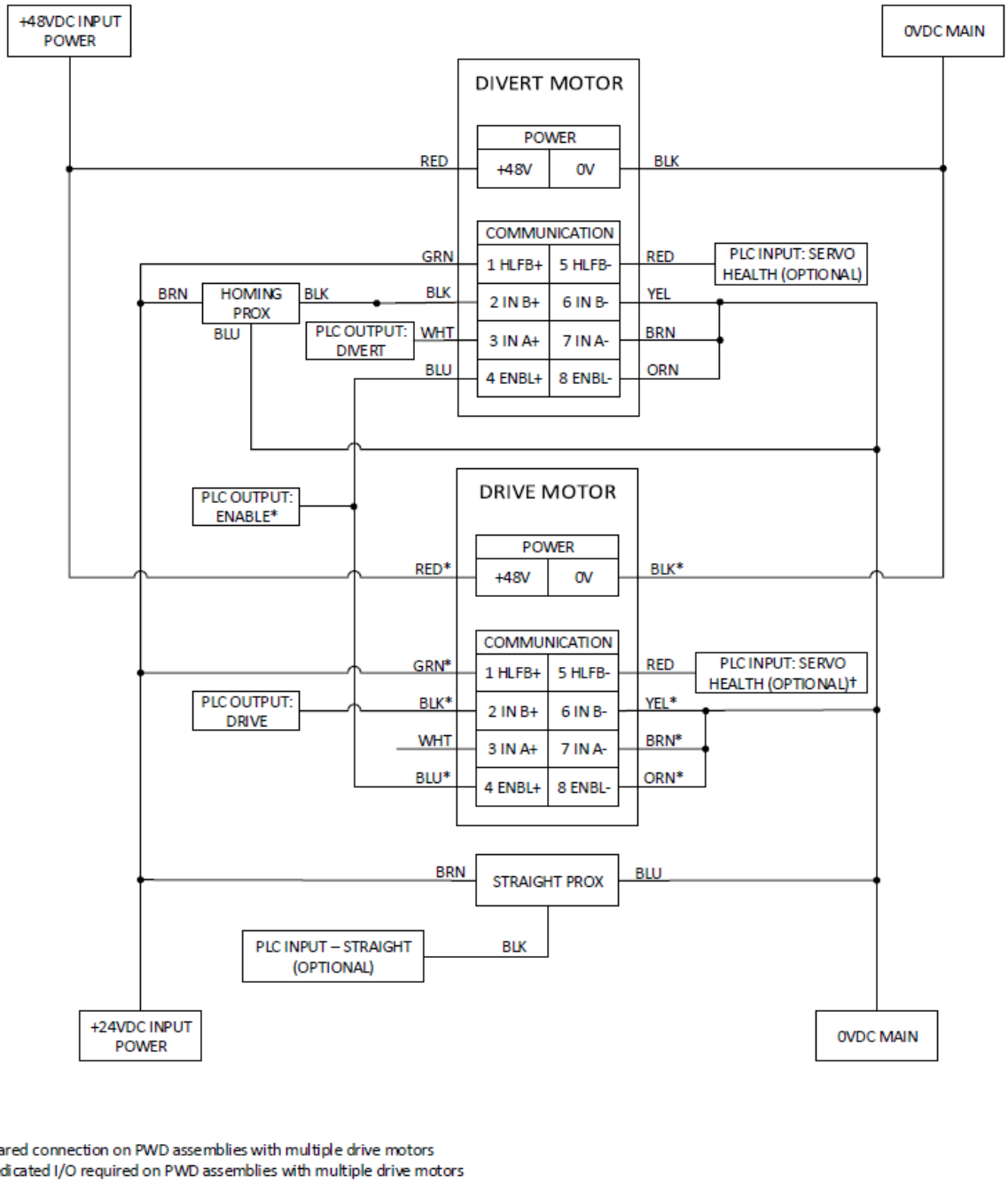
Table 4 refers to the ship loose items provided with purchase of a PWD.

Table 4: Ship loose items for PWD

Part Number	Qty.	Units	Description
A002CA-10085	2	EA	CLEARPATH I/O CABLE, 10', 22GA, 2X4 MINI-FIT TO FLYING LEADS
A002CA-10086	2	EA	CLEARPATH POWER CABLE, 10', 16GA, 2X2 MINI-FIT TO FLYING LEADS
A002EC-10065	2	EA	M12 CONNECTOR, RIGHT ANGLE
A003CB-00061	8	EA	CARRIAGE BOLT, 3/8"-16 UNC X 1"L, GR5, ZINC PLATED, FULL THD
A003WI-00010	8	EA	WIZ NUT, 3/8"-16 UNC, GR2, ZINC PLATED

9.2 PWD wiring diagram

The PWD wiring diagram is illustrated in Figure 25.



* Shared connection on PWD assemblies with multiple drive motors
† Dedicated I/O required on PWD assemblies with multiple drive motors

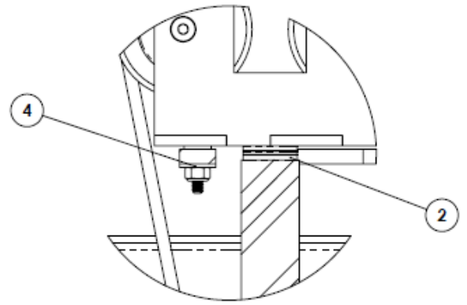
Figure 25: PWD wiring diagram

9.3 Spare Parts - General Arrangements

Please find attached general arrangements for left divert and right divert configurations of a 24” OAW PWD.

ITEM NO.	PART NUMBER	QTY	UNITS	DESCRIPTION
1	A003BR-10012	14	EA	FLANGED BRONZE BEARING, 1/4" ID, 0.38in OD, 0.25in L, 0.47in FLANGE OD, 0.06in FLANGE THK, BRONZE
2	A003BR-10007	12	EA	THRUST BEARING, 1/2" ID, 0.94in OD, 0.25in THICK, STEEL BALL
3	A001BA-10032	12	EA	ORING, 0.216in OD, 21.07in L, BLACK, HEHT, SOFTENED
4	A003BR-10013	14	EA	THRUST BEARING, 1/4" ID, 0.63iN OD, 0.06in THK, BRONZE
5	A013TM-10004	1	EA	DC SERVO MOTOR, TEKNIC MCVC-34215
6	A003EB-10001	1	EA	BALL JOINT, 3/8"-24 RH MALE THD, 1.25in THD LENGTH, 0.38in ID, 2.44in L
7	A003EB-10002	1	EA	BALL JOINT, 3/8"-24 LH MALE THD, 1.25in THD LENGTH, 0.38in ID, 2.44in L
8	A001RL-10047	2	EA	ROLLER, 1.9in OD, POLYV, 7/16" HEX, 20.5in BF, ABEC-1
9	A002EC-10065	2	EA	M12 CONNECTOR, RIGHT ANGLE
10	A002SE-10030	2	EA	PROX, M18 X 1 FLUSH MOUNT TO 3 PIN M12 CONNECTOR, 60mm L, 8mm SENSING RANGE, PNP, NORAMALLY OPEN, 2 LOCK NUTS
11	A013TM-10006	1	EA	DC SERVO MOTOR, TEKNIC MCVC-3441P
12	A001CP-10044	1	EA	V PULLEY, J PROFILE X 9. MACHINED
13	A001BA-10009	2	EA	POLYV, 4 RIBS, 435mm L
14	A002CA-10085	2	EA	CLEARPATH I/O CABLE, 10', 22GA, 2X4 MINI-FIT TO FLYING LEADS
15	A002CA-10086	2	EA	CLEARPATH POWER CABLE, 10', 16GA, 2X2 MINI-FIT TO FLYING LEADS
16	Z075PA-10001	24	EA	ASM, PIVOT DRIVE WHEEL

REVISION DESCRIPTION
ORIGINAL DOCUMENT



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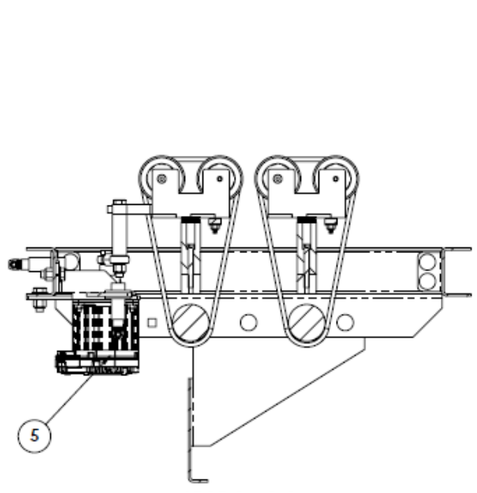

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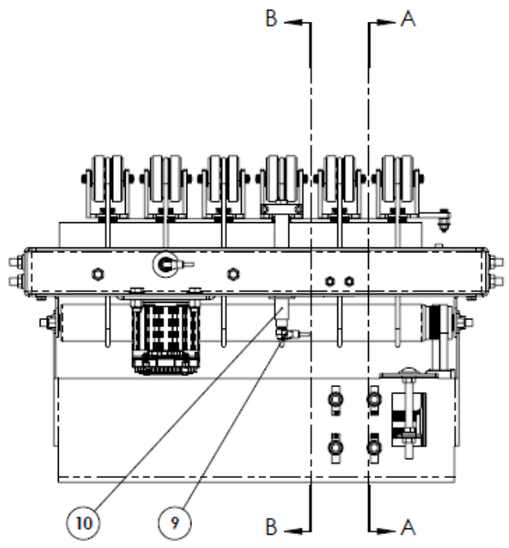

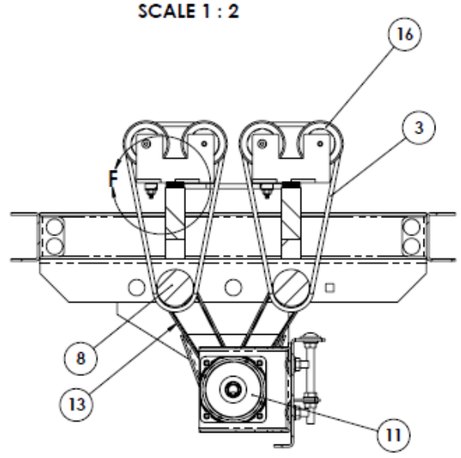

SECTION **A-A**

TORQUE TABLE	
TYPE	TORQUE (±20%)
#2-56, GR2	5.0 in-lb
#6-32, GR2	20.0 in-lb
#8-32, GR2	36.0 in-lb
#10-24, GR2	54.0 in-lb
1/4"-20, GR2	32.0 in-lb
3/8"-16, GR2	10.0 ft-lb
5/8"-11, GR2	48.0 ft-lb
3/4"-10, GR5	85.0 ft-lb

NOTES:
1. ITEM 14 AND 15 ARE NOT ILLUSTRATED IN THE GENERAL ARRANGEMENT. THESE ITEMS ARE THE POWER AND COMMUNICAITON CABLES FOR THE TEKNIC MOTORS (ITEM 5 AND 11).

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ORIGINATOR	R.CHOUDHURI
CHECKER	B.MILLER
APPROVER	C.PERRY
APPROVAL DATE	10/04/2019
TITLE	GENERAL ARRANGEMENT, PIVOT WHEEL DIVERT, 24IN OAW, 24IN OAL, 12IN ZONE L, DIVERT LEFT
DOCUMENT NUMBER	GA-PWD-24-24-12-0001
REVISION	A
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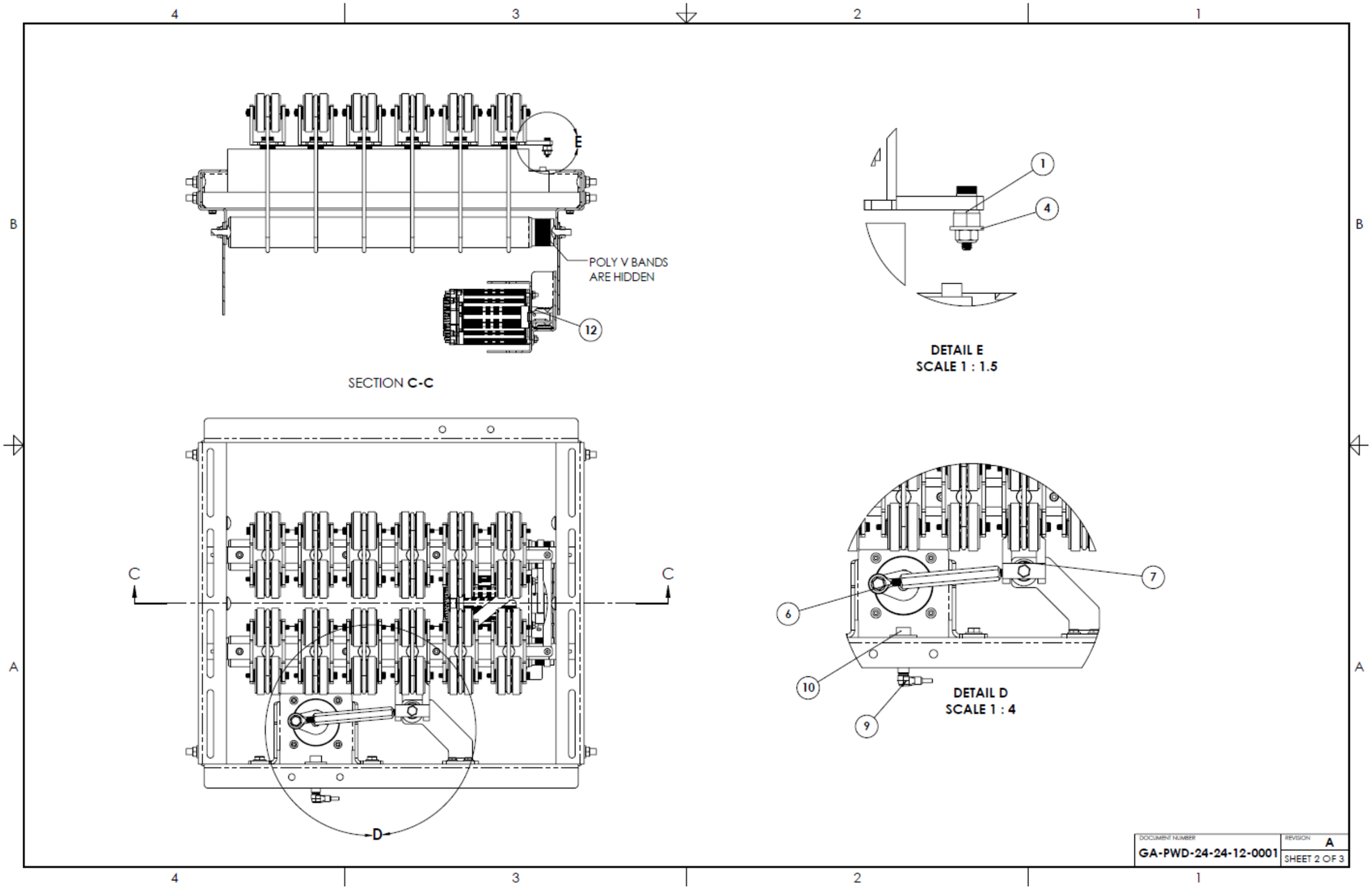
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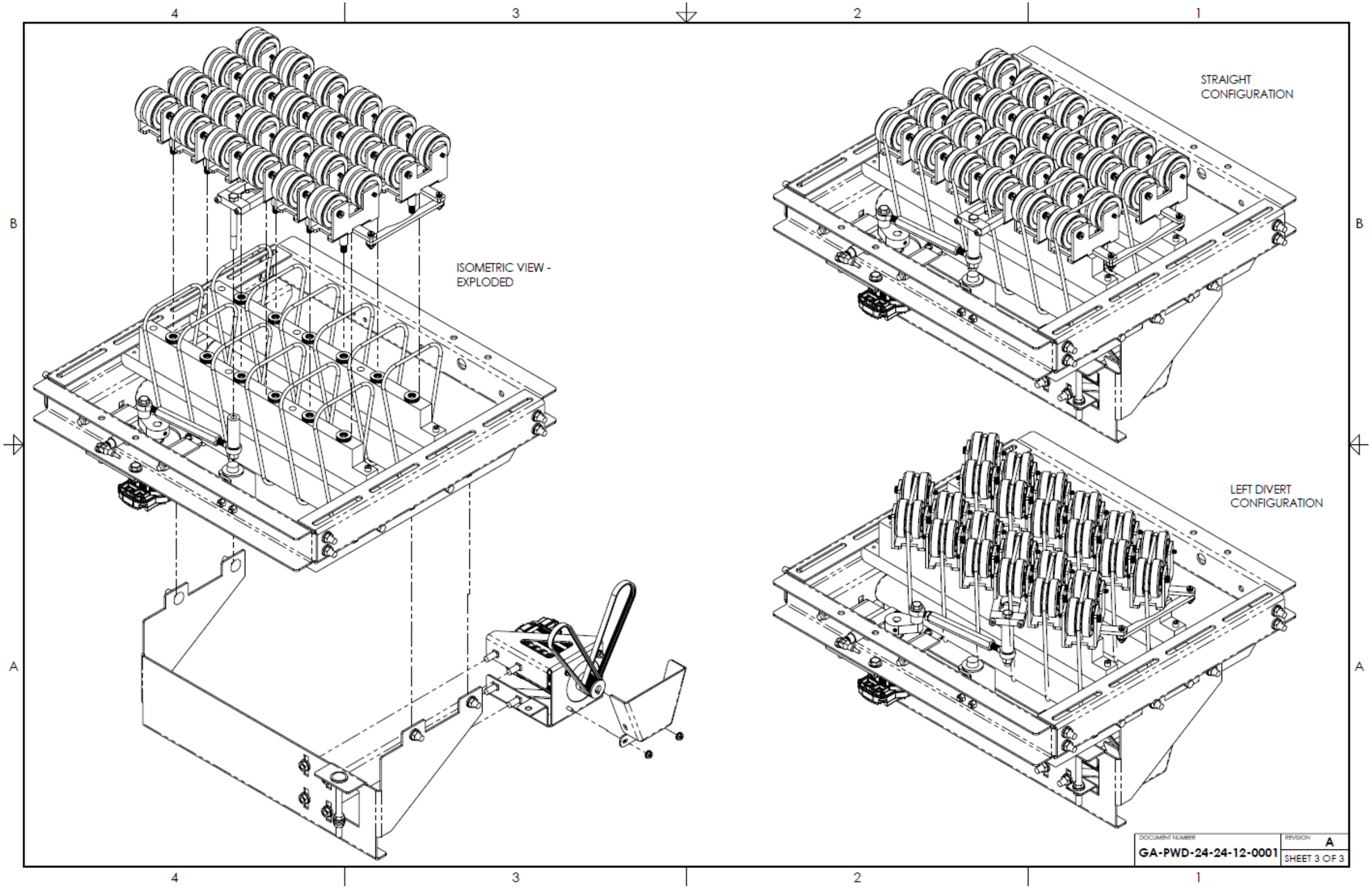
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STRAIGHT CONFIGURATION
LEFT DIVERT CONFIGURATION
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GA-PWD-24-24-12-0001
REVISION
A
SHEET 3 OF 3

ITEM NO.	PART NUMBER	QTY	UNITS	DESCRIPTION
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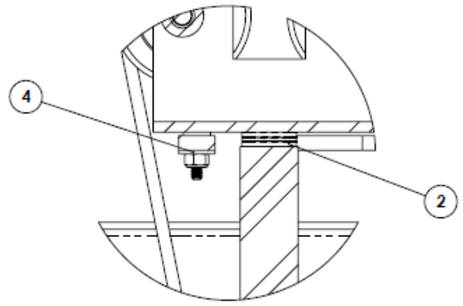

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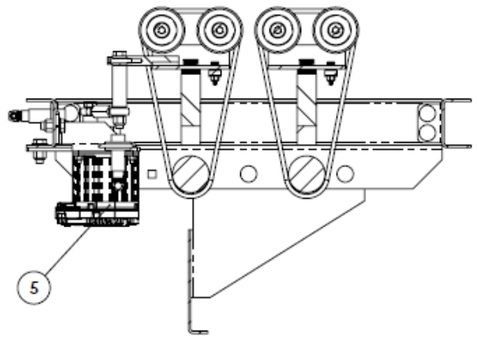

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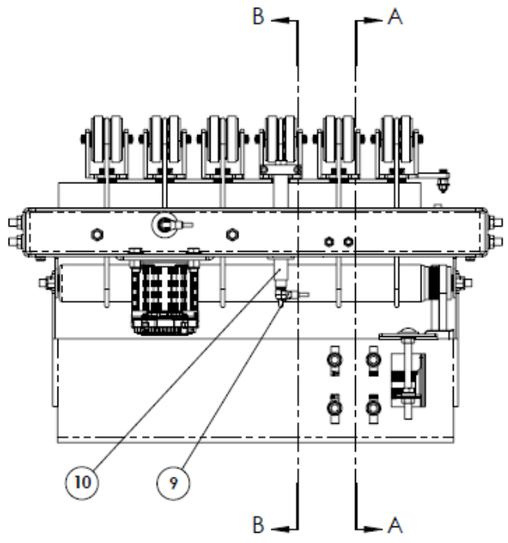

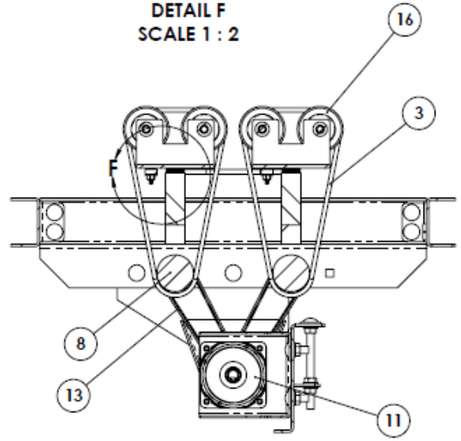

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ORIGINATOR	R.CHOUDHURI
CHECKER	B.MILLER
APPROVER	C.PERRY
APPROVAL DATE	10/08/2019
TITLE	GENERAL ARRANGEMENT, PIVOTED WHEEL DIVERT, 24IN OAW, 24IN OAL, 12IN ZONE L, DIVERT RIGHT
DOCUMENT NUMBER	GA-PWD-24-24-12-0002
REVISION	A
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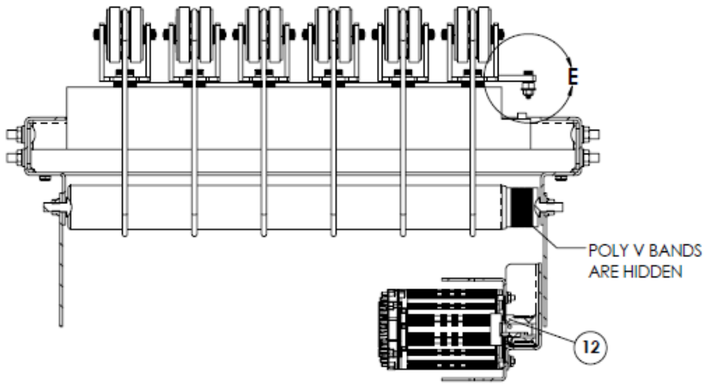
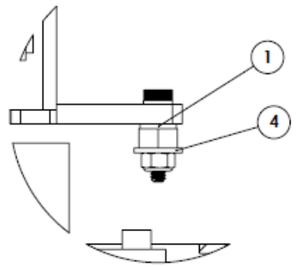
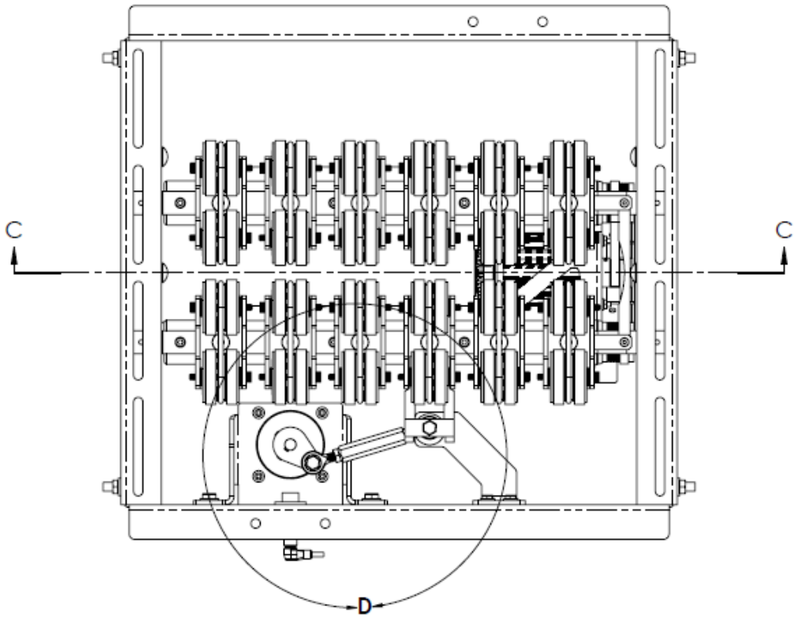
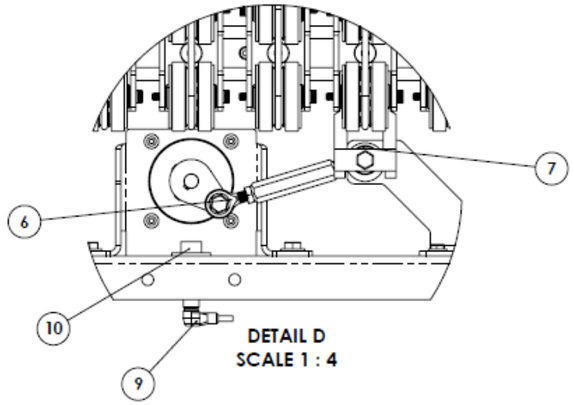


SECTION **C-C**



DETAIL E
SCALE 1 : 1.5





DETAIL D
SCALE 1 : 4

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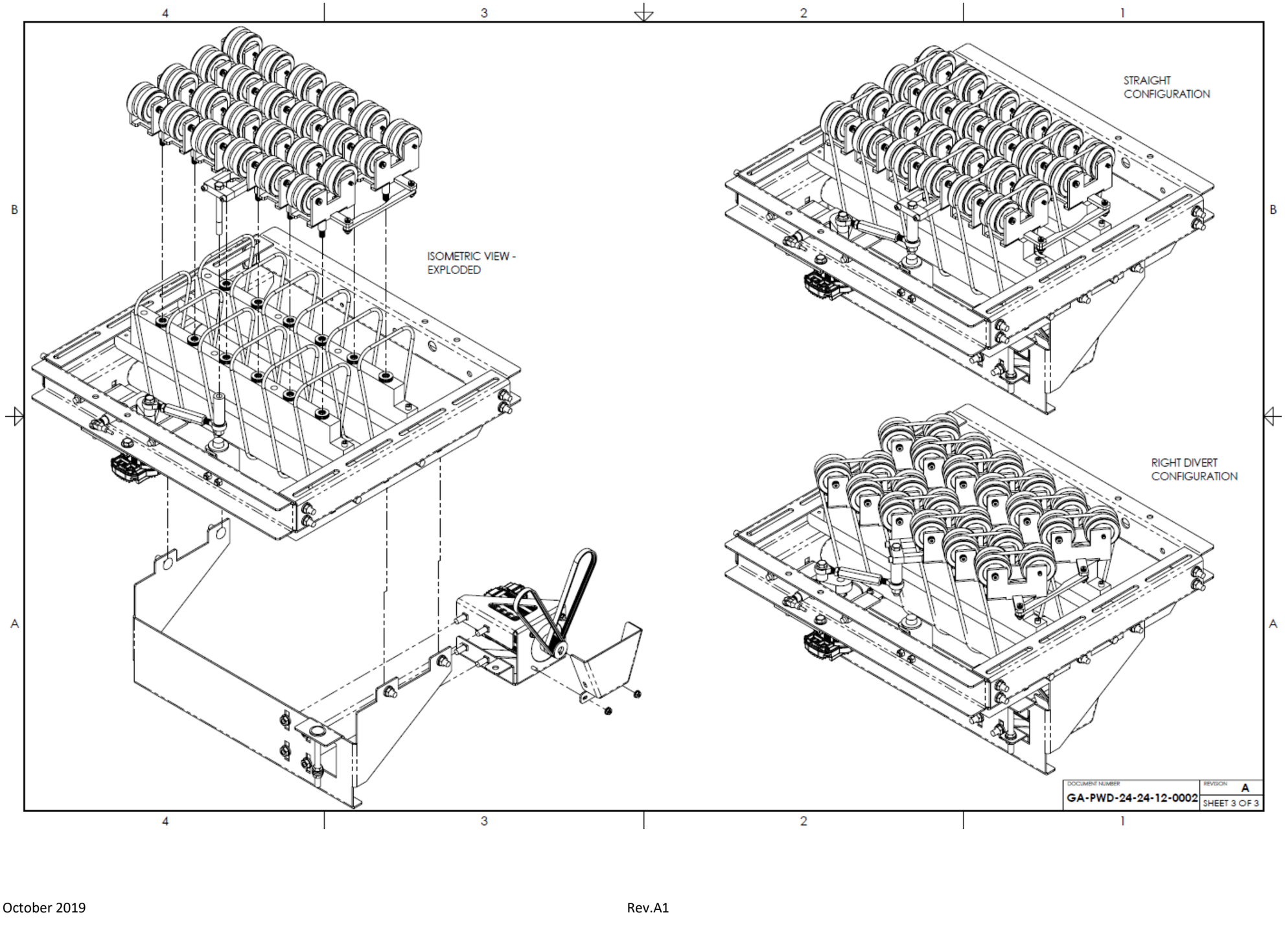
GA-PWD-24-24-12-0002	A
	SHEET 2 OF 3


4
3
2
1
B
A
ISOMETRIC VIEW -
EXPLODED
STRAIGHT
CONFIGURATION
RIGHT DIVERT
CONFIGURATION
DOCUMENT NUMBER
GA-PWD-24-24-12-0002
REVISION
A
SHEET 3 OF 3

Bastian Solutions Conveyor Installation and Maintenance Manual

Model: PWD

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